

Safety Precautions

- Important Notes on exporting this product or equipment containing this product;
If the end-user or application of this product is related to military affairs or weapons, its export may be controlled by "Foreign Exchange and Foreign Trade Control Law" of Japan where export license will be required before product can be exported from Japan.
- This product is designed and manufactured for use in General Purpose Industrial Equipment and it is not intended to be used in equipment or system that may cause personal injury or death.
- All servicing such as installation, wiring, operation, maintenance and etc., should be performed by qualified personnel only.
- Tighten mounting screws with an adequate torque by taking into consideration strength of the screws and the characteristics of material to which the product will be mounted. Over tightening can damage the screw and/or material; under tightening can result in loosening.
- Install safety equipment to prevent serious accidents or loss that is expected in case of failure of this product.
- Consult us before using this product under such special conditions and environments as nuclear energy control, aerospace, transportation, medical equipment, various safety equipments or equipments which require a lesser air contamination.
- We have been making the best effort to ensure the highest quality of our products, however, some applications with exceptionally large external noise disturbance and static electricity, or failure in input power, wiring and components may result in unexpected action. It is highly recommended that you make a fail-safe design and secure the safety in the operative range.
- If the motor shaft is not electrically grounded, it may cause an electrolytic corrosion to the bearing, depending on the condition of the machine and its mounting environment, and may result in the bearing noise. Checking and verification by customer is required.
- Failure of this product depending on its content may generate smoke of about one cigarette. Take this into consideration when the application of the machine is clean room related.
- Please be careful when using the product in an environment with high concentrations of sulfur or sulfuric gases, as sulfuration can lead to disconnection from the chip resistor or a poor contact connection.
- Do not input a supply voltage which significantly exceeds the rated range to the power supply of this product. Failure to heed this caution may lead to damage of the internal parts, causing smoke and/or fire and other troubles.
- The user is responsible for matching between machine and components in terms of configuration, dimensions, life expectancy, characteristics, when installing the machine or changing specification of the machine. The user is also responsible for complying with applicable laws and regulations.
- Manufacturer's warranty will be invalid if the product has been used outside its stated specifications.
- Component parts are subject to minor change to improve performance.
- Read and observe the instruction manual to ensure correct use of the product.

Repair Consult to the dealer from whom you have purchased this product for details of repair work.
When the product is incorporated to the machine you have purchased, consult to the machine manufacturer or its dealer.

URL Electronic data of this product (Instruction Manual, CAD data) can be downloaded from the following web site;
industrial.panasonic.com/ac/e/

● Contact to : _____

Panasonic
INDUSTRY

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Industrial Device Business Division
1-1 Morofuku 7-chome, Daito, Osaka 574-0044, Japan

 [Panasonic Industrial](#)



Panasonic
INDUSTRY

AC Servo Motor & Driver

MINAS A6 Family
MINAS E series

IN Better Solution



AC Servo Motor & Driver <MINAS A6 Family, MINAS E series>

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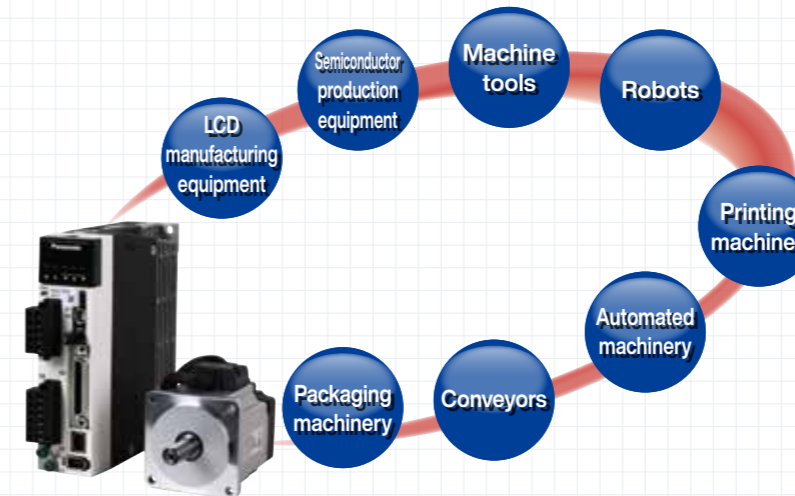
● This product is for industrial equipment. Don't use this product at general household.

MINAS A6 Family



More compact, more faster and more easy-to-use Servomotors that meet the demands of the present age.

The MINAS A6 family of advanced AC servomotors is changing the landscape of industrial machinery.



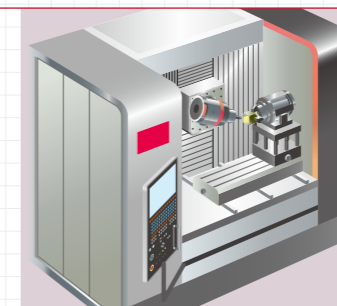
Robots

A robot is required to operate stably despite arm posture and position, workload and other conditions changing from moment to moment. The MINAS A6 family assures stable operation by suppressing effects of load to a minimum using "adaptive load control."



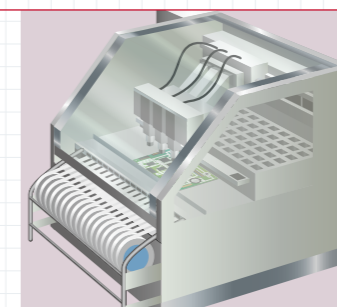
Processing machinery

With metal processing machine, it is very difficult to render mirror-like finishing on a polygonal body. The A6 family realizes "3.2 kHz frequency response" to improve feedback responsiveness, thus enabling mirror surfacing without generating lines or streaks.



Component mounting machines

The A6 family also shows its versatility when used with a component mounting machine where speed and positional accuracy are demanded. In addition to high frequency response, it can process accidental disturbances with the help of built-in "adaptive load control," thus maintaining high productivity.



INDEX

A6 Family

| | |
|---|----|
| A6 Family Line-up..... | 3 |
| Motor Features..... | 9 |
| Driver Features..... | 11 |
| Protective Features..... | 13 |
| Other Driver Functions..... | 13 |
| Setup Support Software..... | 15 |
| Network servo driver..... | 17 |
| Servo motor with battery-less absolute encoder..... | 19 |
| Compliance with International Standards..... | 20 |
| Motor Line-up..... | 21 |
| Model Designation..... | 22 |
| Overall Wiring..... | 23 |
| Applicable Peripheral Devices..... | 27 |
| Table of Part Numbers and Options..... | 29 |

| | |
|--------------------------------------|-----------|
| Driver Specifications | 43 |
| A6SF series..... | 43 |
| A6SG series and A6SE series..... | 45 |
| Wiring Diagram | 47 |
| Wiring to the connector | |
| XA, XB, XC, and Terminal Block..... | 47 |
| Safety Function | 51 |
| Wiring to the Connector, X3..... | 51 |
| Control Circuit Diagram | 52 |
| Wiring to the Connector, X4..... | 52 |
| Wiring to the Connector, X5..... | 54 |
| Wiring to the Connector, X6..... | 55 |
| Dimensions of Driver..... | 57 |

| | |
|--------------------------------------|-----------|
| Motor Specifications | 62 |
| Motor Dimensions..... | 119 |
| Special Order Product..... | 203 |
| Motors with Gear Reducer..... | 293 |
| Motor Specification Description..... | 303 |

| | |
|--|-----|
| Options | |
| Specifications of Motor connector..... | 307 |
| Encoder Cable..... | 309 |
| Motor Cable..... | 313 |
| Brake Cable..... | 321 |
| Interface Cable..... | 322 |
| Connector Kit..... | 323 |
| Battery for Absolute Encoder..... | 338 |
| Surge Absorber for Motor Brake..... | 339 |
| Mounting Bracket..... | 340 |
| Reactor..... | 342 |
| External Regenerative Resistor..... | 343 |
| Daisy Chain..... | 345 |
| Cable part No. Designation..... | 346 |
| List of Peripheral Devices | |
| Manufacturers..... | 347 |

| | |
|-------------------------|------------|
| A6N series | 349 |
|-------------------------|------------|

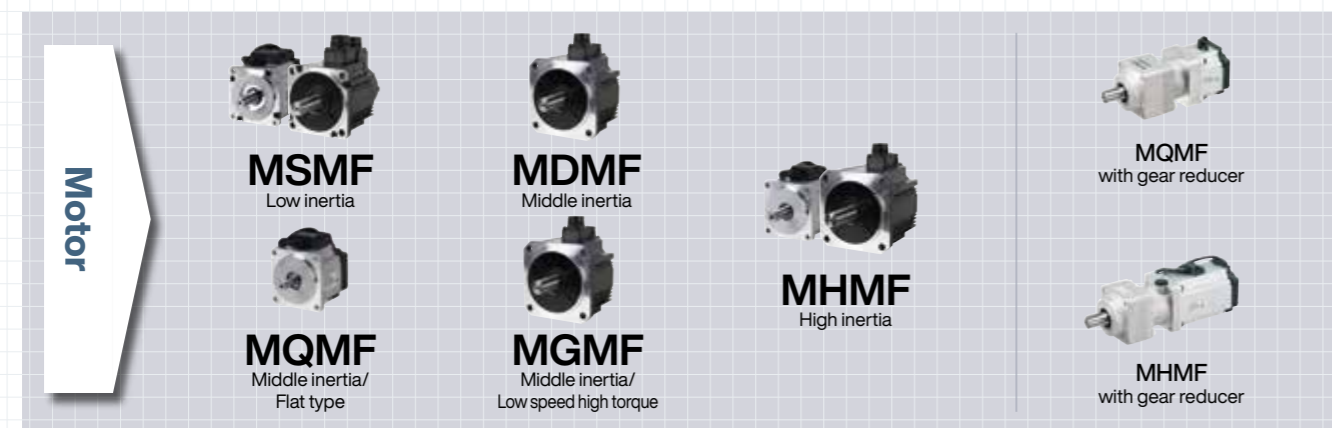
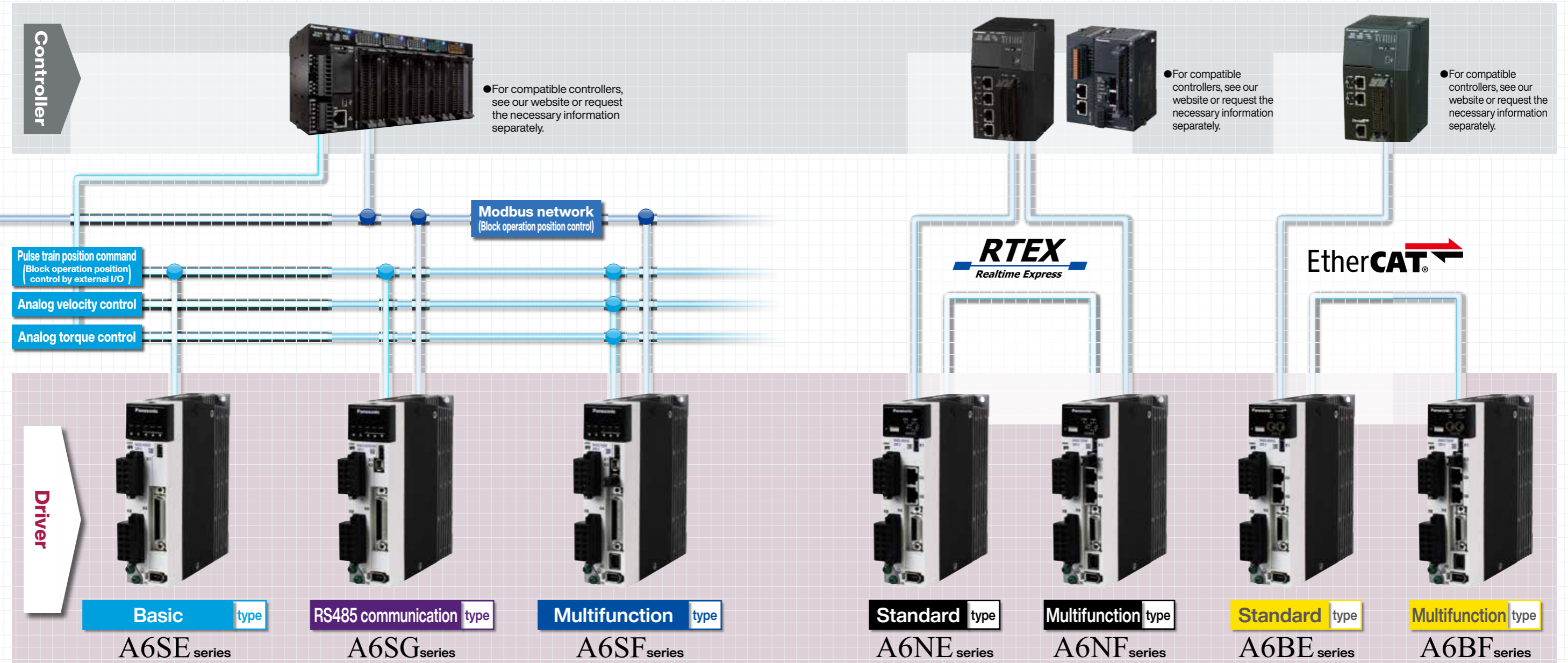
| | |
|-------------------------|------------|
| A6B series | 369 |
|-------------------------|------------|

| | |
|-----------------------|------------|
| E series | 377 |
|-----------------------|------------|

| | |
|-------------------------------|------------|
| Information | 408 |
| Index..... | 448 |
| Sales Office of Overseas..... | 462 |

Servomotors that flexibly and effectively fit into

various system configurations **MINAS** A6 Family



Special order product For more information, visit the website or please request to our distributors separately.

Slim design and position control type

E series

- Ultra-small design and pulse train command type only, DIN-rail mountable (using mounting Kit)
- Rated output: 50 W to 400 W

MINAS A6 DC24 V / DC48 V type Special order product

- DC24 V / DC48 V power supply
- Rated output :
DC24 V: 50 W
100 W
133 W
DC48 V: 50 W
100 W
133 W
266 W

Dual-axis servo driver Special order product

- Reduced wiring by dual-axis integration
- Supports both rotary motors and linear / DD motors
- Rated output :
Max.200 W ×2-axis
Max.400 W ×2-axis
Max.750 W ×2-axis
Max.1 kW ×2-axis

RTEX
Realtime Express

It is MINAS A6 Family lineup that meets the

manufacturing industry needs. **MINAS** A6 Family

Motor line-up













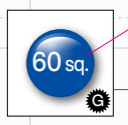
| | | 50 w | 100 w | 200 w | 400 w | 750 w | 850 w | 1000 w | 1.0 kW | 1.3 kW | 1.5 kW | | 1.8 kW | 2.0 kW | 2.4 kW | 2.9 kW | 3.0 kW | 4.0 kW | 4.4 kW | 5.0 kW | 5.5 kW | 7.5 kW | 11.0 kW | 15.0 kW | 22.0 kW | | |
|---|---|------------------------|------------------------|--------|------------------------|--------|--------|------------------------|------------------------|---------|--------|--|---------|---------|---------|------------------------|------------------------|------------------------|---------|---------|---------|--------------------------|--------------------------|------------------------|---------|---------|--|
| Low inertia MSMF | 100 V  | 38 sq. | 38 sq. | 60 sq. | 60 sq. | | | | | | | | | | | | | | | | | | | | | | |
| | Rated rotational speed (Maximum rotational speed) | 3000 r/min(6000 r/min) | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 V  | 38 sq. | 38 sq. | 60 sq. | 60 sq. | 80 sq. | | 80 sq. | 100 sq. | 100 sq. | | | | 100 sq. | | | | 120 sq. | 130 sq. | | | 130 sq. | | | | | |
| Rated rotational speed (Maximum rotational speed) | 3000 r/min(6000 r/min) | | | | | | | | 3000 r/min(5000 r/min) | | | | | | | | | 3000 r/min(5000 r/min) | | | | | | | | | |
| 400 V  | | | | | | | | 100 sq. | 100 sq. | | | | 100 sq. | | | | 120 sq. | 130 sq. | | | 130 sq. | | | | | | |
| Rated rotational speed (Maximum rotational speed) | | | | | | | | 3000 r/min(5000 r/min) | | | | | | | | | 3000 r/min(5000 r/min) | | | | | | | | | | |
| Middle inertia/Flat type MQMF | 100 V  | | 60 sq. | 80 sq. | 80 sq. | | | | | | | | | | | | | | | | | | | | | | |
| | Rated rotational speed (Maximum rotational speed) | | 3000 r/min(6500 r/min) | | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 V  | | 60 sq. | 80 sq. | 80 sq. | | | | | | | | | | | | | | | | | | | | | | |
| Rated rotational speed (Maximum rotational speed) | | 3000 r/min(6500 r/min) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Middle inertia MDMF | 200 V  | | | | | | | | 130 sq. | 130 sq. | | | | 130 sq. | | | 130 sq. | 176 sq. | | | 176 sq. | | 176 sq. | 220 sq. | 220 sq. | 220 sq. | |
| | Rated rotational speed (Maximum rotational speed) | | | | | | | | 2000 r/min(3000 r/min) | | | | | | | | 2000 r/min(3000 r/min) | | | | | 1500 r/min ^{*1} | | 1500 r/min(2000 r/min) | | | |
| | 400 V  | | | | | | | | 130 sq. | 130 sq. | | | | 130 sq. | | | 130 sq. | 176 sq. | | | 176 sq. | | | | | | |
| Rated rotational speed (Maximum rotational speed) | | | | | | | | 2000 r/min(3000 r/min) | | | | | | | | 2000 r/min(3000 r/min) | | | | | | | | | | | |
| Middle inertia/Low speed high torque MGMF | 200 V  | | | | | | | | 130 sq. | 130 sq. | | | | 130 sq. | 176 sq. | 176 sq. | | | | 176 sq. | | | | | | | |
| | Rated rotational speed (Maximum rotational speed) | | | | | | | | 1500 r/min(3000 r/min) | | | | | | | | 1500 r/min(3000 r/min) | | | | | | | | | | |
| | 400 V  | | | | | | | | 130 sq. | 130 sq. | | | | 130 sq. | 176 sq. | 176 sq. | | | | 176 sq. | | | | | | | |
| Rated rotational speed (Maximum rotational speed) | | | | | | | | 1500 r/min(3000 r/min) | | | | | | | | 1500 r/min(3000 r/min) | | | | | | | | | | | |
| High inertia MHMF | 100 V  | 40 sq. | 40 sq. | 60 sq. | 60 sq. | | | | | | | | | | | | | | | | | | | | | | |
| | Rated rotational speed (Maximum rotational speed) | 3000 r/min(6500 r/min) | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 V  | 40 sq. | 40 sq. | 60 sq. | 60 sq. | 80 sq. | | 80 sq. | 130 sq. | 130 sq. | | | | 176 sq. | | | 176 sq. | 176 sq. | | | 176 sq. | | | 176 sq. | | | |
| Rated rotational speed (Maximum rotational speed) | 3000 r/min(6500 r/min) | | | | 3000 r/min(6000 r/min) | | | 2000 r/min(3000 r/min) | | | | | | | | | 2000 r/min(3000 r/min) | | | | | | 1500 r/min ^{*1} | | | | |
| 400 V  | | | 60 sq. | 60 sq. | 80 sq. | | 80 sq. | 130 sq. | 130 sq. | | | | 176 sq. | | | 176 sq. | 176 sq. | | | 176 sq. | | | | | | | |
| Rated rotational speed (Maximum rotational speed) | | | 3000 r/min(6500 r/min) | | 3000 r/min(6000 r/min) | | | 2000 r/min(3000 r/min) | | | | | | | | 2000 r/min(3000 r/min) | | | | | | | | | | | |

Table description



Flange sq. dimension [Unit: mm]

Also available with gear reducer.

<Information> "MINAS A6 Family 400 V Series" catalog is available separately.
For more information, please visit our website or request to our distributors separately.

*1 Maximum rotational speed is 3000 r/min.

It is MINAS A6 Family lineup that meets the

manufacturing industry needs. **MINAS** A6 Family

Driver line-up

| | Rotary motor | | | Linear motor / DD motor | |
|---|--------------------------------|---|---|---|---|
| | Basic type A6SE series | RS485 communication type A6SG series | Multifunction type A6SF series | Basic type A6SL series <small>Special order product</small> | Multifunction type A6SM series <small>Special order product</small> |
| Position control | ● | ● | ● | ● | ● |
| Block operation | (External contact signal only) | (External contact signal or Modbus communication) | (External contact signal or Modbus communication) | (External contact signal or Modbus communication) | (External contact signal or Modbus communication) |
| Speed control | | | ● | | ● |
| Internal velocity command ^{*2} | (External contact signal only) | (External contact signal or Modbus communication) | (External contact signal or Modbus communication) | (External contact signal or Modbus communication) | (External contact signal or Modbus communication) |
| Torque control | | | ● | | ● |
| Full-close control | | | ● | | ● |
| Block operation | | | (External contact signal or Modbus communication) | | |
| Pulse | ● | ● | ● | ● | ● |
| Analog | | | ● | | ● |
| Modbus | | ● | ● | ● | ● |
| External scale | | | ● | ● | ● |
| RS-232/RS-485 | | ● | ● | ● | ● |
| STO (Safety Torques Off) | | | ● | ● | ● |

*1 A6SE series driver (Position control only) does not correspond to the absolute system of using the serial communication with the host device. It supports incremental system only.

*2 When using internal speed command with Modbus, external servo ON is required.

High speed communication For Realtime Express Network servo driver ▶ For Details see P.349

| | Rotary motor | | Linear motor / DD motor | |
|---------------------------------|------------------------------|-----------------------------------|--|---|
| | Standard type A6NE series | Multifunction type A6NF series | Standard type A6NL series <small>Special order product</small> | Multifunction type A6NM series <small>Special order product</small> |
| RTEX Realtime Express | | | | |
| Control mode | | | | |
| Position/Speed/Torque control | ● | ● | ● | ● |
| Full-close control | | ● | | ● |
| Interface | | | | |
| External scale | | ● | ● | ● |
| STO (Safety Torques Off) | | ● | | ● |

Servo drivers with EtherCAT open network ▶ For Details see P.369

| | Rotary motor | | Linear motor / DD motor | |
|-------------------------------|--|---|--|---|
| | Standard type A6BE series <small>Special order product</small> | Multifunction type A6BF series <small>Special order product</small> | Standard type A6BL series <small>Special order product</small> | Multifunction type A6BM series <small>Special order product</small> |
| EtherCAT | | | | |
| Control mode | | | | |
| Position/Speed/Torque control | ● | ● | ● | ● |
| Full-close control | | ● | | ● |
| Interface | | | | |
| External scale | | ● | ● | ● |
| STO (Safety Torques Off) | | ● | | ● |

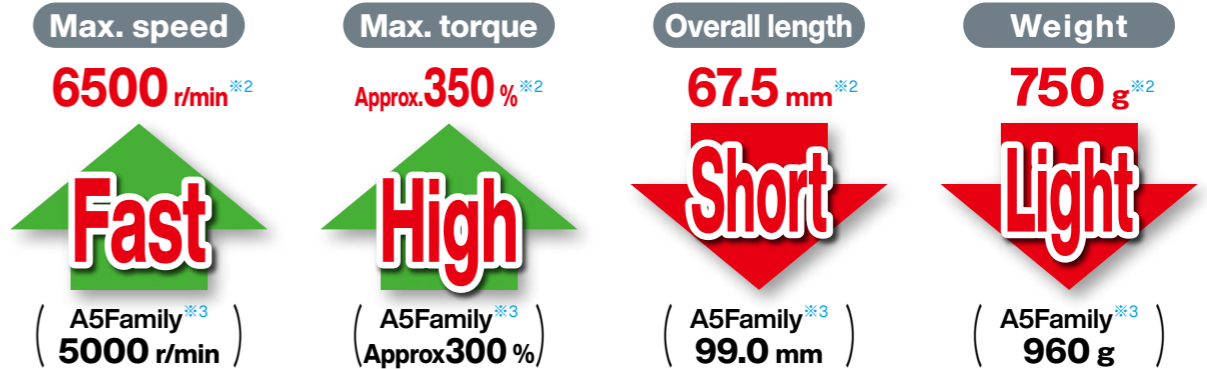
● Please check the instruction manual for necessary wiring.

Special order product For more information, please visit our website or request to our distributors separately.

Small, light, powerful and speedy ^{※1}

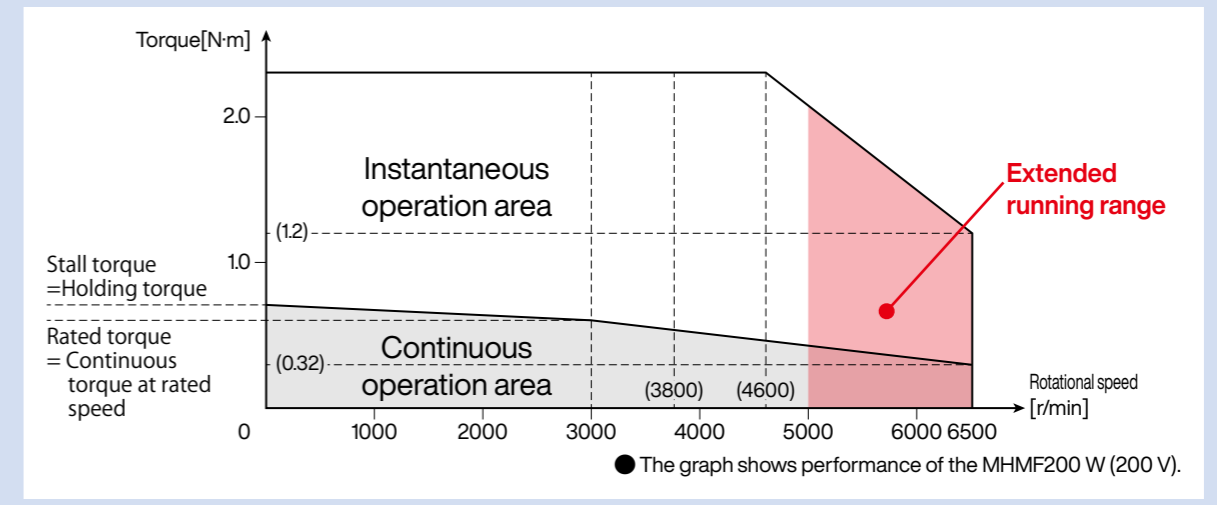
MINAS A6 Family

High-speed, high-torque, compact and lightweight. ^{※1}

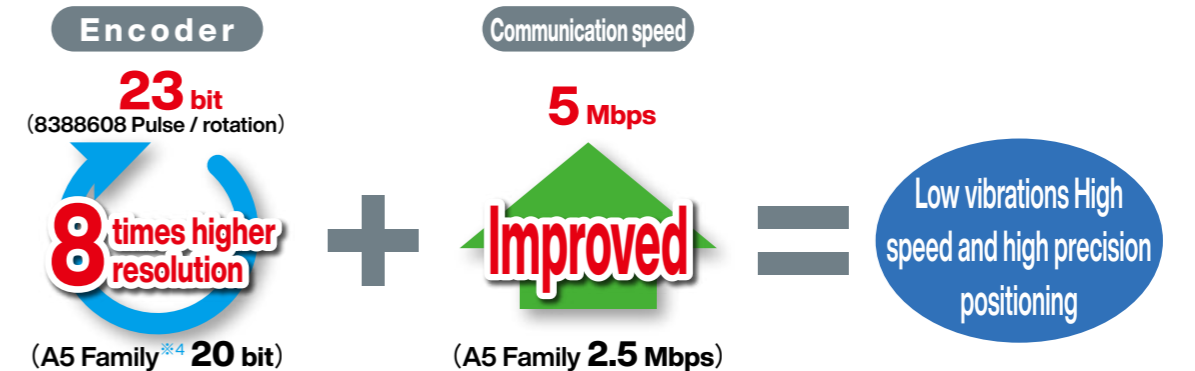


※1 Middle and high inertia types only ※2 MHMF200 W ※3 MHMD200 W

Thanks to high-speed and high-torque, the application area is greatly expanded.



Enhanced position detecting resolution enables smoother and more precise positioning.



※4 Incremental encoder



Swifter, smarter and easier to use

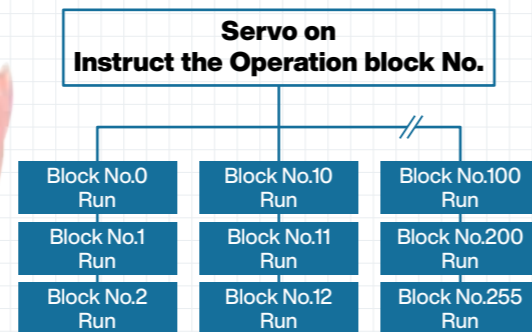
Powered Up compact driver



- New two-degree-of-freedom control system
- Frequency response 3.2 kHz
- Built-in filters and adjusting functions
- PANATERM Support
- Modbus Support (A6SF, A6SG Series)
- Block operation position control (Supports Modbus and external I/O)

Full-scale

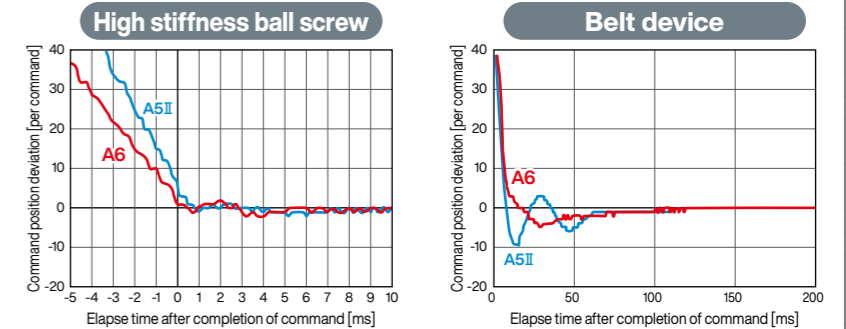
Image of block operations



High-speed response, high-precision positioning for quick and accurate movement

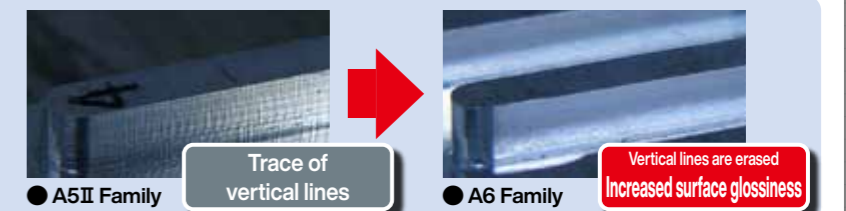
Our proprietary algorithm in addition to upgraded CPU and other hardware realized further high-speed response. Furthermore, high-precision positioning is achieved by automatically eliminating micro vibrations and machine oscillation caused by the resonance.

Comparison of position setting waveforms



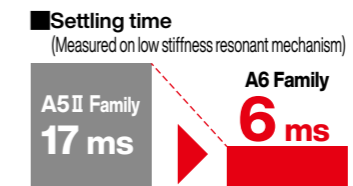
Example of operation with processing machine

A mirror finish is obtained even if a process that tends to cause streaking.



Easy and quick setting, shortening conventional settling time by approx. 64%*1

Newly developed fit gain function substantially reduces adjustment time. Adaptive notch filter and various gains can be automatically set and adjusted.



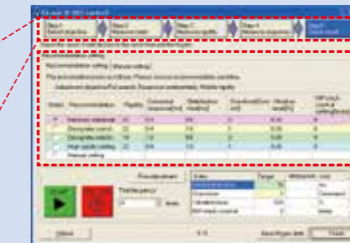
*1 Comparison with conventional product A5II Family

The above is a measure based on our test environment

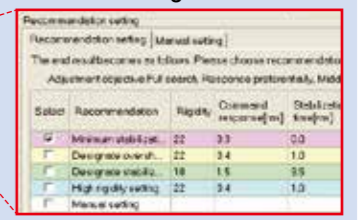
Adjustment completed in only 3 processes



Fit gain adjustment window



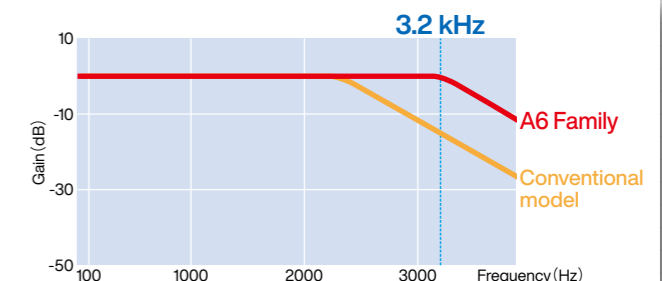
Automatically proposes various settings



Realized 3.2 kHz frequency response to improve productivity

Realizes 3.2 kHz frequency response. At 139% that of conventional models *1, it enables high-speed operation and improves productivity.

*1 Comparison with conventional product A5II Family



Reduced maintenance work

and trouble.

Lineup of motors protected by high dust-proof, high heat-resistant oil seal (With protective lip)

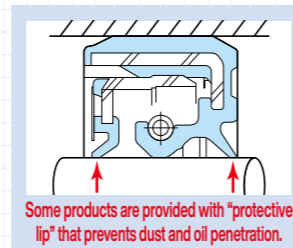
Motors protected by a highly dust-proof, oil-tight oil seal (with protection lip) have been added to the lineup of motor products equipped with oil seals of conventional specifications. The oil seals of this type of motor are made of a material of higher heat resistance.

You can select appropriate motor type according to your application environment such as dusty, powdery or gear connection necessity.

- Oil-seals (with protective lip) are not available for MSMF motors with flange size 80 mm or smaller.
- MQMF and MHMF motors with flange size of 80 mm or smaller provided with oils seals (with protective lip) are not mounting-compatible with A5 Family models.

■ Applicable oil seals

| Flange size | Motor type | With oil seal | | With oil seal (with protective lip) | |
|----------------|------------|---------------|------------------------------|-------------------------------------|---|
| | | With oil seal | Made of nitrile rubber (NBR) | With oil seal | Made of fluororubber |
| 80 mm or less | MSMF | ○ | Made of nitrile rubber (NBR) | No setting | |
| | MHMF, MQMF | ○ | | ○ | Made of fluororubber |
| 100 mm or more | All Type | ○ | ○ | fluororubber | Mounting-compatible with A5 Family products |



IP67 enclosure rating (Motors with flange size of 80 mm or smaller are order-made products)

Direct-mount connectors are used for the motor power supply and encoder input and output to improve sealing performance of the motor to IP67.

- IP67-compatible motors with flange size of 80 mm or smaller are order-made products.
- For environmental conditions of applications, refer to P.303.

What is IP?

An international standard that specifies the degree of dustproof and waterproof performance. (IP: Ingress Protection)

IP-67

| | |
|----------|---|
| 6 | Dust-tight type: Totally protected against dust penetration. |
| 7 | Protected against water penetration when immersed in water for the specified period of time and under the specified pressure. |



Lifespan diagnosis / degradation diagnosis

It warns expected lifetime of the motor & driver, and deterioration limit of the equipment.

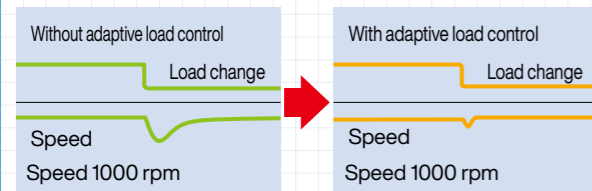
Geared servomotor

The geared servomotor lineup is also added.

Other driver functions

Adaptive load control

Adaptive load control automatically sets the best suitable gain table in response to fluctuations in inertia caused by changes in workload, thus keeping machines operating stably at all times.

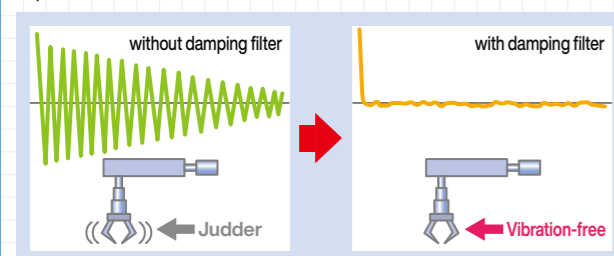


Friction torque compensation

This function reduces the effect of machine related friction and improves responsiveness. Three kinds of friction compensation can be set: unbalanced load compensation, which sets an offset torque that is constantly applied; kinetic friction compensation, which changes direction in response to the direction of movement; and viscous friction compensation, which changes according to the speed command.

Manual/Auto damping filter

Equipped with a damping filter that is automatically set through the setup support software. This filter removes the natural vibration frequency component from the command input, greatly reducing vibration of the axis when stopping. The number of filters for simultaneous use has been increased to three from the conventional two filters. (Two from one in the two-degree-of-freedom-control mode.) The adaptive frequency has also been significantly expanded from 0.5 Hz to 300 Hz.

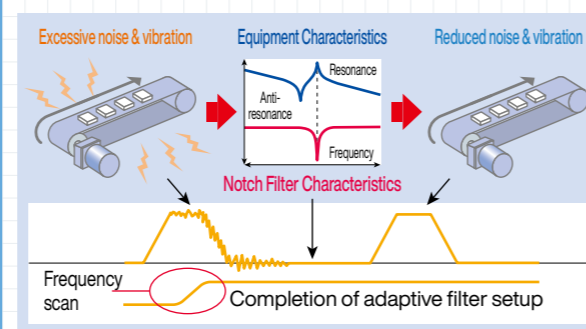


Manual/Auto notch filter

Equipped with auto-setting notch filters for greater convenience. Now there is no need to measure troublesome vibration frequencies.

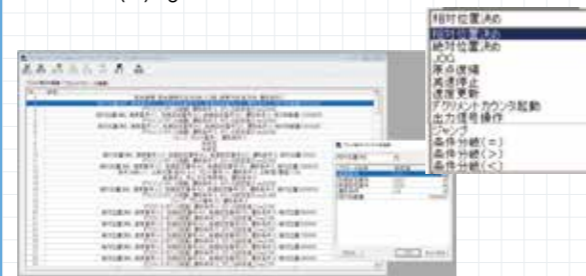
Our notch filters automatically detect vibration and provide simple auto-setting. These notch filters greatly reduce noise and vibration caused by equipment resonance and respond quickly.

The A6 Family is equipped with 5 notch filters with frequencies settable from 50 Hz to 5000 Hz. Depth can be individually adjusted within this range. (Two of the filters share automatic settings.)



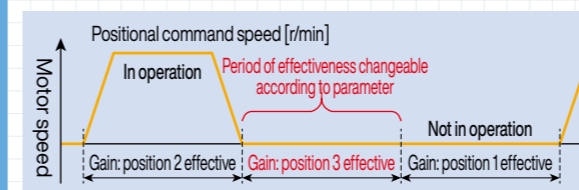
Block operation function

256 block patterns can be created. Easy control is possible because the instruction can be given to block No. by Modbus (RS232, RS485) or interface (IO) signal.



3-step gain

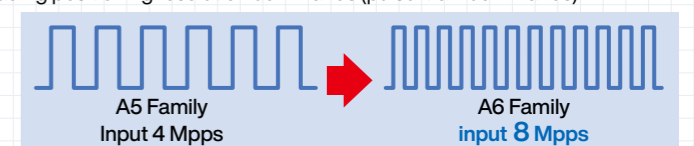
A 3-step gain switch is available in addition to the normal gain switch. This chooses appropriate gain tunings at both stopping and running. The 3-step gain switch gives you choices of 3 different tunings for normal running, stopping for faster positioning and at stopping. The right gaining tunings achieve lower vibration and quicker positioning time of your application.



Supports semi-/full-closed loop (8 Mpps input pulse, 4 Mpps output pulse) control.

Supports full-closed loop control. The A6SF series accommodates a command input of 8 Mpps and feedback output of 4 Mpps, enabling high-resolution, high-speed operation. Supports the industry's leading positioning resolution commands (pulse-train commands).

- The A6SE and A6SG series do not support full-closed loop control.
- Applicable scale: AB-phase feedback scale (general purpose product) and serial feedback scale (dedicated to Panasonic format product)



Dynamic braking

With parameter settings, you can select dynamic braking, which shorts servomotor windings U, V and W at Servo-OFF, during positive direction/ negative direction, and during power shutdown and tripping of the circuit breaker for over travel inhibition.

- The desired action sequence can be set up to accommodate your machine requirements.

Inrush current preventive function

This driver is equipped with a rush current preventive resistor to prevent the circuit breaker from shutting off the power supply as a result of inrush current occurring at power-on.

Inertia ratio conversion

You can adjust right inertia ratio by Inertia ratio conversion input (J-SEL) of interface. When you have significant load inertia changes, it can adjust unbalanced speed and position gain turning combination. It ends up quicker response of your system.

Input/output signal assignment

You can use the parameters to arbitrarily allocate the universal 10 inputs and 6 outputs. (Inputs can be selected as either A contacts or B contacts). The Panaterm setup software provides an exclusive screen for a more simplified setup.

Torque limiter switching

These can be used for applications such as simplified pressure, tension control, and sensor-less homing.

Parameter initialization

Using the front panel or by connecting a PC, you can restore the parameters to the factory settings.

Regenerative energy discharge

A regenerative resistor is used to discharge regenerative energy, which is the energy generated when stopping a load with a large moment of inertia or when using this unit in vertical operation. This energy is returned to the driver from the motor.

- Frame A, and frame B model drivers do not contain a regenerative resistor. Optional regenerative resistors are recommended.
- Frame C to frame F model drivers contain one regenerative resistor; however, adding an optional regenerative resistor provides additional regeneration capability.

Multifunctional software for quick adjustment support

PANATERM set-up support software

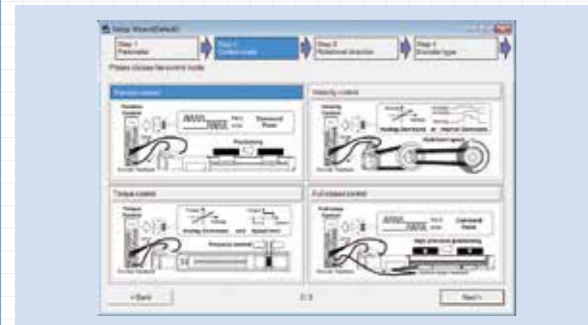
The PANATERM set-up support software, with many added features. The PANATERM assists users in setting parameters, monitoring control conditions, setup support, and analyzing mechanical operation data on the PC screen, when installed in a commercially available personal computer, and connected to the MINAS A6 Family through the USB interface. Choose either English, Japanese, Chinese, Korean-language display.

Please download from our web site and use after install to the PC.

<https://industrial.panasonic.com/ww/products/motors-compressors/fa-motors/ac-servo-motors/minas-a5-panaterm>

Setup wizard

This wizard supports fundamental settings in each control mode step by step, including reading of default setting. In On-line condition, input data related to each step can be monitored in real time.



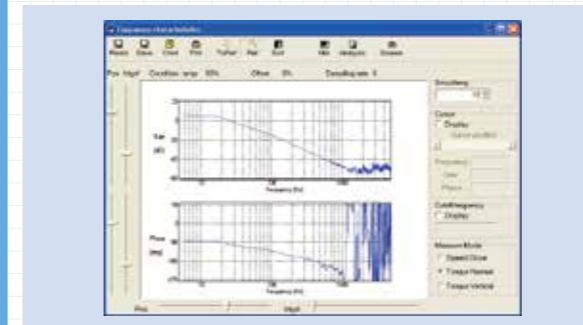
Trial run

This function supports positioning with the Z-phase search and software limit.



Frequency characteristics measurement function

Can check frequency response characteristics of the mechanism and motor. Since resonance frequency of the mechanism is measurable, it is effective for start-up time reduction.



Service Life Prediction

The service life prediction function considers the internal temperature for main components such as the fan and condenser. If the rated value is exceeded, an alarm is displayed. This approach prevents unexpected suspension of operation and allows for planning of systemized maintenance.

Note: The life span prediction value should be considered as a guide only.

| Item | Value | Unit | Status |
|---|-------|---------|--------|
| Power supply on integrated time | 3.0 | % | |
| Driver temperature | 54 | degrees | |
| Number of times of inductive resistance | 0 | times | |
| Number of times of CB relay changing | 0 | times | |
| Fan operation time | 0.0 | % | |
| Fan life time integrated value | 0.0 | % | |
| Condenser life time integrated value | 0.0 | % | |
| Maker users | 0 | - | |

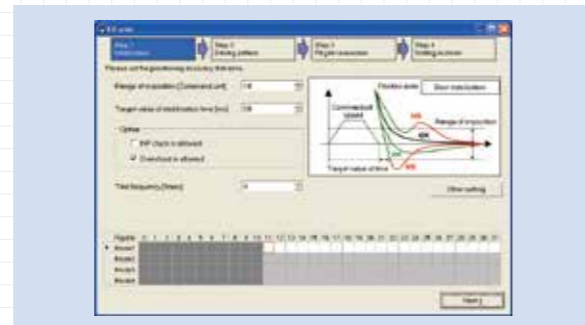
The fit gain function for setting Two-degree-of-freedom control.

- 1) Select the adjustment method
- 2) Load measurement
- 3) Confirming results Adjust gain to meet your needs



Fit gain

This function automatically searches the best suitable stiffness setting and mode and adjusts the gain once the target in-position range and setting time are set.



Encoder temperature monitor

The Encoder Temperature Monitor is a new function capable of real-time measurement of the interior temperature of the encoder, something that has been difficult to achieve in the past. It is valuable for monitoring the motor and can be used as a diagnostic in the event of a malfunction.



Deterioration diagnosis

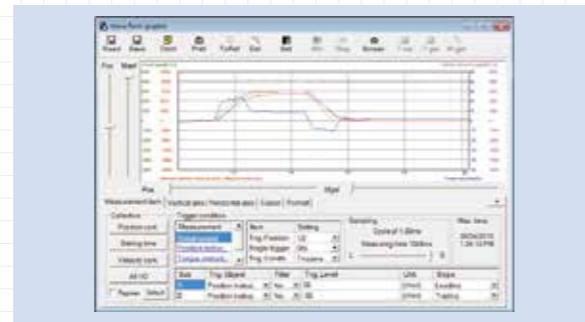
From the equipment information that can be detected by the motor, it is possible to display and check the deterioration and aging status of the equipment.



Added New screen for gain adjustment, equipped with stiffness oscillation auto-reduction function



Significant increase of measuring objects Multi-functional waveform graphic



Other features It has convenient functions such as motor / driver information such as load factor, power supply voltage, driver temperature etc, logging function capable of recording interface recording, display function of non-rotating factors etc

- Deterioration diagnosis ● Block action editor / monitor (A6SE, A6SG, A6SF series) ● Battery refresh ● Object editor (A6BE, A6BF series)

Hardware configuration

| | | |
|-------------------------------|--------------------|---|
| Personal computer | CPU | 800 MHz or more |
| | Memory | System memory 512 MB or more Graphics memory 32 MB or more |
| | Hard disk capacity | Vacancy of 512MB or more recommended |
| | OS | Windows® Vista SP1 (32 bit), Windows® 7 (32 bit, 64 bit), Windows® 8 (32 bit, 64 bit), Windows® 10 (32 bit, 64 bit) Japanese, English, Chinese (Simplified), Korean version |
| Serial communication function | | USB port, COM port (Communication speeds: 2400 bps to 115200 bps) * A COM port is required to use RS232C communications. A 9600 bps or higher baud rate is recommended. |
| | Display | |
| | Resolution | 1024 × 768 pix or more |
| | Number of colors | 24 bit colors (TrueColor) or more |

<CAUTION> This software is applicable only to A5 Family, A6 Family. To apply this software to A, AIII, E or A4 series, consult our distributors.

Lineup of two types of network

servo driver

MINAS A6 Family

Realtime Express(RTEX)

Ultimate Real-time performance

- Com. period min. **0.0625 ms**
- Com. speed **100 Mbps** Full-duplex
- Velocity response **3200 Hz**

Functionality to meet various needs

- Precise position latch & comparing
- Infinitely rotatable absolute encoder
- IEC safety I/F model available ^{*1}

^{*1}: Multi-functional type F. IEC61800-5-2 STO, IEC61508 SIL3.

Simple network

- High-performance & Low-cost
- Isochronous established by ASIC
- Easy device development

RTEX
Realtime Express



Max
16000
times/s

MINAS A6N series

EtherCAT

High-Performance

- Frequency response: **3200 Hz**
- Supports network communication "EtherCAT".
- High-Speed **100 Mbps**
- Real-time auto tuning function, Anti-vibration filters are available.

High-functions

- EtherCAT with many supported applications <7 control modes, 32 hm methods, DC(Synch), SM2(Synch), FreeRUN (Non-synch)>
- System-up possible with various slaves.
- Supports PC-based controller.
- A6BL/A6BM (for Linear Motor) will be available soon.

Standards

- Official EtherCAT Conformance Tested model available.
- IEC safety I/F model available. ^{*2}

^{*2}: Supported by multifunction type. EN61800-5-2 STO, EN61508 SIL3.

EtherCAT®



Small size
servo driver
with EtherCAT

MINAS A6B series Special order product

Absolute system can be configured without the battery.

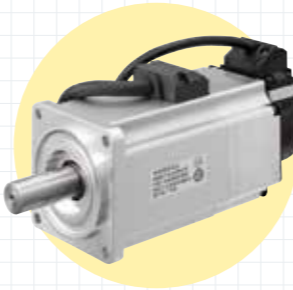
Battery-less absolute encoder motor

For details on the battery-less absolute encoder type, refer to the "MINAS A6 Family Battery-less Absolute Encoder Models" catalog.

Reduced the battery for the absolute encoder by installing the power generating element in the motor. In addition to improving maintainability, we support the construction of ecological and economical industrial machines and systems.

Maintenance work such as battery replacement is reduced because battery is not required anymore.

Reduce wasteful inventory management and replacement costs as battery is no required anymore. It contributes to the construction of ecological and economical industrial machines and systems.



Compliance with MINAS A6 Family international standards



| | Driver | Motor |
|---|---|--|
| EU/UK Standards | EU EMC Directives/ UK EMC Regulation | EN55011 EN61000-6-2 EN61000-6-4 EN61800-3 |
| | EU Low Voltage Directives/ UK Low Voltage Regulation | EN61800-5-1 |
| | Machinery (Functional safety *) | ISO13849-1 EN61508 EN62061 EN61800-5-2 |
| UL Standards | UL61800-5-1 (E164620) | UL1004-1, UL 1004-6 (E327868) |
| CSA Standards | C22.2 No.274 | C22.2 No.100 |
| Radio Waves Act (South Korea) (KC) ² | KN11 KN61000-4-2,3,4,5,6,8,11 | — |

IEC : International Electrotechnical Commission EN : Europaischen Normen EMC : Electromagnetic Compatibility
UL : Underwriters Laboratories CSA : Canadian Standards Association

Safety parameter

| | Diagnosis based on EDM | No diagnosis based on EDM |
|--|--|--|
| Safety Integrity Level | EN61508 (SIL3) EN62061 (SILCL3) | EN61508 (SIL2) EN62061 (SILCL2) |
| Performance level | ISO13849-1 PL e (Cat.3) | ISO13849-1 PL d (Cat.3) |
| Safety function | EN61800-5-2 (SIL 3, STO) | EN61800-5-2 (SIL 2, STO) |
| Hazardous failure probability per hour | <For size A,B,C,D,E,F> PFH = 1.34 × 10 ⁻⁸ (% SIL3 = 13.4 %) <For size G and H> PFH = 1.78 × 10 ⁻⁸ (% SIL3 = 17.8 %) | <For size A,B,C,D,E,F> PFH = 1.40 × 10 ⁻⁸ (% SIL2 = 1.40 %) <For size G and H> PFH = 1.85 × 10 ⁻⁸ (% SIL2 = 1.85 %) |
| Average time of hazardous failure | MTTFd : High (100 years) | MTTFd : High (100 years) |
| Average self-diagnosis rate | DC : Medium | DC : Low |
| Task time | 15 years | 15 years |

* When export this product, follow statutory provisions of the destination country.
*1 A6SE, A6SG, A6NE and A6BE series doesn't correspond to the functional safety standard.
*2 Information related to the Korea Radio Law
This servo driver is a Class A commercial broadcasting radio wave generator not designed for home use.
The user and dealer should be aware of this fact.

A 급 기기 (업무용 방송통신기자재)
이 기기는 업무용(A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.
(대상기종 : Servo Driver)

This products is not an object of china compulsory certification (CCC).

Low noise, compliant with EU EMC Directives/UK EMC Regulation
Radiated noise is minimized to meet EU EMC Directives/UK EMC Regulation and to support international standards.

Compliance with EU safety standards.
Features non-software-based independent redundant circuitry for motor power isolation. Independent redundant circuitry for motor power isolation. This obviates the need for magnetic contactors to isolate the required motor in order to accommodate EU Low Voltage Directives/UK Low Voltage Regulation machinery commands. (The final safety compliance must be applied as machine.)

SEMI-F47
Includes a function in compliance with the SEMI F47 standard for voltage sag immunity under no load or light load. Ideal for the semiconductor and LCD industries.
• Excluding the single-phase 100-V type.
• Please verify the actual compliance with your machine checking the F47 standard for voltage sag immunity.

Battery-less absolute encoder motor list

| | 80 mm sq. or less Leadwire type | | | | | | 100 mm sq. or more Encoder connector (Small size JN2) type | | | | | |
|-------------------------------|---|--------------|--------------|--------------|-------|--------|--|----------------|----------------|----------------|----------------|----------------|
| | 50 W | 100 W | 200 W | 400 W | 750 W | 1000 W | 1.0 kW | 1.5 kW | 2.0 kW | 3.0 kW | 4.0 kW | 5.0 kW |
| Low inertia MSMF | 100V 200V | 100V 200V | 100V 200V | 100V 200V | 200V | 200V | 200V | 200V | 200V | 200V | 200V | 200V |
| Middle inertia MQMF | | 100V 200V | 100V 200V | 100V 200V | | | | | | | | |
| Middle inertia MDMF | Table description Voltage specifications | | | | | | 200V | 200V | 200V | 200V | 200V | 200V |
| Middle inertia MGMF | Voltage specifications | | | | | | 850 W 200V | 1.3 kW 200V | 1.8 kW 200V | 2.4 kW 200V | 2.9 kW 200V | 4.4 kW 200V |
| High inertia MHMF | 100V 200V | 100V 200V | 100V 200V | 100V 200V | 200V | 200V | 200V | 200V | 200V | 200V | 200V | 200V |

<Information> "MINAS A6 Family 400 V Series" catalog is available separately.
For more information, please visit our website or request to our distributors separately.

Motor Line-up For details on the battery-less absolute encoder type, refer to the "MINAS A6 Family Battery-less Absolute Encoder Models" catalog.

| Motor | Rated output (kW) | Rated rotational speed (Max. speed) (r/min) | Rotary encoder 23-bit absolute | Enclosure (*1) | Motor lead-out configuration | Features | Applications |
|---|---|---|--------------------------------|-----------------------|--------------------------------|--|---|
| Low inertia MSMF | 80 mm sq. or less 0.05 0.1 0.2 0.4 0.75 1.0 | 3000 (6000) | ○ | IP65 | Leadwire | <ul style="list-style-type: none"> Small capacity Suitable for high speed application Suitable for all applications | <ul style="list-style-type: none"> Bonder Semiconductor production equipment Packing machines etc |
| | 80 mm sq. or less 0.05 0.1 0.2 0.4 0.75 1.0 | 3000 (6000) | ○ | IP67 | Connector | | |
| | 100 mm sq. or more 1.0 1.5 2.0 3.0 4.0 5.0 | 3000 (5000) 3000 (4500) | ○ | IP67 | Connector | | |
| Middle inertia MQMF (Flat type) | 80 mm sq. or less 0.1 0.2 0.4 | 3000 (6500) | ○ | IP65 | Leadwire | <ul style="list-style-type: none"> Small capacity Flat type and suitable for low stiffness machines with belt driven Motors with gear reducers are also available. (See. P.293) | <ul style="list-style-type: none"> SMT machines Insert machines Belt drive machines unloading robot |
| | 80 mm sq. or less 0.1 0.2 0.4 | 3000 (6500) | ○ | IP67 | Connector | | |
| Middle inertia MDMF | 130 mm sq. or more 1.0 1.5 2.0 3.0 4.0 5.0 7.5 | 2000 (3000) 1500 (3000) | ○ | IP67 (22.0 kW : IP44) | Connector (22.0 kW) : Terminal | <ul style="list-style-type: none"> Middle capacity Suitable for low stiffness machines with belt driven | <ul style="list-style-type: none"> Conveyors Robots Machine tool etc |
| | 130 mm sq. or more 11.0 15.0 22.0 | 1500 (2000) | | | | | |
| Middle inertia MGMF (Low speed/High torque type) | 130 mm sq. or more 0.85 1.3 1.8 2.4 2.9 4.4 5.5 | 1500 (3000) | ○ | IP67 | Connector | <ul style="list-style-type: none"> Middle capacity Suitable for low speed and high torque application | <ul style="list-style-type: none"> Conveyors Robots Textile machines etc |
| High inertia MHMF | 80 mm sq. or less 0.05 0.1 0.2 0.4 0.75 1.0 | 3000 (6500) 3000 (6000) | ○ | IP65 | Leadwire | <ul style="list-style-type: none"> Small capacity Suitable for low stiffness machines with belt driven Motors with gear reducers are also available. (See. P.293) | <ul style="list-style-type: none"> Conveyors Robots etc |
| | 80 mm sq. or less 0.05 0.1 0.2 0.4 0.75 1.0 | 3000 (6500) 3000 (6000) | ○ | IP67 | Connector | | |
| | 130 mm sq. or more 1.0 1.5 2.0 3.0 4.0 5.0 7.5 | 2000 (3000) 1500 (3000) | ○ | IP67 | Connector | | |

(*1) Please refer to P.303 for protection class conditions.

* For possible combinations of motors and drivers, see P.29 to P.42.

- When using a rotary encoder as an absolute system (using multi-turn data), connect a battery to the absolute encoder.
- When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Refer to P.29 to P.42 for motor and driver combinations. * For combination of elements of model number, refer to Index P.448.

Servo Motor "Oil seal with protective lip" option is not available for motors above 7.5 kW.

M S M F 5 A Z L 1 A 1 * ——— Special specifications

① Type

| Symbol | Type |
|--------|------------------------------------|
| MSM | Low inertia (50 W to 5.0 kW) |
| MQM | Middle inertia (100 W to 400 W) |
| MDM | Middle inertia (10 kW to 22.0 kW) |
| MGM | Middle inertia (0.85 kW to 5.5 kW) |
| MHM | High inertia (50 W to 7.5 kW) |

② Series

| Symbol | Series name |
|--------|-------------|
| F | A6 Family |

⑦ Motor specifications: 80 mm sq. or less MSMF 50 W to 1000 W

| Symbol | | Shaft | | Holding brake | | Oil seal | | Motor encoder terminal ^{*1} | |
|--------|---|-------|---------------------|---------------|------|----------|------|--------------------------------------|-----------|
| | | Round | Key-way, center tap | without | with | without | with | Connector JN | Lead wire |
| A | 1 | ● | | | | | | | |
| A | 2 | ● | | | | | | | |
| B | 1 | ● | | | | | | | |
| B | 2 | ● | | | | | | | |
| C | 1 | ● | | | | | | | |
| C | 2 | ● | | | | | | | |
| D | 1 | ● | | | | | | | |
| D | 2 | ● | | | | | | | |
| S | 1 | ● | ● | | | | | | |
| S | 2 | ● | ● | | | | | | |
| T | 1 | ● | ● | | | | | | |
| T | 2 | ● | ● | | | | | | |
| U | 1 | ● | ● | | | | | | |
| U | 2 | ● | ● | | | | | | |
| V | 1 | ● | ● | | | | | | |
| V | 2 | ● | ● | | | | | | |

③ Motor rated output

| Symbol | Rated output | Symbol | Rated output | Symbol | Rated output |
|--------|--|--------|--------------|--------|--------------|
| 5A | 50 W | 13 | 1.3 kW | 44 | 4.4 kW |
| 01 | 100 W | 15 | 1.5 kW | 50 | 5.0 kW |
| 02 | 200 W | 18 | 1.8 kW | 55 | 5.5 kW |
| 04 | 400 W | 20 | 2.0 kW | 75 | 7.5 kW |
| 08 | 750 W | 24 | 2.4 kW | C1 | 11.0 kW |
| 09 | 0.85 kW, 1000 W (130 mm sq.) (80 mm sq.) | 29 | 2.9 kW | C5 | 15.0 kW |
| | | 30 | 3.0 kW | D2 | 22.0 kW |
| 10 | 1.0 kW | 40 | 4.0 kW | | |

④ Voltage specifications

| Symbol | Specifications |
|--------|--------------------------------|
| 1 | 100 V |
| 2 | 200 V |
| Z | 100 V/200 V common (50 W only) |

⑥ Design order

| Symbol | Specifications |
|--------|----------------|
| 1 | Standard |

<Note>

When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

⑤ Rotary encoder specifications

| Symbol | Format | Pulse counts | Resolution | Wires |
|--------|----------|--------------|------------|-------|
| L | Absolute | 23-bit | 8388608 | 7 |

⑦ Motor specifications: 100 mm sq. to 220 mm sq. MSMF, MHMF, MDMF, MGMF

| Symbol | Shaft | | Holding brake | | Oil seal | | Encoder terminal | |
|--------|-------|---------|---------------|------|----------|---------------------|----------------------------|---|
| | Round | Key-way | without | with | with | With protective lip | Connector JN2 (Small size) | Connector JL10 (Large size) ^{*3} |
| C | 5 | ● | | | | | | |
| C | 6 | ● | | | | | | |
| C | 7 | ● | | | | | | |
| C | 8 | ● | | | | | | |
| D | 5 | ● | | | | | | |
| D | 6 | ● | | | | | | |
| D | 7 | ● | | | | | | |
| D | 8 | ● | | | | | | |
| G | 5 | ● | ● | | | | | |
| G | 6 | ● | ● | | | | | |
| G | 7 | ● | ● | | | | | |
| G | 8 | ● | ● | | | | | |
| H | 5 | ● | | | | | | |
| H | 6 | ● | | | | | | |
| H | 7 | ● | | | | | | |
| H | 8 | ● | | | | | | |

⑦ Motor specifications: 80 mm sq. or less MHMF 50 W to 1000 W MQMF 100 W to 400 W

| Symbol | | Shaft | | Holding brake | | Oil seal | | Motor encoder terminal ^{*1} | |
|--------|---|-------|---------------------|---------------|------|----------|------|--------------------------------------|--------------|
| | | Round | Key-way, center tap | without | with | without | with | With protective lip | Connector JN |
| A | 1 | ● | | | | | | | |
| A | 2 | ● | | | | | | | |
| B | 1 | ● | | | | | | | |
| B | 2 | ● | | | | | | | |
| C | 1 | ● | | | | | | | |
| C | 2 | ● | | | | | | | |
| C | 3 | ● | | | | | | | |
| C | 4 | ● | | | | | | | |
| D | 1 | ● | | | | | | | |
| D | 2 | ● | | | | | | | |
| D | 3 | ● | | | | | | | |
| D | 4 | ● | | | | | | | |
| S | 1 | ● | ● | | | | | | |
| S | 2 | ● | ● | | | | | | |
| T | 1 | ● | ● | | | | | | |
| T | 2 | ● | ● | | | | | | |
| U | 1 | ● | ● | | | | | | |
| U | 2 | ● | ● | | | | | | |
| U | 3 | ● | ● | | | | | | |
| U | 4 | ● | ● | | | | | | |
| V | 1 | ● | ● | | | | | | |
| V | 2 | ● | ● | | | | | | |
| V | 3 | ● | ● | | | | | | |
| V | 4 | ● | ● | | | | | | |

*1 Connector type: IP67, Lead wire type: IP65 *2 22.0 kW: IP44

*3 Connector on the motor side encoder. (Also applicable to screwed type).

Servo Driver "Basic" and "RS485 communication" types are not available for G-Frame and H-Frame drivers.

M A D L N 1 5 S E * * * ——— Special specifications

① Frame symbol

| Symbol | Frame | Symbol | Frame |
|--------|---------|--------|---------|
| MAD | A-Frame | MED | E-Frame |
| MBD | B-Frame | MFD | F-Frame |
| MCD | C-Frame | MGD | G-Frame |
| MDD | D-Frame | MHD | H-Frame |

② Series

| Symbol | Series name |
|--------|-------------|
| L | A6 Family |

③ Safety Function^{*4}

| Symbol | Specifications |
|--------|-----------------------------|
| N | without the safety function |
| T | with the safety function |

④ Max. current rating

| Symbol | Current rating | Symbol | Current rating |
|--------|----------------|--------|----------------|
| 0 | 6 A | 9 | 80 A |
| 1 | 8 A | A | 100 A |
| 2 | 12 A | B | 120 A |
| 3 | 22 A | C | 160 A |
| 4 | 24 A | E | 240 A |
| 5 | 40 A | F | 360 A |
| 8 | 60 A | | |

⑤ Supply voltage specifications

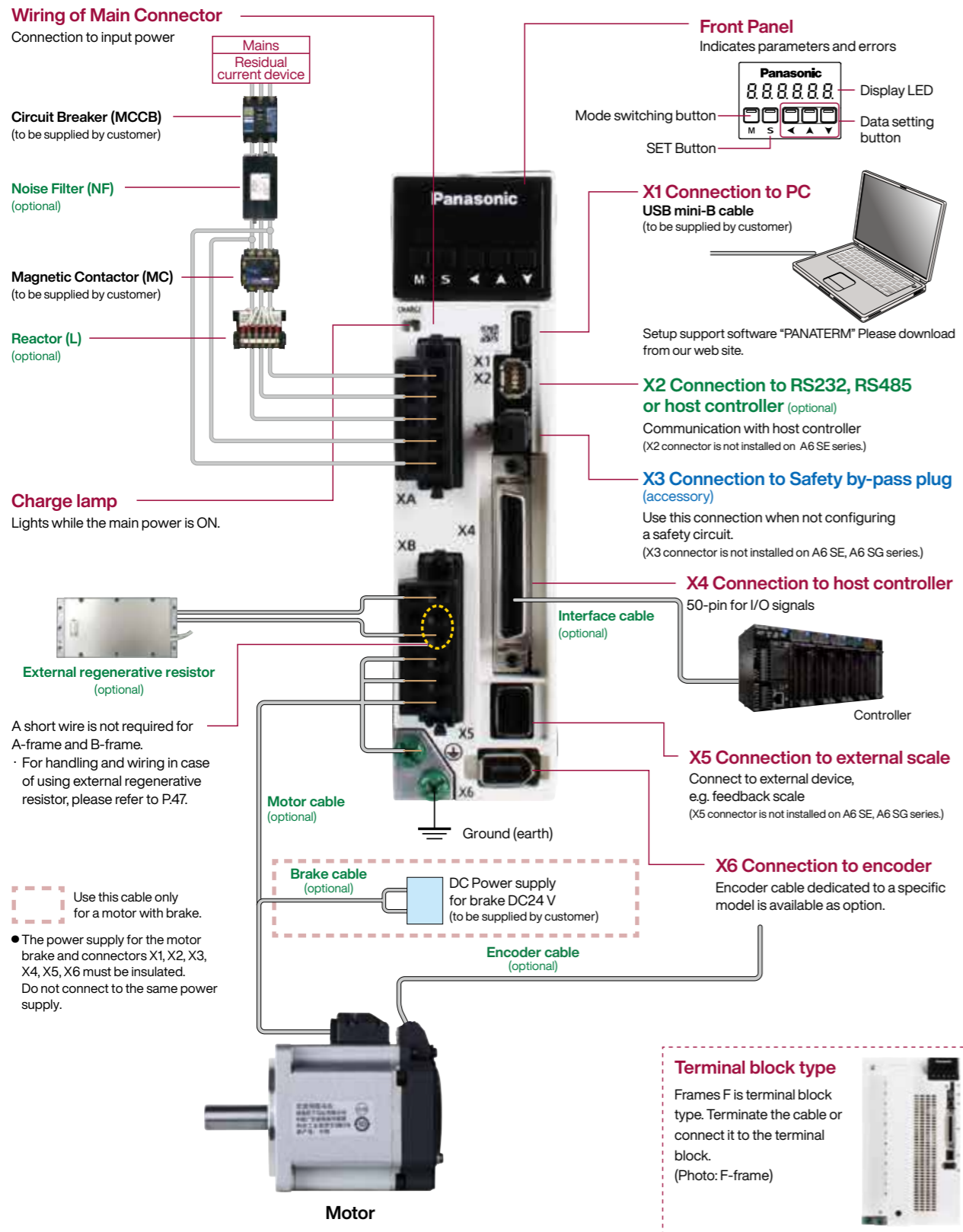
| Symbol | Specifications |
|--------|----------------------|
| 1 | Single phase 100 V |
| 3 | 3-phase 200 V |
| 5 | Single/3-phase 200 V |

⑥ I/f specifications

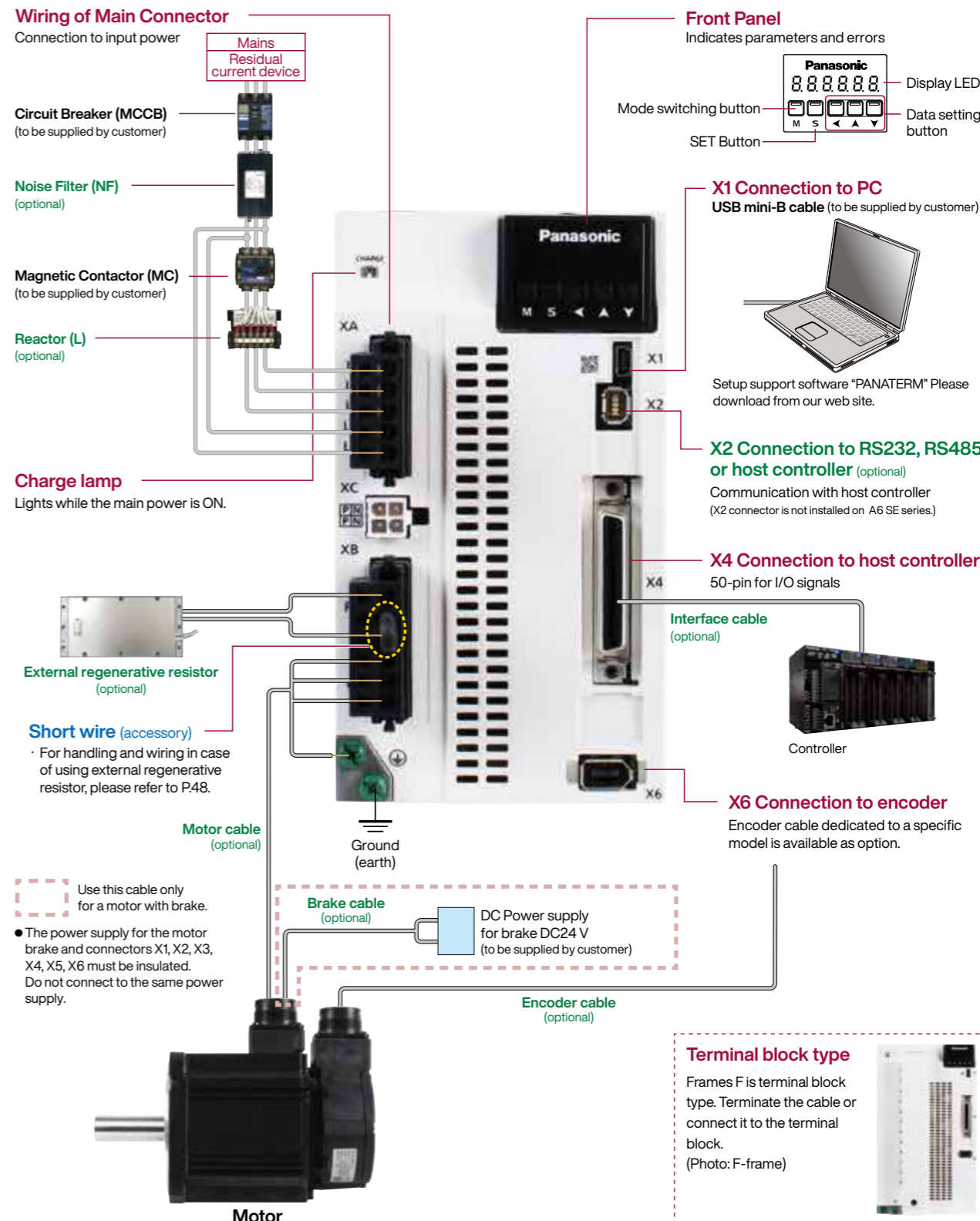
| Symbol (specification) | Symbol | Specification |
|------------------------|--------|--|
| S (Analog/Pulse) | E | Basic type (Pulse train only) |
| | F | Multi function type (Pulse, analog, full-closed) |
| | G | RS485 communication type (Pulse train only) |

*4 Position control type "E" and general communication type "G" do not have a safety function.

<A6SF Series (Driver: A-frame Motor: 200 W)>



<A6SG Series/ A6SE Series (Driver: D-frame Motor: 1.0 kW)>

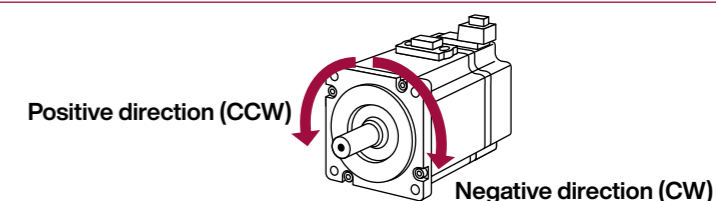


<Caution>

Apply adequate tightening torque to the product mounting screw by taking into consideration strength of the screw and the characteristics of material to which the product is installed. Overtightening can damage the screw and/or material; undertightening can result in loosening.

<Note>

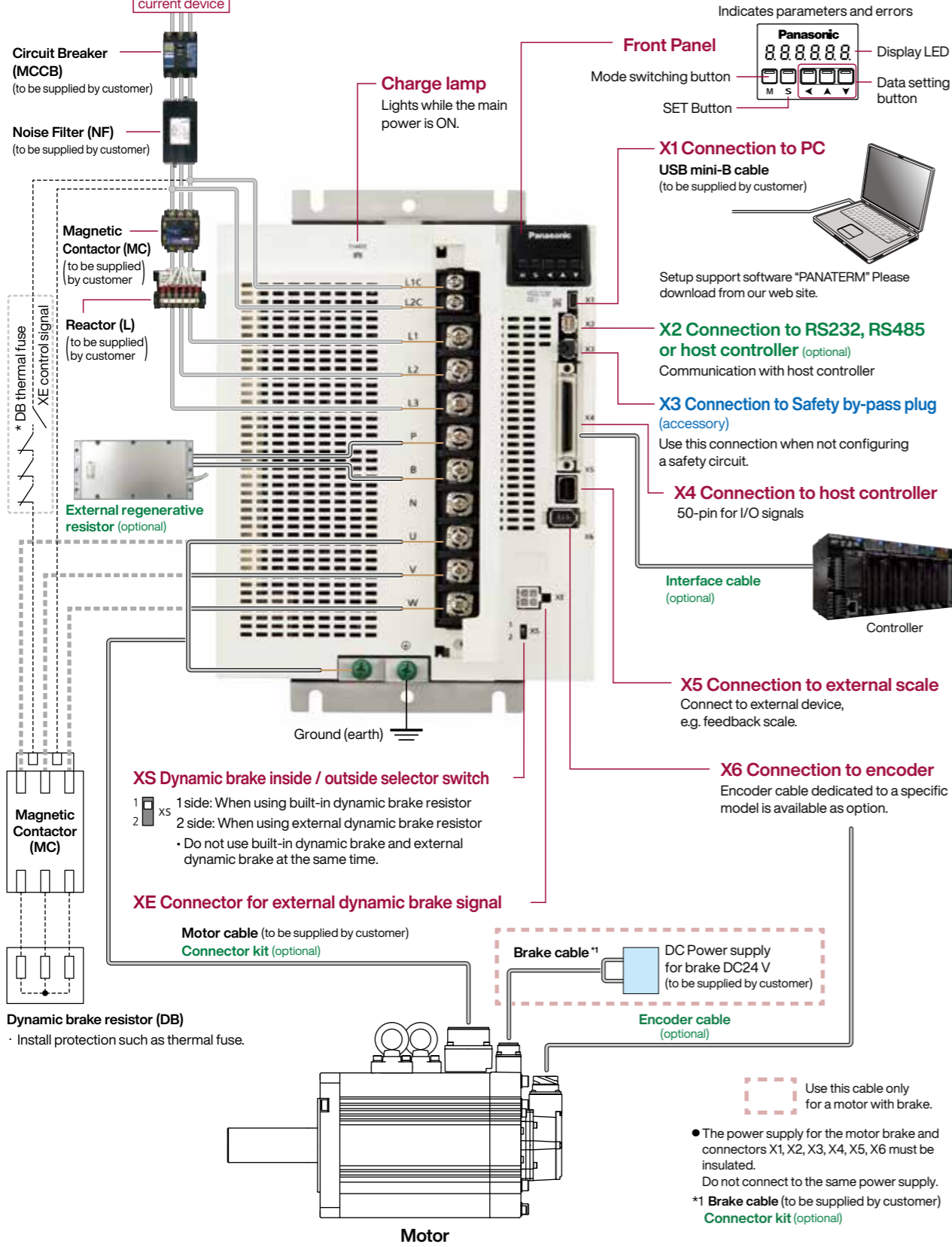
Initial setup of rotational direction: positive = CCW and negative = CW. Pay an extra attention.



<A6SF Series (Driver: G-frame Motor: 7.5 kW)>

Wiring of Main Connector

Connection to input power

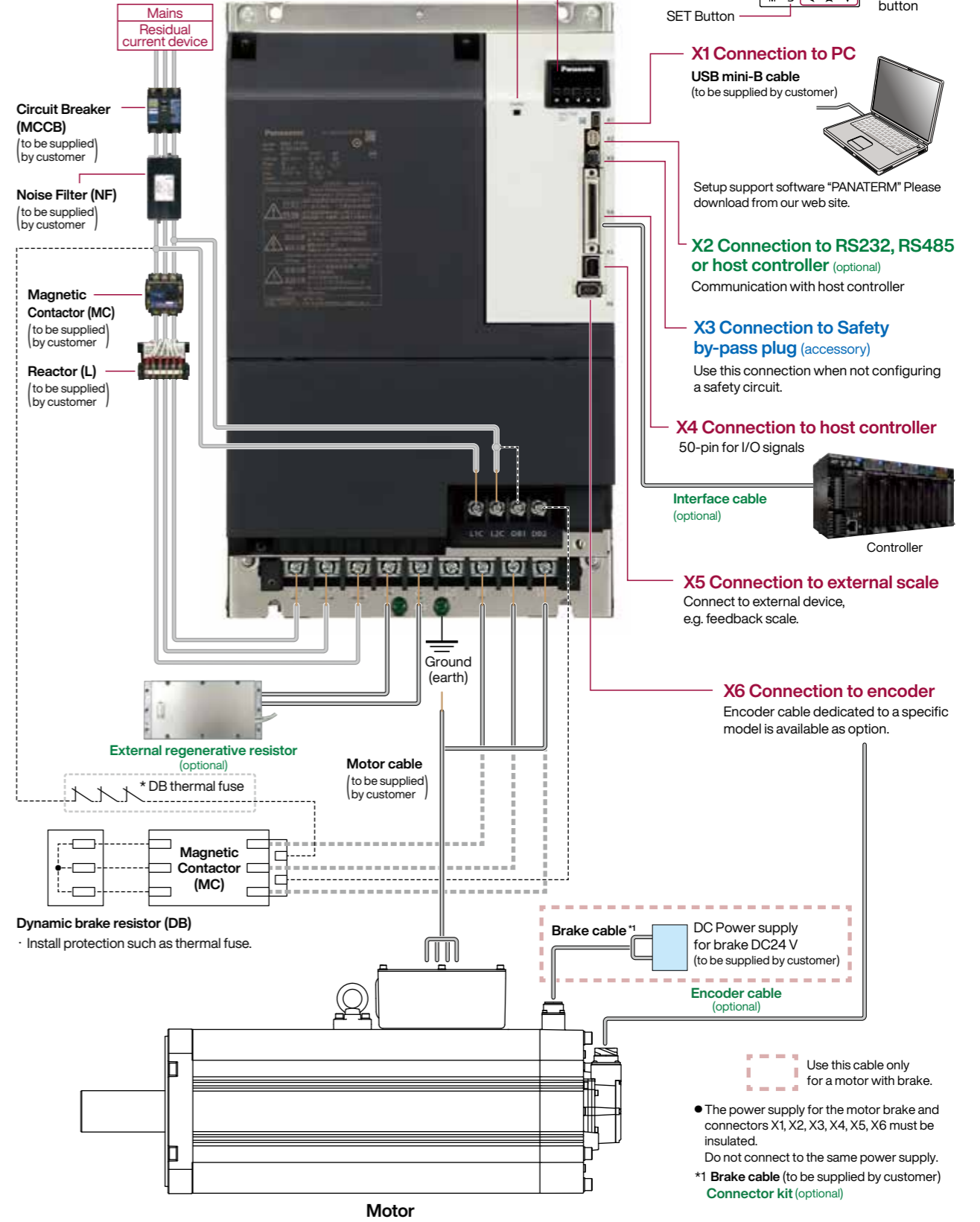


<Caution> Apply adequate tightening torque to the product mounting screw by taking into consideration strength of the screw and the characteristics of material to which the product is installed. Overtightening can damage the screw and/or material; undertightening can result in loosening.

<A6SF Series (Driver: H-frame Motor: 22.0 kW)>

Wiring of Main Connector

Connection to input power



<Note> Initial setup of rotational direction: positive = CCW and negative = CW. Pay an extra attention.


| Driver | Applicable motor | Voltage (V) *1 | Rated output (kW) | Required Power at the rated load (kVA) | Circuit breaker (rated current) (A) | Noise filter (Single phase/3-phase) | Surge absorber (Single phase/3-phase) | Ferrite core | Rated operating current of magnetic contactor (configuration) *2 | Diameter and withstand voltage of main circuit cable | Crimp terminal for main circuit terminal block *3 | Diameter and withstand voltage of control power supply cable | Crimp terminal for control power supply terminal block | Diameter and withstand voltage of motor cable *4 | Diameter and withstand voltage of brake cable |
|--------|----------------------|--------------------|-------------------|--|-------------------------------------|--------------------------------------|---------------------------------------|--------------|--|--|---|--|--|--|---|
| MADL | MSMF MHMF | Single phase, 100 | 0.05 | approx. 0.4 | 10 | DV0P4170 | DV0P4190 | | 20 A (3P+1a) | 0.75 mm ² / AWG18 600 VAC or more | Connection to exclusive connector | Connection to exclusive connector | 0.75 mm ² / AWG18 600 VAC or more | 0.28 mm ² to 0.75 mm ² / AWG22 to AWG18 100 VAC or more | |
| | MSMF MQMF MHMF | | 0.1 | | | | | | | | | | | | |
| MBDL | MSMF MQMF MHMF | Single/3-phase 200 | 0.05 | approx. 0.5 | 10 | DV0P4170 DV0PM20042 | DV0P4190 DV0P1450 | | 20 A (3P+1a) | 0.75 mm ² / AWG18 600 VAC or more | Connection to exclusive connector | Connection to exclusive connector | 0.75 mm ² / AWG18 600 VAC or more | 0.28 mm ² to 0.75 mm ² / AWG22 to AWG18 100 VAC or more | |
| | MSMF MQMF MHMF | | 0.1, 0.2 | | | | | | | | | | | | |
| MCDL | MSMF MQMF MHMF | Single phase, 100 | 0.2 | approx. 0.9 | 15 | DV0P4170 DV0PM20042 | DV0P4190 DV0P1450 | | 20 A (3P+1a) | 0.75 mm ² / AWG18 600 VAC or more | Connection to exclusive connector | Connection to exclusive connector | 0.75 mm ² / AWG18 600 VAC or more | 0.28 mm ² to 0.75 mm ² / AWG22 to AWG18 100 VAC or more | |
| | MSMF MQMF MHMF | | 0.4 | | | | | | | | | | | | |
| MDDL | MSMF MQMF MHMF | Single/3-phase 200 | 0.4 | approx. 1.8 | 20 | DV0P4220 | DV0P4190 DV0P1450 | DV0P1460 | 30 A (3P+1a) | 2.0 mm ² / AWG14 600 VAC or more | Connection to exclusive connector | Connection to exclusive connector | 2.0 mm ² / AWG14 600 VAC or more | 0.75 mm ² to 2.0 mm ² / AWG14 600 VAC or more | |
| | MSMF MQMF MHMF | | 0.75 | | | | | | | | | | | | |
| MEDL | MGMF | Single/3-phase 200 | 0.85 | approx. 2.4 | 20 | DV0P4220 | DV0P4190 DV0P1450 | DV0P1460 | 30 A (3P+1a) | 2.0 mm ² / AWG14 600 VAC or more | Connection to exclusive connector | Connection to exclusive connector | 2.0 mm ² / AWG14 600 VAC or more | 0.75 mm ² to 2.0 mm ² / AWG14 600 VAC or more | |
| | MSMF | | 1.0 (80 mm sq.) | | | | | | | | | | | | |
| | MDMF MHMF | | 1.0 | | | | | | | | | | | | |
| | MHMF | | 1.0 (80 mm sq.) | | | | | | | | | | | | |
| | MSMF | | 1.0 | | | | | | | | | | | | |
| | MGMF | | 1.3 | | | | | | | | | | | | |
| MEDL | MSMF MDMF MHMF | 3-phase 200 | 1.8 | approx. 3.4 | 30 | DV0PM20043 | DV0P1450 | DV0P1460 | 60 A (3P+1a) | 2.0 mm ² / AWG14 600 VAC or more | Connection to exclusive connector | Connection to exclusive connector | 2.0 mm ² / AWG14 600 VAC or more | 0.75 mm ² to 2.0 mm ² / AWG18 600 VAC or more | |
| | MSMF MDMF MHMF | | 2.0 | | | | | | | | | | | | |
| | MGMF | | 2.4 | | | | | | | | | | | | |
| MFDL | MGMF | 3-phase 200 | 2.9 | approx. 5.0 | 50 | DV0P3410 | DV0P1450 | DV0P1460 | 100 A (3P+1a) | 3.5 mm ² / AWG12 600 VAC or more | 11 mm or smaller φ5.3 Terminal block M5 | 11 mm or smaller φ5.3 Terminal block M5 | 3.5 mm ² / AWG12 600 VAC or more | 0.75 mm ² to 3.5 mm ² / AWG18 600 VAC or more | |
| | MSMF MDMF MHMF | | 3.0 | | | | | | | | | | | | |
| | MSMF MDMF MHMF | | 4.0 | | | | | | | | | | | | |
| | MGMF | | 4.4 | | | | | | | | | | | | |
| | MSMF MDMF MHMF | | 5.0 | | | | | | | | | | | | |
| MGDL | MGMF | 3-phase 200 | 5.5 | approx. 8.5 | 60 | HF3080C-SZA (Recommended components) | DV0P1450 | DV0P1460 | 100 A (3P+1a) | 8.0 mm ² / AWG8 600 VAC or more | 7 mm or smaller φ3.2 Terminal block M3 | 7 mm or smaller φ3.2 Terminal block M3 | 14 mm ² / AWG6 600 VAC or more | 0.75 mm ² to 14 mm ² / AWG18 600 VAC or more | |
| | MDMF | | 7.5 | | | | | | | | | | | | |
| | MHMF | | | | | | | | | | | | | | |
| MHDL | MDMF | 3-phase 200 | 11.0 | approx. 20 | 125 | HF3100C-SZA (Recommended components) | DV0P1450 | DV0P1460 | 150 A (3P+1a) | 22 mm ² / AWG4 600 VAC or more | 16 mm or smaller φ6.4 Terminal block M6 | 10 mm or smaller φ4.3 Terminal block M4 | 22 mm ² / AWG4 600 VAC or more *6 22.8 mm or smaller φ8.5 Terminal block M8 | 0.75 mm ² to 22 mm ² / AWG18 100 VAC or more | |
| | | | 15.0 | | | | | | | | | | | | |
| | | | 22.0 | | | | | | | | | | | | |

*1 Select peripheral devices for single/3phase common specification according to the power source.
 *2 The magnetic contactor used for the external dynamic brake resistor should have the same rating as the magnetic contactor used for the main circuit.
 *3 For the ground screw, use the same crimp terminal as that for the main circuit terminal block.
 *4 The thickness of the grounding wire and the thickness of the external dynamic brake resistor should be the same as or larger than the thickness of the motor wire.
 *5 Please use all to comply with international standards.
 *6 22.0 kW The connection of the motor power line is a terminal block. In order to comply with the CSA standard, it is necessary to use a CSA standard-certified power wire round terminal.

● Related page

Noise filterP.412 “Composition of Peripheral Devices”
 Surge absorberP.413 “Composition of Peripheral Devices”
 Ferrite coreP.414 “Composition of Peripheral Devices”
 Motor/brake connectorP.307 “Specifications of Motor connector”

● About circuit breaker and magnetic contactor

To comply to EU Directives/UK Regulation, install a circuit breaker between the power and the noise filter without fail, and the circuit breaker should conform to IEC Standards and UL recognized (Listed and  marked).

Suitable for use on a circuit capable of delivering not more than 5000 Arms symmetrical amperes, below the maximum input voltage of the product.

If the short-circuit current of the power supply exceeds this value, install a current limit device (current limiting fuse, current limiting circuit breaker, transformer, etc.) to limit the short-circuit current.

<Caution>

- Select a circuit breaker and noise filter which match to the capacity of power supply (including a load condition).

● Terminal block and protective earth terminals

- Use a copper conductor cables with temperature rating of 75 or higher.
- Use the attached exclusive connector for A-frame to E-frame, and maintain the peeled off length of 8 mm to 9 mm.

■ Fastening torque list (Terminal block screw/Terminal cover fastening screw)

| Frame | Terminal name | Terminal block screw | | Terminal cover fastening screw | |
|-------|--|----------------------|--|--------------------------------|--|
| | | Nominal size | Fastening torque (N·m) ^{Note)1} | Nominal size | Fastening torque (N·m) ^{Note)1} |
| MFDL | L1, L2, L3, L1C, L2C, P, RB, B, N, U, V, W | M5 | 1.8 to 2.0 | M3 | 0.19 to 0.21 |
| MGDL | L1C, L2C | M3 | 0.4 to 0.6 | M3 | 0.19 to 0.21 |
| | L1, L2, L3, P, B, N, U, V, W | M5 | 2.0 to 2.4 | | |
| MHDL | L1C, L2C, DB1, DB2 | M4 | 0.7 to 1.0 | M5 | 2.0 to 2.5 |
| | L1, L2, L3, P, B, N, U, V, W | M6 | 2.2 to 2.5 | M3 | 0.19 to 0.21 |

■ Fastening torque list (Ground terminal screw/Connector to host controller [X4])

| Driver frame | Ground screw | | Connector to host controller (X4) | |
|------------------------------|--------------|--|-----------------------------------|--|
| | Nominal size | Fastening torque (N·m) ^{Note)1} | Nominal size | Fastening torque (N·m) ^{Note)1} |
| MADL, MBDL, MCDL, MDDL, MEDL | M4 | 1.0 to 1.2 | M2.6 | 0.2±0.05 |
| MFDL, MGDL | M5 | 1.8 to 2.0 | | |
| MHDL | M6 | 2.4 to 2.6 | | |

■ Motor: Fastening torque

| Motor | U, V, W terminal Ground terminal screw | | Terminal box cover fastening screw | |
|--------------|--|--|------------------------------------|--|
| | Nominal size | Fastening torque (N·m) ^{Note)1} | Nominal size | Fastening torque (N·m) ^{Note)1} |
| MDMF 22.0 kW | M8 | 12.0 | M5 | 4.4 |

Note)1 <Caution>

- Applying fastening torque larger than the maximum value may result in damage to the product.
- Do not turn on power without tightening all terminal block screws properly, otherwise, loose contacts may generate heat (smoking, firing).

<Remarks>

- To check for looseness, conduct periodic inspection of fastening torque once a year.

| Motor | | | | | Driver | | | | Optional parts ▶ refer to P.306 | | | | | | | |
|--------------------------|--------------------------------------|--------------------|--------------------------------|--------------------------------|--|---|-----------|--------------------------------------|--|---|----------------------------|-----------------------|-----------------------|--------------------------------|----------------------------------|---------------------------------------|
| Motor series | Power supply | Output (W) | Part No. Note)1 | Rating/Spec. Dimensions (page) | A6SF series Multi function type (Pulse, analog, full-closed) | A6SG series RS485 communication A6SE series Basic (Pulse signal input) Note)2, Note)4 | Frame | Power capacity (at rated load) (kVA) | Encoder Cable Note)3 | | Motor Cable Note)3 | | Brake Cable Note)3 | External Regenerative Resistor | Reactor (Single phase) (3-phase) | Noise Filter (Single phase) (3-phase) |
| | | | | | | | | | 23-bit Absolute | | without Brake | with Brake | | | | |
| | | | | | | | | | Use in the absolute system (with battery box) Note)5 | Use in the Incremental system (without battery box) | | | | | | |
| Fixed cable | | Movable cable | | Movable cable | | | | | | | | | | | | |
| Low inertia | MSMF (Leadwire type) 3000 r/min IP65 | Single phase 100 V | 50 | MSMF5AZL1 □ 2 | 63, 119 | MADLT01SF | MADLN01S◇ | A-frame ★ | Approx. 0.4 | MFECA 0* *0EAE (For fixed) | MFECA 0* *0EAD (For fixed) | MFMCA 0* *0EED | MFMCB 0* *0GET Note)6 | DV0P4280 | DV0P227 | DV0P4170 |
| | | | 100 | MSMF011L1 □ 2 | 65, 120 | MADLT11SF | MADLN11S◇ | B-frame ★ | | | | | | DV0P4283 | DV0P228 | |
| | | | 200 | MSMF021L1 □ 2 | 67, 121 | MBDLT21SF | MBDLN21S◇ | C-frame | | | | | | DV0P4282 | | |
| | | | 400 | MSMF041L1 □ 2 | 69, 123 | MCDLT31SF | MCDLN31S◇ | | | | | | | | | |
| | Single phase/3-phase 200 V | 50 | MSMF5AZL1 □ 2 | 64, 119 | MADLT05SF | MADLN05S◇ | A-frame ★ | Approx. 0.5 | DV0P4281 | | | | | DV0P227 DV0P220 | DV0P4170 DV0PM20042 | |
| | | 100 | MSMF012L1 □ 2 | 66, 120 | MADLT05SF | MADLN05S◇ | | | DV0P4283 | | | | | DV0P228 DV0P220 | | |
| | | 200 | MSMF022L1 □ 2 | 68, 121 | MADLT15SF | MADLN15S◇ | B-frame ★ | | DV0P4284 | | | | | DV0P228 DV0P222 | | |
| | | 400 | MSMF042L1 □ 2 | 70, 123 | MBDLT25SF | MBDLN25S◇ | C-frame | | | | | | | | | |
| 750 | MSMF082L1 □ 2 | 71, 124 | MCDLT35SF | MCDLN35S◇ | D-frame | | | | | | | | | | | |
| 1000 | MSMF092L1 □ 2 | 72, 125 | MDDLTL45SF | MDDLNL45S◇ | | | | | | | | | | | | |
| Middle inertia Flat type | MQMF (Leadwire type) 3000 r/min IP65 | Single phase 100 V | 100 | MQMF011L1 □ 2 MQMF011L1 □ 4 | 79, 135 | MADLT11SF | MADLN11S◇ | A-frame ★ | MFECA 0* *0EAE (For fixed) | MFECA 0* *0EAD (For fixed) | MFMCA 0* *0EED | MFMCB 0* *0GET Note)6 | DV0P4280 | DV0P227 | DV0P4170 | |
| | | | 200 | MQMF021L1 □ 2 MQMF021L1 □ 4 | 81, 139 | MBDLT21SF | MBDLN21S◇ | B-frame ★ | | | | | DV0P4283 | DV0P228 | | |
| | | | 400 | MQMF041L1 □ 2 MQMF041L1 □ 4 | 83, 143 | MCDLT31SF | MCDLN31S◇ | C-frame | | | | | DV0P4282 | | | |
| | Single phase/3-phase 200 V | 100 | MQMF012L1 □ 2 MQMF012L1 □ 4 | 80, 135 | MADLT05SF | MADLN05S◇ | A-frame ★ | Approx. 0.5 | | | | | DV0P4281 | DV0P227 DV0P220 | DV0P4170 DV0PM20042 | |
| | | 200 | MQMF022L1 □ 2 MQMF022L1 □ 4 | 82, 139 | MADLT15SF | MADLN15S◇ | | | | | | | DV0P4283 | DV0P228 DV0P220 | | |
| | | 400 | MQMF042L1 □ 2 MQMF042L1 □ 4 | 84, 143 | MBDLT25SF | MBDLN25S◇ | B-frame ★ | | | | | | | | | |
| High inertia | MHMF (Leadwire type) 3000 r/min IP65 | Single phase 100 V | 50 | MHMF5AZL1 □ 2 MHMF5AZL1 □ 4 | 85, 147 | MADLT01SF | MADLN01S◇ | A-frame ★ | MFECA 0* *0EAE (For fixed) | MFECA 0* *0EAD (For fixed) | MFMCA 0* *0EED | MFMCB 0* *0GET Note)6 | DV0P4280 | DV0P227 | DV0P4170 | |
| | | | 100 | MHMF011L1 □ 2 MHMF011L1 □ 4 | 87, 151 | MADLT11SF | MADLN11S◇ | B-frame ★ | | | | | DV0P4283 | DV0P228 | | |
| | | | 200 | MHMF021L1 □ 2 MHMF021L1 □ 4 | 89, 155 | MBDLT21SF | MBDLN21S◇ | C-frame | | | | | DV0P4282 | | | |
| | | | 400 | MHMF041L1 □ 2 MHMF041L1 □ 4 | 91, 159 | MCDLT31SF | MCDLN31S◇ | | | | | | | | | |
| | Single phase/3-phase 200 V | 50 | MHMF5AZL1 □ 2 MHMF5AZL1 □ 4 | 86, 147 | MADLT05SF | MADLN05S◇ | A-frame ★ | Approx. 0.5 | | | | | DV0P4281 | DV0P227 DV0P220 | DV0P4170 DV0PM20042 | |
| | | 100 | MHMF012L1 □ 2 MHMF012L1 □ 4 | 88, 151 | MADLT05SF | MADLN05S◇ | | | | | | | DV0P4283 | DV0P228 DV0P220 | | |
| | | 200 | MHMF022L1 □ 2 MHMF022L1 □ 4 | 90, 155 | MADLT15SF | MADLN15S◇ | B-frame ★ | | | | | | | | | |
| | | 400 | MHMF042L1 □ 2 MHMF042L1 □ 4 | 92, 159 | MBDLT25SF | MBDLN25S◇ | C-frame | | | | | | | | | |
| | | 750 | MHMF082L1 □ 2 MHMF082L1 □ 4 | 93, 163 | MCDLT35SF | MCDLN35S◇ | D-frame | | | | | | | | | |
| | | 1000 | MHMF092L1 □ 2 MHMF092L1 □ 4 | 94, 167 | MDDLTL55SF | MDDLNL55S◇ | | | | | | | | | | |

★ : Frame-A and B drivers are not equipped with regenerative resistors. When regeneration occurs, please prepare an optional external regenerative resistor.

Note)1 □ : Represents the motor specifications. (refer to "Model designation" P.22.)

Note)2 ◇ : Represents the driver specifications. (refer to "Model designation" P.22.)

Note)3 * * : Represents the cable length (03/3 m, 05/5 m, 10/10 m, 20/20 m). Example. 3 m/MFECA0030EAE

Note)4 Because A6SE series driver (dedicated for position control) does not support the absolute system specification, only incremental system can be used in combination.

Note)5 Please note that a battery is not supplied together with 23-bit absolute encoder cable (with battery box). Please buy the battery part number "DV0P2990" separately.

Note)6 Brake cable and motor cables are required for the motors with brake.

| Motor | | | | | Driver | | | | Optional parts ▶ refer to P.306 | | | | | | | | |
|--|-----------------------------------|------------|--------------------------------|--------------------------------|--|---|-----------|--------------------------------------|--|--|--|--|---|---|--------------------------------|-------------------------------------|--------------------|
| Motor series | Power supply | Output (W) | Part No. Note)1 | Rating/Spec. Dimensions (page) | A6SF series Multi function type (Pulse, analog, full-closed) | A6SG series RS485 communication A6SE series Basic (Pulse signal input) Note)2, Note)5 | Frame | Power capacity (at rated load) (kVA) | Encoder Cable Note)3 | | Motor Cable Note)3 | | Brake Cable Note)3 | External Regenerative Resistor | Reactor (Single phase 3-phase) | Noise Filter (Single phase 3-phase) | |
| | | | | | | | | | 23-bit Absolute | | without Brake | with Brake | | | | | |
| | | | | | | | | | Use in the absolute system (with battery box) Note)6 | Use in the Incremental system (without battery box) | | | | | | | |
| Low Inertia MSMF (Connector type) 3000 r/min IP67 | Single phase 100 V | 50 | MSMF5AZL1 □ 1 | 63, 119 | MADLT01SF | MADLN01S◇ | A-frame ★ | Approx. 0.4 | | | | | | DV0P4280 | DV0P227 | DV0P4170 | |
| | | 100 | MSMF011L1 □ 1 | 65, 121 | MADLT11SF | MADLN11S◇ | | | | | | | | DV0P4283 | DV0P228 | DV0PM20042 | |
| | | 200 | MSMF021L1 □ 1 | 67, 122 | MBDLT21SF | MBDLN21S◇ | B-frame ★ | Approx. 0.5 | MFECA 0* *0MJJE (For movable, direction of motor shaft) | MFECA 0* *0MJJD (For movable, direction of motor shaft) | MFMC A 0* *0NJJD (For movable, direction of motor shaft) | MFMCB 0* *0PJTD (For movable, direction of motor shaft) | | | | | |
| | | 400 | MSMF041L1 □ 1 | 69, 123 | MCDLT31SF | MCDLN31S◇ | C-frame | Approx. 0.9 | MFECA 0* *0MKE (For movable, opposite direction of motor shaft) | MFECA 0* *0MKD (For movable, opposite direction of motor shaft) | MFMC A 0* *0NKD (For movable, opposite direction of motor shaft) | MFMCB 0* *0PKTD (For movable, opposite direction of motor shaft) | | | | | |
| | Single phase/ 3-phase 200 V | 50 | MSMF5AZL1 □ 1 | 64, 119 | MADLT05SF | MADLN05S◇ | A-frame ★ | Approx. 0.5 | MFECA 0* *0TJE (For fixed, direction of motor shaft) | MFECA 0* *0TJD (For fixed, direction of motor shaft) | MFMC A 0* *0RJJD (For fixed, direction of motor shaft) | MFMCB 0* *0SJTD (For fixed, direction of motor shaft) | | DV0P4281 | DV0P227 DV0P220 | DV0P4170 DV0PM20042 | |
| | | 100 | MSMF012L1 □ 1 | 66, 121 | MADLT05SF | MADLN05S◇ | | | | | MFECA 0* *0TKE (For fixed, opposite direction of motor shaft) | MFECA 0* *0TKD (For fixed, opposite direction of motor shaft) | MFMC A 0* *0RKD (For fixed, opposite direction of motor shaft) Note)4 | MFMCB 0* *0SKTD (For fixed, opposite direction of motor shaft) Note)7 | | DV0P4283 | DV0P228 DV0P220 |
| | | 200 | MSMF022L1 □ 1 | 68, 122 | MADLT15SF | MADLN15S◇ | | | | | | | | | | | |
| | | 400 | MSMF042L1 □ 1 | 70, 123 | MBDLT25SF | MBDLN25S◇ | B-frame ★ | Approx. 0.9 | | | | | | | | | |
| | | 750 | MSMF082L1 □ 1 | 71, 125 | MCDLT35SF | MCDLN35S◇ | C-frame | Approx. 1.8 | | | | | | | | | |
| | | 1000 | MSMF092L1 □ 1 | 72, 126 | MDDLT45SF | MDDL N45S◇ | D-frame | Approx. 2.4 | | | | | | | | DV0P4284 | DV0P228 DV0P222 |
| Middle Inertia Flat type MQMF (Connector type) 3000 r/min IP67 | Single phase 100 V | 100 | MQMF011L1 □ 1 MQMF011L1 □ 3 | 79, 137 | MADLT11SF | MADLN11S◇ | A-frame ★ | Approx. 0.4 | MFECA 0* *0MJJE (For movable, direction of motor shaft) | MFECA 0* *0MJJD (For movable, direction of motor shaft) | MFMC A 0* *0UJFD (For movable, direction of motor shaft) | MFMC A 0* *0VJFD (For movable, direction of motor shaft) | | DV0P4280 | DV0P227 | DV0P4170 | |
| | | 200 | MQMF021L1 □ 1 MQMF021L1 □ 3 | 81, 141 | MBDLT21SF | MBDLN21S◇ | B-frame ★ | Approx. 0.5 | MFECA 0* *0MKE (For movable, opposite direction of motor shaft) | MFECA 0* *0MKD (For movable, opposite direction of motor shaft) | MFMC A 0* *0UJGD (For movable, opposite direction of motor shaft) | MFMC A 0* *0VJGD (For movable, opposite direction of motor shaft) | | DV0P4283 | DV0P228 | DV0PM20042 | |
| | | 400 | MQMF041L1 □ 1 MQMF041L1 □ 3 | 83, 145 | MCDLT31SF | MCDLN31S◇ | C-frame | Approx. 0.9 | MFECA 0* *0TJE (For fixed, direction of motor shaft) | MFECA 0* *0TJD (For fixed, direction of motor shaft) | MFMC A 0* *0WJFD (For fixed, direction of motor shaft) | MFMC A 0* *0XJFD (For fixed, direction of motor shaft) | | DV0P4282 | | | |
| | Single phase/ 3-phase 200 V | 100 | MQMF012L1 □ 1 MQMF012L1 □ 3 | 80, 137 | MADLT05SF | MADLN05S◇ | A-frame ★ | Approx. 0.5 | MFECA 0* *0TKE (For fixed, opposite direction of motor shaft) | MFECA 0* *0TKD (For fixed, opposite direction of motor shaft) | MFMC A 0* *0WJGD (For fixed, opposite direction of motor shaft) | MFMC A 0* *0XJGD (For fixed, opposite direction of motor shaft) | | DV0P4281 | DV0P227 DV0P220 | DV0P4170 DV0PM20042 | |
| | | 200 | MQMF022L1 □ 1 MQMF022L1 □ 3 | 82, 141 | MADLT15SF | MADLN15S◇ | | | | | | | | | | | |
| | | 400 | MQMF042L1 □ 1 MQMF042L1 □ 3 | 84, 145 | MBDLT25SF | MBDLN25S◇ | B-frame ★ | Approx. 0.9 | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

★ : Frame-A and B drivers are not equipped with regenerative resistors. When regeneration occurs, please prepare an optional external regenerative resistor.

Note)1 □ : Represents the motor specifications. (refer to "Model designation" P.22.)

Note)2 ◇ : Represents the driver specifications. (refer to "Model designation" P.22.)

Note)3 * * : Represents the cable length (03/3 m, 05/5 m, 10/10 m, 20/20 m). Example. 3 m/MFECA0030MJJE

Note)4 Cables for opposite to output shaft cannot be used with 50 W or 100 W motor. (MSMF connector type only.)

Note)5 Because A6SE series driver (dedicated for position control) does not support the absolute system specification, only incremental system can be used in combination.

Note)6 Please note that a battery is not supplied together with 23-bit absolute encoder cable (with battery box). Please buy the battery part number "DV0P2990" separately.

Note)7 Brake cable and motor cables are required for the motors with brake.

Movable : For application where the cable is movable.
Fixed : For application where the cable is fixed.
Direction of motor shaft/Opposite direction of motor shaft : Cable direction

| Motor | | | | | Driver | | | Power capacity (at rated load) (kVA) | Optional parts ▶ refer to P.306 | | | | | | | |
|--------------|--|-----------------------------------|--------------------------------|--------------------------------|--|---|--------------|--|--|--|--|----------------|--|--------------------------------|--------------------------------|--|
| Motor series | Power supply | Output (W) | Part No. Note)1 | Rating/Spec. Dimensions (page) | A6SF series Multi function type (Pulse, analog, full-closed) | A6SG series RS485 communication A6SE series Basic (Pulse signal input) Note)2, Note)4 | Frame | | Encoder Cable Note)3 | | Motor Cable Note)3 | | Brake Cable Note)3 | External Regenerative Resistor | Reactor (Single phase 3-phase) | Noise Filter (Single phase 3-phase) |
| | | | | | | | | | 23-bit Absolute | | without Brake | with Brake | | | | |
| | | | | | | | | | Use in the absolute system (with battery box) Note)5 | Use in the Incremental system (without battery box) | | | | | | |
| High inertia | MHMF (Connector type) 3000 r/min IP67 | Single phase 100 V | 50 | MHMF5AZL1 □ 1 MHMF5AZL1 □ 3 | 85, 149 | MADLT01SF | MADLN01S◇ | A-frame ★ | Approx. 0.4 | MFCA 0 * * 7UFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7VFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7UGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 7VGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 0UFD (For movable, direction of motor shaft) MFCA 0 * * 0VFD (For movable, direction of motor shaft) MFCA 0 * * 0UGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0VGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0WFD (For fixed, direction of motor shaft) MFCA 0 * * 0XFD (For fixed, direction of motor shaft) MFCA 0 * * 0WGD (For fixed, opposite direction of motor shaft) MFCA 0 * * 0XGD (For fixed, opposite direction of motor shaft) MFCA 0 * * 7UFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7VFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7UGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 7VGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 0UFD (For movable, direction of motor shaft) MFCA 0 * * 0VFD (For movable, direction of motor shaft) MFCA 0 * * 0UGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0VGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0WFD (For fixed, direction of motor shaft) MFCA 0 * * 0XFD (For fixed, direction of motor shaft) MFCA 0 * * 0WGD (For fixed, opposite direction of motor shaft) MFCA 0 * * 0XGD (For fixed, opposite direction of motor shaft) MFCA 0 * * 7UFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7VFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7UGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 7VGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 0UFD (For movable, direction of motor shaft) MFCA 0 * * 0VFD (For movable, direction of motor shaft) MFCA 0 * * 0UGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0VGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0WFD (For fixed, direction of motor shaft) MFCA 0 * * 0XFD (For fixed, direction of motor shaft) MFCA 0 * * 0WGD (For fixed, opposite direction of motor shaft) MFCA 0 * * 0XGD (For fixed, opposite direction of motor shaft) | DV0P4280 | DV0P227 | DV0P4170 | | | |
| | | | 100 | MHMF011L1 □ 1 MHMF011L1 □ 3 | 87, 153 | MADLT11SF | MADLN11S◇ | | | | | | | B-frame ★ | Approx. 0.5 | DV0P4283 |
| | | | 200 | MHMF021L1 □ 1 MHMF021L1 □ 3 | 89, 157 | MBDLT21SF | MBDLN21S◇ | C-frame ★ | Approx. 0.9 | | DV0P4282 | DV0P228 | DV0P20042 | | | |
| | | 400 | MHMF041L1 □ 1 MHMF041L1 □ 3 | 91, 161 | MCDLT31SF | MCDLN31S◇ | A-frame ★ | | | | Approx. 0.5 | | | DV0P4281 | DV0P227 DV0P220 | DV0P4170 DV0P20042 |
| | | Single phase/ 3-phase 200 V | 50 | MHMF5AZL1 □ 1 MHMF5AZL1 □ 3 | 86, 149 | MADLT05SF | | MADLN05S◇ | B-frame ★ | | | Approx. 0.9 | MFCA 0 * * 7UFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7VFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7UGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 7VGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 0UFD (For movable, direction of motor shaft) MFCA 0 * * 0VFD (For movable, direction of motor shaft) MFCA 0 * * 0UGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0VGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0WFD (For fixed, direction of motor shaft) MFCA 0 * * 0XFD (For fixed, direction of motor shaft) MFCA 0 * * 0WGD (For fixed, opposite direction of motor shaft) MFCA 0 * * 0XGD (For fixed, opposite direction of motor shaft) | DV0P4283 | | |
| | | | 100 | MHMF012L1 □ 1 MHMF012L1 □ 3 | 88, 153 | MADLT05SF | | MADLN05S◇ | | | | | | | C-frame ★ | Approx. 1.8 |
| | | | 200 | MHMF022L1 □ 1 MHMF022L1 □ 3 | 90, 157 | MADLT15SF | MADLN15S◇ | D-frame | Approx. 2.4 | | MFCA 0 * * 7UFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7VFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7UGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 7VGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 0UFD (For movable, direction of motor shaft) MFCA 0 * * 0VFD (For movable, direction of motor shaft) MFCA 0 * * 0UGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0VGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0WFD (For fixed, direction of motor shaft) MFCA 0 * * 0XFD (For fixed, direction of motor shaft) MFCA 0 * * 0WGD (For fixed, opposite direction of motor shaft) MFCA 0 * * 0XGD (For fixed, opposite direction of motor shaft) | DV0P4284 | DV0P228 DV0P222 | DV0P4220 | | |
| | | 400 | MHMF042L1 □ 1 MHMF042L1 □ 3 | 92, 161 | MBDLT25SF | MBDLN25S◇ | D-frame | | | | | | | | Approx. 2.4 | MFCA 0 * * 7UFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7VFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7UGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 7VGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 0UFD (For movable, direction of motor shaft) MFCA 0 * * 0VFD (For movable, direction of motor shaft) MFCA 0 * * 0UGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0VGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0WFD (For fixed, direction of motor shaft) MFCA 0 * * 0XFD (For fixed, direction of motor shaft) MFCA 0 * * 0WGD (For fixed, opposite direction of motor shaft) MFCA 0 * * 0XGD (For fixed, opposite direction of motor shaft) |
| | | 750 | MHMF082L1 □ 1 MHMF082L1 □ 3 | 93, 165 | MCDLT35SF | MCDLN35S◇ | | D-frame | Approx. 2.4 | | MFCA 0 * * 7UFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7VFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7UGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 7VGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 0UFD (For movable, direction of motor shaft) MFCA 0 * * 0VFD (For movable, direction of motor shaft) MFCA 0 * * 0UGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0VGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0WFD (For fixed, direction of motor shaft) MFCA 0 * * 0XFD (For fixed, direction of motor shaft) MFCA 0 * * 0WGD (For fixed, opposite direction of motor shaft) MFCA 0 * * 0XGD (For fixed, opposite direction of motor shaft) | DV0P4284 | DV0P228 DV0P222 | DV0P4220 | | |
| | | 1000 | MHMF092L1 □ 1 MHMF092L1 □ 3 | 94, 169 | MDDLT55SF | MDDLN55S◇ | D-frame | | | | | | | | Approx. 2.4 | MFCA 0 * * 7UFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7VFD (Movable/fixed common-use, direction of motor shaft) MFCA 0 * * 7UGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 7VGD (Movable/fixed common-use, opposite direction of motor shaft) MFCA 0 * * 0UFD (For movable, direction of motor shaft) MFCA 0 * * 0VFD (For movable, direction of motor shaft) MFCA 0 * * 0UGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0VGD (For movable, opposite direction of motor shaft) MFCA 0 * * 0WFD (For fixed, direction of motor shaft) MFCA 0 * * 0XFD (For fixed, direction of motor shaft) MFCA 0 * * 0WGD (For fixed, opposite direction of motor shaft) MFCA 0 * * 0XGD (For fixed, opposite direction of motor shaft) |

★ : Frame-A and B drivers are not equipped with regenerative resistors. When regeneration occurs, please prepare an optional external regenerative resistor.

Note)1 □ : Represents the motor specifications. (refer to "Model designation" P.22.)

Note)2 ◇ : Represents the driver specifications. (refer to "Model designation" P.22.)

Note)3 * * : Represents the cable length (03/3 m, 05/5 m, 10/10 m, 20/20 m). Example. 3 m/MFECA0030MJE

Note)4 Because A6SE series driver (dedicated for position control) does not support the absolute system specification, only incremental system can be used in combination.

Note)5 Please note that a battery is not supplied together with 23-bit absolute encoder cable (with battery box). Please buy the battery part number "DV0P2990" separately.

Movable : For application where the cable is movable.
Fixed : For application where the cable is fixed.
Direction of motor shaft/Opposite direction of motor shaft : Cable direction

| Motor series | | Motor | | | | Driver | | | | Optional parts ▶ refer to P.306 | | | | | | | | | | | | |
|----------------|---|-----------------------------------|--------------------------------|--------------------------------|--------------------------------|--|---|-----------------|--------------------------------------|---|---|--|--------------------|--------------------------------|----------------------------------|--------------------|--------------------|----------------------------|------------|----------------------------|---------|----------|
| | | Power supply | Output (W) | Part No. Note)1 | Rating/Spec. Dimensions (page) | A6SF series Multi function type (Pulse, analog, full-closed) | A6SG series RS485 communication A6SE series Basic (Pulse signal input) Note)2, Note)4 | Frame | Power capacity (at rated load) (kVA) | Encoder Cable Note)3,5 JL10 (Large size) (One-touch lock type) (N/MS screwed type) | | Motor Cable Note)3,5 JL10 (One-touch lock type) (JL04 screwed type) | | External Regenerative Resistor | Reactor (Single phase / 3-phase) | Noise Filter | | | | | | |
| | | | | | | | | 23-bit Absolute | | | | | | | | | | | | | | |
| | | | | | | | | | | Use in the absolute system (with battery box) Note)7 | Use in the incremental system (without battery box) | without Brake | with Brake | | | | | | | | | |
| | | | | | | | | | | Fixed cable | | Movable cable | | | | | | | | | | |
| Low inertia | MSMF Large size JL10 type 3000 r/min IP67 | Single phase/ 3-phase 200 V | 1000 | MSMF102L1 □ 6 MSMF102L1 □ 8 | 73, 127 | MDDL55SF | MDDL55S◇ | D-frame | Approx. 2.4 | MFECA 0 * * 0EPE | MFECA 0 * * 0EPD | MFCA 0 * * 2EUD | MFCA 0 * * 2FUD | DV0P4284 | DV0P228 / DV0P222 | DV0P4220 | | | | | | |
| | | | 1500 | MSMF152L1 □ 6 MSMF152L1 □ 8 | 74, 128 | MDDL55SF | MDDL55S◇ | | Approx. 2.9 | | | | | | DV0P228 / DV0P222 | | | | | | | |
| | | 3-phase 200 V | 2000 | MSMF202L1 □ 6 MSMF202L1 □ 8 | 75, 129 | MEDLT83SF | MEDLN83S◇ | E-frame | Approx. 3.8 | | | | | | MFCA 0 * * 2ECD | MFCA 0 * * 2FCD | DV0P4285 Note)6 | DV0P223 | DV0PM20043 | | | |
| | | | 3000 | MSMF302L1 □ 6 MSMF302L1 □ 8 | 76, 131 | MFDLTA3SF | MFDLNA3S◇ | | F-frame | | | | | | Approx. 5.2 | MFCA 0 * * 3EUT | MFCA 0 * * 3FUT | DV0P4285 x2 in parallel | DV0P224 | DV0P3410 | | |
| | | | 4000 | MSMF402L1 □ 6 MSMF402L1 □ 8 | 77, 132 | MFDLTB3SF | MFDLNB3S◇ | | | | | | | | Approx. 7.8 | MFCA 0 * * 3ECT | MFCA 0 * * 3FCT | | DV0P225 | | | |
| 5000 | MSMF502L1 □ 6 MSMF502L1 □ 8 | 78, 133 | MFDLTB3SF | MFDLNB3S◇ | | | | | | | | | | | | | | | | | | |
| Middle inertia | MDMF Large size JL10 type 2000 r/min IP67 | Single phase/ 3-phase 200 V | 1000 | MDMF102L1 □ 6 MDMF102L1 □ 8 | 102, 180 | MDDL45SF | MDDL45S◇ | D-frame | Approx. 2.4 | MFECA 0 * * 0EPE | MFECA 0 * * 0EPD | MFCA 0 * * 2EUD | MFCA 0 * * 2FUD | DV0P4284 | DV0P228 / DV0P222 | DV0P4220 | | | | | | |
| | | | 1500 | MDMF152L1 □ 6 MDMF152L1 □ 8 | 103, 181 | MDDL55SF | MDDL55S◇ | | Approx. 2.9 | | | | | | DV0P228 / DV0P222 | | | | | | | |
| | | 3-phase 200 V | 2000 | MDMF202L1 □ 6 MDMF202L1 □ 8 | 104, 183 | MEDLT83SF | MEDLN83S◇ | E-frame | Approx. 3.8 | | | | | | MFCA 0 * * 2ECD | MFCA 0 * * 2FCD | DV0P4285 Note)6 | DV0P223 | DV0PM20043 | | | |
| | | | 3000 | MDMF302L1 □ 6 MDMF302L1 □ 8 | 105, 184 | MFDLTA3SF | MFDLNA3S◇ | | F-frame | | | | | | Approx. 5.2 | MFCA 0 * * 3EUT | MFCA 0 * * 3FUT | DV0P4285 x2 in parallel | DV0P224 | DV0P3410 | | |
| | | | 4000 | MDMF402L1 □ 6 MDMF402L1 □ 8 | 106, 185 | MFDLTB3SF | MFDLNB3S◇ | | | | | | | | Approx. 7.8 | MFCA 0 * * 3ECT | MFCA 0 * * 3FCT | | DV0P225 | | | |
| | 5000 | MDMF502L1 □ 6 MDMF502L1 □ 8 | 107, 187 | MFDLTB3SF | MFDLNB3S◇ | | | | | | | | | | | | | | | | | |
| | MGMF Large size JL10 type (Low speed/ High torque type) 1500 r/min IP67 | Single phase/ 3-phase 200 V | 850 | MGMF092L1 □ 6 MGMF092L1 □ 8 | 112, 193 | MDDL45SF | MDDL45S◇ | D-frame | Approx. 2.0 | MFECA 0 * * 0EPE | MFECA 0 * * 0EPD | MFCA 0 * * 2EUD | MFCA 0 * * 2FUD | DV0P4284 | DV0P228 / DV0P221 | DV0P4220 | | | | | | |
| | | | 1300 | MGMF132L1 □ 6 MGMF132L1 □ 8 | 113, 195 | MDDL55SF | MDDL55S◇ | | Approx. 2.6 | | | | | | DV0P228 / DV0P222 | | | | | | | |
| | | 3-phase 200 V | 1800 | MGMF182L1 □ 6 MGMF182L1 □ 8 | 114, 196 | MEDLT83SF | MEDLN83S◇ | E-frame | Approx. 3.4 | | | | | | MFCA 0 * * 2ECD | MFCA 0 * * 2FCD | DV0P4285 Note)6 | DV0P223 | DV0PM20043 | | | |
| | | | 2400 | MGMF242L1 □ 6 MGMF242L1 □ 8 | 115, 197 | MEDLT93SF | MEDLN93S◇ | | F-frame | | | | | | Approx. 4.5 | MFCE 0 * * 3EUT | | MFCD 0 * * 3FUT | | DV0P4285 x2 in parallel | DV0P224 | DV0P3410 |
| 2900 | | | MGMF292L1 □ 6 MGMF292L1 □ 8 | 116, 199 | MFDLTA3SF | MFDLNA3S◇ | Approx. 5.0 | | | | | | | | MFCA 0 * * 3ECT | MFCA 0 * * 3FCT | | DV0P225 | | | | |
| 4400 | MGMF442L1 □ 6 MGMF442L1 □ 8 | 117, 200 | MFDLTB3SF | MFDLNB3S◇ | | | | | | | | | | | | | | | | | | |
| High inertia | MHMF Large size JL10 type 2000 r/min IP67 | Single phase/ 3-phase 200 V | 1000 | MHMF102L1 □ 6 MHMF102L1 □ 8 | 95, 171 | MDDL45SF | MDDL45S◇ | D-frame | Approx. 2.4 | MFECA 0 * * 0EPE | MFECA 0 * * 0EPD | MFCA 0 * * 2EUD | MFCA 0 * * 2FUD | DV0P4284 | DV0P228 / DV0P222 | DV0P4220 | | | | | | |
| | | | 1500 | MHMF152L1 □ 6 MHMF152L1 □ 8 | 96, 172 | MDDL55SF | MDDL55S◇ | | Approx. 2.9 | | | | | | DV0P228 / DV0P222 | | | | | | | |
| | | 3-phase 200 V | 2000 | MHMF202L1 □ 6 MHMF202L1 □ 8 | 97, 173 | MEDLT83SF | MEDLN83S◇ | E-frame | Approx. 3.8 | | | | | | MFCE 0 * * 2EUD | MFCE 0 * * 2FUD | DV0P4285 Note)6 | DV0P223 | DV0PM20043 | | | |
| | | | 3000 | MHMF302L1 □ 6 MHMF302L1 □ 8 | 98, 175 | MFDLTA3SF | MFDLNA3S◇ | | F-frame | | | | | | Approx. 5.2 | MFCE 0 * * 2ECD | | MFCE 0 * * 2FCD | | DV0P4285 x2 in parallel | DV0P224 | DV0P3410 |
| | | | 4000 | MHMF402L1 □ 6 MHMF402L1 □ 8 | 99, 176 | MFDLTB3SF | MFDLNB3S◇ | | | | | | | | Approx. 7.8 | MFCA 0 * * 3EUT | | MFCA 0 * * 3FUT | | | DV0P225 | |
| | | | 5000 | MHMF502L1 □ 6 MHMF502L1 □ 8 | 100, 177 | MFDLTB3SF | MFDLNB3S◇ | | | | | | | | | | | | | | | |

Note)1 □ : Represents the motor specifications. (refer to "Model designation" P.22.)
 Note)2 ◇ : Represents the driver specifications. (refer to "Model designation" P.22.)
 Note)3 * * : Represents the cable length (03/3 m, 05/5 m, 10/10 m, 20/20 m). Example. 3 m/MFCA0030EPE
 Note)4 Because A6SE series driver (dedicated for position control) does not support the absolute system specification, only incremental system can be used in combination.

Note)5 Use of JL10 type encoder cables and motor cables enable one-touch lock connections. Conventional screwed type N/MS and JL04V type cables can also be used.
 Note)6 For other possible combinations, refer to P.343.
 Note)7 Please note that a battery is not supplied together with 23-bit absolute encoder cable (with battery box). Please buy the battery part number "DV0P2990" separately.

A6 Series **Table of Part Numbers and Options** **100 mm sq. or more** **0.85 kW to 5.0 kW**
 IP67 motor Encoder connector (Small size JN2) type

| Motor | | | | | Driver | | | | Optional parts ▶ refer to P.306 | | | | | | | | |
|--|---|-----------------------------|--------------------------------|----------------------------------|--|---|-----------|--------------------------------------|--|---|--|---|--------------------------------|----------------------------------|-------------------------|-------------------------|--------------------|
| Motor series | Power supply | Output (W) | Part No. Note)1 | Rating/ Spec. Dimensions (page) | A6SF series Multi function type (Pulse, analog, full-closed) | A6SG series RS485 communication A6SE series Basic (Pulse signal input) Note)2, Note)4 | Frame | Power capacity (at rated load) (kVA) | Encoder Cable Note)3 | | Motor Cable Note)3,5 | | External Regenerative Resistor | Reactor (Single phase / 3-phase) | Noise Filter | | |
| | | | | | | | | | JN2 (Small size) (One-touch lock type) | | JL10 (One-touch lock type) (JL04 screwed type) | | | | | without Brake | with Brake |
| | | | | | | | | | 23-bit Absolute | | Use in the absolute system (with battery box) Note)7 | Use in the Incremental system (without battery box) | | | | | |
| | | | | | | | | | Use in the absolute system (with battery box) Note)7 | Use in the Incremental system (without battery box) | | | | | | | |
| Fixed cable | | Movable cable | | | | | | | | | | | | | | | |
| Low inertia | MSMF Small size JN2 type 3000 r/min IP67 | Single phase/ 3-phase 200 V | 1000 | MSMF102L1 □ 5 MSMF102L1 □ 7 | 73, 127 | MDDL55SF | MDDL55S◇ | D-frame | Approx. 2.4 | MFCEA 0 * * 0ETE | MFCEA 0 * * 0ETD | MFMC 0 * * 2EUD | MFMC 0 * * 2FUD | DV0P4284 | DV0P228 / DV0P222 | DV0P4220 | |
| | | | 1500 | MSMF152L1 □ 5 MSMF152L1 □ 7 | 74, 129 | MDDL55SF | MDDL55S◇ | | | | | | | | DV0PM20047 / DV0P222 | | |
| | | 3-phase 200 V | 2000 | MSMF202L1 □ 5 MSMF202L1 □ 7 | 75, 130 | MEDLT83SF | MEDLN83S◇ | E-frame | Approx. 3.8 | | | MFMC 0 * * 2ECD | MFMC 0 * * 2FCD | DV0P4285 Note)6 | DV0P223 | DV0PM20043 | |
| | | | 3000 | MSMF302L1 □ 5 MSMF302L1 □ 7 | 76, 131 | MFDLTA3SF | MFDLNA3S◇ | | | | | F-frame | Approx. 5.2 | | MFMC 0 * * 3EUT | | MFMC 0 * * 3FUT |
| | | | 4000 | MSMF402L1 □ 5 MSMF402L1 □ 7 | 77, 133 | MFDLTB3SF | MFDLNB3S◇ | F-frame | Approx. 7.8 | | | | | MFMC 0 * * 3ECT | MFMC 0 * * 3FCT | DV0P4285 x2 in parallel | DV0P225 |
| | | | 5000 | MSMF502L1 □ 5 MSMF502L1 □ 7 | 78, 134 | MFDLTB3SF | MFDLNB3S◇ | | | | | | | | | | |
| Middle inertia | MDMF Small size JN2 type 2000 r/min IP67 | Single phase/ 3-phase 200 V | 1000 | MDMF102L1 □ 5 MDMF102L1 □ 7 | 102, 181 | MDDL45SF | MDDL45S◇ | D-frame | Approx. 2.4 | MFCEA 0 * * 0ETE | MFCEA 0 * * 0ETD | MFMC 0 * * 2EUD | MFMC 0 * * 2FUD | DV0P4284 | DV0P228 / DV0P222 | DV0P4220 | |
| | | | 1500 | MDMF152L1 □ 5 MDMF152L1 □ 7 | 103, 182 | MDDL55SF | MDDL55S◇ | | | | | | | | DV0PM20047 / DV0P222 | | |
| | | 3-phase 200 V | 2000 | MDMF202L1 □ 5 MDMF202L1 □ 7 | 104, 183 | MEDLT83SF | MEDLN83S◇ | E-frame | Approx. 3.8 | | | MFMC 0 * * 2ECD | MFMC 0 * * 2FCD | DV0P4285 Note)6 | DV0P223 | DV0PM20043 | |
| | | | 3000 | MDMF302L1 □ 5 MDMF302L1 □ 7 | 105, 185 | MFDLTA3SF | MFDLNA3S◇ | | | | | F-frame | Approx. 5.2 | | MFMC 0 * * 3EUT | | MFMC 0 * * 3FUT |
| | | | 4000 | MDMF402L1 □ 5 MDMF402L1 □ 7 | 106, 186 | MFDLTB3SF | MFDLNB3S◇ | F-frame | Approx. 7.8 | | | | | MFMC 0 * * 3ECT | MFMC 0 * * 3FCT | DV0P4285 x2 in parallel | DV0P225 |
| | | | 5000 | MDMF502L1 □ 5 MDMF502L1 □ 7 | 107, 187 | MFDLTB3SF | MFDLNB3S◇ | | | | | | | | | | |
| | MGMF Small size JN2 type (Low speed/ High torque type) 1500 r/min IP67 | Single phase/ 3-phase 200 V | 850 | MGMF092L1 □ 5 MGMF092L1 □ 7 | 112, 194 | MDDL45SF | MDDL45S◇ | D-frame | Approx. 2.0 | MFCEA 0 * * 0ETE | MFCEA 0 * * 0ETD | MFMC 0 * * 2EUD | MFMC 0 * * 2FUD | DV0P4284 | DV0P228 / DV0P221 | DV0P4220 | |
| | | | 1300 | MGMF132L1 □ 5 MGMF132L1 □ 7 | 113, 195 | MDDL55SF | MDDL55S◇ | | | | | | | | DV0PM20047 / DV0P222 | | |
| | | 3-phase 200 V | 1800 | MGMF182L1 □ 5 MGMF182L1 □ 7 | 114, 197 | MEDLT83SF | MEDLN83S◇ | E-frame | Approx. 3.4 | | | MFMC 0 * * 2ECD | MFMC 0 * * 2FCD | DV0P4285 Note)6 | DV0P223 | DV0PM20043 | |
| | | | 2400 | MGMF242 L1 □ 5 MGMF242 L1 □ 7 | 115, 198 | MEDLT93SF | MEDLN93S◇ | | | | | F-frame | Approx. 4.5 | | MFMC 0 * * 3EUT | | MFMC 0 * * 3FUT |
| | | | 2900 | MGMF292L1 □ 5 MGMF292L1 □ 7 | 116, 199 | MFDLTB3SF | MFDLNB3S◇ | F-frame | Approx. 5.0 | | | | | MFMC 0 * * 3ECT | MFMC 0 * * 3FCT | DV0P4285 x2 in parallel | DV0P3410 |
| | | | 4400 | MGMF442L1 □ 5 MGMF442L1 □ 7 | 117, 201 | MFDLTB3SF | MFDLNB3S◇ | | | | | | | | | | |
| MHMF Small size JN2 type 2000 r/min IP67 | Single phase/ 3-phase 200 V | 1000 | MHMF102L1 □ 5 MHMF102L1 □ 7 | 95, 171 | MDDL45SF | MDDL45S◇ | D-frame | Approx. 2.4 | MFCEA 0 * * 0ETE | MFCEA 0 * * 0ETD | MFMC 0 * * 2EUD | MFMC 0 * * 2FUD | DV0P4284 | DV0P228 / DV0P222 | DV0P4220 | | |
| | | 1500 | MHMF152L1 □ 5 MHMF152L1 □ 7 | 96, 173 | MDDL55SF | MDDL55S◇ | | | | | | | | DV0PM20047 / DV0P222 | | | |
| | 3-phase 200 V | 2000 | MHMF202L1 □ 5 MHMF202L1 □ 7 | 97, 174 | MEDLT83SF | MEDLN83S◇ | E-frame | Approx. 3.8 | | | MFMC 0 * * 2ECD | MFMC 0 * * 2FCD | DV0P4285 Note)6 | DV0P223 | DV0PM20043 | | |
| | | 3000 | MHMF302L1 □ 5 MHMF302L1 □ 7 | 98, 175 | MFDLTA3SF | MFDLNA3S◇ | | | | | F-frame | Approx. 5.2 | | MFMC 0 * * 3EUT | | MFMC 0 * * 3FUT | DV0P224 |
| | | 4000 | MHMF402L1 □ 5 MHMF402L1 □ 7 | 99, 177 | MFDLTB3SF | MFDLNB3S◇ | F-frame | Approx. 7.8 | | | | | MFMC 0 * * 3ECT | MFMC 0 * * 3FCT | DV0P4285 x2 in parallel | DV0P225 | DV0P3410 |
| | | 5000 | MHMF502L1 □ 5 MHMF502L1 □ 7 | 100, 178 | MFDLTB3SF | MFDLNB3S◇ | | | | | | | | | | | |

Note)1 □ : Represents the motor specifications. (refer to "Model designation" P.22.)

Note)2 ◇ : Represents the driver specifications. (refer to "Model designation" P.22.)

Note)3 * * : Represents the cable length (03/3 m, 05/5 m, 10/10 m, 20/20 m). Example. 3 m/MFCEA0030ETE

Note)4 Because A6SE series driver (dedicated for position control) does not support the absolute system specification, only incremental system can be used in combination.

Note)5 Use of JL10 type motor cables enable one-touch lock connections. Conventional screwed type JL04V type cables can also be used.

Note)6 For other possible combinations, refer to P.343.

Note)7 Please note that a battery is not supplied together with 23-bit absolute encoder cable (with battery box). Please buy the battery part number "DV0P2990" separately.

| Motor | | | | Driver | | | | Optional parts ▶ refer to P.306 | | | | | | | | | | | |
|----------------|---------------|------------|------------------|--------------------------------|--|--|------------|--|---|--|---|---|--------------------------------|--|--|--|----------------------------|--|--|
| Motor series | Power supply | Output (W) | Part No. (Note)1 | Rating/Spec. Dimensions (page) | A6SF series Multi function type (Pulse, analog, full-closed) | A6SG series RS485 communication A6SE series Basic (Pulse signal input) | Frame | Power capacity (at rated load) (kVA) | Encoder Cable Note)2,3 | | Motor Cable | | External Regenerative Resistor | Reactor (Single phase / 3-phase) | Noise Filter | | | | |
| | | | | | | | | | JL10 (Large size) (One-touch lock type) (N/MS screwed type) | | Note)6 | | | | | without Brake | with Brake | | |
| | | | | | | | | | 23-bit Absolute | | Use in the absolute system (with battery box) (Note)4 | Use in the Incremental system (without battery box) | | | | | | | |
| | | | | | | | | | Fixed cable | | | | | | | | | | |
| Middle inertia | 3-phase 200 V | 7500 | MDMF752L1 □ 6 | 108 188 | MGDLTC3SF | — | G-frame | Approx. 11 | MFECA 0 * * 0EPE MFECA 0 * * 0ESE | MFECA 0 * * 0EPD MFECA 0 * * 0ESD | Note)6 | Note)6 | DV0P4285 x3 in parallel | — Note)5 | HF3080C-SZA (Recommended components) P.413 | | | | |
| | | 11000 | MDMFC12L1 □ 6 | 109 189 | MHDLTE3SF | — | H-frame | Approx. 20 | | | | | | | | Note)6 | Note)6 | DV0P4285 x6 in parallel | HF3100C-SZA (Recommended components) P.413 |
| | | 15000 | MDMFC52L1 □ 6 | 110 191 | MHDLTE3SF | — | | | | | | | | | | | | | |
| | | 22000 | MDMFD22L1 □ 6 | 111 192 | MHDLTF3SF | — | Approx. 28 | Note)6 (U, V, W, Ground) : M8 terminal block | | | | | | | | Note)6 (U, V, W, Ground) : M8 terminal block | DV0P4285 x3 in parallel | HF3080C-SZA (Recommended components) P.413 | |
| Middle inertia | 3-phase 200 V | 5500 | MGMF552L1 □ 6 | 118 201 | MGDLTC3SF | — | G-frame | Approx. 8.5 | MFECA 0 * * 0EPE MFECA 0 * * 0ESE | MFECA 0 * * 0EPD MFECA 0 * * 0ESD | Note)6 | Note)6 | DV0P4285 x3 in parallel | — Note)5 | HF3080C-SZA (Recommended components) P.413 | | | | |
| High inertia | 3-phase 200 V | 7500 | MHMF752L1 □ 6 | 101 179 | MGDLTC3SF | — | G-frame | Approx. 11 | MFECA 0 * * 0EPE MFECA 0 * * 0ESE | MFECA 0 * * 0EPD MFECA 0 * * 0ESD | Note)6 | Note)6 | — Note)5 | HF3080C-SZA (Recommended components) P.413 | | | | | |

■ About dynamic brake

G frame is built-in / external, H frame is external
 The indication of the internal / {external} dynamic brake resistance capacity is the maximum allowable inertia (load inertia moment ratio to rotor inertia moment is 10 times) up to three consecutive emergency stops at the rated speed. If used under conditions higher than that, the resistance may break and the dynamic brake may not operate.
 Recommended resistance: 1.2 Ω 400 W or more × 3 pieces
 For inquiries: Iwaki Musen Kenkyusho Co.,Ltd. Tel: +81-44-833-4311

- Note)1 □ : Represents the motor specifications. (refer to "Model designation" P.22.)
- Note)2 * * : Represents the cable length (03/3 m, 05/5 m, 10/10 m, 20/20 m). Example. 3 m/MFECA0030ETE
- Note)3 Use of JL10 type encoder cables and motor cables enable one-touch lock connections. Conventional screwed type N/MS and JL04V type cables can also be used.
- Note)4 Please note that a battery is not supplied together with 23-bit absolute encoder cable (with battery box). Please buy the battery part number "DV0P2990" separately.
- Note)5 The reactor has to be prepared by the customer.
- Note)6 We recommend purchasing an optional connector kit.

■ Connector kit (option) components Note)6

| Motor | Driver | | Option No. Connector Kit for motor, encoder connection | Encoder Cable | | Motor Cable | | Brake Cable | |
|---|--------|---------------------|--|--|------------------|---|--|--------------|---|
| | Frame | Connection terminal | | Motor side | Driver side | Motor side | Driver side | Motor side | Power supply for brake |
| MDMF 7.5 kW MGMF 5.5 kW MHMF 7.5 kW | G | M5 | DV0PM20107 | Large size connector One-touch lock type | For Connector X6 | Connector Screwed type | (to be supplied by customer) M5 Round terminal | not included | Connector Screwed type (to be supplied by customer) |
| | | | DV0PM20108 | | | | | | |
| | | | DV0PM20111 | Large size connector Screwed type | | | | | |
| | | | DV0PM20112 | | | | | | |
| MDMF 11.0 kW MDMF 15.0 kW | H | M6 | DV0PM20107 | Large size connector One-touch lock type | For Connector X6 | Connector Screwed type | (to be supplied by customer) M6 Round terminal | not included | Connector Screwed type (to be supplied by customer) |
| | | | DV0PM20108 | | | | | | |
| | | | DV0PM20111 | Large size connector Screwed type | | | | | |
| | | | DV0PM20112 | | | | | | |
| MDMF 22.0 kW | H | M6 | DV0PM20109 | Large size connector One-touch lock type | For Connector X6 | Terminal block (to be supplied by customer) M8 Round terminal | (to be supplied by customer) M6 Round terminal | not included | Connector Screwed type (to be supplied by customer) |
| | | | DV0PM20110 | | | | | | |
| | | | DV0PM20113 | Large size connector Screwed type | | | | | |
| | | | DV0PM20114 | | | | | | |

| Motor | | | | | Driver | | | | Optional parts ▶ refer to P.306 | | | | | | | | |
|----------------|--|---------------|------------------|--------------------------------|--|---|-------|--------------------------------------|--|------------------|---|---|--------------------------------|--|--|---------------|--|
| Motor series | Power supply | Output (W) | Part No. (Note)1 | Rating/Spec. Dimensions (page) | A6SF series Multi function type (Pulse, analog, full-closed) | A6SG series RS485 communication A6SE series Basic (Pulse signal input) | Frame | Power capacity (at rated load) (kVA) | Encoder Cable (Note)2 | | Motor Cable (Note)5 | | External Regenerative Resistor | Reactor (Single phase / 3-phase) | Noise Filter | | |
| | | | | | | | | | JN2 (Small size) (One-touch lock type) | | | | | | | without Brake | with Brake |
| | | | | | | | | | 23-bit Absolute | | Use in the absolute system (with battery box) (Note)3 | Use in the Incremental system (without battery box) | | | | | |
| | | | | | | | | | Fixed cable | | | | | | | | |
| Middle inertia | MDMF Small size JN2 type 1500 r/min IP67 IP44 (22000 W) | 3-phase 200 V | 7500 | MDMF752L1 □ 5 | 108 189 | MGDLTC3SF | — | G-frame | Approx. 11 | MFECA 0 * * 0ETE | MFECA 0 * * 0ETD | Note)5 | Note)5 | DV0P4285 x3 in parallel | HF3080C-SZA (Recommended components) P.413 | | |
| | | | 11000 | MDMFC12L1 □ 5 | 109 190 | MHDLTE3SF | — | H-frame | Approx. 20 | | | | | DV0P4285 x6 in parallel | HF3100C-SZA (Recommended components) P.413 | | |
| | | | 15000 | MDMFC52L1 □ 5 | 110 191 | MHDLTE3SF | — | H-frame | Approx. 28 | | | | | Note)5 (U, V, W, Ground) (: M8 terminal block) | Note)5 (U, V, W, Ground) (: M8 terminal block) | Note)4 | HF3080C-SZA (Recommended components) P.413 |
| | | | 22000 | MDMFD22L1 □ 5 | 111 193 | MHDLTF3SF | — | H-frame | | | | | | | | | |
| Middle inertia | MGMF Small size JN2 type (Low speed/High torque type) 1500 r/min IP67 | 3-phase 200 V | 5500 | MGMF552L1 □ 5 | 118 202 | MGDLTC3SF | — | G-frame | Approx. 8.5 | MFECA 0 * * 0ETE | MFECA 0 * * 0ETD | Note)5 | Note)5 | DVO P4285 x3 in parallel | HF3080C-SZA (Recommended components) P.413 | | |
| High inertia | MHMF Small size JN2 type 1500 r/min IP67 | 3-phase 200 V | 7500 | MHMF752L1 □ 5 | 101 179 | MGDLTC3SF | — | G-frame | Approx. 11 | MFECA 0 * * 0ETE | MFECA 0 * * 0ETD | Note)5 | Note)5 | Note)4 | HF3080C-SZA (Recommended components) P.413 | | |

■ About dynamic brake

G frame is built-in / external, H frame is external
 The indication of the internal / {external} dynamic brake resistance capacity is the maximum allowable inertia (load inertia moment ratio to rotor inertia moment is 10 times) up to three consecutive emergency stops at the rated speed. If used under conditions higher than that, the resistance may break and the dynamic brake may not operate.
 Recommended resistance: 1.2 Ω 400 W or more × 3 pieces
 For inquiries: Iwaki Musen Kenkyusho Co.,Ltd. Tel: +81-44-833-4311

■ Connector kit (option) components (Note)5

| Motor | Driver | | Option No. Connector Kit for motor, encoder connection | Encoder Cable | | Motor Cable | | Brake Cable | |
|---|--------|---------------------|--|-----------------------------------|------------------|---|--|------------------------|------------------------------|
| | Frame | Connection terminal | | Motor side | Driver side | Motor side | Driver side | Motor side | Power supply for brake |
| MDMF 7.5 kW MGMF 5.5 kW MHMF 7.5 kW | G | M5 | DV0PM20056 | Small size connector Screwed type | For Connector X6 | Connector Screwed type | (to be supplied by customer) M5 Round terminal | not included | (to be supplied by customer) |
| | | | DV0PM20057 | | | | | Connector Screwed type | |
| MDMF 11.0 kW MDMF 15.0 kW | H | M6 | DV0PM20056 | Small size connector Screwed type | For Connector X6 | Connector Screwed type | (to be supplied by customer) M6 Round terminal | not included | (to be supplied by customer) |
| | | | DV0PM20057 | | | | | Connector Screwed type | |
| MDMF 22.0 kW | H | M6 | DV0PM20115 | Small size connector Screwed type | For Connector X6 | Terminal block (to be supplied by customer) M8 Round terminal | (to be supplied by customer) M6 Round terminal | not included | (to be supplied by customer) |
| | | | DV0PM20116 | | | | | Connector Screwed type | |

- Note)1 □ : Represents the motor specifications. (refer to "Model designation" P.22.)
- Note)2 * * : Represents the cable length (03/3 m, 05/5 m, 10/10 m, 20/20 m). Example. 3 m/MFECA0030ETE
- Note)3 Please note that a battery is not supplied together with 23-bit absolute encoder cable (with battery box). Please buy the battery part number "DV0P2990" separately.
- Note)4 The reactor has to be prepared by the customer.
- Note)5 We recommend purchasing an optional connector kit.

A6 Family
 A6N Series
 A6B Series
 E Series
 Information

| | | | | | | | | |
|-------------------------|---|---|--|--------------------|---|--|--|---------------|
| Basic Specifications | Input power | 100 V | Main circuit | Single phase | 100 V ^{+10 %} _{-15 %} | to 120 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz | |
| | | | Control circuit | Single phase | 100 V ^{+10 %} _{-15 %} | to 120 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz | |
| | | 200 V | Main circuit | A-frame to D-frame | Single/3-phase | 200 V ^{+10 %} _{-15 %} | to 240 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz |
| | | | | E-frame to H-frame | 3-phase | 200 V ^{+10 %} _{-15 %} | to 240 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz |
| | | | Control circuit | A-frame to D-frame | Single phase | 200 V ^{+10 %} _{-15 %} | to 240 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz |
| | | | E-frame to H-frame | Single phase | 200 V ^{+10 %} _{-15 %} | to 240 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz | |
| | Environment | temperature | Ambient temperature: 0 °C to 55 °C (free from freezing) Storage temperature: -20 °C to 65 °C (Max.temperature guarantee: 80 °C for 72 hours free from condensation ^{*1}) | | | | | |
| | | humidity | Both operating and storage : 20 %RH to 85 %RH (free from condensation ^{*1}) | | | | | |
| | | Altitude | Lower than 1000 m | | | | | |
| | | Vibration | 5.88 m/s ² or less, 10 Hz to 60 Hz | | | | | |
| Control method | IGBT PWM Sinusoidal wave drive | | | | | | | |
| Encoder feedback | 23-bit (8388608 resolution) absolute encoder, 7-wire serial * When using it as an incremental system (not using multi-turn data), do not connect the battery for absolute encoder. Parameter Pr. 0.15 must be set to "1" (factory settings). | | | | | | | |
| External scale feedback | A/B phase, homing signal differential input. Serial communication is also supported. Manufacturers that support serial communication scale: Fagor Automation S.Coop., HEIDENHAIN, Magnescale Co., Ltd., Mitutoyo Corporation Nidec Instruments Corporation, Renishaw plc | | | | | | | |
| Interface connector | Control signal | Input | General purpose 10 inputs The function of general-purpose input is selected by parameters. | | | | | |
| | | Output | General purpose 6 outputs The function of general-purpose output is selected by parameters. | | | | | |
| | Analog signal | Input | 3 inputs (16-bit A/D : 1 input, 12-bit A/D : 2 inputs) | | | | | |
| | | Output | 2 outputs (Analog monitor: 2 output) | | | | | |
| Pulse signal | Input | 2 inputs (Photo-coupler input, Line receiver input) Both open collector and line driver interface can be connected. High speed line driver interface can be connected. | | | | | | |
| | Output | 4 outputs (Line driver: 3 output, open collector: 1 output) Line driver output for encoder pulses (A/B/Z signal) or external feedback pulses (EXA/EXB/EXZ signal) open collector output also available for Z or EXZ signal. | | | | | | |
| Communication function | USB | USB interface to connect to computers for parameter setting or status monitoring. | | | | | | |
| | RS232 | 1:1 communication | | | | | | |
| | RS485 | 1: n communication (max 31) (Supports Modbus) | | | | | | |
| Safety function | A dedicated connector is provided for Functional Safety. | | | | | | | |
| Front panel | (1) 5 keys (2) LED (6-digit) | | | | | | | |
| Regeneration | A-frame, B-frame, G-frame, H-frame: no built-in regenerative resistor (external resistor only) C-frame to F-frame: Built-in regenerative resistor (external resistor is also enabled.) | | | | | | | |
| Dynamic brake | A-frame to G-frame: Built-in H-frame: External resistor only | | | | | | | |
| Control mode | Switching among the following 7 mode is enabled, (1) Position control (2) Speed control (3) Toque control (4) Position/Speed control (5) Position/Torque control (6) Speed/Torque control (7) Full-closed control | | | | | | | |

*1 Air containing water vapor will become saturated with water vapor as the temperature falls, causing dew.

| | | | | | | | |
|------------------------------------|---|---|--|--|--|--|--|
| Function | Control input | (1) servo-ON input (2) Alarm clear input (3) Gain switch input (4) Positive direction drive inhibit input (5) Negative direction drive inhibit input (6) Forced alarm input (7) Inertia ratio switch input | | | | | |
| | | Control output | (1) Servo-alarm output (2) Servo-ready output (3) External brake off output (4) At-speed output (5) Torque in-limit output (6) Zero speed detection output (7) Warning output (8) Alarm clear attribute output (9) Servo on status output | | | | |
| | Position control | | Control input | (1) Deviation counter clear input (2) Command pulse inhibit input (3) Command division/multiplication switch input (4) Anti-vibration switch input (5) Torque limit switch input (6) Control mode switch input | | | |
| | | Control output | (1) In-position output (2) Position command ON/OFF output | | | | |
| | Pulse input | Max. command pulse frequency | 500 kpps (Optocoupler interface), 8 Mpps (When using line receiver input multiplied by 4) | | | | |
| | | Input pulse signal format | Differential input. Selectable by parameter. ([1]Positive/Negative pulse [2]A/B quadrature [3]Pulse/Direction) | | | | |
| | | Electronic gear (Division/Multiplication of command pulse) | Applicable scaling ratio: 1/1000 times to 8000 times Any value of 1 - 2 ³⁰ can be set for both numerator (which corresponds to encoder resolution) and denominator (which corresponds to command pulse resolution per motor revolution), but the combination has to be within the range shown above. | | | | |
| | | Smoothing filter | Primary delay filter or FIR type filter is adaptable to the command input | | | | |
| | Analog input | Torque limit command input | Individual torque limit for both positive and negative direction is enabled. | | | | |
| | | Torque feed forward input | Analog voltage can be used as torque feed forward input. | | | | |
| Two-degree-of-freedom control | Available | | | | | | |
| Anti-vibration control | Available | | | | | | |
| Load variation suppression control | Available | | | | | | |
| Block operation | Modbus (RS 232, RS 485) or interface is selectable | | | | | | |
| Speed control | Control input | (1) Internal command velocity selection input (2) Speed zero clamp input (3) Velocity command sign input (4) Control mode switch input | | | | | |
| | Control output | (1) Speed coincidence output (2) Velocity command ON/OFF output | | | | | |
| | Analog input | Velocity command input | Velocity command input with analog voltage is possible. Scale setting and command polarity vary depending on parameters. (6 V/Rated rotational speed: Default) | | | | |
| | | Torque limit command input | Individual torque limit for both positive and negative direction is enabled. | | | | |
| | Torque feed forward input | Analog voltage can be used as torque feed forward input. | | | | | |
| Internal velocity command | Switching the internal 8 speed is enabled by command input. | | | | | | |
| Soft-start/down function | Individual setup of acceleration and deceleration is enabled, with 0 s to 10 s / 1000 r/min. Sigmoid acceleration/deceleration is also enabled. | | | | | | |
| Speed zero clamp | Internal velocity command can be clamped to 0 with speed zero clamp input. | | | | | | |
| Two-degree-of-freedom control | Available | | | | | | |
| Torque control | Control input | Speed zero clamp input, torque command sign input, control mode switch input. | | | | | |
| | Control output | (1) Speed coincidence output (2) Speed in-limit output | | | | | |
| | Analog input | Torque command input | Torque command input with analog voltage is possible. Scale setting and command polarity vary depending on parameters. (3 V/rated torque Default) | | | | |
| Speed limit function | Speed limit value with parameter is enabled. | | | | | | |
| Full-closed control | Control input | (1) Deviation counter clear input (2) Command pulse inhibit input (3) Command division/multiplication switch input (4) Anti-vibration switch input (5) Torque limit switch input | | | | | |
| | | Control output | (1) In-position output (2) Position command ON/OFF output | | | | |
| | Pulse input | | Max. command pulse frequency | 500 kpps (Optocoupler interface), 8 Mpps (When using line receiver input multiplied by 4) | | | |
| | | Input pulse signal format | Differential input. Selectable by parameter. ([1]Positive/Negative pulse [2]A/B quadrature [3]Pulse/Direction) | | | | |
| | | Electronic gear (Division/Multiplication of command pulse) | Applicable scaling ratio: 1/1000 times to 8000 times Any value of 1 - 2 ³⁰ can be set for both numerator (which corresponds to encoder resolution) and denominator (which corresponds to command pulse resolution per motor revolution), but the combination has to be within the range shown above. | | | | |
| | | Smoothing filter | Primary delay filter or FIR type filter is adaptable to the command input | | | | |
| | Analog input | Torque limit command input | Individual torque limit for both positive and negative direction is enabled. | | | | |
| | | Torque feed forward input | Analog voltage can be used as torque feed forward input. | | | | |
| | Setting range of external scale division/multiplication | 1/40 times to 1280 times Although ratio of the encoder pulse (numerator) and external scale pulse (denominator) can be arbitrarily set in the range of 1 to 2 ²³ for the numerator and in the range of 1 to 2 ²³ for the denominator, this product should be used within the aforementioned range. | | | | | |
| | Two-degree-of-freedom control | Available | | | | | |
| Anti-vibration control | Available | | | | | | |
| Load variation suppression control | Available | | | | | | |
| Block operation | Modbus (RS 232, RS 485) or interface is selectable | | | | | | |
| Common | Auto tuning | The load inertia is identified in real time by the driving state of the motor operating according to the command given by the controlling device and set up support software "PANATERM". The gain is set automatically in accordance with the rigidity setting. | | | | | |
| | Division of encoder feedback pulse | Set up of any value is enabled (encoder pulses count is the max.). | | | | | |
| | Protective function | Hard error | Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current and encoder error etc. | | | | |
| | | Soft error | Excess position deviation, command pulse division error, EEPROM error etc. | | | | |
| Alarm data trace back | Tracing back of alarm data is available | | | | | | |

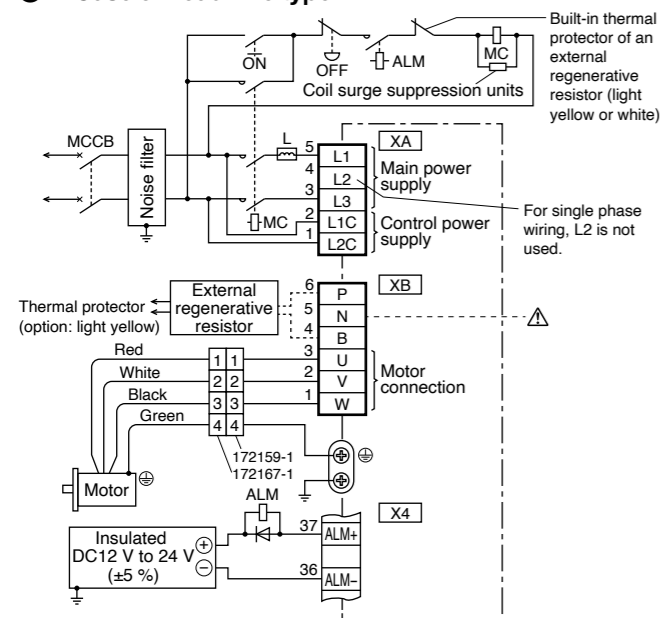
| | | | | | | |
|------------------------|---|---|---|--|--|--|
| Basic Specifications | Input power | 100 V | Main circuit | Single phase 100 V ^{+10 %} to 120 V ^{+10 %} _{-15 %} 50 Hz / 60 Hz | | |
| | | | Control circuit | Single phase 100 V ^{+10 %} to 120 V ^{+10 %} _{-15 %} 50 Hz / 60 Hz | | |
| | | 200 V | Main circuit | A-frame to D-frame | Single/3-phase 200 V ^{+10 %} to 240 V ^{+10 %} _{-15 %} 50 Hz / 60 Hz | |
| | | | | E-frame to F-frame | 3-phase 200 V ^{+10 %} to 240 V ^{+10 %} _{-15 %} 50 Hz / 60 Hz | |
| | | | Control circuit | A-frame to D-frame | Single phase 200 V ^{+10 %} to 240 V ^{+10 %} _{-15 %} 50 Hz / 60 Hz | |
| | | | | E-frame to F-frame | Single phase 200 V ^{+10 %} to 240 V ^{+10 %} _{-15 %} 50 Hz / 60 Hz | |
| | Environment | temperature | Ambient temperature: 0 °C to 55 °C (free from freezing) Storage temperature: -20 °C to 65 °C (Max.temperature guarantee: 80 °C for 72 hours free from condensation*1) | | | |
| | | humidity | Both operating and storage : 20 %RH to 85 %RH (free from condensation*1) | | | |
| | | Altitude | Lower than 1000 m | | | |
| | | Vibration | 5.88 m/s ² or less, 10 Hz to 60 Hz | | | |
| Control method | IGBT PWM Sinusoidal wave drive | | | | | |
| Encoder feedback | 23-bit (8388608 resolution) absolute encoder, 7-wire serial * A6SG series When using it as an incremental system (not using multi-turn data), do not connect the battery for absolute encoder. Parameter Pr. 0.15 must be set to "1" (factory settings). * A6SE series Since it can be used only as an incremental system, do not connect the battery for absolute encoder. Parameter Pr. 0.15 must be set to "1" (factory settings). | | | | | |
| Interface connector | Control signal | Input | General purpose 10 inputs The function of general-purpose input is selected by parameters. | | | |
| | | Output | General purpose 6 outputs The function of general-purpose input is selected by parameters. | | | |
| | Analog signal | Input | None | | | |
| | | Output | 2 outputs (Analog monitor: 2 output) | | | |
| | Pulse signal | Input | 2 inputs (Photo-coupler input, Line receiver input) | | | |
| | | Output | 4 outputs (Line driver: 3 output, open collector: 1 output) | | | |
| Communication function | USB | USB interface to connect to computers for parameter setting or status monitoring. | | | | |
| | RS232 | 1:1 communication | * RS485, RS232 connector is not installed on A6 SE series. | | | |
| | RS485 | 1: n communication (max 31) | | | | |
| Front panel | (1) 5 keys (2) LED (6-digit) | | | | | |
| Regeneration | A-frame, B,-frame: no built-in regenerative resistor (external resistor only) C-frame to F-frame: Built-in regenerative resistor (external resistor is also enabled.) | | | | | |
| Dynamic brake | A-frame to F-frame: Built-in | | | | | |
| Control mode | (1) Position control (2) Internal velocity command (3) Position/Internal velocity command | | | | | |

*1 Air containing water vapor will become saturated with water vapor as the temperature falls, causing dew.

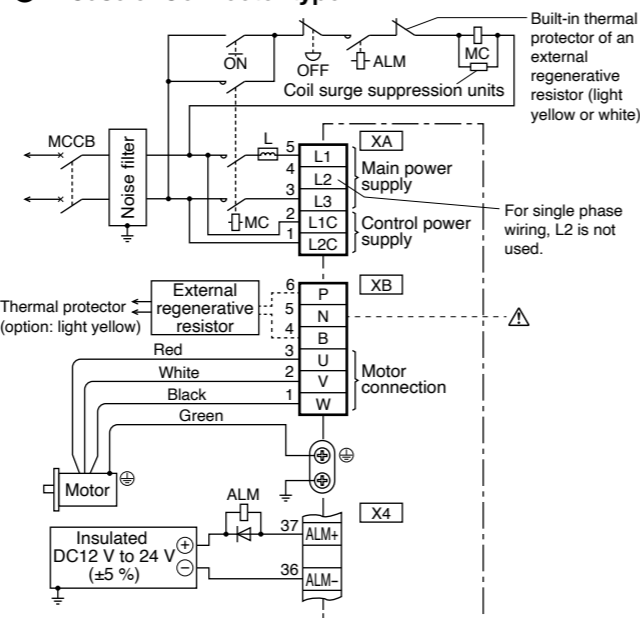
| | | | | | |
|-----------------------|--|--|--|--|--|
| Function | Control input | (1) servo-ON input (2) Alarm clear input (3) Gain switch input (4) Positive direction drive inhibit input (5) Negative direction drive inhibit input (6) Forced alarm input (7) Inertia ratio switch input | | | |
| | | Control output | (1) Servo-alarm output (2) Servo-ready output (3) External brake off output (4) At-speed output (5) Torque in-limit output (6) Zero speed detection output (7) Warning output (8) Alarm clear attribute output (9) Servo on status output | | |
| | Position control | | Control input | (1) Deviation counter clear input (2) Command pulse inhibit input (3) Command division/multiplication switch input (4) Anti-vibration switch input (5) Torque limit switch input (6) Control mode switch input | |
| | | Control output | (1) In-position output (2) Position command ON/OFF output | | |
| | | Pulse input | Max. command pulse frequency | 500 kpps (Optocoupler interface) 8 Mpps (Line receiver interface) | |
| | | | Input pulse signal format | Differential input. Selectable by parameter. ([1]Positive/Negative pulse [2]A/B quadrature [3]Pulse/Direction) | |
| | Electronic gear (Division/Multiplication of command pulse) | | Applicable scaling ratio: 1/1000 times to 8000 times Any value of 1 - 2 ³⁰ can be set for both numerator (which corresponds to encoder resolution) and denominator (which corresponds to command pulse resolution per motor revolution), but the combination has to be within the range shown above. | | |
| | Smoothing filter | Primary delay filter or FIR type filter is adaptable to the command input | | | |
| | Anti-vibration control | Available | | | |
| | Two-degree-of-freedom control | Available | | | |
| | Load variation suppression control | Available | | | |
| | Block operation | Modbus (RS 232, RS 485) or interface is selectable. (A6SE : interface only.) | | | |
| | Speed control | Control input | (1) Internal command velocity selection input (2) Speed zero clamp input (3) Velocity command sign input (4) Control mode switch input | | |
| | | Control output | (1) Speed coincidence output (2) Velocity command ON/OFF output | | |
| | | Internal velocity command | Switching the internal 8 speed is enabled by command input. | | |
| | | Soft-start/down function | Individual setup of acceleration and deceleration is enabled, with 0 s to 10 s/1000 r/min. Sigmoid acceleration/deceleration is also enabled. | | |
| | | Zero-speed clamp | Internal velocity command can be clamped to 0 with speed zero clamp input. | | |
| | | Two-degree-of-freedom control | Available | | |
| | Common | Auto tuning | The load inertia is identified in real time by the driving state of the motor operating according to the command given by the controlling device and set up support software "PANATERM". The gain is set automatically in accordance with the rigidity setting. | | |
| | | Division of encoder feedback pulse | Set up of any value is enabled (encoder pulses count is the max.). | | |
| Protective function | | Hard error | Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current and encoder error etc. | | |
| | | Soft error | Excess position deviation, command pulse division error, EEPROM error etc. | | |
| Alarm data trace back | | Tracing back of alarm data is available | | | |

In Case of Single phase, A-frame, B-frame, 100 V / 200 V type

● In Case of Leadwire type



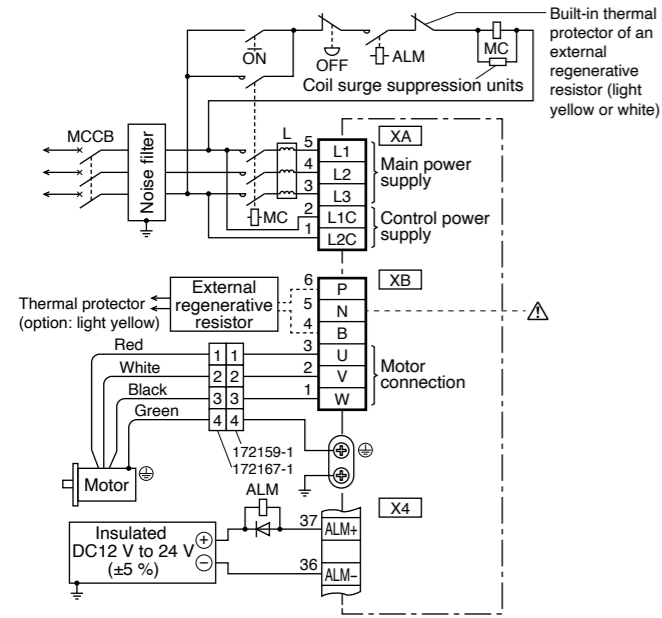
● In Case of Connector type



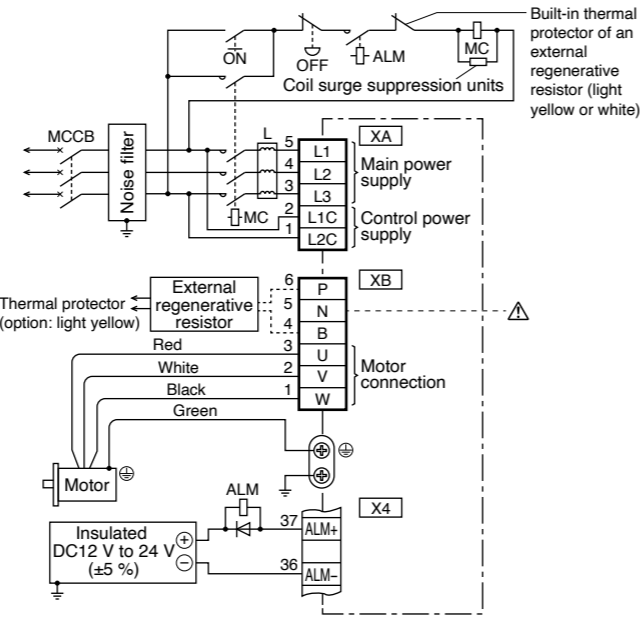
- The pin number of X4 is based on the factory setting parameters.
- * Power supply for motor brake and connector X4 requires insulation. Do not connect to the same power supply.

In Case of 3-phase, A-frame, B-frame, 200 V type

● In Case of Leadwire type



● In Case of Connector type



- The pin number of X4 is based on the factory setting parameters.
- * Power supply for motor brake and connector X4 requires insulation. Do not connect to the same power supply.

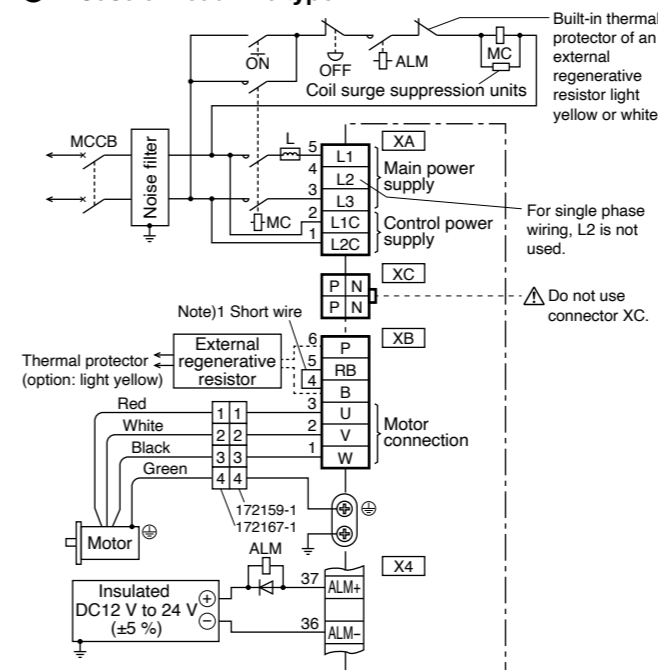
Connect an external regenerative resistor.

| Frame No. | Short wire (Accessory) | Built-in regenerative resistor | Connection of the connector XB ⚠ Do not connect anything to N. | |
|--------------------|------------------------|--------------------------------|--|--|
| | | | In case of using an external regenerative resistor | In case of not using an external regenerative resistor |
| A-frame B-frame | without | without | • Connect an external regenerative resistor between P-B. | • Always open between P-B. |

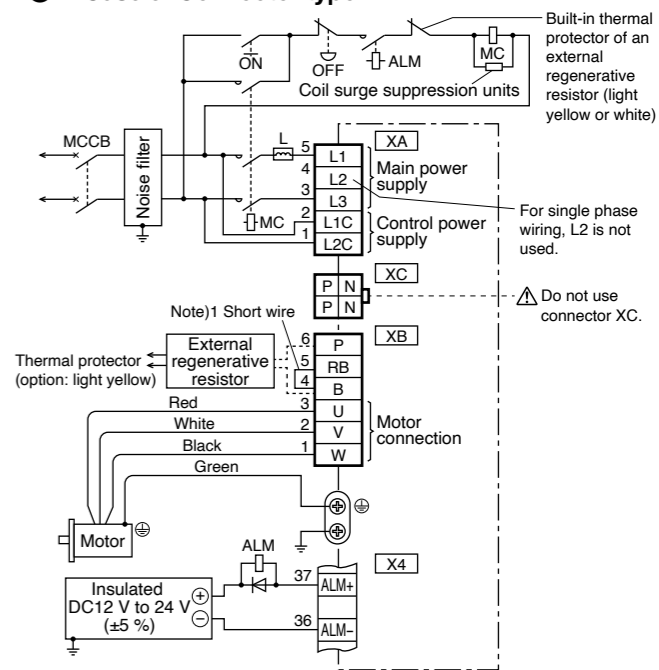
* Refer to P.307 Specifications of Motor connector.

In Case of Single phase, C-frame, D-frame, 100 V / 200 V type

● In Case of Leadwire type



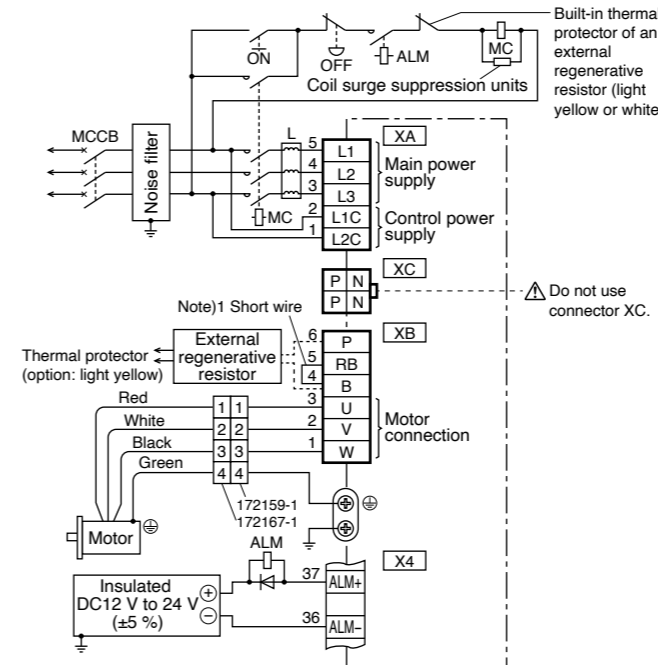
● In Case of Connector type



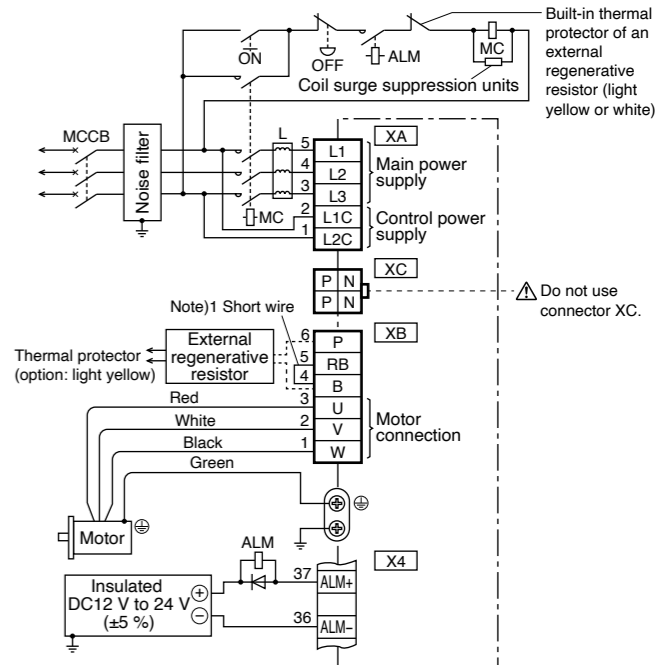
- The pin number of X4 is based on the factory setting parameters.
- * Power supply for motor brake and connector X4 requires insulation. Do not connect to the same power supply.

In Case of 3-phase, C-frame, D-frame, 200 V type

● In Case of Leadwire type



● In Case of Connector type



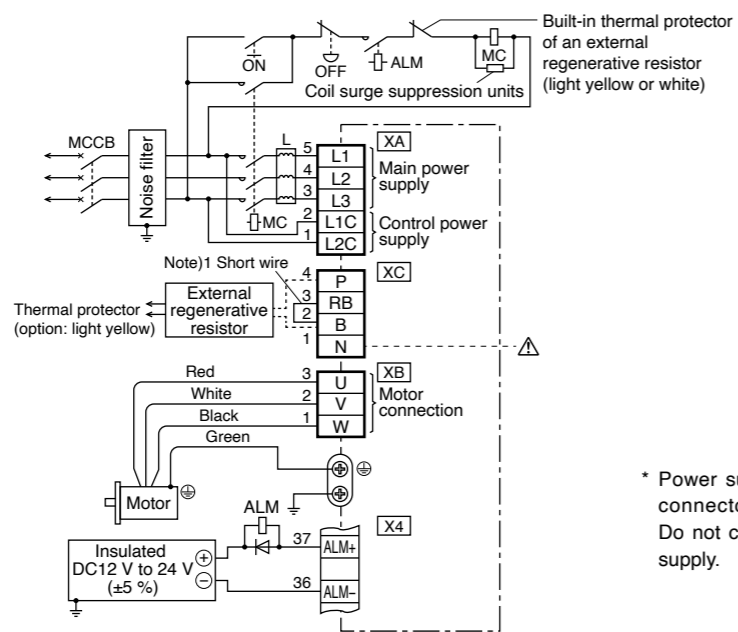
- The pin number of X4 is based on the factory setting parameters.
- * Power supply for motor brake and connector X4 requires insulation. Do not connect to the same power supply.

Note)1

| Frame No. | Short wire (Accessory) | Built-in regenerative resistor | Connection of the connector XB ⚠ Do not connect anything to N. | |
|--------------------|------------------------|--------------------------------|--|--|
| | | | In case of using an external regenerative resistor | In case of not using an external regenerative resistor |
| C-frame D-frame | with | with | • Remove the short wire accessory from between RB-B. • Connect an external regenerative resistor between P-B. | • Shorted between RB-B with an attached short wire |

* Refer to P.307, P.308, Specifications of Motor connector.

In Case of 3-phase, E-frame, 200 V type



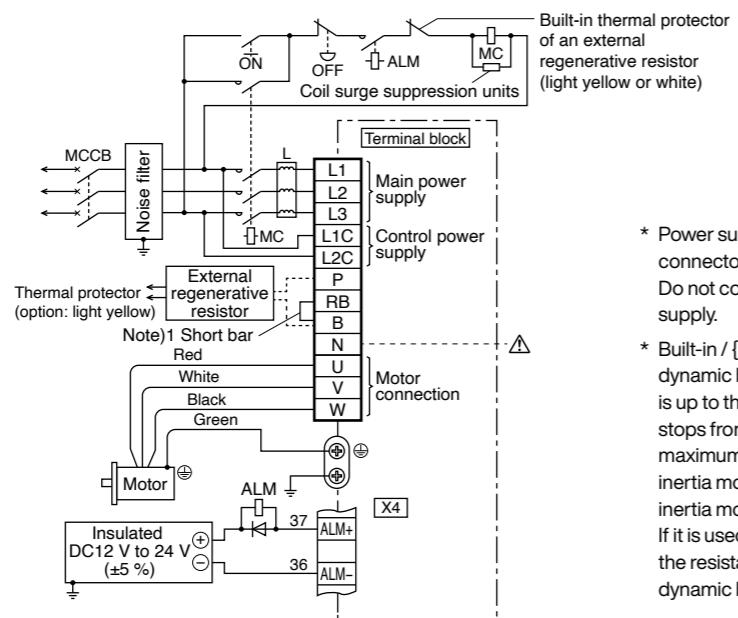
* Power supply for motor brake and connector X4 requires insulation. Do not connect to the same power supply.

● The pin number of X4 is based on the factory setting parameters.

Note)1

| Frame No. | Short wire (Accessory) | Built-in regenerative resistor | Connection of the connector XC ⚠ Do not connect anything to N. | |
|-----------|------------------------|--------------------------------|--|--|
| | | | In case of using an external regenerative resistor | In case of not using an external regenerative resistor |
| E-frame | with | with | <ul style="list-style-type: none"> Remove the short wire accessory from between RB-B. Connect an external regenerative resistor between P-B. | <ul style="list-style-type: none"> Shorted between RB-B with an attached short wire |

In Case of 3-phase, F-frame, 200 V type



* Power supply for motor brake and connector X4 requires insulation. Do not connect to the same power supply.

* Built-in / {external} The standard of the dynamic brake resistance's capability is up to three consecutive emergency stops from the rated speed at the maximum allowable inertia (load inertia moment ratio 10 times the rotor inertia moment). If it is used under more conditions, the resistance may be broken and the dynamic brake may not operate.

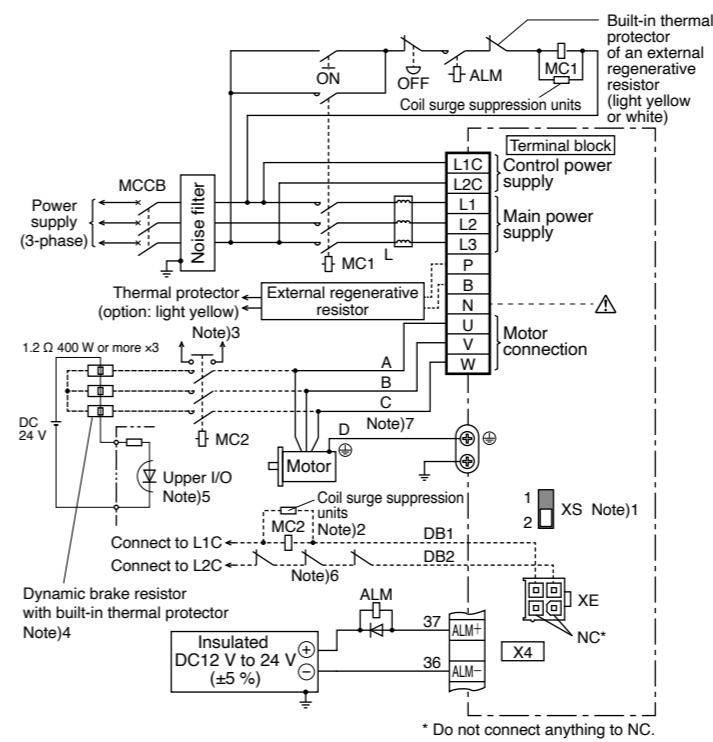
● The pin number of X4 is based on the factory setting parameters.

Note)1

| Frame No. | Short bar (Accessory) | Built-in regenerative resistor | Connection of terminal block ⚠ Do not connect anything to N. | |
|-----------|-----------------------|--------------------------------|---|---|
| | | | In case of using an external regenerative resistor | In case of not using an external regenerative resistor |
| F-frame | with | with | <ul style="list-style-type: none"> Remove the short bar accessory from between RB-B. Connect an external regenerative resistor between P-B. | <ul style="list-style-type: none"> Shorted between RB-B with an attached short bar |

* Refer to P.308, Specifications of Motor connector.

In Case of 3-phase, G-frame, 200 V type

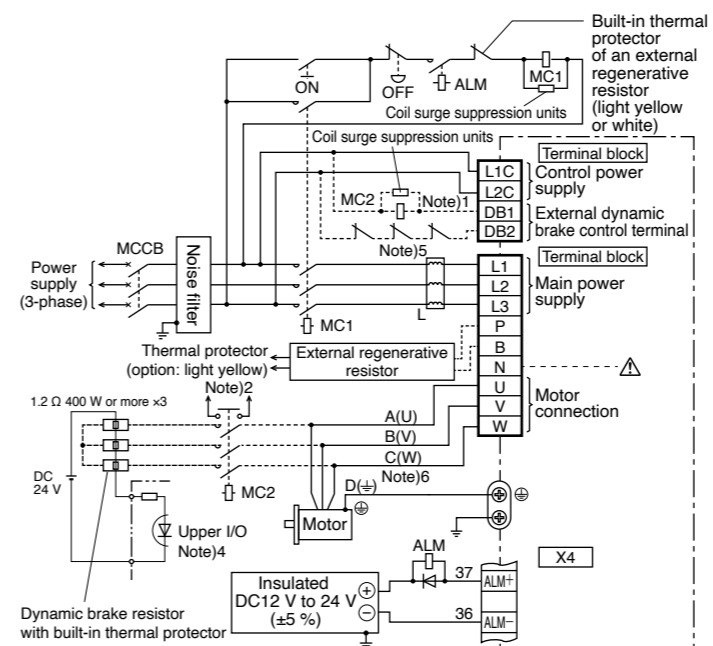


● The pin number of X4 is based on the factory setting parameters.

■ Connection of regenerative resistor

| Frame No. | Short bar (Accessory) | Built-in regenerative resistor | Connection of terminal block ⚠ Do not connect anything to N. | |
|-----------|-----------------------|--------------------------------|--|--|
| | | | In case of using an external regenerative resistor | In case of not using an external regenerative resistor |
| G-frame | without | without | <ul style="list-style-type: none"> Connect an external regenerative resistor between P-B. | <ul style="list-style-type: none"> Always open between P-B. |

In Case of 3-phase, H-frame, 200 V type



● The pin number of X4 is based on the factory setting parameters.

■ Connection of regenerative resistor

| Frame No. | Short bar (Accessory) | Built-in regenerative resistor | Connection of terminal block ⚠ Do not connect anything to N. | |
|-----------|-----------------------|--------------------------------|--|--|
| | | | In case of using an external regenerative resistor | In case of not using an external regenerative resistor |
| H-frame | without | without | <ul style="list-style-type: none"> Connect an external regenerative resistor between P-B. | <ul style="list-style-type: none"> Always open between P-B. |

* Refer to P.308, Specifications of Motor connector.

■ **About the Dynamic Brake**
G frame has built-in dynamic brake resistor. When using built-in dynamic brake, set switch XS to "1" side. When exceeding the capacity of built-in dynamic brake resistor, set switch XS to "2" side and use external dynamic brake resistor.

■ **When using external dynamic brake**
Note 1) Set switch XS to "2" side.
Note 2) Make the electromagnetic contactor (MC2) the same as the electromagnetic contactor (MC1) of the main circuit.
Note 3) Provide an auxiliary contact, and configure protection so that the servo will not turn on in the external sequence if the main contact is welded.
Note 4) Mount the dynamic brake resistor on incombustible material such as metal.
Note 5) Install a thermal protector on the dynamic brake resistor and monitor it with the upper I/O, and configure protection so that the servo is not turned on in the external sequence when the thermal protector is operating.
Note 6) If the upper I/O cannot monitor the thermal protector, input the output of the thermal protector between L2C and DB2 so that the dynamic brake does not operate when the temperature protection works.

■ **About motor wiring**
Note 7) This is the terminal symbol of the connector.
* Power supply for motor brake and connector X4 requires insulation. Do not connect to the same power supply.
* Do not use built-in dynamic brake and external dynamic brake at the same time.

■ **About the Dynamic Brake**
The H frame does not have a built-in dynamic brake resistor, so it will be in a free run state when the motor does emergency stop. Use an external dynamic brake resistor if it may cause a machine collision.

■ **When using external dynamic brake**
Note 1) Make the electromagnetic contactor (MC2) the same as the electromagnetic contactor (MC1) of the main circuit.
Note 2) Provide an auxiliary contact, and configure protection so that the servo will not turn on in the external sequence if the main contact is welded.
Note 3) Mount the dynamic brake resistor on incombustible material such as metal.
Note 4) Install a thermal protector on the dynamic brake resistor and monitor it with the upper I/O, and configure protection so that the servo is not turned on in the external sequence when the thermal protector is operating.
Note 5) If the upper I/O cannot monitor the thermal protector, input the output of the thermal protector between L2C and DB2 so that the dynamic brake does not operate when the temperature protection works.

■ **About motor wiring**
Note 6) This is the terminal symbol of the connector.
() Is the terminal symbol of 22.0 kW motor.
* Do not use built-in dynamic brake and external dynamic brake at the same time.

Connecting the host controller can configure a safety circuit that controls the safety functions.

When not constructing the safety circuit, use the supplied safety bypass plug.

Outline Description of Safe Torque Off (STO)

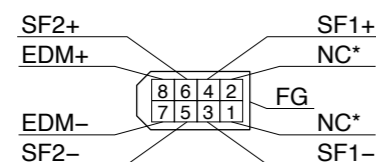
The safe torque off (STO) function is a safety function that shuts the motor current and turns off motor output torque by forcibly turning off the driving signal of the servo driver internal power transistor. For this purpose, the STO uses safety input signal and hardware (circuit).

When STO function operates, the servo driver turns off the servo ready output signal (S-RDY) and enters STO state. When the driver becomes STO state, front panel displays the "St.". Then, when the driver's state is STO input is off and servo-on input is off, the driver automatically becomes servo-off.

Safety Precautions

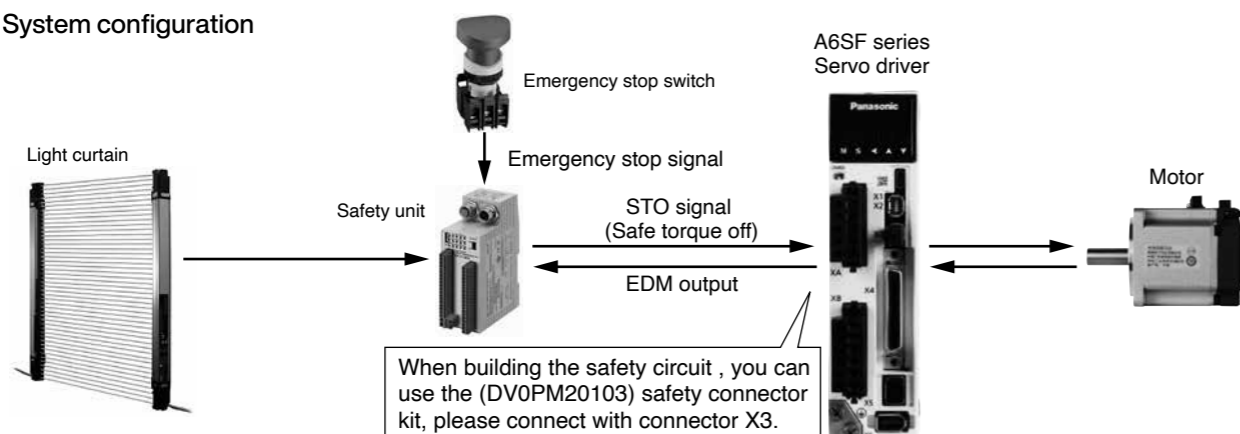
- When using the STO function, be sure to perform equipment risk assessment to ensure that the system conforms to the safety requirements.
- Even while the STO function is working, the following potential safety hazards exist. Check safety in risk assessment.
 - The motor may move when external force (e.g. gravity force on vertical axis) is exerted on it. Provide an external brake, etc., as necessary to secure the motor. Note that the purpose of motor with brake is holding and it cannot be used for braking application.
 - When parameter Pr5.10 Sequence at alarm is set to free run (disable dynamic brake), the motor is free run state and requires longer stop distance even if no external force is applied. Make sure that this does not cause any problem.
 - When power transistor, etc., becomes defective, the motor will move to the extent equivalent of 180 electrical angle (max.). Make sure that this does not cause any problem.
 - The STO turns off the current to the motor but does not turn off power to the servo driver and does not isolate it. When starting maintenance service on the servo driver, turn off the driver by using a different disconnecting device.
- External device monitor (EDM) output signal is not a safety signal. Do not use it for an application other than failure monitoring.
- Dynamic brake and external brake release signal output are not related to safety function. When designing the system, make sure that the failure of external brake release during STO condition does not result in danger condition.
- When using STO function, connect equipment conforming to the safety standards.

[Connector pin assignment] (Viewed from cable)



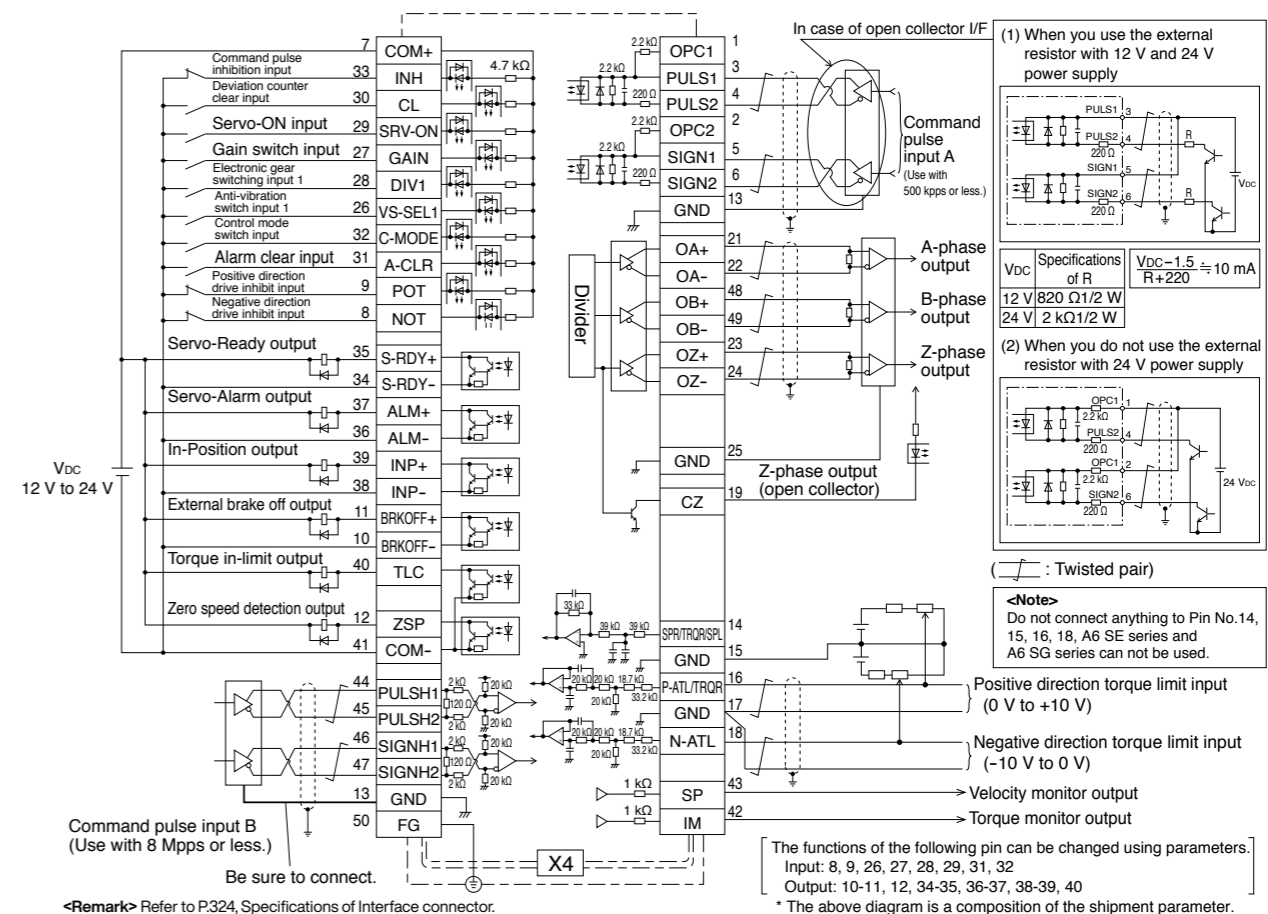
* Do not connect anything to NC.

System configuration



When building the safety circuit, you can use the (DV0PM20103) safety connector kit, please connect with connector X3.

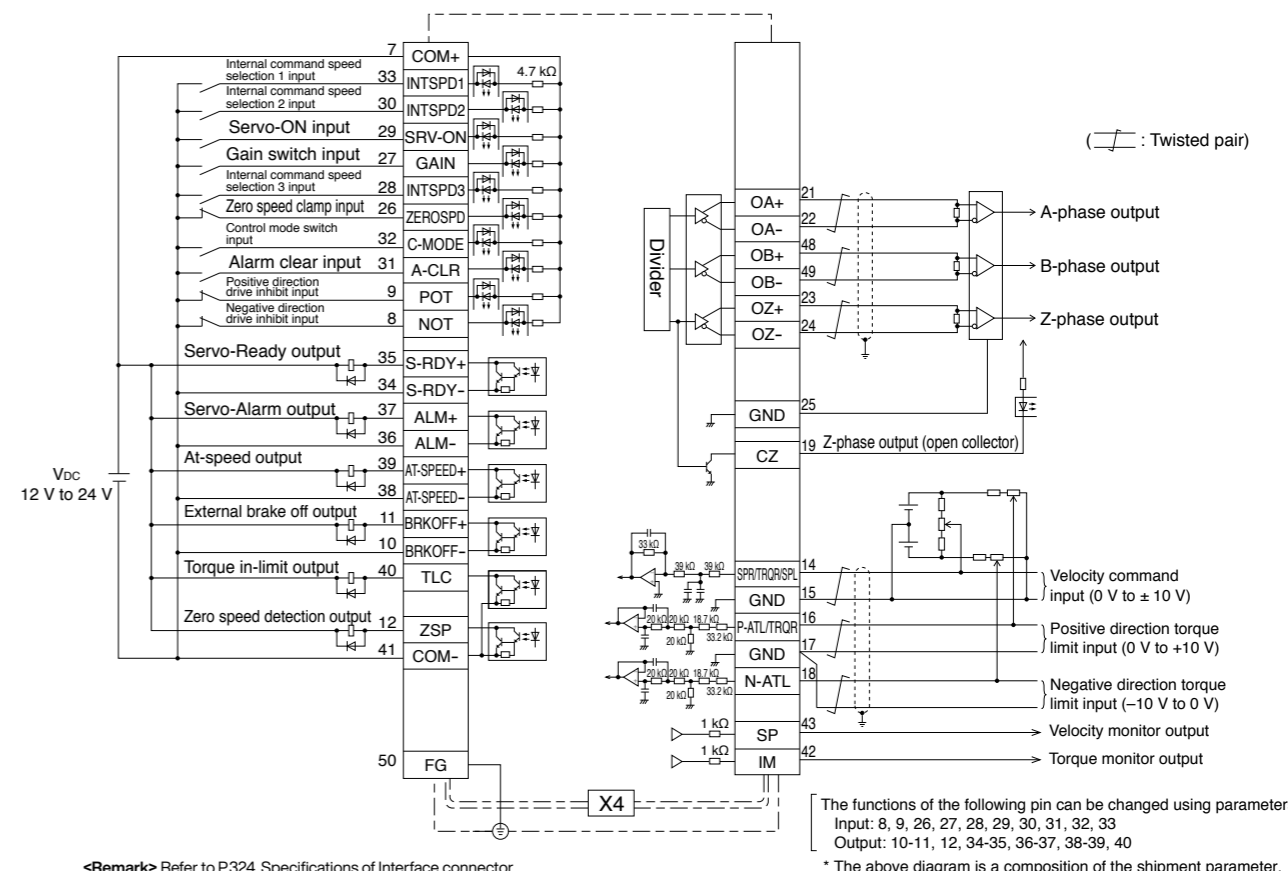
Wiring Example of Position Control Mode



<Remark> Refer to P.324, Specifications of Interface connector.

Wiring Example of Velocity Control Mode

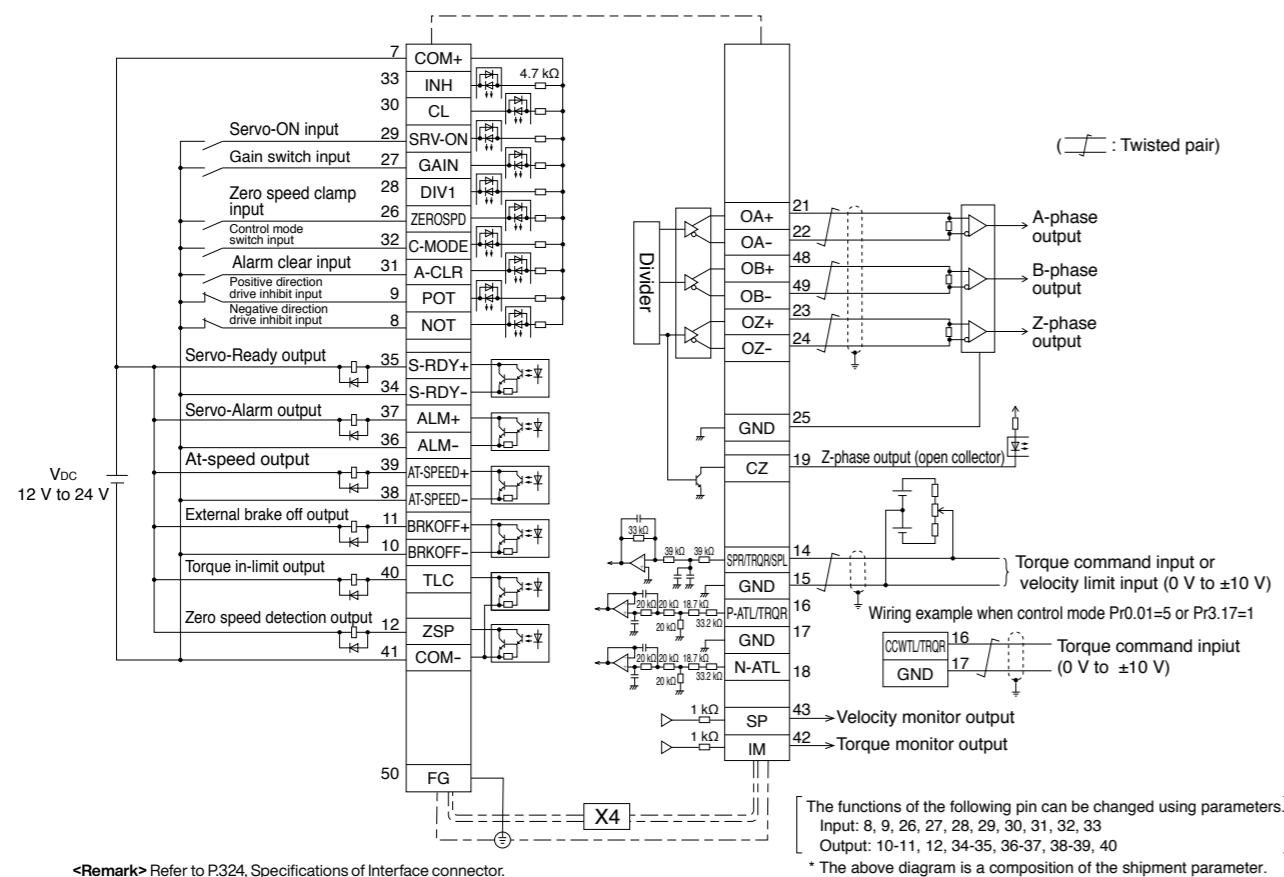
* Internal velocity command is available only for A6SE and A6SG series



<Remark> Refer to P.324, Specifications of Interface connector.

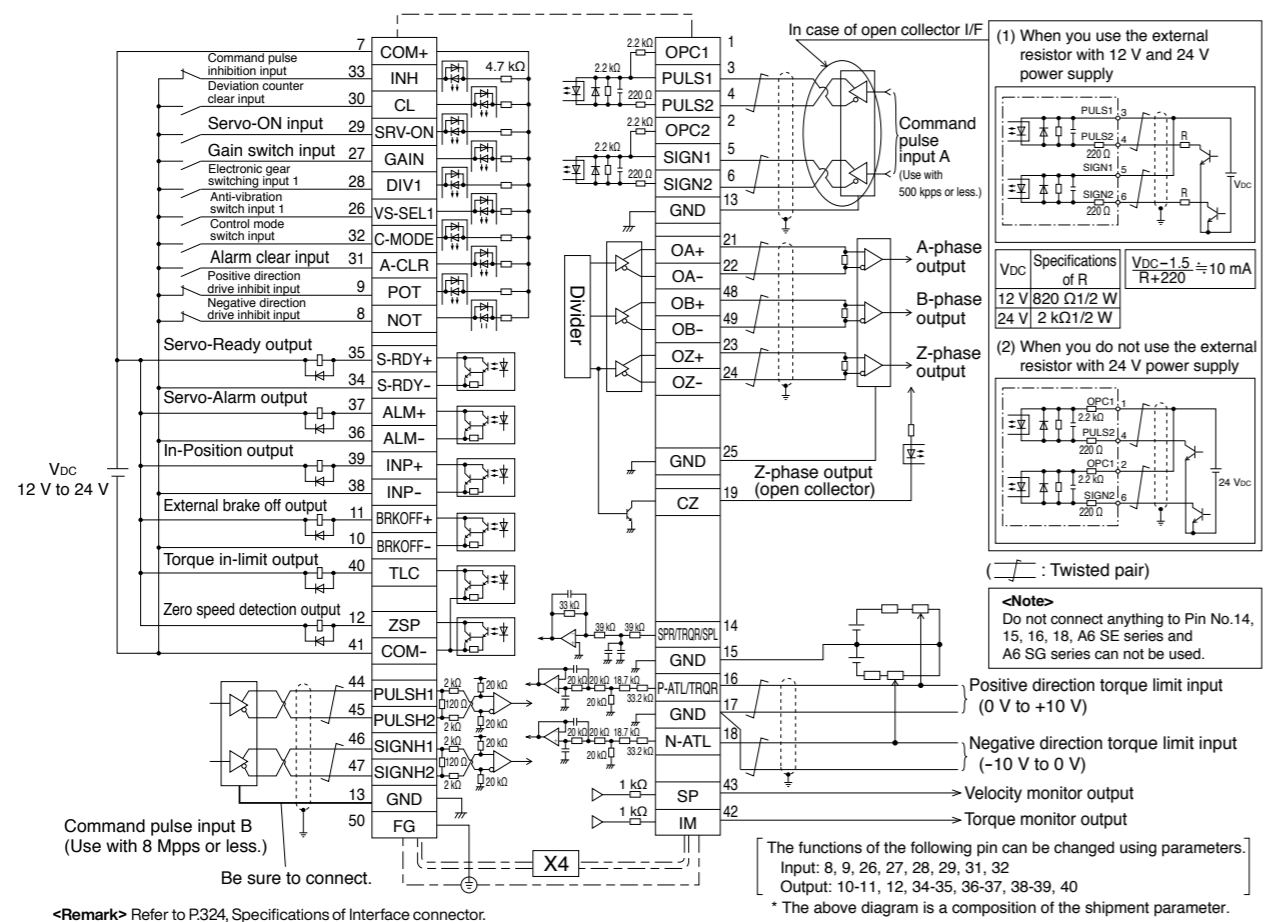
* Excluding A6SE, A6SG Series

Wiring Example of Torque Control Mode



Wiring Example of Full-closed Control Mode

* Excluding A6SE, A6SG Series

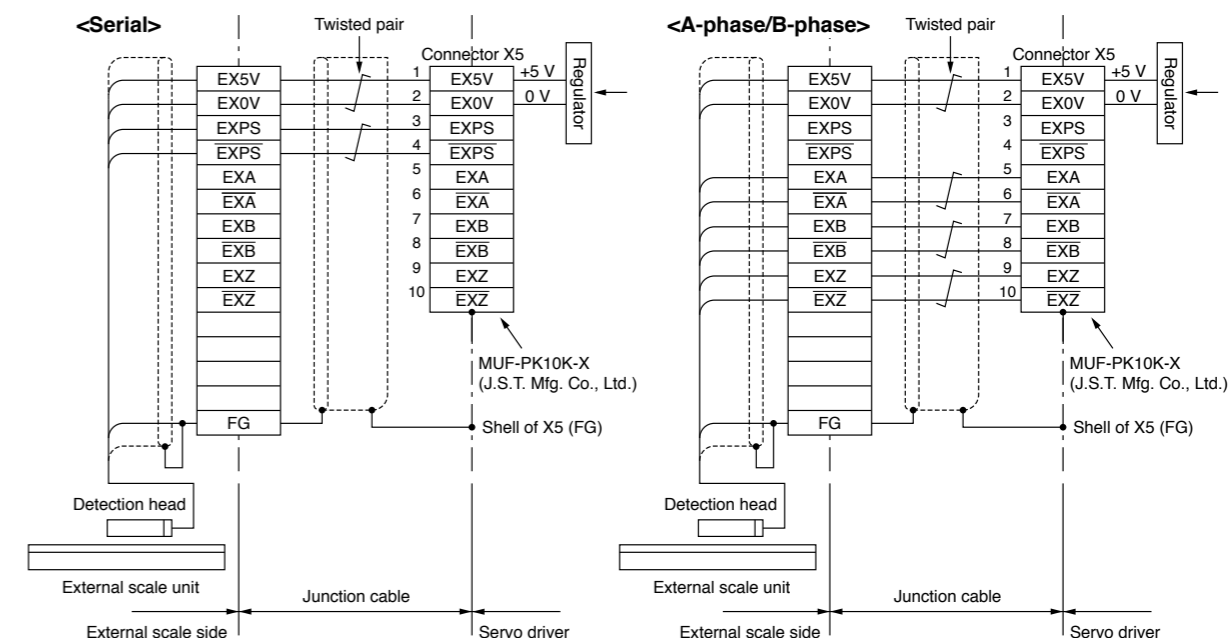


Applicable External Scale

| Scale Type | Partner | Series | Resolution*1 [μm] | Max. rate*1 [m/s] | |
|---------------------------------|-------------------------------|--|--|---|----------------------|
| Parallel Type (A/B/Z phase) | General | — | Maximum speed after 4× multiplication : 4 Mpps | | |
| | | Serial communication (Incremental) | Magnescale Co., Ltd. | SL700-PL101RP/RHP SL710-PL101RP/RHP | 0.1 |
| SR75/SR85 | 0.01 to 1 | | | 3.3 | |
| BF1 | 0.001/0.01 | | | 0.4/1.8 | |
| NIDEC MACHINE TOOL CORPORATION | MPLIN | | 0.1 | 30 | |
| | Nidec Instruments Corporation | | PSLH041+PSLG | 0.1 | 6 |
| FAGOR AUTOMATION | | | S3BP/G3BP | 0.01/0.05 | 3 |
| | | | LAP | 0.01/0.05 | 3 |
| | EXA/ EXG/ EXT | | 0.01/0.05 | 8 | |
| Serial communication (Absolute) | HEIDENHAIN | | H2AP-D200/H2AP-D90 | 29 bit/23 bit | 750 r/min/1500 r/min |
| | | | S2AP-D90 | 23 bit | 1500 rpm |
| | | LIC 2197P/LIC 2199P | 0.05/0.1 | 10 | |
| | | LIC 4193P/LIC 4195P LIC 4197P/LIC 4199P | 0.001/0.005/0.01 | 10 | |
| | | LC 195P/LC 495P | 0.001/0.01 | 3 | |
| | | ECA 4490P | 27 bits to 29 bits | 7000 r/min~550 r/min (Depends on drum size) | |
| | Magnescale Co.,Ltd. | RCN 2x90P/RCN 5x90P | 26 bits/28 bits | 1500 r/min | |
| | | RCN 8x90P | 29 bit | 500 r/min | |
| | Mitutoyo Corporation | SR77/SR87 | 0.01 to 1 | 3.3 | |
| | | AT573-SC/H | 0.05 | 2.5 | |
| NIDEC MACHINE TOOL CORPORATION | ST700 | 0.1 | 5 | | |
| | ST1300 | 0.001/0.01 | 8 | | |
| Renishaw plc | RESOLUTE | 0.001 | 4 | | |
| | | 0.05 | 100 | | |
| RSF Elektronik | MC 15P MP/MC 15P MK | 0.1 | 100 | | |
| | | 0.05/0.1 | 10 | | |
| | | 22 bits~25 bits | — | | |

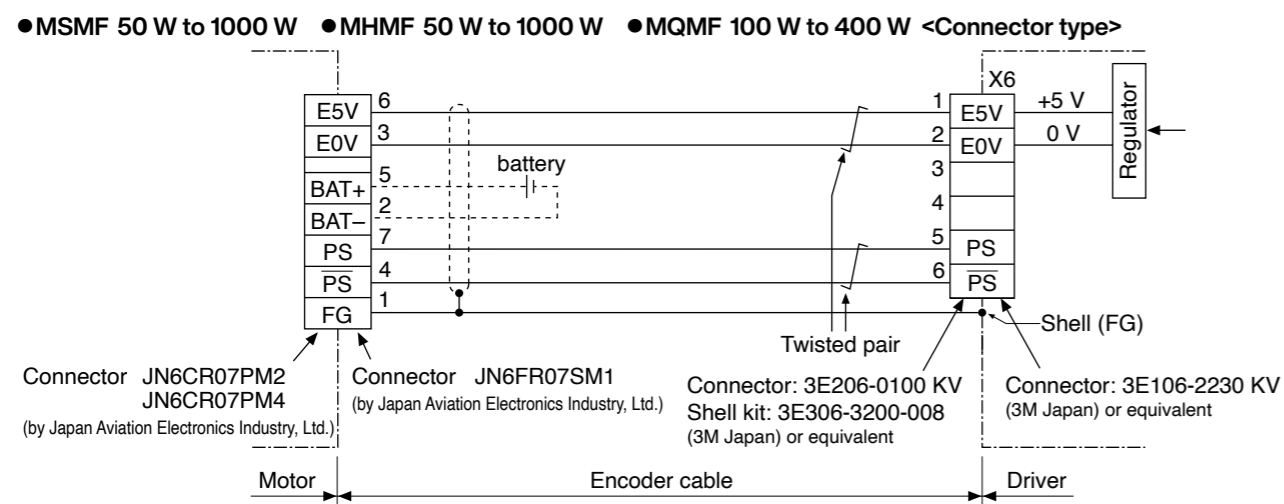
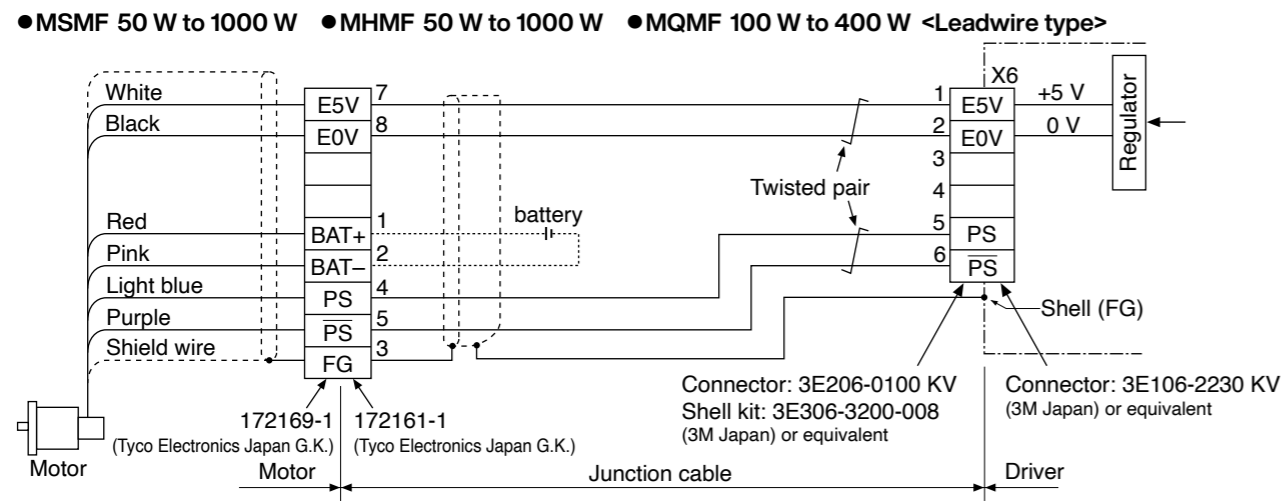
*1 The maximum speed is a characteristic of the driver. It is limited by the configuration of the machine and the system.
 * For more information about the external scale product, please contact the manufacturer.

Wiring Diagram of X5



When using a 23-bit absolute encoder as an absolute system*.

* When use a multi-turn data.



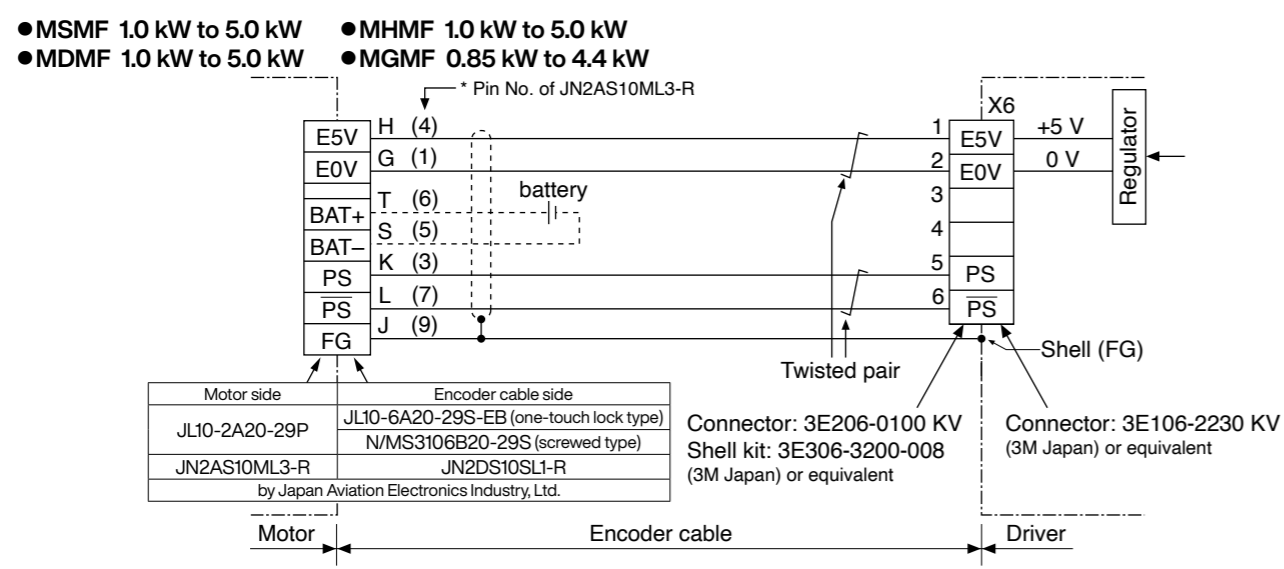
<Caution>

- Tighten the motor connector mounting screw (M2) with a torque between 0.19 N·m and 0.21 N·m. To avoid damage, be sure to use only the screw supplied with the connector.
- Do not remove the gasket supplied with the junction cable connector. Securely install the gasket in place. Otherwise, the degree of protection of IP67 will not be guaranteed.

[Connector pin assignment (Motor side)]

| | |
|---|---|
| 1 | 5 |
| 2 | 6 |
| 3 | 7 |
| 4 | 7 |

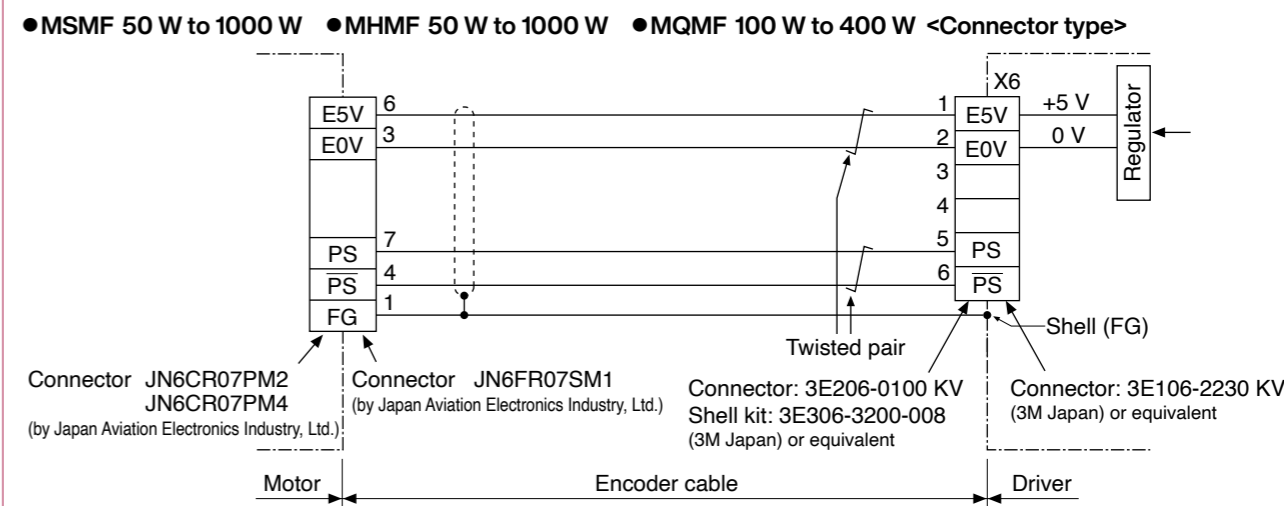
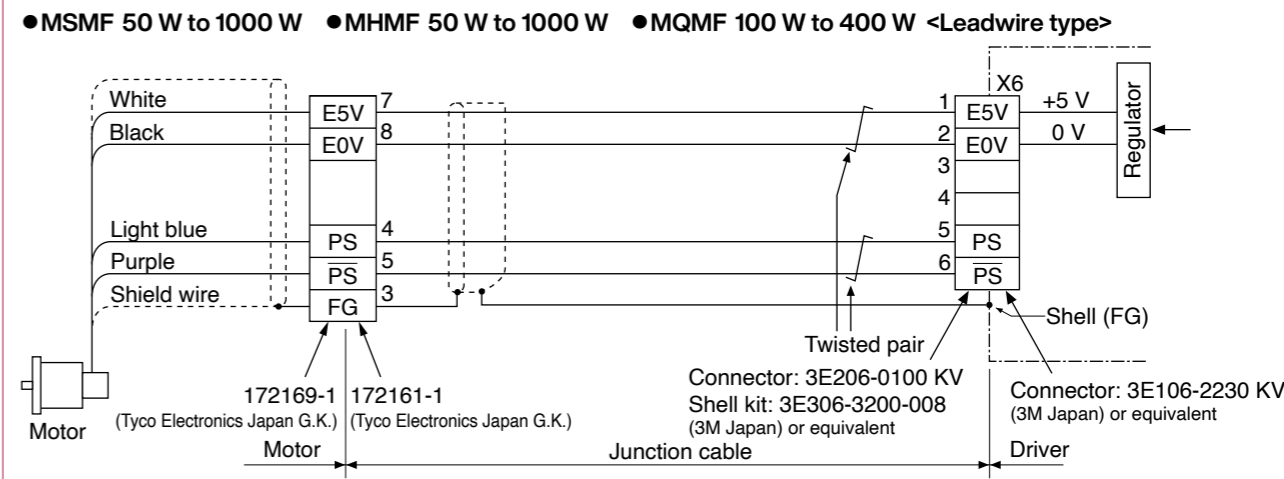
(Viewed from cable)



[Connector pin assignment] Refer to P.307, P.308 "Specifications of Motor connector".

When using a 23-bit absolute encoder as a incremental system*.

* When do not use a multi-turn data.



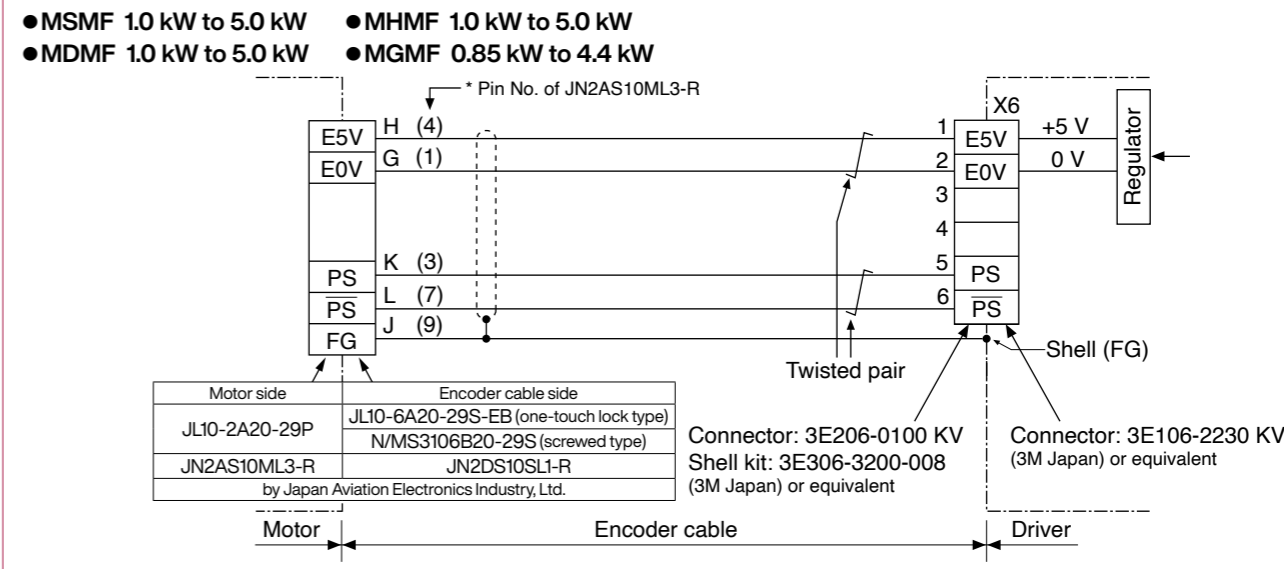
<Caution>

- Tighten the motor connector mounting screw (M2) with a torque between 0.19 N·m and 0.21 N·m. To avoid damage, be sure to use only the screw supplied with the connector.
- Do not remove the gasket supplied with the junction cable connector. Securely install the gasket in place. Otherwise, the degree of protection of IP67 will not be guaranteed.

[Connector pin assignment (Motor side)]

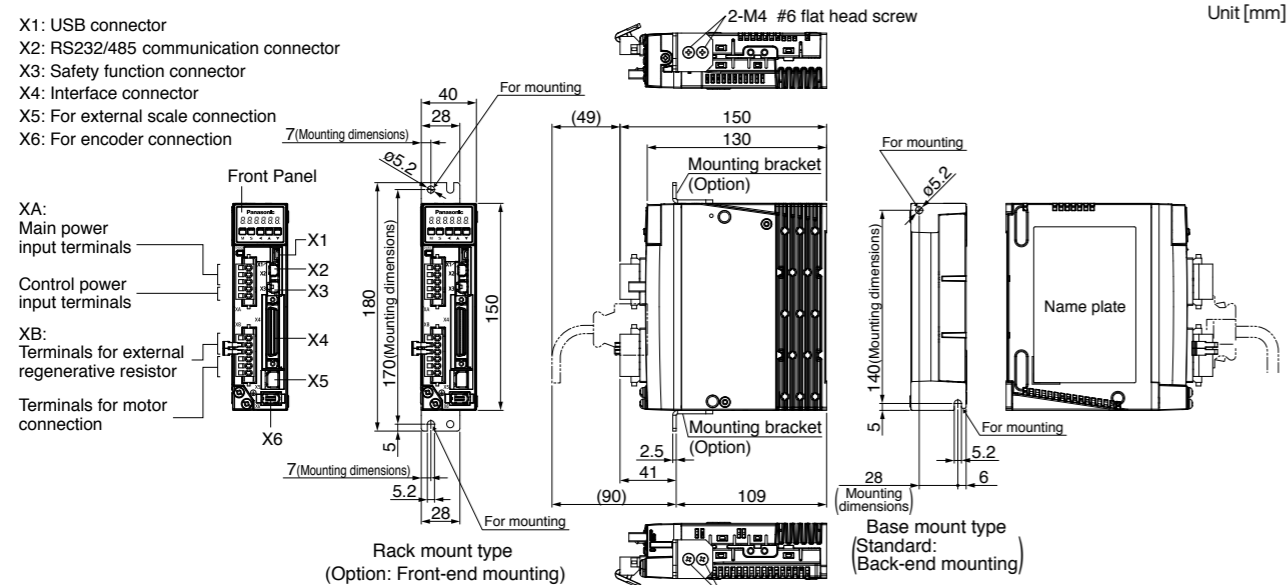
| | |
|---|---|
| 1 | 5 |
| 2 | 6 |
| 3 | 7 |
| 4 | 7 |

(Viewed from cable)



[Connector pin assignment] Refer to P.307, P.308 "Specifications of Motor connector".

A-frame

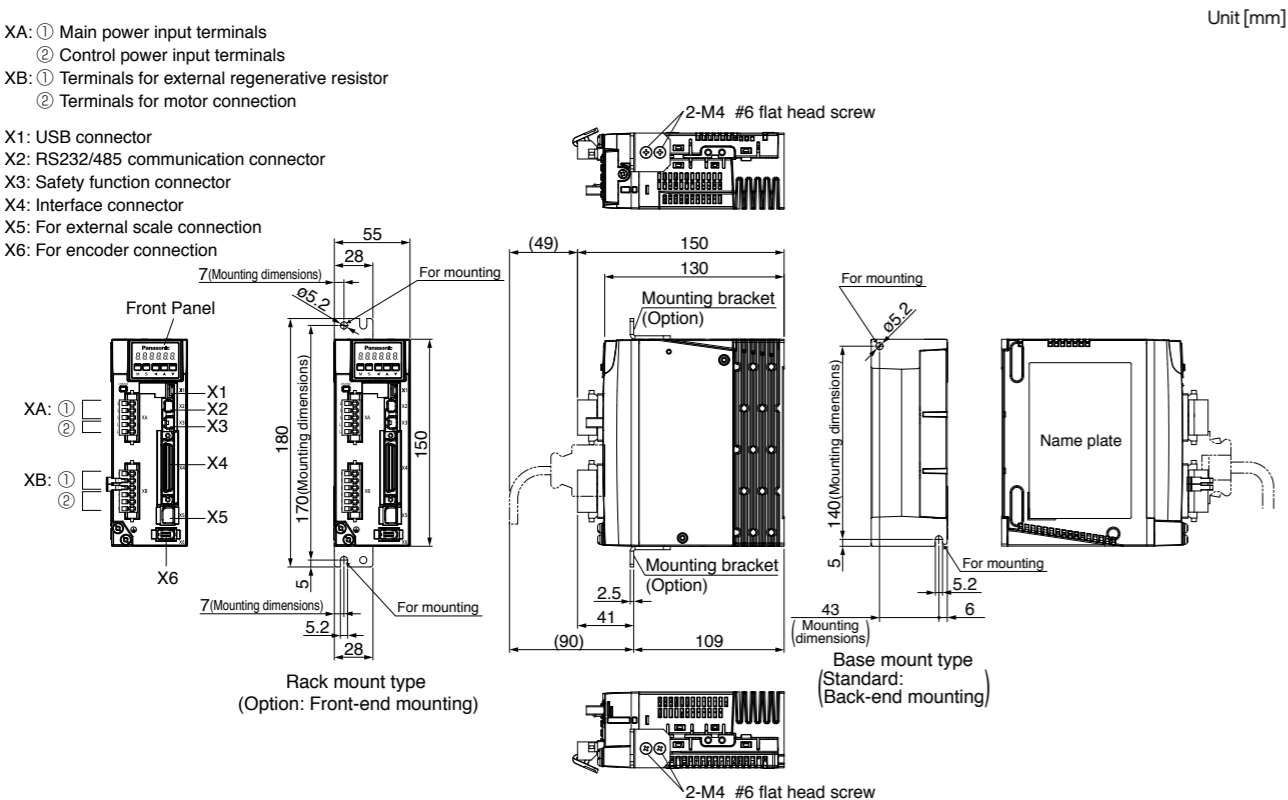


| A-frame: Connector of driver side | | Multifunction type | RS485 communication type | Basic type |
|-----------------------------------|----------------------------------|-----------------------------|--------------------------|------------|
| Connector XA | S05B-F32SK-GGXR | J.S.T. Mfg. Co., Ltd. | ● | ● |
| Connector XB | S06B-F32SK-GGXR | J.S.T. Mfg. Co., Ltd. | ● | ● |
| Connector X1 | UB-M5BR-DMP14-4S (or equivalent) | J.S.T. Mfg. Co., Ltd. | ● | ● |
| Connector X2 | 1-2040537-1 (or equivalent) | Tyco Electronics Japan G.K. | ● | — |
| Connector X3 | 2040537-1 (or equivalent) | Tyco Electronics Japan G.K. | — | — |
| Connector X4 | 10250-52A2PE (or equivalent) | 3M Japan | ● | ● |
| Connector X5 | MUF-RS10DK-GKXR (or equivalent) | J.S.T. Mfg. Co., Ltd. | — | — |
| Connector X6 | 3E106-2230 KV (or equivalent) | 3M Japan | ● | ● |

| <Attached to the driver> | | Multifunction type | RS485 communication type | Basic type |
|-----------------------------------|------------------|-----------------------|--------------------------|------------|
| Connector of power and motor side | | | | |
| Connector XA | 05JFAT-SAXGGKK-A | J.S.T. Mfg. Co., Ltd. | ● | ● |
| Connector XB | 06JFAT-SAXGGKK-A | J.S.T. Mfg. Co., Ltd. | ● | ● |

Mass: 0.8 kg

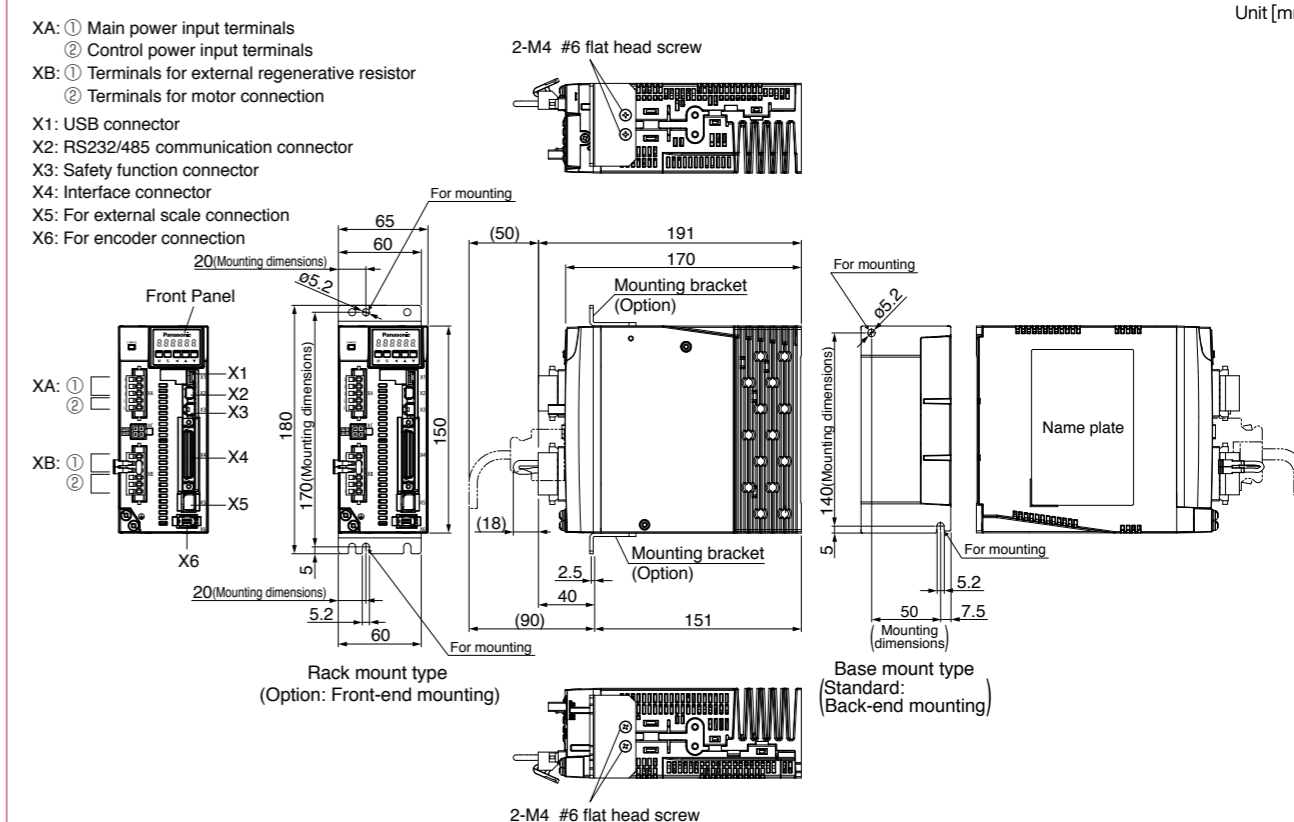
B-frame



*For connectors used to connect to the driver, power supply and motor, refer to the A-frame table because both frames use the same connectors.

Mass: 1.0 kg

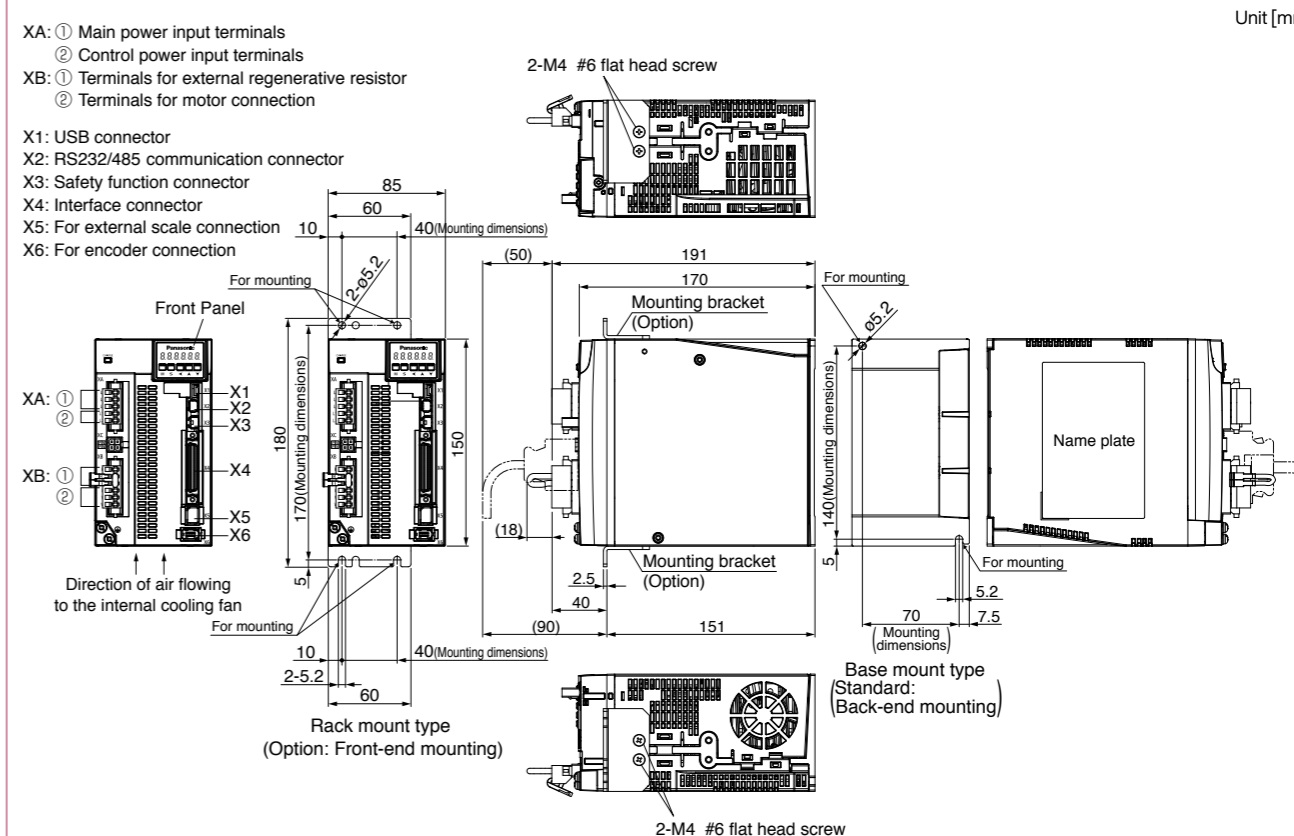
C-frame



*For connectors used to connect to the driver, power supply and motor, refer to the A-frame table because both frames use the same connectors.

Mass: 1.6 kg

D-frame (200 V)



*For connectors used to connect to the driver, power supply and motor, refer to the A-frame table because both frames use the same connectors.

Mass: 2.1 kg

E-frame (200 V)

Unit [mm]

X1: USB connector
 X2: RS232/485 communication connector
 X3: Safety function connector
 X4: Interface connector
 X5: For external scale connection
 X6: For encoder connection

XA: ① Main power input terminals
 ② Control power input terminals
 XB: Terminals for motor connection
 XC: Terminals for external regenerative resistor

Front Panel

Direction of air flowing to the internal cooling fan

2-M4 #6 flat head screw

2-M4 #6 flat head screw

Mounting bracket (If re-positioned from front end)

Name plate

Mounting bracket (If re-positioned from front end)

2-M4 #6 flat head screw

2-M4 #6 flat head screw

| E-frame: Connector of driver side | | |
|-----------------------------------|--------------------|-----------------------|
| Connector XA | S05B-JTSLSK-GSANXR | J.S.T. Mfg. Co., Ltd. |
| Connector XB | S03B-JTSLSK-GSANXR | J.S.T. Mfg. Co., Ltd. |
| Connector XC | S04B-JTSLSS-GSANXR | J.S.T. Mfg. Co., Ltd. |

<Attached to the driver>

| E-frame: Connector of power and motor side | | |
|--|-----------------|-----------------------|
| Connector XA | 05JFAT-SAXGSA-L | J.S.T. Mfg. Co., Ltd. |
| Connector XB | 03JFAT-SAXGSA-L | J.S.T. Mfg. Co., Ltd. |
| Connector XC | 04JFAT-SAXGSA-L | J.S.T. Mfg. Co., Ltd. |

* For connectors X1 to X6, refer to the list provided in the A-frame table because both frames use the same connectors.

Mass: 2.7 kg

F-frame (200 V)

Unit [mm]

X1: USB connector
 X2: RS232/485 communication connector
 X3: Safety function connector
 X4: Interface connector
 X5: For external scale connection
 X6: For encoder connection

① Main power input terminals
 ② Control power input terminals
 ③ Terminals for external regenerative resistor
 ④ Terminals for motor connection

Front Panel

Direction of air flowing to the internal cooling fan

2-M4 #6 flat head screw

2-M4 #6 flat head screw

Mounting bracket (If re-positioned from front end)

Name plate

Mounting bracket (If re-positioned from front end)

2-M4 #6 flat head screw

2-M4 #6 flat head screw

* For connectors X1 to X6, refer to the list provided in the A-frame table because both frames use the same connectors.

Mass: 5.2 kg

G-frame (200 V) (The lineup of A6SE and A6SG series is not available.)

Unit [mm]

X1: USB connector
 X2: RS232/485 communication connector
 X3: Safety function connector
 X4: Interface connector
 X5: For external scale connection
 X6: For encoder connection
 XE: Connector for external dynamic brake signal
 XS: Built-in dynamic brake switch

Front Panel

Control power input terminals

Main power input terminals

Terminals for external regenerative resistor

Terminals for motor connection

Direction of air flowing to the internal cooling fan

3-M4 #6 flat head screw

3-M4 #6 flat head screw

Mounting bracket (If re-positioned from front end)

Name plate

Mounting bracket (If re-positioned from front end)

3-M4 #6 flat head screw

3-M4 #6 flat head screw

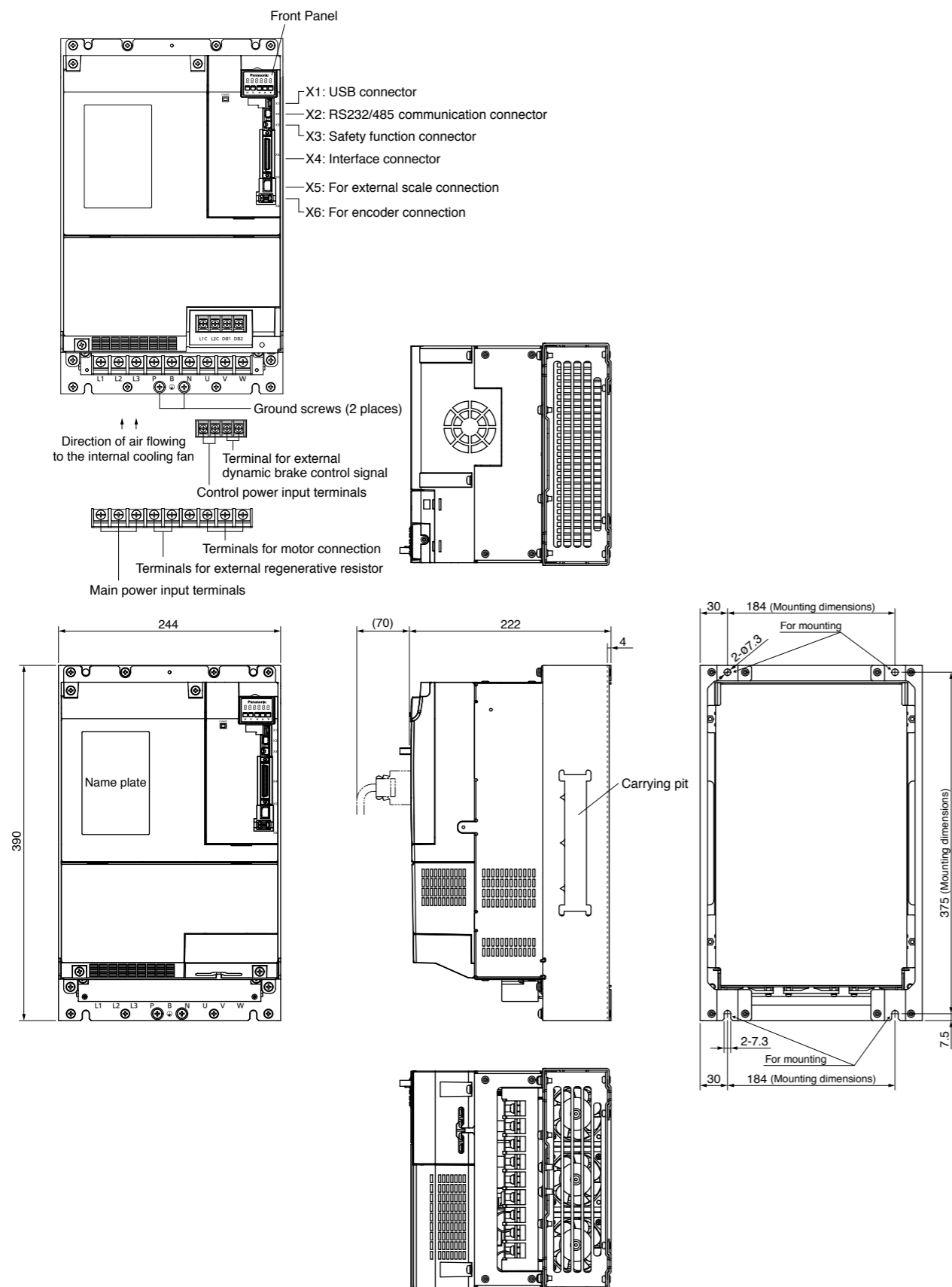
| Connector of driver side | Controlor side (customer prepares) |
|--------------------------------------|------------------------------------|
| Connector XE : 5569-04A2-210 (Molex) | Connector : 5557-04R-210 (Molex) |
| | Pin : 5556PBTL |

* For connectors X1 to X6, refer to the list provided in the A-frame table because both frames use the same connectors.

Mass: 8.2 kg

H-frame (200 V) (The lineup of A6SE and A6SG series is not available.)

Unit [mm]










Mass:
 MHDLTE3SF/ 14.2 kg
 MHDLTF3SF/ 15.2 kg

* For connectors X1 to X6, refer to the list provided in the A-frame table because both frames use the same connectors.

Features

- Line-up IP67 motor: 50 W to 5.0 kW
- Max speed: 6500r/min (MHMF 50 W to 400 W)
- Low inertia (MSMF) to High inertia (MHMF).
- Low cogging torque: Rated torque ratio 0.5 % (typical value).
- 23-bit absolute encoder (8388608 pulse).

Motor Lineup

| | | | |
|-------------------|--|--|---|
| 80 mm sq. or less |  <p>MSMF Low inertia</p> <p>Max. speed : 6000 r/min Rated speed : 3000 r/min Rated output : 50 W to 1000 W Enclosure: IP65: Leadwire type IP67: Connector type</p> |  <p>MQMF (Flat type) Middle inertia</p> <p>Max. speed : 6500 r/min Rated speed : 3000 r/min Rated output : 100 W to 400 W Enclosure: IP65: Leadwire type IP67: Connector type</p> |  <p>MHMF High inertia</p> <p>Max. speed : 6500 r/min 6000 r/min (750 W, 1000 W) Rated speed : 3000 r/min Rated output : 50 W to 1000 W Enclosure: IP65: Leadwire type IP67: Connector type</p> |
| |  <p>MSMF Low inertia</p> <p>Max. speed : 5000 r/min 4500 r/min (4.0 kW, 5.0 kW) Rated speed : 3000 r/min Rated output : 1.0 kW to 5.0 kW Enclosure : IP67</p> |  <p>MDMF Middle inertia</p> <p>Max. speed : 3000 r/min 2000 r/min (11.0 kW to 22.0 kW) Rated speed : 2000 r/min 1500 r/min (11.0 kW to 22.0 kW) Rated output : 1.0 kW to 22.0 kW Enclosure : IP67, IP44 (22.0 kW)</p> | |
| |  <p>MGMF (Low speed/ High torque type) Middle inertia</p> <p>Max. speed : 3000 r/min Rated speed : 1500 r/min Rated output : 0.85 kW to 5.5 kW Enclosure : IP67</p> |  <p>MHMF High inertia</p> <p>Max. speed : 3000 r/min Rated speed : 2000 r/min 1500 r/min (7.5 kW) Rated output : 1.0 kW to 7.5 kW Enclosure : IP67</p> | |

Motor Contents

MSMF
50 W to 5.0 kW P.63

MQMF
100 W to 400 W P.79

MHMF
50 W to 7.5 kW P.85

MDMF
1.0 kW to 22.0 kW P.102

MGMF
0.85 kW to 5.5 kW P.112

Dimensions
 MSMF (50 W to 1000 W) P.119

MSMF (1.0 kW to 5.0 kW) P.127

MQMF (100 W to 400 W) P.135

MHMF (50 W to 1000 W) P.147

MHMF (1.0 kW to 7.5 kW) P.171

MDMF (1.0 kW to 22.0 kW) P.180

MGMF (0.85 kW to 5.5 kW) P.193

Special Order Product P.203

Motors with Gear Reducer P.293

Motor Specification Description

Environmental Conditions P.303
 Notes on [Motor specification] page P.303
 Permissible Load at Output Shaft P.304
 Built-in Holding Brake P.305

Specifications

| | | AC100 V |
|---|----------------------------|--|
| Motor model ^{*1} | | MSMF5AZL1□□ |
| Applicable driver | Model No. | Multifunction type RS485 communication type ^{*2} Basic type ^{*2} |
| | | MADLT01SF MADLN01SG MADLN01SE |
| | Frame symbol | A-frame |
| Power supply capacity | (kVA) | 0.4 |
| Rated output | (W) | 50 |
| Rated torque | (N·m) | 0.16 |
| Continuous stall torque | (N·m) | 0.16 |
| Momentary Max. peak torque | (N·m) | 0.48 |
| Rated current | (A(rms)) | 1.1 |
| Max. current | (A(o-p)) | 4.7 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4280 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.026 |
| | With brake | 0.029 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

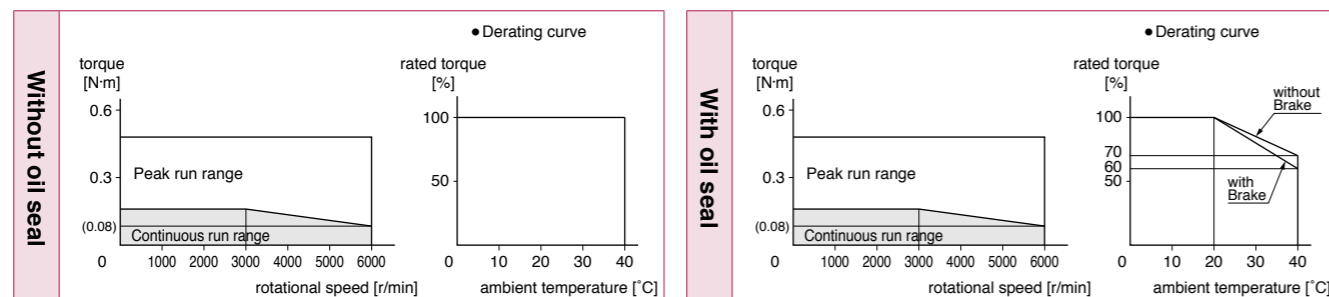
| | |
|---------------------------------------|---------------|
| Static friction torque (N·m) | 0.294 or more |
| Engaging time (ms) | 35 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±1.2 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88.0 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 58.8 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC100 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.119 | | | P.119 | | |
| Connector type (IP67) | P.119 | | | P.120 | | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|----------------------------|--|
| Motor model ^{*1} | | MSMF5AZL1□□ |
| Applicable driver | Model No. | Multifunction type RS485 communication type ^{*2} Basic type ^{*2} |
| | | MADLT05SF MADLN05SG MADLN05SE |
| | Frame symbol | A-frame |
| Power supply capacity | (kVA) | 0.5 |
| Rated output | (W) | 50 |
| Rated torque | (N·m) | 0.16 |
| Continuous stall torque | (N·m) | 0.16 |
| Momentary Max. peak torque | (N·m) | 0.48 |
| Rated current | (A(rms)) | 1.1 |
| Max. current | (A(o-p)) | 4.7 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4281 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.026 |
| | With brake | 0.029 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

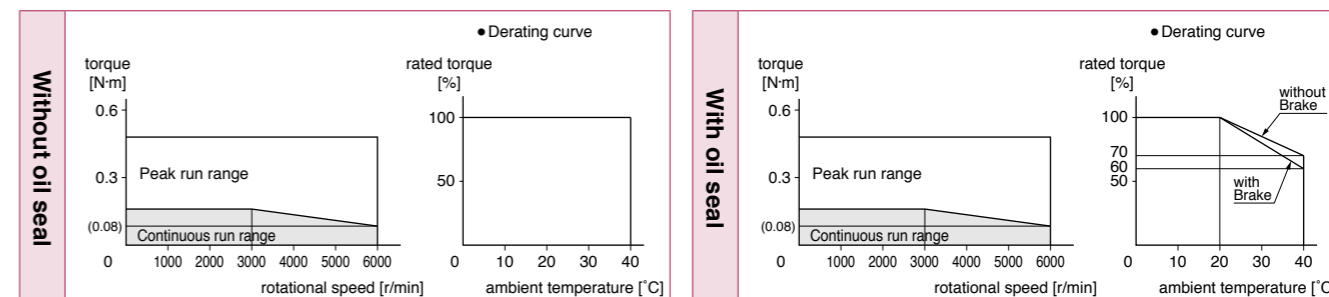
| | |
|---------------------------------------|---------------|
| Static friction torque (N·m) | 0.294 or more |
| Engaging time (ms) | 35 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±1.2 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88.0 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 58.8 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.119 | | | P.119 | | |
| Connector type (IP67) | P.119 | | | P.120 | | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC100 V |
|---|--|--|
| Motor model ^{*1} | | MSMF011L1□□ |
| Applicable driver | Model No. | Multifunction type MADLT11SF |
| | RS485 communication type ^{*2} | MADLN11SG |
| | Basic type ^{*2} | MADLN11SE |
| Frame symbol | | A-frame |
| Power supply capacity | (kVA) | 0.4 |
| Rated output | (W) | 100 |
| Rated torque | (N·m) | 0.32 |
| Continuous stall torque | (N·m) | 0.32 |
| Momentary Max. peak torque | (N·m) | 0.95 |
| Rated current | (A(rms)) | 1.6 |
| Max. current | (A(o-p)) | 6.9 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4280 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.048 |
| | With brake | 0.051 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

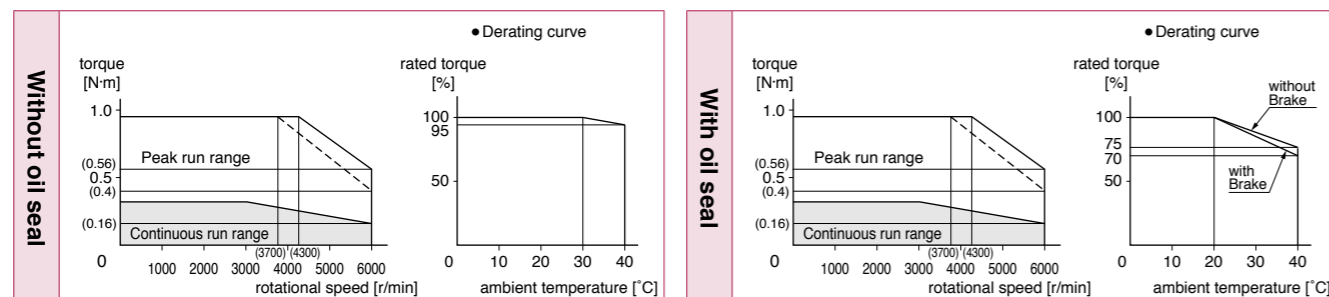
| | |
|---------------------------------------|---------------|
| Static friction torque (N·m) | 0.294 or more |
| Engaging time (ms) | 35 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±1.2 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88.0 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 58.8 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC100 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.120 | | | P.120 | | |
| Connector type (IP67) | P.121 | | | P.121 | | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|--|--|
| Motor model ^{*1} | | MSMF012L1□□ |
| Applicable driver | Model No. | Multifunction type MADLT05SF |
| | RS485 communication type ^{*2} | MADLN05SG |
| | Basic type ^{*2} | MADLN05SE |
| Frame symbol | | A-frame |
| Power supply capacity | (kVA) | 0.5 |
| Rated output | (W) | 100 |
| Rated torque | (N·m) | 0.32 |
| Continuous stall torque | (N·m) | 0.32 |
| Momentary Max. peak torque | (N·m) | 0.95 |
| Rated current | (A(rms)) | 1.1 |
| Max. current | (A(o-p)) | 4.7 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4281 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.048 |
| | With brake | 0.051 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

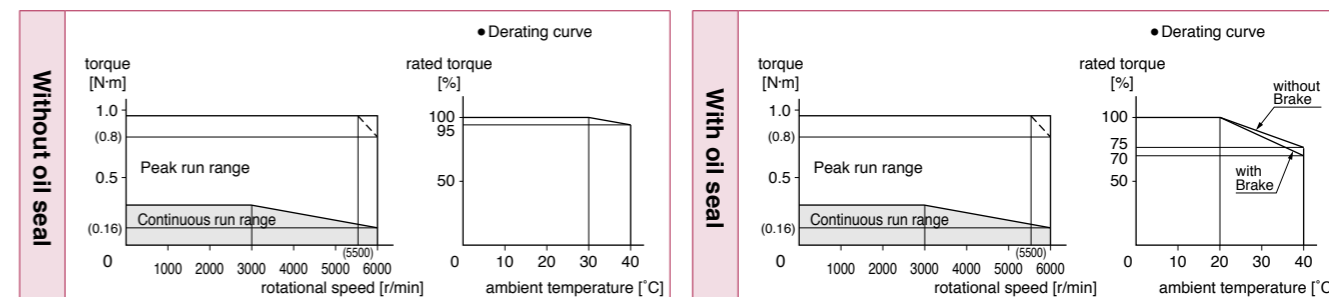
| | |
|---------------------------------------|---------------|
| Static friction torque (N·m) | 0.294 or more |
| Engaging time (ms) | 35 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±1.2 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88.0 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 58.8 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.120 | | | P.120 | | |
| Connector type (IP67) | P.121 | | | P.121 | | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC100 V |
|---|----------------|--|
| Motor model ¹ | | MSMF021L1□□ |
| Applicable driver | Model No. | Multifunction type MBDLT21SF |
| | | RS485 communication type ² MBDLN21SG |
| | | Basic type ² MBDLN21SE |
| Frame symbol | | B-frame |
| Power supply capacity (kVA) | | 0.5 |
| Rated output (W) | | 200 |
| Rated torque (N·m) | | 0.64 |
| Continuous stall torque (N·m) | | 0.64 |
| Momentary Max. peak torque (N·m) | | 1.91 |
| Rated current (A(rms)) | | 2.5 |
| Max. current (A(o-p)) | | 10.6 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.14 |
| | With brake | 0.17 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 1.27 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 15 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±1.2 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98.0 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.57.

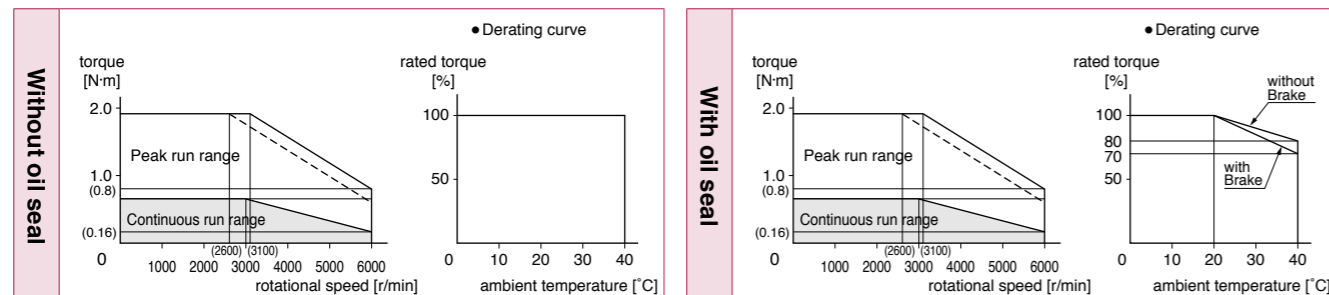
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.22.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC100 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.121 | | | P.122 | | |
| Connector type (IP67) | P.122 | | | P.122 | | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|----------------|--|
| Motor model ¹ | | MSMF022L1□□ |
| Applicable driver | Model No. | Multifunction type MADLT15SF |
| | | RS485 communication type ² MADLN15SG |
| | | Basic type ² MADLN15SE |
| Frame symbol | | A-frame |
| Power supply capacity (kVA) | | 0.5 |
| Rated output (W) | | 200 |
| Rated torque (N·m) | | 0.64 |
| Continuous stall torque (N·m) | | 0.64 |
| Momentary Max. peak torque (N·m) | | 1.91 |
| Rated current (A(rms)) | | 1.5 |
| Max. current (A(o-p)) | | 6.5 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.14 |
| | With brake | 0.17 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 1.27 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 15 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±1.2 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98.0 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.57.

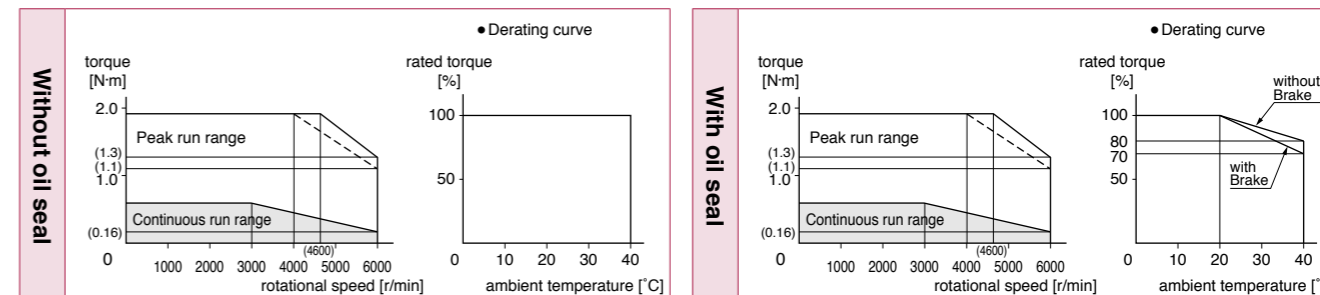
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.22.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.121 | | | P.122 | | |
| Connector type (IP67) | P.122 | | | P.122 | | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC100 V |
|---|----------------------------|---|
| Motor model ^{*1} | | MSMF041L1□□ |
| Applicable driver | Model No. | Multifunction type MCDLT31SF |
| | | RS485 communication type ^{*2} MCDLN31SG |
| | | Basic type ^{*2} MCDLN31SE |
| Frame symbol | | C-frame |
| Power supply capacity | (kVA) | 0.9 |
| Rated output | (W) | 400 |
| Rated torque | (N·m) | 1.27 |
| Continuous stall torque | (N·m) | 1.27 |
| Momentary Max. peak torque | (N·m) | 3.82 |
| Rated current | (A(rms)) | 4.6 |
| Max. current | (A(o-p)) | 19.5 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4282 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.27 |
| | With brake | 0.30 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

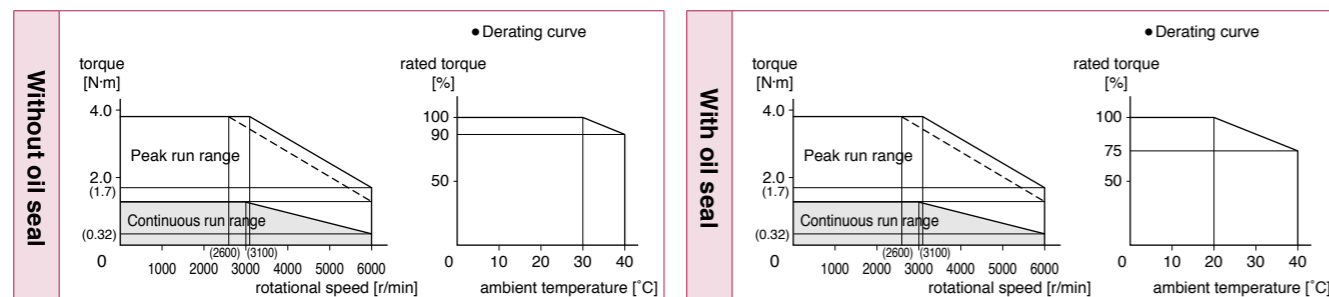
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 1.27 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 15 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±1.2 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98.0 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC100 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.123 | — | — | P.123 | — | — |
| Connector type (IP67) | P.123 | — | — | P.124 | — | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|----------------------------|---|
| Motor model ^{*1} | | MSMF042L1□□ |
| Applicable driver | Model No. | Multifunction type MBDLT25SF |
| | | RS485 communication type ^{*2} MBDLN25SG |
| | | Basic type ^{*2} MBDLN25SE |
| Frame symbol | | B-frame |
| Power supply capacity | (kVA) | 0.9 |
| Rated output | (W) | 400 |
| Rated torque | (N·m) | 1.27 |
| Continuous stall torque | (N·m) | 1.27 |
| Momentary Max. peak torque | (N·m) | 3.82 |
| Rated current | (A(rms)) | 2.4 |
| Max. current | (A(o-p)) | 10.2 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.27 |
| | With brake | 0.30 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

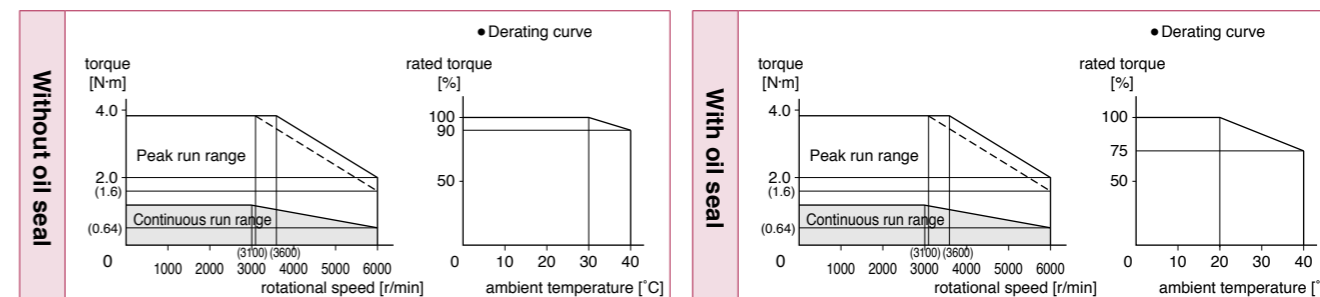
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 1.27 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 15 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±1.2 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98.0 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.123 | — | — | P.123 | — | — |
| Connector type (IP67) | P.123 | — | — | P.124 | — | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|----------------|---|
| Motor model ^{*1} | | MSMF082L1□□ |
| Applicable driver | Model No. | Multifunction type MCDLT35SF |
| | | RS485 communication type ^{*2} MCDLN35SG |
| | | Basic type ^{*2} MCDLN35SE |
| Frame symbol | | C-frame |
| Power supply capacity (kVA) | | 1.8 |
| Rated output (W) | | 750 |
| Rated torque (N·m) | | 2.39 |
| Continuous stall torque (N·m) | | 2.39 |
| Momentary Max. peak torque (N·m) | | 7.16 |
| Rated current (A(rms)) | | 4.1 |
| Max. current (A(o-p)) | | 17.4 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.96 |
| | With brake | 1.06 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 20 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

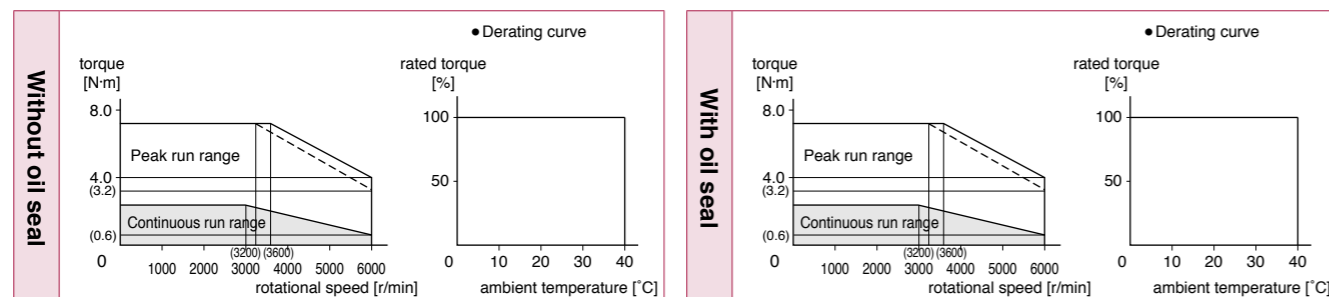
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 2.45 or more |
| Engaging time (ms) | 70 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.42 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±1.2 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 686 |
| | Thrust load A-direction (N) | 294 |
| | Thrust load B-direction (N) | 392 |
| During operation | Radial load P-direction (N) | 392 |
| | Thrust load A, B-direction (N) | 147 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.124 | | | P.124 | | |
| Connector type (IP67) | P.125 | | | P.125 | | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|----------------|--|
| Motor model ^{*1} | | MSMF092L1□□ |
| Applicable driver | Model No. | Multifunction type MDDLTL45SF |
| | | RS485 communication type ^{*2} MDDLNL45SG |
| | | Basic type ^{*2} MDDLNL45SE |
| Frame symbol | | D-frame |
| Power supply capacity (kVA) | | 2.4 |
| Rated output (W) | | 1000 |
| Rated torque (N·m) | | 3.18 |
| Continuous stall torque (N·m) | | 3.18 |
| Momentary Max. peak torque (N·m) | | 9.55 |
| Rated current (A(rms)) | | 5.7 |
| Max. current (A(o-p)) | | 24.2 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 1.26 |
| | With brake | 1.36 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

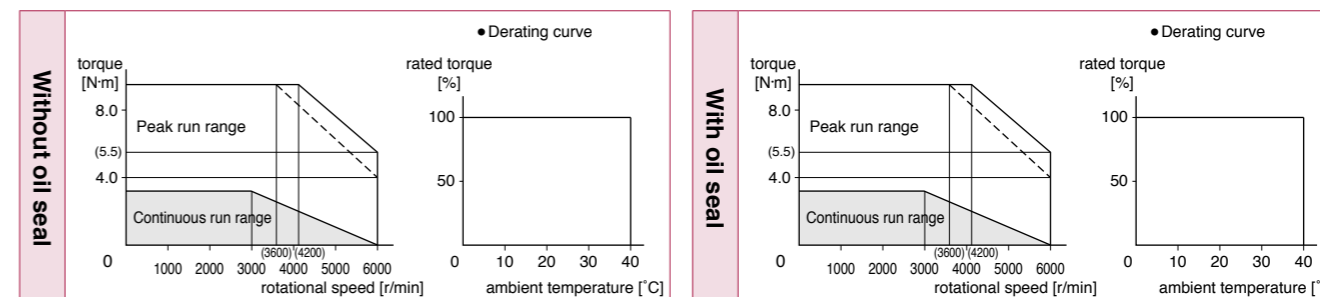
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 3.80 or more |
| Engaging time (ms) | 70 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.42 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 686 |
| | Thrust load A-direction (N) | 294 |
| | Thrust load B-direction (N) | 392 |
| During operation | Radial load P-direction (N) | 392 |
| | Thrust load A, B-direction (N) | 147 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.125 | | | P.126 | | |
| Connector type (IP67) | P.126 | | | P.126 | | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|----------------|---|
| Motor model ¹ | | MSMF102L1□□ |
| Applicable driver | Model No. | Multifunction type MDDL55SF |
| | | RS485 communication type ² MDDL55SG |
| | | Basic type ² MDDL55SE |
| Frame symbol | | D-frame |
| Power supply capacity (kVA) | | 2.4 |
| Rated output (W) | | 1000 |
| Rated torque (N·m) | | 3.18 |
| Continuous stall torque (N·m) | | 3.82 |
| Momentary Max. peak torque (N·m) | | 9.55 |
| Rated current (A(rms)) | | 6.6 |
| Max. current (A(o-p)) | | 28 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 5000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 2.15 |
| | With brake | 2.47 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

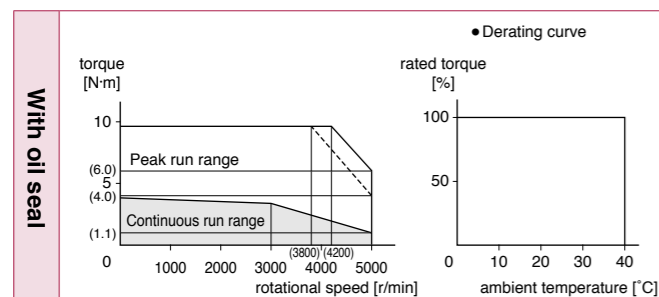
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 8.0 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 15 or less |
| Exciting current (DC) (A) | 0.81 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.127 | | — | P.127 | |
| Encoder connector Small size (JN2) type | — | P.127 | | — | P.128 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|----------------|---|
| Motor model ¹ | | MSMF152L1□□ |
| Applicable driver | Model No. | Multifunction type MDDL55SF |
| | | RS485 communication type ² MDDL55SG |
| | | Basic type ² MDDL55SE |
| Frame symbol | | D-frame |
| Power supply capacity (kVA) | | 2.9 |
| Rated output (W) | | 1500 |
| Rated torque (N·m) | | 4.77 |
| Continuous stall torque (N·m) | | 5.72 |
| Momentary Max. peak torque (N·m) | | 14.3 |
| Rated current (A(rms)) | | 8.2 |
| Max. current (A(o-p)) | | 35 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 5000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 3.10 |
| | With brake | 3.45 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

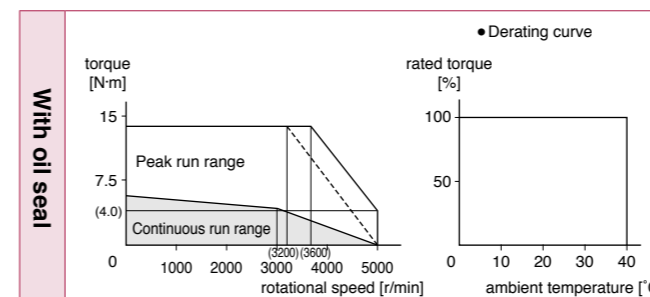
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 8.0 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 15 or less |
| Exciting current (DC) (A) | 0.81 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.128 | | — | P.128 | |
| Encoder connector Small size (JN2) type | — | P.129 | | — | P.129 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|---------------------------------------|---------------------------------|
| Motor model ¹ | | MSMF202L1□□ |
| Applicable driver | Model No. | Multifunction type MEDLT83SF |
| | RS485 communication type ² | MEDLN83SG |
| | Basic type ² | MEDLN83SE |
| Frame symbol | | E-frame |
| Power supply capacity (kVA) | | 3.8 |
| Rated output (W) | | 2000 |
| Rated torque (N·m) | | 6.37 |
| Continuous stall torque (N·m) | | 7.64 |
| Momentary Max. peak torque (N·m) | | 19.1 |
| Rated current (A(rms)) | | 11.3 |
| Max. current (A(o-p)) | | 48 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 5000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 4.06 |
| | With brake | 4.41 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• **Brake specifications** (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

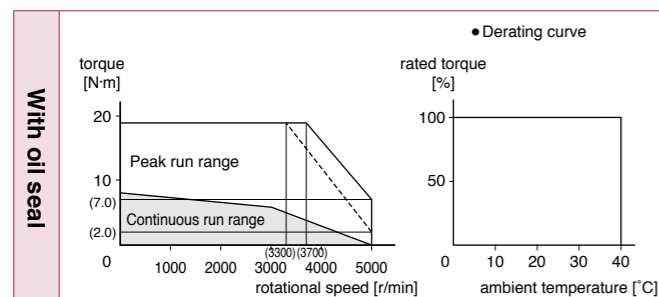
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 8.0 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 15 or less |
| Exciting current (DC) (A) | 0.81 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.59.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.129 | | — | P.130 | |
| Encoder connector Small size (JN2) type | — | P.130 | | — | P.130 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|---------------------------------------|---------------------------------|
| Motor model ¹ | | MSMF302L1□□ |
| Applicable driver | Model No. | Multifunction type MFDLTA3SF |
| | RS485 communication type ² | MFDLNA3SG |
| | Basic type ² | MFDLNA3SE |
| Frame symbol | | F-frame |
| Power supply capacity (kVA) | | 5.2 |
| Rated output (W) | | 3000 |
| Rated torque (N·m) | | 9.55 |
| Continuous stall torque (N·m) | | 11.0 |
| Momentary Max. peak torque (N·m) | | 28.6 |
| Rated current (A(rms)) | | 18.1 |
| Max. current (A(o-p)) | | 77 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285×2 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 5000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 7.04 |
| | With brake | 7.38 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• **Brake specifications** (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

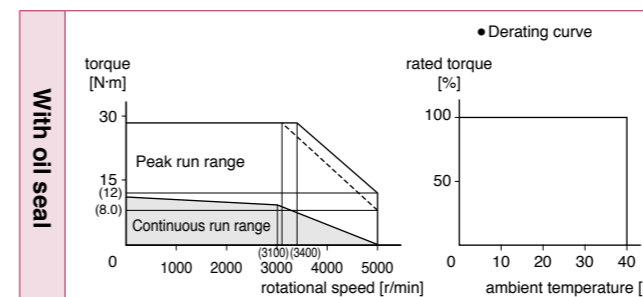
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 12.0 or more |
| Engaging time (ms) | 80 or less |
| Releasing time (ms) ^{Note)4} | 15 or less |
| Exciting current (DC) (A) | 0.81 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.59.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.131 | | — | P.131 | |
| Encoder connector Small size (JN2) type | — | P.131 | | — | P.132 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|--|----------------------------|
| Motor model ^{*1} | | MSMF402L1□□ |
| Applicable driver | Model No. | MFDLTB3SF |
| | Multifunction type | MFDLNB3SG |
| | RS485 communication type ^{*2} | MFDLNB3SE |
| | Basic type ^{*2} | |
| | Frame symbol | F-frame |
| Power supply capacity | (kVA) | 7.8 |
| Rated output | (W) | 4000 |
| Rated torque | (N·m) | 12.7 |
| Continuous stall torque | (N·m) | 15.2 |
| Momentary Max. peak torque | (N·m) | 38.2 |
| Rated current | (A(rms)) | 19.6 |
| Max. current | (A(o-p)) | 83 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285x2 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 4500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 14.4 |
| | With brake | 15.6 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

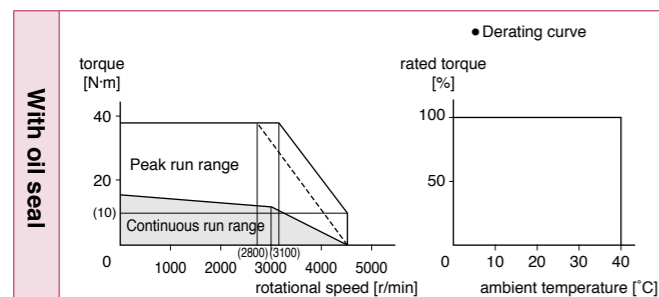
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 16.2 or more |
| Engaging time (ms) | 110 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.90 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.59.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.132 | | — | P.132 | |
| Encoder connector Small size (JN2) type | — | P.133 | | — | P.133 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|--|----------------------------|
| Motor model ^{*1} | | MSMF502L1□□ |
| Applicable driver | Model No. | MFDLTB3SF |
| | Multifunction type | MFDLNB3SG |
| | RS485 communication type ^{*2} | MFDLNB3SE |
| | Basic type ^{*2} | |
| | Frame symbol | F-frame |
| Power supply capacity | (kVA) | 7.8 |
| Rated output | (W) | 5000 |
| Rated torque | (N·m) | 15.9 |
| Continuous stall torque | (N·m) | 19.1 |
| Momentary Max. peak torque | (N·m) | 47.7 |
| Rated current | (A(rms)) | 24.0 |
| Max. current | (A(o-p)) | 102 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285x2 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 4500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 19.0 |
| | With brake | 20.2 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

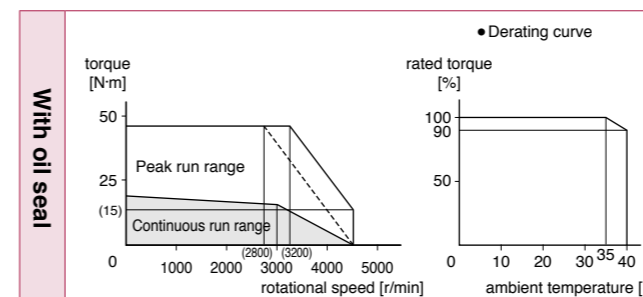
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 22.0 or more |
| Engaging time (ms) | 110 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.90 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.59.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.133 | | — | P.134 | |
| Encoder connector Small size (JN2) type | — | P.134 | | — | P.134 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC100 V |
|--|----------------------------|--|
| Motor model ¹ | | MQMF011L1 □□ |
| Applicable driver | Model No. | Multifunction type MADLT11SF |
| | | RS485 communication type ² MADLN11SG |
| | | Basic type ² MADLN11SE |
| Frame symbol | | A-frame |
| Power supply capacity | (kVA) | 0.4 |
| Rated output | (W) | 100 |
| Rated torque | (N·m) | 0.32 |
| Continuous stall torque | (N·m) | 0.33 |
| Momentary Max. peak torque | (N·m) | 1.11 |
| Rated current | (A(rms)) | 1.6 |
| Max. current | (A(o-p)) | 7.9 |
| Regenerative brake frequency (times/min) ^{Note1} | Without option | No limit ^{Note2} |
| | DV0P4280 | No limit ^{Note2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.15 |
| | With brake | 0.18 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note3} | | 20 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

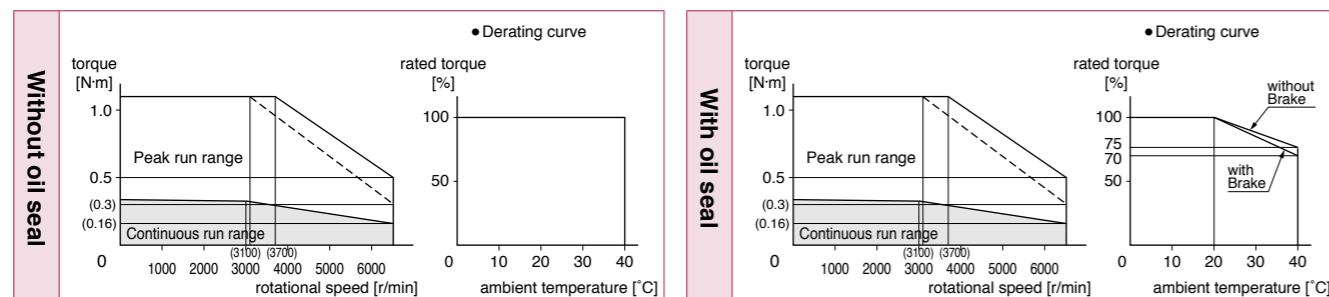
| | |
|--------------------------------------|--------------|
| Static friction torque (N·m) | 0.39 or more |
| Engaging time (ms) | 15 or less |
| Releasing time (ms) ^{Note4} | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 58.8 |

- For details of Note1 to Note4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC100 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.135 | P.135 | P.135 | P.136 | P.136 | P.136 |
| Connector type (IP67) | P.137 | P.137 | P.137 | P.138 | P.138 | P.138 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|--|----------------------------|--|
| Motor model ¹ | | MQMF012L1 □□ |
| Applicable driver | Model No. | Multifunction type MADLT05SF |
| | | RS485 communication type ² MADLN05SG |
| | | Basic type ² MADLN05SE |
| Frame symbol | | A-frame |
| Power supply capacity | (kVA) | 0.5 |
| Rated output | (W) | 100 |
| Rated torque | (N·m) | 0.32 |
| Continuous stall torque | (N·m) | 0.33 |
| Momentary Max. peak torque | (N·m) | 1.11 |
| Rated current | (A(rms)) | 1.1 |
| Max. current | (A(o-p)) | 5.5 |
| Regenerative brake frequency (times/min) ^{Note1} | Without option | No limit ^{Note2} |
| | DV0P4281 | No limit ^{Note2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.15 |
| | With brake | 0.18 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note3} | | 20 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

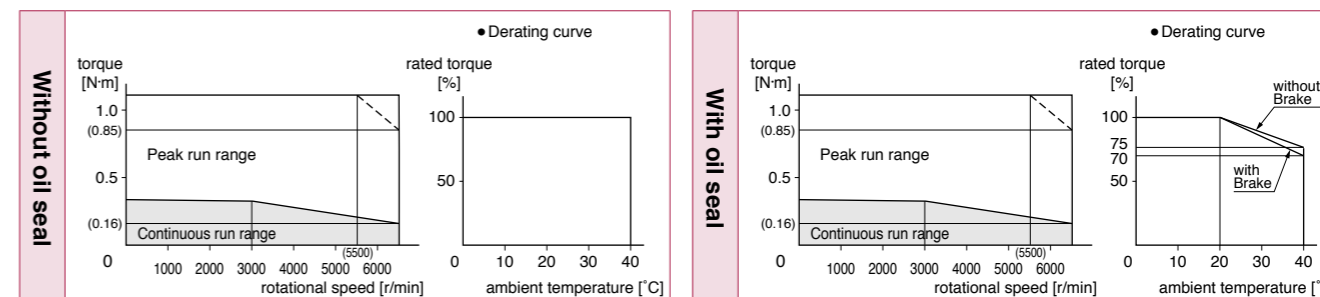
| | |
|--------------------------------------|--------------|
| Static friction torque (N·m) | 0.39 or more |
| Engaging time (ms) | 15 or less |
| Releasing time (ms) ^{Note4} | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 58.8 |

- For details of Note1 to Note4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.135 | P.135 | P.135 | P.136 | P.136 | P.136 |
| Connector type (IP67) | P.137 | P.137 | P.137 | P.138 | P.138 | P.138 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC100 V |
|---|----------------|---|
| Motor model ^{*1} | | MQMF021L1 □□ |
| Applicable driver | Model No. | Multifunction type MBDLT21SF |
| | | RS485 communication type ^{*2} MBDLN21SG |
| | | Basic type ^{*2} MBDLN21SE |
| Frame symbol | | B-frame |
| Power supply capacity (kVA) | | 0.5 |
| Rated output (W) | | 200 |
| Rated torque (N·m) | | 0.64 |
| Continuous stall torque (N·m) | | 0.76 |
| Momentary Max. peak torque (N·m) | | 2.23 |
| Rated current (A(rms)) | | 2.1 |
| Max. current (A(o-p)) | | 10.4 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.50 |
| | With brake | 0.59 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 20 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

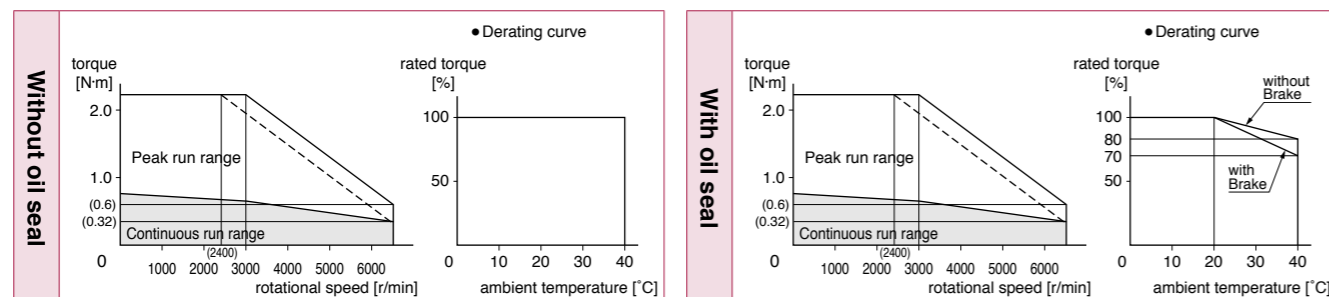
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 1.6 or more |
| Engaging time (ms) | 70 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC100 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.139 | P.139 | P.139 | P.140 | P.140 | P.140 |
| Connector type (IP67) | P.141 | P.141 | P.141 | P.142 | P.142 | P.142 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|----------------|---|
| Motor model ^{*1} | | MQMF022L1 □□ |
| Applicable driver | Model No. | Multifunction type MADLT15SF |
| | | RS485 communication type ^{*2} MADLN15SG |
| | | Basic type ^{*2} MADLN15SE |
| Frame symbol | | A-frame |
| Power supply capacity (kVA) | | 0.5 |
| Rated output (W) | | 200 |
| Rated torque (N·m) | | 0.64 |
| Continuous stall torque (N·m) | | 0.76 |
| Momentary Max. peak torque (N·m) | | 2.23 |
| Rated current (A(rms)) | | 1.4 |
| Max. current (A(o-p)) | | 6.9 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.50 |
| | With brake | 0.59 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 20 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

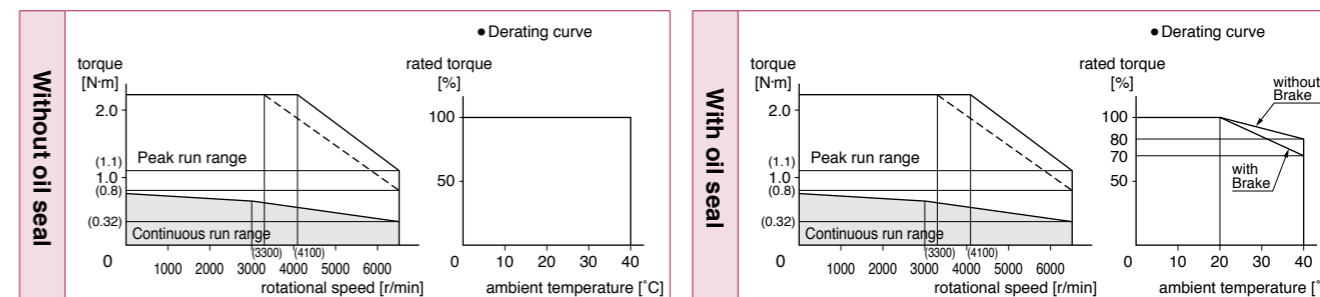
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 1.6 or more |
| Engaging time (ms) | 70 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.139 | P.139 | P.139 | P.140 | P.140 | P.140 |
| Connector type (IP67) | P.141 | P.141 | P.141 | P.142 | P.142 | P.142 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC100 V |
|---|----------------------------|---|
| Motor model ^{*1} | | MQMF041L1 □□ |
| Applicable driver | Model No. | Multifunction type MCDLT31SF |
| | | RS485 communication type ^{*2} MCDLN31SG |
| | | Basic type ^{*2} MCDLN31SE |
| Frame symbol | | C-frame |
| Power supply capacity | (kVA) | 0.9 |
| Rated output | (W) | 400 |
| Rated torque | (N·m) | 1.27 |
| Continuous stall torque | (N·m) | 1.40 |
| Momentary Max. peak torque | (N·m) | 4.46 |
| Rated current | (A(rms)) | 4.1 |
| Max. current | (A(o-p)) | 20.3 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4282 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.98 |
| | With brake | 1.06 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 20 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

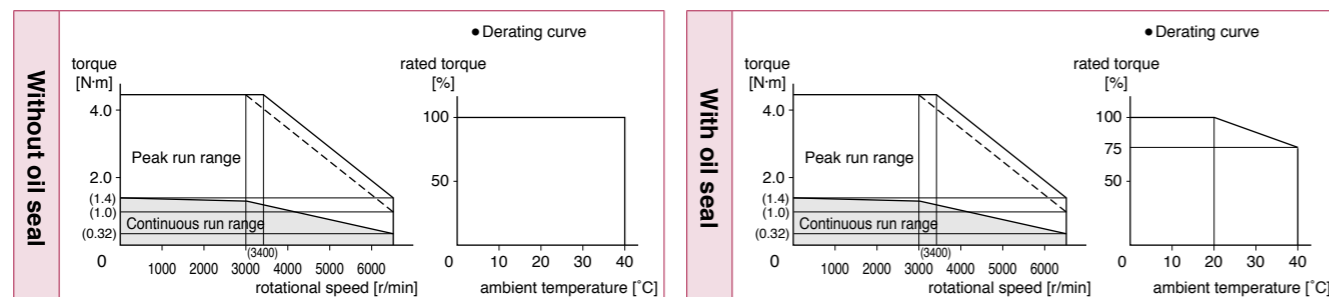
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 1.6 or more |
| Engaging time (ms) | 70 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC100 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.143 | P.143 | P.143 | P.144 | P.144 | P.144 |
| Connector type (IP67) | P.145 | P.145 | P.145 | P.146 | P.146 | P.146 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|----------------------------|---|
| Motor model ^{*1} | | MQMF042L1 □□ |
| Applicable driver | Model No. | Multifunction type MBDLT25SF |
| | | RS485 communication type ^{*2} MBDLN25SG |
| | | Basic type ^{*2} MBDLN25SE |
| Frame symbol | | B-frame |
| Power supply capacity | (kVA) | 0.9 |
| Rated output | (W) | 400 |
| Rated torque | (N·m) | 1.27 |
| Continuous stall torque | (N·m) | 1.40 |
| Momentary Max. peak torque | (N·m) | 4.46 |
| Rated current | (A(rms)) | 2.1 |
| Max. current | (A(o-p)) | 10.4 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.98 |
| | With brake | 1.06 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 20 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

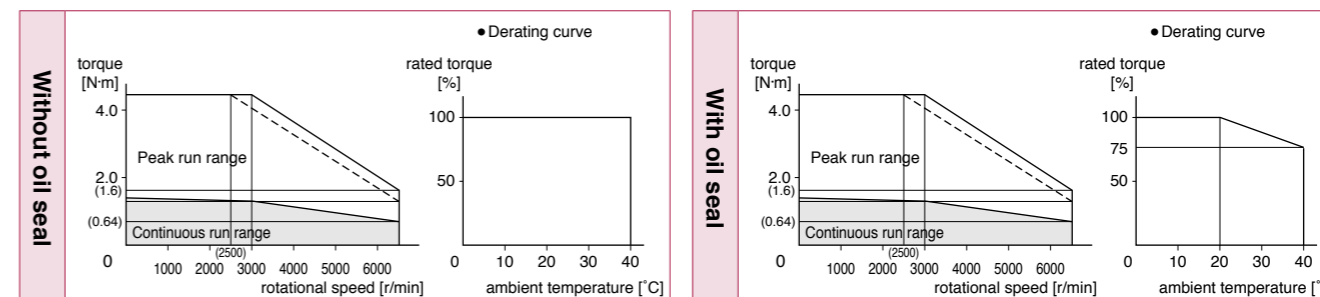
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 1.6 or more |
| Engaging time (ms) | 70 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.143 | P.143 | P.143 | P.144 | P.144 | P.144 |
| Connector type (IP67) | P.145 | P.145 | P.145 | P.146 | P.146 | P.146 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC100 V |
|---|--|----------------------------|
| Motor model ^{*1} | | MHPF5AZL1□□ |
| Applicable driver | Model No. | MADLT01SF |
| | Multifunction type | MADLN01SG |
| | RS485 communication type ^{*2} | MADLN01SE |
| | Basic type ^{*2} | |
| | Frame symbol | A-frame |
| Power supply capacity | (kVA) | 0.4 |
| Rated output | (W) | 50 |
| Rated torque | (N·m) | 0.16 |
| Continuous stall torque | (N·m) | 0.18 |
| Momentary Max. peak torque | (N·m) | 0.56 |
| Rated current | (A(rms)) | 1.1 |
| Max. current | (A(o-p)) | 5.5 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4280 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.038 |
| | With brake | 0.042 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

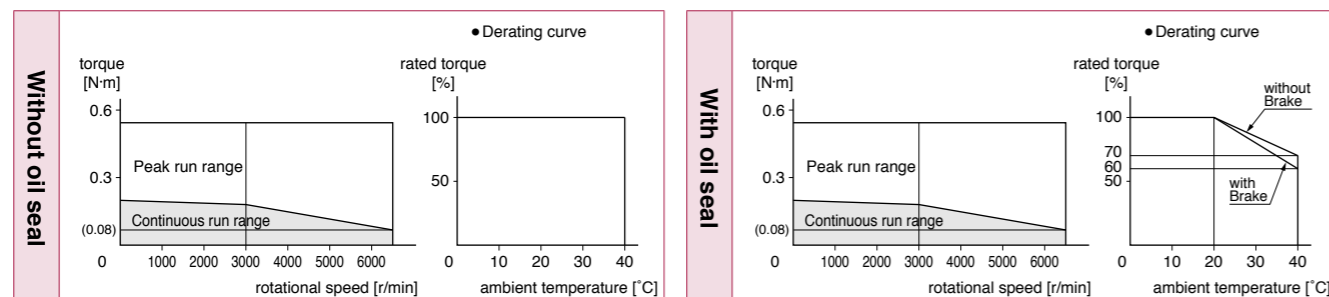
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 0.38 or more |
| Engaging time (ms) | 35 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 49 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC100 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.147 | P.147 | P.147 | P.148 | P.148 | P.148 |
| Connector type (IP67) | P.149 | P.149 | P.149 | P.150 | P.150 | P.150 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|--|----------------------------|
| Motor model ^{*1} | | MHPF5AZL1□□ |
| Applicable driver | Model No. | MADLT05SF |
| | Multifunction type | MADLN05SG |
| | RS485 communication type ^{*2} | MADLN05SE |
| | Basic type ^{*2} | |
| | Frame symbol | A-frame |
| Power supply capacity | (kVA) | 0.5 |
| Rated output | (W) | 50 |
| Rated torque | (N·m) | 0.16 |
| Continuous stall torque | (N·m) | 0.18 |
| Momentary Max. peak torque | (N·m) | 0.56 |
| Rated current | (A(rms)) | 1.1 |
| Max. current | (A(o-p)) | 5.5 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4281 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.038 |
| | With brake | 0.042 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

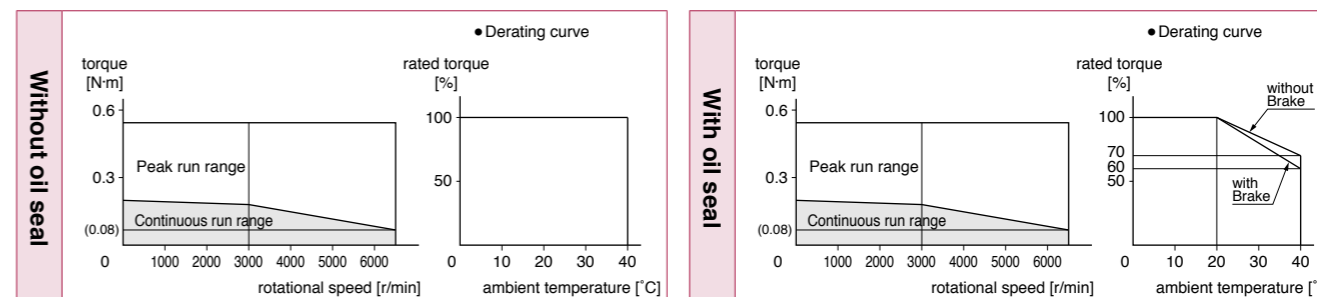
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 0.38 or more |
| Engaging time (ms) | 35 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 49 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.147 | P.147 | P.147 | P.148 | P.148 | P.148 |
| Connector type (IP67) | P.149 | P.149 | P.149 | P.150 | P.150 | P.150 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC100 V |
|---|--|----------------------------|
| Motor model ^{*1} | | MHPF011L1□□ |
| Applicable driver | Model No. | MADLT11SF |
| | Multifunction type | MADLN11SG |
| | RS485 communication type ^{*2} | MADLN11SE |
| | Basic type ^{*2} | |
| | Frame symbol | A-frame |
| Power supply capacity | (kVA) | 0.4 |
| Rated output | (W) | 100 |
| Rated torque | (N·m) | 0.32 |
| Continuous stall torque | (N·m) | 0.33 |
| Momentary Max. peak torque | (N·m) | 1.11 |
| Rated current | (A(rms)) | 1.6 |
| Max. current | (A(o-p)) | 7.9 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4280 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.071 |
| | With brake | 0.074 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

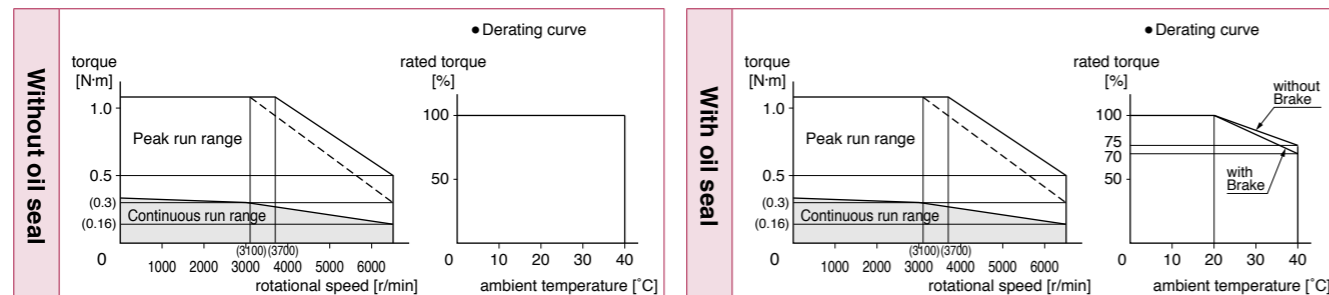
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 0.38 or more |
| Engaging time (ms) | 35 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 58.8 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC100 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.151 | P.151 | P.151 | P.152 | P.152 | P.152 |
| Connector type (IP67) | P.153 | P.153 | P.153 | P.154 | P.154 | P.154 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|--|----------------------------|
| Motor model ^{*1} | | MHPF012L1□□ |
| Applicable driver | Model No. | MADLT05SF |
| | Multifunction type | MADLN05SG |
| | RS485 communication type ^{*2} | MADLN05SE |
| | Basic type ^{*2} | |
| | Frame symbol | A-frame |
| Power supply capacity | (kVA) | 0.5 |
| Rated output | (W) | 100 |
| Rated torque | (N·m) | 0.32 |
| Continuous stall torque | (N·m) | 0.33 |
| Momentary Max. peak torque | (N·m) | 1.11 |
| Rated current | (A(rms)) | 1.1 |
| Max. current | (A(o-p)) | 5.5 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4281 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.071 |
| | With brake | 0.074 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

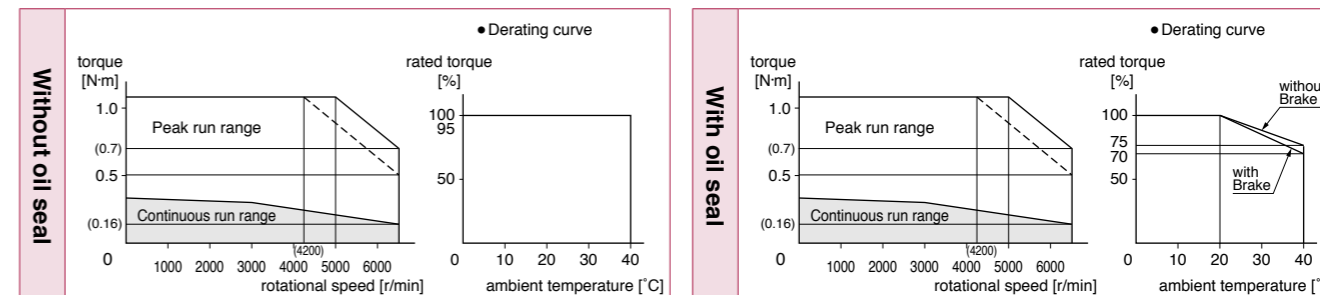
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 0.38 or more |
| Engaging time (ms) | 35 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 58.8 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.151 | P.151 | P.151 | P.152 | P.152 | P.152 |
| Connector type (IP67) | P.153 | P.153 | P.153 | P.154 | P.154 | P.154 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC100 V |
|---|----------------|---|
| Motor model ^{*1} | | MHPF021L1□□ |
| Applicable driver | Model No. | Multifunction type MBDLT21SF |
| | | RS485 communication type ^{*2} MBDLN21SG |
| | | Basic type ^{*2} MBDLN21SE |
| Frame symbol | | B-frame |
| Power supply capacity (kVA) | | 0.5 |
| Rated output (W) | | 200 |
| Rated torque (N·m) | | 0.64 |
| Continuous stall torque (N·m) | | 0.76 |
| Momentary Max. peak torque (N·m) | | 2.23 |
| Rated current (A(rms)) | | 2.1 |
| Max. current (A(o-p)) | | 10.4 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.29 |
| | With brake | 0.31 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

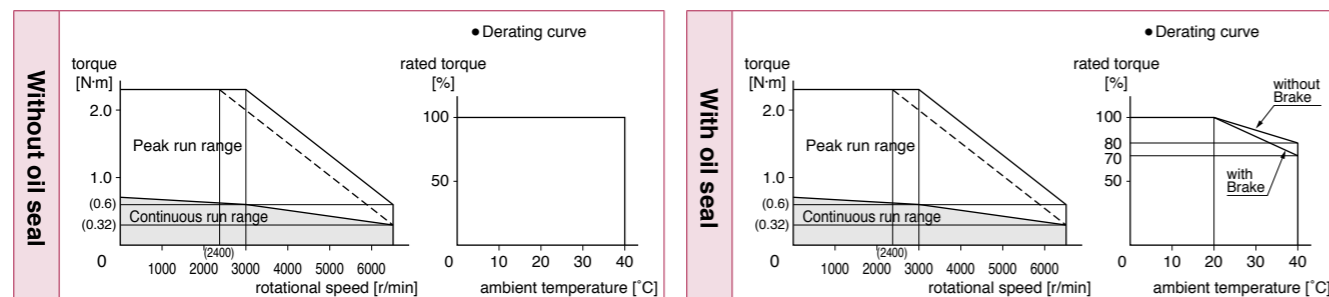
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 1.6 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC100 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.155 | P.155 | P.155 | P.156 | P.156 | P.156 |
| Connector type (IP67) | P.157 | P.157 | P.157 | P.158 | P.158 | P.158 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|----------------|---|
| Motor model ^{*1} | | MHPF022L1□□ |
| Applicable driver | Model No. | Multifunction type MADLT15SF |
| | | RS485 communication type ^{*2} MADLN15SG |
| | | Basic type ^{*2} MADLN15SE |
| Frame symbol | | A-frame |
| Power supply capacity (kVA) | | 0.5 |
| Rated output (W) | | 200 |
| Rated torque (N·m) | | 0.64 |
| Continuous stall torque (N·m) | | 0.76 |
| Momentary Max. peak torque (N·m) | | 2.23 |
| Rated current (A(rms)) | | 1.4 |
| Max. current (A(o-p)) | | 6.9 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.29 |
| | With brake | 0.31 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

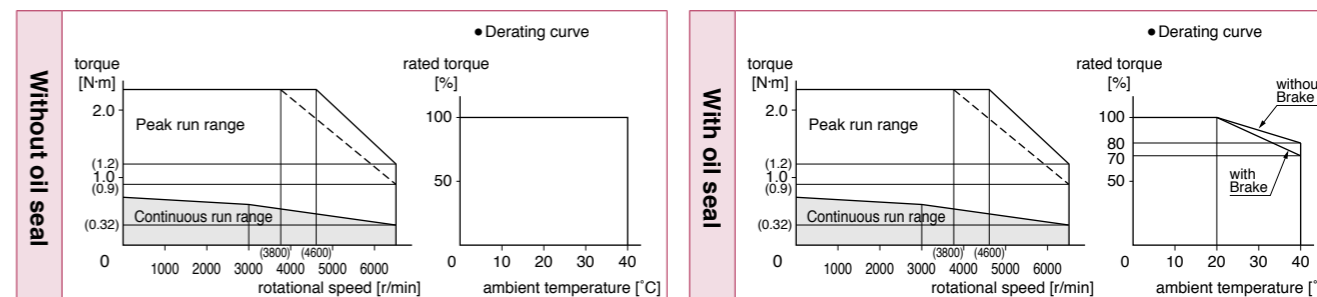
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 1.6 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.155 | P.155 | P.155 | P.156 | P.156 | P.156 |
| Connector type (IP67) | P.157 | P.157 | P.157 | P.158 | P.158 | P.158 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC100 V |
|---|---------------------------------------|----------------------------|
| Motor model ¹ | | MHPF041L1□□ |
| Applicable driver | Model No. | MCDLT31SF |
| | Multifunction type | MCDLN31SG |
| | RS485 communication type ² | MCDLN31SE |
| | Basic type ² | |
| | Frame symbol | C-frame |
| Power supply capacity | (kVA) | 0.9 |
| Rated output | (W) | 400 |
| Rated torque | (N·m) | 1.27 |
| Continuous stall torque | (N·m) | 1.40 |
| Momentary Max. peak torque | (N·m) | 4.46 |
| Rated current | (A(rms)) | 4.1 |
| Max. current | (A(o-p)) | 20.3 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4282 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.56 |
| | With brake | 0.58 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

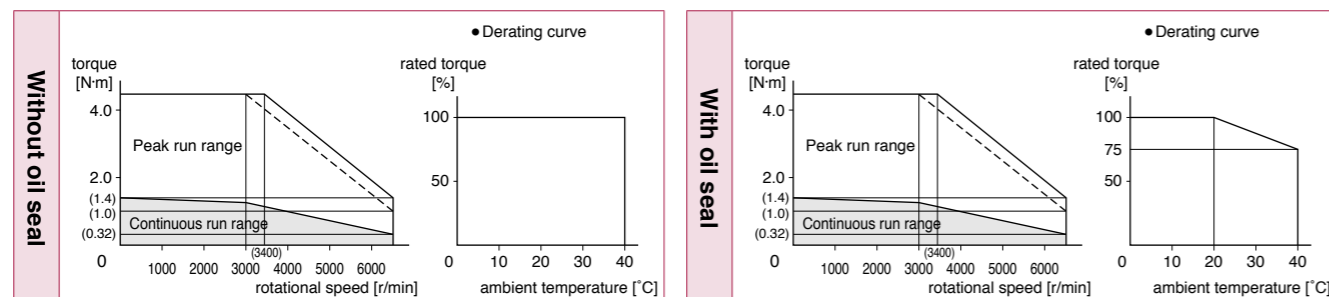
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 1.6 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC100 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.159 | P.159 | P.159 | P.160 | P.160 | P.160 |
| Connector type (IP67) | P.161 | P.161 | P.161 | P.162 | P.162 | P.162 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|---------------------------------------|----------------------------|
| Motor model ¹ | | MHPF042L1□□ |
| Applicable driver | Model No. | MBDLT25SF |
| | Multifunction type | MBDLN25SG |
| | RS485 communication type ² | MBDLN25SE |
| | Basic type ² | |
| | Frame symbol | B-frame |
| Power supply capacity | (kVA) | 0.9 |
| Rated output | (W) | 400 |
| Rated torque | (N·m) | 1.27 |
| Continuous stall torque | (N·m) | 1.40 |
| Momentary Max. peak torque | (N·m) | 4.46 |
| Rated current | (A(rms)) | 2.1 |
| Max. current | (A(o-p)) | 10.4 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.56 |
| | With brake | 0.58 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

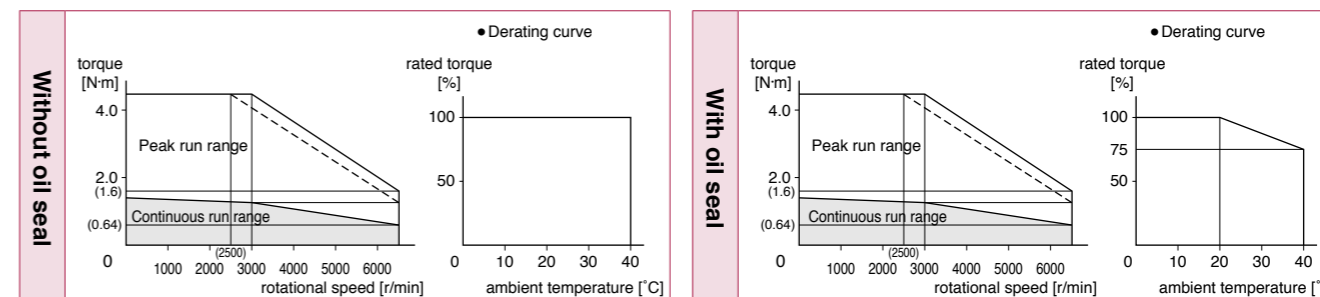
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 1.6 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.57.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.159 | P.159 | P.159 | P.160 | P.160 | P.160 |
| Connector type (IP67) | P.161 | P.161 | P.161 | P.162 | P.162 | P.162 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|--|----------------------------|
| Motor model ^{*1} | | MHPF082L1□□ |
| Applicable driver | Model No. | MCDLT35SF |
| | Multifunction type | MCDLN35SG |
| | RS485 communication type ^{*2} | MCDLN35SE |
| Frame symbol | | C-frame |
| Power supply capacity | (kVA) | 1.8 |
| Rated output | (W) | 750 |
| Rated torque | (N·m) | 2.39 |
| Continuous stall torque | (N·m) | 2.86 |
| Momentary Max. peak torque | (N·m) | 8.36 |
| Rated current | (A(rms)) | 3.8 |
| Max. current | (A(o-p)) | 18.8 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 1.56 |
| | With brake | 1.66 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 20 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

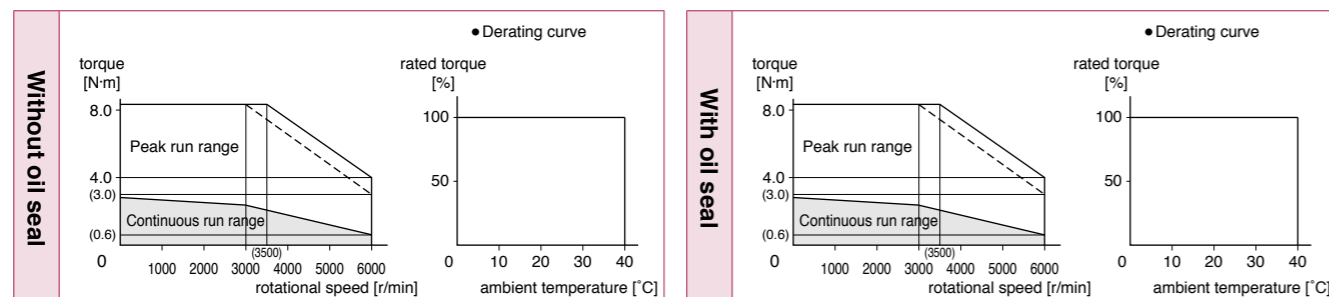
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 3.8 or more |
| Engaging time (ms) | 70 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.42 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 686 |
| | Thrust load A-direction (N) | 294 |
| | Thrust load B-direction (N) | 392 |
| During operation | Radial load P-direction (N) | 392 |
| | Thrust load A, B-direction (N) | 147 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.163 | P.163 | P.163 | P.164 | P.164 | P.164 |
| Connector type (IP67) | P.165 | P.165 | P.165 | P.166 | P.166 | P.166 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|--|----------------------------|
| Motor model ^{*1} | | MHPF092L1□□ |
| Applicable driver | Model No. | MDDL55SF |
| | Multifunction type | MDDL55SG |
| | RS485 communication type ^{*2} | MDDL55SE |
| Frame symbol | | D-frame |
| Power supply capacity | (kVA) | 2.4 |
| Rated output | (W) | 1000 |
| Rated torque | (N·m) | 3.18 |
| Continuous stall torque | (N·m) | 3.34 |
| Momentary Max. peak torque | (N·m) | 11.1 |
| Rated current | (A(rms)) | 5.7 |
| Max. current | (A(o-p)) | 28.2 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 2.03 |
| | With brake | 2.13 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

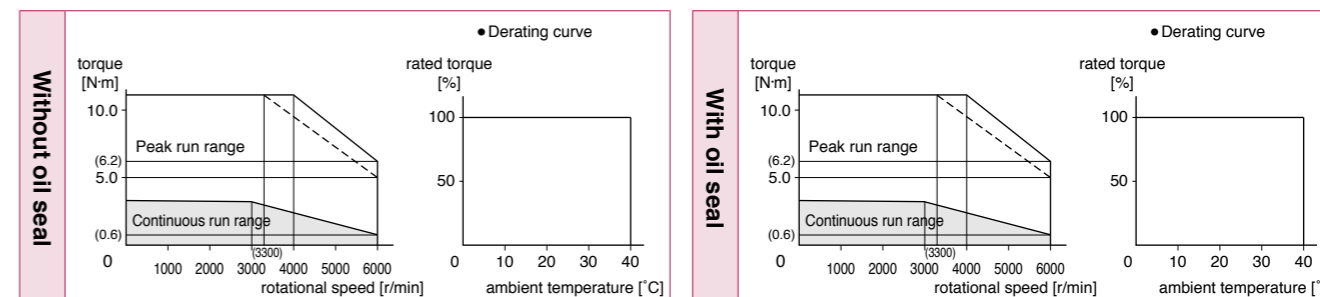
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 3.8 or more |
| Engaging time (ms) | 70 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.42 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 686 |
| | Thrust load A-direction (N) | 294 |
| | Thrust load B-direction (N) | 392 |
| During operation | Radial load P-direction (N) | 392 |
| | Thrust load A, B-direction (N) | 147 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|-----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.167 | P.167 | P.167 | P.168 | P.168 | P.168 |
| Connector type (IP67) | P.169 | P.169 | P.169 | P.170 | P.170 | P.170 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|---------------------------------------|----------------------------|
| Motor model ¹ | | MHPF102L1□□ |
| Applicable driver | Model No. | MDDL45SF |
| | Multifunction type | MDDL45SG |
| | RS485 communication type ² | MDDL45SE |
| Frame symbol | | D-frame |
| Power supply capacity | (kVA) | 2.4 |
| Rated output | (W) | 1000 |
| Rated torque | (N·m) | 4.77 |
| Continuous stall torque | (N·m) | 5.25 |
| Momentary Max. peak torque | (N·m) | 14.3 |
| Rated current | (A(rms)) | 5.2 |
| Max. current | (A(o-p)) | 22 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 22.9 |
| | With brake | 24.1 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 5 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

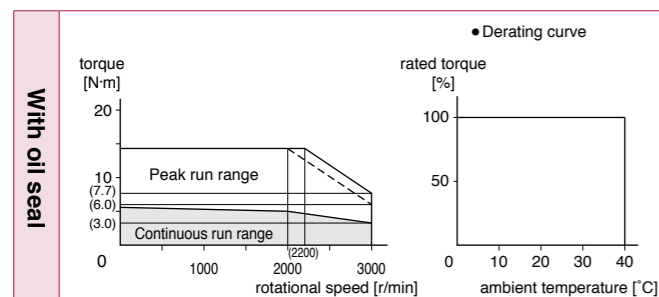
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.171 | | — | P.171 | |
| Encoder connector Small size (JN2) type | — | P.171 | | — | P.172 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|---------------------------------------|----------------------------|
| Motor model ¹ | | MHPF152L1□□ |
| Applicable driver | Model No. | MDDL55SF |
| | Multifunction type | MDDL55SG |
| | RS485 communication type ² | MDDL55SE |
| Frame symbol | | D-frame |
| Power supply capacity | (kVA) | 2.9 |
| Rated output | (W) | 1500 |
| Rated torque | (N·m) | 7.16 |
| Continuous stall torque | (N·m) | 7.52 |
| Momentary Max. peak torque | (N·m) | 21.5 |
| Rated current | (A(rms)) | 8.0 |
| Max. current | (A(o-p)) | 34 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 33.4 |
| | With brake | 34.6 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 5 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

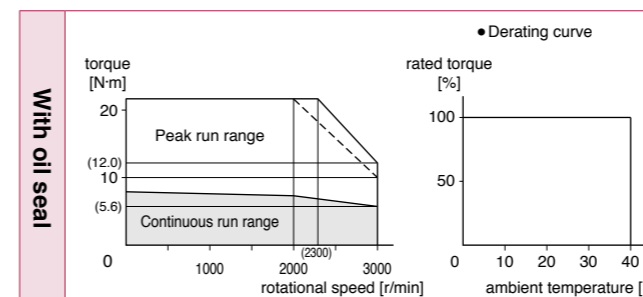
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.172 | | — | P.172 | |
| Encoder connector Small size (JN2) type | — | P.173 | | — | P.173 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|--|---------------------------------------|---------------------------|
| Motor model ¹ | | MHPF202L1□□ |
| Applicable driver | Model No. | MEDLT83SF |
| | Multifunction type | MEDLN83SG |
| | RS485 communication type ² | MEDLN83SE |
| | Basic type ² | |
| | Frame symbol | E-frame |
| Power supply capacity | (kVA) | 3.8 |
| Rated output | (W) | 2000 |
| Rated torque | (N·m) | 9.55 |
| Continuous stall torque | (N·m) | 11.5 |
| Momentary Max. peak torque | (N·m) | 28.6 |
| Rated current | (A(rms)) | 12.5 |
| Max. current | (A(o-p)) | 53 |
| Regenerative brake frequency (times/min) ^{Note1} | Without option | No limit ^{Note2} |
| | DV0P4285 | No limit ^{Note2} |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 55.7 |
| | With brake | 61.0 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note3} | | 5 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

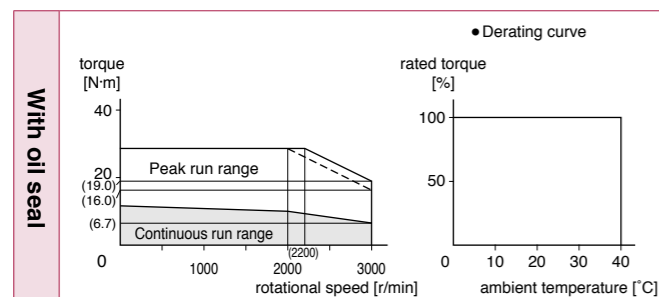
| | |
|--------------------------------------|--------------|
| Static friction torque (N·m) | 25.0 or more |
| Engaging time (ms) | 80 or less |
| Releasing time (ms) ^{Note4} | 25 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

- For details of Note1 to Note4, refer to P.303.
- Dimensions of Driver, refer to P.59.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.173 | | — | P.174 | |
| Encoder connector Small size (JN2) type | — | P.174 | | — | P.174 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|--|---------------------------------------|---------------------------|
| Motor model ¹ | | MHPF302L1□□ |
| Applicable driver | Model No. | MFDLTA3SF |
| | Multifunction type | MFDLNA3SG |
| | RS485 communication type ² | MFDLNA3SE |
| | Basic type ² | |
| | Frame symbol | F-frame |
| Power supply capacity | (kVA) | 5.2 |
| Rated output | (W) | 3000 |
| Rated torque | (N·m) | 14.3 |
| Continuous stall torque | (N·m) | 17.2 |
| Momentary Max. peak torque | (N·m) | 43.0 |
| Rated current | (A(rms)) | 17.0 |
| Max. current | (A(o-p)) | 72 |
| Regenerative brake frequency (times/min) ^{Note1} | Without option | No limit ^{Note2} |
| | DV0P4285×2 | No limit ^{Note2} |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 85.3 |
| | With brake | 90.7 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note3} | | 5 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

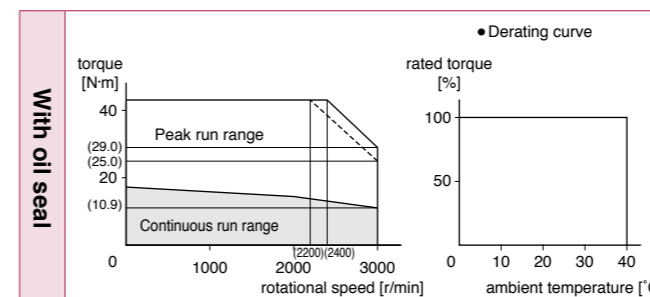
| | |
|--------------------------------------|--------------|
| Static friction torque (N·m) | 25.0 or more |
| Engaging time (ms) | 80 or less |
| Releasing time (ms) ^{Note4} | 25 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

- For details of Note1 to Note4, refer to P.303.
- Dimensions of Driver, refer to P.59.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.175 | | — | P.175 | |
| Encoder connector Small size (JN2) type | — | P.175 | | — | P.176 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|--|---------------------------------------|---------------------------|
| Motor model ¹ | | MHPF402L1□□ |
| Applicable driver | Model No. | MFDLTB3SF |
| | Multifunction type | MFDLNB3SG |
| | RS485 communication type ² | MFDLNB3SE |
| | Basic type ² | |
| | Frame symbol | F-frame |
| Power supply capacity | (kVA) | 7.8 |
| Rated output | (W) | 4000 |
| Rated torque | (N·m) | 19.1 |
| Continuous stall torque | (N·m) | 22.0 |
| Momentary Max. peak torque | (N·m) | 57.3 |
| Rated current | (A(rms)) | 20 |
| Max. current | (A(o-p)) | 85 |
| Regenerative brake frequency (times/min) ^{Note1} | Without option | No limit ^{Note2} |
| | DV0P4285x2 | No limit ^{Note2} |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 104 |
| | With brake | 110 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note3} | | 5 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

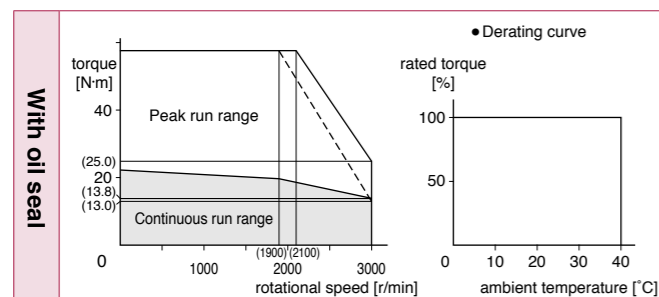
| | |
|--------------------------------------|--------------|
| Static friction torque (N·m) | 25.0 or more |
| Engaging time (ms) | 80 or less |
| Releasing time (ms) ^{Note4} | 25 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.59.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.176 | | — | P.176 | |
| Encoder connector Small size (JN2) type | — | P.177 | | — | P.177 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|--|---------------------------------------|---------------------------|
| Motor model ¹ | | MHPF502L1□□ |
| Applicable driver | Model No. | MFDLTB3SF |
| | Multifunction type | MFDLNB3SG |
| | RS485 communication type ² | MFDLNB3SE |
| | Basic type ² | |
| | Frame symbol | F-frame |
| Power supply capacity | (kVA) | 7.8 |
| Rated output | (W) | 5000 |
| Rated torque | (N·m) | 23.9 |
| Continuous stall torque | (N·m) | 26.3 |
| Momentary Max. peak torque | (N·m) | 71.6 |
| Rated current | (A(rms)) | 23.3 |
| Max. current | (A(o-p)) | 99 |
| Regenerative brake frequency (times/min) ^{Note1} | Without option | No limit ^{Note2} |
| | DV0P4285x2 | No limit ^{Note2} |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 146 |
| | With brake | 151 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note3} | | 5 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

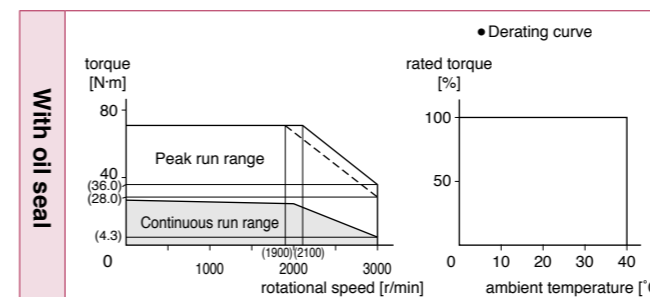
| | |
|--------------------------------------|--------------|
| Static friction torque (N·m) | 44.1 or more |
| Engaging time (ms) | 150 or less |
| Releasing time (ms) ^{Note4} | 30 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.59.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.177 | | — | P.178 | |
| Encoder connector Small size (JN2) type | — | P.178 | | — | P.178 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|--|---------------------------------------|---------------------------|
| Motor model ¹ | | MHMF752L1□□ |
| Applicable driver | Model No. | Multifunction type |
| | RS485 communication type ² | MGDLTC3SF |
| | Basic type ² | — |
| Frame symbol | | G-frame |
| Power supply capacity | (kVA) | 11 |
| Rated output | (W) | 7500 |
| Rated torque | (N·m) | 47.8 |
| Continuous stall torque | (N·m) | 47.8 |
| Momentary Max. peak torque | (N·m) | 125 |
| Rated current | (A(rms)) | 40.2 |
| Max. current | (A(o-p)) | 154 |
| Regenerative brake frequency (times/min) ^{Note1} | Without option | No limit ^{Note2} |
| | DV0P4285x3 | No limit ^{Note2} |
| Rated rotational speed | (r/min) | 1500 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 272 |
| | With brake | 279 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note3} | | 5 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

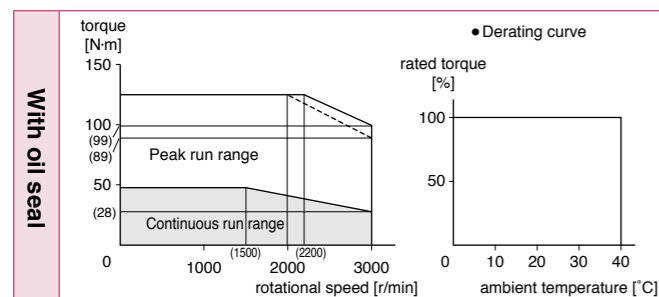
| | |
|--------------------------------------|--------------|
| Static friction torque (N·m) | 63.0 or more |
| Engaging time (ms) | 200 or less |
| Releasing time (ms) ^{Note4} | 80 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 2058 |
| | Thrust load A-direction (N) | 980 |
| | Thrust load B-direction (N) | 1176 |
| During operation | Radial load P-direction (N) | 1176 |
| | Thrust load A, B-direction (N) | 490 |

- For details of Note1 to Note4, refer to P.303.
- Dimensions of Driver, refer to P.60.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.179 | — | — | P.179 | — |
| Encoder connector Small size (JN2) type | — | P.179 | — | — | P.180 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|--|---------------------------------------|---------------------------|
| Motor model ¹ | | MDMF102L1□□ |
| Applicable driver | Model No. | Multifunction type |
| | RS485 communication type ² | MDDL45SF |
| | Basic type ² | MDDL45SG |
| Frame symbol | | D-frame |
| Power supply capacity | (kVA) | 2.4 |
| Rated output | (W) | 1000 |
| Rated torque | (N·m) | 4.77 |
| Continuous stall torque | (N·m) | 5.25 |
| Momentary Max. peak torque | (N·m) | 14.3 |
| Rated current | (A(rms)) | 5.2 |
| Max. current | (A(o-p)) | 22 |
| Regenerative brake frequency (times/min) ^{Note1} | Without option | No limit ^{Note2} |
| | DV0P4284 | No limit ^{Note2} |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 6.18 |
| | With brake | 7.40 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note3} | | 10 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

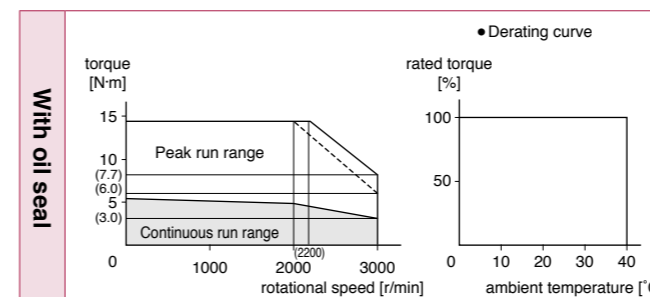
| | |
|--------------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) ^{Note4} | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note1 to Note4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.180 | — | — | P.180 | — |
| Encoder connector Small size (JN2) type | — | P.181 | — | — | P.181 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|---------------------------------------|------------------------------------|
| Motor model ¹ | | MDMF152L1 □□ |
| Applicable driver | Model No. | Multifunction type MDDL55SF |
| | RS485 communication type ² | MDDL55SG |
| | Basic type ² | MDDL55SE |
| Frame symbol | | D-frame |
| Power supply capacity (kVA) | | 2.9 |
| Rated output (W) | | 1500 |
| Rated torque (N·m) | | 7.16 |
| Continuous stall torque (N·m) | | 7.52 |
| Momentary Max. peak torque (N·m) | | 21.5 |
| Rated current (A(rms)) | | 8.0 |
| Max. current (A(o-p)) | | 34 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 2000 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 9.16 |
| | With brake | 10.4 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 10 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

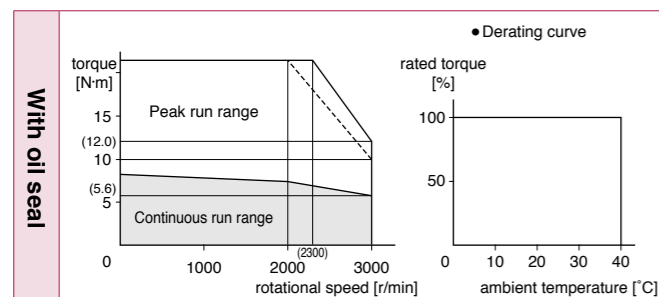
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.181 | | — | P.182 | |
| Encoder connector Small size (JN2) type | — | P.182 | | — | P.182 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|---------------------------------------|-------------------------------------|
| Motor model ¹ | | MDMF202L1 □□ |
| Applicable driver | Model No. | Multifunction type MEDLT83SF |
| | RS485 communication type ² | MEDLN83SG |
| | Basic type ² | MEDLN83SE |
| Frame symbol | | E-frame |
| Power supply capacity (kVA) | | 3.8 |
| Rated output (W) | | 2000 |
| Rated torque (N·m) | | 9.55 |
| Continuous stall torque (N·m) | | 10.0 |
| Momentary Max. peak torque (N·m) | | 28.6 |
| Rated current (A(rms)) | | 9.9 |
| Max. current (A(o-p)) | | 42 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 2000 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 12.1 |
| | With brake | 13.3 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 10 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

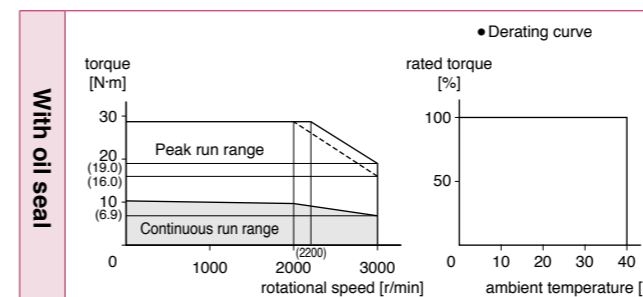
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.59.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.183 | | — | P.183 | |
| Encoder connector Small size (JN2) type | — | P.183 | | — | P.184 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|---------------------------------------|-------------------------------------|
| Motor model ¹ | | MDMF302L1 □□ |
| Applicable driver | Model No. | Multifunction type MFDLTA3SF |
| | RS485 communication type ² | MFDLNA3SG |
| | Basic type ² | MFDLNA3SE |
| Frame symbol | | F-frame |
| Power supply capacity | (kVA) | 5.2 |
| Rated output | (W) | 3000 |
| Rated torque | (N·m) | 14.3 |
| Continuous stall torque | (N·m) | 15.0 |
| Momentary Max. peak torque | (N·m) | 43.0 |
| Rated current | (A(rms)) | 16.4 |
| Max. current | (A(o-p)) | 70 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285x2 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 18.6 |
| | With brake | 19.6 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 10 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

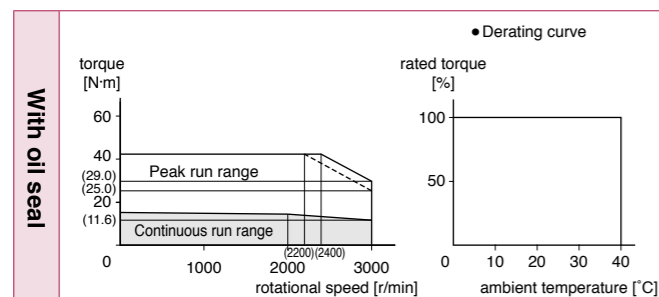
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 22.0 or more |
| Engaging time (ms) | 110 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.90 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.59.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.184 | | — | P.184 | |
| Encoder connector Small size (JN2) type | — | P.185 | | — | P.185 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|---------------------------------------|-------------------------------------|
| Motor model ¹ | | MDMF402L1 □□ |
| Applicable driver | Model No. | Multifunction type MFDLTB3SF |
| | RS485 communication type ² | MFDLNB3SG |
| | Basic type ² | MFDLNB3SE |
| Frame symbol | | F-frame |
| Power supply capacity | (kVA) | 7.8 |
| Rated output | (W) | 4000 |
| Rated torque | (N·m) | 19.1 |
| Continuous stall torque | (N·m) | 22.0 |
| Momentary Max. peak torque | (N·m) | 57.3 |
| Rated current | (A(rms)) | 20.0 |
| Max. current | (A(o-p)) | 85 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285x2 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 46.9 |
| | With brake | 52.3 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 10 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

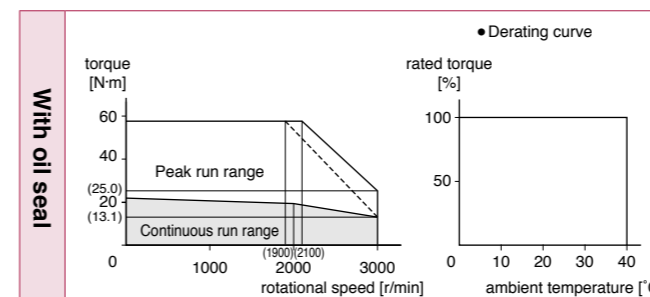
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 25.0 or more |
| Engaging time (ms) | 80 or less |
| Releasing time (ms) ^{Note)4} | 25 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.59.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.185 | | — | P.186 | |
| Encoder connector Small size (JN2) type | — | P.186 | | — | P.186 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|--|---------------------------------------|-------------------------------------|
| Motor model ¹ | | MDMF502L1 □□ |
| Applicable driver | Model No. | Multifunction type MFDLTB3SF |
| | RS485 communication type ² | MFDLNB3SG |
| | Basic type ² | MFDLNB3SE |
| Frame symbol | | F-frame |
| Power supply capacity | (kVA) | 7.8 |
| Rated output | (W) | 5000 |
| Rated torque | (N·m) | 23.9 |
| Continuous stall torque | (N·m) | 26.3 |
| Momentary Max. peak torque | (N·m) | 71.6 |
| Rated current | (A(rms)) | 23.3 |
| Max. current | (A(o-p)) | 99 |
| Regenerative brake frequency (times/min) ^{Note1} | Without option | No limit ^{Note2} |
| | DV0P4285x2 | No limit ^{Note2} |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 58.2 |
| | With brake | 63.0 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note3} | | 10 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

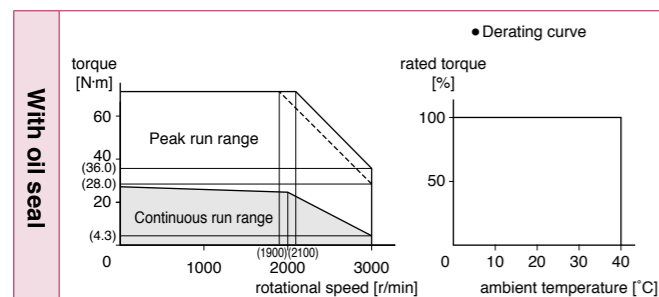
| | |
|--------------------------------------|--------------|
| Static friction torque (N·m) | 44.1 or more |
| Engaging time (ms) | 150 or less |
| Releasing time (ms) ^{Note4} | 30 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.59.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.187 | — | — | P.187 | — |
| Encoder connector Small size (JN2) type | — | P.187 | — | — | P.188 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|--|---------------------------------------|-------------------------------------|
| Motor model ¹ | | MDMF752L1 □□ |
| Applicable driver | Model No. | Multifunction type MGDLTC3SF |
| | RS485 communication type ² | — |
| | Basic type ² | — |
| Frame symbol | | G-frame |
| Power supply capacity | (kVA) | 11 |
| Rated output | (W) | 7500 |
| Rated torque | (N·m) | 47.8 |
| Continuous stall torque | (N·m) | 47.8 |
| Momentary Max. peak torque | (N·m) | 125 |
| Rated current | (A(rms)) | 40.2 |
| Max. current | (A(o-p)) | 154 |
| Regenerative brake frequency (times/min) ^{Note1} | Without option | No limit ^{Note2} |
| | DV0P4285x3 | No limit ^{Note2} |
| Rated rotational speed | (r/min) | 1500 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 122 |
| | With brake | 127 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note3} | | 10 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

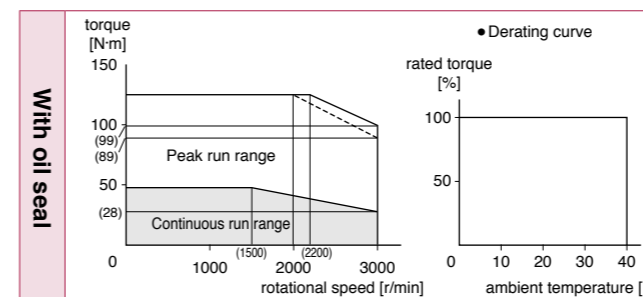
| | |
|--------------------------------------|--------------|
| Static friction torque (N·m) | 63.0 or more |
| Engaging time (ms) | 200 or less |
| Releasing time (ms) ^{Note4} | 80 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 2058 |
| | Thrust load A-direction (N) | 980 |
| | Thrust load B-direction (N) | 1176 |
| During operation | Radial load P-direction (N) | 1176 |
| | Thrust load A, B-direction (N) | 490 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.60.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.188 | — | — | P.188 | — |
| Encoder connector Small size (JN2) type | — | P.189 | — | — | P.189 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|---------------------------------------|----------------------------|
| Motor model ¹ | | MDMFC12L1□□ |
| Applicable driver | Model No. | MHDLTE3SF |
| | Multifunction type | — |
| | RS485 communication type ² | — |
| | Basic type ² | — |
| | Frame symbol | H-frame |
| Power supply capacity | (kVA) | 20 |
| Rated output | (W) | 11000 |
| Rated torque | (N·m) | 70.0 |
| Continuous stall torque | (N·m) | 70.0 |
| Momentary Max. peak torque | (N·m) | 175 |
| Rated current | (A(rms)) | 57.1 |
| Max. current | (A(o-p)) | 209 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285x6 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 1500 |
| Max. rotational speed | (r/min) | 2000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 205 |
| | With brake | 214 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 10 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

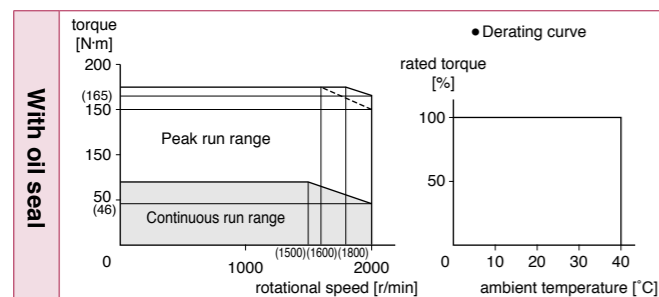
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 100 or more |
| Engaging time (ms) | 300 or less |
| Releasing time (ms) ^{Note)4} | 140 or less |
| Exciting current (DC) (A) | 1.08 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 4508 |
| | Thrust load A-direction (N) | 1470 |
| | Thrust load B-direction (N) | 2646 |
| During operation | Radial load P-direction (N) | 2254 |
| | Thrust load A, B-direction (N) | 686 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.61.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.189 | — | — | P.190 | — |
| Encoder connector Small size (JN2) type | — | P.190 | — | — | P.190 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|---------------------------------------|----------------------------|
| Motor model ¹ | | MDMFC52L1□□ |
| Applicable driver | Model No. | MHDLTE3SF |
| | Multifunction type | — |
| | RS485 communication type ² | — |
| | Basic type ² | — |
| | Frame symbol | H-frame |
| Power supply capacity | (kVA) | 20 |
| Rated output | (W) | 15000 |
| Rated torque | (N·m) | 95.5 |
| Continuous stall torque | (N·m) | 95.5 |
| Momentary Max. peak torque | (N·m) | 224 |
| Rated current | (A(rms)) | 65.8 |
| Max. current | (A(o-p)) | 225 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285x6 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 1500 |
| Max. rotational speed | (r/min) | 2000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 280 |
| | With brake | 289 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 10 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

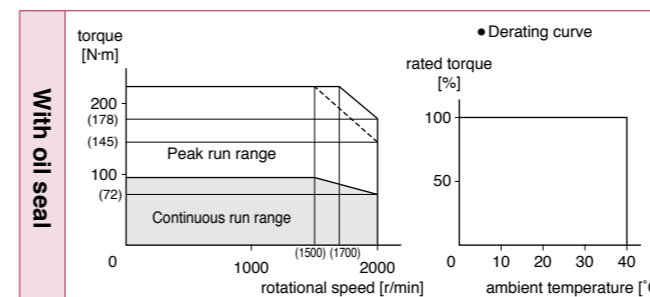
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 100 or more |
| Engaging time (ms) | 300 or less |
| Releasing time (ms) ^{Note)4} | 140 or less |
| Exciting current (DC) (A) | 1.08 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 4508 |
| | Thrust load A-direction (N) | 1470 |
| | Thrust load B-direction (N) | 2646 |
| During operation | Radial load P-direction (N) | 2254 |
| | Thrust load A, B-direction (N) | 686 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.61.
- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.191 | — | — | P.191 | — |
| Encoder connector Small size (JN2) type | — | P.191 | — | — | P.192 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|----------------------------|--|
| Motor model ^{*1} | | MDMFD22L1 □ □ |
| Applicable driver | Model No. | Multifunction type MHDLTF3SF |
| | | RS485 communication type ^{*2} — |
| | | Basic type ^{*2} — |
| Frame symbol | | H-frame |
| Power supply capacity | (kVA) | 28 |
| Rated output | (W) | 22000 |
| Rated torque | (N·m) | 140 |
| Continuous stall torque | (N·m) | 140 |
| Momentary Max. peak torque | (N·m) | 350 |
| Rated current | (A(rms)) | 80.9 |
| Max. current | (A(o-p)) | 294 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285x6 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 1500 |
| Max. rotational speed | (r/min) | 2000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 431 |
| | With brake | 455 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 10 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

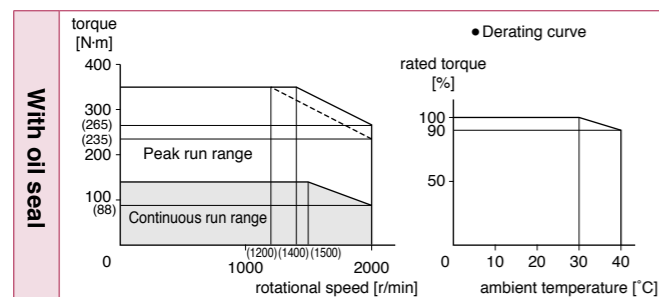
| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 200 or more |
| Engaging time (ms) | 300 or less |
| Releasing time (ms) ^{Note)4} | 150 or less |
| Exciting current (DC) (A) | 1.72 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| During assembly | Radial load P-direction (N) | 4508 |
|------------------|--------------------------------|------|
| | Thrust load A-direction (N) | 1470 |
| | Thrust load B-direction (N) | 2646 |
| During operation | Radial load P-direction (N) | 2254 |
| | Thrust load A, B-direction (N) | 686 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.61.
- *1 □ □ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.192 | — | — | P.192 | — |
| Encoder connector Small size (JN2) type | — | P.193 | — | — | P.193 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|----------------------------|--|
| Motor model ^{*1} | | MGMF092L1 □ □ |
| Applicable driver | Model No. | Multifunction type MDDL45SF |
| | | RS485 communication type ^{*2} MDDL45SG |
| | | Basic type ^{*2} MDDL45SE |
| Frame symbol | | D-frame |
| Power supply capacity | (kVA) | 2.0 |
| Rated output | (W) | 850 |
| Rated torque | (N·m) | 5.41 |
| Continuous stall torque | (N·m) | 5.41 |
| Momentary Max. peak torque | (N·m) | 14.3 |
| Rated current | (A(rms)) | 5.9 |
| Max. current | (A(o-p)) | 22 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 1500 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 6.18 |
| | With brake | 7.40 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 10 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

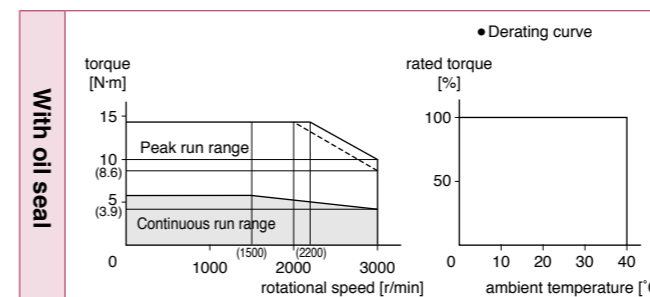
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| During assembly | Radial load P-direction (N) | 980 |
|------------------|--------------------------------|-----|
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 686 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □ □ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.193 | — | — | P.194 | — |
| Encoder connector Small size (JN2) type | — | P.194 | — | — | P.194 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|----------------|---|
| Motor model ¹ | | MGMF132L1 □ □ |
| Applicable driver | Model No. | Multifunction type MDDL55SF |
| | | RS485 communication type ² MDDL55SG |
| | | Basic type ² MDDL55SE |
| Frame symbol | | D-frame |
| Power supply capacity (kVA) | | 2.6 |
| Rated output (W) | | 1300 |
| Rated torque (N·m) | | 8.28 |
| Continuous stall torque (N·m) | | 8.28 |
| Momentary Max. peak torque (N·m) | | 23.3 |
| Rated current (A(rms)) | | 9.3 |
| Max. current (A(o-p)) | | 37 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 1500 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 9.16 |
| | With brake | 10.4 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 10 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

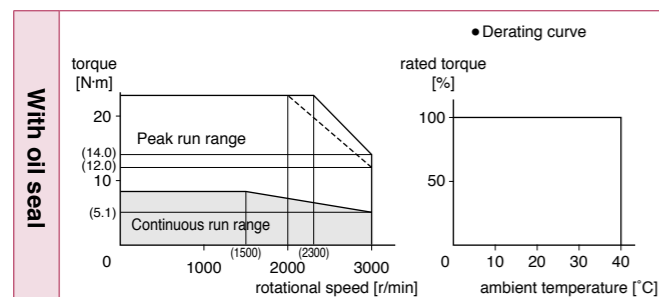
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 686 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.
- *1 □ □ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.195 | — | — | P.195 | — |
| Encoder connector Small size (JN2) type | — | P.195 | — | — | P.196 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|----------------|--|
| Motor model ¹ | | MGMF182L1 □ □ |
| Applicable driver | Model No. | Multifunction type MEDLT83SF |
| | | RS485 communication type ² MEDLN83SG |
| | | Basic type ² MEDLN83SE |
| Frame symbol | | E-frame |
| Power supply capacity (kVA) | | 3.4 |
| Rated output (W) | | 1800 |
| Rated torque (N·m) | | 11.5 |
| Continuous stall torque (N·m) | | 11.5 |
| Momentary Max. peak torque (N·m) | | 28.7 |
| Rated current (A(rms)) | | 11.8 |
| Max. current (A(o-p)) | | 42 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285×2 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 1500 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 12.1 |
| | With brake | 13.3 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 10 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• **Brake specifications** (For details, refer to P.305)
 (This brake will be released when it is energized.)
 (Do not use this for braking the motor in motion.)

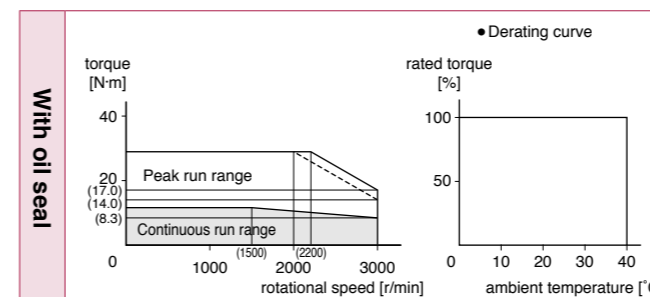
| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 686 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.59.
- *1 □ □ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.196 | — | — | P.196 | — |
| Encoder connector Small size (JN2) type | — | P.197 | — | — | P.197 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
 Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|-----------------------------|---------------------------------|
| Motor model *1 | | MGMF242L1□□ |
| Applicable driver | Model No. | Multifunction type MEDLT93SF |
| | RS485 communication type *2 | MEDLN93SG |
| | Basic type *2 | MEDLN93SE |
| Frame symbol | | E-frame |
| Power supply capacity | (kVA) | 4.5 |
| Rated output | (W) | 2400 |
| Rated torque | (N·m) | 15.3 |
| Continuous stall torque | (N·m) | 15.3 |
| Momentary Max. peak torque | (N·m) | 45.2 |
| Rated current | (A(rms)) | 16.0 |
| Max. current | (A(o-p)) | 67 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285x2 | No limit Note2 |
| Rated rotational speed | (r/min) | 1500 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 46.9 |
| | With brake | 52.3 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 25.0 or more |
| Engaging time (ms) | 80 or less |
| Releasing time (ms) Note4 | 25 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

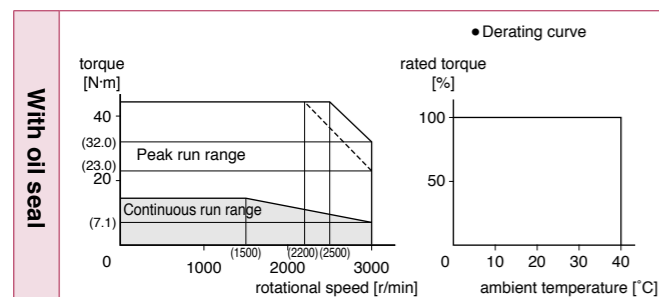
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 1176 |
| | Thrust load A, B-direction (N) | 490 |

• For details of Note1 to Note4, refer to P.303.
• Dimensions of Driver, refer to P.59.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.197 | | — | P.198 | |
| Encoder connector Small size (JN2) type | — | P.198 | | — | P.198 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|-----------------------------|---------------------------------|
| Motor model *1 | | MGMF292L1□□ |
| Applicable driver | Model No. | Multifunction type MFDLTB3SF |
| | RS485 communication type *2 | MFDLNB3SG |
| | Basic type *2 | MFDLNB3SE |
| Frame symbol | | F-frame |
| Power supply capacity | (kVA) | 5.0 |
| Rated output | (W) | 2900 |
| Rated torque | (N·m) | 18.5 |
| Continuous stall torque | (N·m) | 18.5 |
| Momentary Max. peak torque | (N·m) | 45.2 |
| Rated current | (A(rms)) | 19.3 |
| Max. current | (A(o-p)) | 67 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285x2 | No limit Note2 |
| Rated rotational speed | (r/min) | 1500 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 46.9 |
| | With brake | 52.3 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 25.0 or more |
| Engaging time (ms) | 80 or less |
| Releasing time (ms) Note4 | 25 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

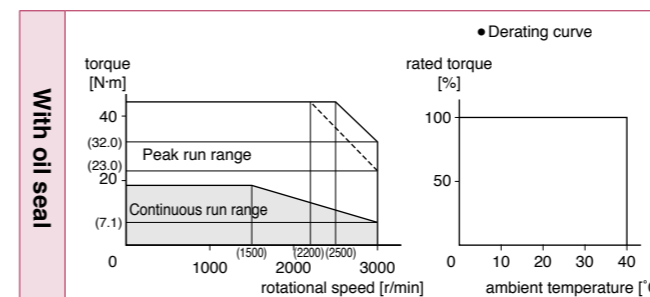
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 1176 |
| | Thrust load A, B-direction (N) | 490 |

• For details of Note1 to Note4, refer to P.303.
• Dimensions of Driver, refer to P.59.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.199 | | — | P.199 | |
| Encoder connector Small size (JN2) type | — | P.199 | | — | P.200 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|-----------------------------|------------------|
| Motor model *1 | | MGMF442L1□□ |
| Applicable driver | Model No. | MFDLTB3SF |
| | Multifunction type | MFDLNB3SG |
| | RS485 communication type *2 | MFDLNB3SE |
| | Basic type *2 | |
| | Frame symbol | F-frame |
| Power supply capacity | (kVA) | 7.0 |
| Rated output | (W) | 4400 |
| Rated torque | (N·m) | 28.0 |
| Continuous stall torque | (N·m) | 28.0 |
| Momentary Max. peak torque | (N·m) | 70.0 |
| Rated current | (A(rms)) | 27.2 |
| Max. current | (A(o-p)) | 96 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285x2 | No limit Note2 |
| Rated rotational speed | (r/min) | 1500 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 58.2 |
| | With brake | 63.0 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 44.1 or more |
| Engaging time (ms) | 150 or less |
| Releasing time (ms) Note4 | 30 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

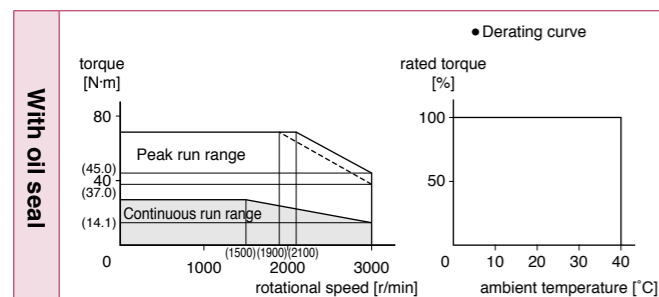
• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 1470 |
| | Thrust load A, B-direction (N) | 490 |

• For details of Note1 to Note4, refer to P.303.
• Dimensions of Driver, refer to P.59.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.200 | — | — | P.200 | — |
| Encoder connector Small size (JN2) type | — | P.201 | — | — | P.201 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

Specifications

| | | AC200 V |
|---|-----------------------------|------------------|
| Motor model *1 | | MGMF552L1□□ |
| Applicable driver | Model No. | MGDLTC3SF |
| | Multifunction type | — |
| | RS485 communication type *2 | — |
| | Basic type *2 | — |
| | Frame symbol | G-frame |
| Power supply capacity | (kVA) | 8.5 |
| Rated output | (W) | 5500 |
| Rated torque | (N·m) | 35.0 |
| Continuous stall torque | (N·m) | 35.0 |
| Momentary Max. peak torque | (N·m) | 102 |
| Rated current | (A(rms)) | 39.8 |
| Max. current | (A(o-p)) | 164 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285x3 | No limit Note2 |
| Rated rotational speed | (r/min) | 1500 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 83.0 |
| | With brake | 88.0 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• **Brake specifications** (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 63.0 or more |
| Engaging time (ms) | 200 or less |
| Releasing time (ms) Note4 | 80 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

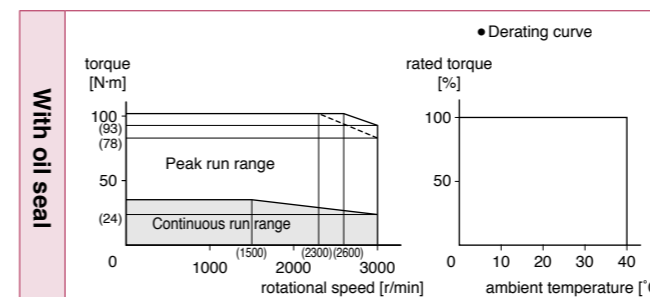
• **Permissible load** (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 2058 |
| | Thrust load A-direction (N) | 980 |
| | Thrust load B-direction (N) | 1176 |
| During operation | Radial load P-direction (N) | 1176 |
| | Thrust load A, B-direction (N) | 490 |

• For details of Note1 to Note4, refer to P.303.
• Dimensions of Driver, refer to P.60.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.22.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



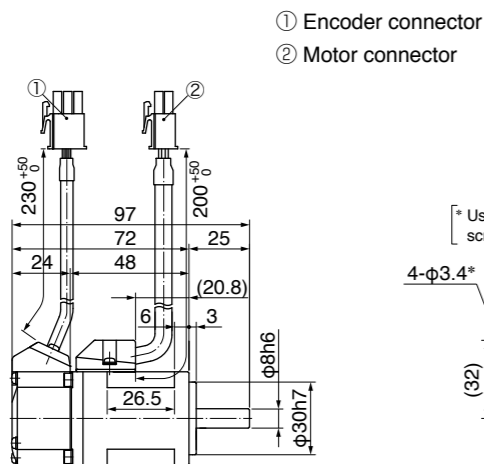
Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.201 | — | — | P.202 | — |
| Encoder connector Small size (JN2) type | — | P.202 | — | — | P.202 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

MSMF 50 W

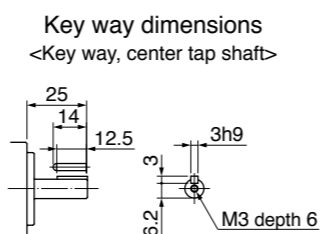
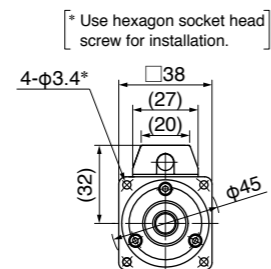
Leadwire type (IP65) • without brake • without/with oil seal • Round shaft/ Key way, center tap shaft



● Motor model Mass: 0.32 kg

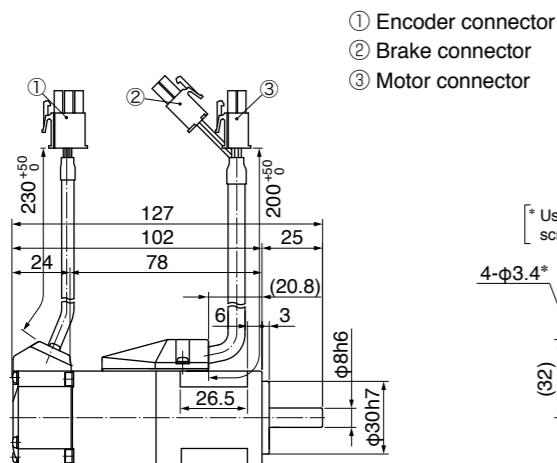
| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 100 V | Round | MSMF5AZL1A2 | MSMF5AZL1C2 |
| | Key-way, center tap | MSMF5AZL1S2 | MSMF5AZL1U2 |
| 200 V | Round | MSMF5AZL1A2 | MSMF5AZL1C2 |
| | Key-way, center tap | MSMF5AZL1S2 | MSMF5AZL1U2 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



[Unit: mm]

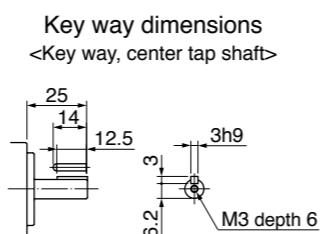
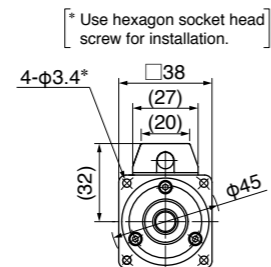
Leadwire type (IP65) • with brake • without/with oil seal • Round shaft/ Key way, center tap shaft



● Motor model Mass: 0.53 kg

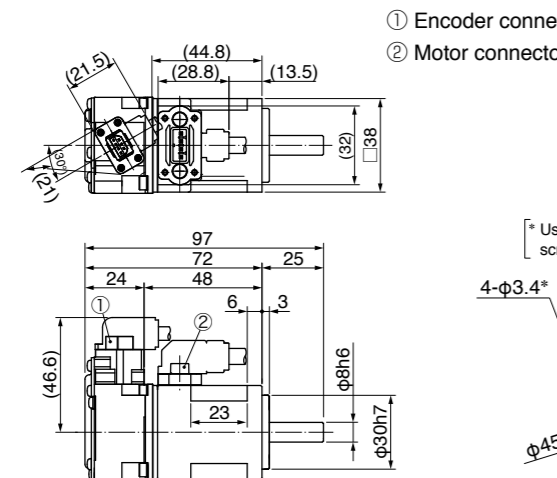
| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 100 V | Round | MSMF5AZL1B2 | MSMF5AZL1D2 |
| | Key-way, center tap | MSMF5AZL1T2 | MSMF5AZL1V2 |
| 200 V | Round | MSMF5AZL1B2 | MSMF5AZL1D2 |
| | Key-way, center tap | MSMF5AZL1T2 | MSMF5AZL1V2 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



[Unit: mm]

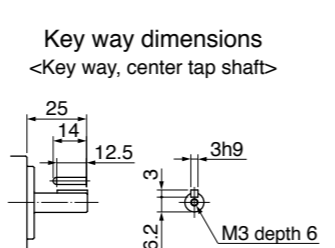
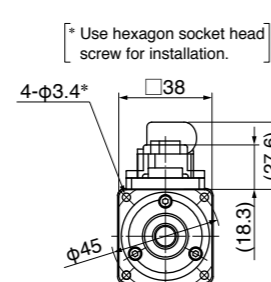
Connector type (IP67) • without brake • without/with oil seal • Round shaft/ Key way, center tap shaft



● Motor model Mass: 0.32 kg

| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 100 V | Round | MSMF5AZL1A1 | MSMF5AZL1C1 |
| | Key-way, center tap | MSMF5AZL1S1 | MSMF5AZL1U1 |
| 200 V | Round | MSMF5AZL1A1 | MSMF5AZL1C1 |
| | Key-way, center tap | MSMF5AZL1S1 | MSMF5AZL1U1 |

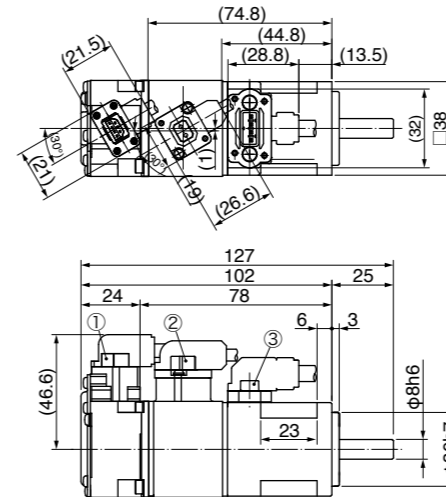
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



[Unit: mm]

MSMF 50 W

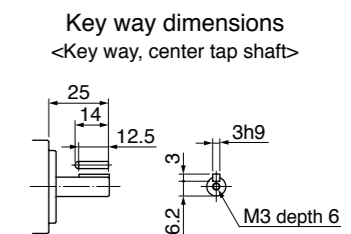
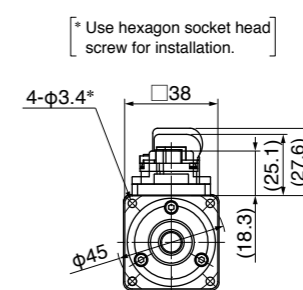
Connector type (IP67) • with brake • without/with oil seal • Round shaft/ Key way, center tap shaft



● Motor model Mass: 0.53 kg

| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 100 V | Round | MSMF5AZL1B1 | MSMF5AZL1D1 |
| | Key-way, center tap | MSMF5AZL1T1 | MSMF5AZL1V1 |
| 200 V | Round | MSMF5AZL1B1 | MSMF5AZL1D1 |
| | Key-way, center tap | MSMF5AZL1T1 | MSMF5AZL1V1 |

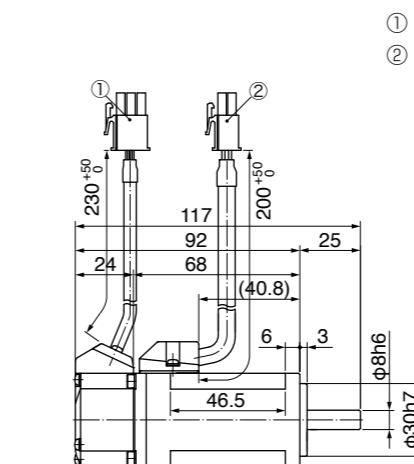
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



[Unit: mm]

MSMF 100 W

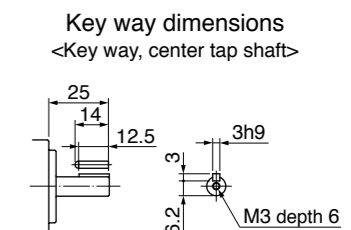
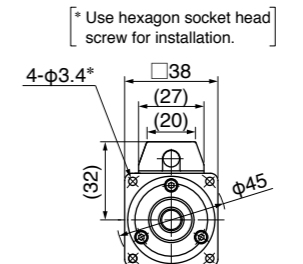
Leadwire type (IP65) • without brake • without/with oil seal • Round shaft/ Key way, center tap shaft



● Motor model Mass: 0.47 kg

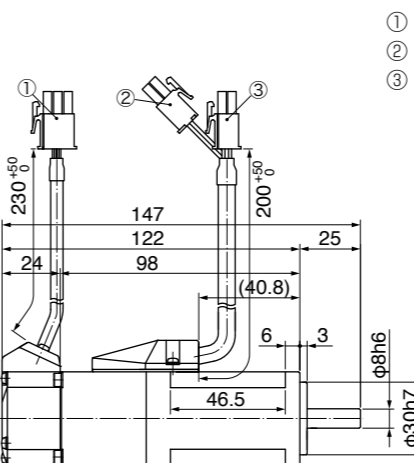
| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 100 V | Round | MSMF011L1A2 | MSMF011L1C2 |
| | Key-way, center tap | MSMF011L1S2 | MSMF011L1V2 |
| 200 V | Round | MSMF012L1A2 | MSMF012L1C2 |
| | Key-way, center tap | MSMF012L1S2 | MSMF012L1V2 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



[Unit: mm]

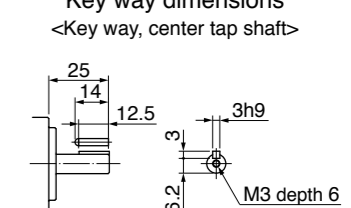
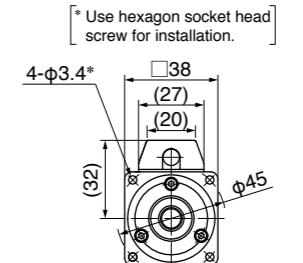
Leadwire type (IP65) • with brake • without/with oil seal • Round shaft/ Key way, center tap shaft



● Motor model Mass: 0.68 kg

| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 100 V | Round | MSMF011L1B2 | MSMF011L1D2 |
| | Key-way, center tap | MSMF011L1T2 | MSMF011L1V2 |
| 200 V | Round | MSMF012L1B2 | MSMF012L1D2 |
| | Key-way, center tap | MSMF012L1T2 | MSMF012L1V2 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



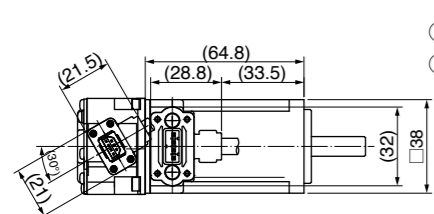
[Unit: mm]

* For motors specifications, refer to P63, P64.

* For motors specifications, refer to P63 to P66.

MSMF 100 W

Connector type (IP67) • without brake • without/with oil seal • Round shaft/ Key way, center tap shaft

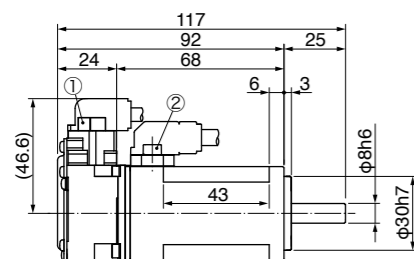


- ① Encoder connector
- ② Motor connector

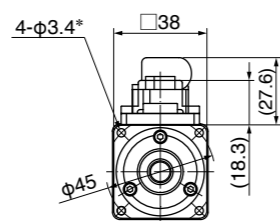
● Motor model Mass: 0.47 kg

| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 100 V | Round | MSMF011L1A1 | MSMF011L1C1 |
| | Key-way, center tap | MSMF011L1S1 | MSMF011L1U1 |
| 200 V | Round | MSMF012L1A1 | MSMF012L1C1 |
| | Key-way, center tap | MSMF012L1S1 | MSMF012L1U1 |

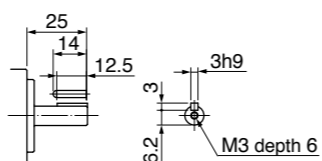
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



* Use hexagon socket head screw for installation.

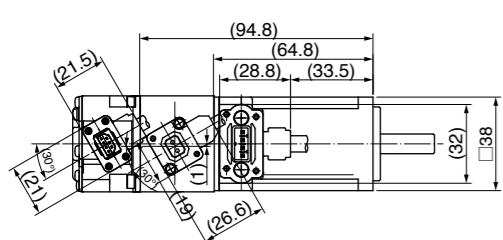


Key way dimensions <Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • with brake • without/with oil seal • Round shaft/ Key way, center tap shaft

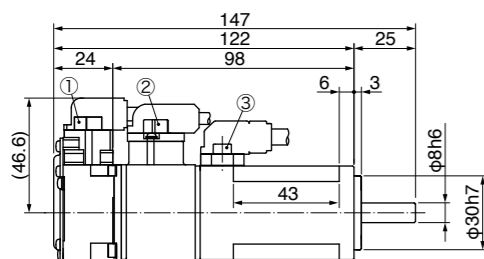


- ① Encoder connector
- ② Brake connector
- ③ Motor connector

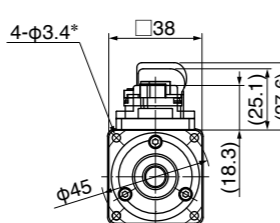
● Motor model Mass: 0.68 kg

| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 100 V | Round | MSMF011L1B1 | MSMF011L1D1 |
| | Key-way, center tap | MSMF011L1T1 | MSMF011L1V1 |
| 200 V | Round | MSMF012L1B1 | MSMF012L1D1 |
| | Key-way, center tap | MSMF012L1T1 | MSMF012L1V1 |

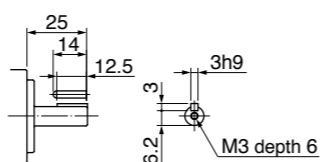
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



* Use hexagon socket head screw for installation.



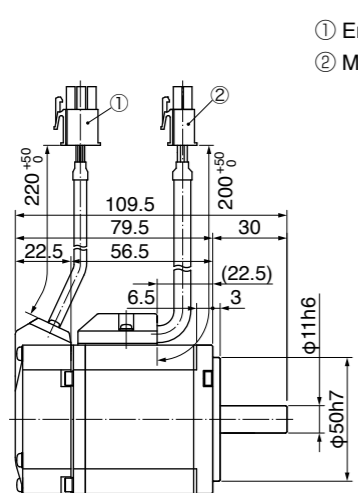
Key way dimensions <Key way, center tap shaft>



[Unit: mm]

MSMF 200 W

Leadwire type (IP65) • without brake • without/with oil seal • Round shaft/ Key way, center tap shaft



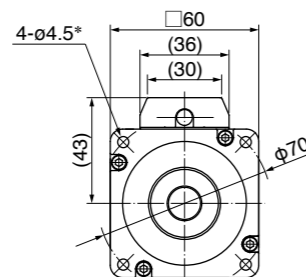
- ① Encoder connector
- ② Motor connector

● Motor model Mass: 0.82 kg

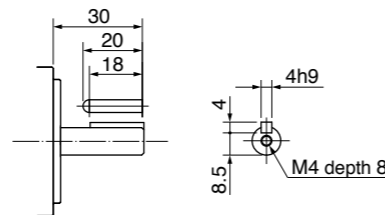
| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 100 V | Round | MSMF021L1A2 | MSMF021L1C2 |
| | Key-way, center tap | MSMF021L1S2 | MSMF021L1U2 |
| 200 V | Round | MSMF022L1A2 | MSMF022L1C2 |
| | Key-way, center tap | MSMF022L1S2 | MSMF022L1U2 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.



Key way dimensions <Key way, center tap shaft>

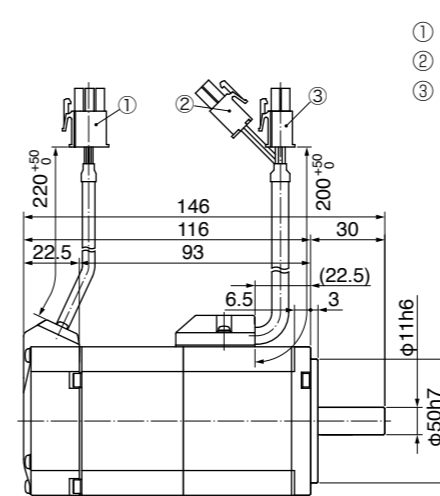


[Unit: mm]

* For motors specifications, refer to P65 to P68.

MSMF 200 W

Leadwire type (IP65) • with brake • without/with oil seal • Round shaft/ Key way, center tap shaft



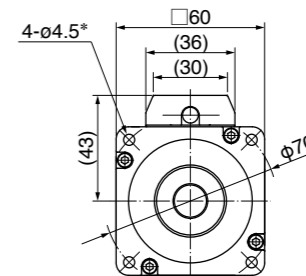
- ① Encoder connector
- ② Brake connector
- ③ Motor connector

● Motor model Mass: 1.3 kg

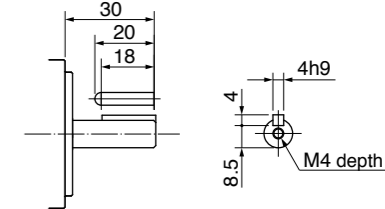
| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 100 V | Round | MSMF021L1B2 | MSMF021L1D2 |
| | Key-way, center tap | MSMF021L1T2 | MSMF021L1V2 |
| 200 V | Round | MSMF022L1B2 | MSMF022L1D2 |
| | Key-way, center tap | MSMF022L1T2 | MSMF022L1V2 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

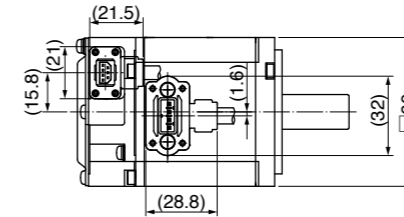


Key way dimensions <Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • without brake • without/with oil seal • Round shaft/ Key way, center tap shaft



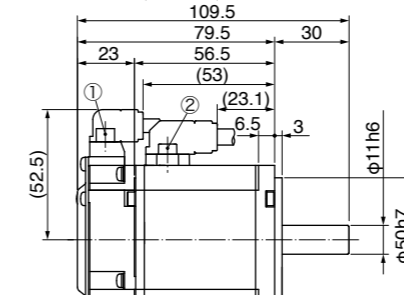
- ① Encoder connector
- ② Motor connector

● Motor model Mass: 0.82 kg

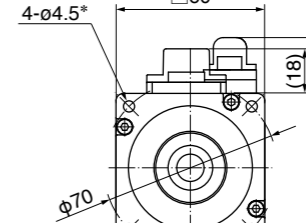
| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 100 V | Round | MSMF021L1A1 | MSMF021L1C1 |
| | Key-way, center tap | MSMF021L1S1 | MSMF021L1U1 |
| 200 V | Round | MSMF022L1A1 | MSMF022L1C1 |
| | Key-way, center tap | MSMF022L1S1 | MSMF022L1U1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

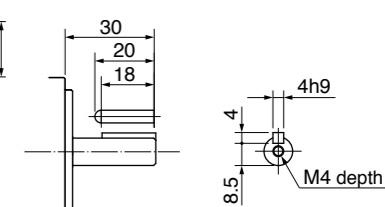
* Use hexagon socket head screw for installation.



* Use hexagon socket head screw for installation.

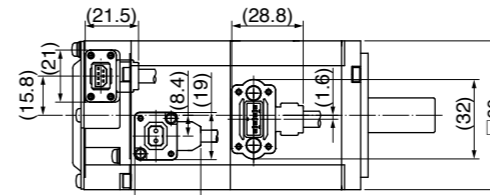


Key way dimensions <Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • with brake • without/with oil seal • Round shaft/ Key way, center tap shaft



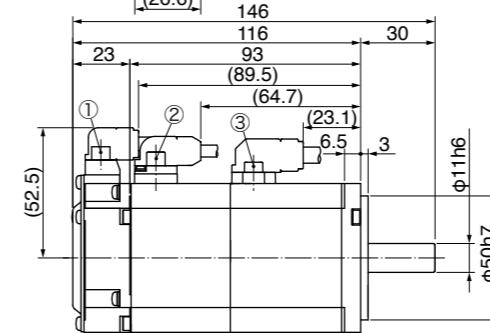
- ① Encoder connector
- ② Brake connector
- ③ Motor connector

● Motor model Mass: 1.3 kg

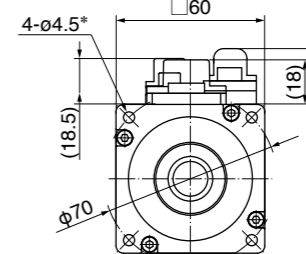
| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 100 V | Round | MSMF021L1B1 | MSMF021L1D1 |
| | Key-way, center tap | MSMF021L1T1 | MSMF021L1V1 |
| 200 V | Round | MSMF022L1B1 | MSMF022L1D1 |
| | Key-way, center tap | MSMF022L1T1 | MSMF022L1V1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

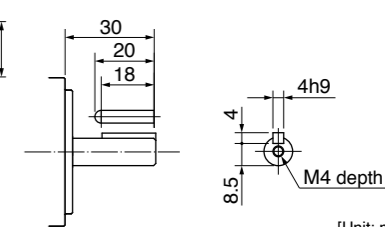
* Use hexagon socket head screw for installation.



* Use hexagon socket head screw for installation.



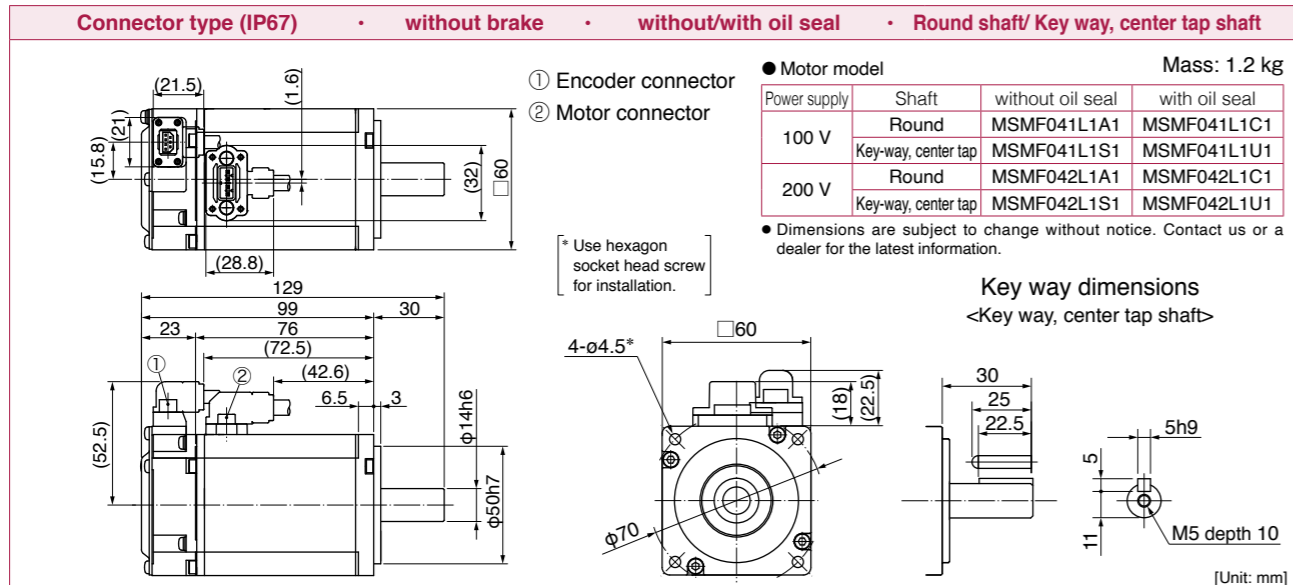
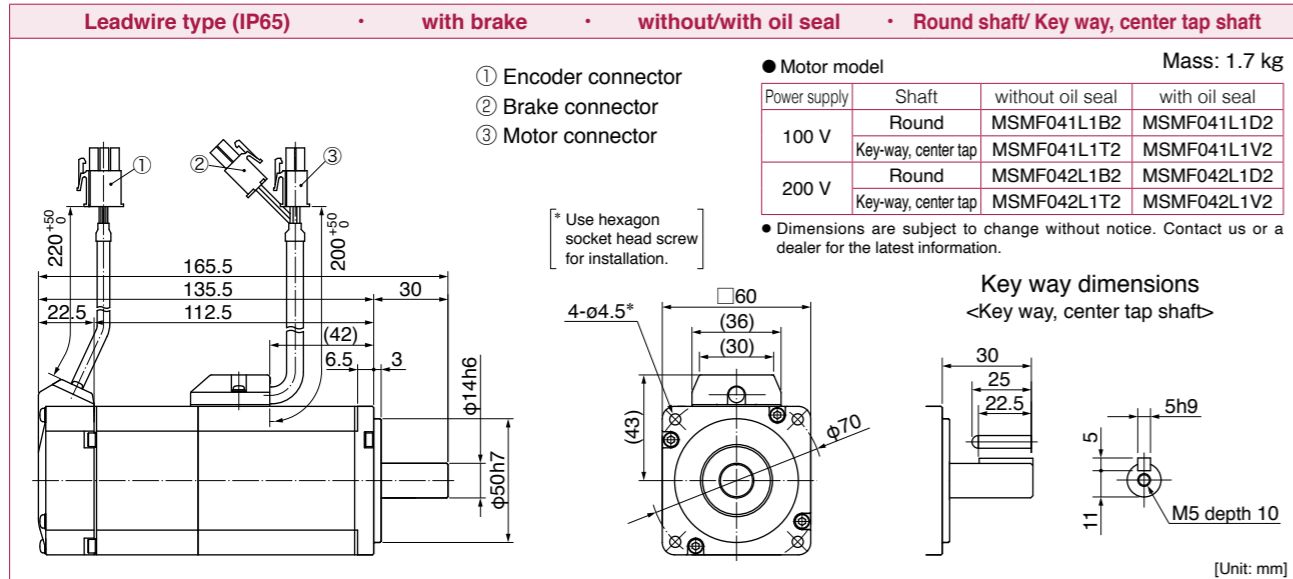
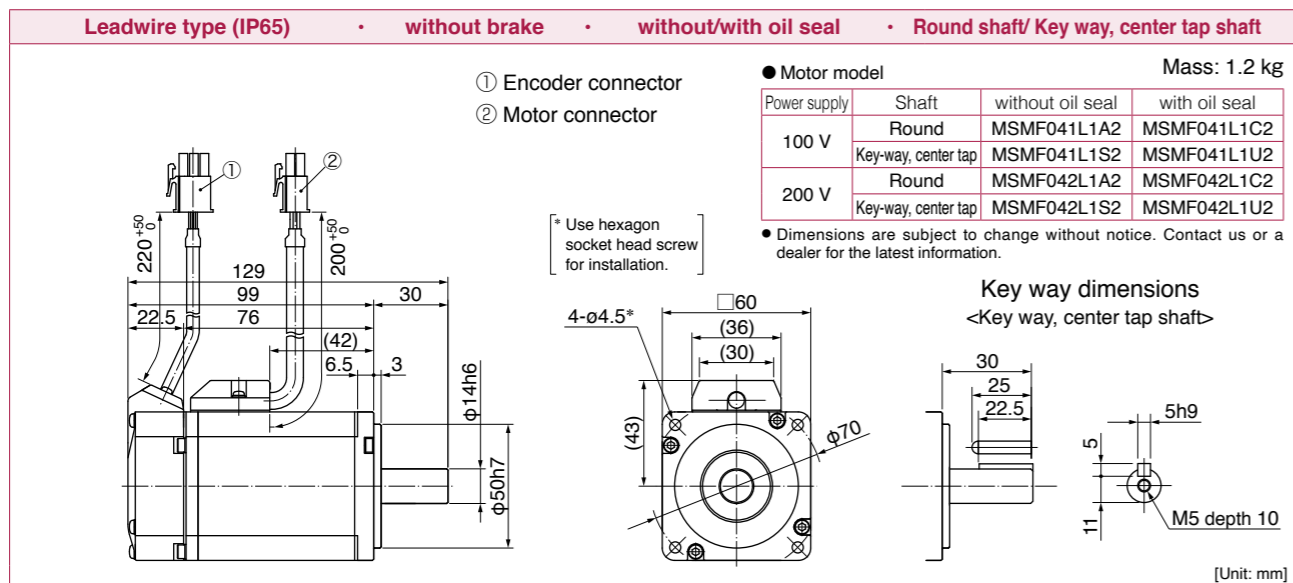
Key way dimensions <Key way, center tap shaft>



[Unit: mm]

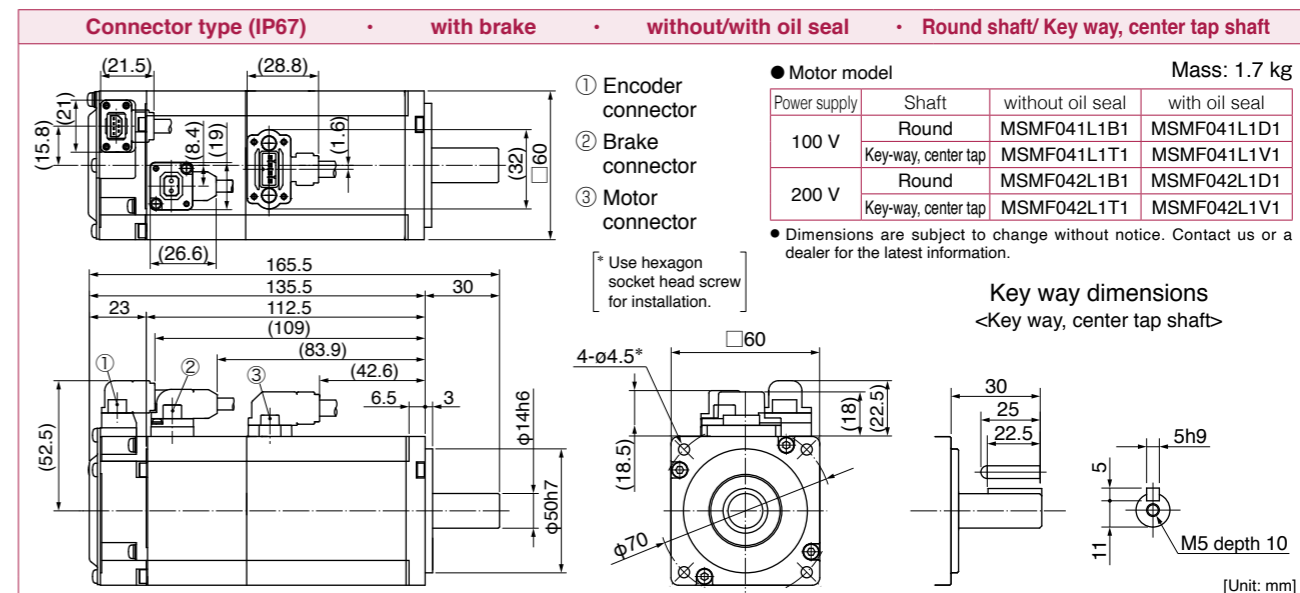
* For motors specifications, refer to P67, P68.

MSMF 400 W

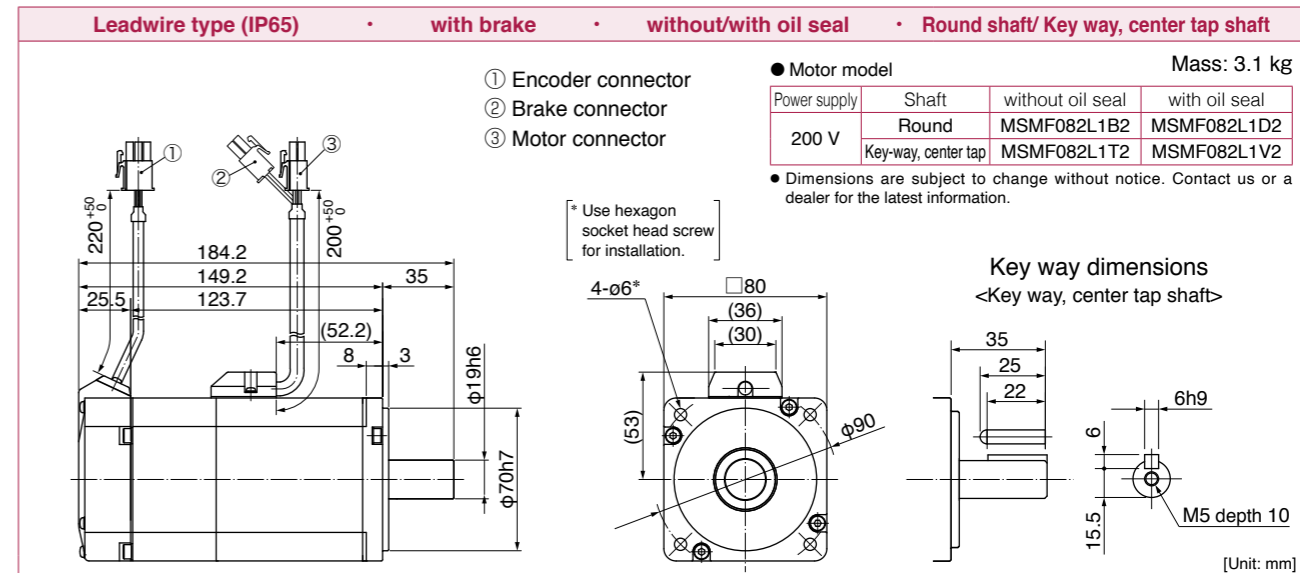
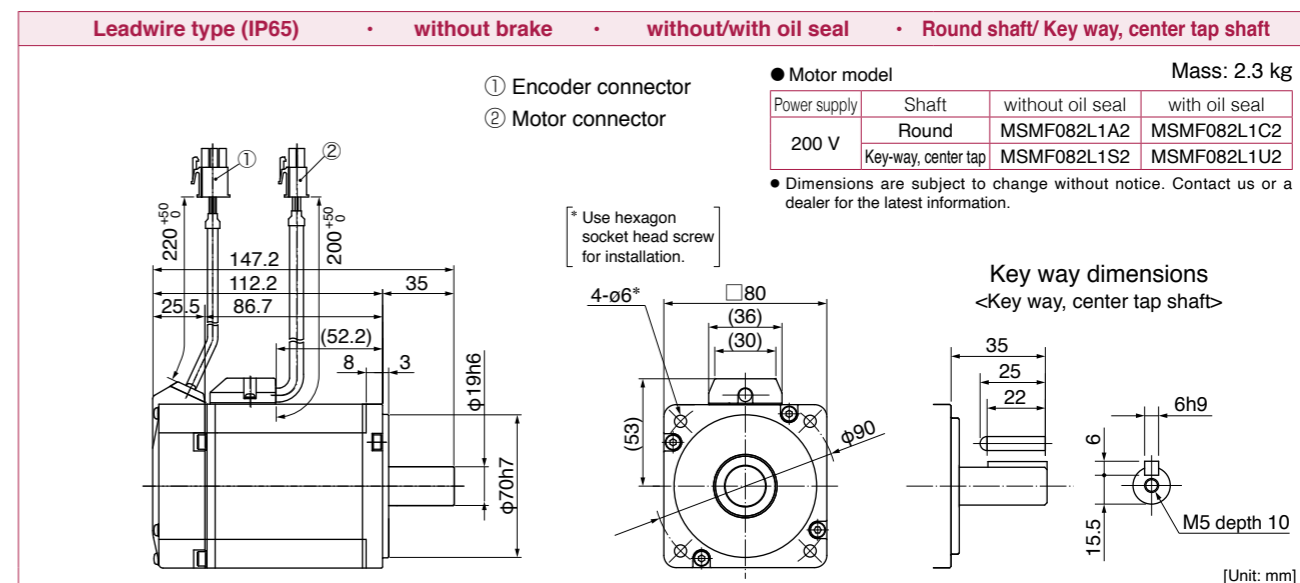


* For motors specifications, refer to P.69, P.70.

MSMF 400 W



MSMF 750 W



* For motors specifications, refer to P.69 to P.71.

MSMF 750 W

Connector type (IP67) • without brake • without/with oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor connector

● Motor model Mass: 2.3 kg

| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 200 V | Round | MSMF082L1A1 | MSMF082L1C1 |
| | Key-way, center tap | MSMF082L1S1 | MSMF082L1U1 |

• Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
-Key way, center tap shaft

[Unit: mm]

Connector type (IP67) • with brake • without/with oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Brake connector
③ Motor connector

● Motor model Mass: 3.1 kg

| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 200 V | Round | MSMF082L1B1 | MSMF082L1D1 |
| | Key-way, center tap | MSMF082L1T1 | MSMF082L1V1 |

• Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
-Key way, center tap shaft

[Unit: mm]

MSMF 1000 W

Leadwire type (IP65) • without brake • without/with oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor connector

● Motor model Mass: 2.8 kg

| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 200 V | Round | MSMF092L1A2 | MSMF092L1C2 |
| | Key-way, center tap | MSMF092L1S2 | MSMF092L1U2 |

• Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
-Key way, center tap shaft

[Unit: mm]

* For motors specifications, refer to P.71, P.72.

MSMF 1000 W

Leadwire type (IP65) • with brake • without/with oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Brake connector
③ Motor connector

● Motor model Mass: 3.6 kg

| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 200 V | Round | MSMF092L1B2 | MSMF092L1D2 |
| | Key-way, center tap | MSMF092L1T2 | MSMF092L1V2 |

• Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
-Key way, center tap shaft

[Unit: mm]

Connector type (IP67) • without brake • without/with oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor connector

● Motor model Mass: 2.8 kg

| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 200 V | Round | MSMF092L1A1 | MSMF092L1C1 |
| | Key-way, center tap | MSMF092L1S1 | MSMF092L1U1 |

• Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
-Key way, center tap shaft

[Unit: mm]

Connector type (IP67) • with brake • without/with oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Brake connector
③ Motor connector

● Motor model Mass: 3.6 kg

| Power supply | Shaft | without oil seal | with oil seal |
|--------------|---------------------|------------------|---------------|
| 200 V | Round | MSMF092L1B1 | MSMF092L1D1 |
| | Key-way, center tap | MSMF092L1T1 | MSMF092L1V1 |

• Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
-Key way, center tap shaft

[Unit: mm]

* For motors specifications, refer to P.72.

MSMF 1.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Large size JL10)
② Motor connector

● Motor model Mass: 3.6 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MSMF102L1C6 | MSMF102L1C8 |
| | Key-way | MSMF102L1G6 | MSMF102L1G8 |

* Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions

[Unit: mm]

Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Large size JL10)
② Motor/Brake connector

● Motor model Mass: 4.7 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MSMF102L1D6 | MSMF102L1D8 |
| | Key-way | MSMF102L1H6 | MSMF102L1H8 |

* Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions

[Unit: mm]

Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Small size JN2)
② Motor connector

● Motor model Mass: 3.6 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MSMF102L1C5 | MSMF102L1C7 |
| | Key-way | MSMF102L1G5 | MSMF102L1G7 |

* Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions

[Unit: mm]

* For motors specifications, refer to P.73.

MSMF 1.0 kW

Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Small size JN2)
② Motor/Brake connector

● Motor model Mass: 4.7 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MSMF102L1D5 | MSMF102L1D7 |
| | Key-way | MSMF102L1H5 | MSMF102L1H7 |

* Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions

[Unit: mm]

MSMF 1.5 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Large size JL10)
② Motor connector

● Motor model Mass: 4.6 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MSMF152L1C6 | MSMF152L1C8 |
| | Key-way | MSMF152L1G6 | MSMF152L1G8 |

* Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions

[Unit: mm]

Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Large size JL10)
② Motor/Brake connector

● Motor model Mass: 5.6 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MSMF152L1D6 | MSMF152L1D8 |
| | Key-way | MSMF152L1H6 | MSMF152L1H8 |

* Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

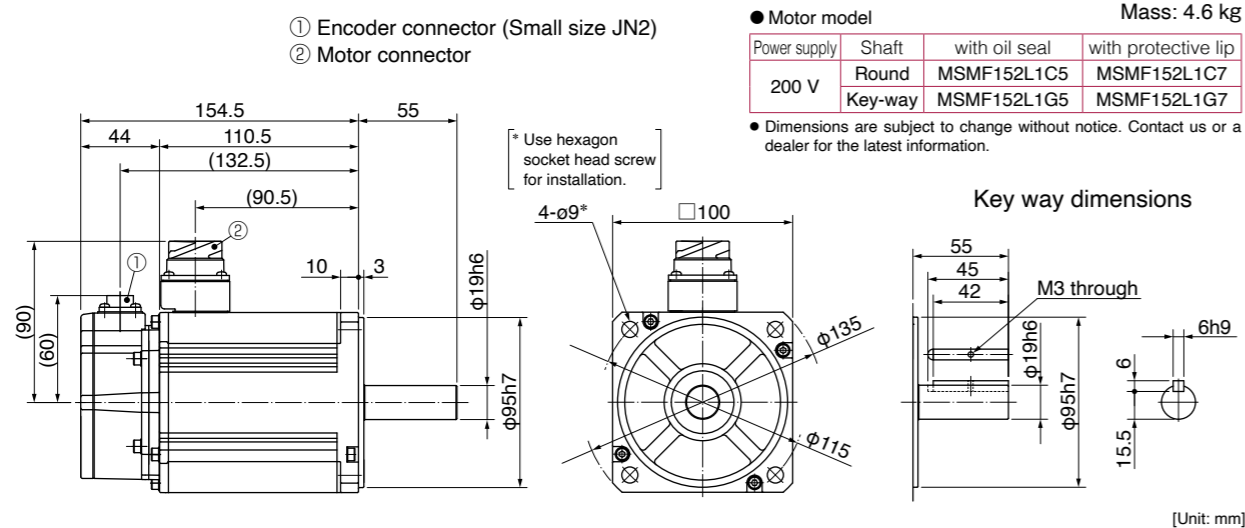
Key way dimensions

[Unit: mm]

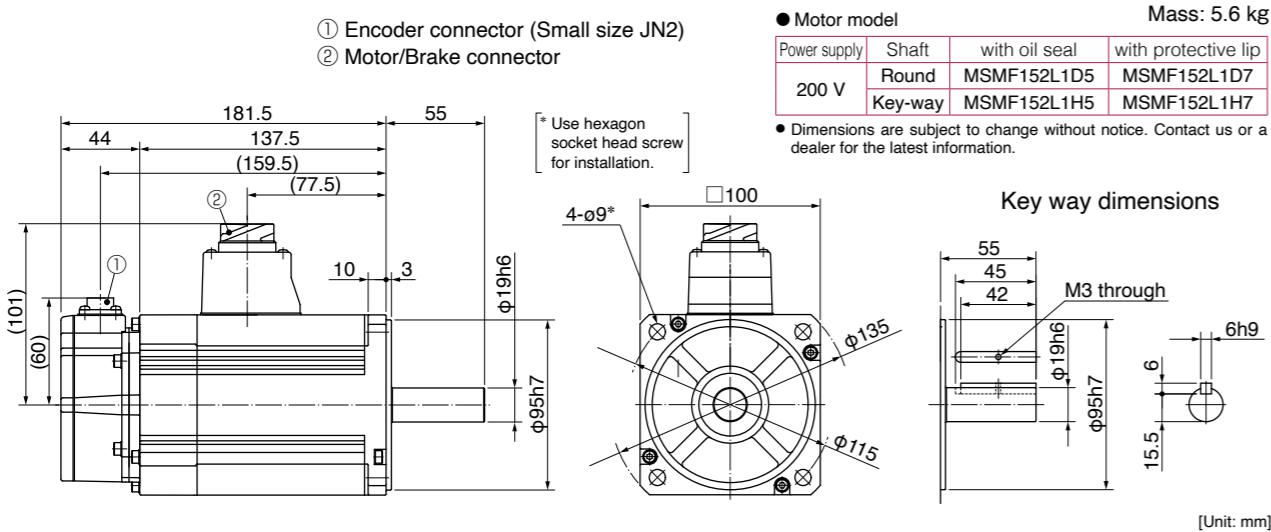
* For motors specifications, refer to P.73, P.74.

MSMF 1.5 kW

Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

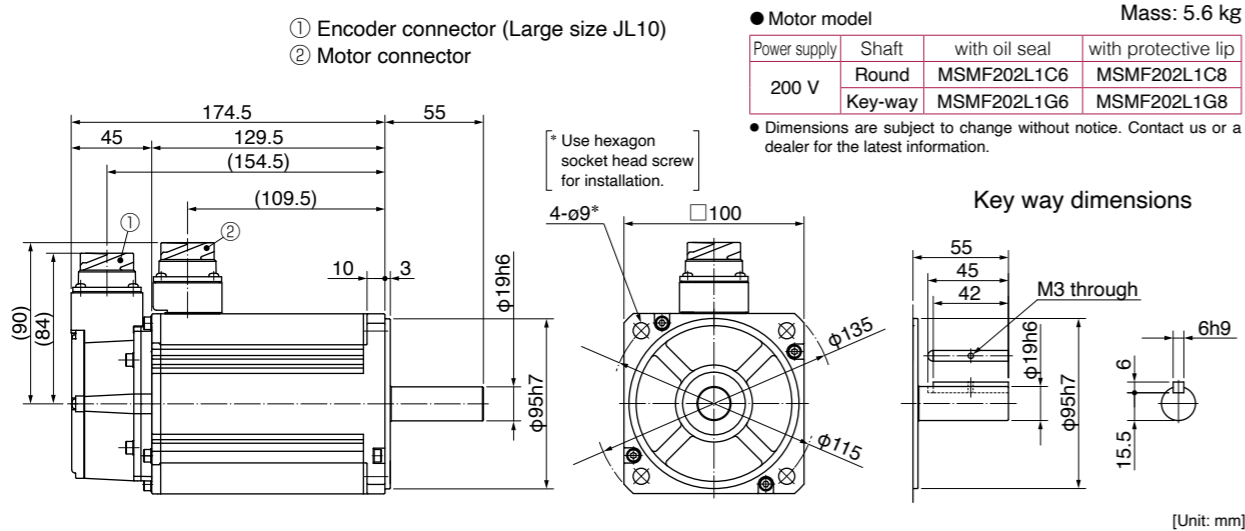


Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MSMF 2.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

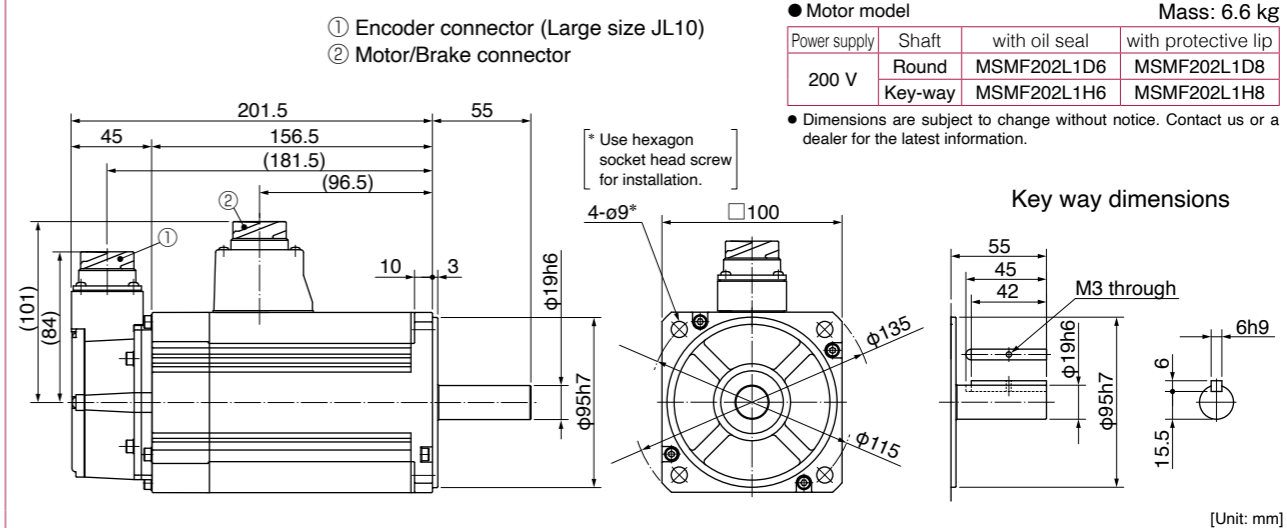


* For motors specifications, refer to P.74, P.75.

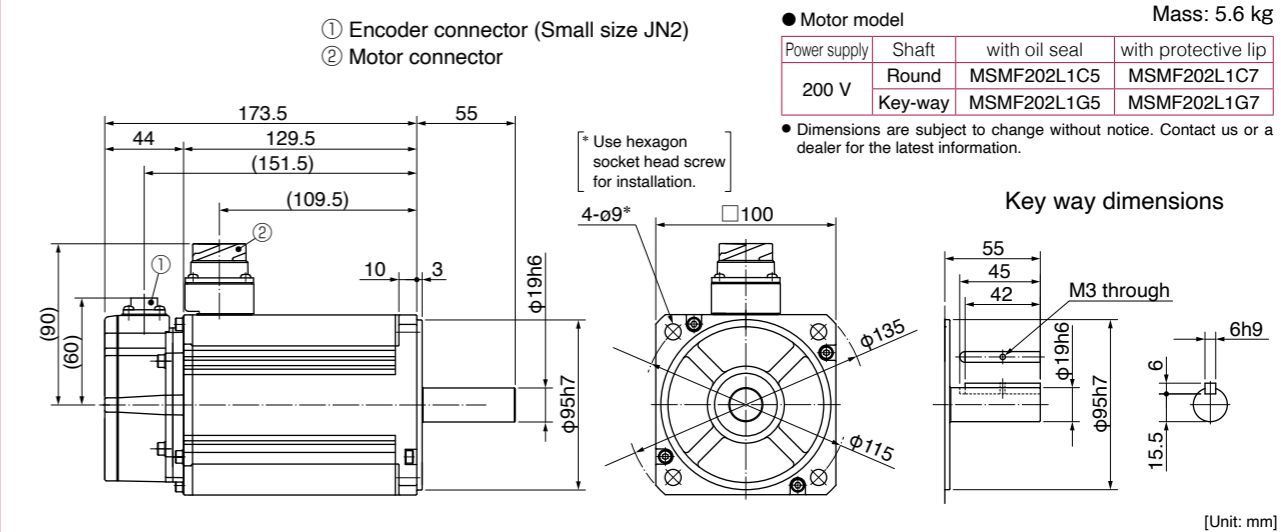
MSMF 2.0 kW

MSMF 2.0 kW

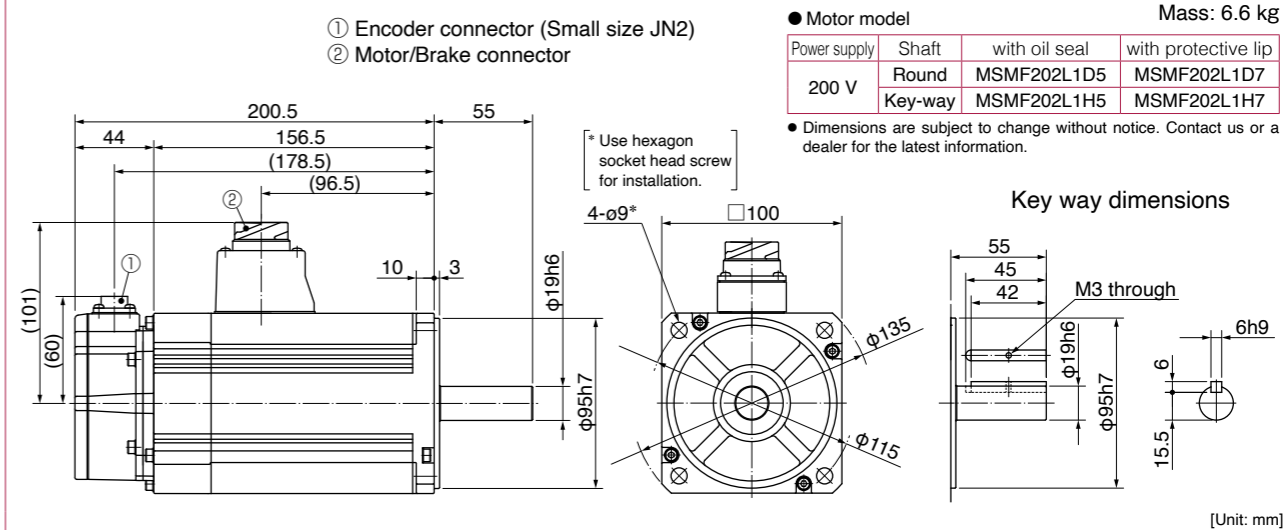
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



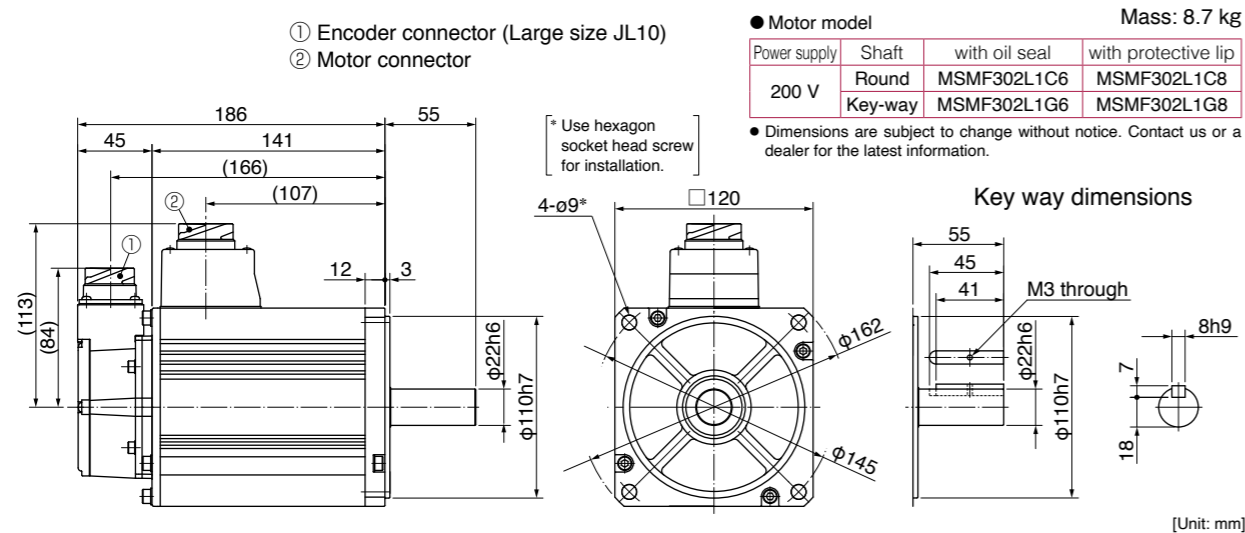
Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



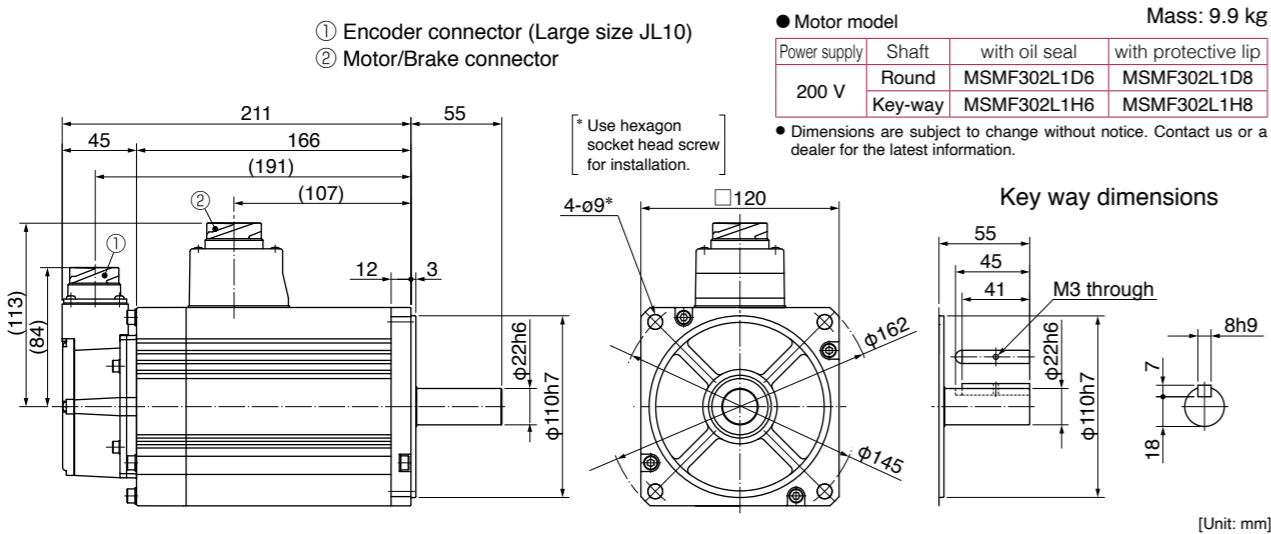
* For motors specifications, refer to P.75.

MSMF 3.0 kW

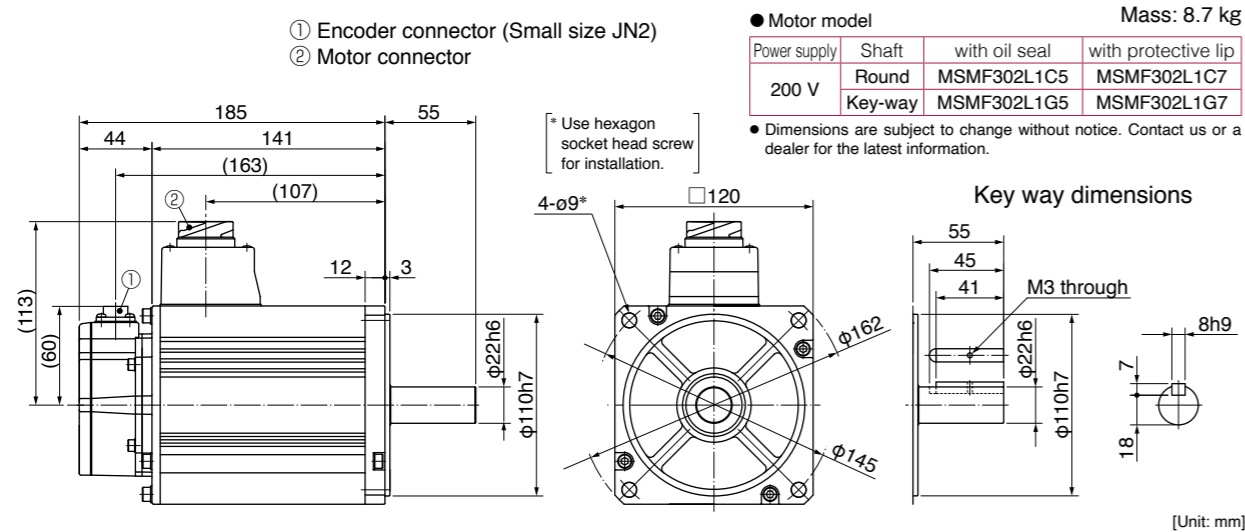
Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



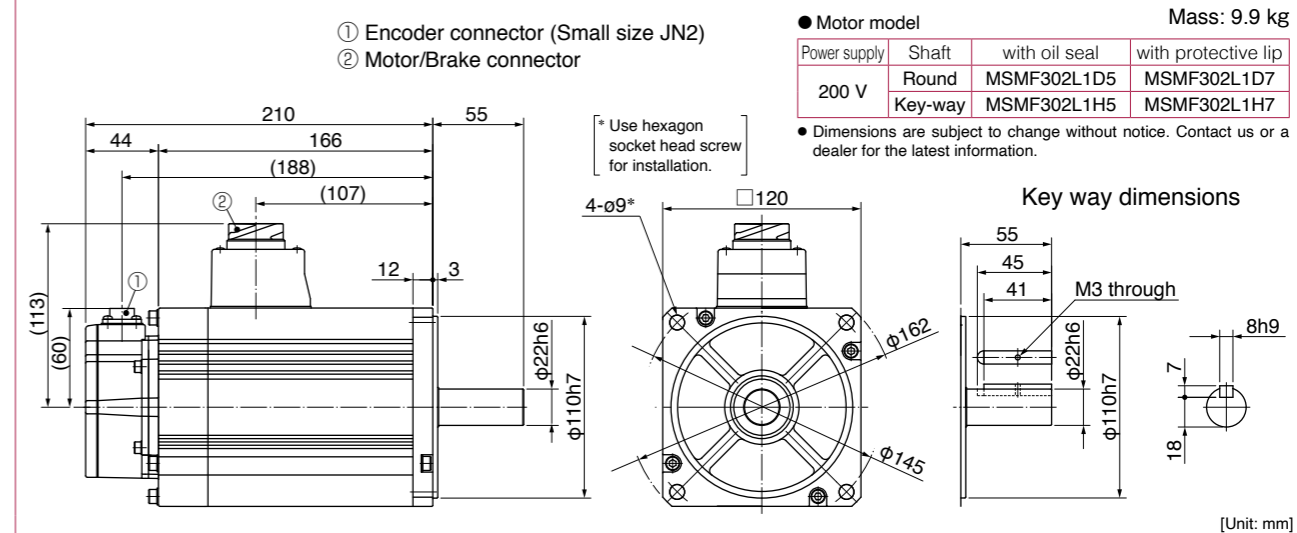
Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



* For motors specifications, refer to P.76.

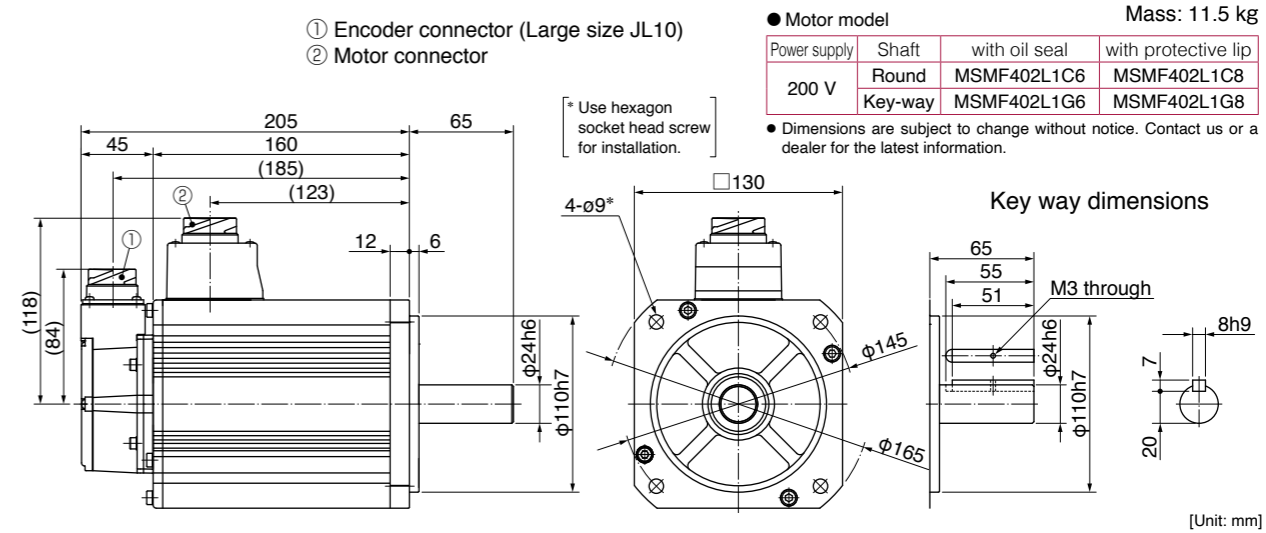
MSMF 3.0 kW

Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

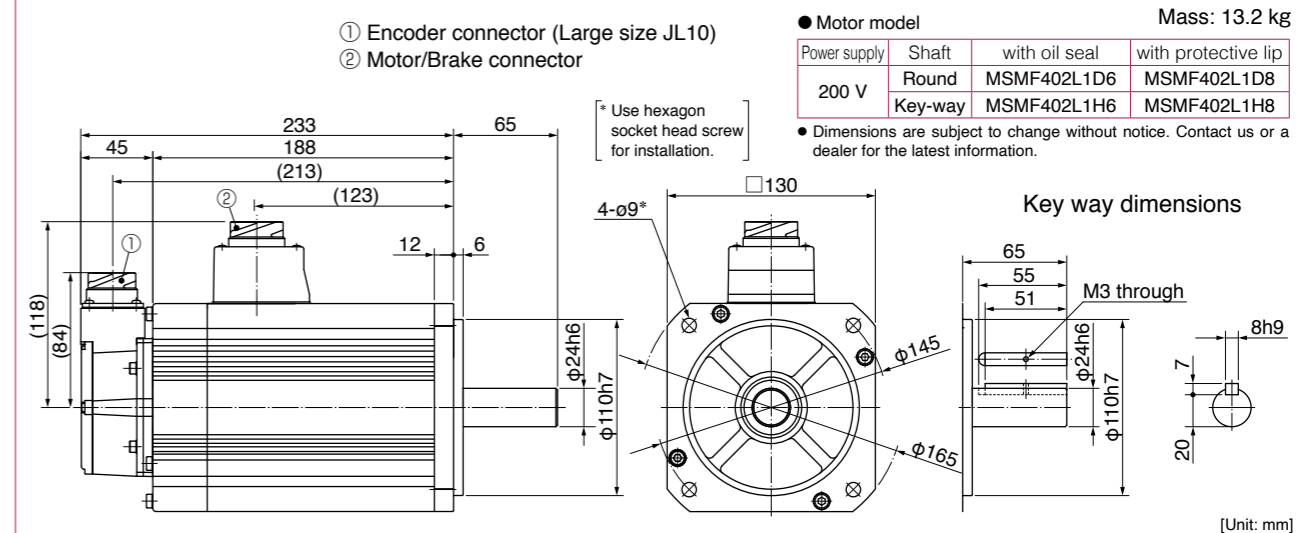


MSMF 4.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



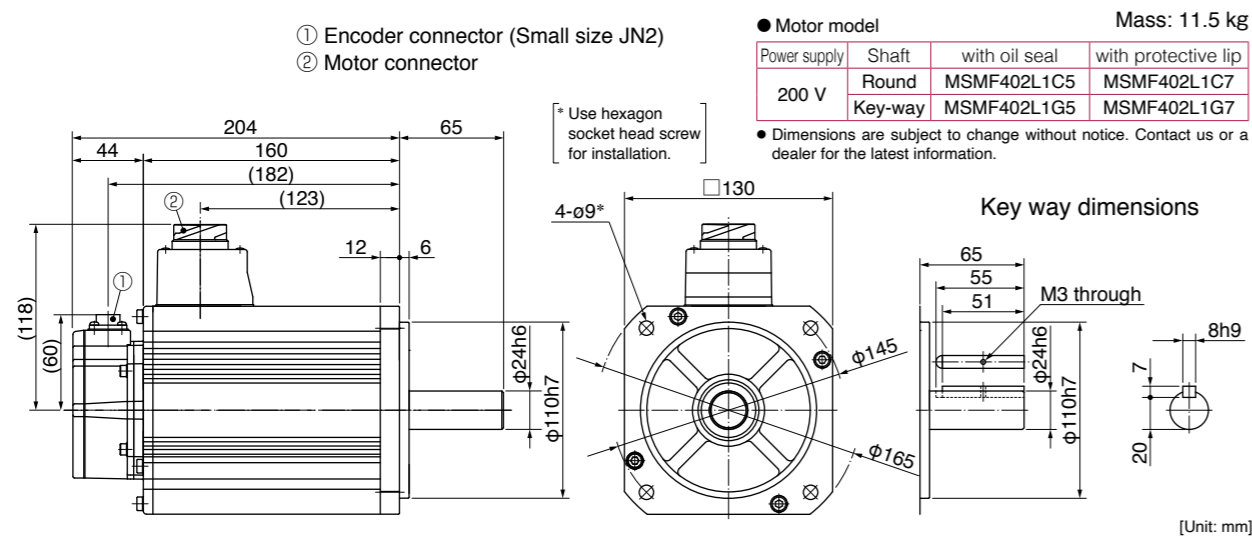
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



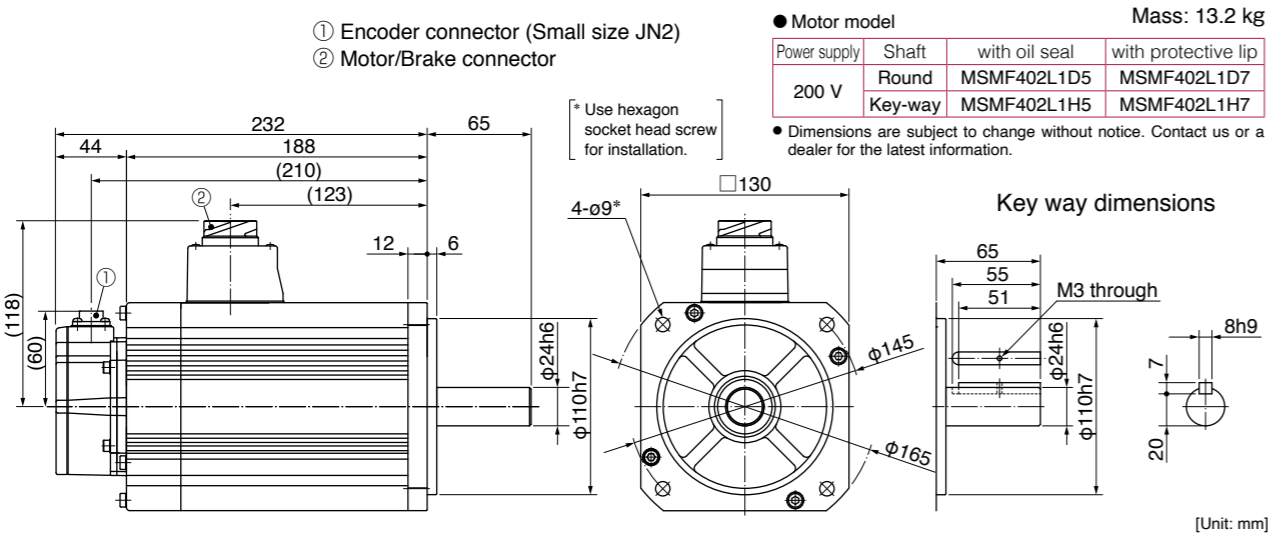
* For motors specifications, refer to P.76, P.77.

MSMF 4.0 kW

Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

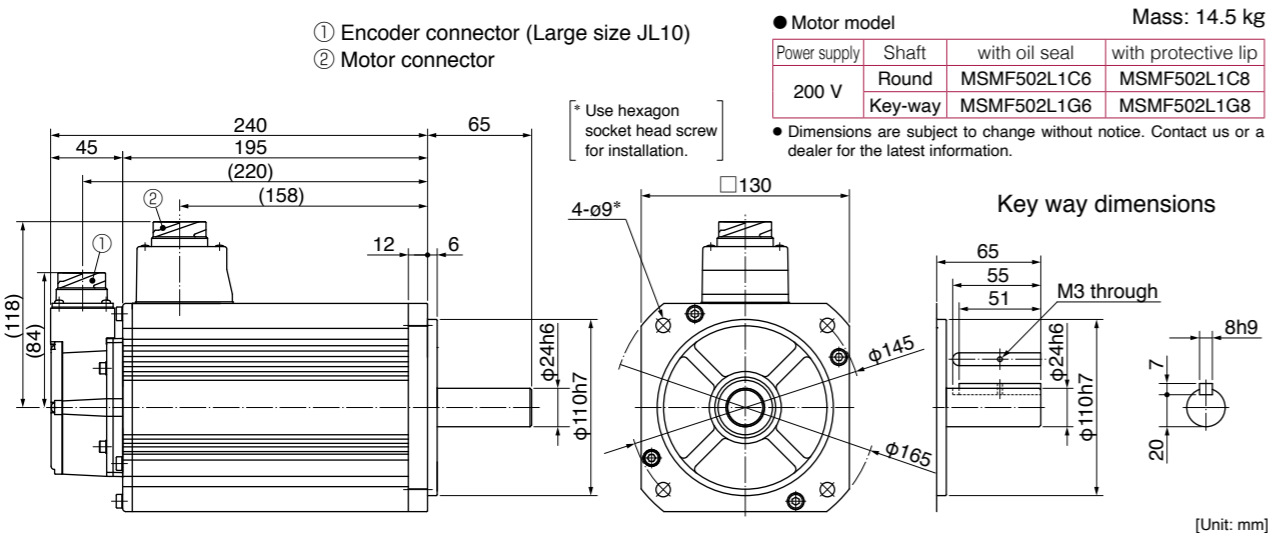


Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MSMF 5.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

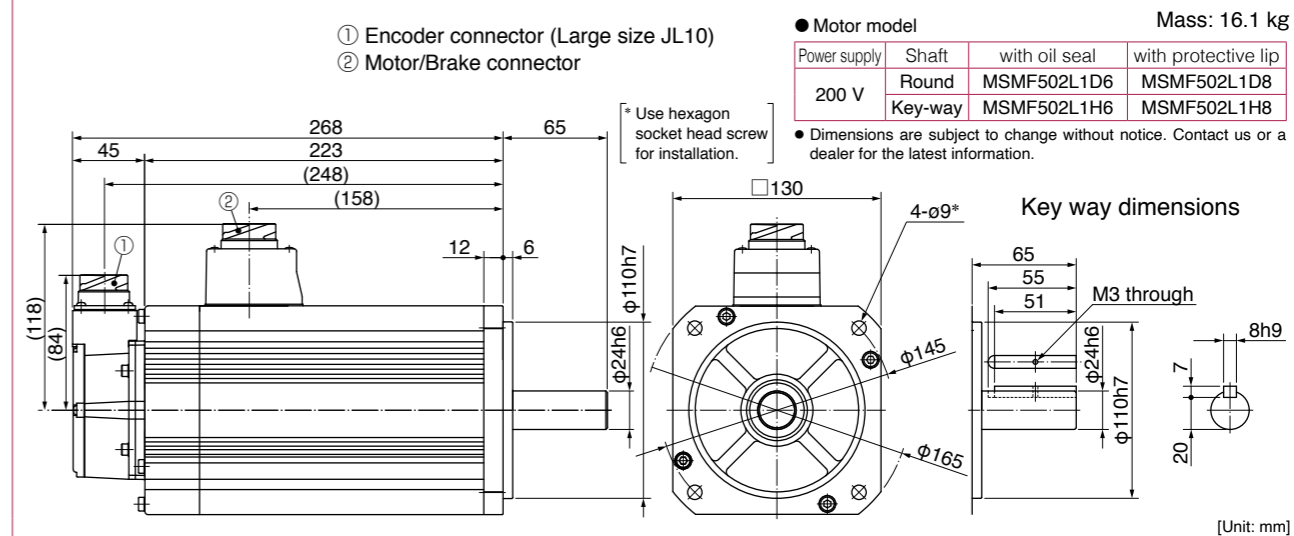


* For motors specifications, refer to P.77, P.78.

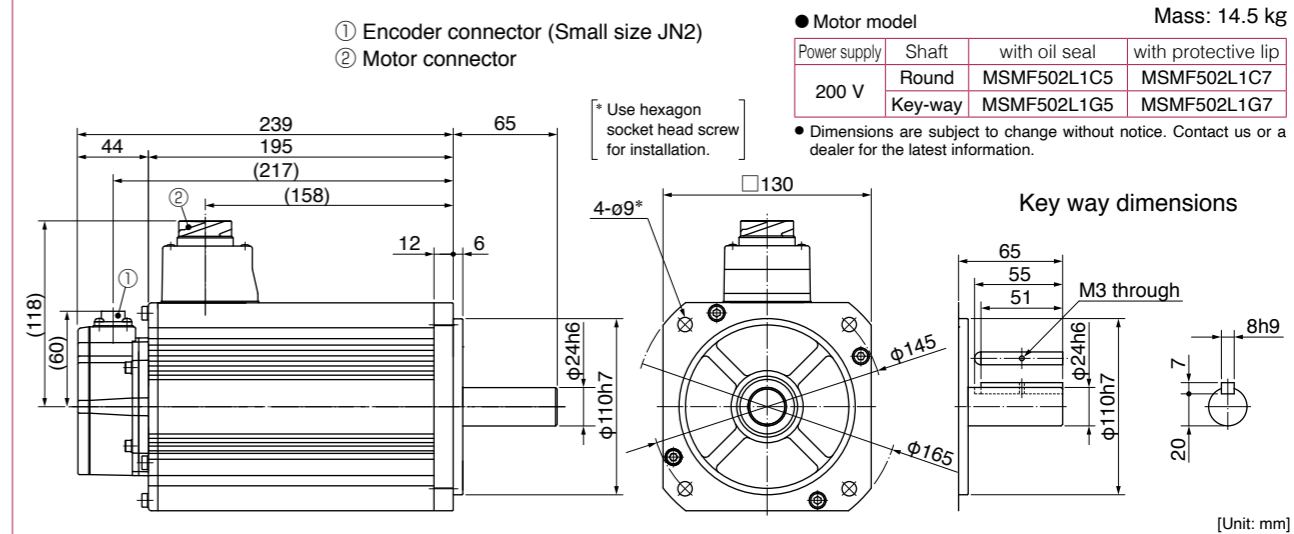
MSMF 5.0 kW

MSMF 5.0 kW

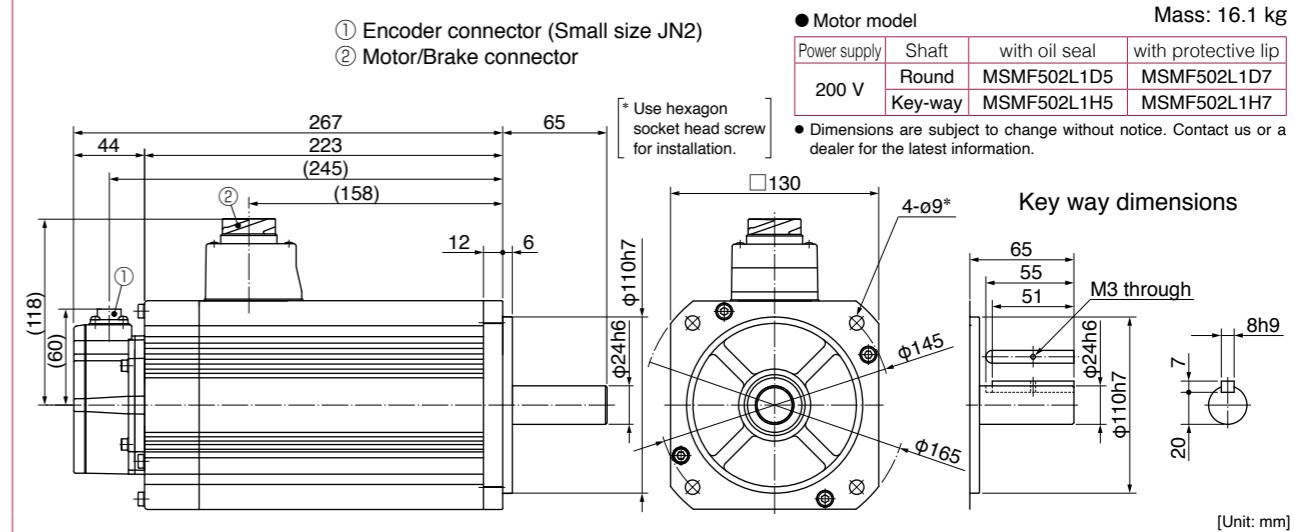
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



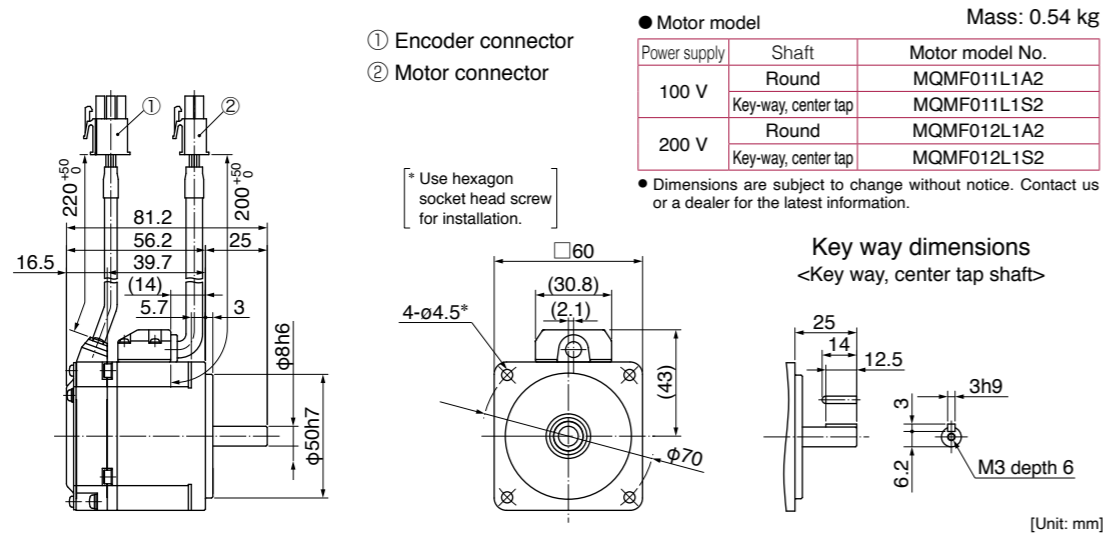
Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



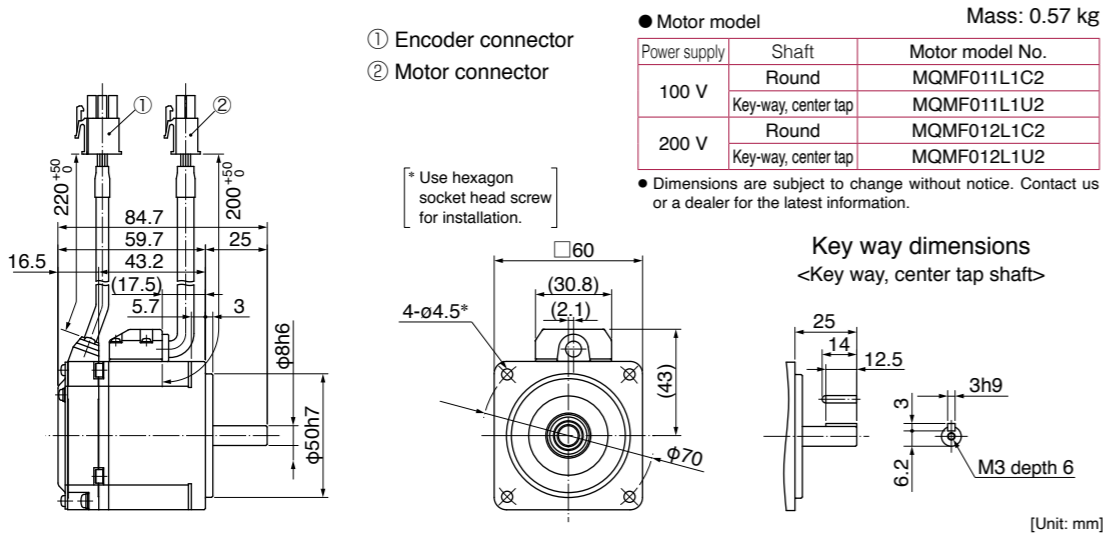
* For motors specifications, refer to P.78.

MQMF 100 W

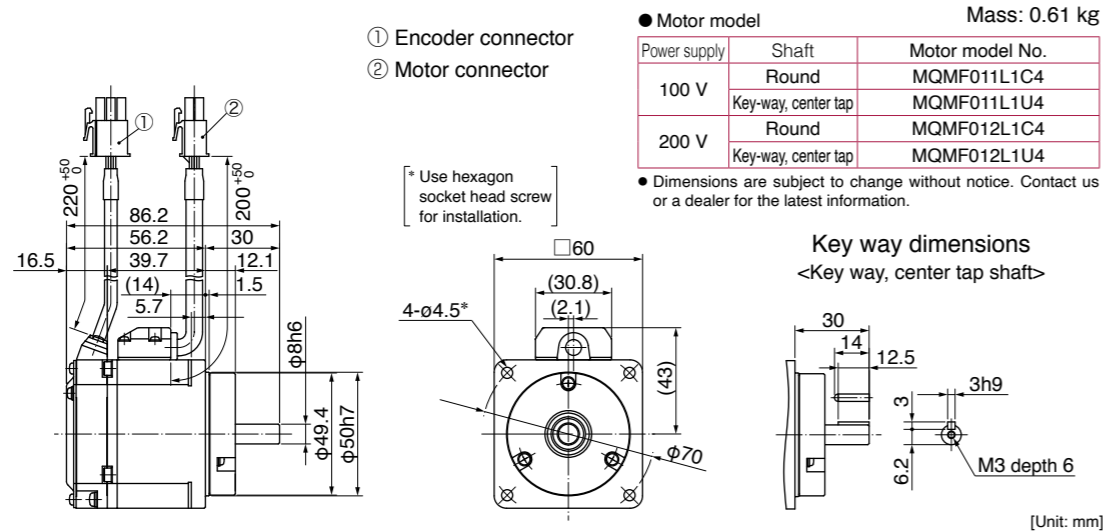
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



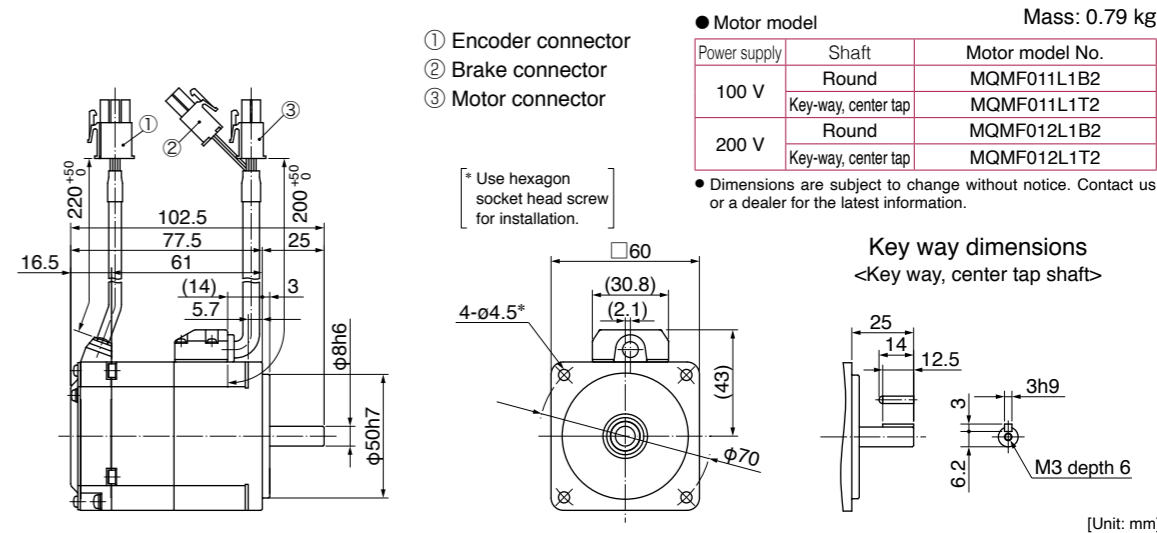
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



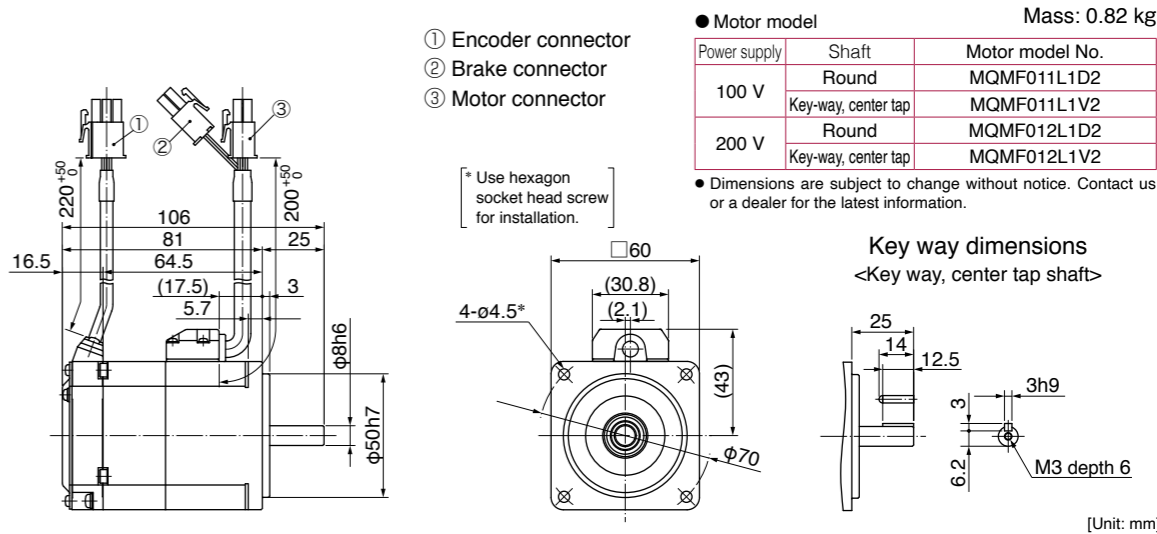
* For motors specifications, refer to P.79, P.80.

MQMF 100 W

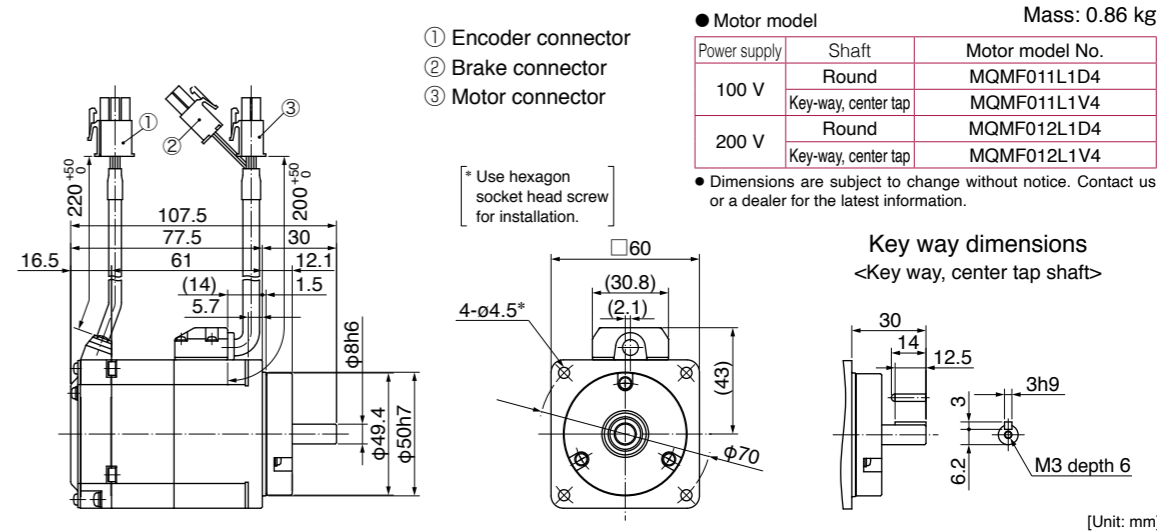
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



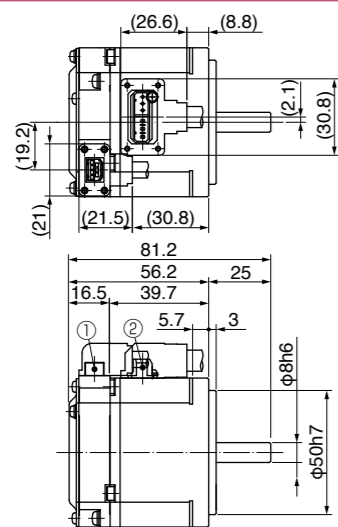
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



* For motors specifications, refer to P.79, P.80.

MQMF 100 W

Connector type (IP67) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



- ① Encoder connector
- ② Motor connector

● Motor model Mass: 0.54 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF011L1A1 |
| | Key-way, center tap | MQMF011L1S1 |
| 200 V | Round | MQMF012L1A1 |
| | Key-way, center tap | MQMF012L1S1 |

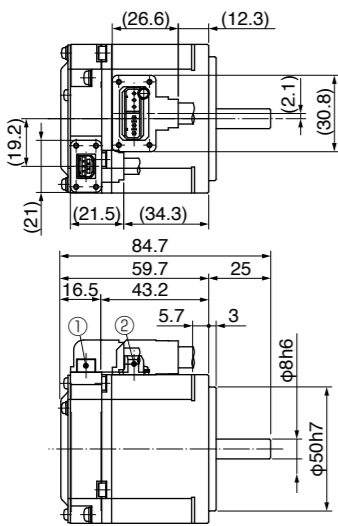
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
<Key way, center tap shaft>

[Unit: mm]

Connector type (IP67) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



- ① Encoder connector
- ② Motor connector

● Motor model Mass: 0.57 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF011L1C1 |
| | Key-way, center tap | MQMF011L1U1 |
| 200 V | Round | MQMF012L1C1 |
| | Key-way, center tap | MQMF012L1U1 |

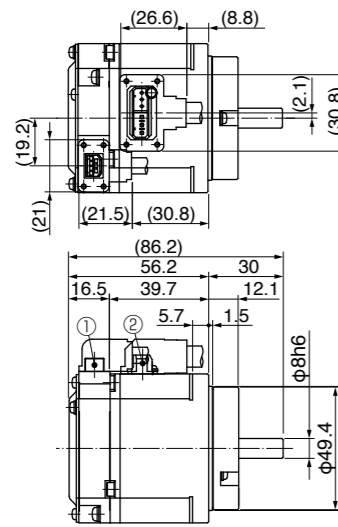
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
<Key way, center tap shaft>

[Unit: mm]

Connector type (IP67) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



- ① Encoder connector
- ② Motor connector

● Motor model Mass: 0.61 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF011L1C3 |
| | Key-way, center tap | MQMF011L1U3 |
| 200 V | Round | MQMF012L1C3 |
| | Key-way, center tap | MQMF012L1U3 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

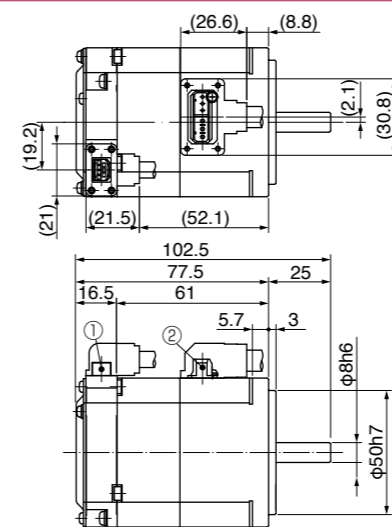
Key way dimensions
<Key way, center tap shaft>

[Unit: mm]

* For motors specifications, refer to P.79, P.80.

MQMF 100 W

Connector type (IP67) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



- ① Encoder connector
- ② Motor/Brake connector

● Motor model Mass: 0.79 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF011L1B1 |
| | Key-way, center tap | MQMF011L1T1 |
| 200 V | Round | MQMF012L1B1 |
| | Key-way, center tap | MQMF012L1T1 |

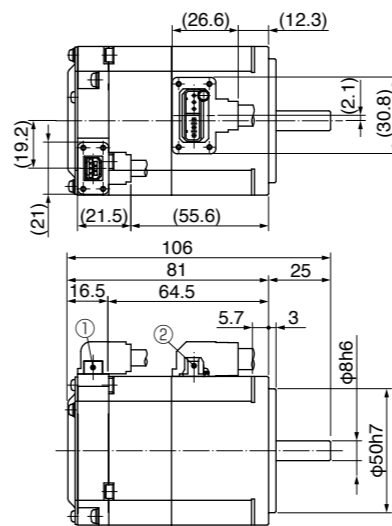
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
<Key way, center tap shaft>

[Unit: mm]

Connector type (IP67) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



- ① Encoder connector
- ② Motor/Brake connector

● Motor model Mass: 0.82 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF011L1D1 |
| | Key-way, center tap | MQMF011L1V1 |
| 200 V | Round | MQMF012L1D1 |
| | Key-way, center tap | MQMF012L1V1 |

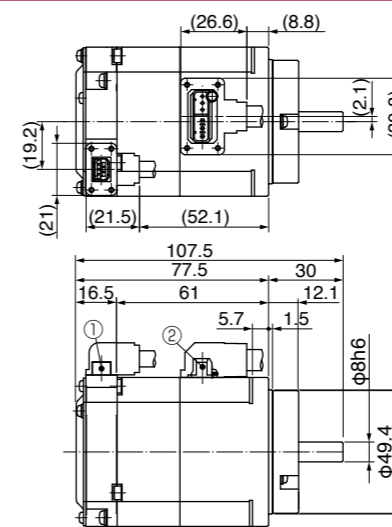
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
<Key way, center tap shaft>

[Unit: mm]

Connector type (IP67) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



- ① Encoder connector
- ② Motor/Brake connector

● Motor model Mass: 0.86 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF011L1D3 |
| | Key-way, center tap | MQMF011L1V3 |
| 200 V | Round | MQMF012L1D3 |
| | Key-way, center tap | MQMF012L1V3 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

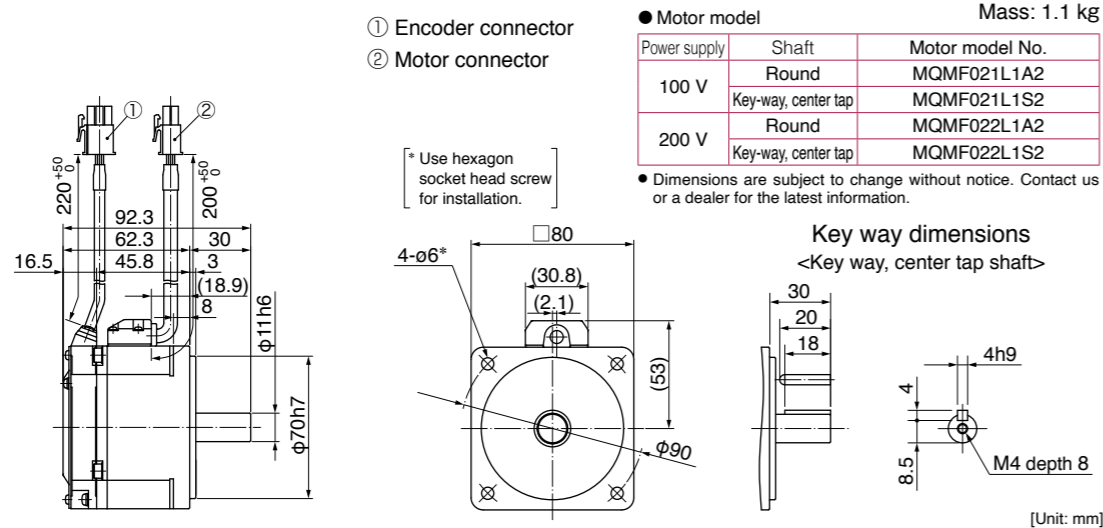
Key way dimensions
<Key way, center tap shaft>

[Unit: mm]

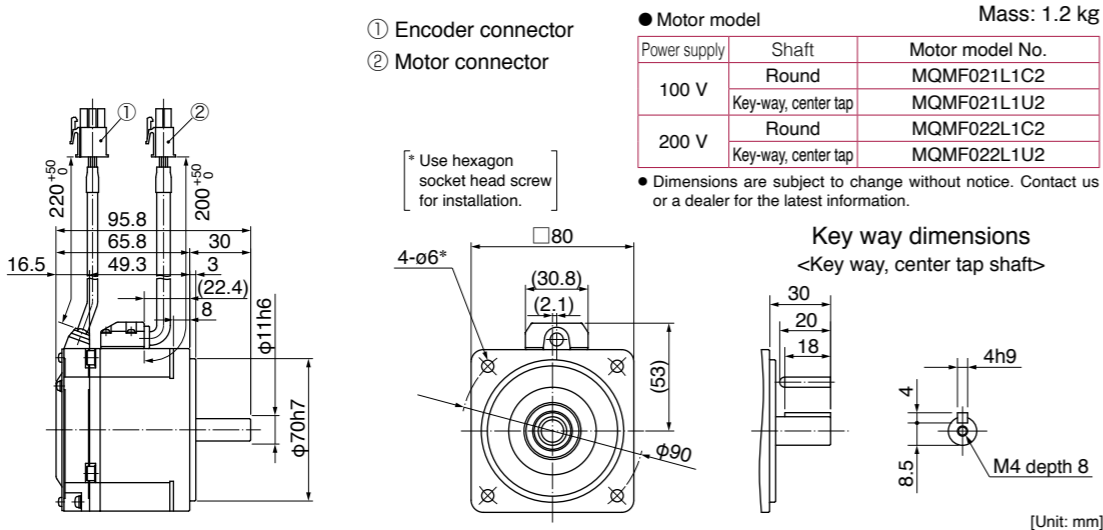
* For motors specifications, refer to P.79, P.80.

MQMF 200 W

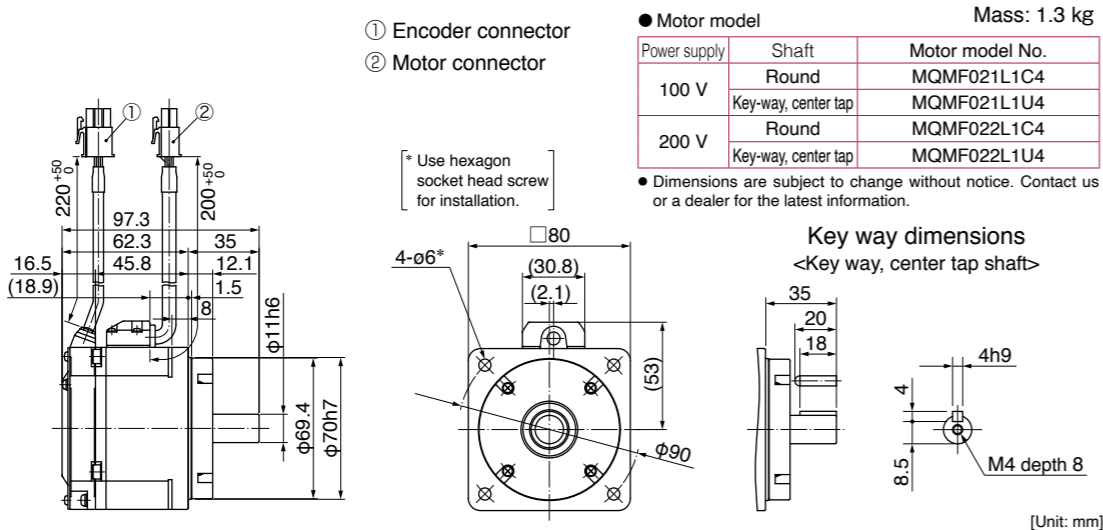
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



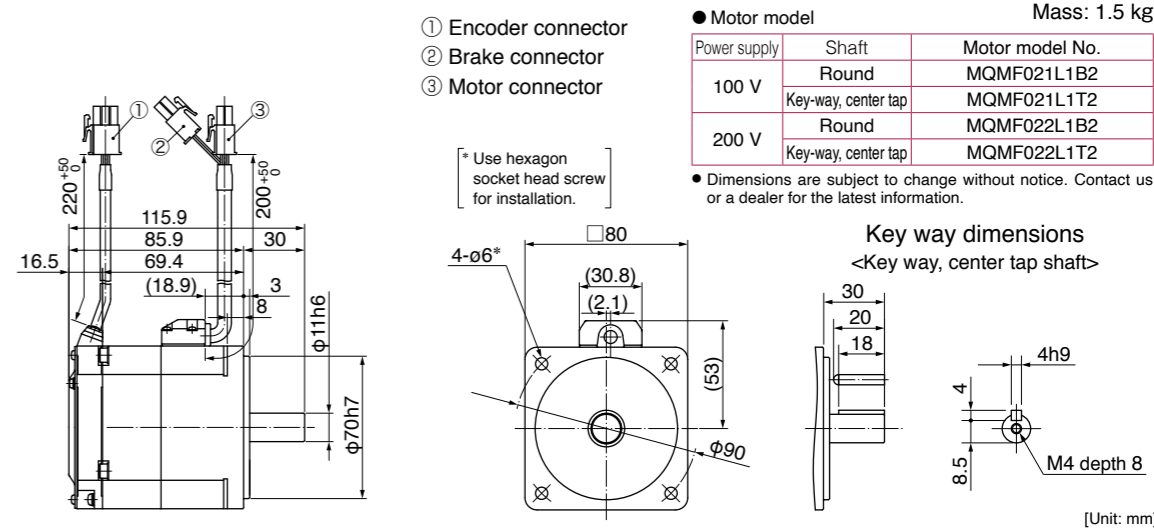
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



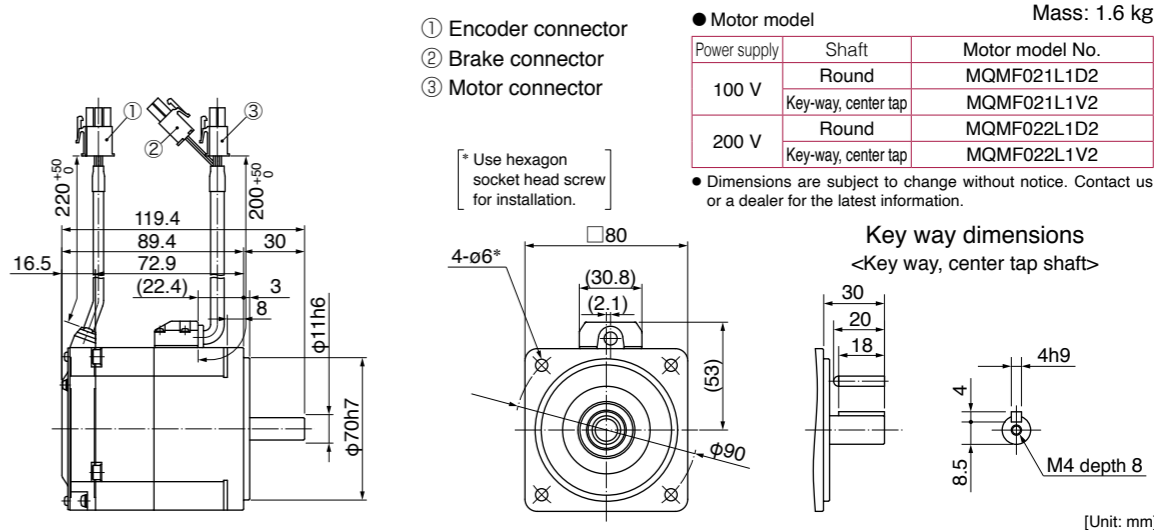
* For motors specifications, refer to P.81, P.82.

MQMF 200 W

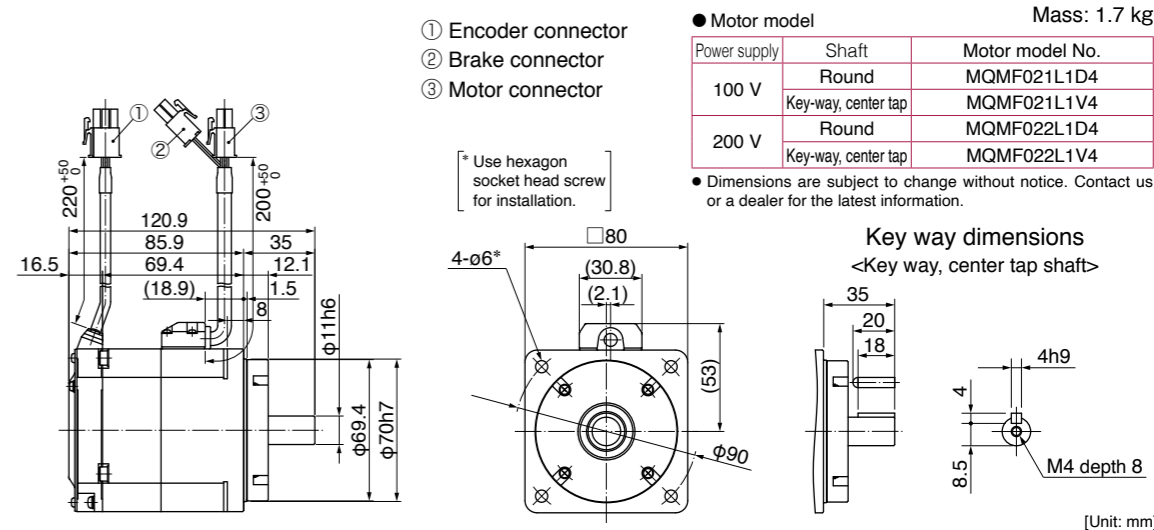
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



* For motors specifications, refer to P.81, P.82.

MQMF 200 W

Connector type (IP67) • without brake • without oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor connector

● Motor model Mass: 1.1 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF021L1A1 |
| | Key-way, center tap | MQMF021L1S1 |
| 200 V | Round | MQMF022L1A1 |
| | Key-way, center tap | MQMF022L1S1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Key way dimensions
-Key way, center tap shaft-

[Unit: mm]

Connector type (IP67) • without brake • with oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor connector

● Motor model Mass: 1.2 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF021L1C1 |
| | Key-way, center tap | MQMF021L1U1 |
| 200 V | Round | MQMF022L1C1 |
| | Key-way, center tap | MQMF022L1U1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Key way dimensions
-Key way, center tap shaft-

[Unit: mm]

Connector type (IP67) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor connector

● Motor model Mass: 1.3 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF021L1C3 |
| | Key-way, center tap | MQMF021L1U3 |
| 200 V | Round | MQMF022L1C3 |
| | Key-way, center tap | MQMF022L1U3 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Key way dimensions
-Key way, center tap shaft-

[Unit: mm]

* For motors specifications, refer to P.81, P.82.

MQMF 200 W

Connector type (IP67) • with brake • without oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor/Brake connector

● Motor model Mass: 1.5 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF021L1B1 |
| | Key-way, center tap | MQMF021L1T1 |
| 200 V | Round | MQMF022L1B1 |
| | Key-way, center tap | MQMF022L1T1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Key way dimensions
-Key way, center tap shaft-

[Unit: mm]

Connector type (IP67) • with brake • with oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor/Brake connector

● Motor model Mass: 1.6 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF021L1D1 |
| | Key-way, center tap | MQMF021L1V1 |
| 200 V | Round | MQMF022L1D1 |
| | Key-way, center tap | MQMF022L1V1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Key way dimensions
-Key way, center tap shaft-

[Unit: mm]

Connector type (IP67) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor/Brake connector

● Motor model Mass: 1.7 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF021L1D3 |
| | Key-way, center tap | MQMF021L1V3 |
| 200 V | Round | MQMF022L1D3 |
| | Key-way, center tap | MQMF022L1V3 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

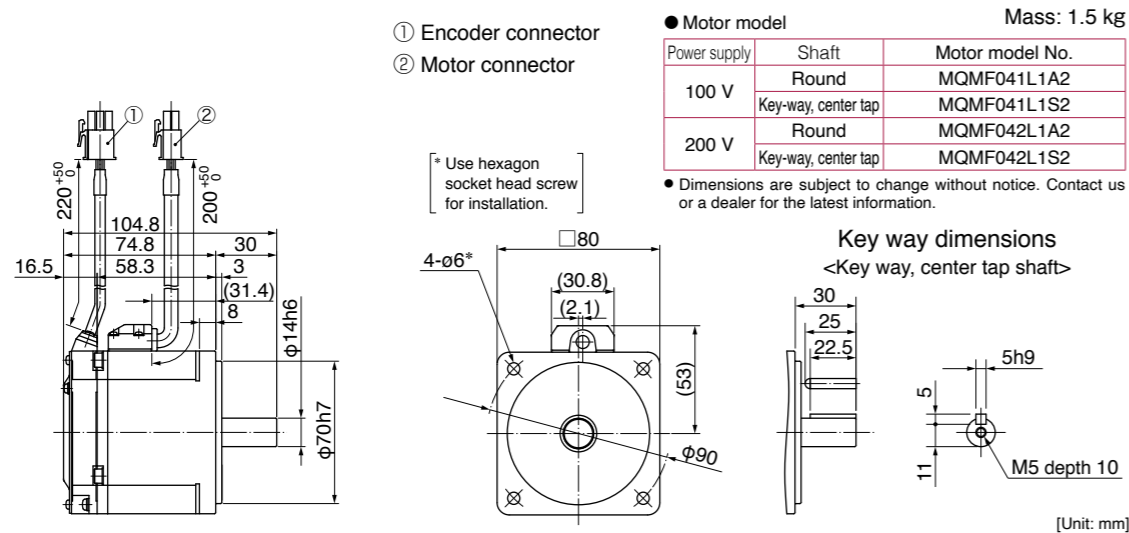
Key way dimensions
-Key way, center tap shaft-

[Unit: mm]

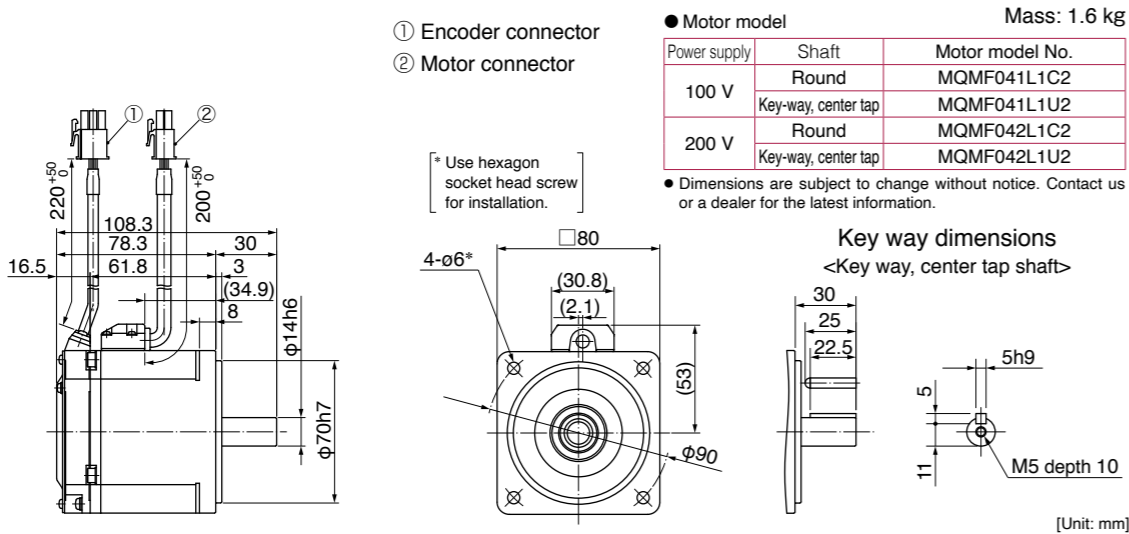
* For motors specifications, refer to P.81, P.82.

MQMF 400 W

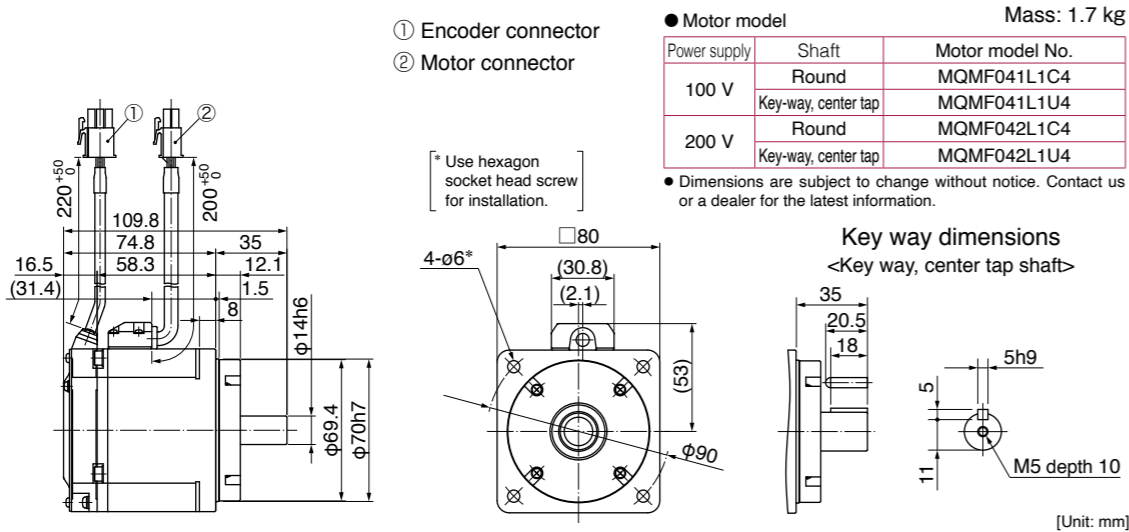
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



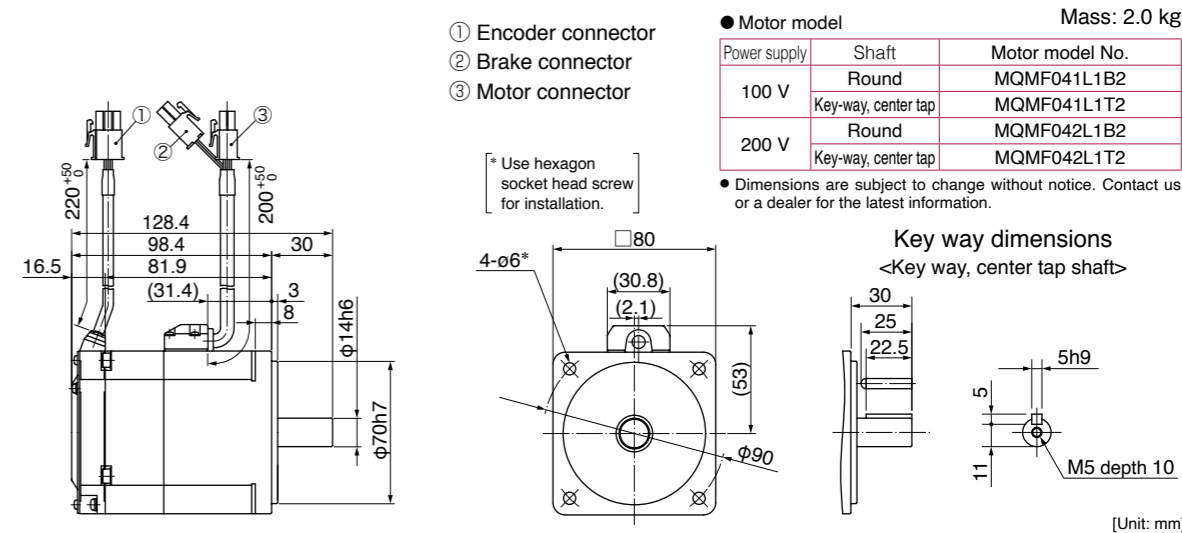
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



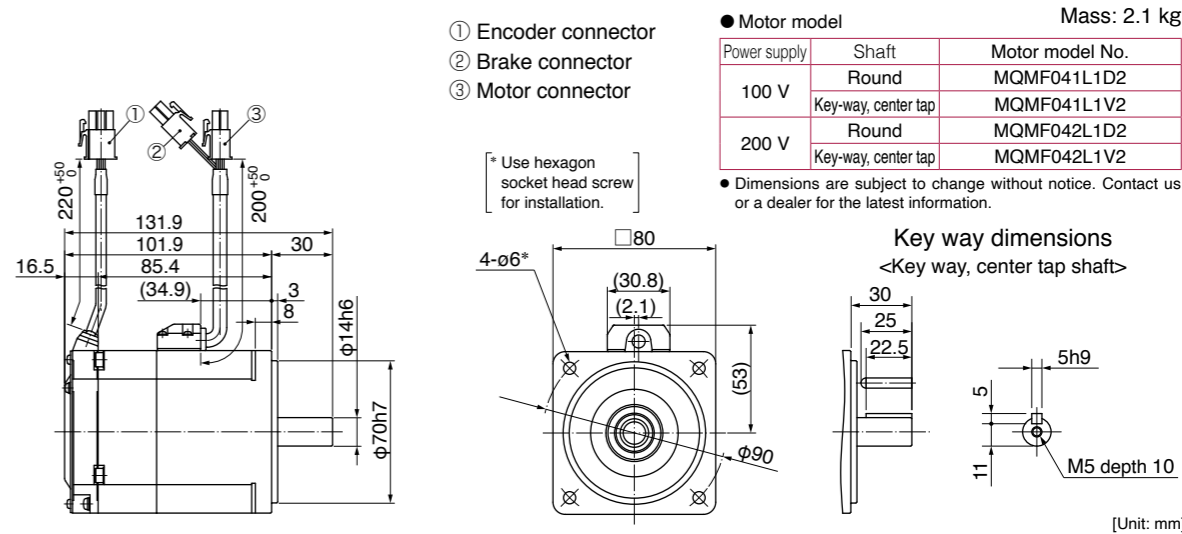
* For motors specifications, refer to P.83, P.84.

MQMF 400 W

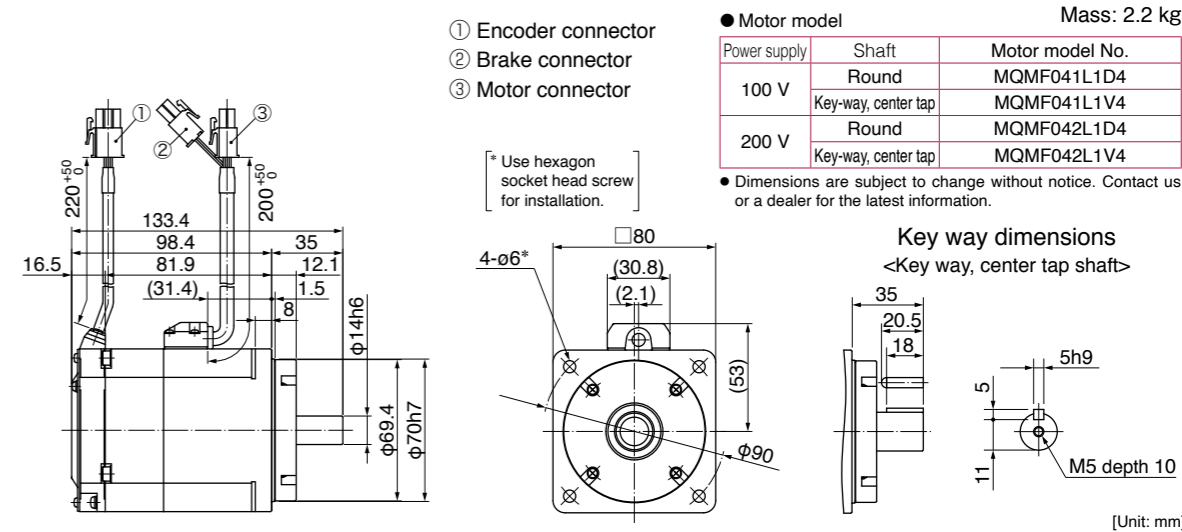
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



* For motors specifications, refer to P.83, P.84.

MQMF 400 W

Connector type (IP67) • without brake • without oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor connector

● Motor model Mass: 1.5 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF041L1A1 |
| | Key-way, center tap | MQMF041L1S1 |
| 200 V | Round | MQMF042L1A1 |
| | Key-way, center tap | MQMF042L1S1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
<Key way, center tap shaft>

[Unit: mm]

Connector type (IP67) • without brake • with oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor connector

● Motor model Mass: 1.6 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF041L1C1 |
| | Key-way, center tap | MQMF041L1U1 |
| 200 V | Round | MQMF042L1C1 |
| | Key-way, center tap | MQMF042L1U1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
<Key way, center tap shaft>

[Unit: mm]

Connector type (IP67) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor connector

● Motor model Mass: 1.7 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF041L1C3 |
| | Key-way, center tap | MQMF041L1U3 |
| 200 V | Round | MQMF042L1C3 |
| | Key-way, center tap | MQMF042L1U3 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
<Key way, center tap shaft>

[Unit: mm]

* For motors specifications, refer to P.83, P.84.

MQMF 400 W

Connector type (IP67) • with brake • without oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor/Brake connector

● Motor model Mass: 2.0 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF041L1B1 |
| | Key-way, center tap | MQMF041L1T1 |
| 200 V | Round | MQMF042L1B1 |
| | Key-way, center tap | MQMF042L1T1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
<Key way, center tap shaft>

[Unit: mm]

Connector type (IP67) • with brake • with oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor/Brake connector

● Motor model Mass: 2.1 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF041L1D1 |
| | Key-way, center tap | MQMF041L1V1 |
| 200 V | Round | MQMF042L1D1 |
| | Key-way, center tap | MQMF042L1V1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
<Key way, center tap shaft>

[Unit: mm]

Connector type (IP67) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft

① Encoder connector
② Motor/Brake connector

● Motor model Mass: 2.2 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MQMF041L1D3 |
| | Key-way, center tap | MQMF041L1V3 |
| 200 V | Round | MQMF042L1D3 |
| | Key-way, center tap | MQMF042L1V3 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

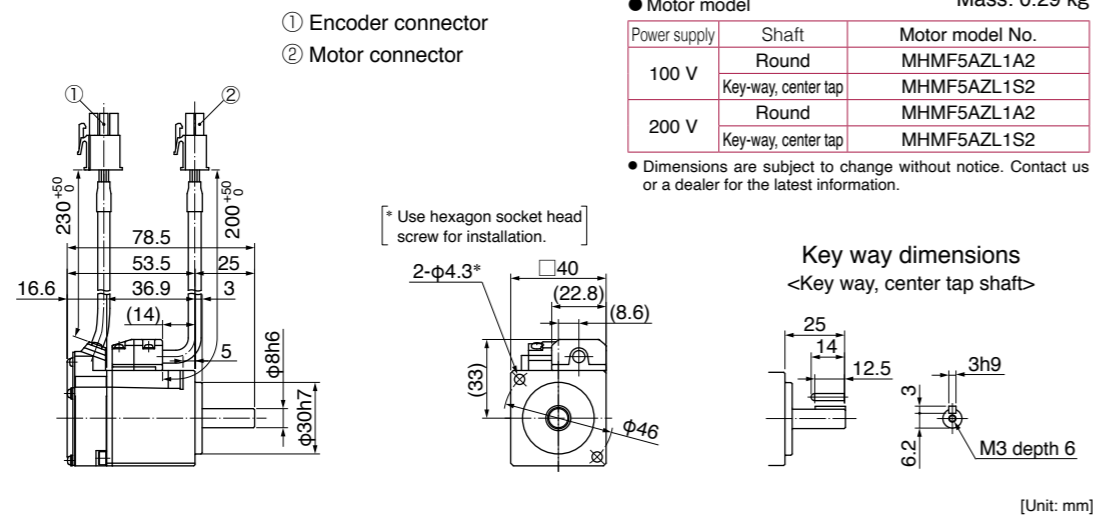
Key way dimensions
<Key way, center tap shaft>

[Unit: mm]

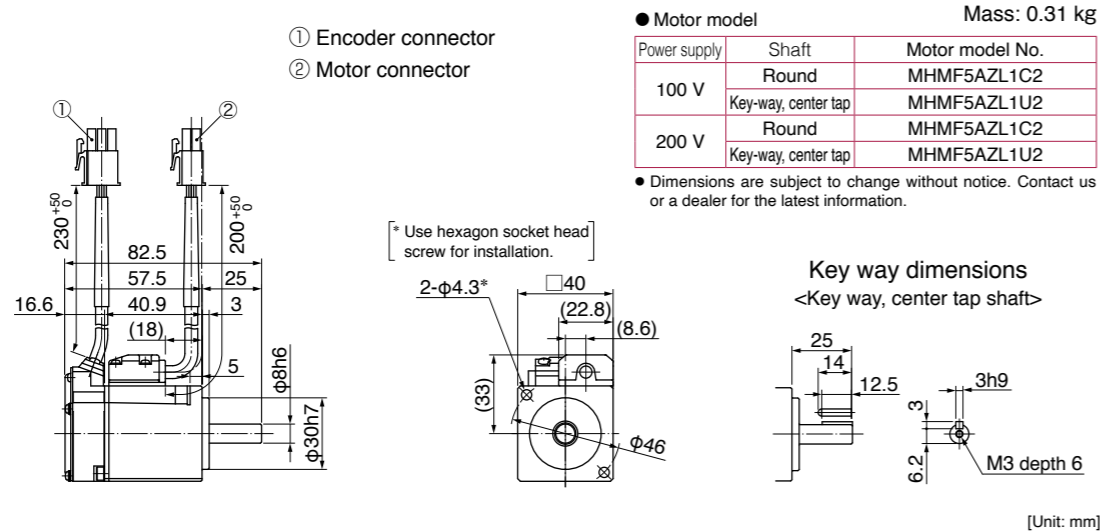
* For motors specifications, refer to P.83, P.84.

MHMF 50 W

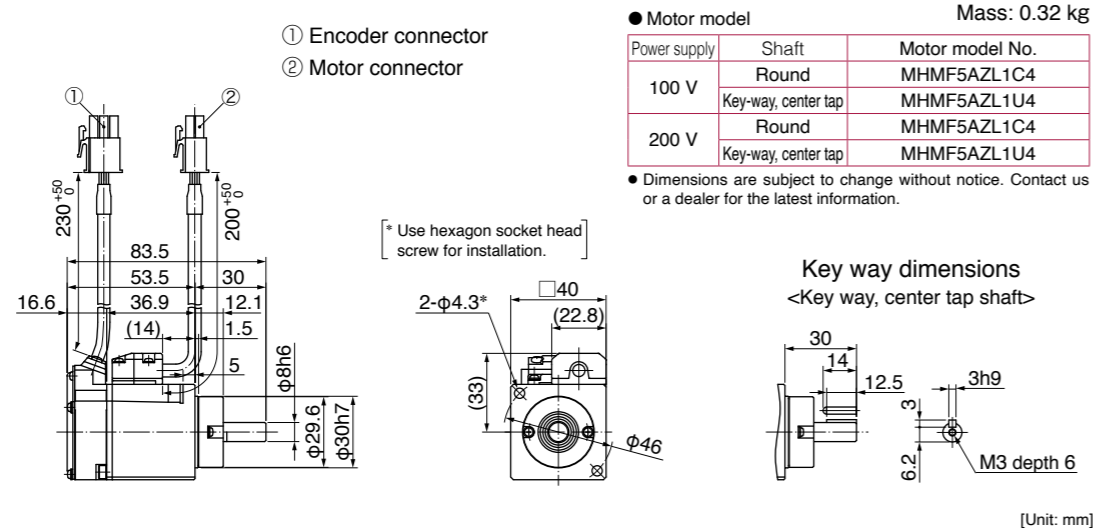
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



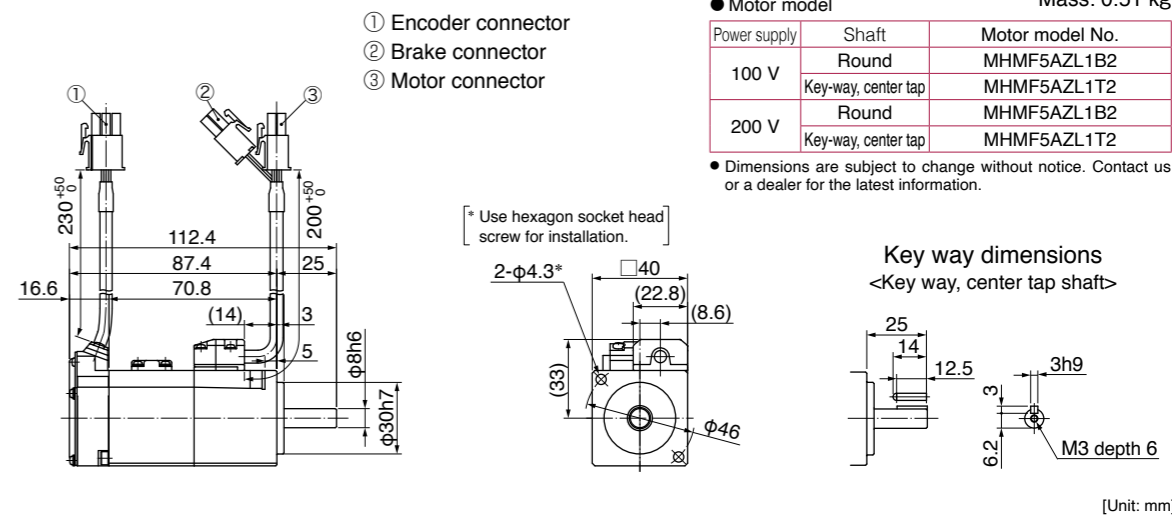
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



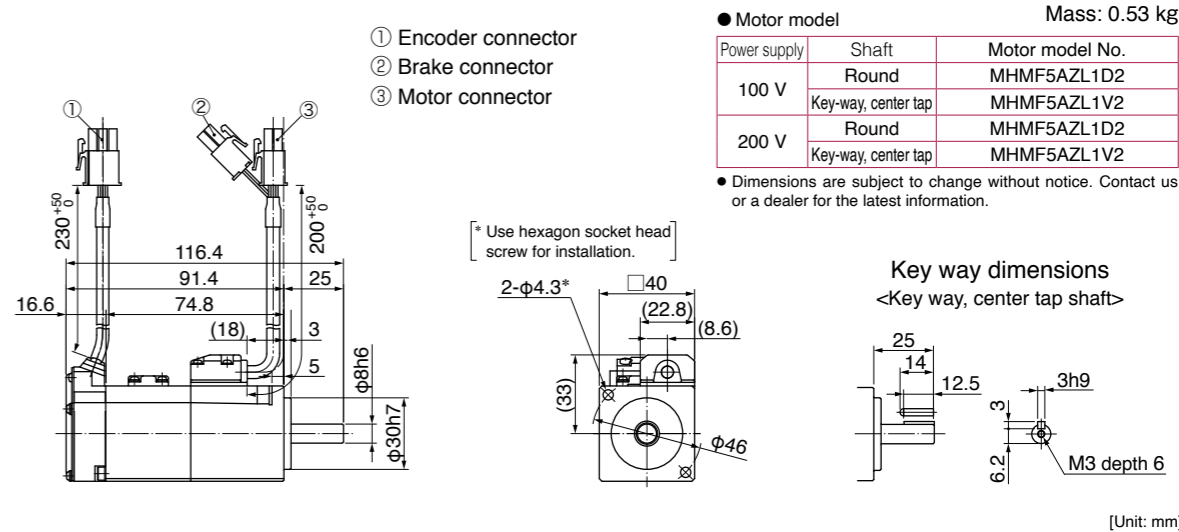
* For motors specifications, refer to P.85, P.86.

MHMF 50 W

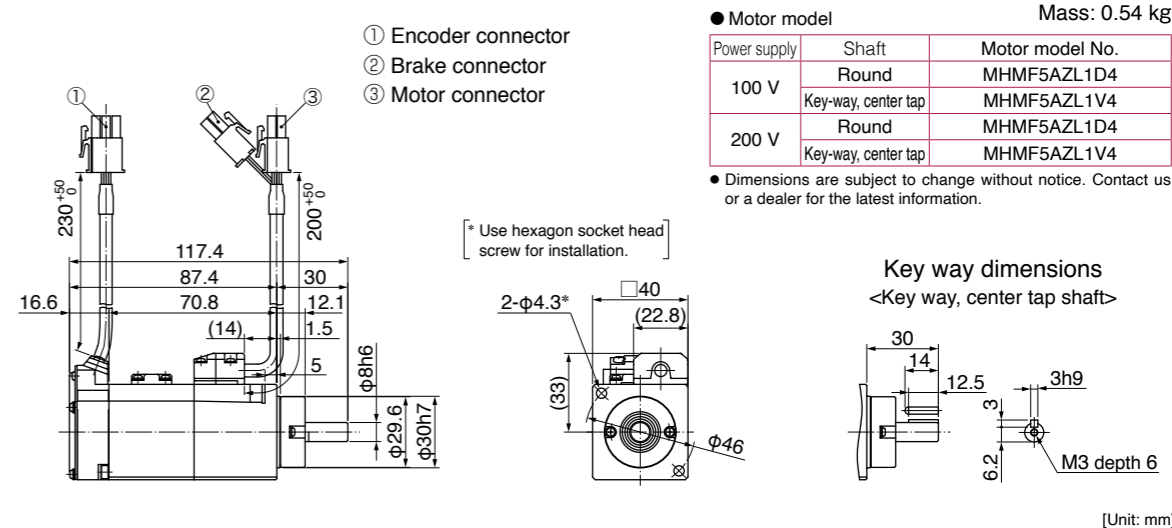
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



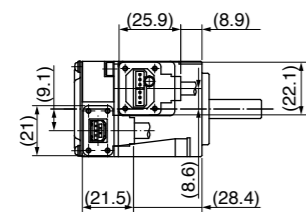
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



* For motors specifications, refer to P.85, P.86.

MHMF 50 W

Connector type (IP67) • without brake • without oil seal • Round shaft/ Key way, center tap shaft

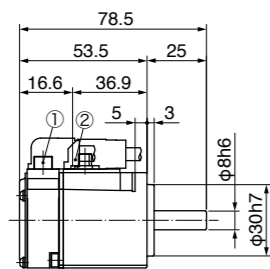


- ① Encoder connector
- ② Motor connector

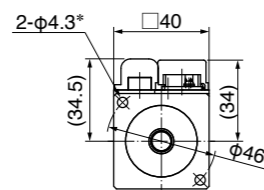
● Motor model Mass: 0.29 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF5AZL1A1 |
| | Key-way, center tap | MHMF5AZL1S1 |
| 200 V | Round | MHMF5AZL1A1 |
| | Key-way, center tap | MHMF5AZL1S1 |

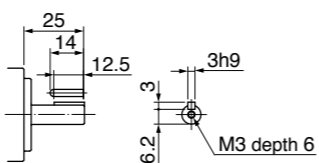
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



* Use hexagon socket head screw for installation.

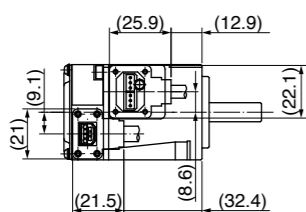


Key way dimensions <Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • without brake • with oil seal • Round shaft/ Key way, center tap shaft

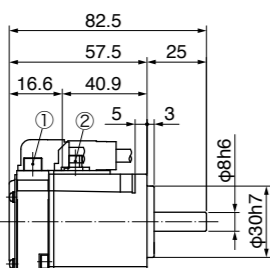


- ① Encoder connector
- ② Motor connector

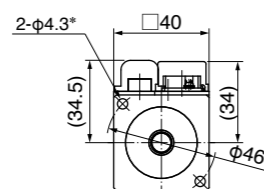
● Motor model Mass: 0.31 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF5AZL1C1 |
| | Key-way, center tap | MHMF5AZL1U1 |
| 200 V | Round | MHMF5AZL1C1 |
| | Key-way, center tap | MHMF5AZL1U1 |

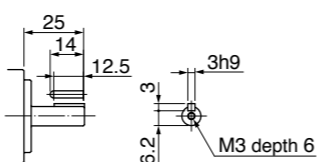
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



* Use hexagon socket head screw for installation.

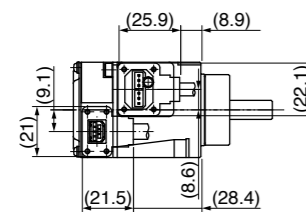


Key way dimensions <Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft

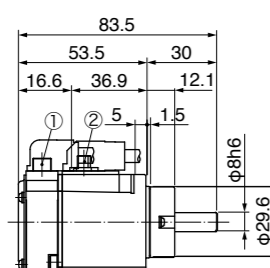


- ① Encoder connector
- ② Motor connector

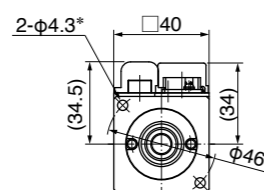
● Motor model Mass: 0.32 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF5AZL1C3 |
| | Key-way, center tap | MHMF5AZL1U3 |
| 200 V | Round | MHMF5AZL1C3 |
| | Key-way, center tap | MHMF5AZL1U3 |

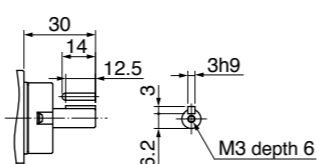
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



* Use hexagon socket head screw for installation.



Key way dimensions <Key way, center tap shaft>

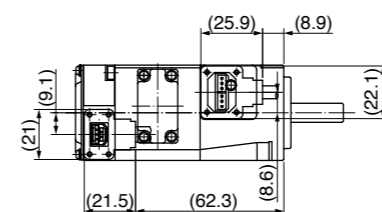


[Unit: mm]

* For motors specifications, refer to P.85, P.86.

MHMF 50 W

Connector type (IP67) • with brake • without oil seal • Round shaft/ Key way, center tap shaft

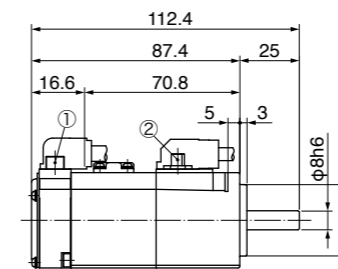


- ① Encoder connector
- ② Motor/Brake connector

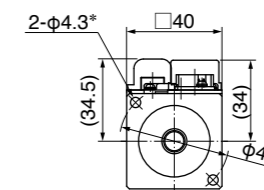
● Motor model Mass: 0.51 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF5AZL1B1 |
| | Key-way, center tap | MHMF5AZL1T1 |
| 200 V | Round | MHMF5AZL1B1 |
| | Key-way, center tap | MHMF5AZL1T1 |

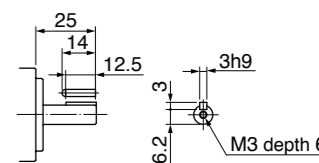
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



* Use hexagon socket head screw for installation.

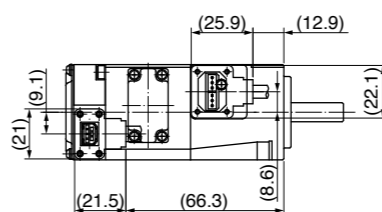


Key way dimensions <Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • with brake • with oil seal • Round shaft/ Key way, center tap shaft

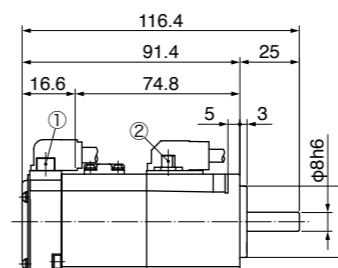


- ① Encoder connector
- ② Motor/Brake connector

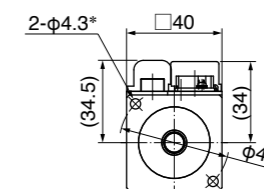
● Motor model Mass: 0.53 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF5AZL1D1 |
| | Key-way, center tap | MHMF5AZL1V1 |
| 200 V | Round | MHMF5AZL1D1 |
| | Key-way, center tap | MHMF5AZL1V1 |

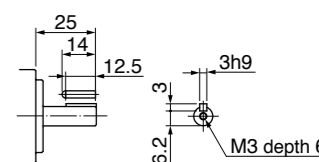
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



* Use hexagon socket head screw for installation.

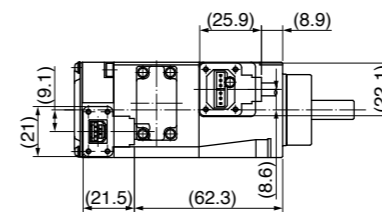


Key way dimensions <Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft

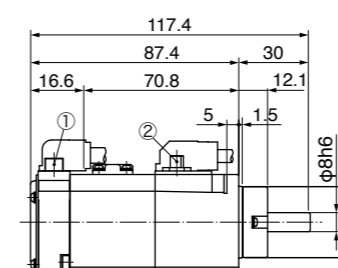


- ① Encoder connector
- ② Motor/Brake connector

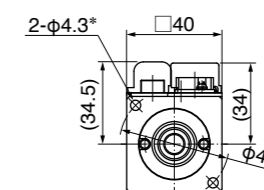
● Motor model Mass: 0.54 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF5AZL1D3 |
| | Key-way, center tap | MHMF5AZL1V3 |
| 200 V | Round | MHMF5AZL1D3 |
| | Key-way, center tap | MHMF5AZL1V3 |

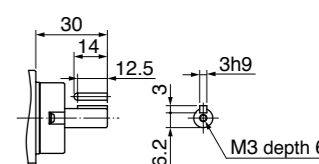
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.



* Use hexagon socket head screw for installation.



Key way dimensions <Key way, center tap shaft>

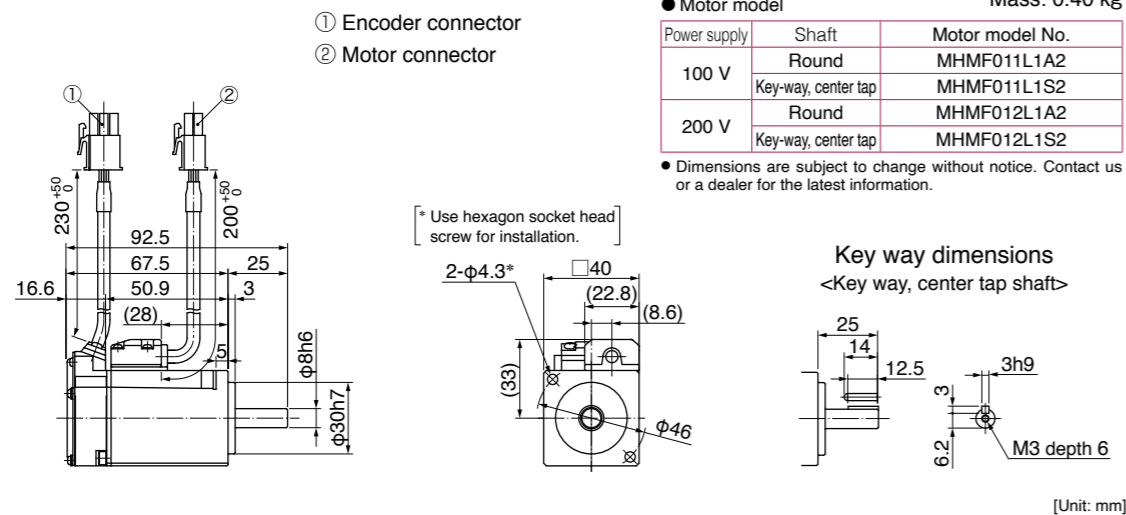


[Unit: mm]

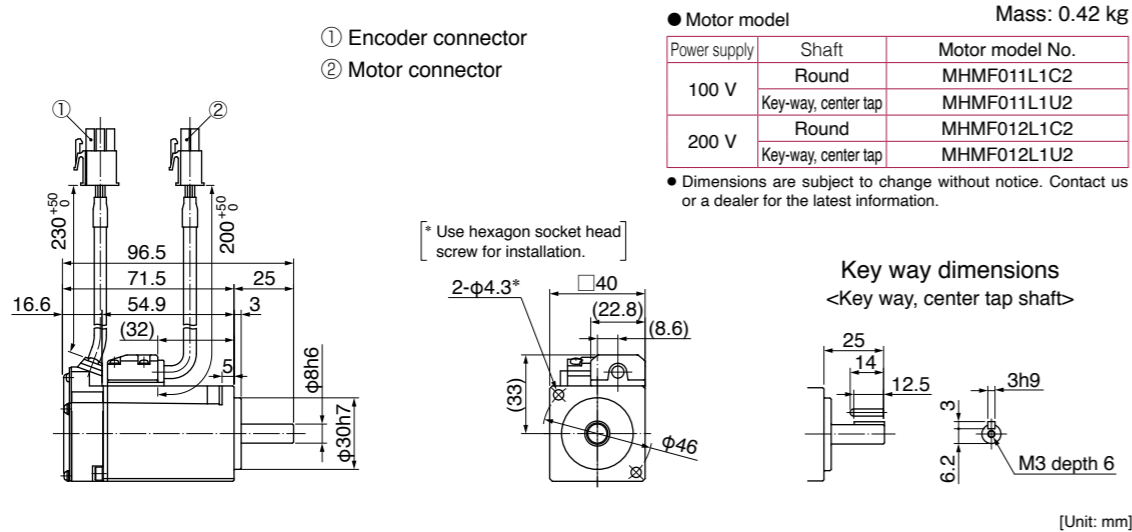
* For motors specifications, refer to P.85, P.86.

MHMF 100 W

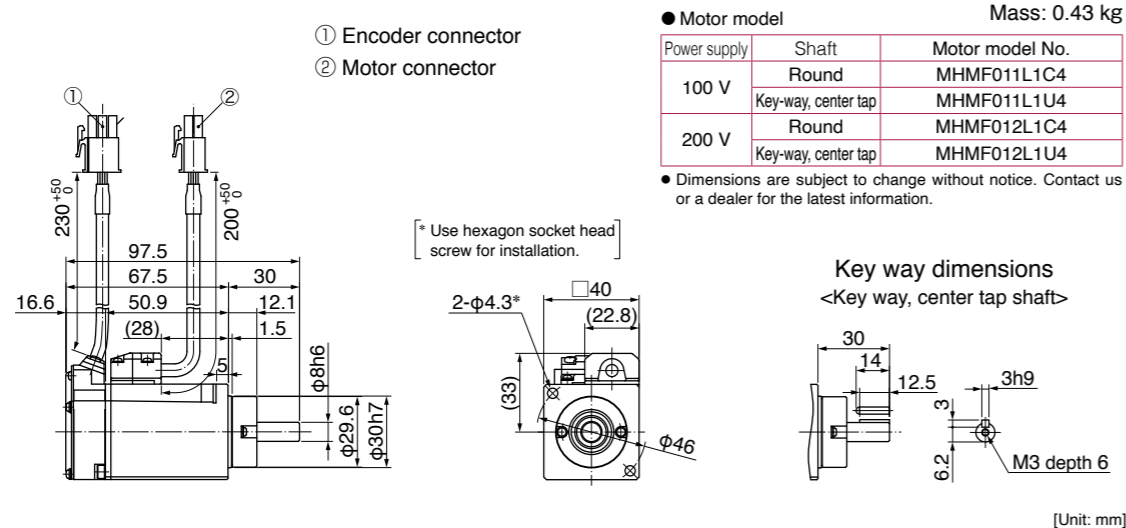
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



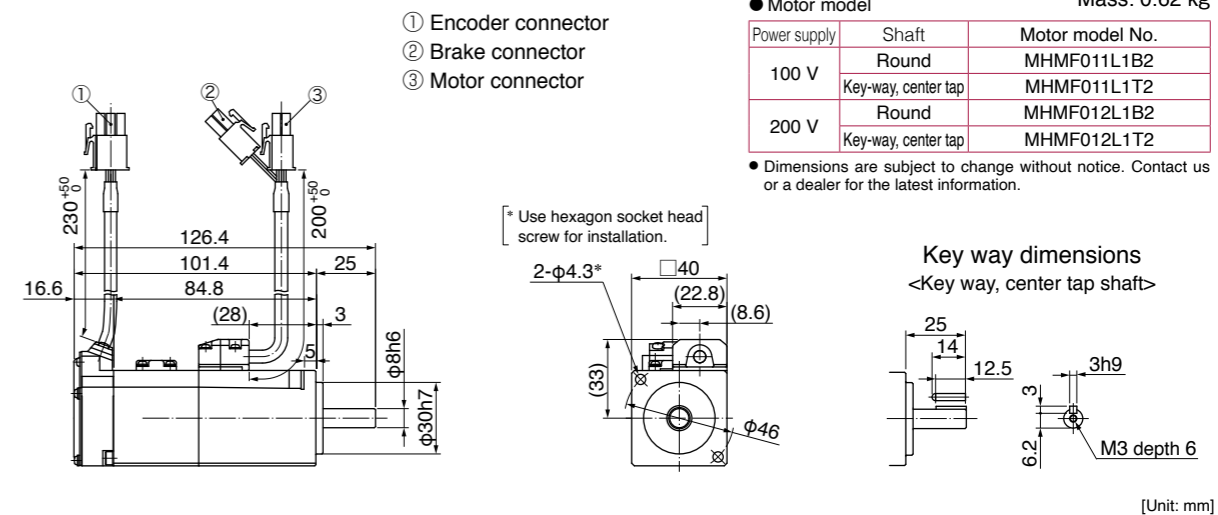
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



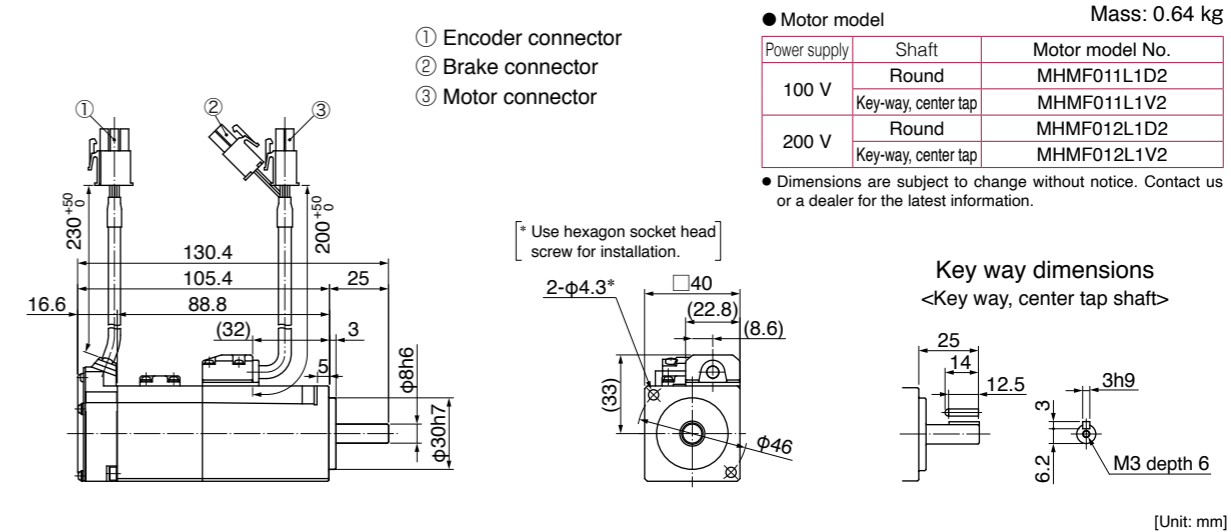
* For motors specifications, refer to P.87, P.88.

MHMF 100 W

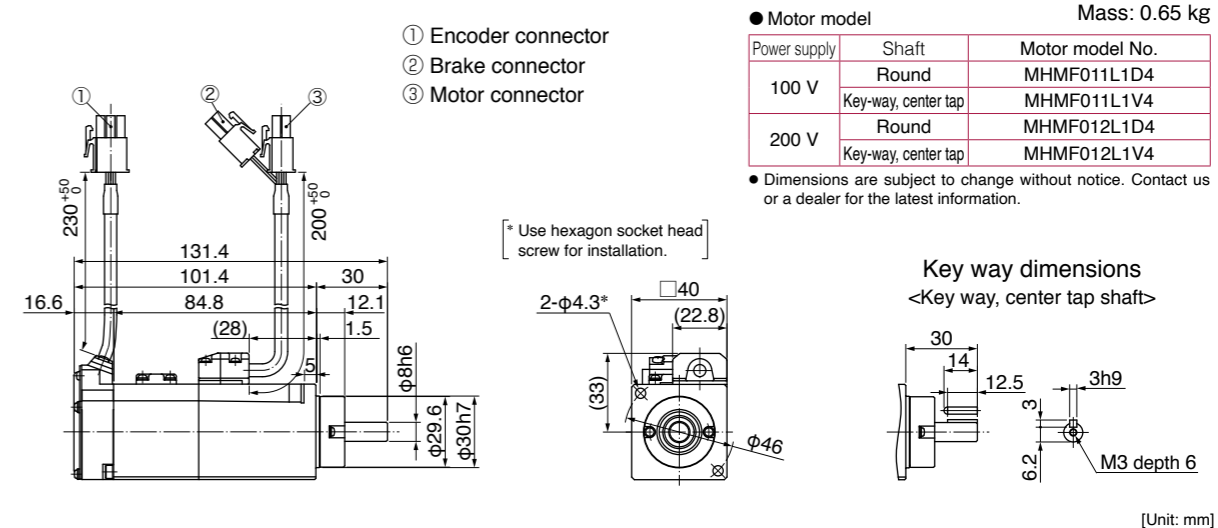
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



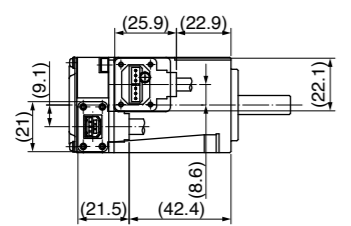
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



* For motors specifications, refer to P.87, P.88.

MHMF 100 W

Connector type (IP67) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



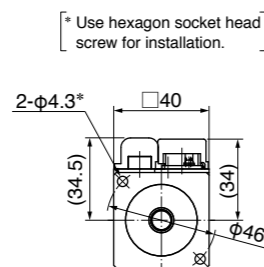
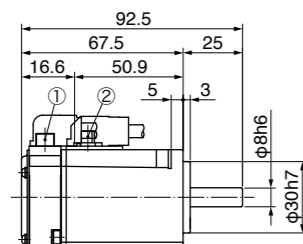
- ① Encoder connector
- ② Motor connector

● Motor model Mass: 0.40 kg

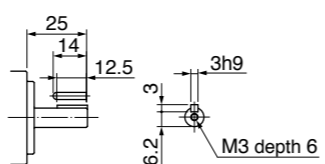
| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF011L1A1 |
| | Key-way, center tap | MHMF011L1S1 |
| 200 V | Round | MHMF012L1A1 |
| | Key-way, center tap | MHMF012L1S1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

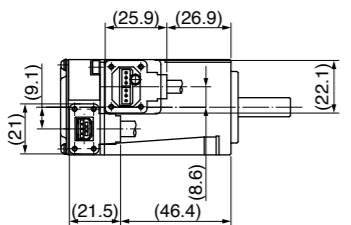


Key way dimensions
<Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



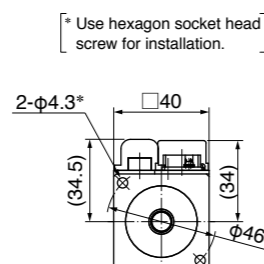
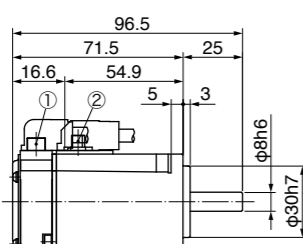
- ① Encoder connector
- ② Motor connector

● Motor model Mass: 0.42 kg

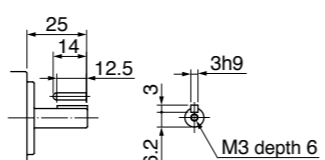
| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF011L1C1 |
| | Key-way, center tap | MHMF011L1U1 |
| 200 V | Round | MHMF012L1C1 |
| | Key-way, center tap | MHMF012L1U1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

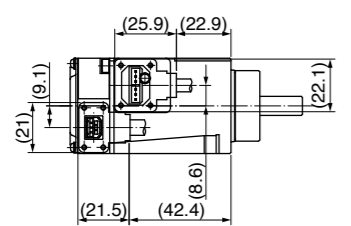


Key way dimensions
<Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



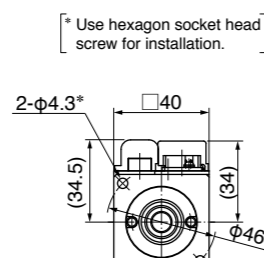
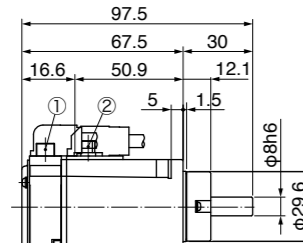
- ① Encoder connector
- ② Motor connector

● Motor model Mass: 0.43 kg

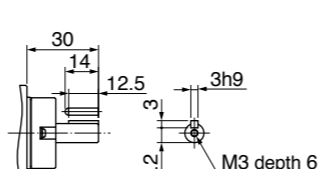
| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF011L1C3 |
| | Key-way, center tap | MHMF011L1U3 |
| 200 V | Round | MHMF012L1C3 |
| | Key-way, center tap | MHMF012L1U3 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.



Key way dimensions
<Key way, center tap shaft>

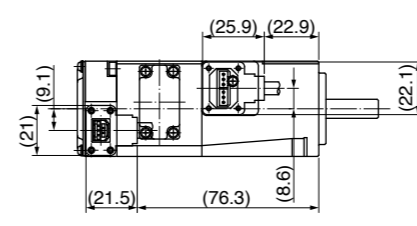


[Unit: mm]

* For motors specifications, refer to P.87, P.88.

MHMF 100 W

Connector type (IP67) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



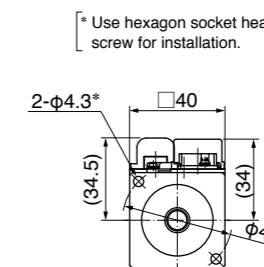
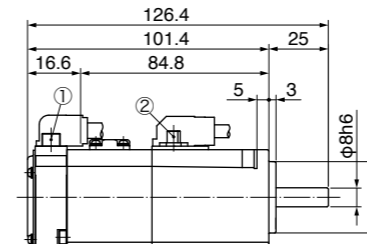
- ① Encoder connector
- ② Motor/Brake connector

● Motor model Mass: 0.62 kg

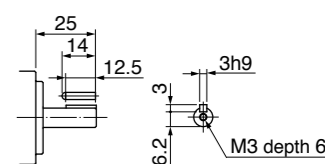
| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF011L1B1 |
| | Key-way, center tap | MHMF011L1T1 |
| 200 V | Round | MHMF012L1B1 |
| | Key-way, center tap | MHMF012L1T1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

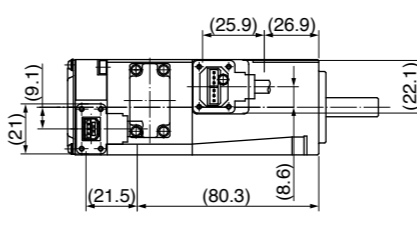


Key way dimensions
<Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



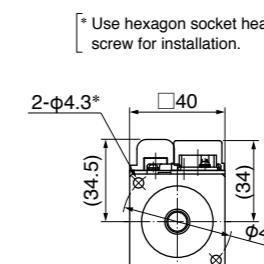
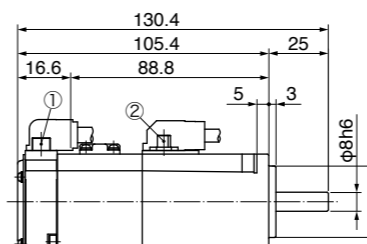
- ① Encoder connector
- ② Motor/Brake connector

● Motor model Mass: 0.64 kg

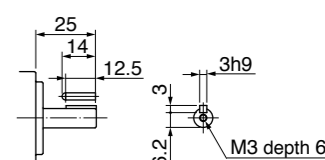
| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF011L1D1 |
| | Key-way, center tap | MHMF011L1V1 |
| 200 V | Round | MHMF012L1D1 |
| | Key-way, center tap | MHMF012L1V1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

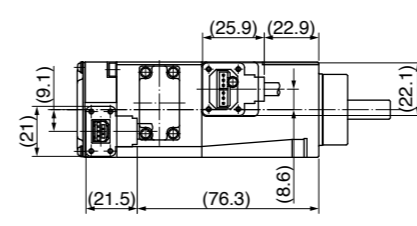


Key way dimensions
<Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



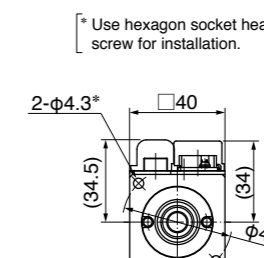
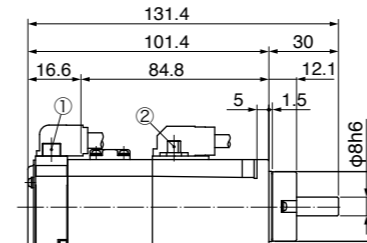
- ① Encoder connector
- ② Motor/Brake connector

● Motor model Mass: 0.65 kg

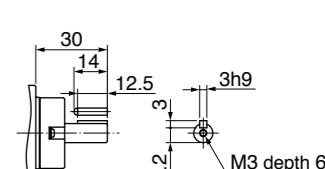
| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF011L1D3 |
| | Key-way, center tap | MHMF011L1V3 |
| 200 V | Round | MHMF012L1D3 |
| | Key-way, center tap | MHMF012L1V3 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.



Key way dimensions
<Key way, center tap shaft>

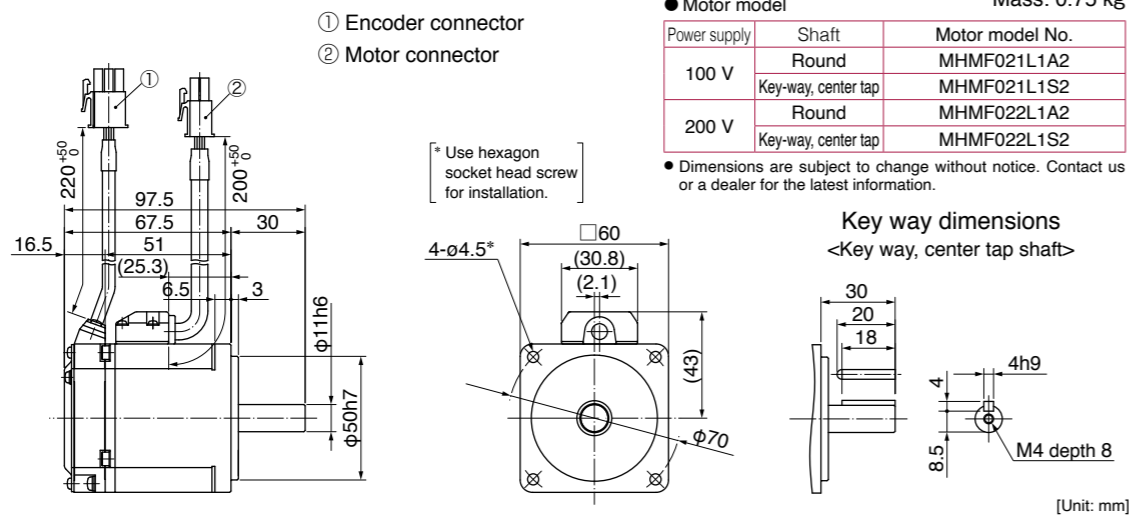


[Unit: mm]

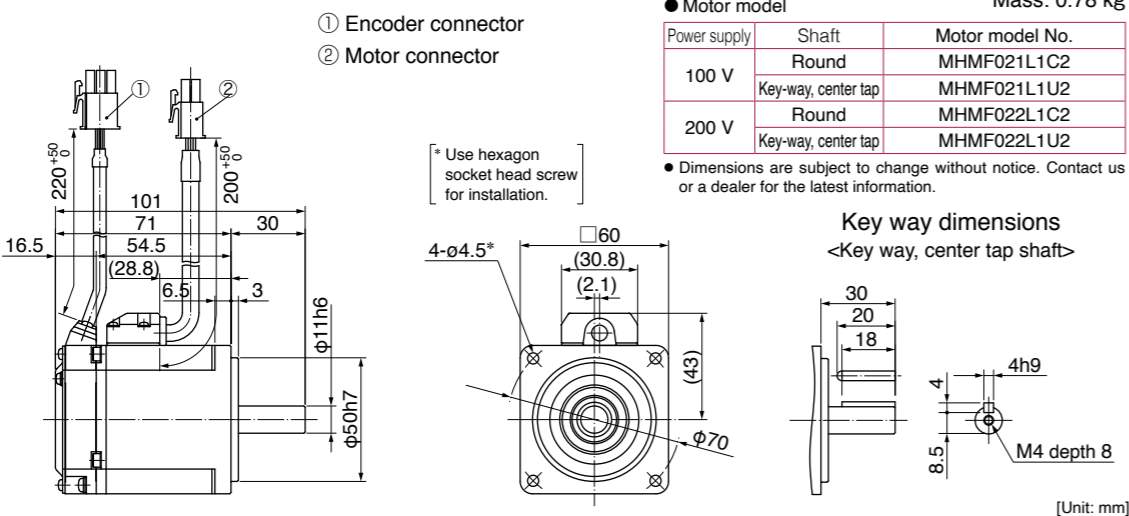
* For motors specifications, refer to P.87, P.88.

MHMF 200 W

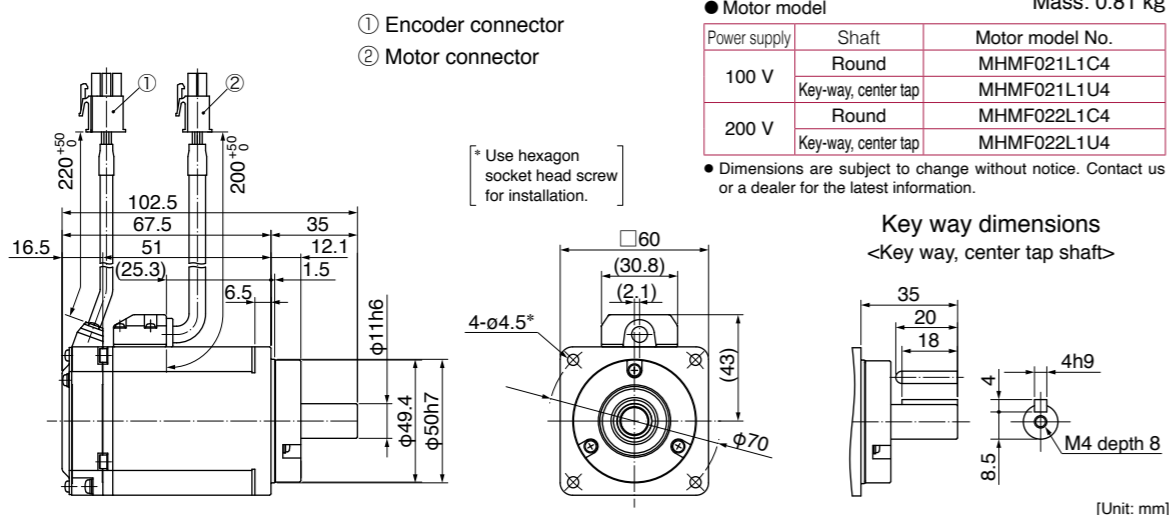
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



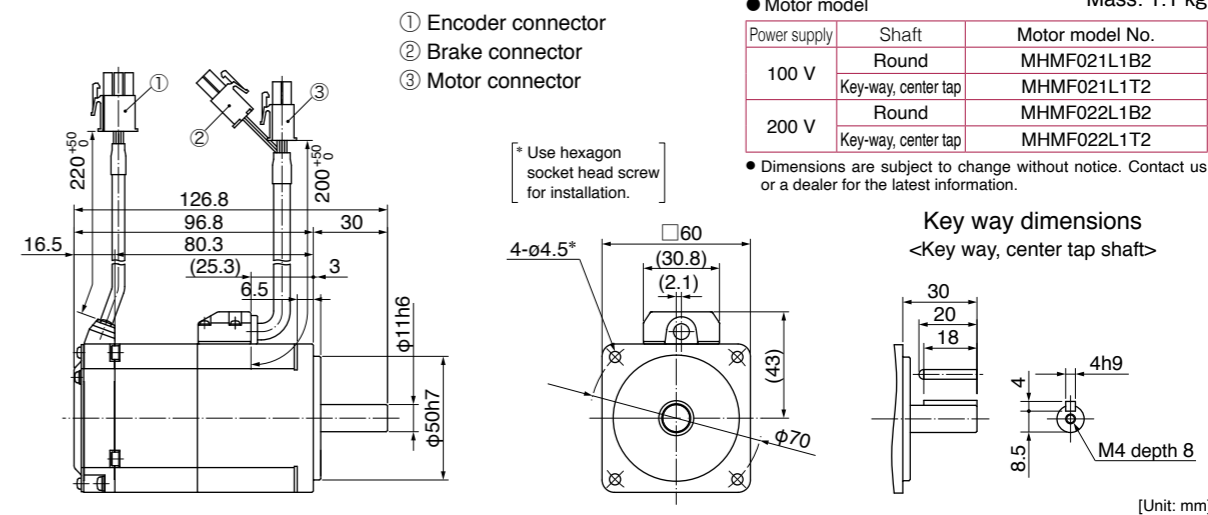
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



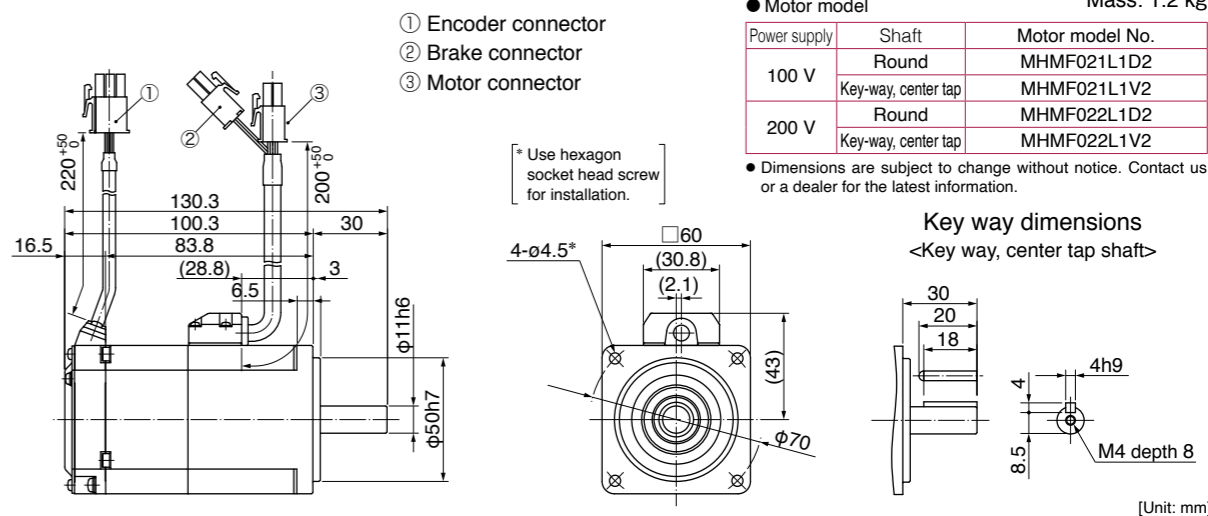
* For motors specifications, refer to P.89, P.90.

MHMF 200 W

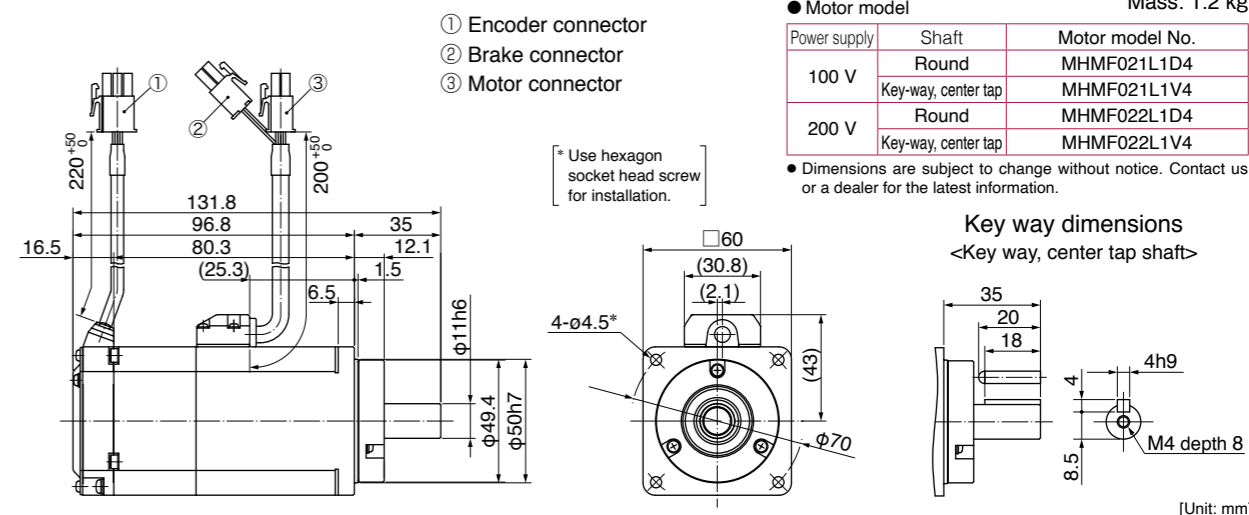
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



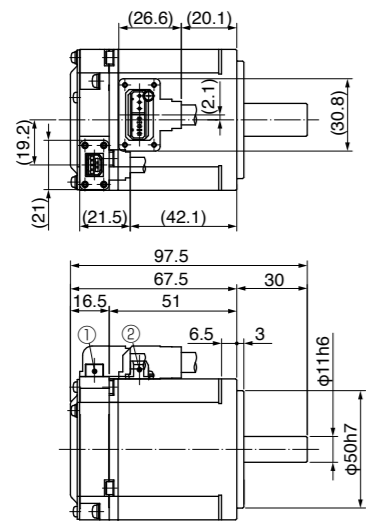
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



* For motors specifications, refer to P.89, P.90.

MHMF 200 W

Connector type (IP67) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



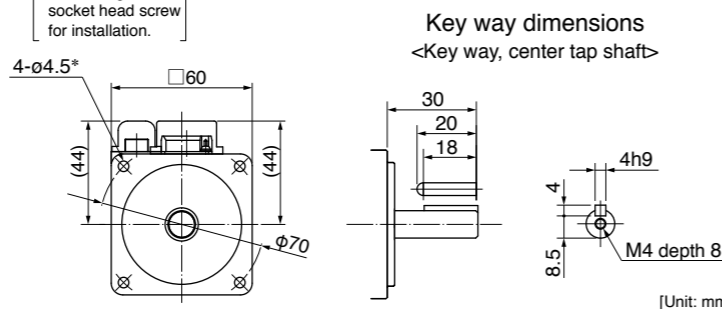
- ① Encoder connector
- ② Motor connector

● Motor model Mass: 0.75 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF021L1A1 |
| | Key-way, center tap | MHMF021L1S1 |
| 200 V | Round | MHMF022L1A1 |
| | Key-way, center tap | MHMF022L1S1 |

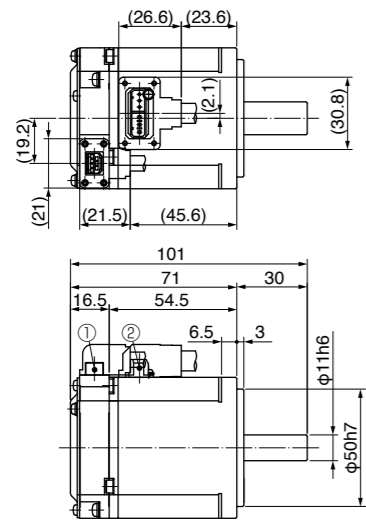
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.



[Unit: mm]

Connector type (IP67) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



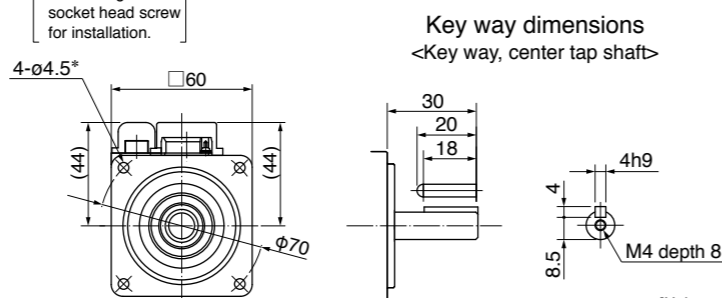
- ① Encoder connector
- ② Motor connector

● Motor model Mass: 0.78 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF021L1C1 |
| | Key-way, center tap | MHMF021L1U1 |
| 200 V | Round | MHMF022L1C1 |
| | Key-way, center tap | MHMF022L1U1 |

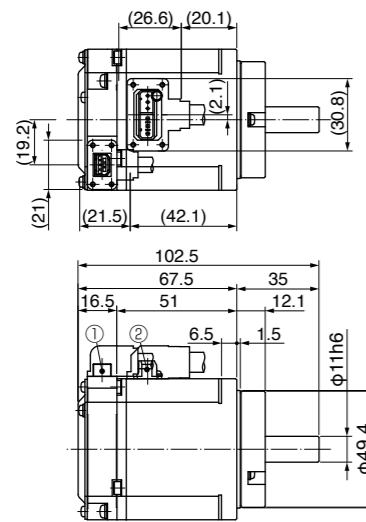
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.



[Unit: mm]

Connector type (IP67) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



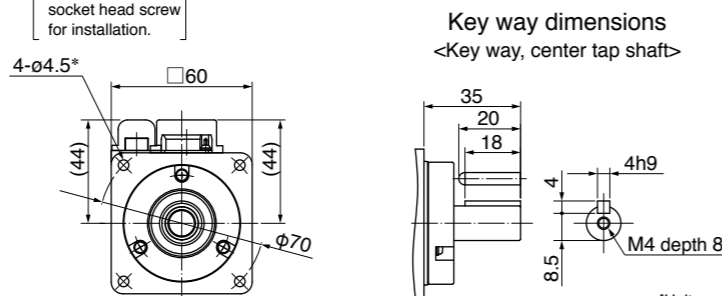
- ① Encoder connector
- ② Motor connector

● Motor model Mass: 0.81 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF021L1C3 |
| | Key-way, center tap | MHMF021L1U3 |
| 200 V | Round | MHMF022L1C3 |
| | Key-way, center tap | MHMF022L1U3 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

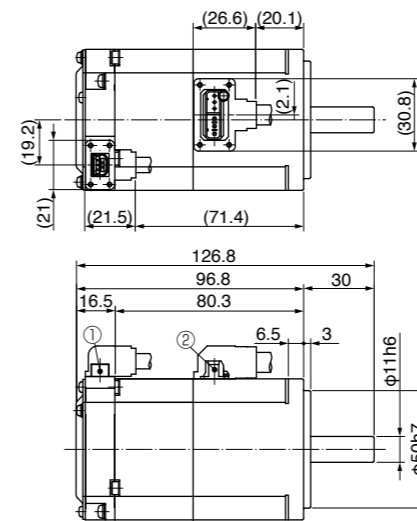


[Unit: mm]

* For motors specifications, refer to P.89, P.90.

MHMF 200 W

Connector type (IP67) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



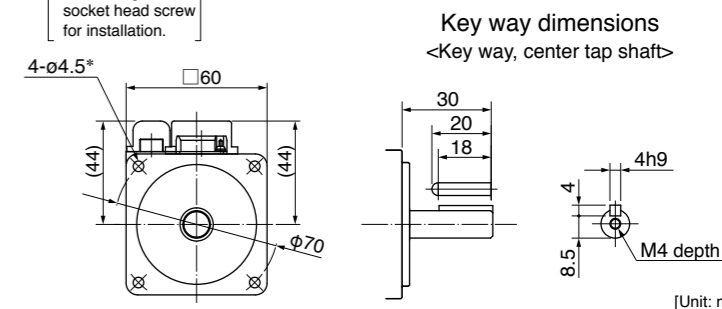
- ① Encoder connector
- ② Motor/Brake connector

● Motor model Mass: 1.1 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF021L1B1 |
| | Key-way, center tap | MHMF021L1T1 |
| 200 V | Round | MHMF022L1B1 |
| | Key-way, center tap | MHMF022L1T1 |

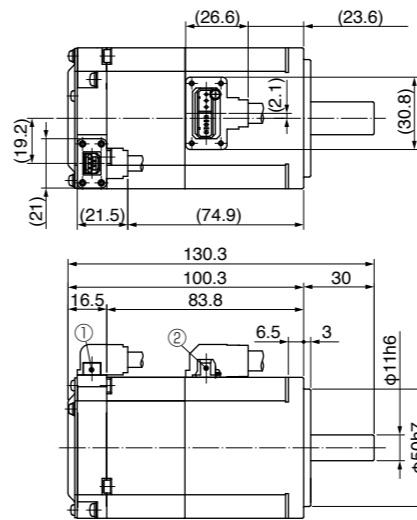
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.



[Unit: mm]

Connector type (IP67) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



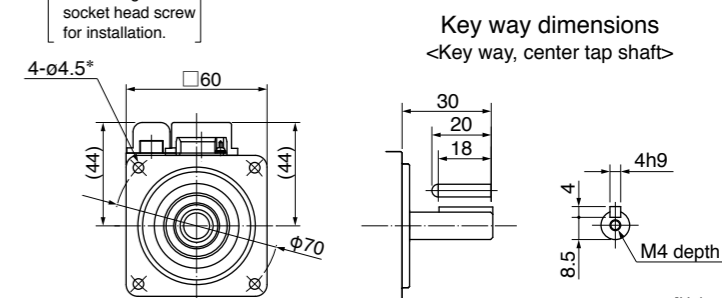
- ① Encoder connector
- ② Motor/Brake connector

● Motor model Mass: 1.2 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF021L1D1 |
| | Key-way, center tap | MHMF021L1V1 |
| 200 V | Round | MHMF022L1D1 |
| | Key-way, center tap | MHMF022L1V1 |

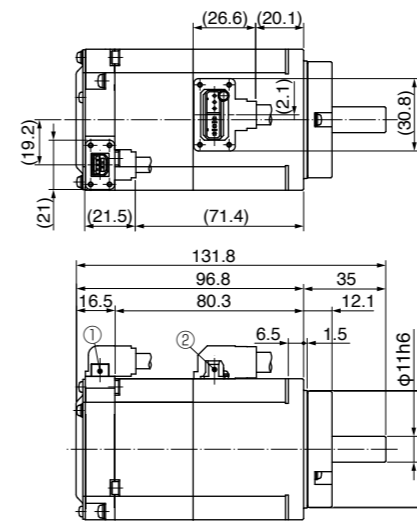
● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.



[Unit: mm]

Connector type (IP67) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



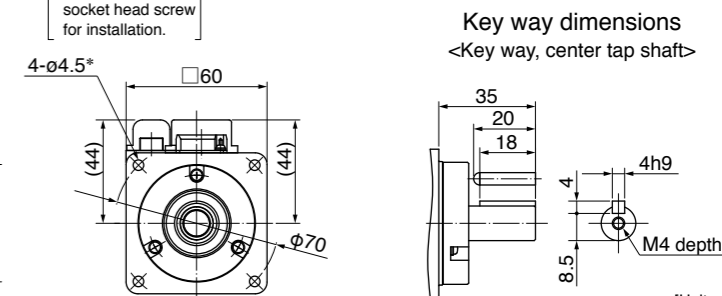
- ① Encoder connector
- ② Motor/Brake connector

● Motor model Mass: 1.2 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF021L1D3 |
| | Key-way, center tap | MHMF021L1V3 |
| 200 V | Round | MHMF022L1D3 |
| | Key-way, center tap | MHMF022L1V3 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

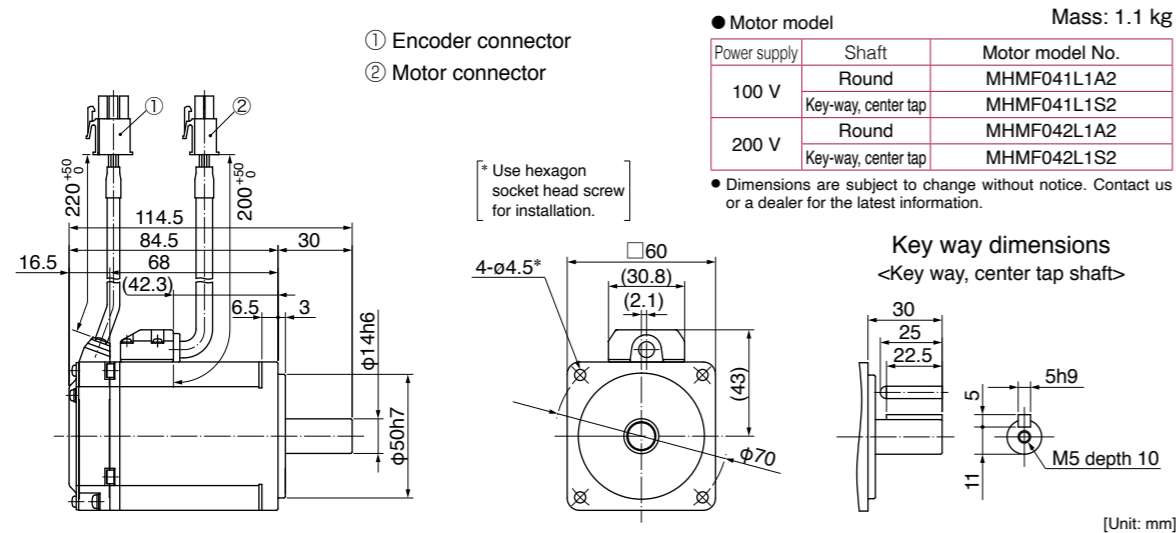


[Unit: mm]

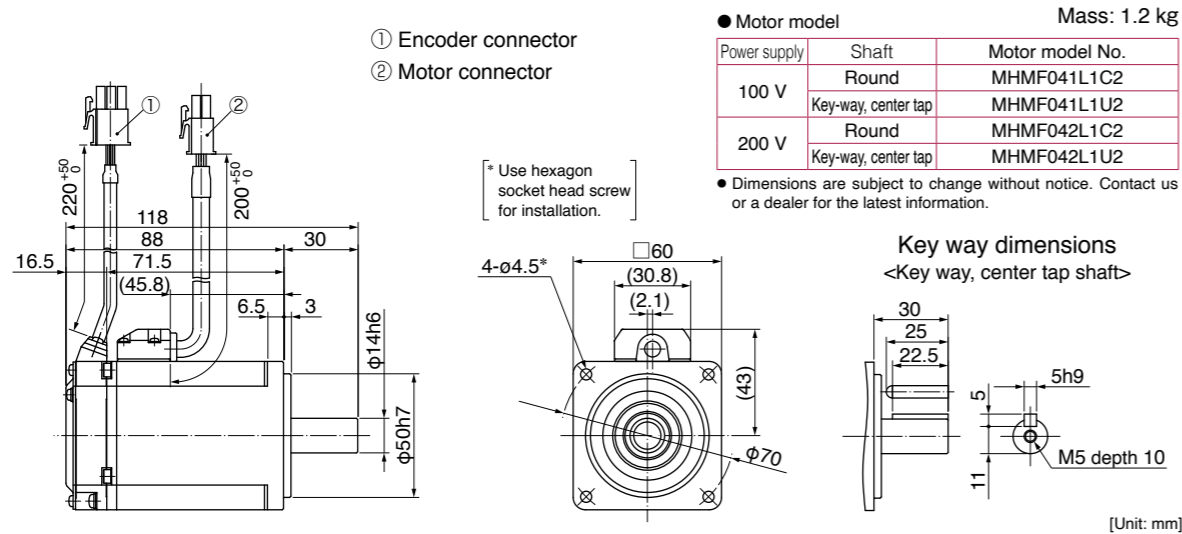
* For motors specifications, refer to P.89, P.90.

MHMF 400 W

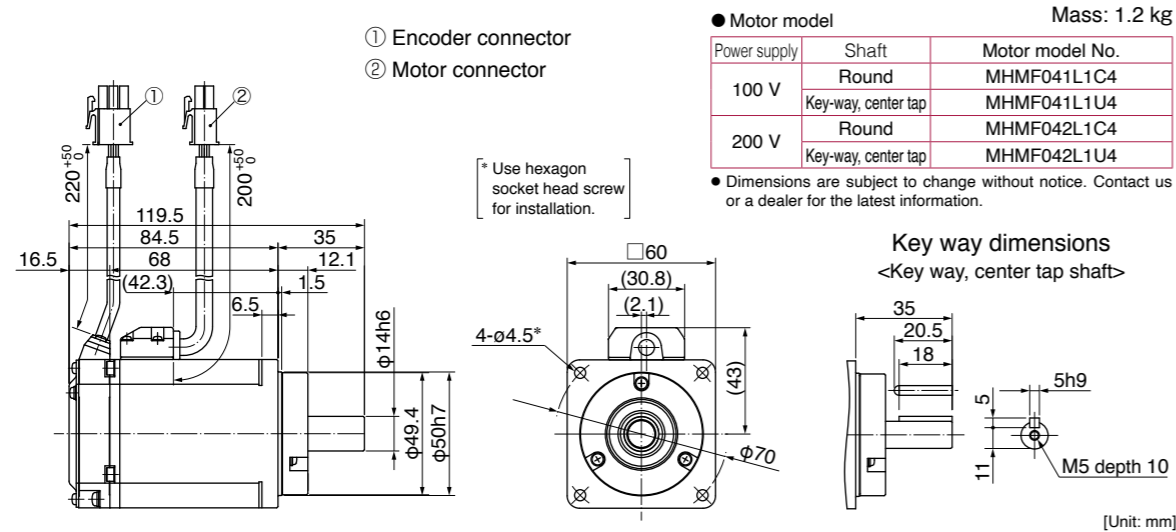
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



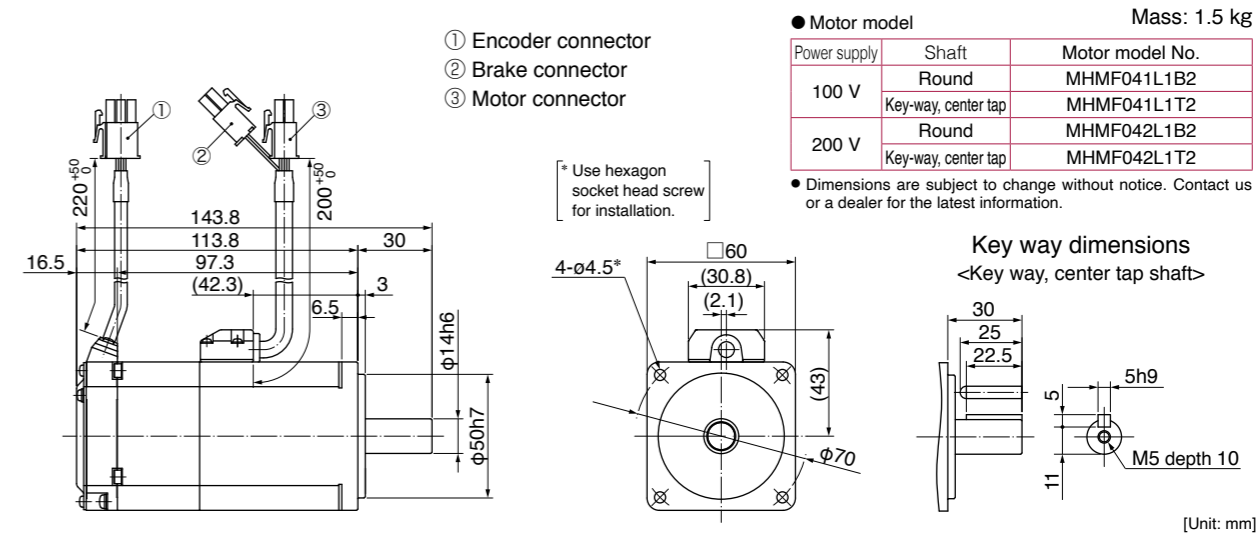
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



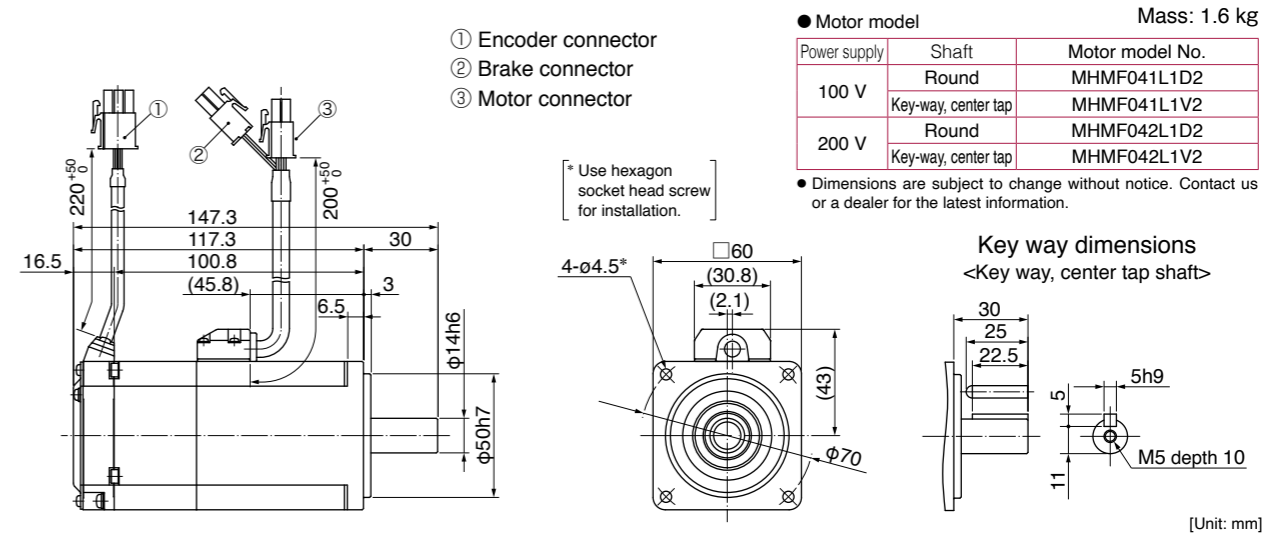
* For motors specifications, refer to P.91, P.92.

MHMF 400 W

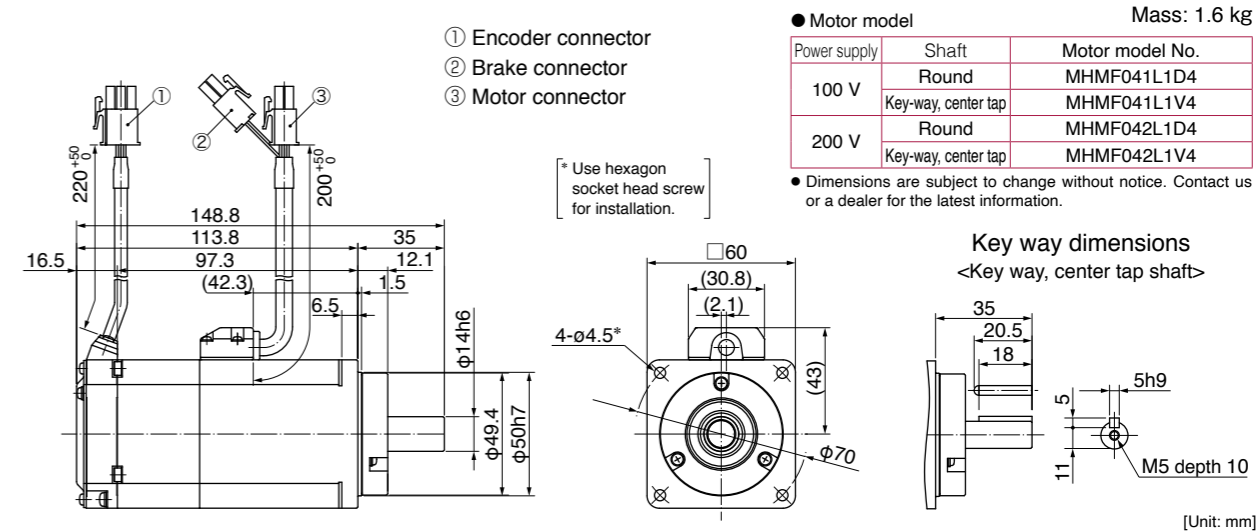
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



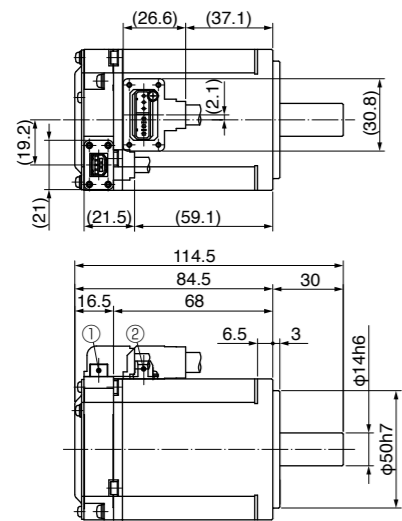
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



* For motors specifications, refer to P.91, P.92.

MHMF 400 W

Connector type (IP67) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



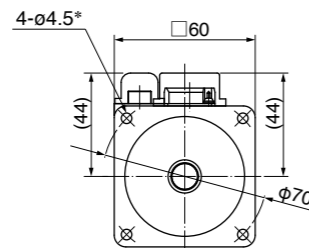
- ① Encoder connector
- ② Motor connector

● Motor model Mass: 1.1 kg

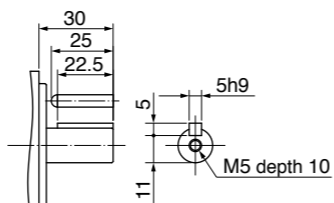
| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF041L1A1 |
| | Key-way, center tap | MHMF041L1S1 |
| 200 V | Round | MHMF042L1A1 |
| | Key-way, center tap | MHMF042L1S1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

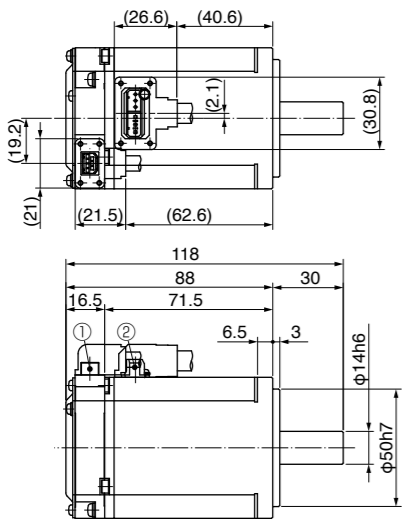


Key way dimensions
<Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



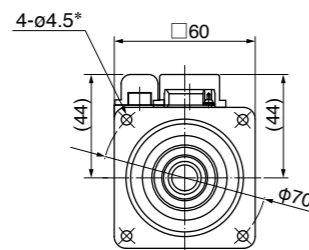
- ① Encoder connector
- ② Motor connector

● Motor model Mass: 1.2 kg

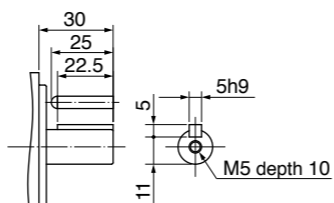
| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF041L1C1 |
| | Key-way, center tap | MHMF041L1U1 |
| 200 V | Round | MHMF042L1C1 |
| | Key-way, center tap | MHMF042L1U1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

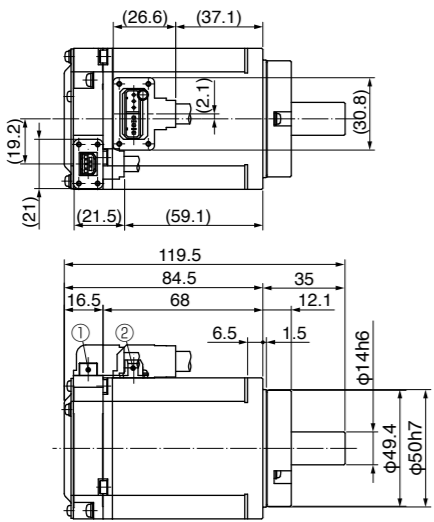


Key way dimensions
<Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



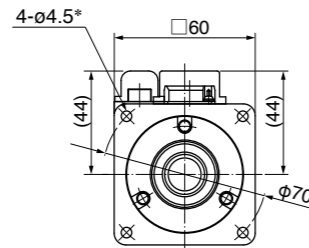
- ① Encoder connector
- ② Motor connector

● Motor model Mass: 1.2 kg

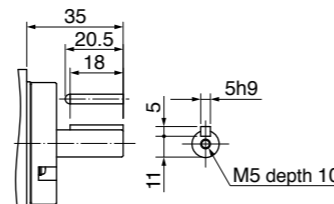
| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF041L1C3 |
| | Key-way, center tap | MHMF041L1U3 |
| 200 V | Round | MHMF042L1C3 |
| | Key-way, center tap | MHMF042L1U3 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.



Key way dimensions
<Key way, center tap shaft>

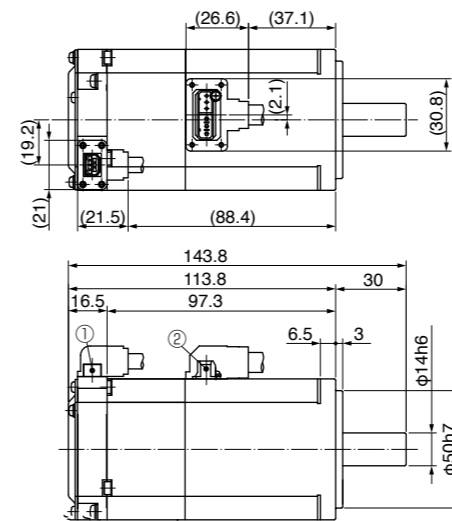


[Unit: mm]

* For motors specifications, refer to P.91, P.92.

MHMF 400 W

Connector type (IP67) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



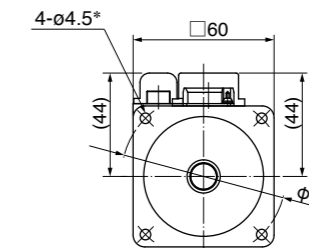
- ① Encoder connector
- ② Motor/Brake connector

● Motor model Mass: 1.5 kg

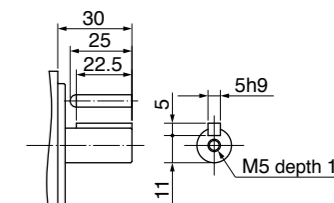
| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF041L1B1 |
| | Key-way, center tap | MHMF041L1T1 |
| 200 V | Round | MHMF042L1B1 |
| | Key-way, center tap | MHMF042L1T1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

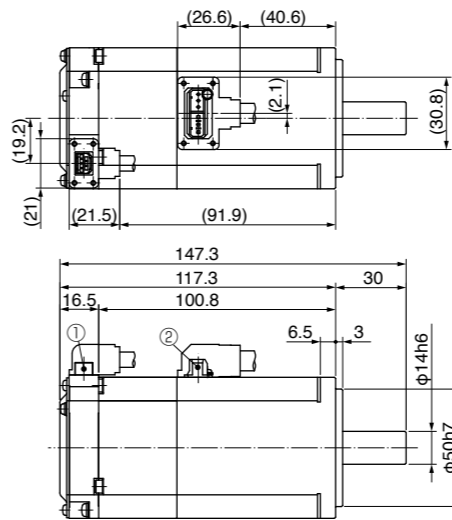


Key way dimensions
<Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



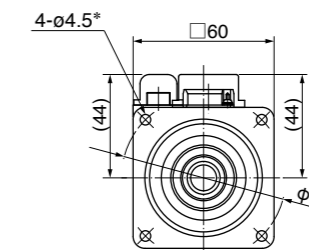
- ① Encoder connector
- ② Motor/Brake connector

● Motor model Mass: 1.6 kg

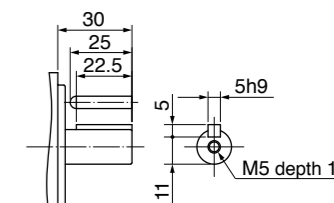
| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF041L1D1 |
| | Key-way, center tap | MHMF041L1V1 |
| 200 V | Round | MHMF042L1D1 |
| | Key-way, center tap | MHMF042L1V1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

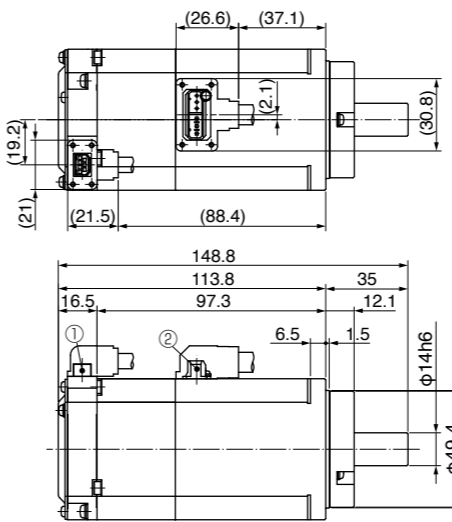


Key way dimensions
<Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



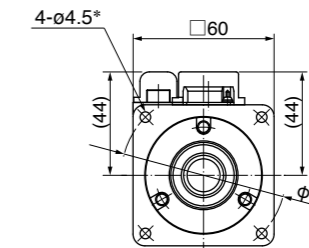
- ① Encoder connector
- ② Motor/Brake connector

● Motor model Mass: 1.6 kg

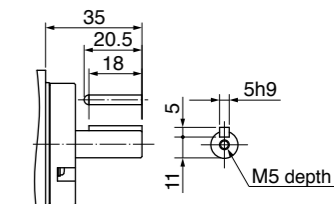
| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 100 V | Round | MHMF041L1D3 |
| | Key-way, center tap | MHMF041L1V3 |
| 200 V | Round | MHMF042L1D3 |
| | Key-way, center tap | MHMF042L1V3 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.



Key way dimensions
<Key way, center tap shaft>

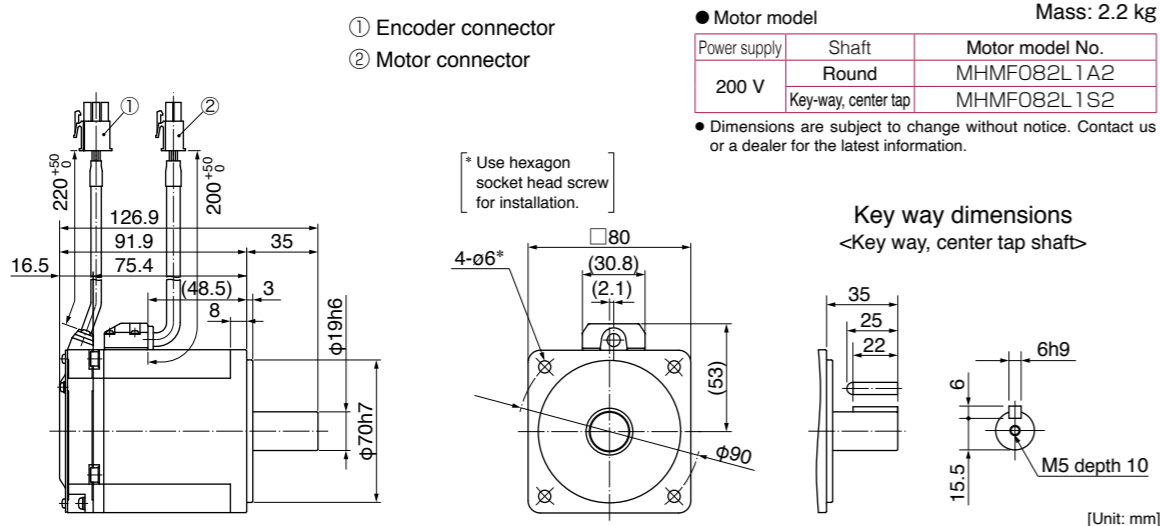


[Unit: mm]

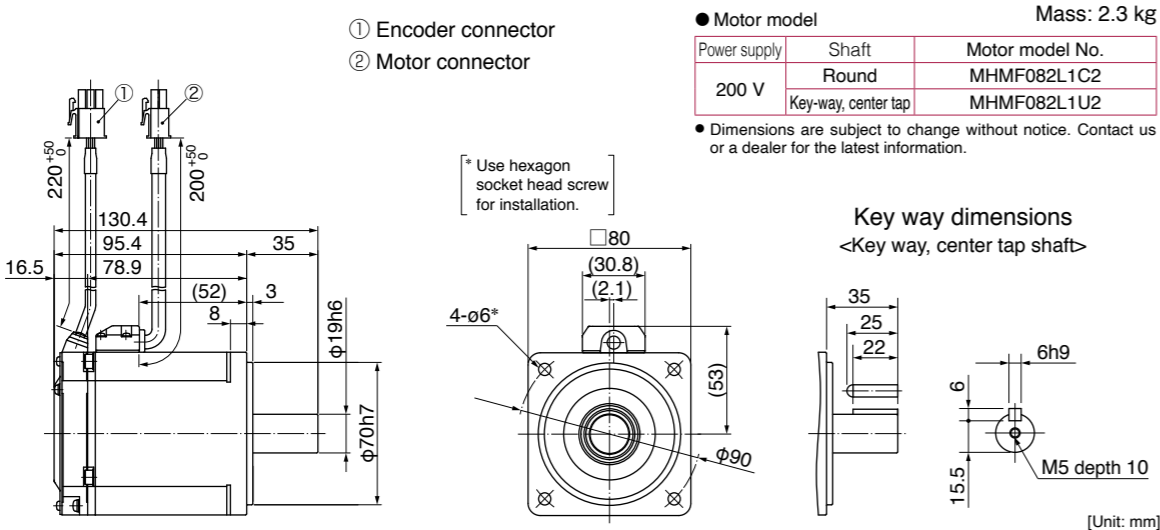
* For motors specifications, refer to P.91, P.92.

MHMF 750 W

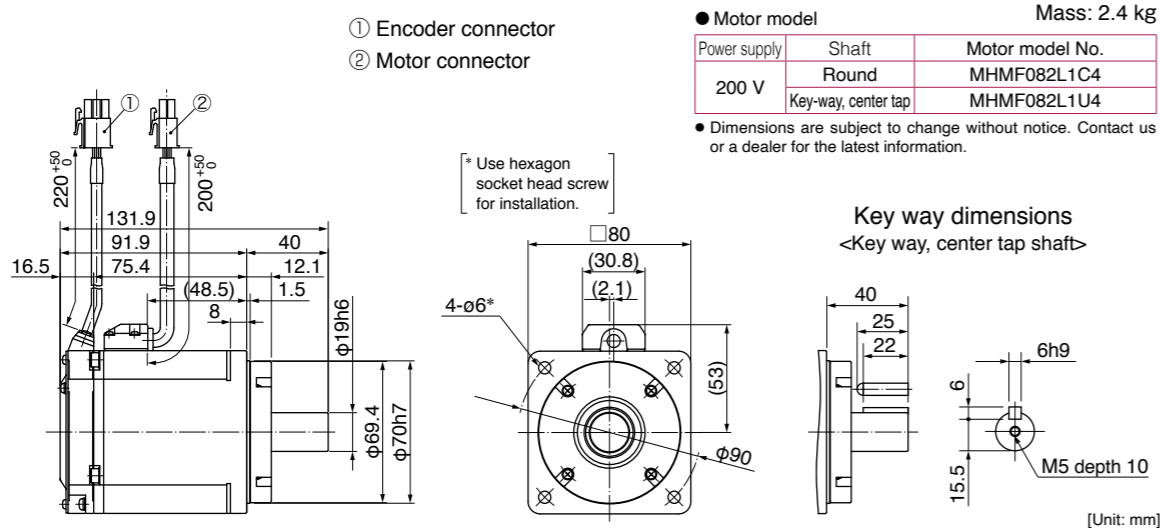
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



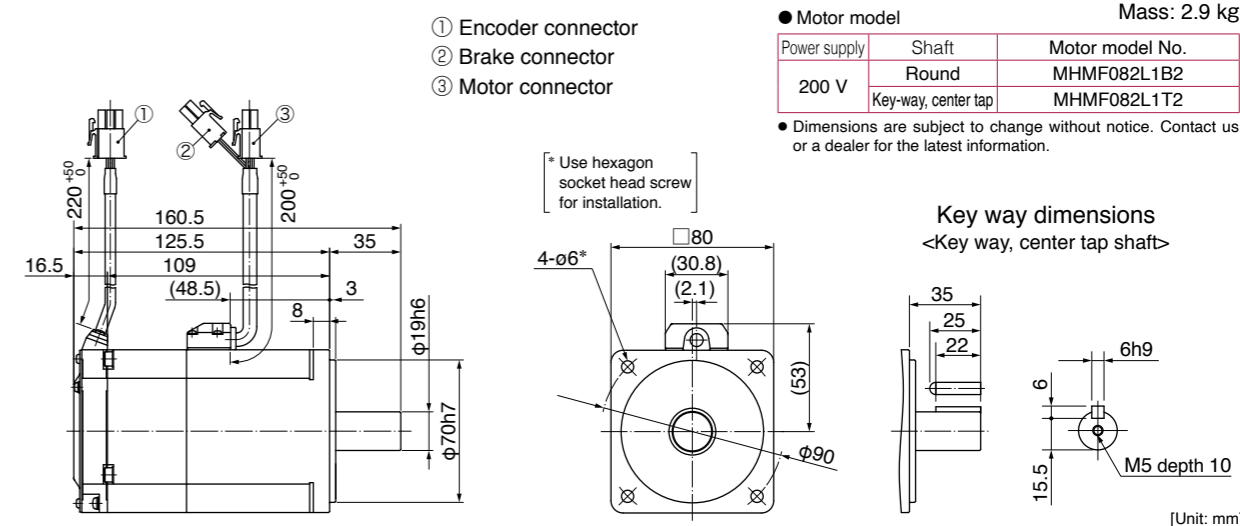
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



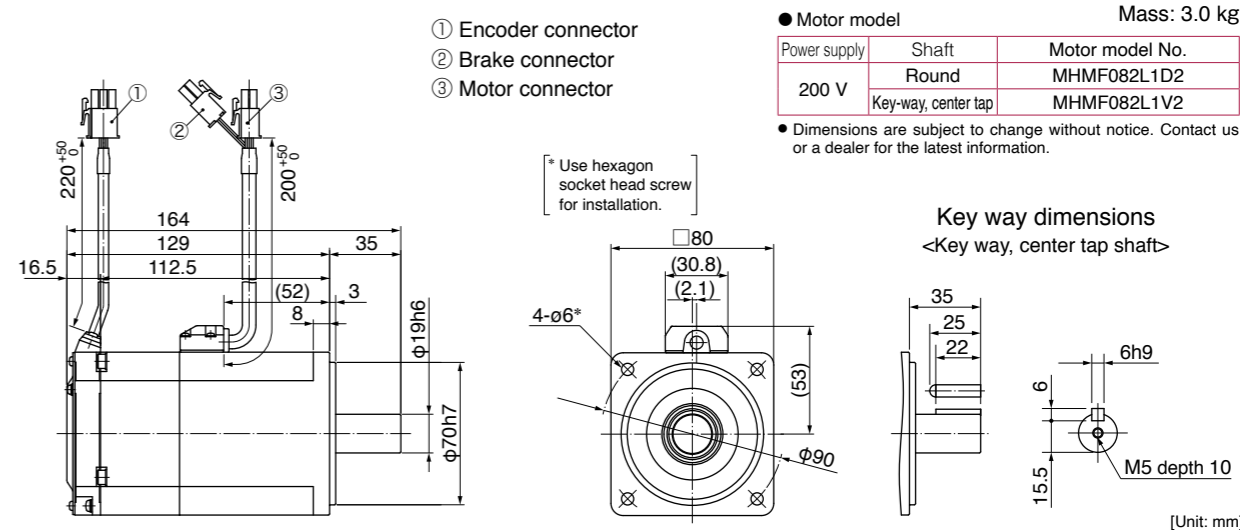
* For motors specifications, refer to P.93.

MHMF 750 W

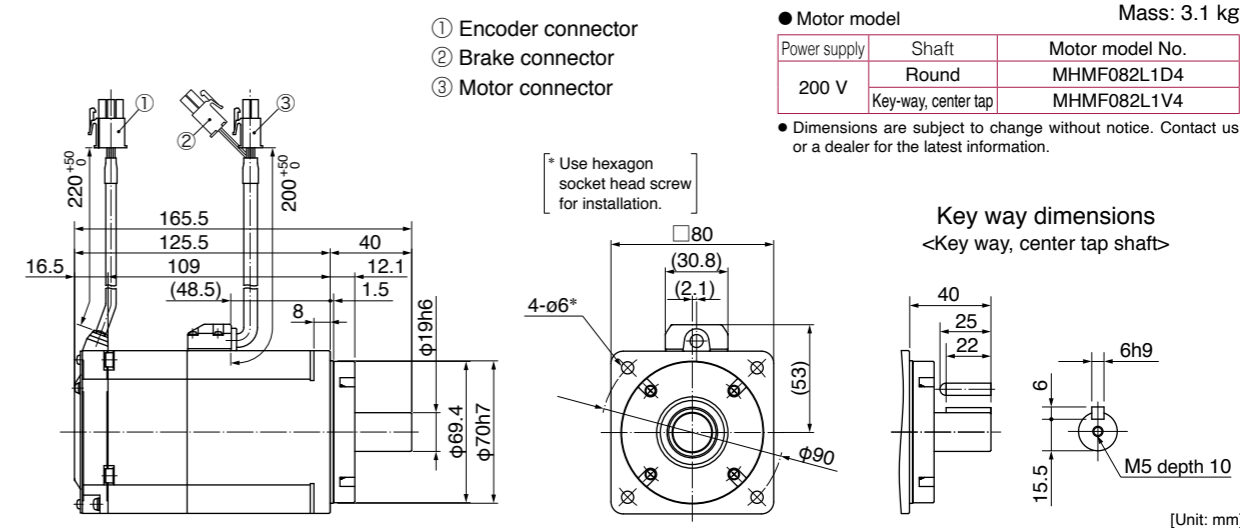
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



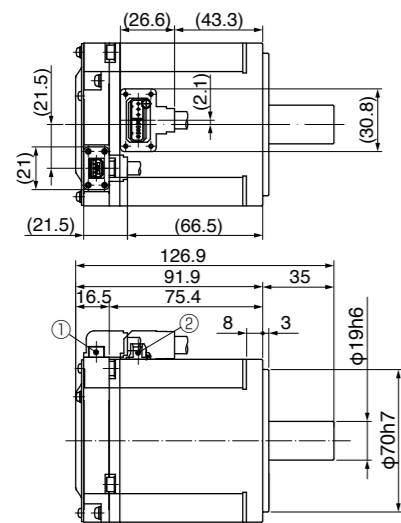
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



* For motors specifications, refer to P.93.

MHMF 750 W

Connector type (IP67) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



- ① Encoder connector
- ② Motor connector

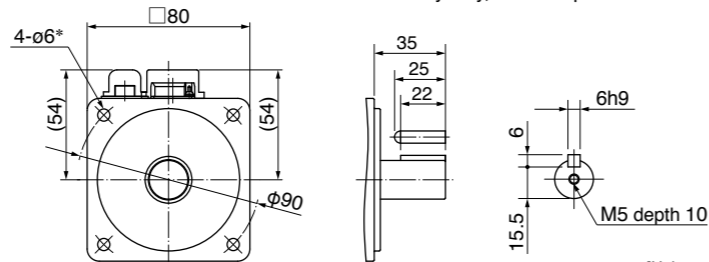
● Motor model Mass: 2.2 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 200 V | Round | MHMF082L1A1 |
| | Key-way, center tap | MHMF082L1S1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

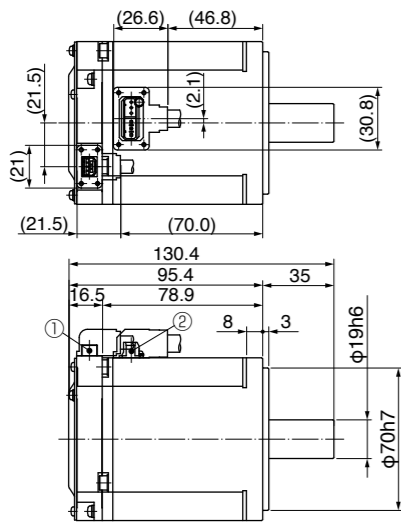
* Use hexagon socket head screw for installation.

Key way dimensions
 <Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



- ① Encoder connector
- ② Motor connector

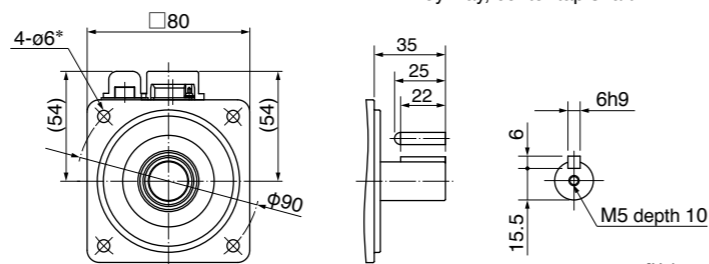
● Motor model Mass: 2.3 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 200 V | Round | MHMF082L1C1 |
| | Key-way, center tap | MHMF082L1U1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

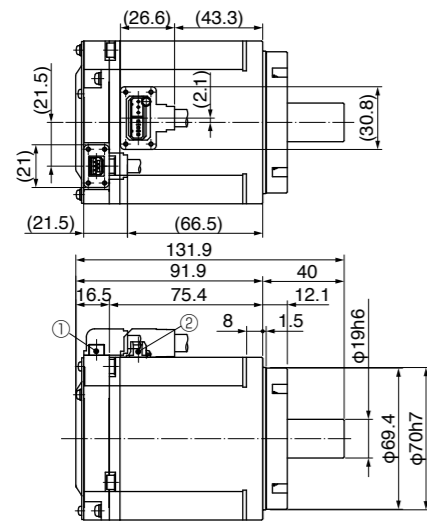
* Use hexagon socket head screw for installation.

Key way dimensions
 <Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



- ① Encoder connector
- ② Motor connector

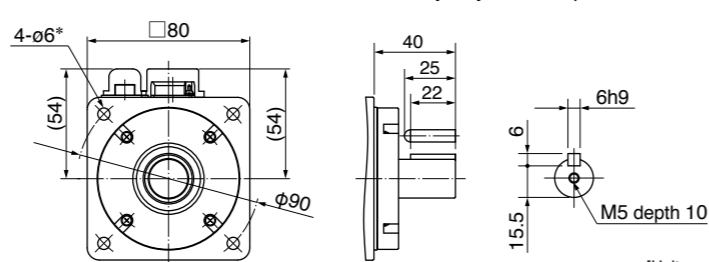
● Motor model Mass: 2.4 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 200 V | Round | MHMF082L1C3 |
| | Key-way, center tap | MHMF082L1U3 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
 <Key way, center tap shaft>

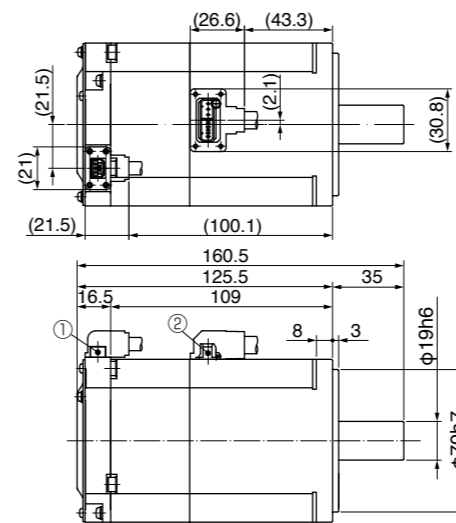


[Unit: mm]

* For motors specifications, refer to P.93.

MHMF 750 W

Connector type (IP67) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



- ① Encoder connector
- ② Motor/Brake connector

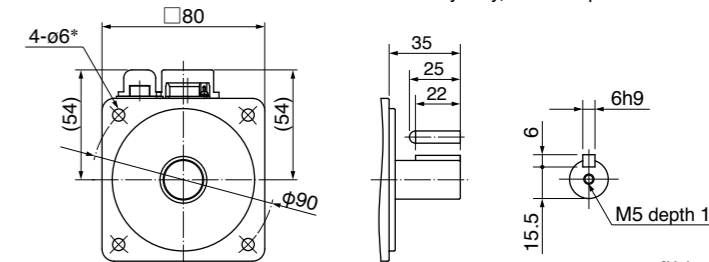
● Motor model Mass: 2.9 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 200 V | Round | MHMF082L1B1 |
| | Key-way, center tap | MHMF082L1T1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

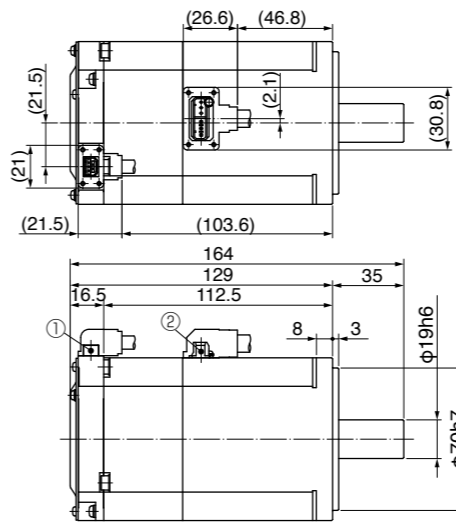
* Use hexagon socket head screw for installation.

Key way dimensions
 <Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



- ① Encoder connector
- ② Motor/Brake connector

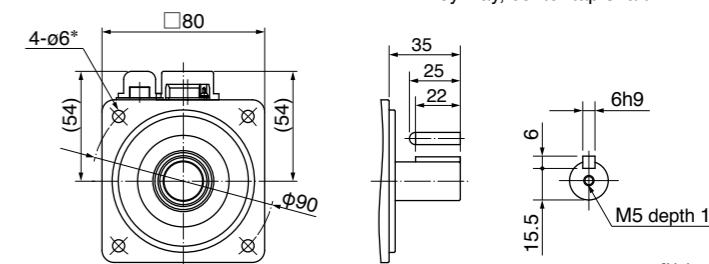
● Motor model Mass: 3.0 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 200 V | Round | MHMF082L1D1 |
| | Key-way, center tap | MHMF082L1V1 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

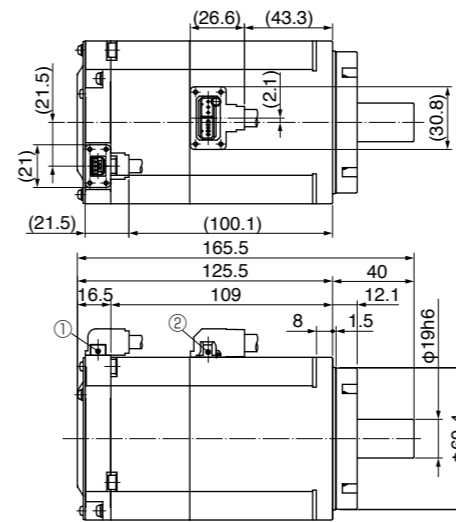
* Use hexagon socket head screw for installation.

Key way dimensions
 <Key way, center tap shaft>



[Unit: mm]

Connector type (IP67) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



- ① Encoder connector
- ② Motor/Brake connector

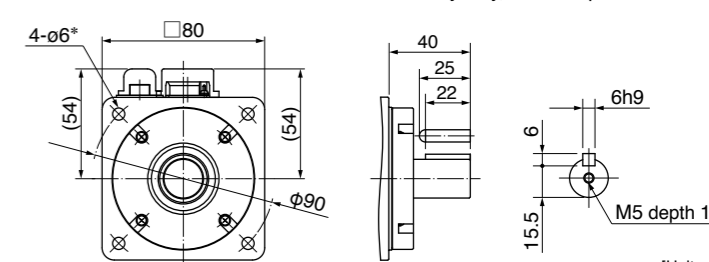
● Motor model Mass: 3.1 kg

| Power supply | Shaft | Motor model No. |
|--------------|---------------------|-----------------|
| 200 V | Round | MHMF082L1D3 |
| | Key-way, center tap | MHMF082L1V3 |

● Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions
 <Key way, center tap shaft>

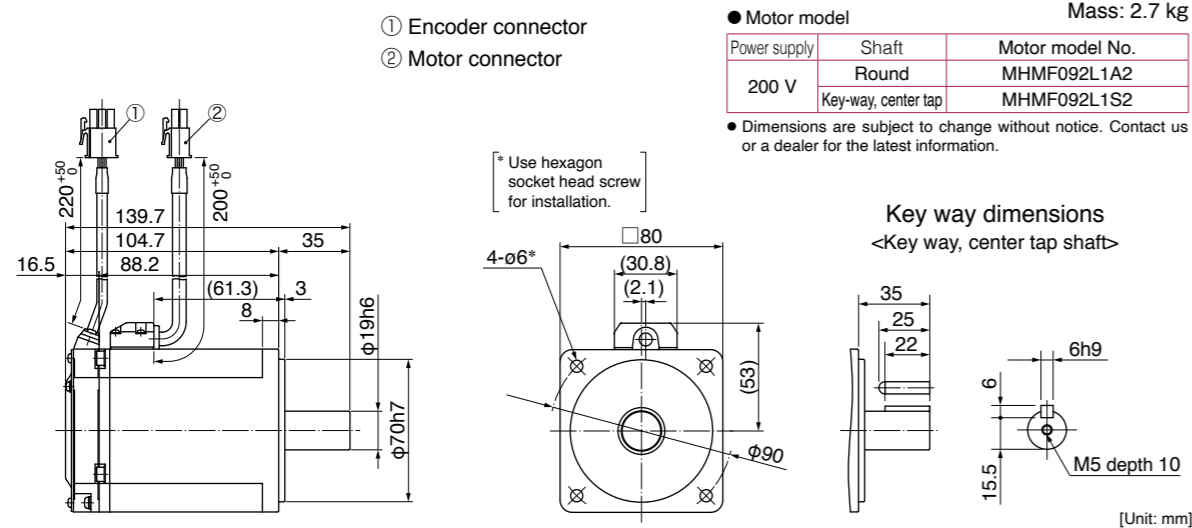


[Unit: mm]

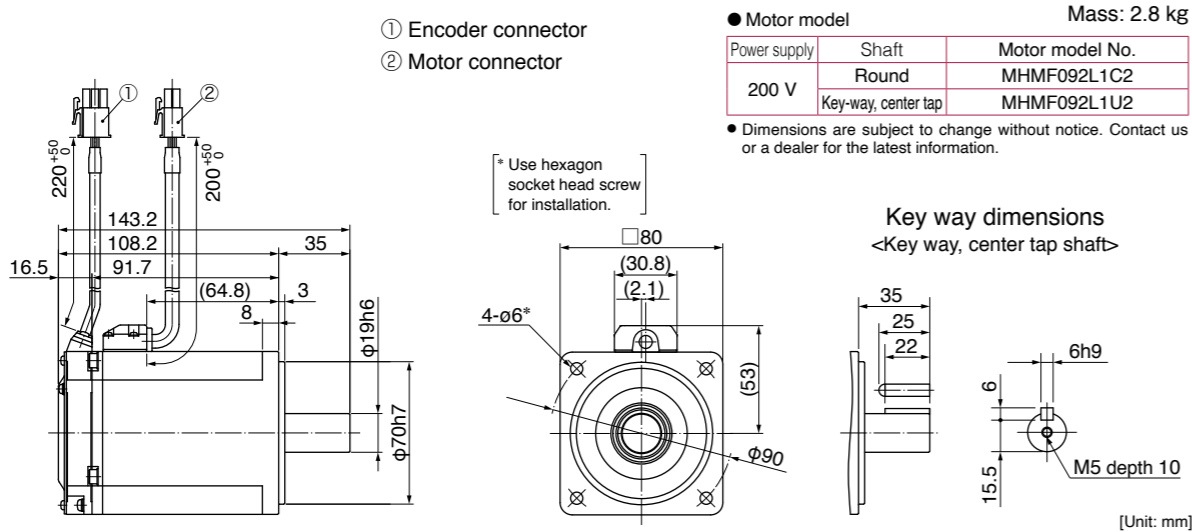
* For motors specifications, refer to P.93.

MHMF 1000 W

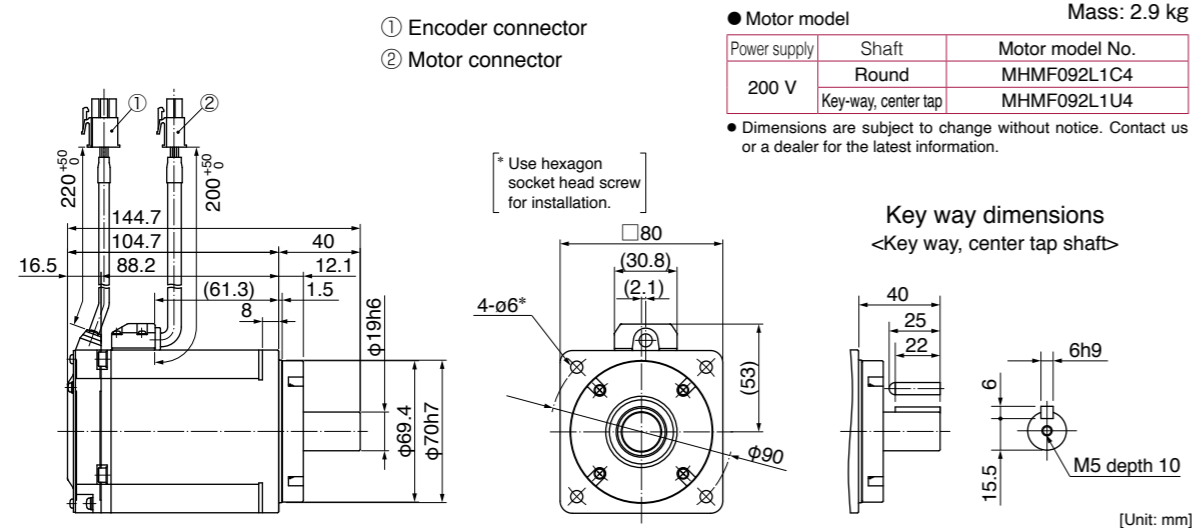
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



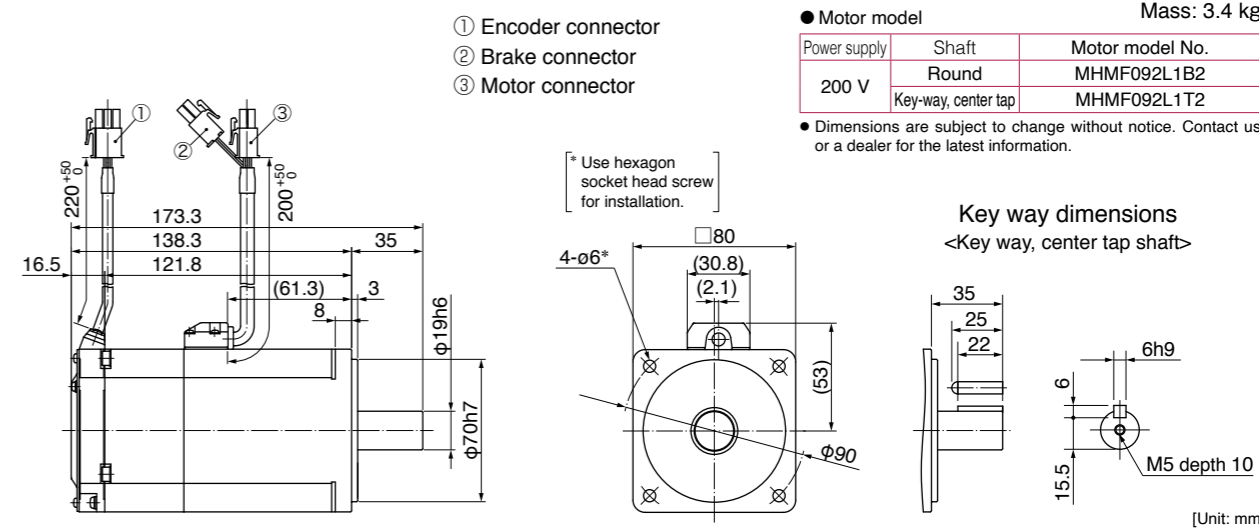
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



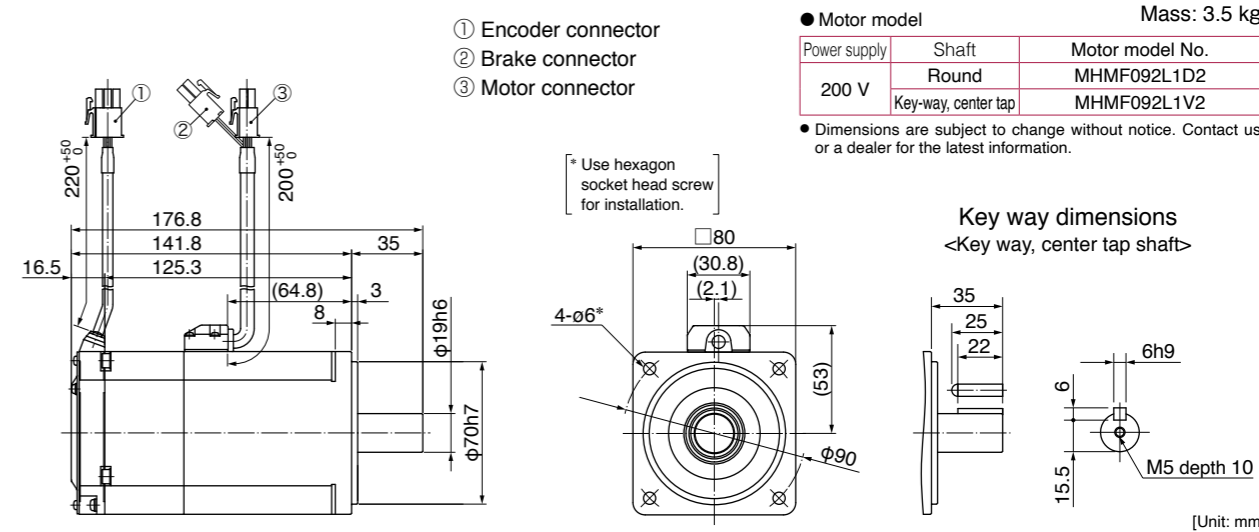
* For motors specifications, refer to P.94.

MHMF 1000 W

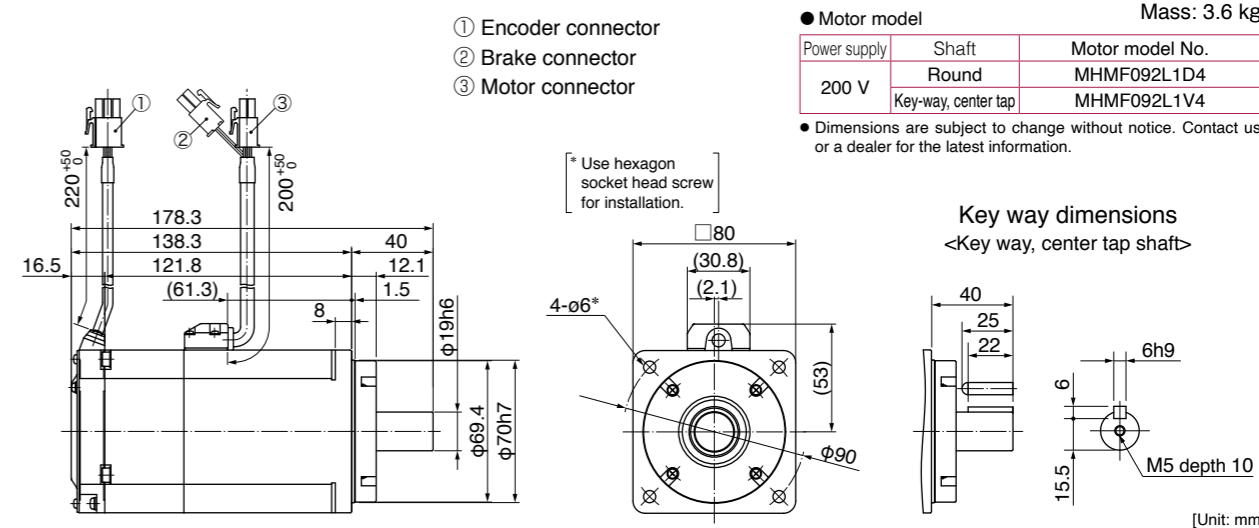
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



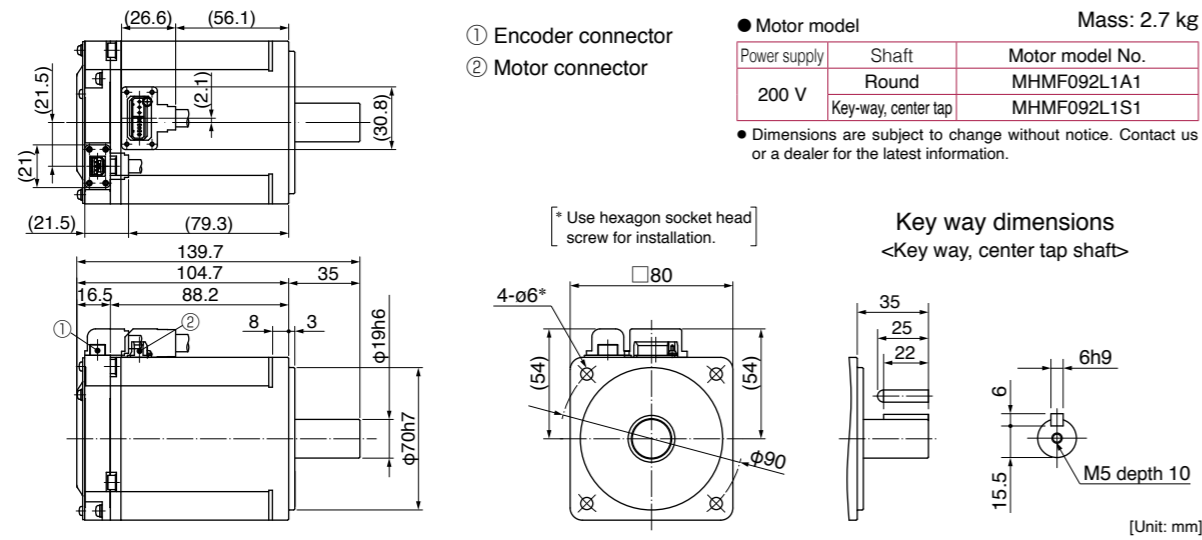
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



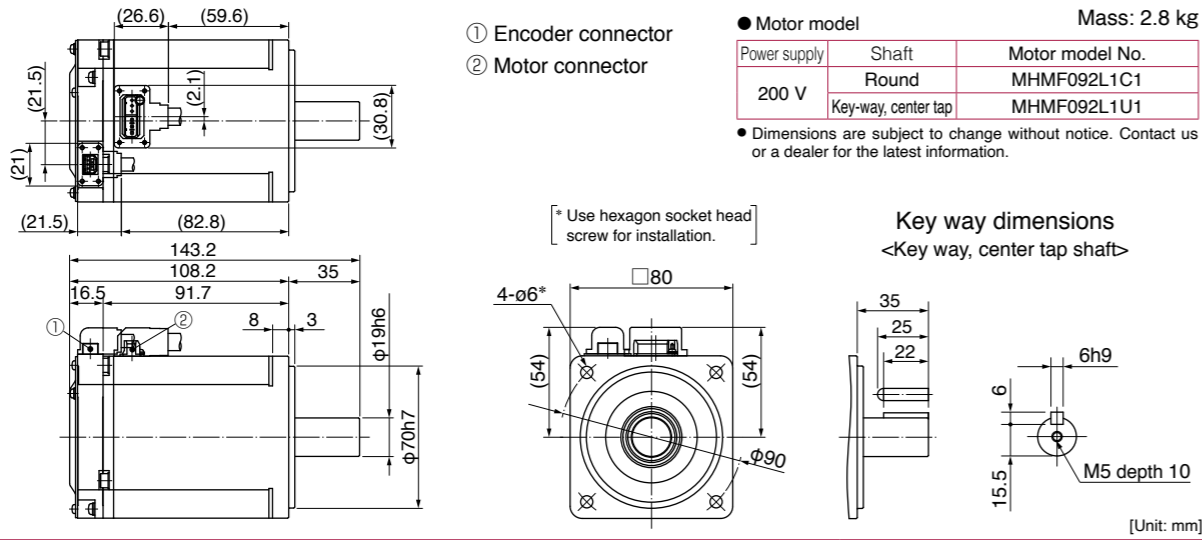
* For motors specifications, refer to P.94.

MHMF 1000 W

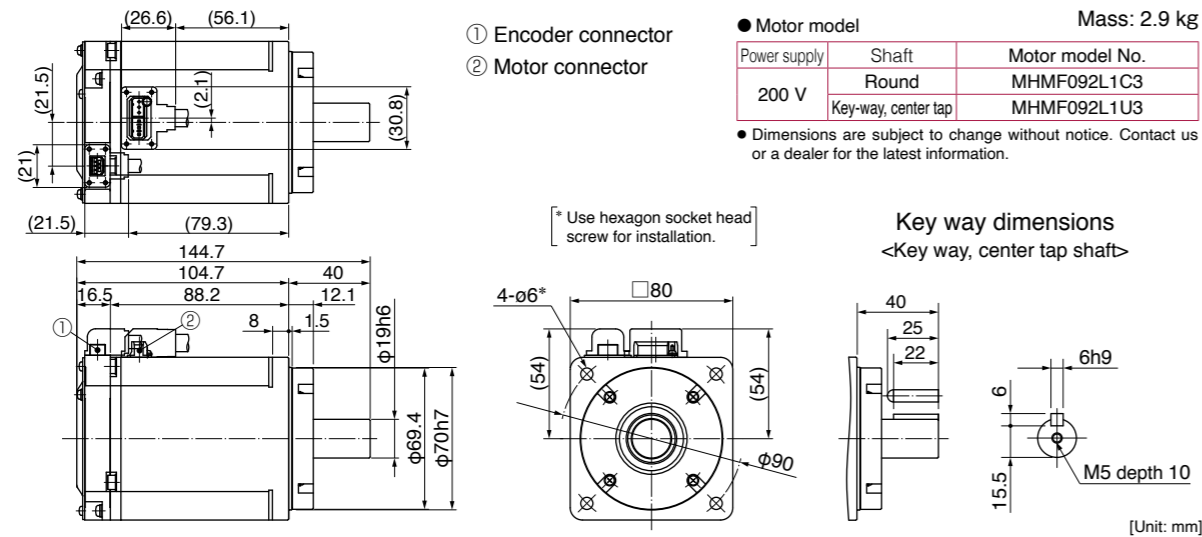
Connector type (IP67) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Connector type (IP67) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



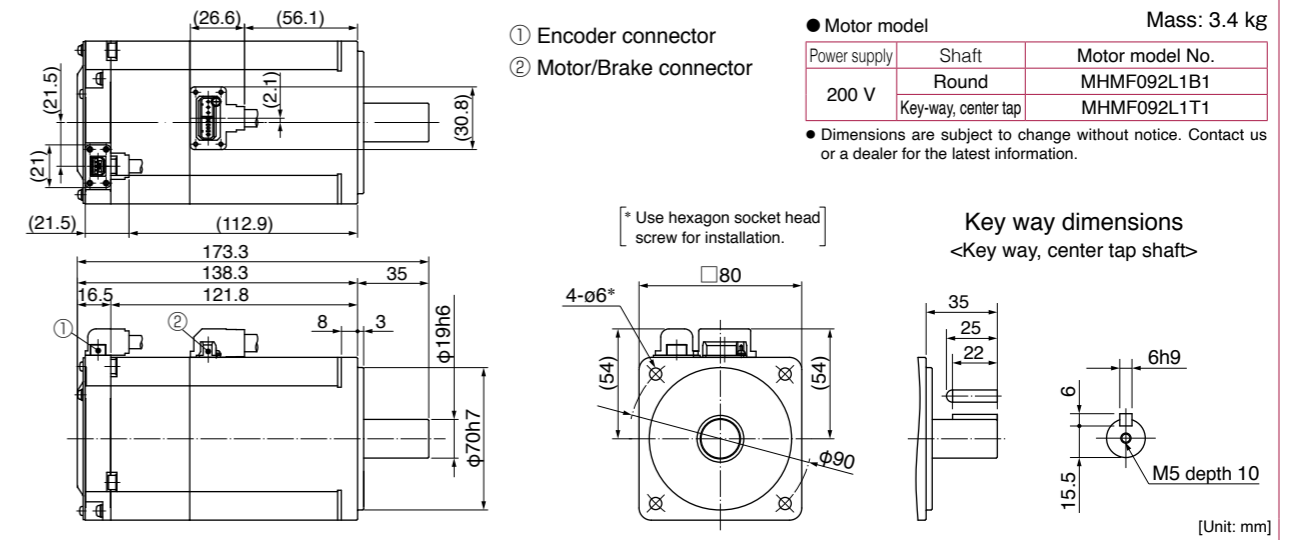
Connector type (IP67) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



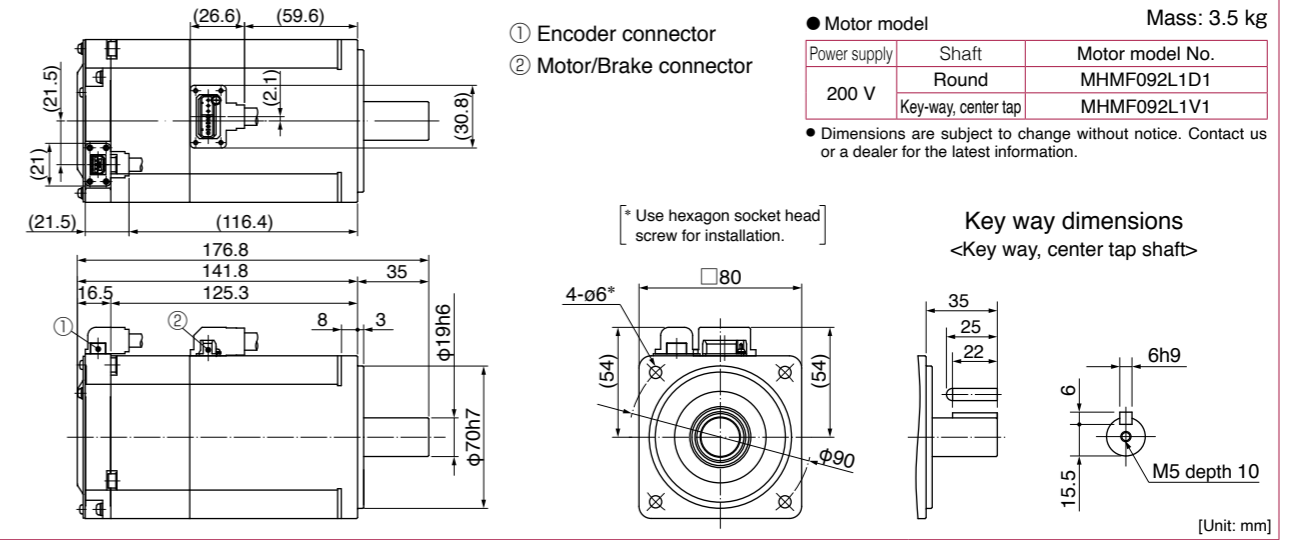
* For motors specifications, refer to P.94.

MHMF 1000 W

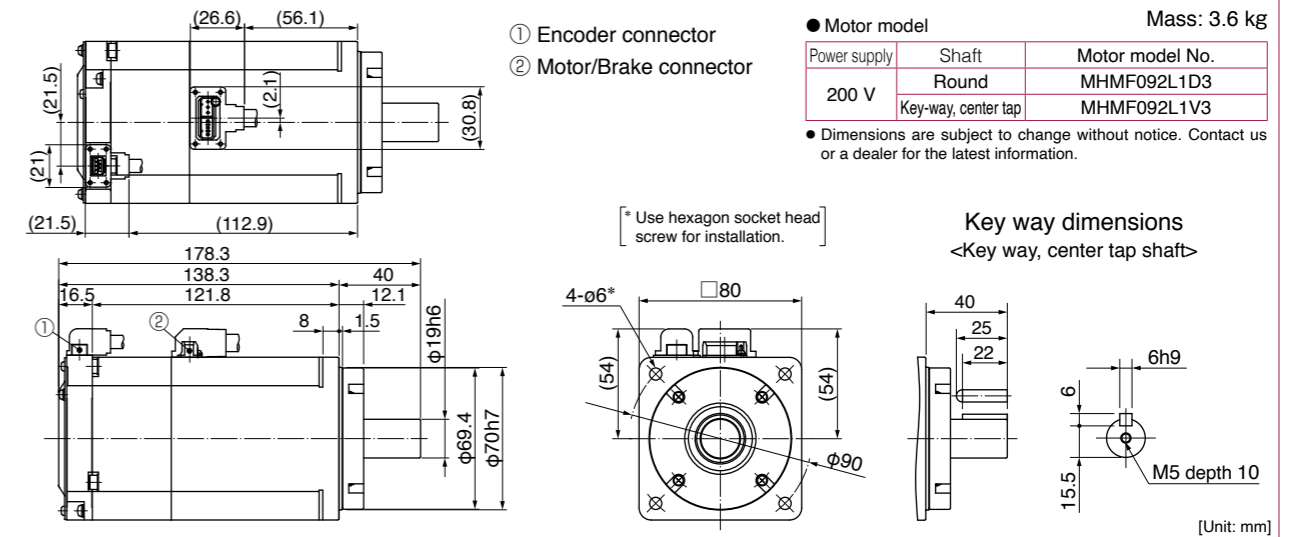
Connector type (IP67) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Connector type (IP67) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



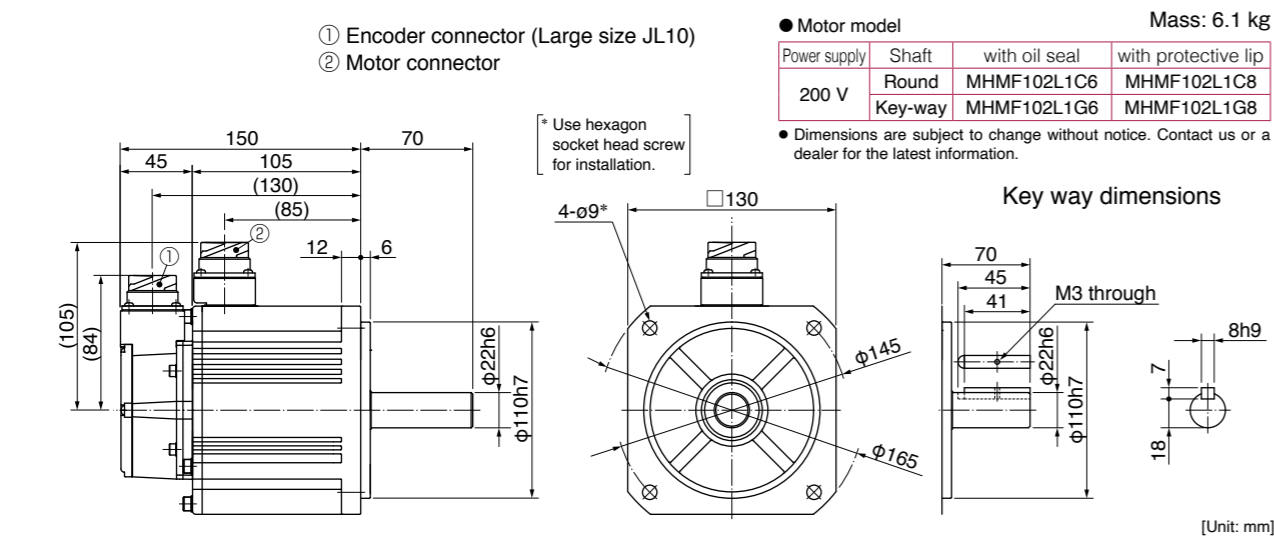
Connector type (IP67) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



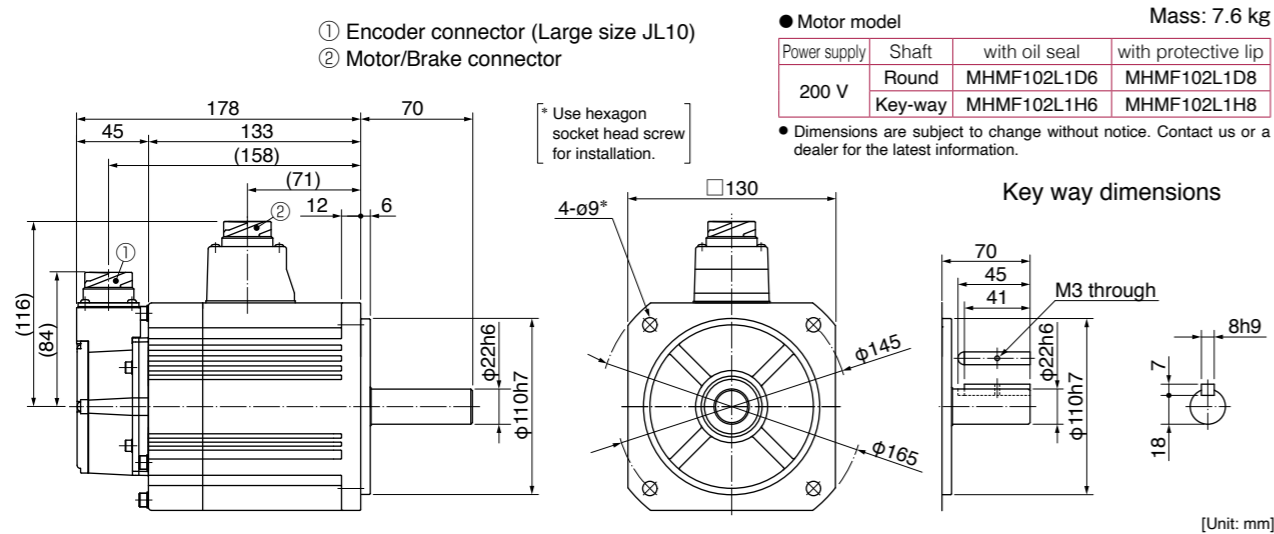
* For motors specifications, refer to P.94.

MHMF 1.0 kW

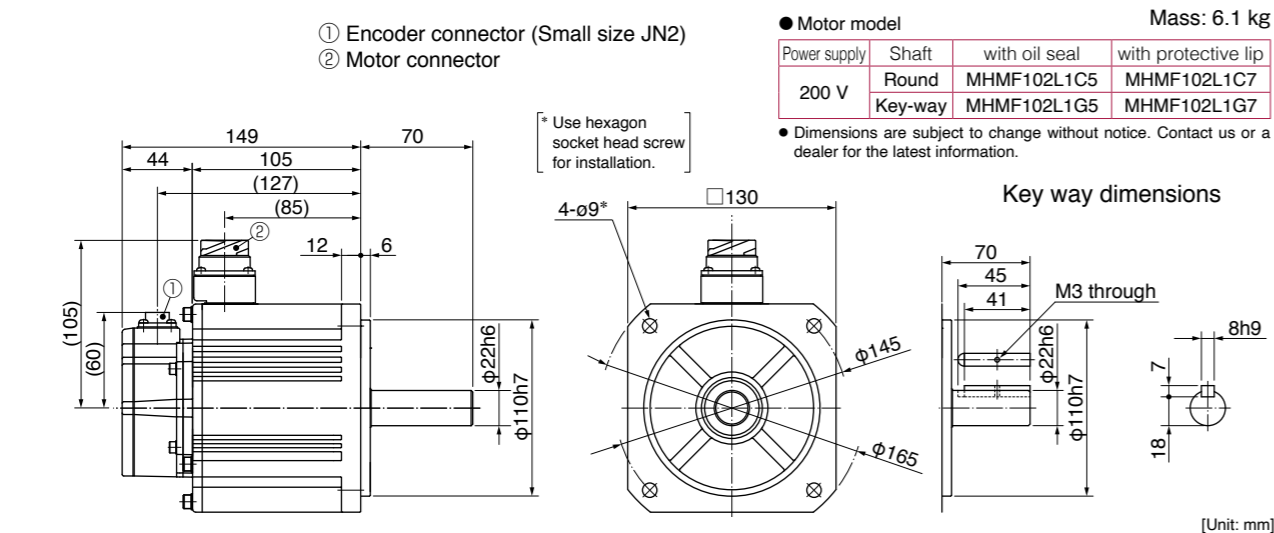
Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



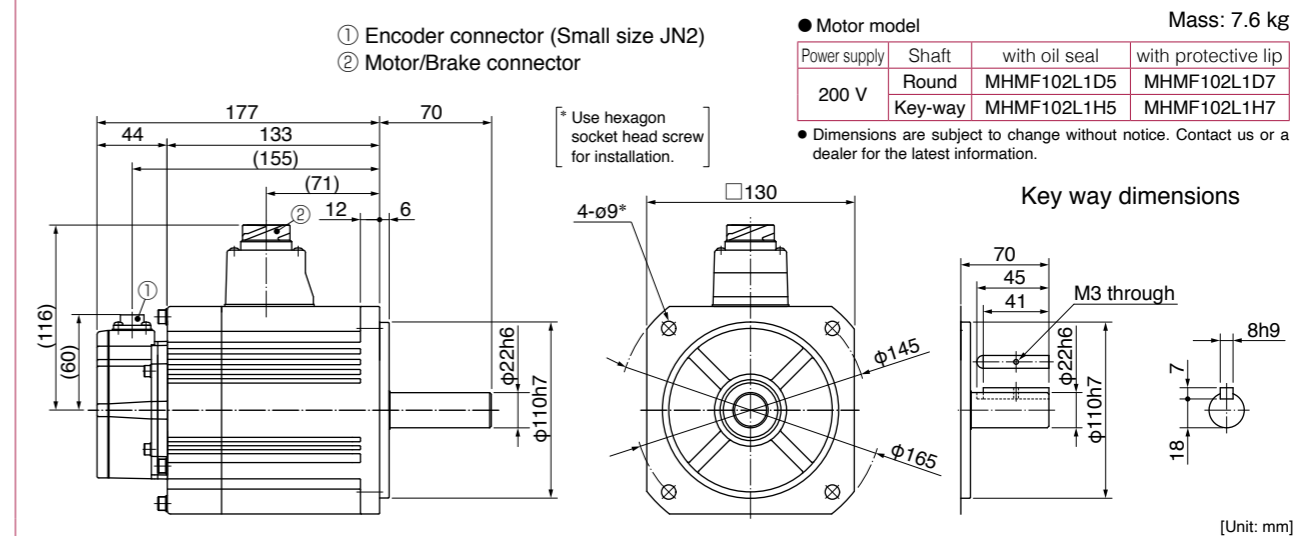
Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



* For motors specifications, refer to P.95.

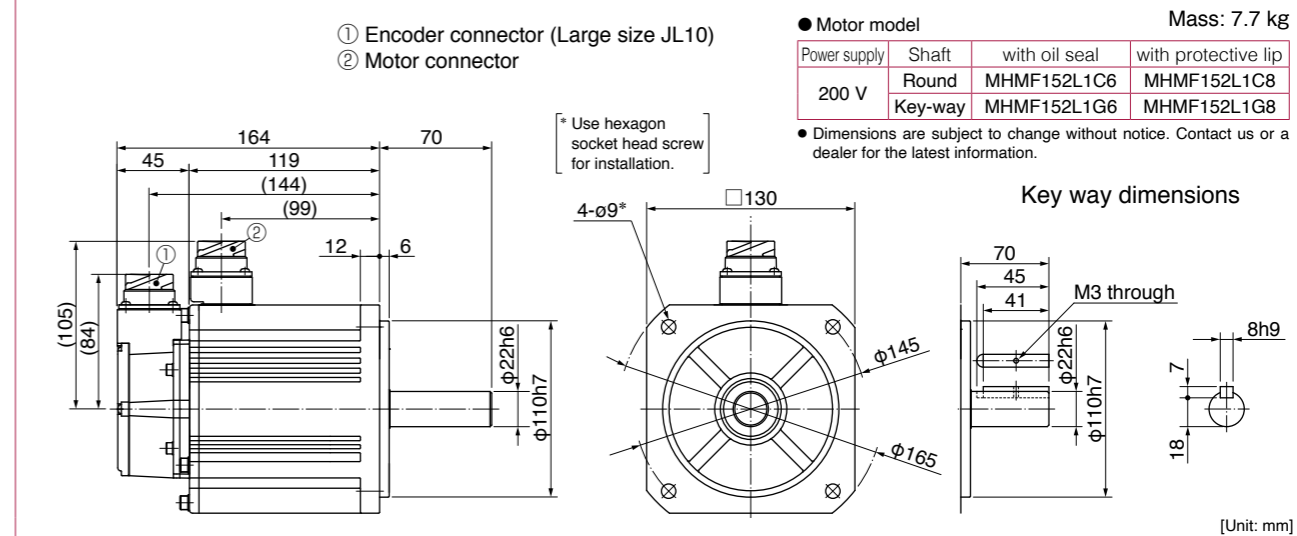
MHMF 1.0 kW

Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

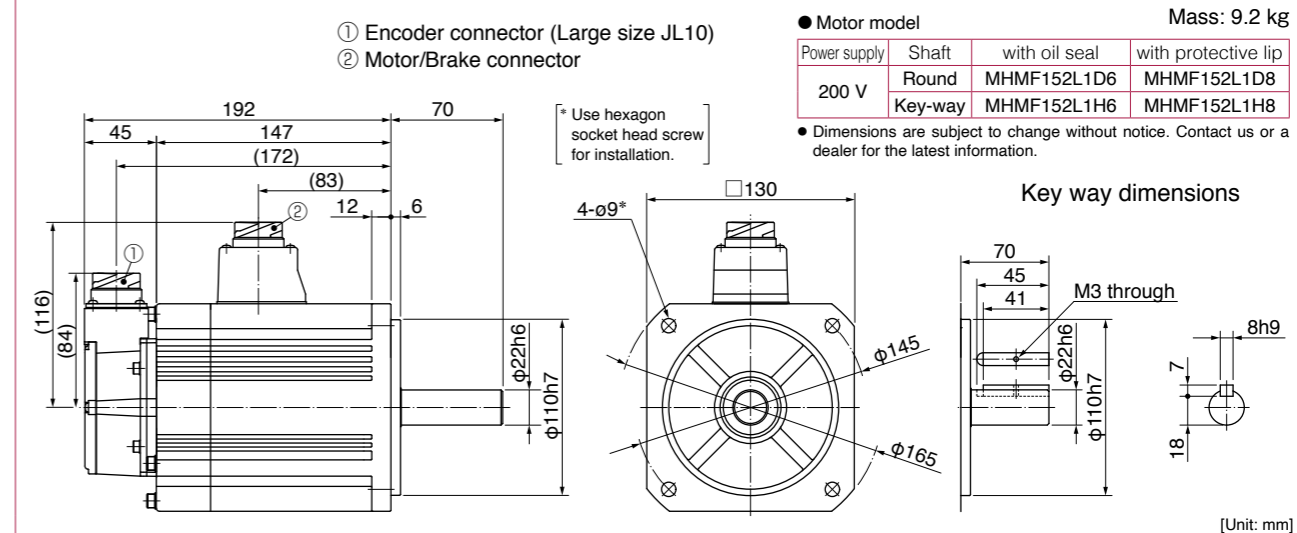


MHMF 1.5 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



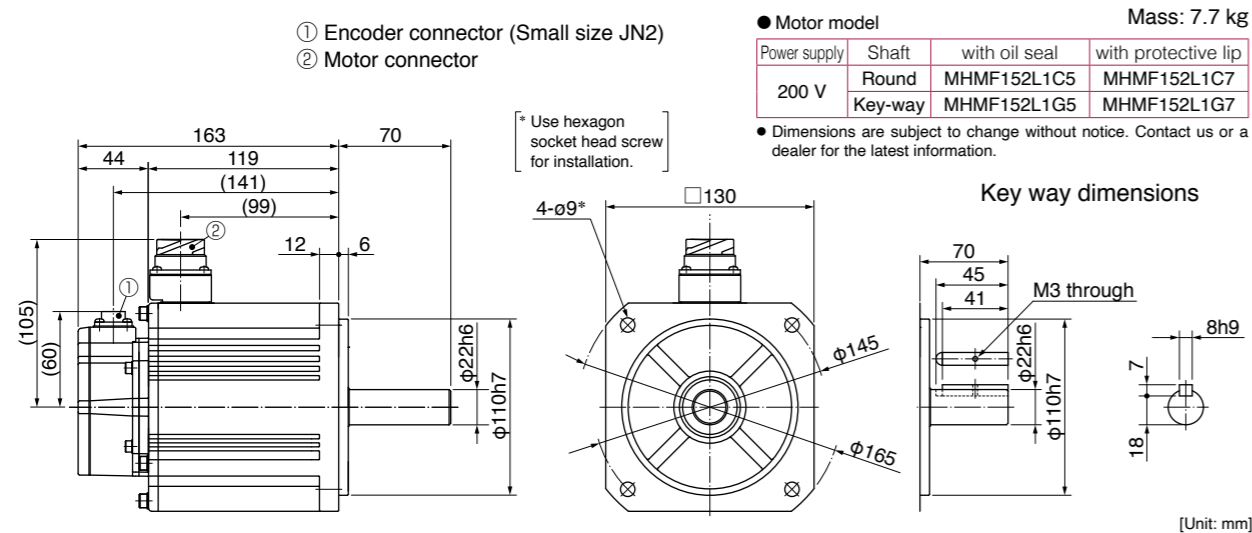
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



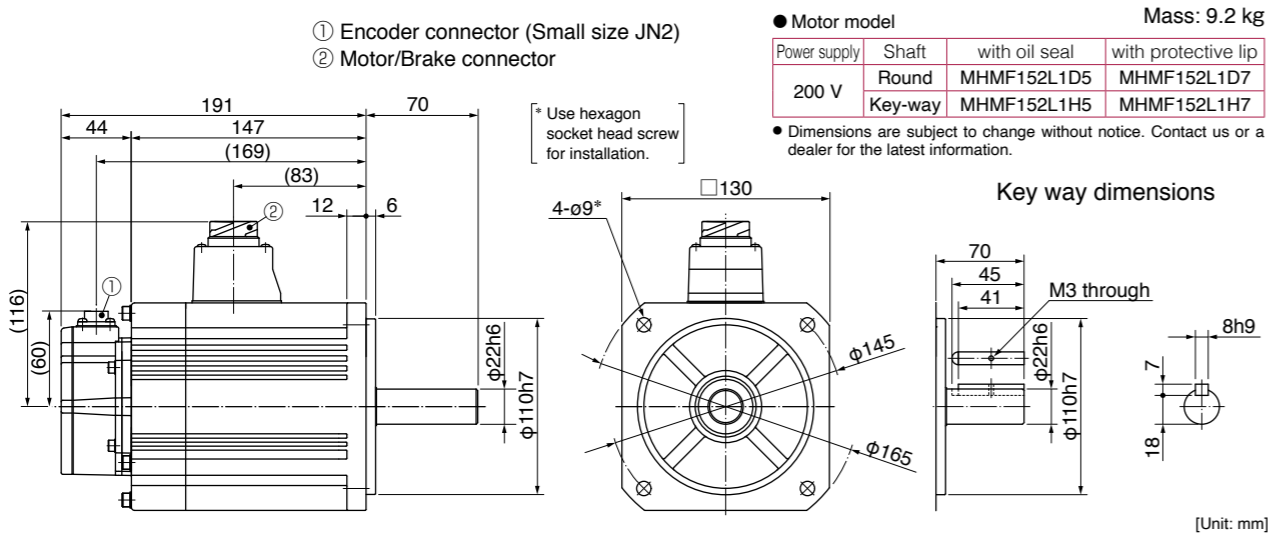
* For motors specifications, refer to P.95, P.96.

MHMF 1.5 kW

Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

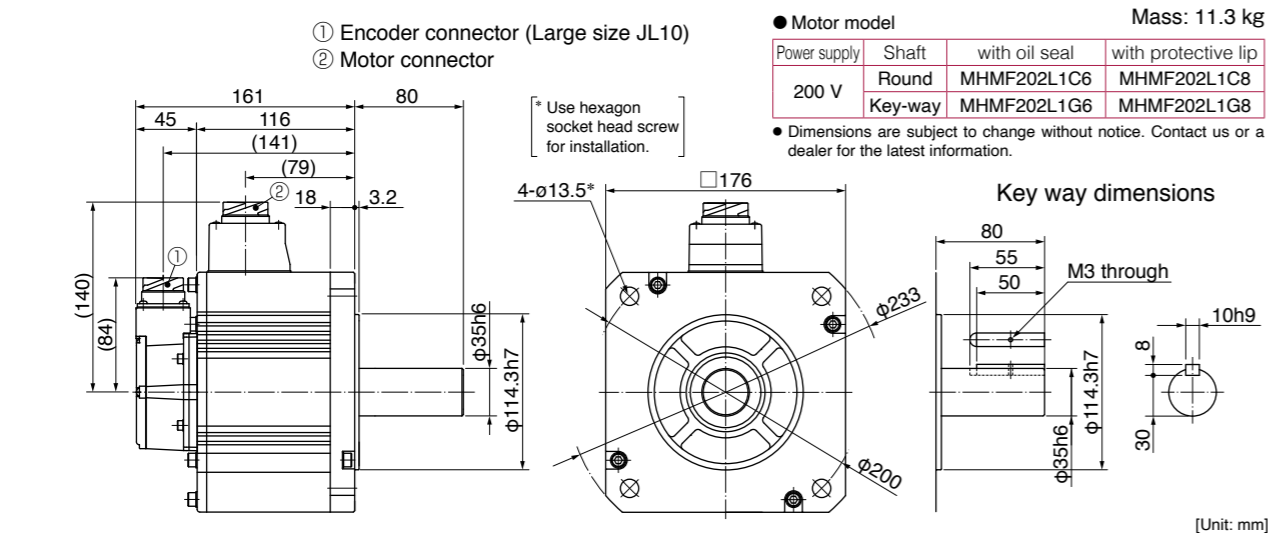


Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MHMF 2.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

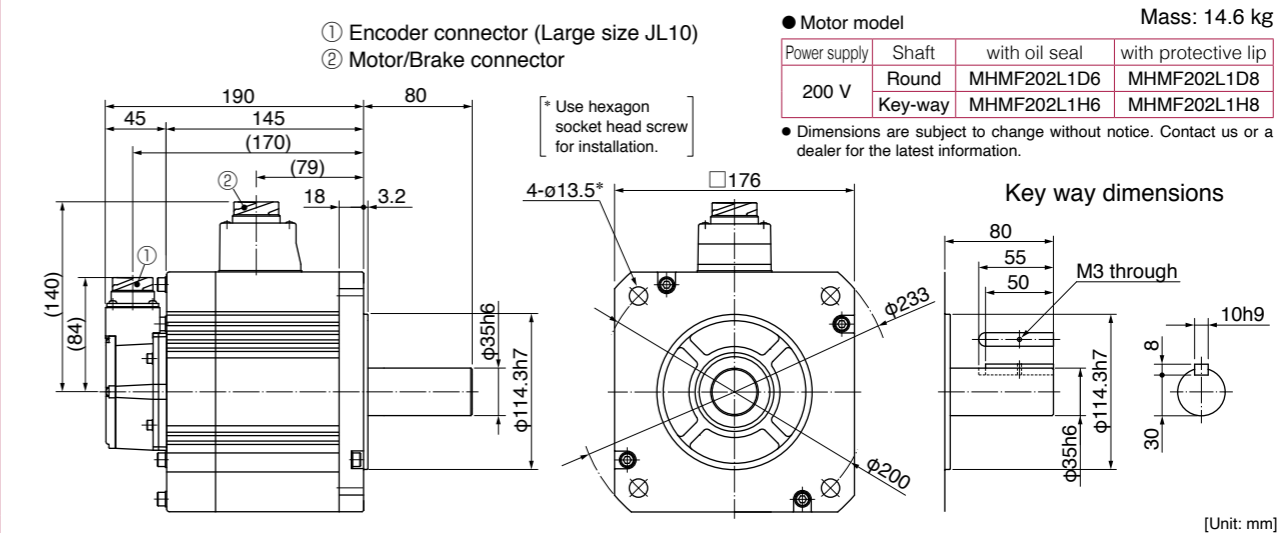


* For motors specifications, refer to P.96, P.97.

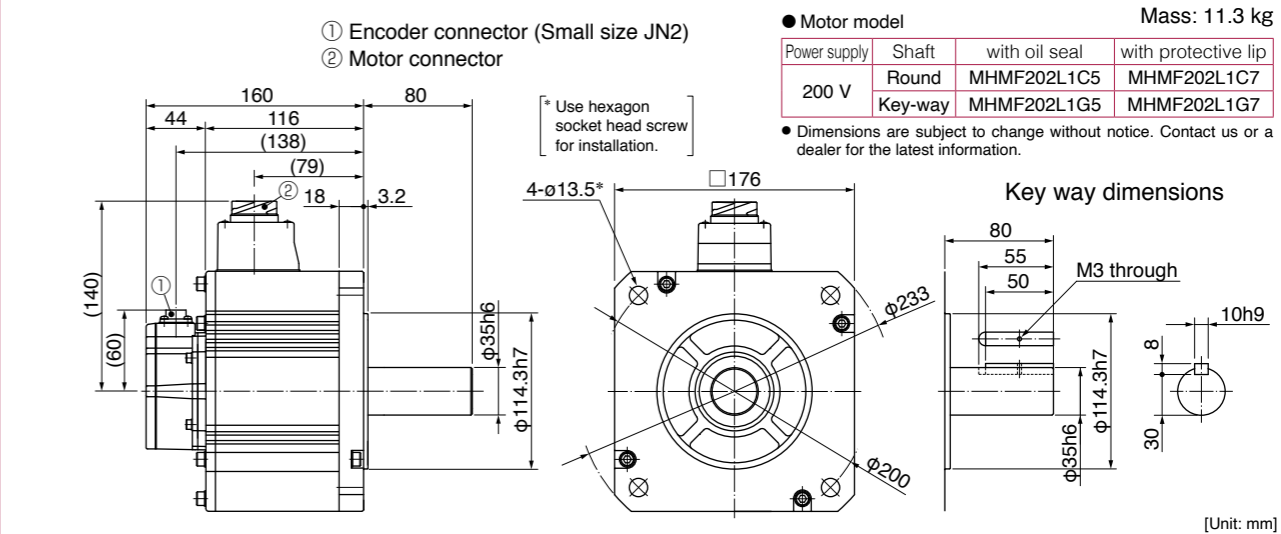
MHMF 2.0 kW

MHMF 2.0 kW

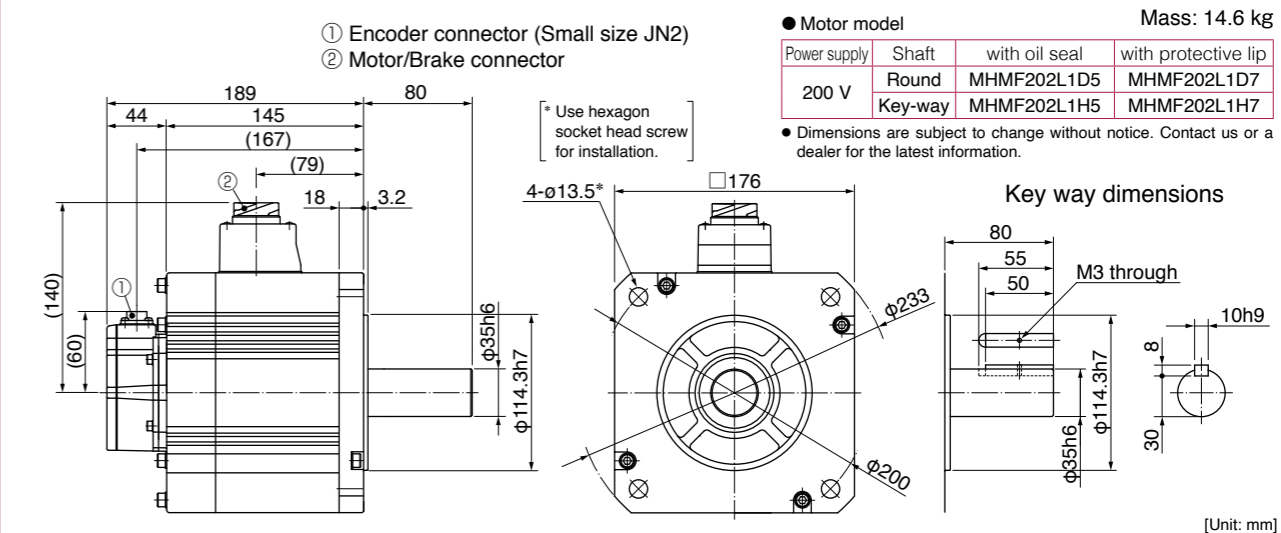
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



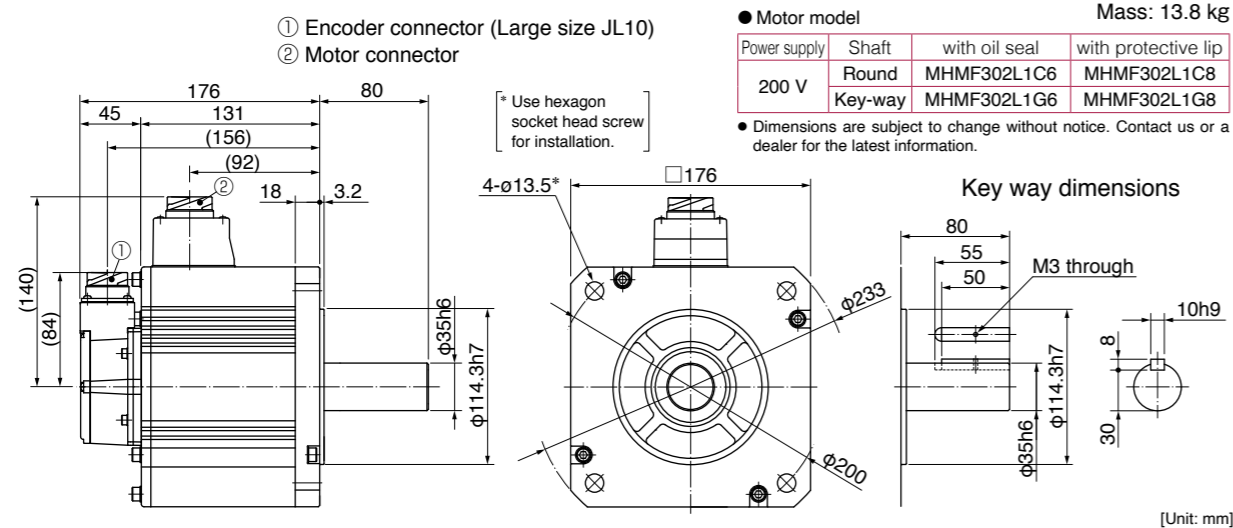
Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



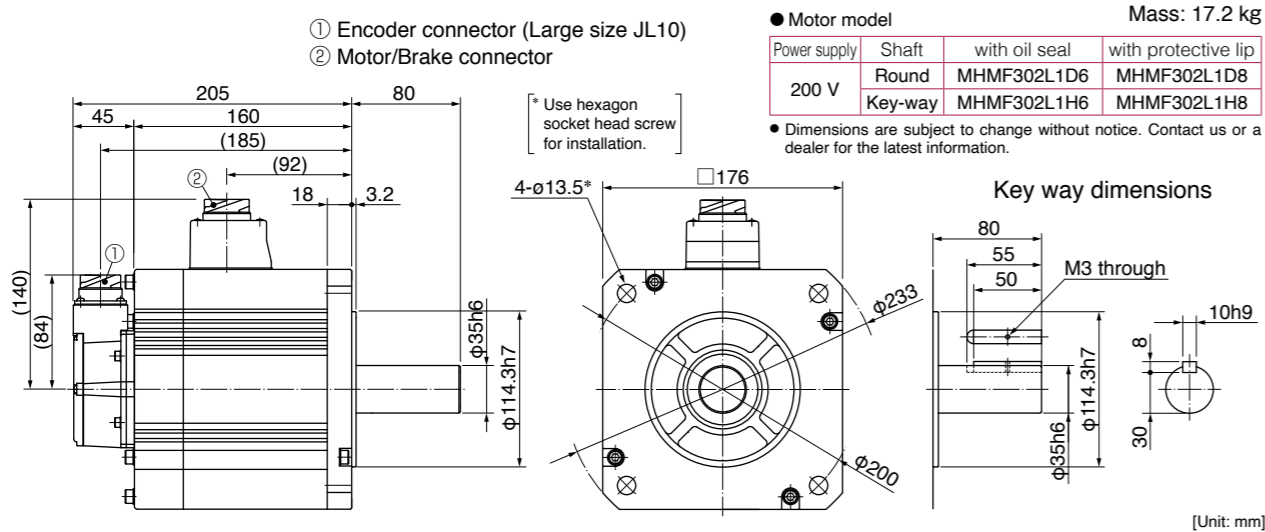
* For motors specifications, refer to P.97.

MHMF 3.0 kW

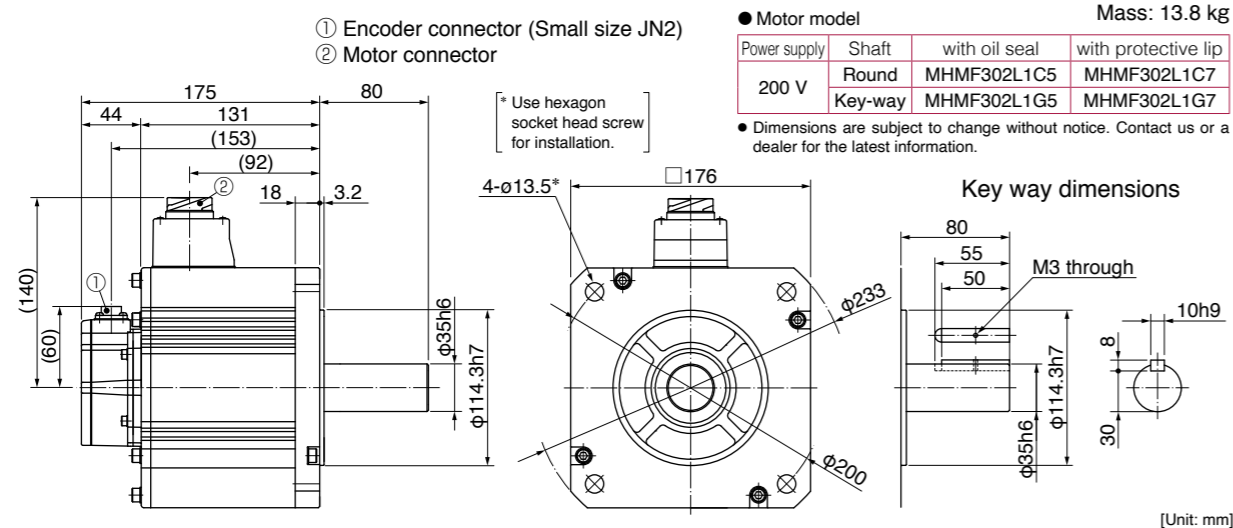
Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



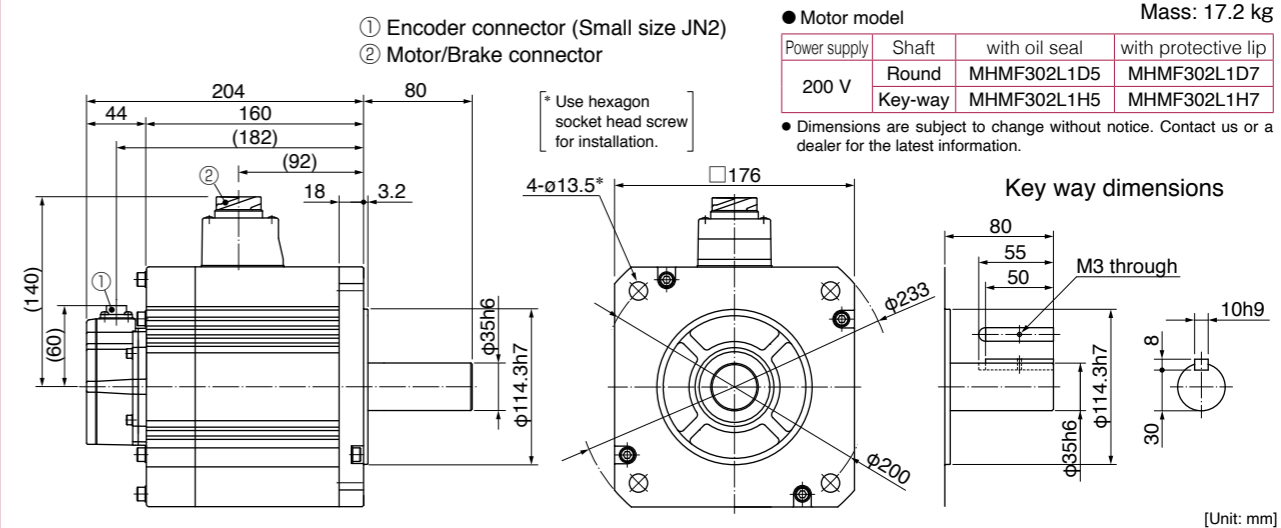
Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



* For motors specifications, refer to P.98.

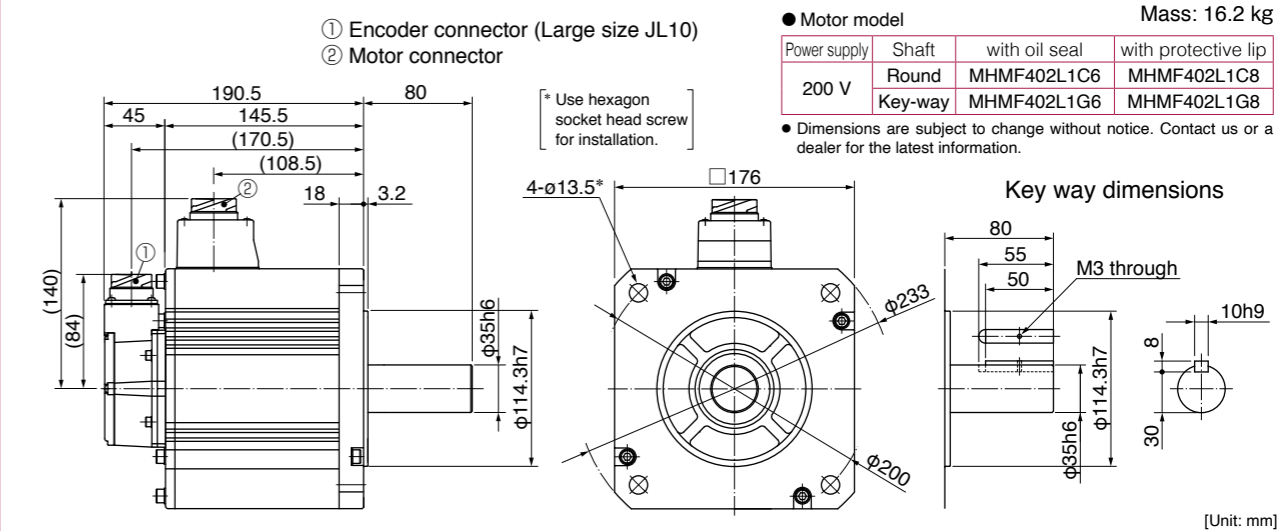
MHMF 3.0 kW

Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

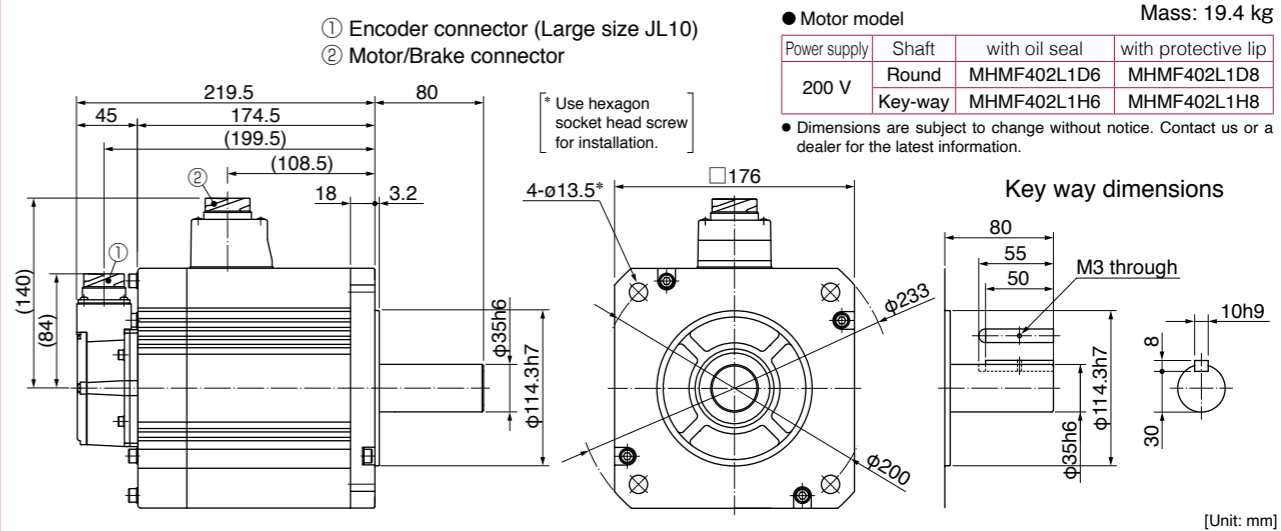


MHMF 4.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



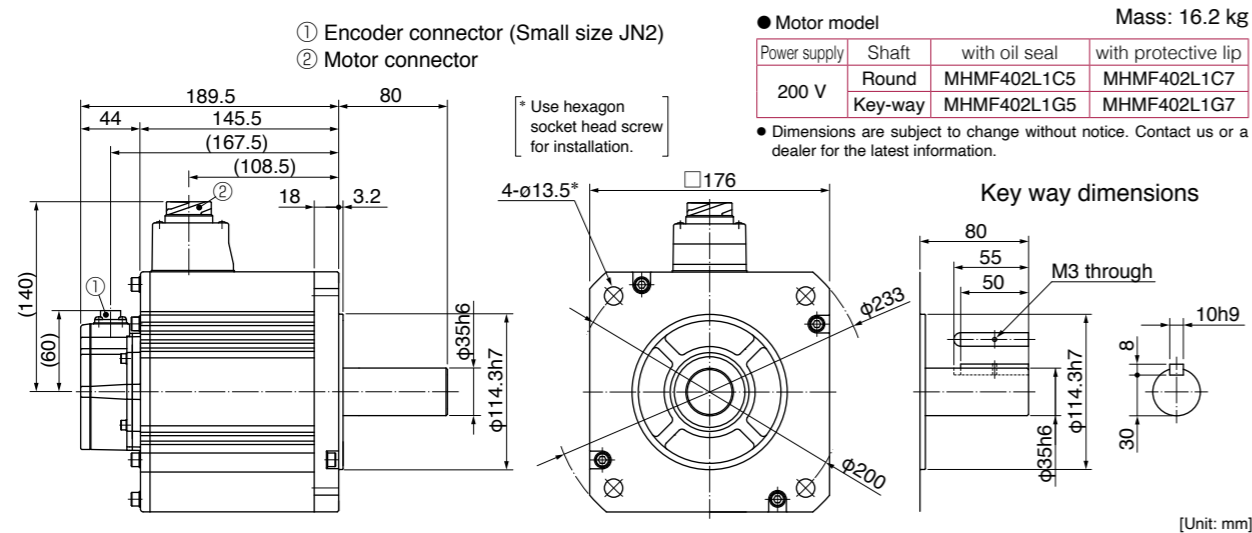
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



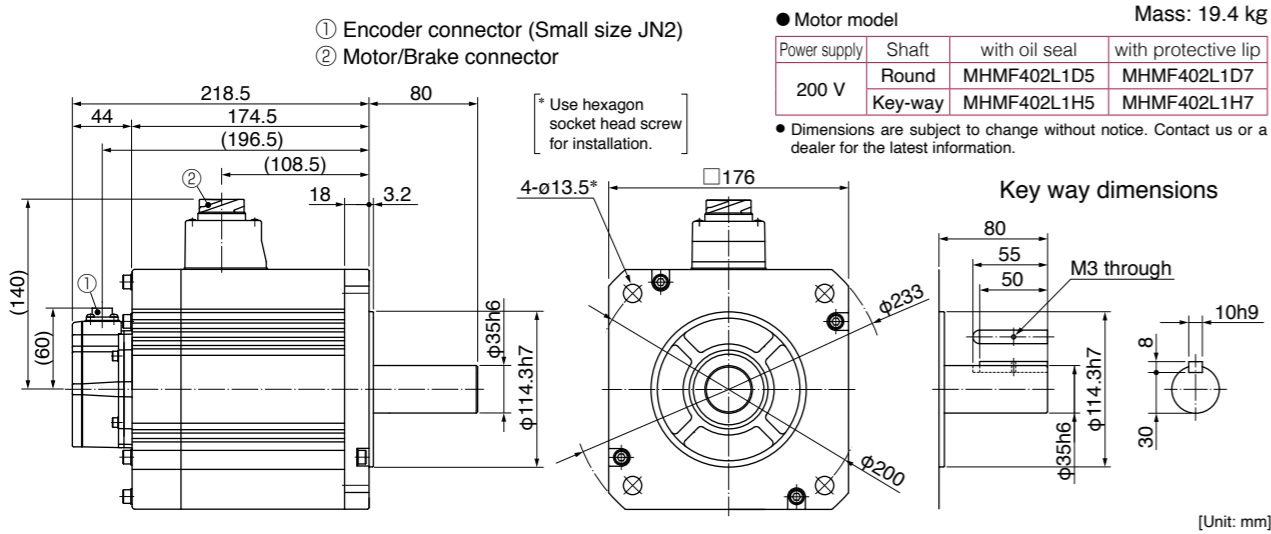
* For motors specifications, refer to P.98, P.99.

MHMF 4.0 kW

Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

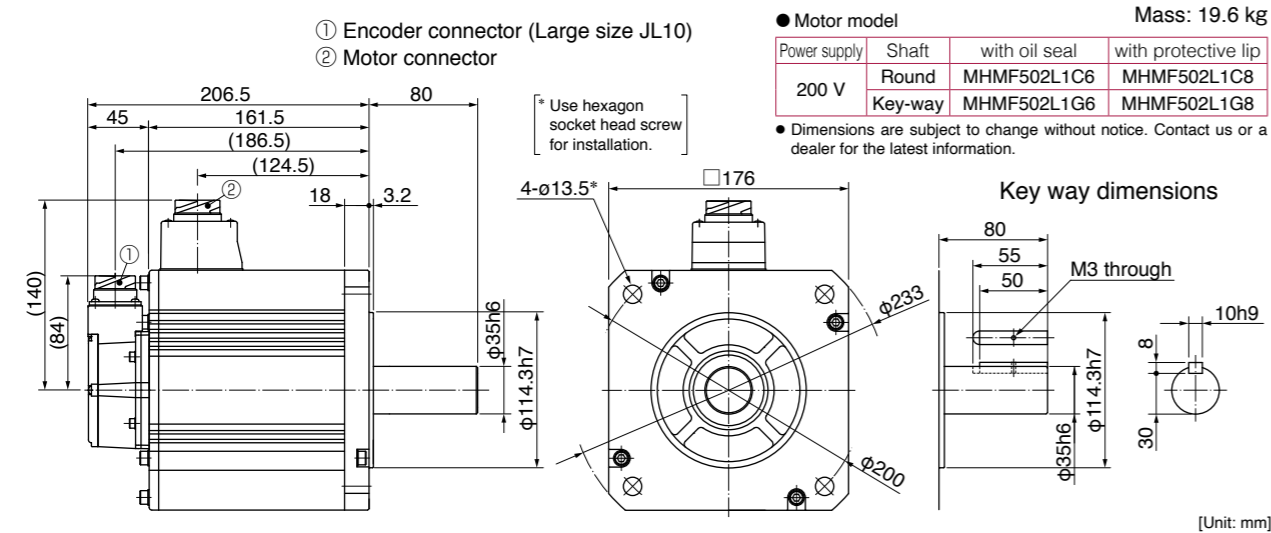


Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MHMF 5.0 kW

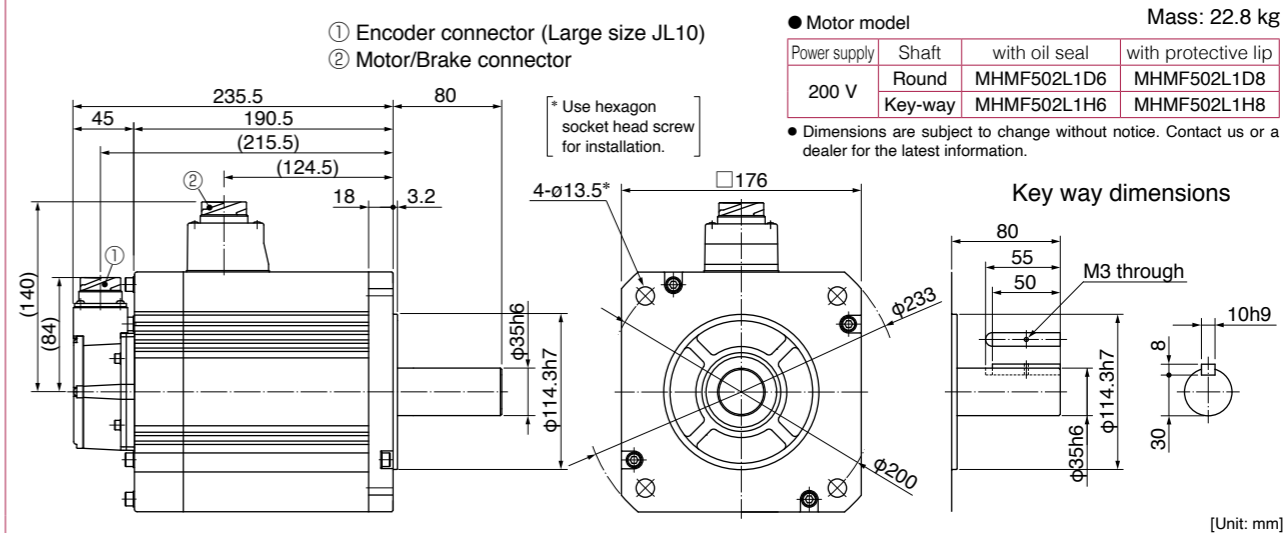
Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



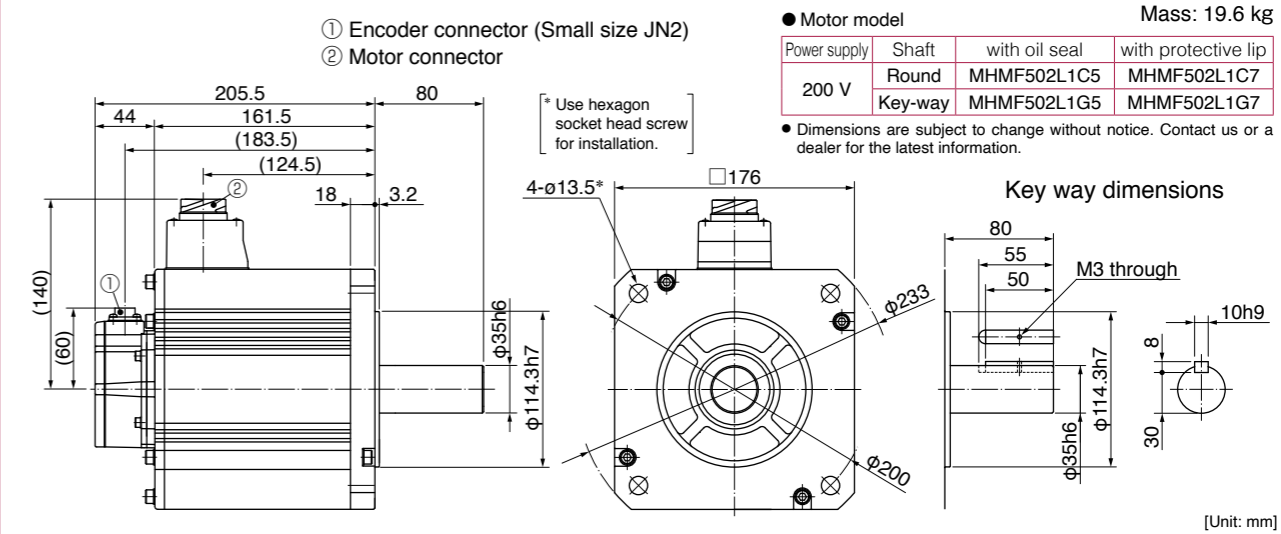
* For motors specifications, refer to P.99, P.100.

MHMF 5.0 kW

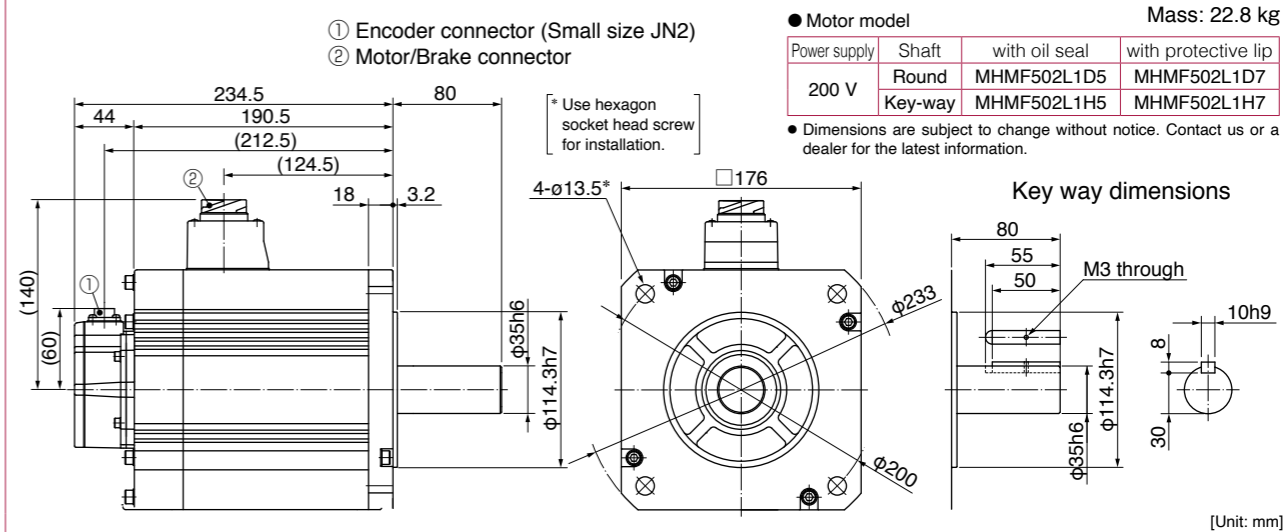
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



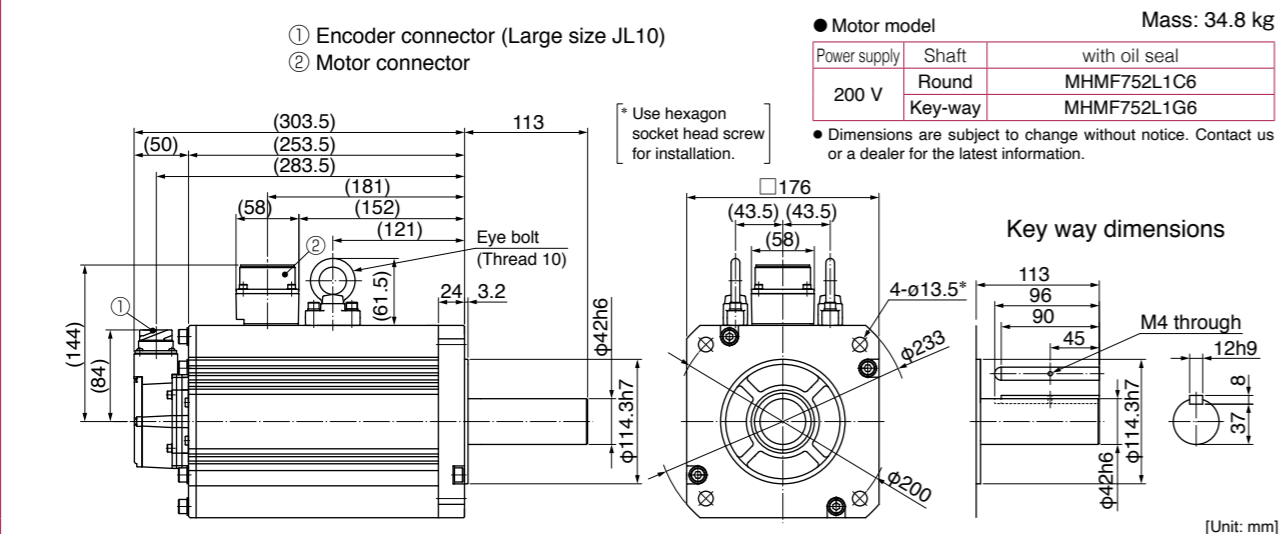
Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



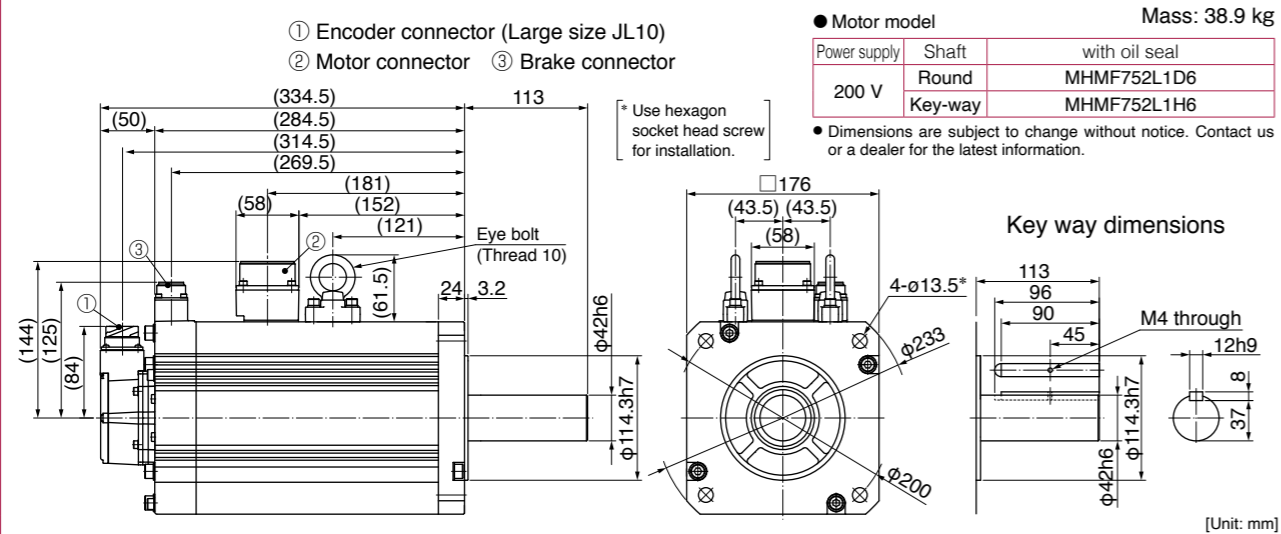
* For motors specifications, refer to P.100.

MHMF 7.5 kW

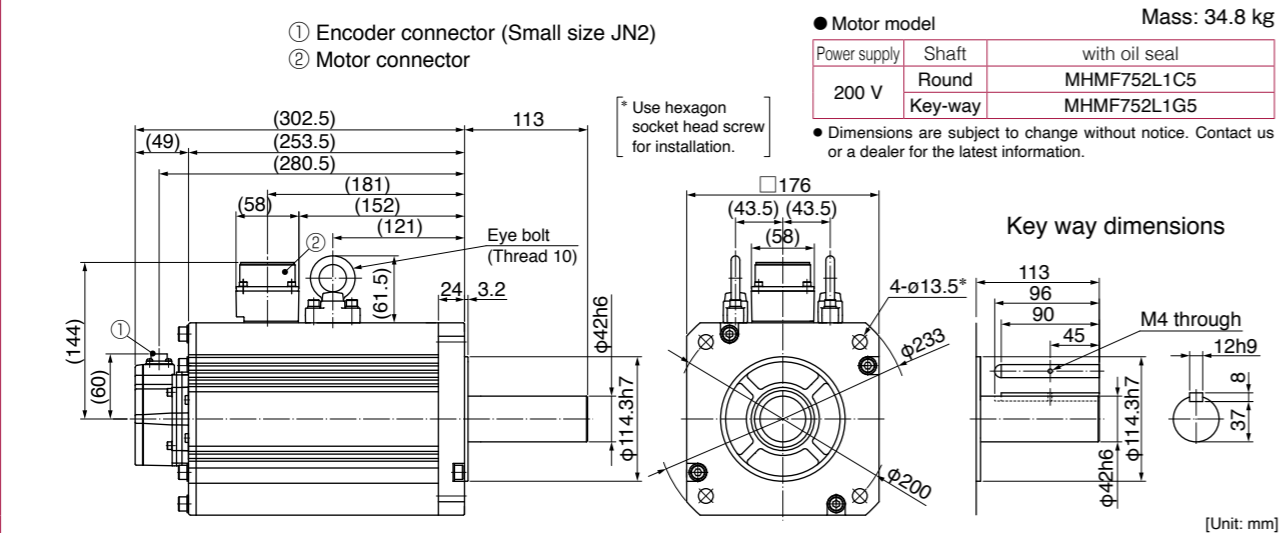
Large size connector (JL10) type • without brake • with oil seal • Key way shaft/ Round shaft



Large size connector (JL10) type • with brake • with oil seal • Key way shaft/ Round shaft



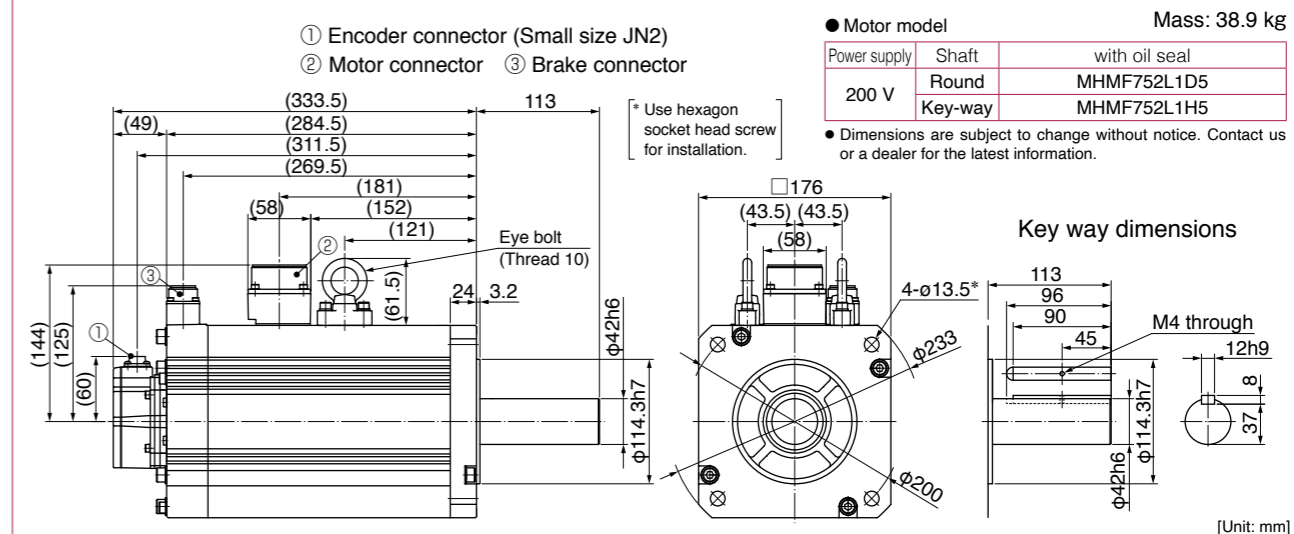
Small size connector (JN2) type • without brake • with oil seal • Key way shaft/ Round shaft



* For motors specifications, refer to P.101.

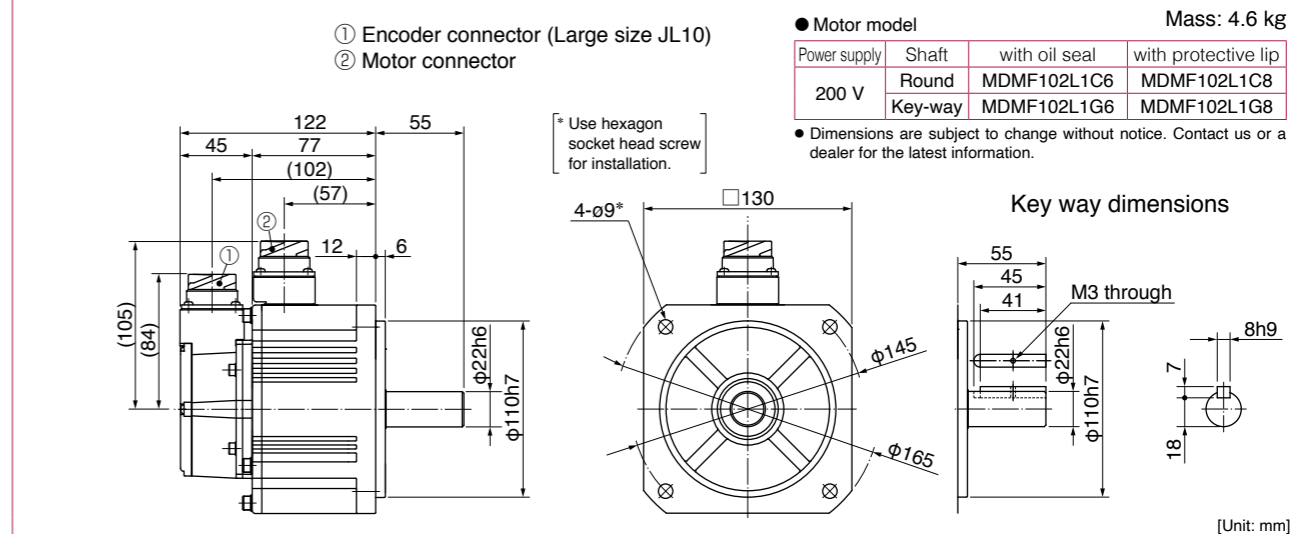
MHMF 7.5 kW

Small size connector (JN2) type • with brake • with oil seal • Key way shaft/ Round shaft

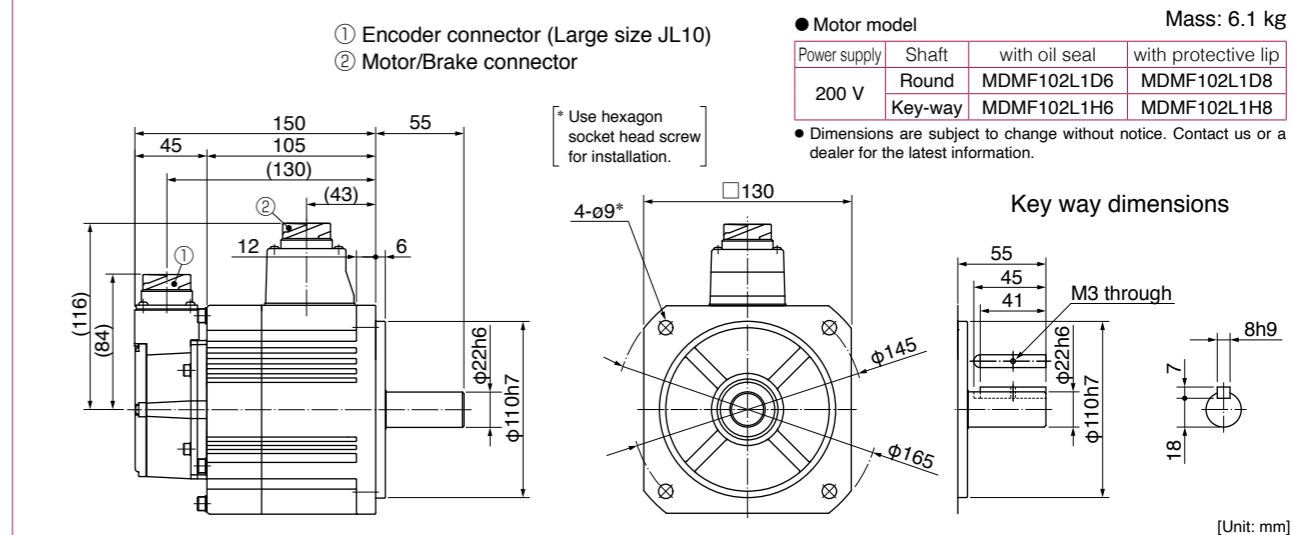


MDMF 1.0 kW

Large size connector (JL10) type • without brake • with oil seal/ with protective lip • Key way shaft/ Round shaft



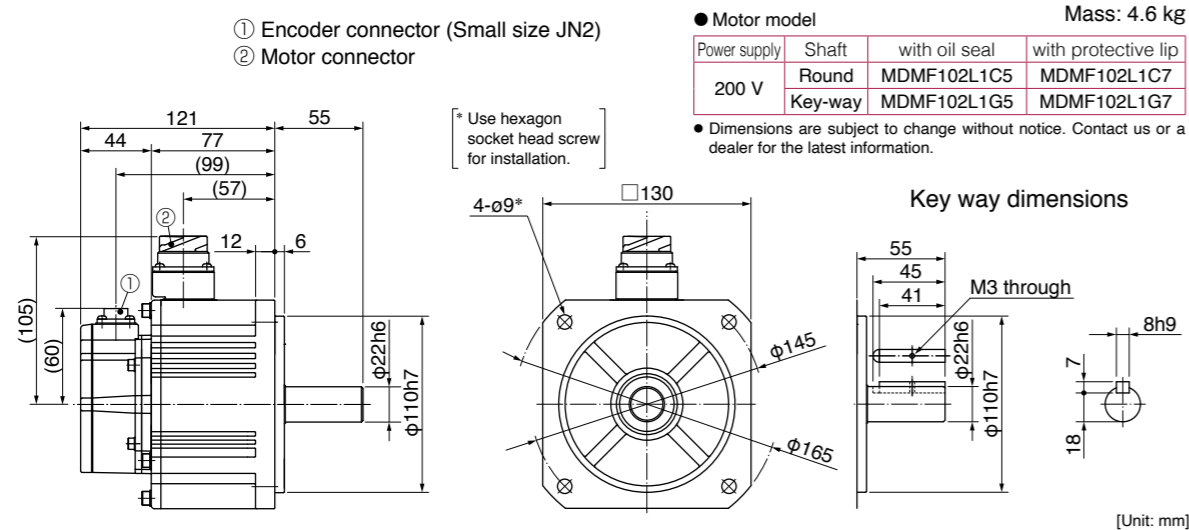
Large size connector (JL10) type • with brake • with oil seal/ with protective lip • Key way shaft/ Round shaft



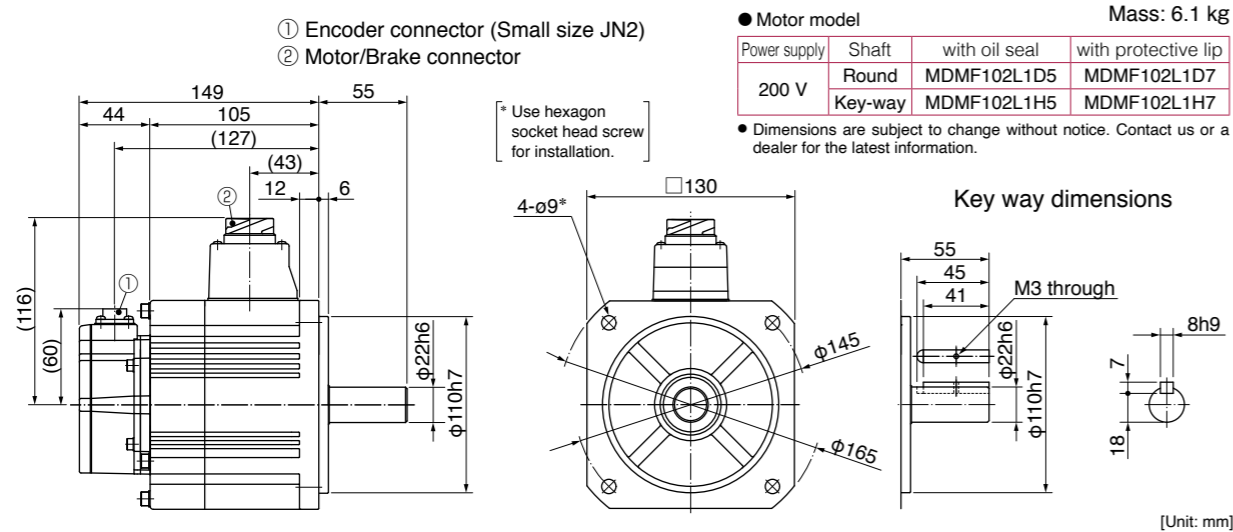
* For motors specifications, refer to P.101, P.102.

MDMF 1.0 kW

Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

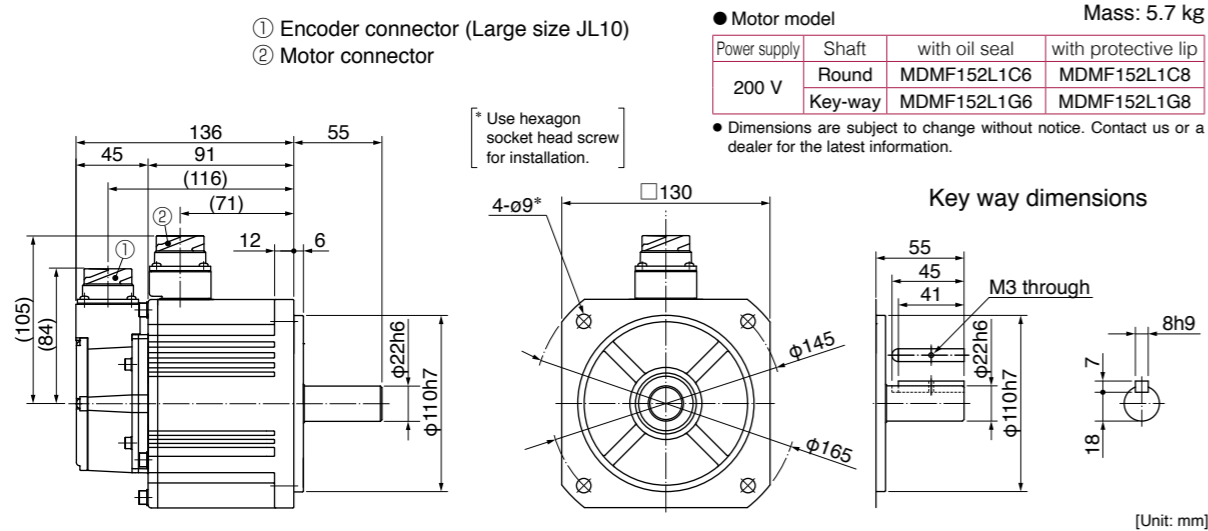


Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MDMF 1.5 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

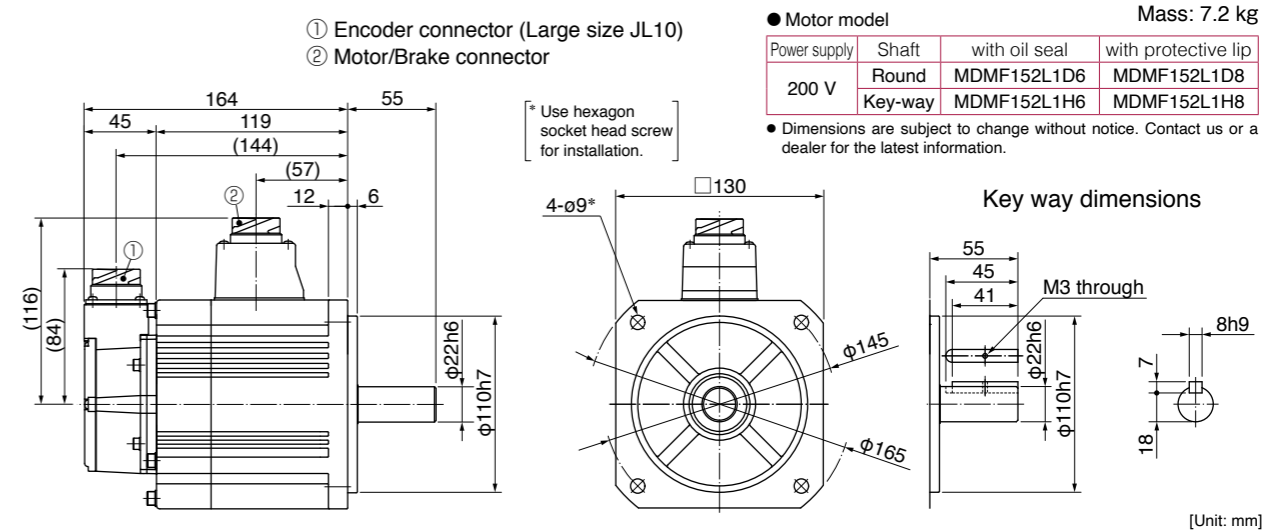


* For motors specifications, refer to P.102, P.103.

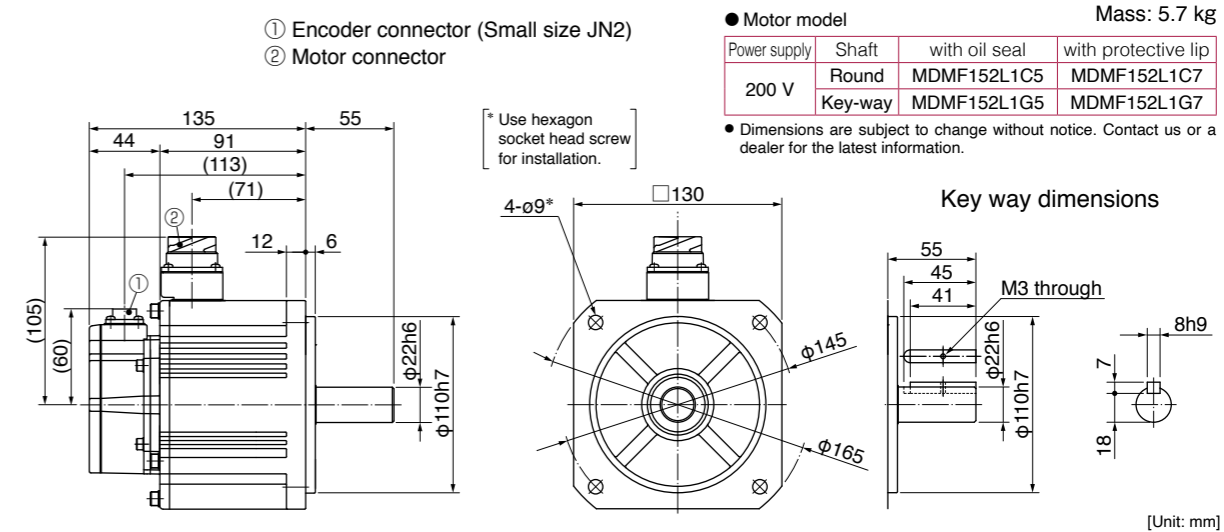
MDMF 1.5 kW

MDMF 1.5 kW

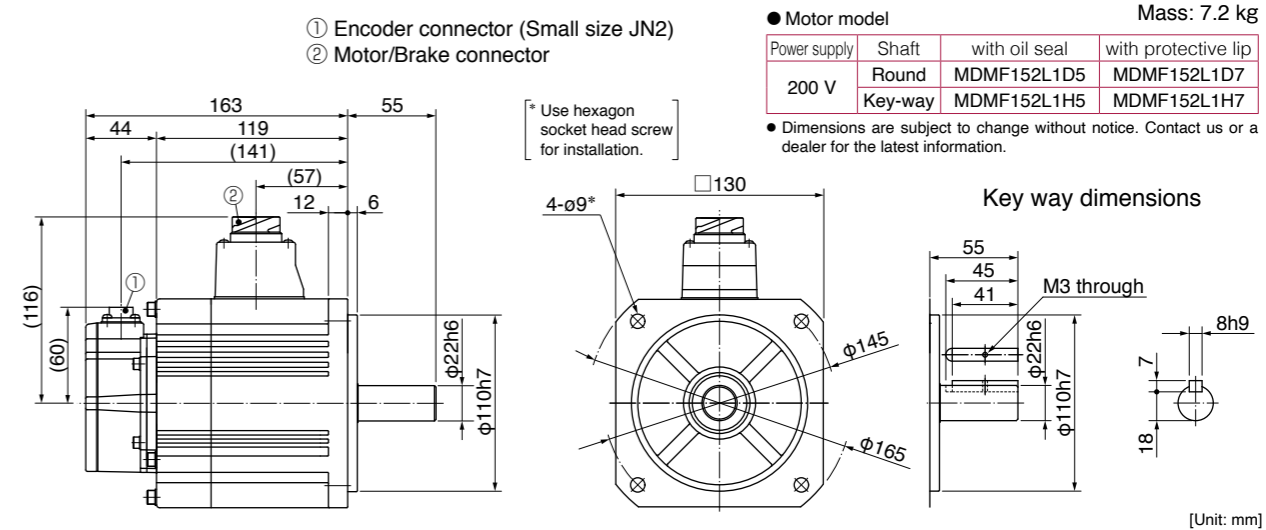
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



* For motors specifications, refer to P.103.

MDMF 2.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Large size JL10)
② Motor connector

● Motor model Mass: 6.9 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MDMF202L1C6 | MDMF202L1C8 |
| | Key-way | MDMF202L1G6 | MDMF202L1G8 |

* Use hexagon socket head screw for installation.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Key way dimensions

[Unit: mm]

Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Large size JL10)
② Motor/Brake connector

● Motor model Mass: 8.4 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MDMF202L1D6 | MDMF202L1D8 |
| | Key-way | MDMF202L1H6 | MDMF202L1H8 |

* Use hexagon socket head screw for installation.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Key way dimensions

[Unit: mm]

Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Small size JN2)
② Motor connector

● Motor model Mass: 6.9 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MDMF202L1C5 | MDMF202L1C7 |
| | Key-way | MDMF202L1G5 | MDMF202L1G7 |

* Use hexagon socket head screw for installation.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Key way dimensions

[Unit: mm]

* For motors specifications, refer to P.104.

MDMF 2.0 kW

Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Small size JN2)
② Motor/Brake connector

● Motor model Mass: 8.4 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MDMF202L1D5 | MDMF202L1D7 |
| | Key-way | MDMF202L1H5 | MDMF202L1H7 |

* Use hexagon socket head screw for installation.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Key way dimensions

[Unit: mm]

MDMF 3.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Large size JL10)
② Motor connector

● Motor model Mass: 9.3 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MDMF302L1C6 | MDMF302L1C8 |
| | Key-way | MDMF302L1G6 | MDMF302L1G8 |

* Use hexagon socket head screw for installation.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

Key way dimensions

[Unit: mm]

Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Large size JL10)
② Motor/Brake connector

● Motor model Mass: 10.9 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MDMF302L1D6 | MDMF302L1D8 |
| | Key-way | MDMF302L1H6 | MDMF302L1H8 |

* Use hexagon socket head screw for installation.

Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

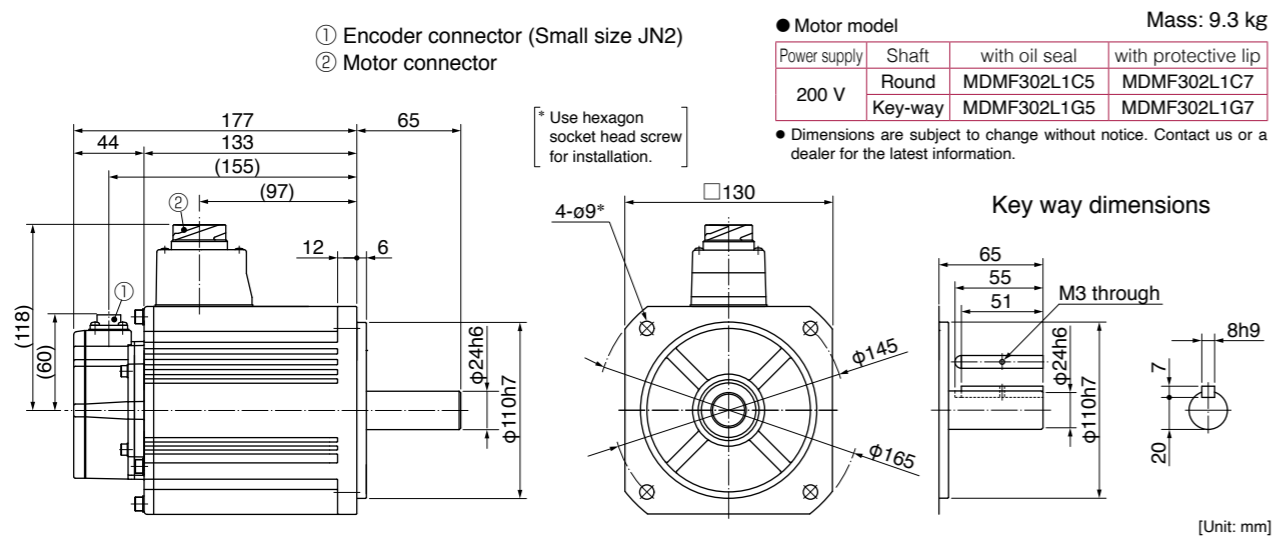
Key way dimensions

[Unit: mm]

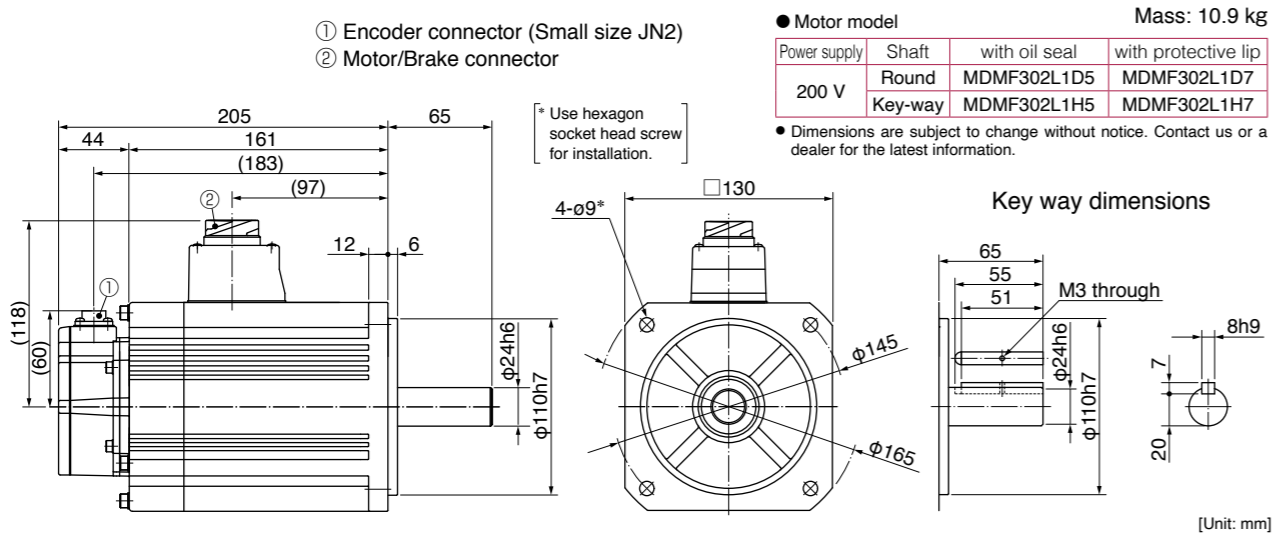
* For motors specifications, refer to P.104, P.105.

MDMF 3.0 kW

Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

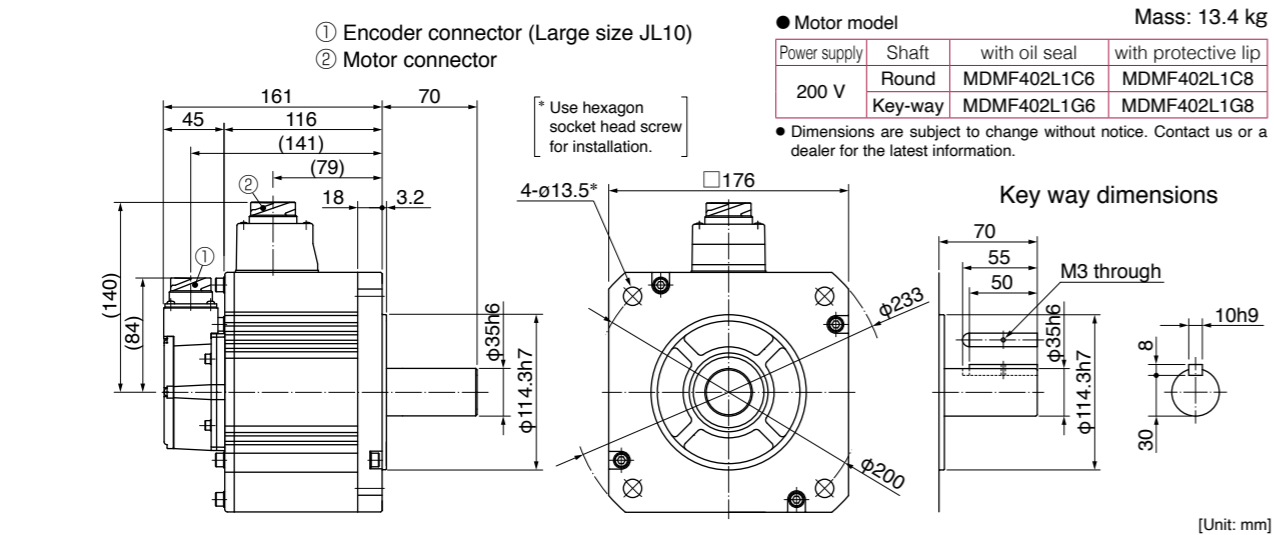


Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MDMF 4.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

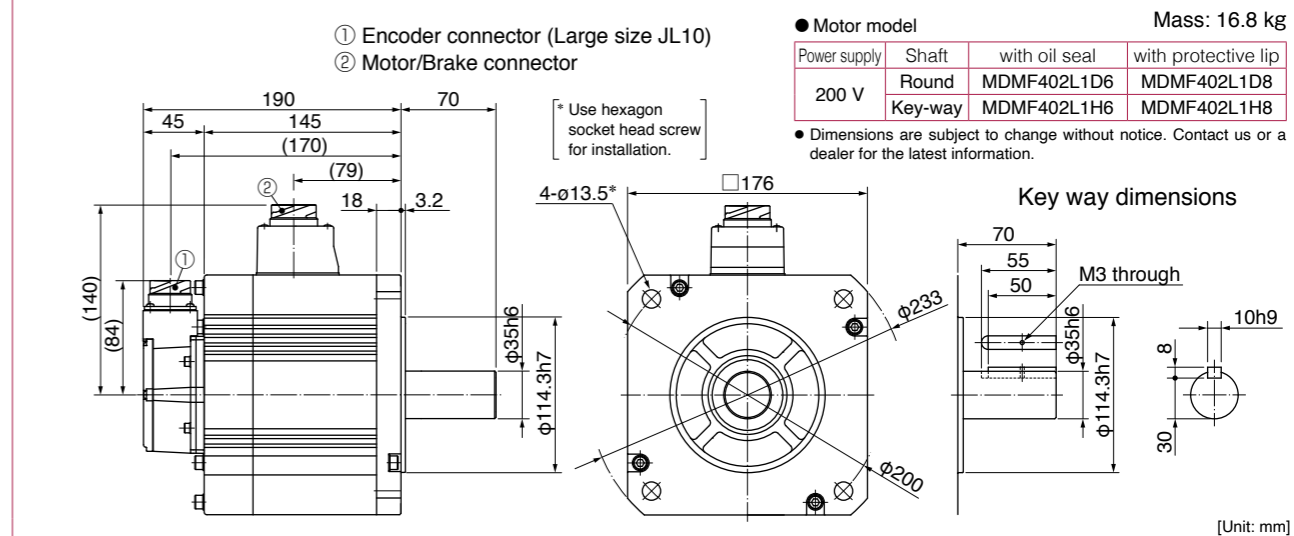


* For motors specifications, refer to P.105, P.106.

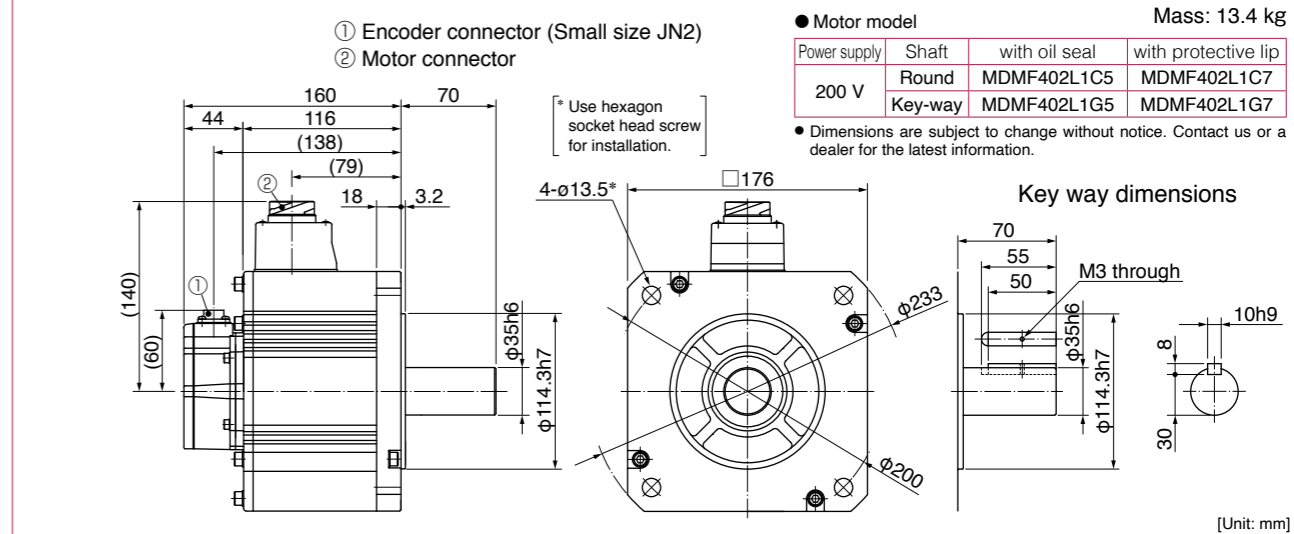
MDMF 4.0 kW

MDMF 4.0 kW

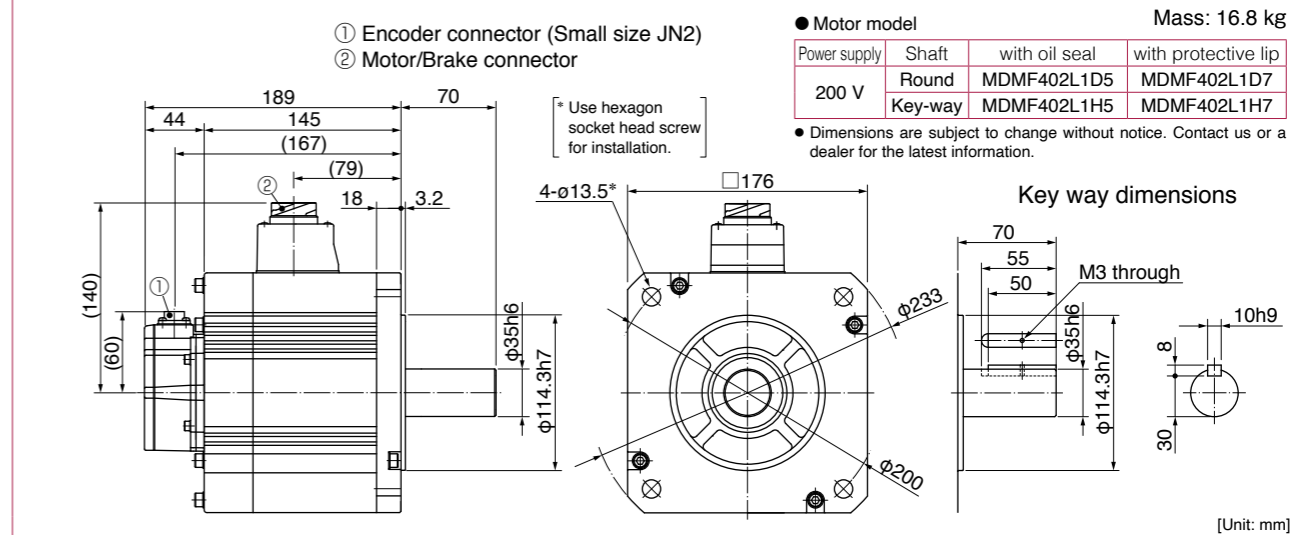
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



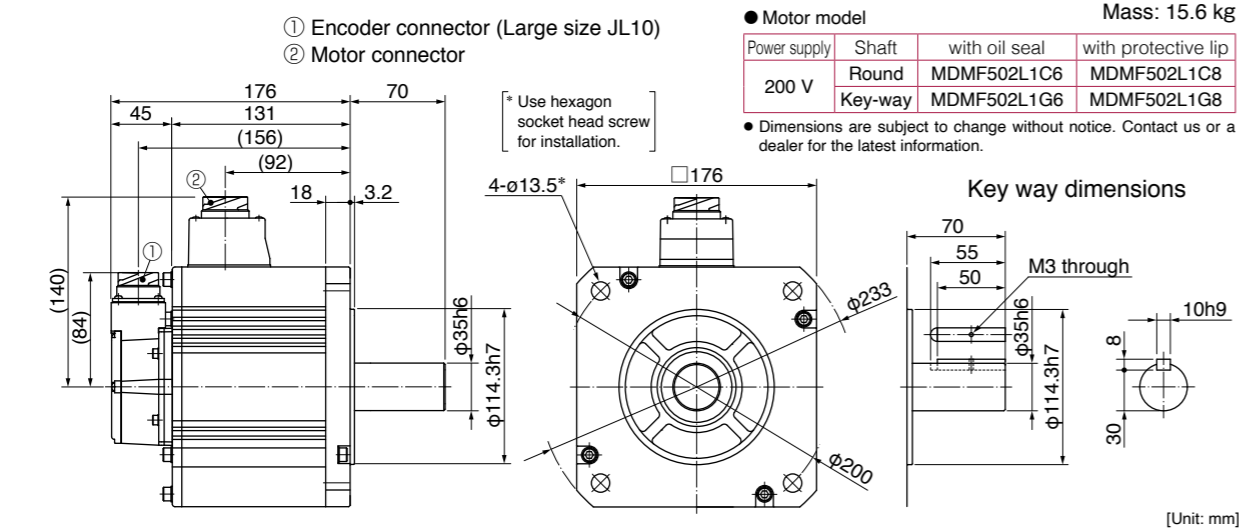
Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



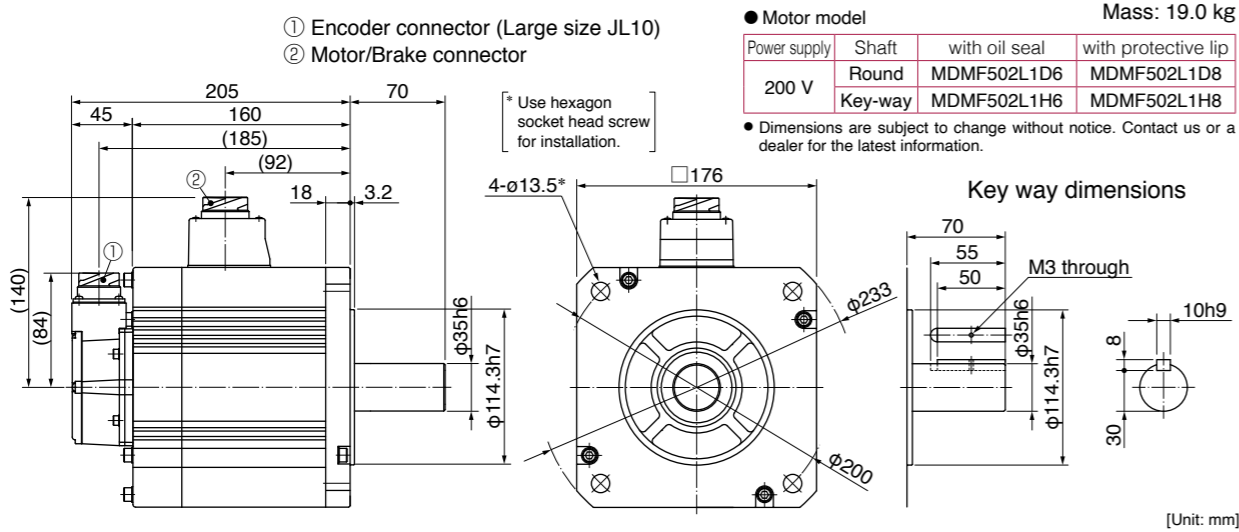
* For motors specifications, refer to P.106.

MDMF 5.0 kW

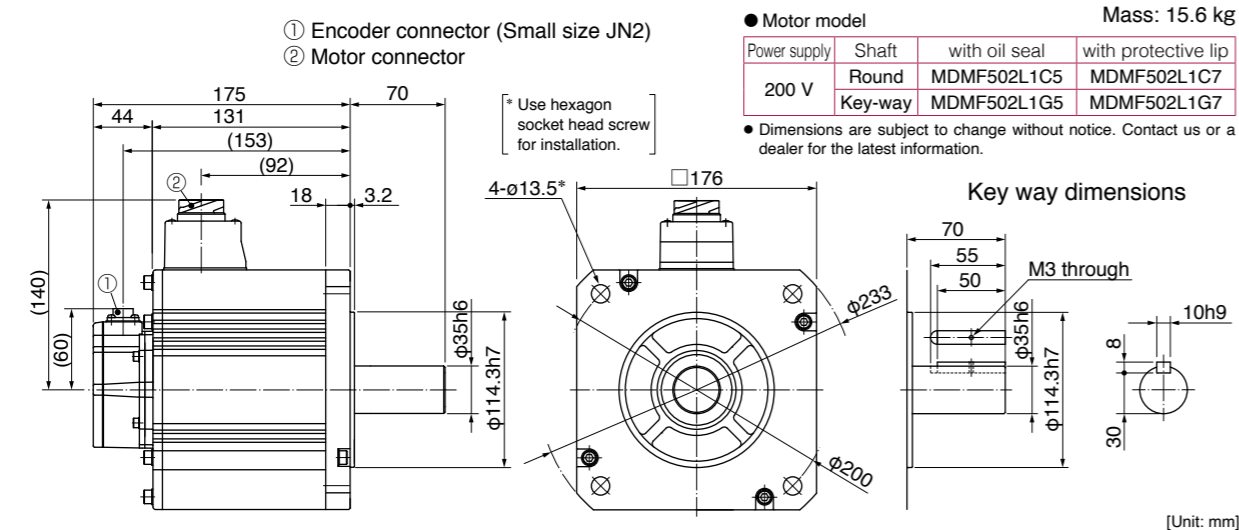
Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



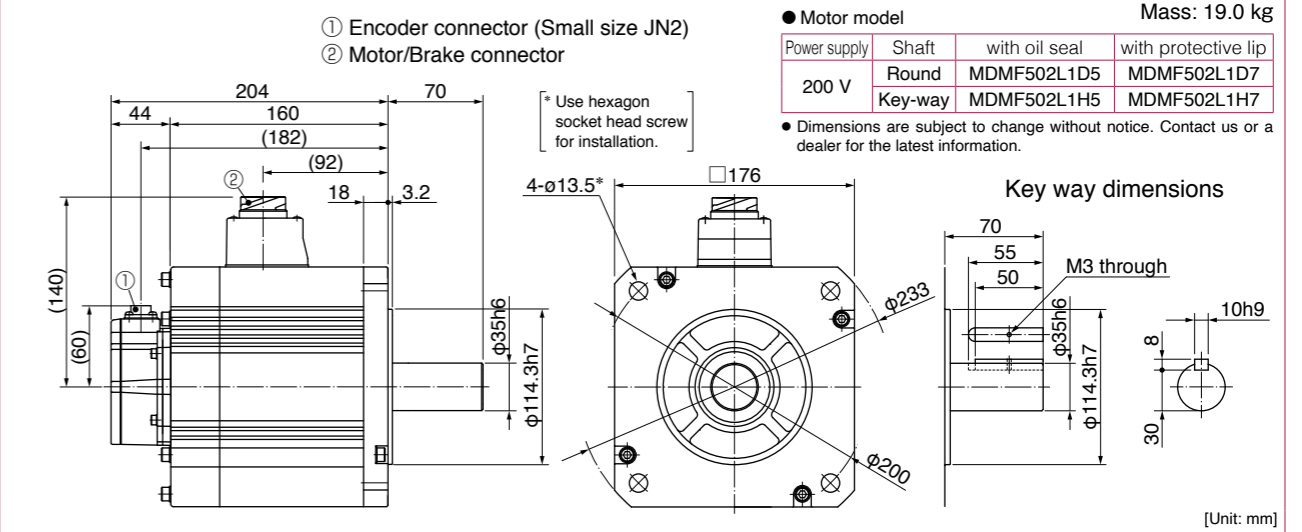
Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



* For motors specifications, refer to P.107.

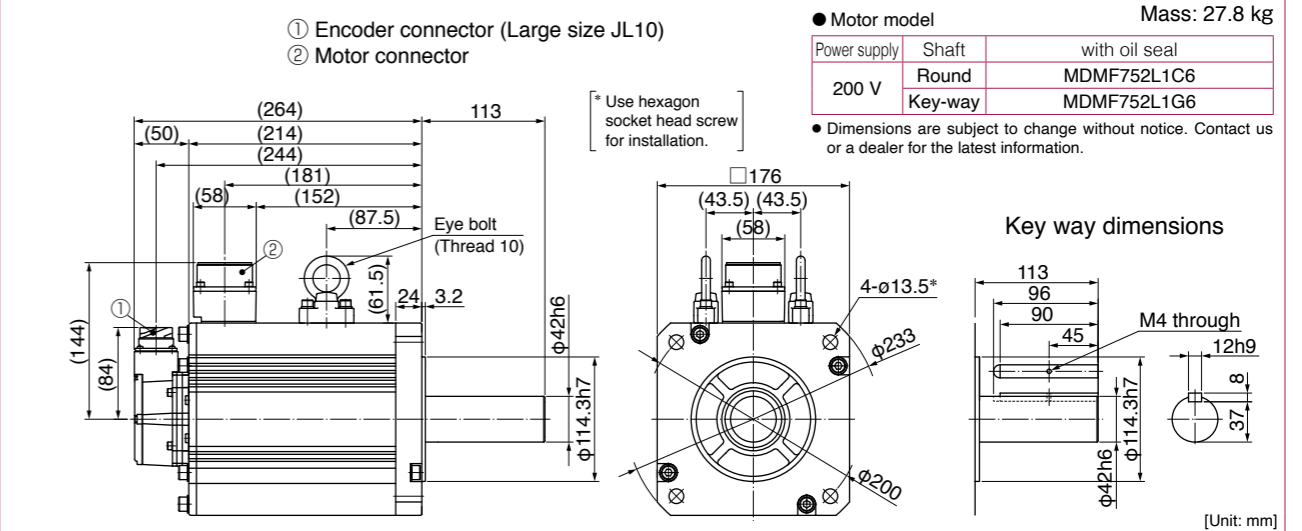
MDMF 5.0 kW

Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

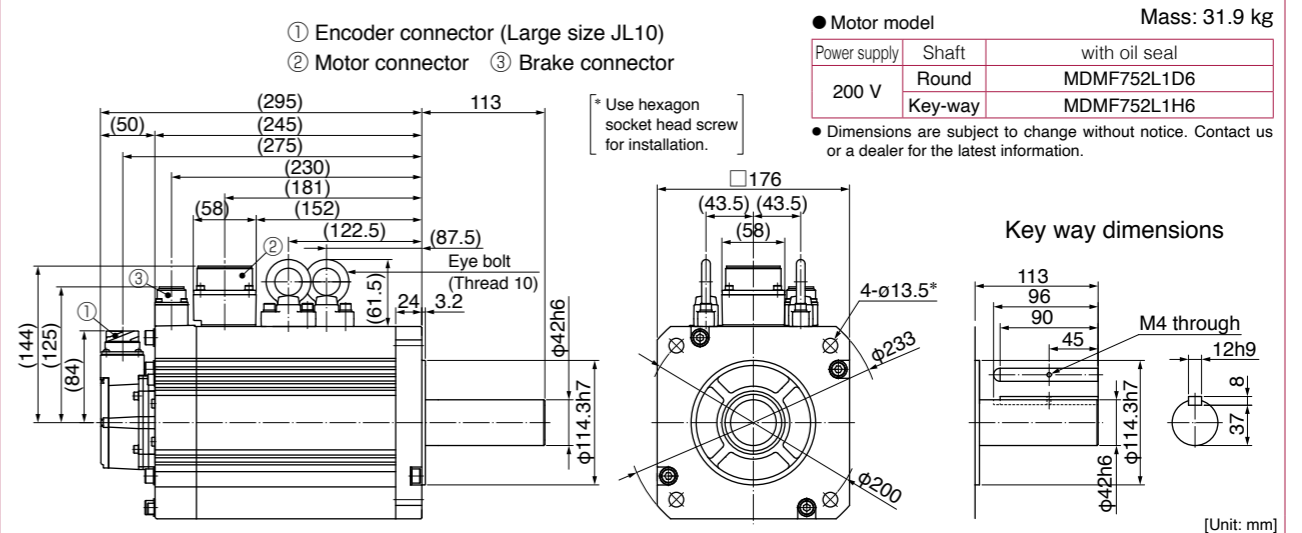


MDMF 7.5 kW

Large size connector (JL10) type · without brake · with oil seal · Key way shaft/ Round shaft

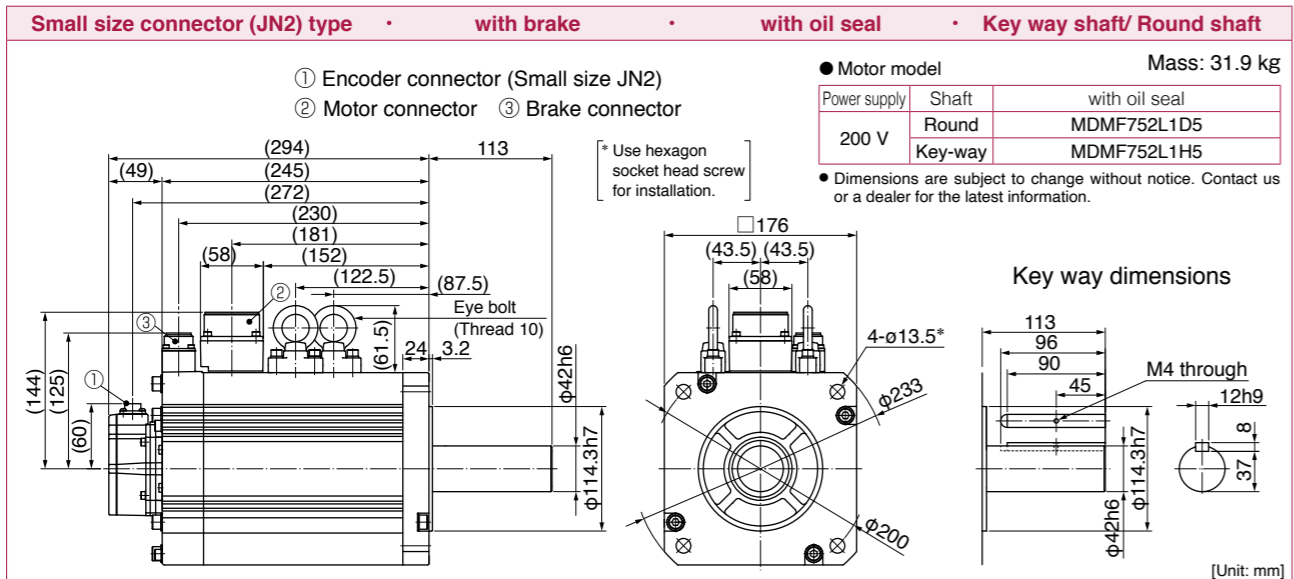
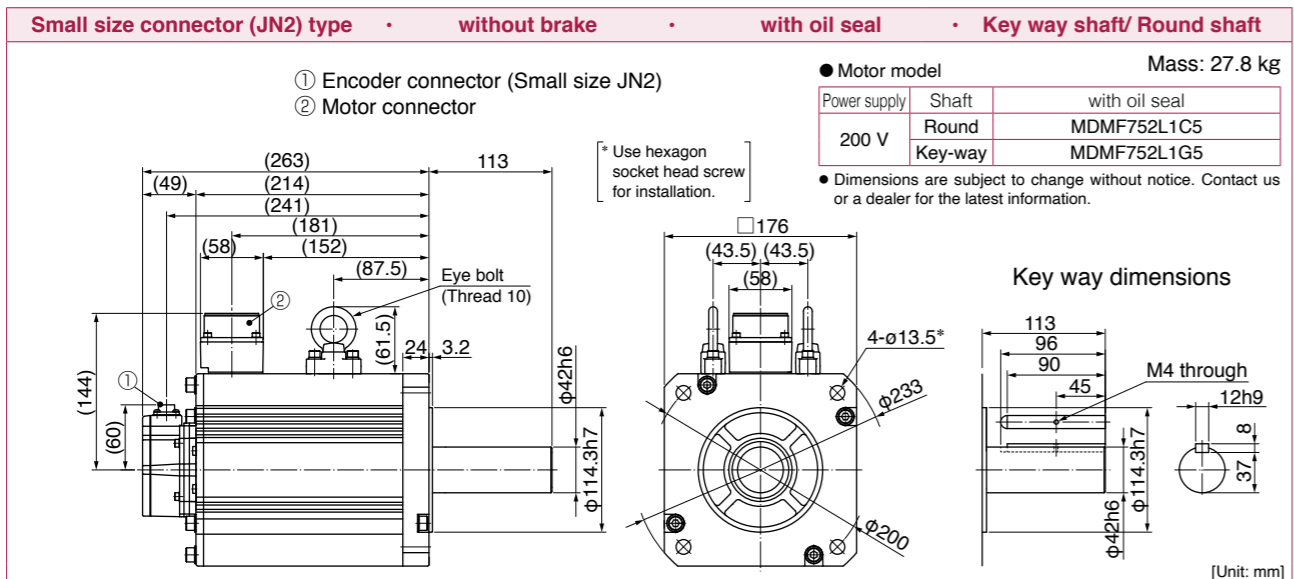


Large size connector (JL10) type · with brake · with oil seal · Key way shaft/ Round shaft

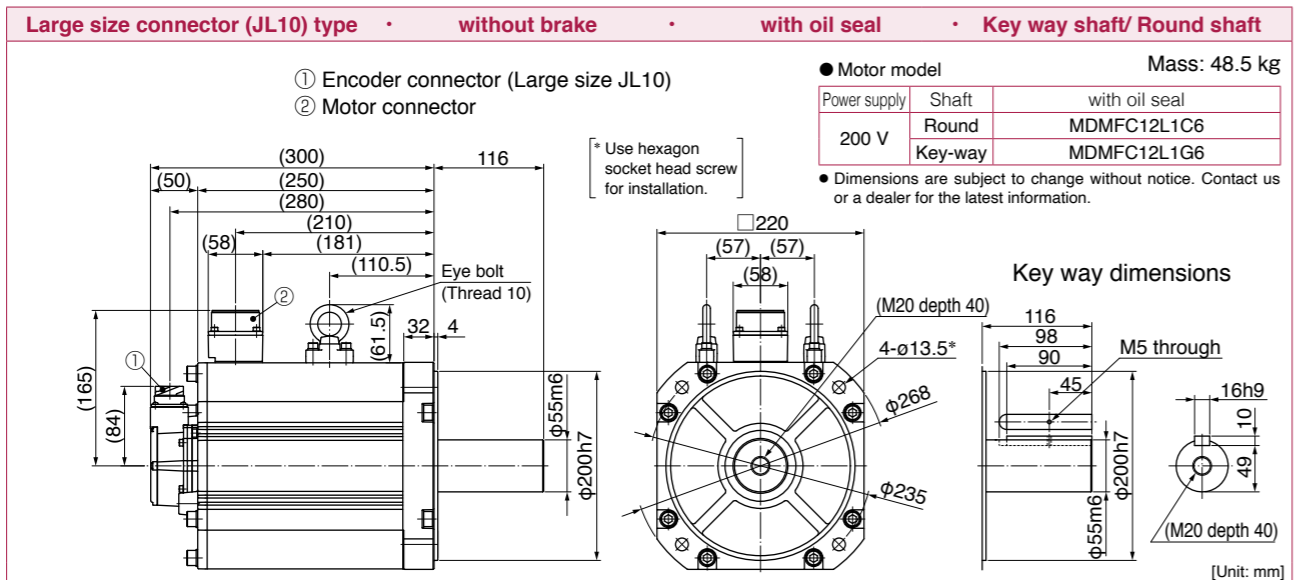


* For motors specifications, refer to P.107, P.108.

MDMF 7.5 kW



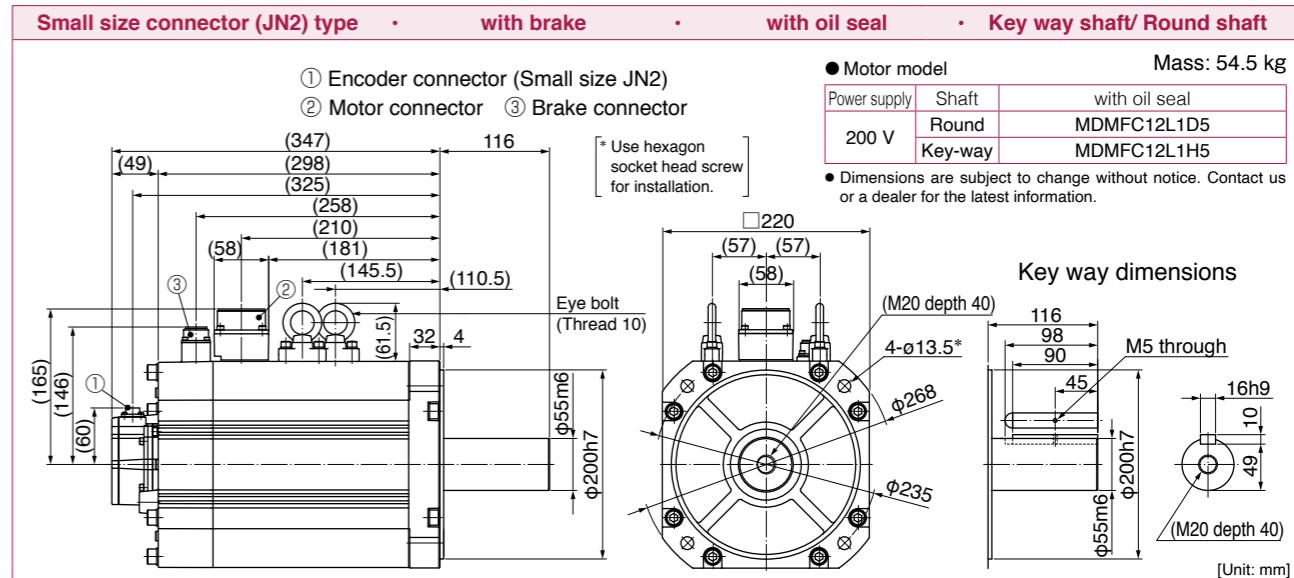
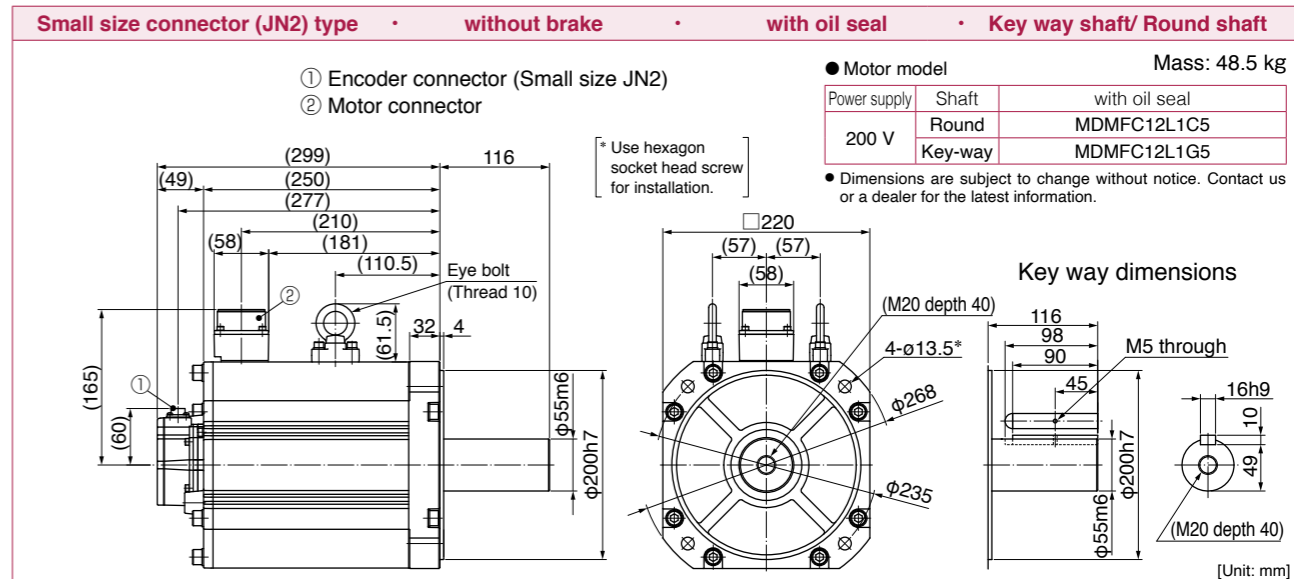
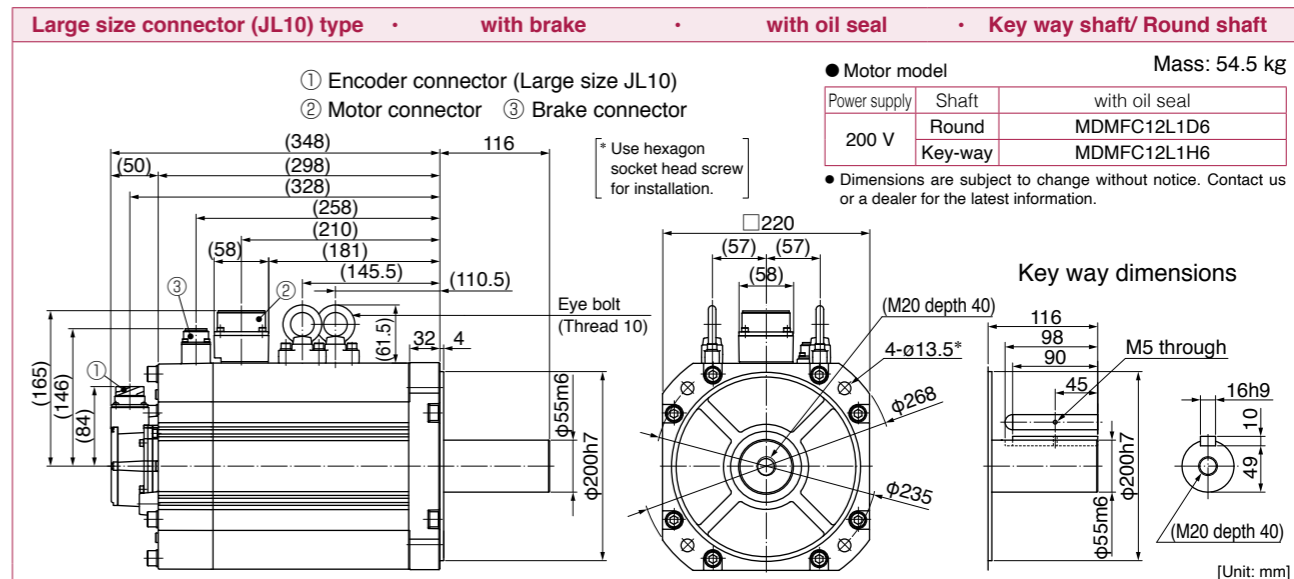
MDMF 11.0 kW



* For motors specifications, refer to P:108, P:109.

MDMF 11.0 kW

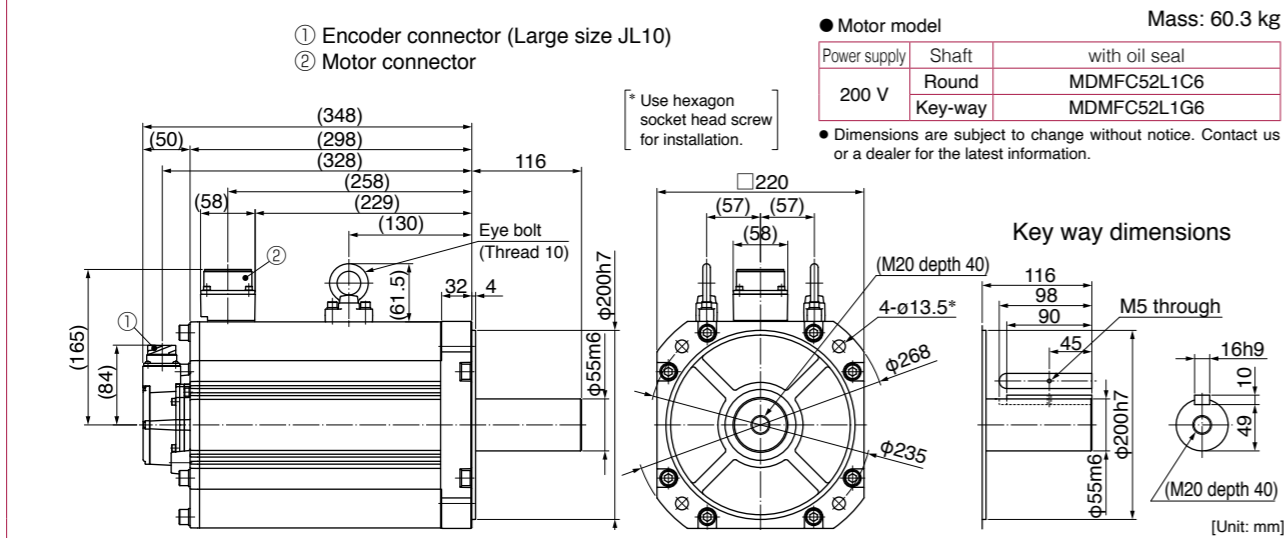
MDMF 11.0 kW



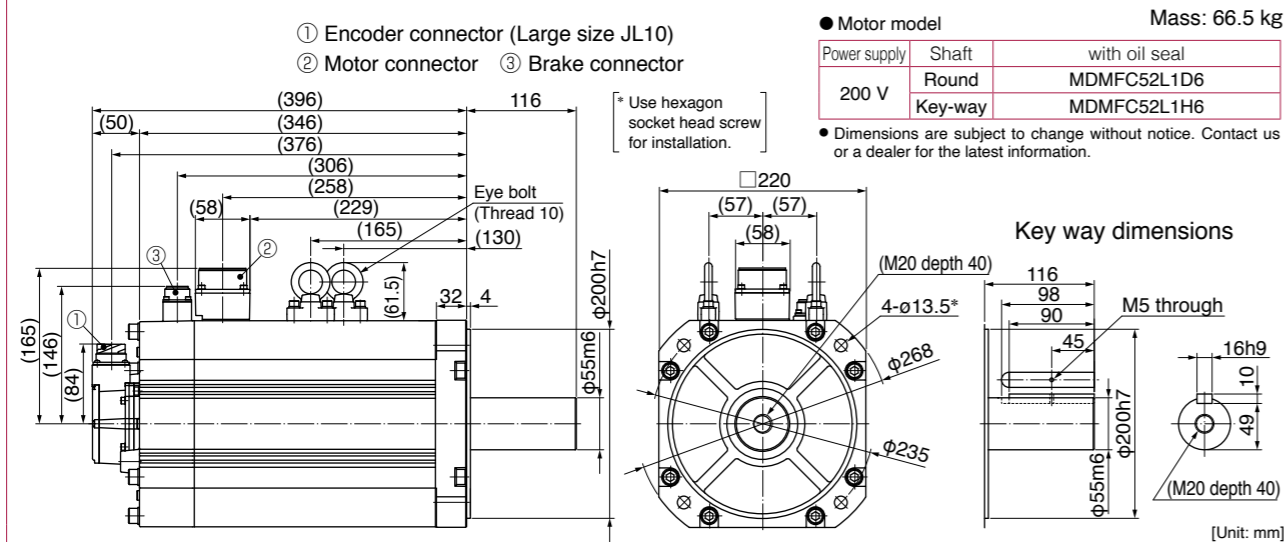
* For motors specifications, refer to P:109.

MDMF 15.0 kW

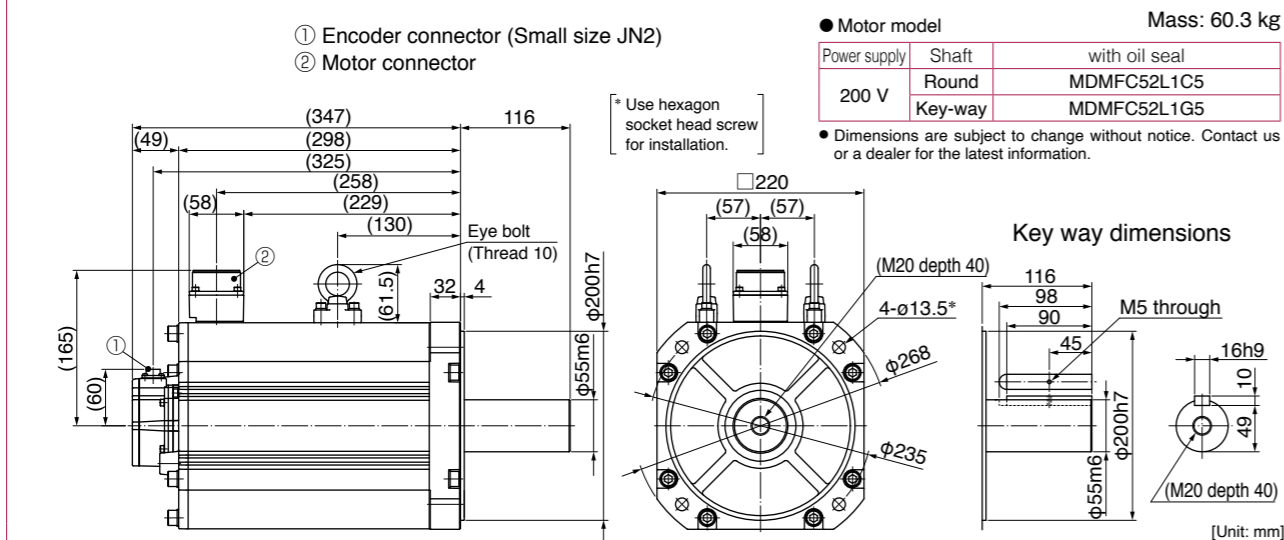
Large size connector (JL10) type • without brake • with oil seal • Key way shaft/ Round shaft



Large size connector (JL10) type • with brake • with oil seal • Key way shaft/ Round shaft



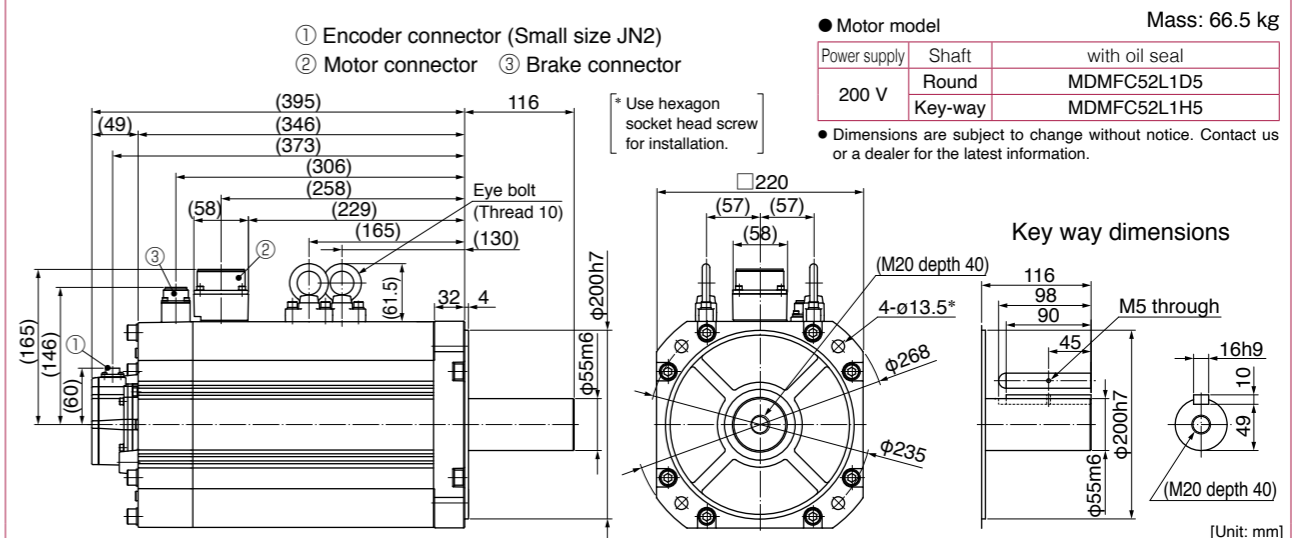
Small size connector (JN2) type • without brake • with oil seal • Key way shaft/ Round shaft



* For motors specifications, refer to P.110.

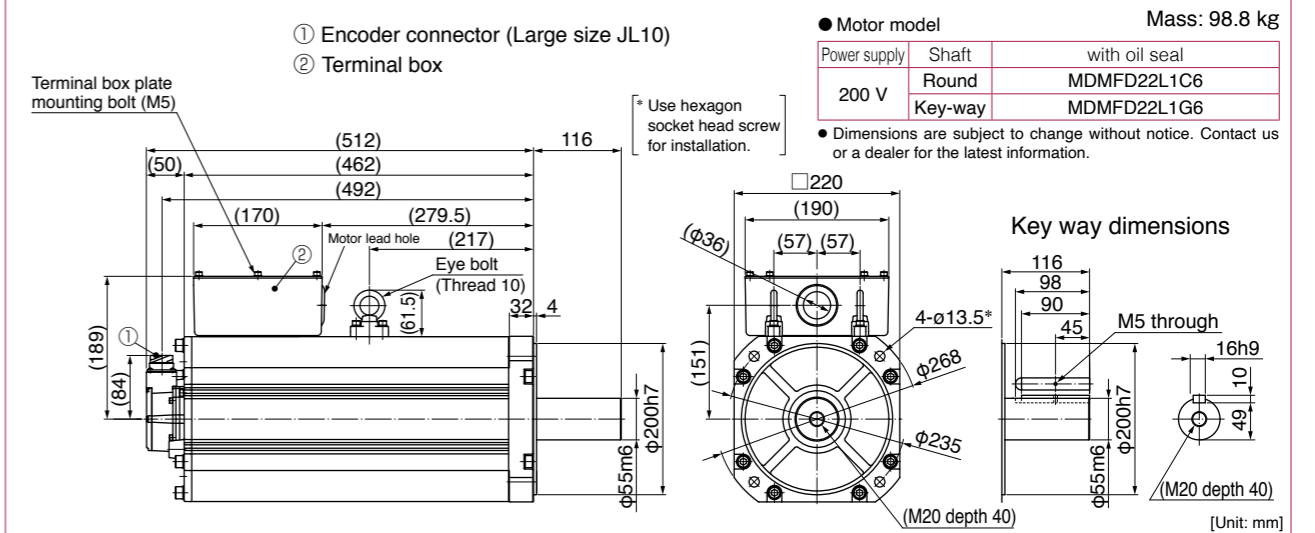
MDMF 15.0 kW

Small size connector (JN2) type • with brake • with oil seal • Key way shaft/ Round shaft

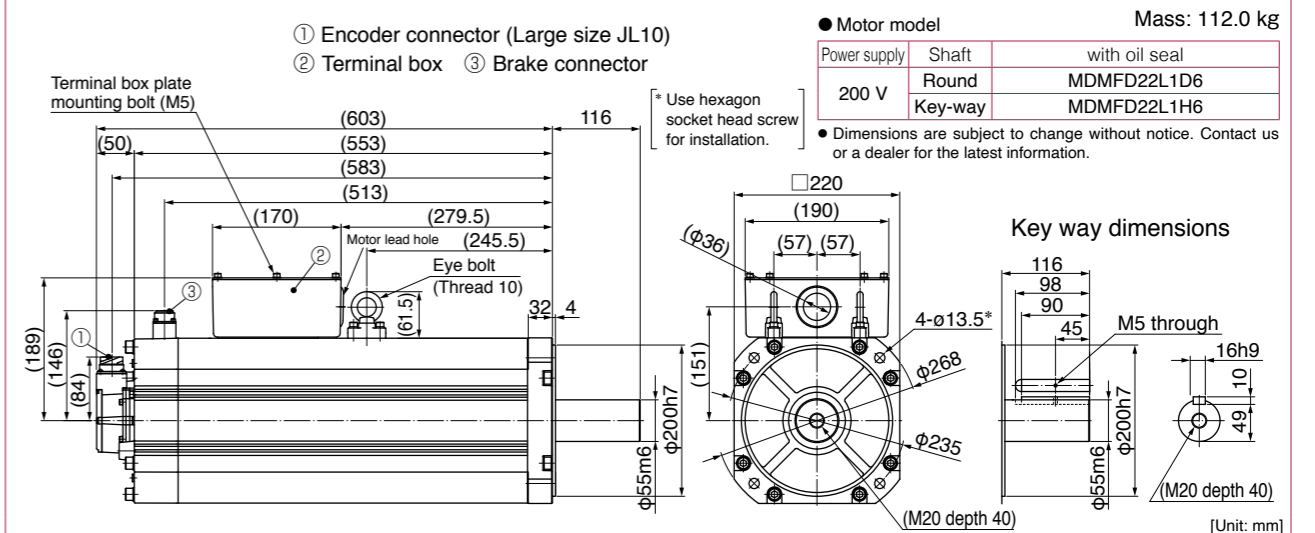


MDMF 22.0 kW

Large size connector (JL10) type • without brake • with oil seal • Key way shaft/ Round shaft

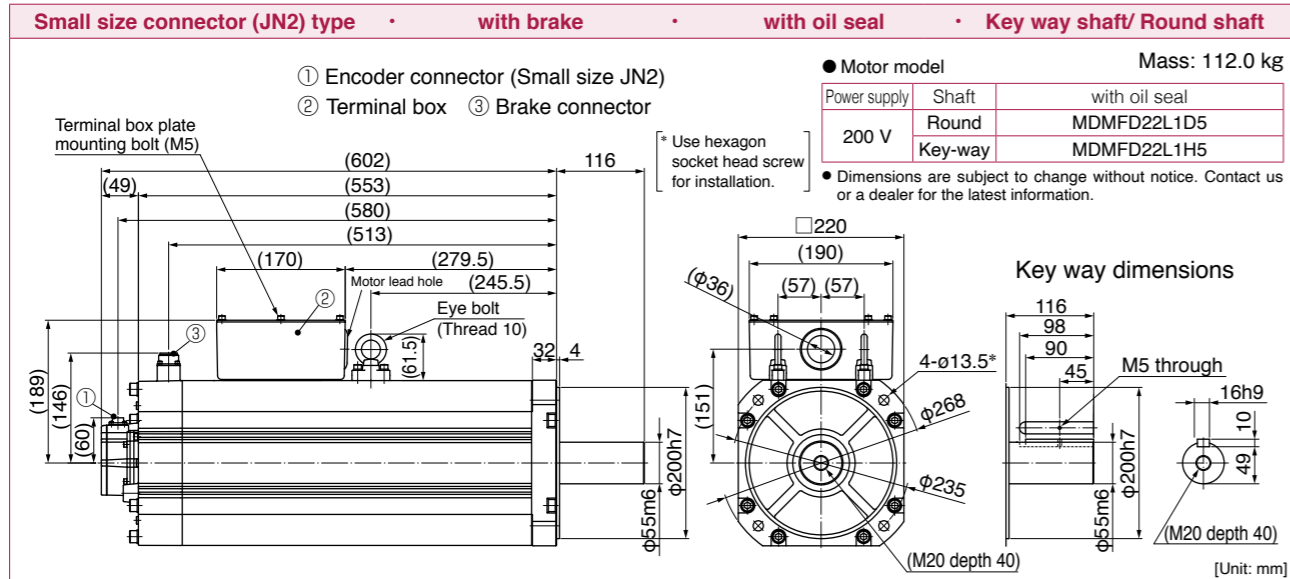
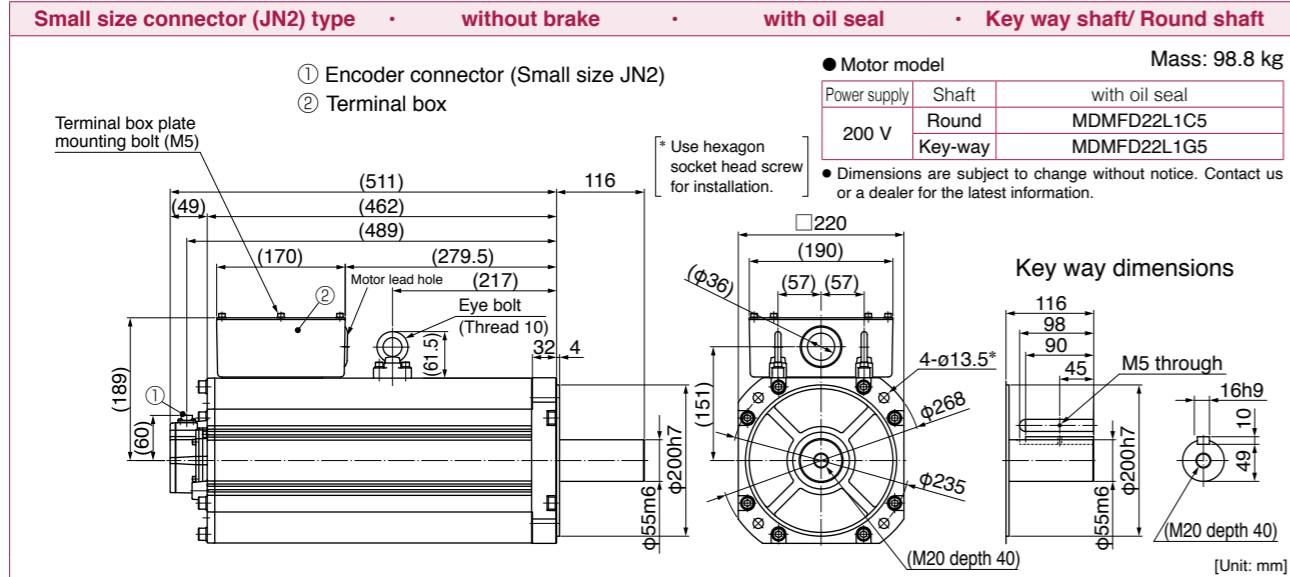


Large size connector (JL10) type • with brake • with oil seal • Key way shaft/ Round shaft

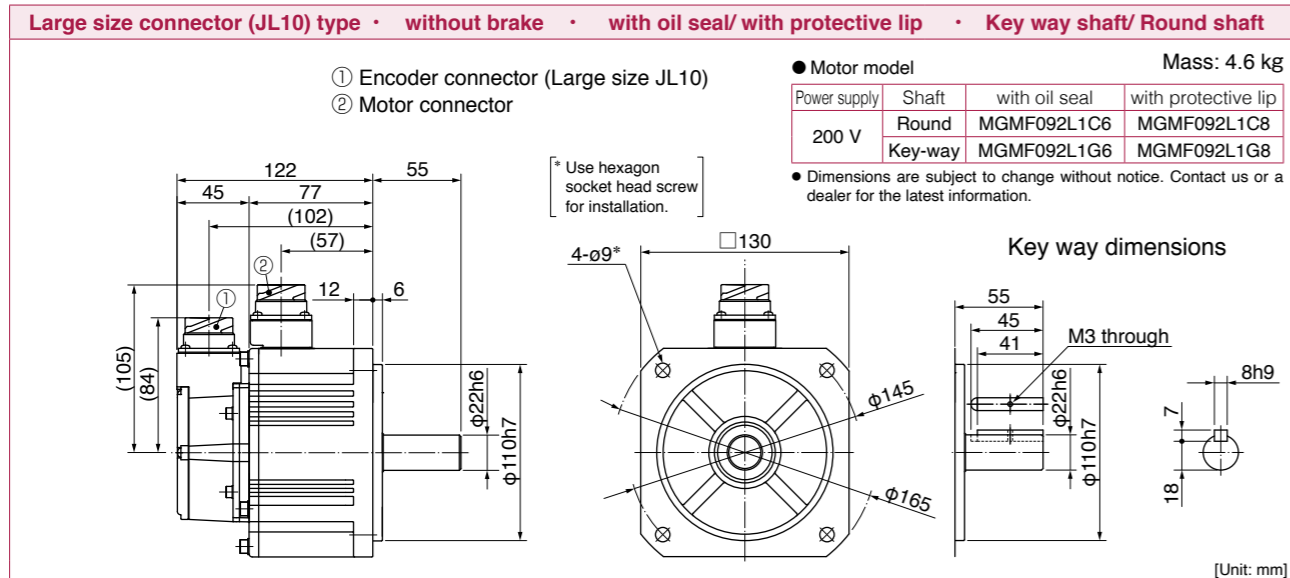


* For motors specifications, refer to P.110, P.111.

MDMF 22.0 kW

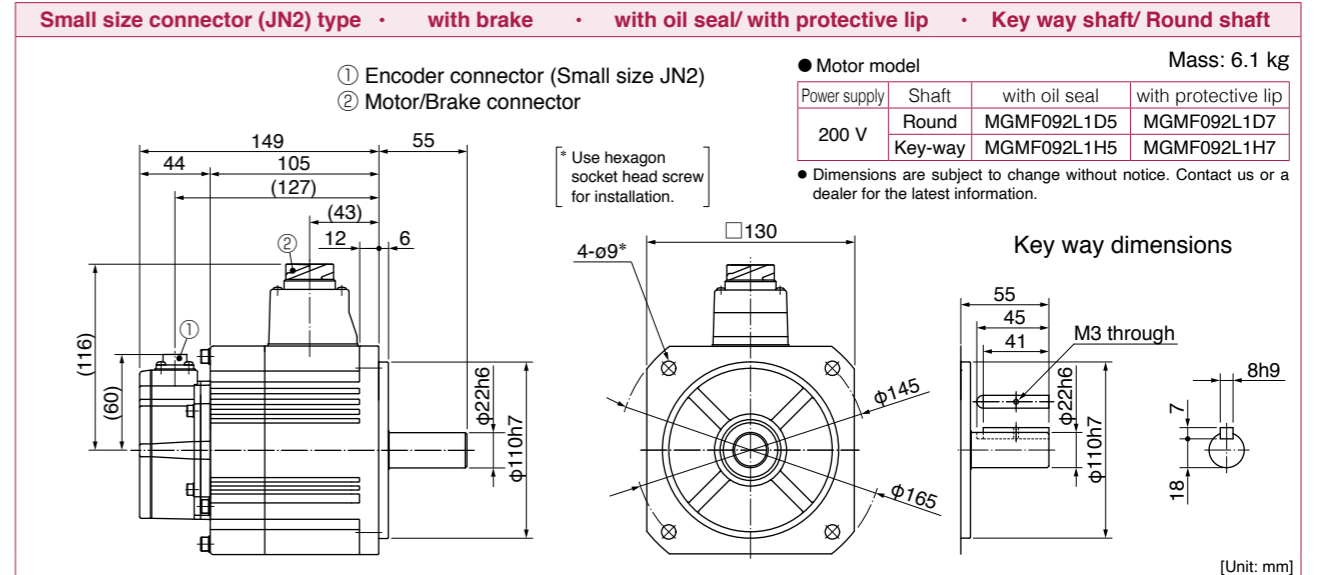
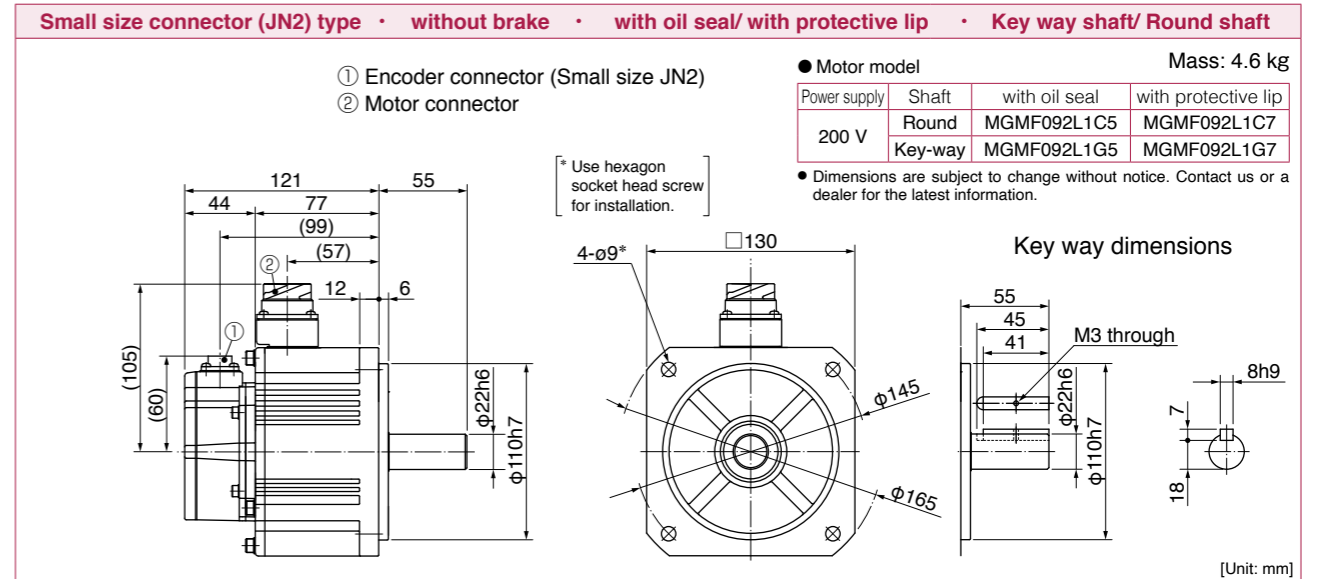
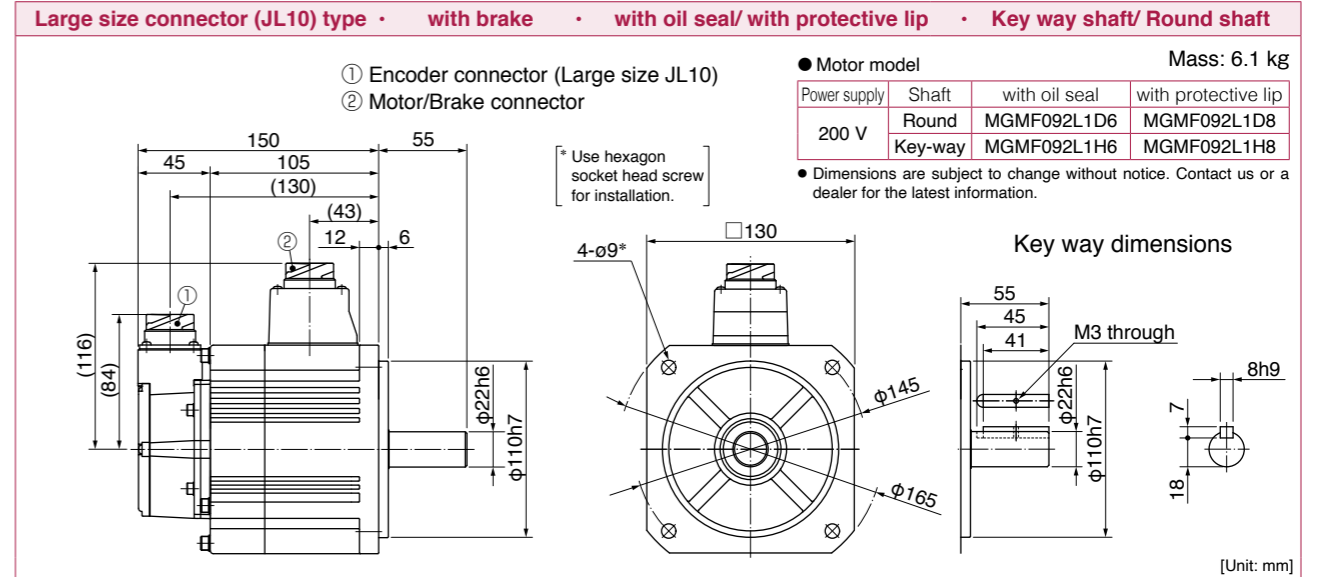


MGMF 0.85 kW



* For motors specifications, refer to P.111, P.112.

MGMF 0.85 kW



* For motors specifications, refer to P.112.

MGMF 1.3 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Large size JL10)
② Motor connector

● Motor model Mass: 5.7 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MGMF132L1C6 | MGMF132L1C8 |
| | Key-way | MGMF132L1G6 | MGMF132L1G8 |

* Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions

[Unit: mm]

Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Large size JL10)
② Motor/Brake connector

● Motor model Mass: 7.2 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MGMF132L1D6 | MGMF132L1D8 |
| | Key-way | MGMF132L1H6 | MGMF132L1H8 |

* Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions

[Unit: mm]

Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Small size JN2)
② Motor connector

● Motor model Mass: 5.7 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MGMF132L1C5 | MGMF132L1C7 |
| | Key-way | MGMF132L1G5 | MGMF132L1G7 |

* Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions

[Unit: mm]

* For motors specifications, refer to P.113.

MGMF 1.3 kW

Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Small size JN2)
② Motor/Brake connector

● Motor model Mass: 7.5 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MGMF132L1D5 | MGMF132L1D7 |
| | Key-way | MGMF132L1H5 | MGMF132L1H7 |

* Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions

[Unit: mm]

MGMF 1.8 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Large size JL10)
② Motor connector

● Motor model Mass: 6.9 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MGMF182L1C6 | MGMF182L1C8 |
| | Key-way | MGMF182L1G6 | MGMF182L1G8 |

* Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

Key way dimensions

[Unit: mm]

Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

① Encoder connector (Large size JL10)
② Motor/Brake connector

● Motor model Mass: 8.4 kg

| Power supply | Shaft | with oil seal | with protective lip |
|--------------|---------|---------------|---------------------|
| 200 V | Round | MGMF182L1D6 | MGMF182L1D8 |
| | Key-way | MGMF182L1H6 | MGMF182L1H8 |

* Dimensions are subject to change without notice. Contact us or a dealer for the latest information.

* Use hexagon socket head screw for installation.

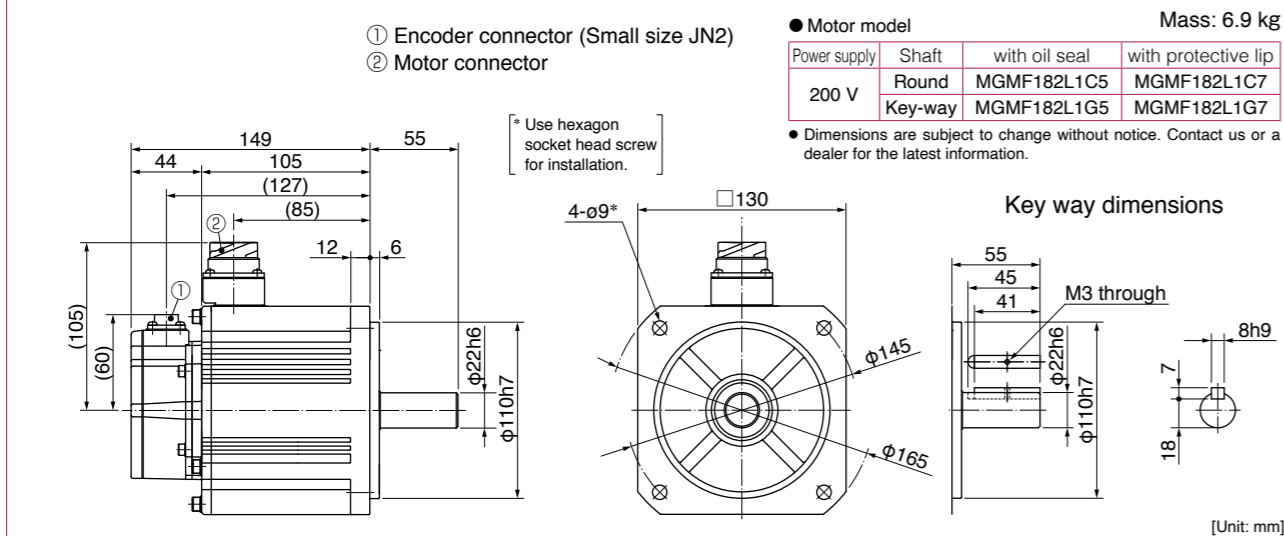
Key way dimensions

[Unit: mm]

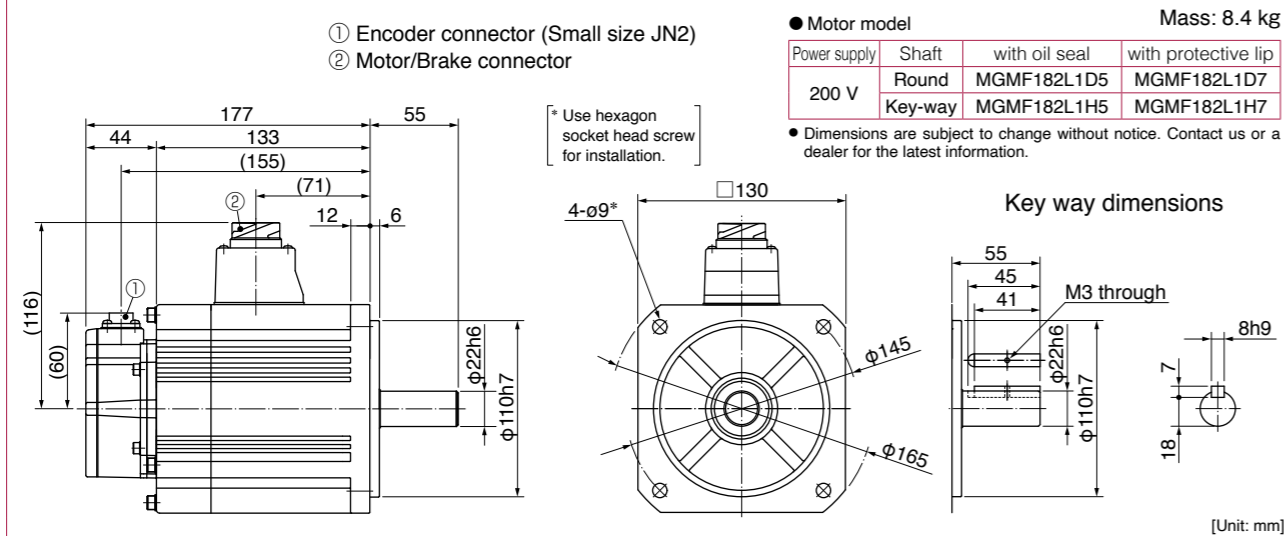
* For motors specifications, refer to P.113, P.114.

MGMF 1.8 kW

Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

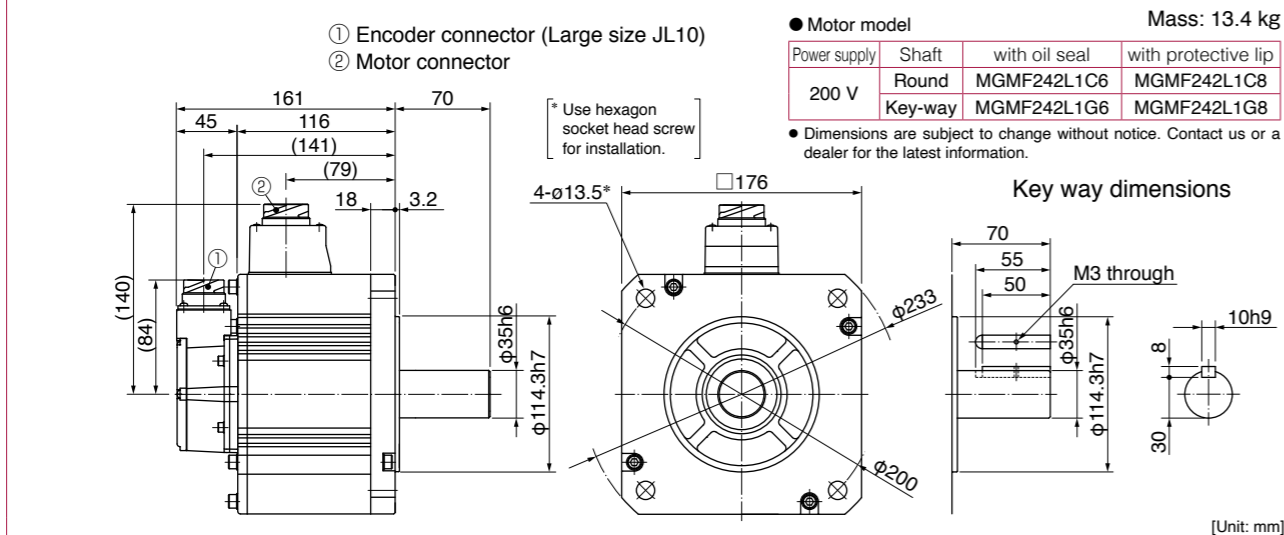


Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MGMF 2.4 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

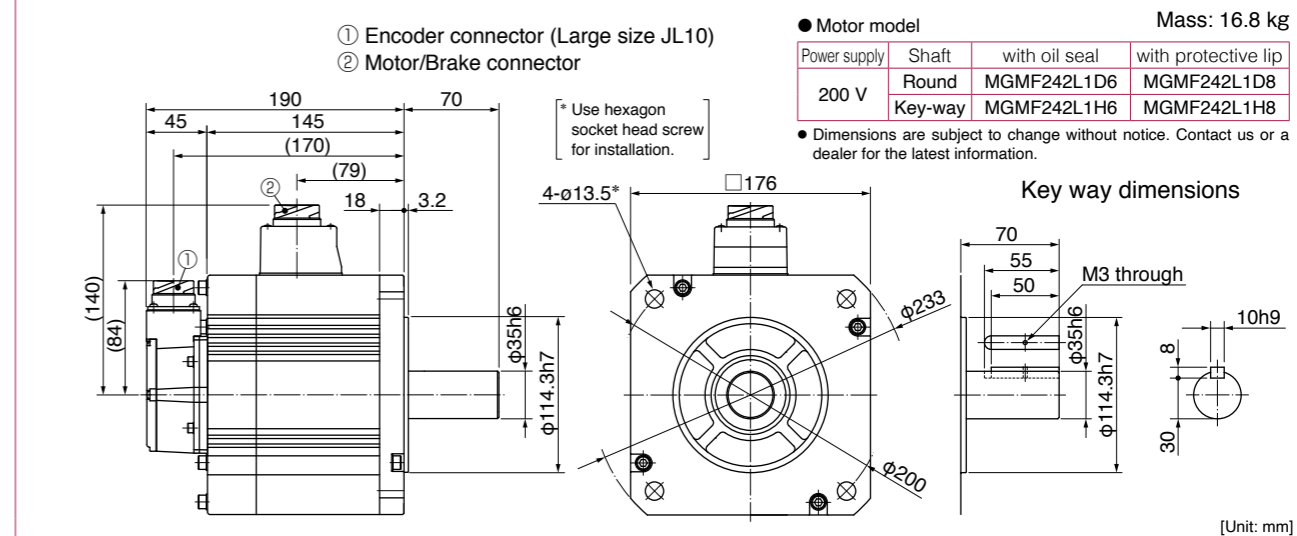


* For motors specifications, refer to P.114, P.115.

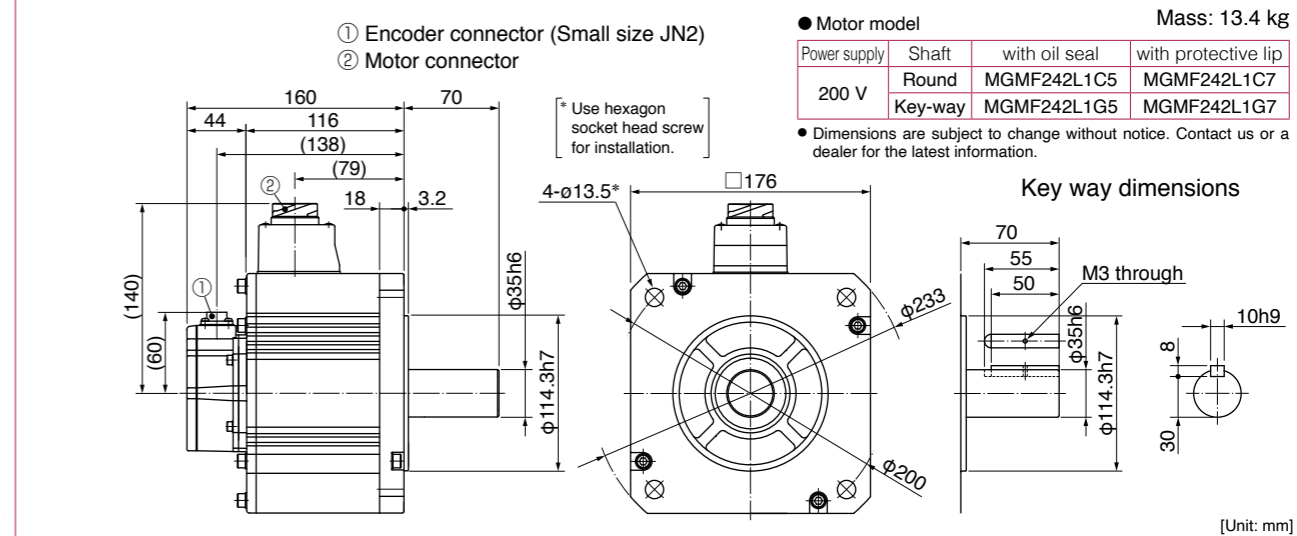
MGMF 2.4 kW

MGMF 2.4 kW

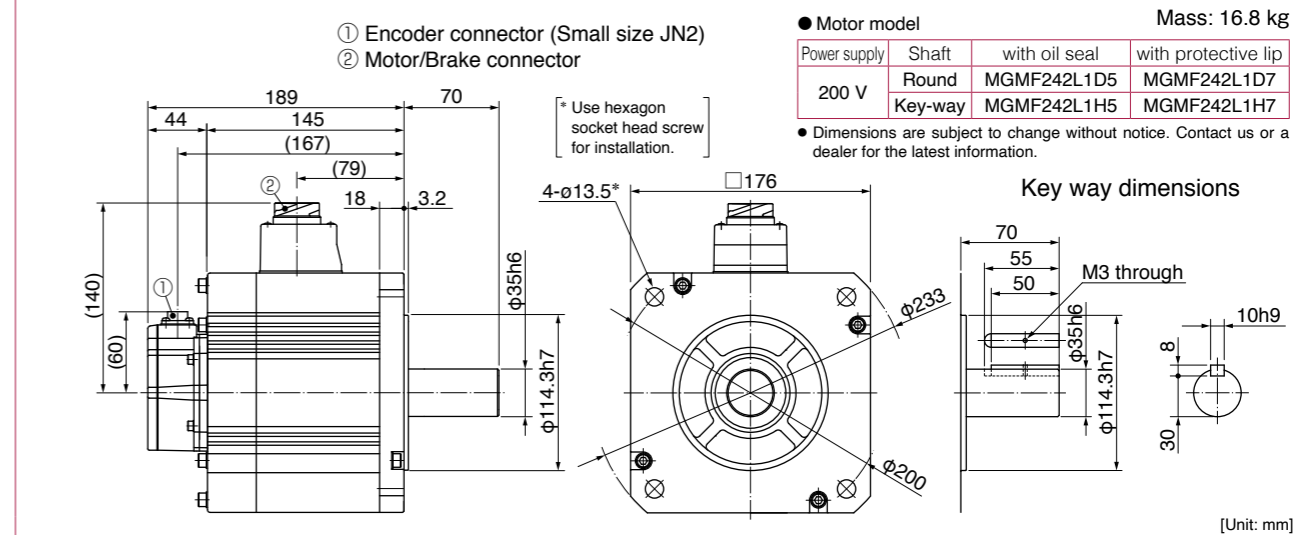
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



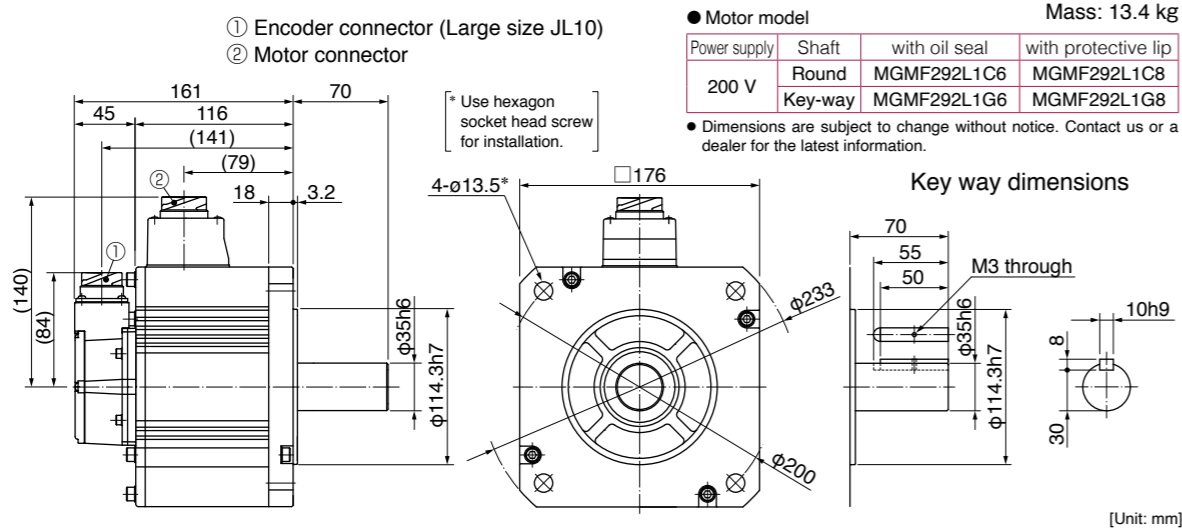
Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



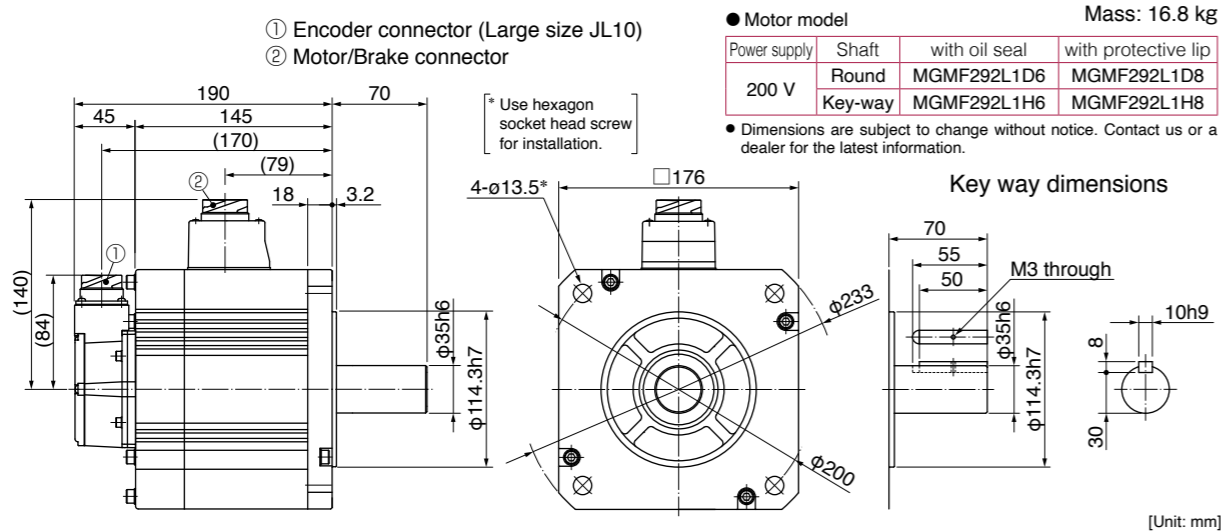
* For motors specifications, refer to P.115.

MGMF 2.9 kW

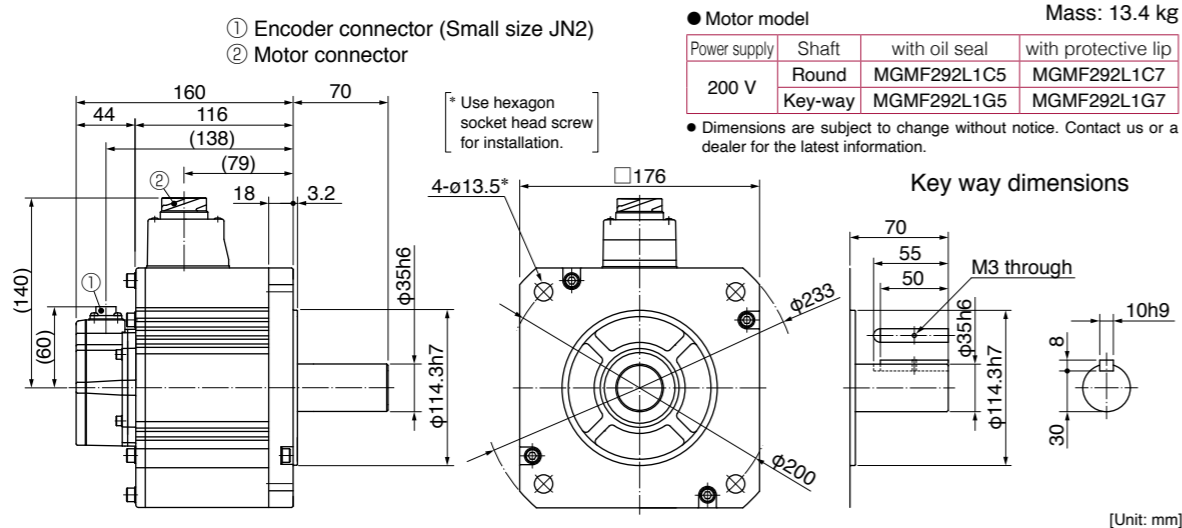
Large size connector (JL10) type • without brake • with oil seal/ with protective lip • Key way shaft/ Round shaft



Large size connector (JL10) type • with brake • with oil seal/ with protective lip • Key way shaft/ Round shaft



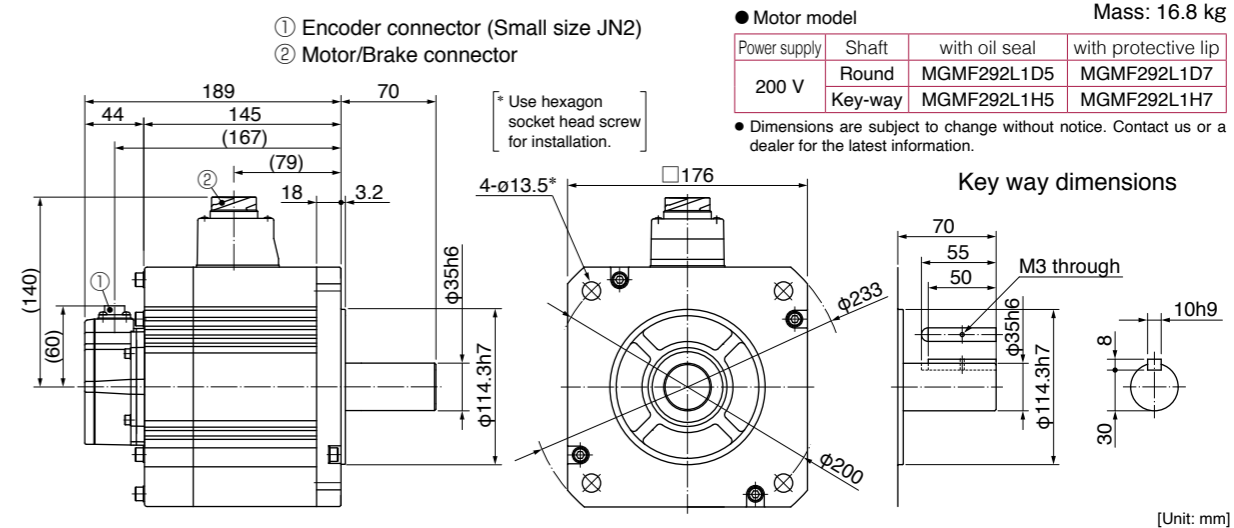
Small size connector (JN2) type • without brake • with oil seal/ with protective lip • Key way shaft/ Round shaft



* For motors specifications, refer to P.116.

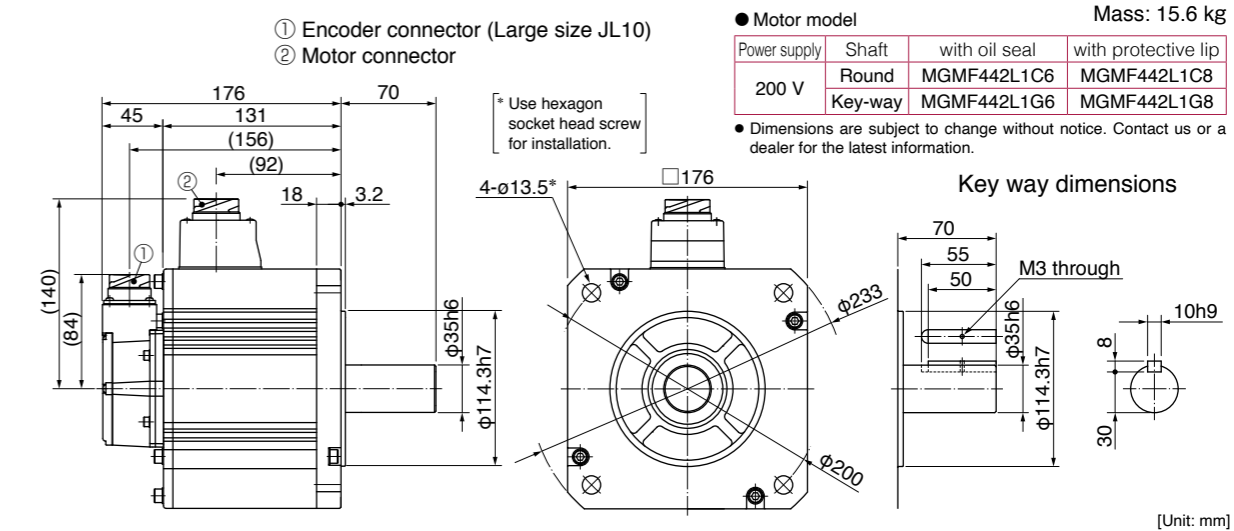
MGMF 2.9 kW

Small size connector (JN2) type • with brake • with oil seal/ with protective lip • Key way shaft/ Round shaft

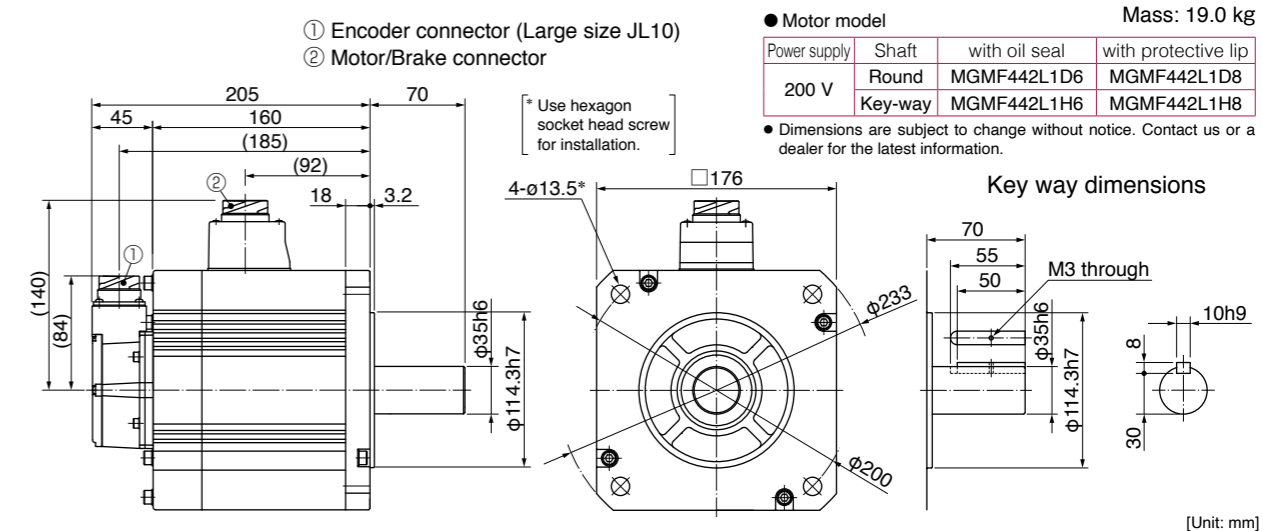


MGMF 4.4 kW

Large size connector (JL10) type • without brake • with oil seal/ with protective lip • Key way shaft/ Round shaft



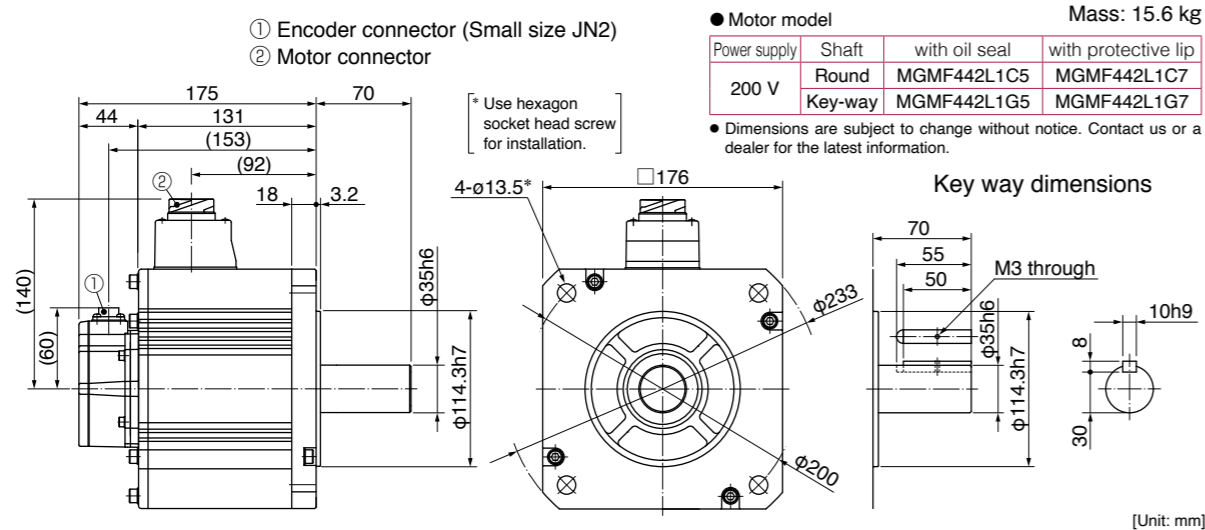
Large size connector (JL10) type • with brake • with oil seal/ with protective lip • Key way shaft/ Round shaft



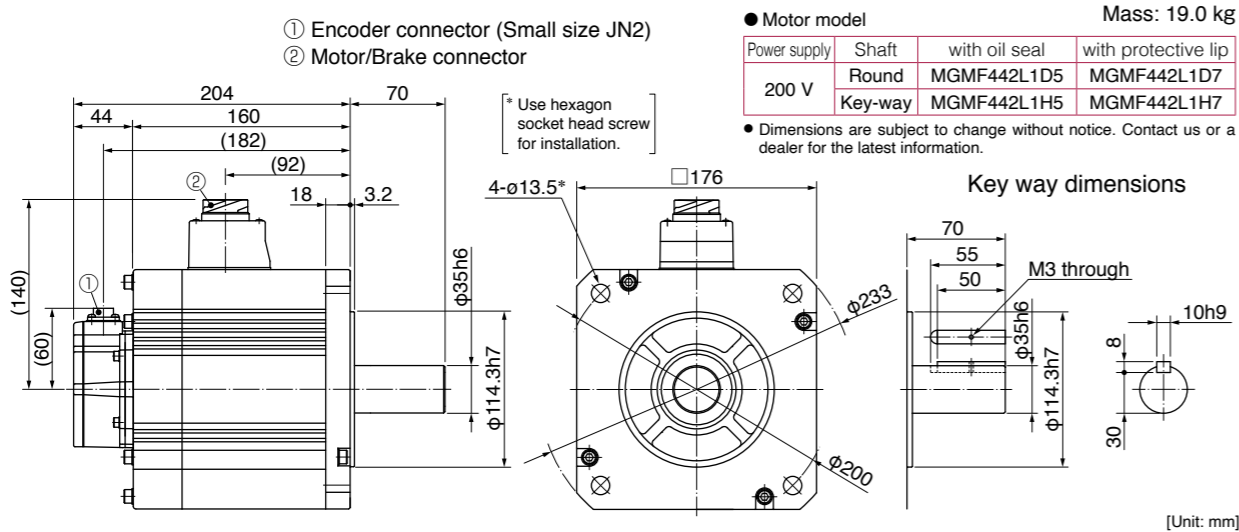
* For motors specifications, refer to P.116, P.117.

MGMF 4.4 kW

Small size connector (JN2) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

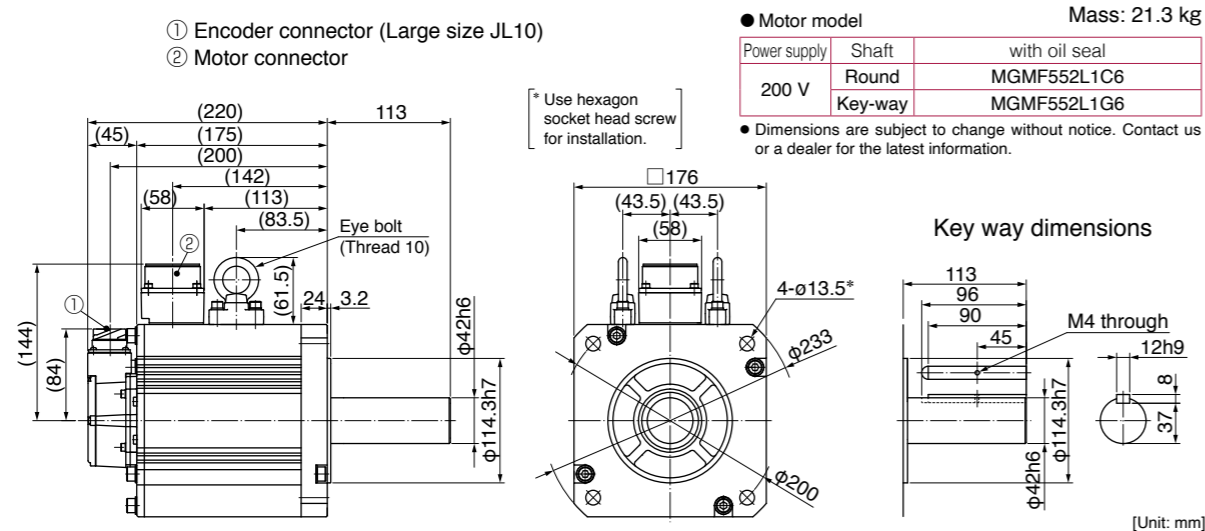


Small size connector (JN2) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MGMF 5.5 kW

Large size connector (JL10) type · without brake · with oil seal · Key way shaft/ Round shaft

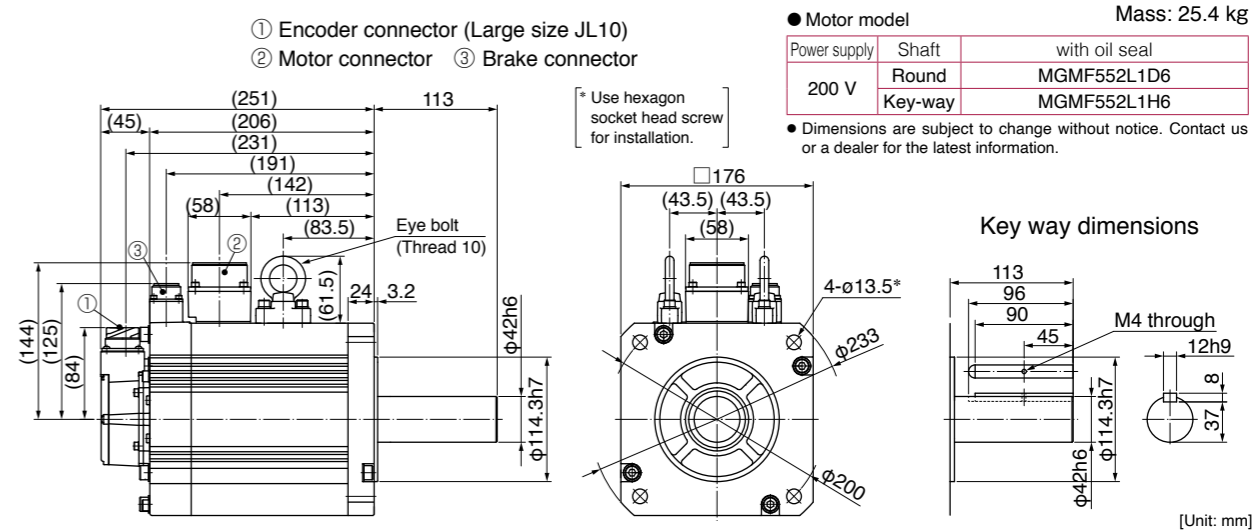


* For motors specifications, refer to P.117, P.118.

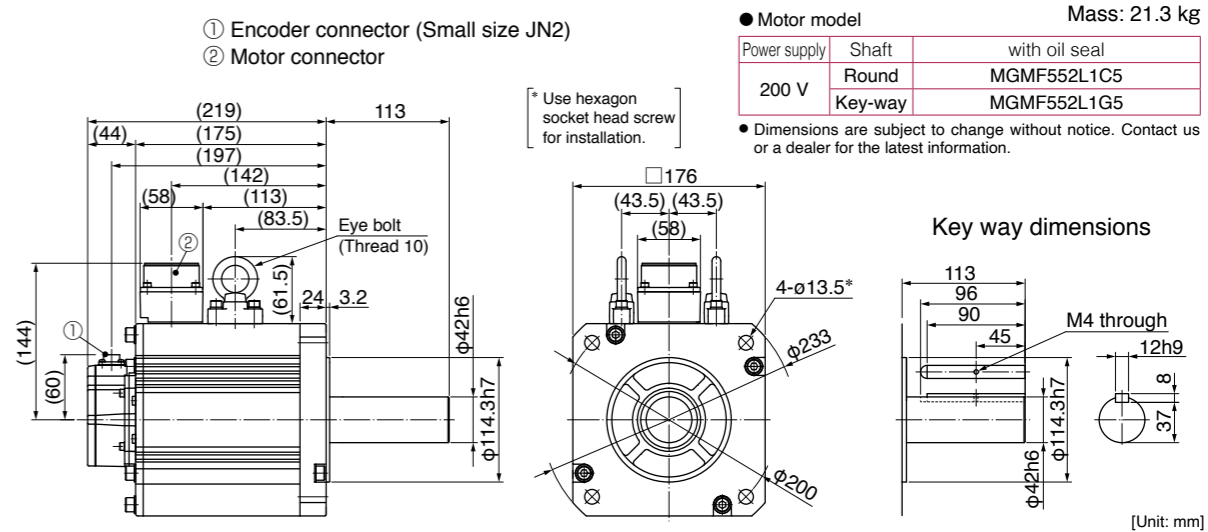
MGMF 5.5 kW

MGMF 5.5 kW

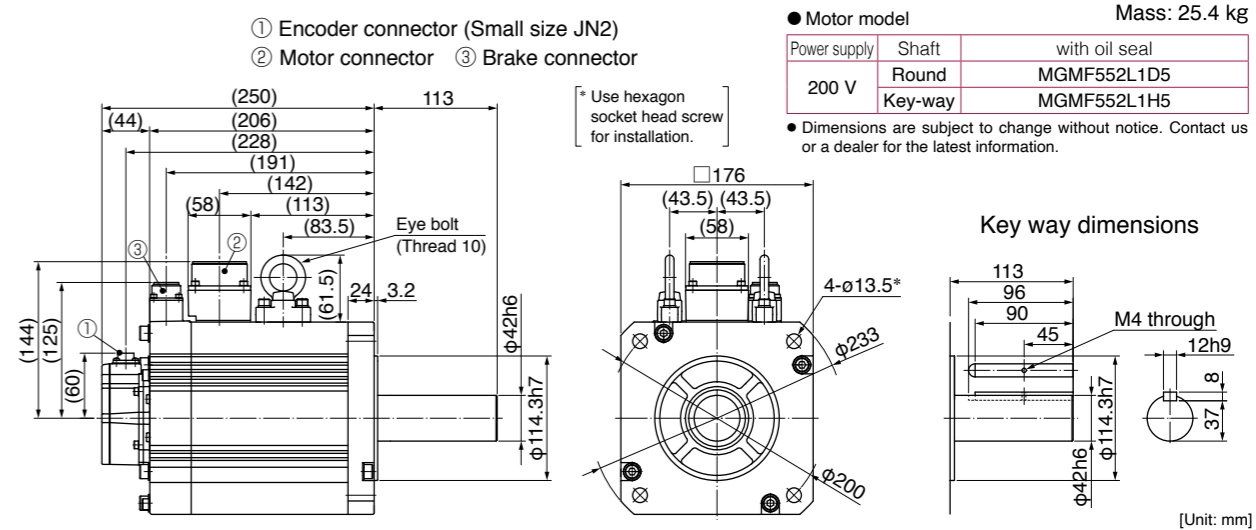
Large size connector (JL10) type · with brake · with oil seal · Key way shaft/ Round shaft



Small size connector (JN2) type · without brake · with oil seal · Key way shaft/ Round shaft



Small size connector (JN2) type · with brake · with oil seal · Key way shaft/ Round shaft







* For motors specifications, refer to P.118.

Features

- Line-up IP67 motor: 1.0 kW to 7.5 kW
- Max speed: 6500r/min (MHMF 50 W to 400 W)
- Low inertia (MSMF) to High inertia (MHMF).
- Low cogging torque: Rated torque ratio 0.5 % (typical value).
- 23-bit absolute encoder (8388608 pulse).

Motor Lineup

| | | | |
|--------------------|---|---|---|
| 80 mm sq. or less |  MSMF Low inertia |  MQMF (Flat type) Middle inertia |  MHMF High inertia |
| | Max. speed : 6000 r/min Rated speed : 3000 r/min Rated output : 50 W to 1000 W Enclosure: IP65: Leadwire type | Max. speed : 6500 r/min Rated speed : 3000 r/min Rated output : 100 W to 400 W Enclosure: IP65: Leadwire type | Max. speed : 6500 r/min 6000 r/min (750 W,1000 W) Rated speed : 3000 r/min Rated output : 50 W to 1000 W Enclosure: IP65: Leadwire type |
| | | | |
| 100 mm sq. or more |  MSMF Low inertia |  MDMF Middle inertia | |
| | Max. speed : 5000 r/min 4500 r/min (4.0 kW,5.0 kW) Rated speed : 3000 r/min Rated output : 1.0 kW to 5.0 kW Enclosure : IP67 | Max. speed : 3000 r/min Rated speed : 2000 r/min : 1500 r/min (7.5 kW) Rated output : 1.0 kW to 7.5 kW Enclosure : IP67 | |
| |  MGMF (Low speed/ High torque type) Middle inertia |  MHMF High inertia | |
| | Max. speed : 3000 r/min Rated speed : 1500 r/min Rated output : 0.85 kW to 5.5 kW Enclosure : IP67 | Max. speed : 3000 r/min Rated speed : 2000 r/min : 1500 r/min (7.5 kW) Rated output : 1.0 kW to 7.5 kW Enclosure : IP67 | |

Special Order Product Motor Contents

- MSMF (200 V)**
50 W to 5.0 kW P.211
- MQMF (200 V)**
100 W to 400 W P.223
- MHMF (200 V)**
50 W to 7.5 kW P.226
- MDMF (200 V)**
1.0 kW to 7.5 kW P.239
- MGMF (200 V)**
0.85 kW to 5.5 kW P.246

Dimensions

- MSMF (50 W to 1000 W)P.253
- MSMF (1.0 kW to 5.0 kW) P.257
- MQMF (100 W to 400 W)P.261
- MHMF (50 W to 1000 W)P.267
- MHMF (1.0 kW to 7.5 kW)P.279
- MDMF (1.0 kW to 7.5 kW) P.283
- MGMF (0.85 kW to 5.5kW) P.288

Motor Specification Description

- Environmental ConditionsP.303
- Notes on [Motor specification] page P.303
- Permissible Load at Output ShaftP.304
- Built-in Holding BrakeP.305

Model Designation

Refer to P.205 to P.210 for motor and driver combinations. * For combination of elements of model number, refer to Index P.448.

Servo Motor "Oil seal with protective lip" option is not available for motors above 7.5 kW.

M S M F 5 A Z L 1 A 2 * Special specifications

① ② ③ ④ ⑤ ⑥ ⑦

① Type

| Symbol | Type |
|--------|------------------------------------|
| MSM | Low inertia (50 W to 5.0 kW) |
| MQM | Middle inertia (100 W to 400 W) |
| MDM | Middle inertia (1.0 kW to 7.5 kW) |
| MGM | Middle inertia (0.85 kW to 5.5 kW) |
| MHM | High inertia (50 W to 7.5 kW) |

⑦ Motor specifications: 80 mm sq. or less Leadwire type IP65 MSMF 50 W to 1000 W

| Symbol | | Shaft | | Holding brake | | Oil seal | |
|--------|---|-------|---------------------|---------------|------|----------|------|
| | | Round | Key-way, center tap | without | with | without | with |
| A | 2 | ● | | ● | | ● | |
| B | 2 | ● | | | ● | ● | |
| C | 2 | ● | | ● | | | ● |
| D | 2 | ● | | | ● | | ● |
| S | 2 | | ● | ● | | | |
| T | 2 | | ● | | ● | ● | |
| U | 2 | | ● | ● | | | ● |
| V | 2 | | ● | | ● | | ● |

② Series

| Symbol | Series name |
|--------|-------------|
| F | A6 Family |

③ Motor rated output

| Symbol | Rated output | Symbol | Rated output |
|--------|---|--------|--------------|
| 5A | 50 W | 18 | 1.8 kW |
| 01 | 100 W | 20 | 2.0 kW |
| 02 | 200 W | 24 | 2.4 kW |
| 04 | 400 W | 29 | 2.9 kW |
| 08 | 750 W | 30 | 3.0 kW |
| | | 40 | 4.0 kW |
| 09 | 0.85 kW, 1000 W (130 mm sq.) (80 mm sq.) | 44 | 4.4 kW |
| 10 | 1.0 kW | 50 | 5.0 kW |
| 13 | 1.3 kW | 55 | 5.5 kW |
| 15 | 1.5 kW | 75 | 7.5 kW |

⑦ Motor specifications: 80 mm sq. or less Leadwire type IP65 MHMF 50 W to 1000 W, MQMF 100 W to 400 W

| Symbol | | Shaft | | Holding brake | | Oil seal | | With protective lip |
|--------|---|-------|---------------------|---------------|------|----------|------|---------------------|
| | | Round | Key-way, center tap | without | with | without | with | |
| A | 2 | ● | | ● | | ● | | |
| B | 2 | ● | | | ● | ● | | |
| C | 2 | ● | | ● | | | ● | |
| C | 4 | ● | | ● | | | | ● |
| D | 2 | ● | | | ● | | ● | |
| D | 4 | ● | | | ● | | | ● |
| S | 2 | | ● | ● | | ● | | |
| T | 2 | | ● | | ● | ● | | |
| U | 2 | | ● | ● | | | ● | |
| U | 4 | | ● | ● | | | | ● |
| V | 2 | | ● | | ● | | ● | |
| V | 4 | | ● | | ● | | | ● |

④ Voltage specifications

| Symbol | Specifications |
|--------|--------------------------------|
| 2 | 200 V |
| Z | 100 V/200 V common (50 W only) |

⑤ Rotary encoder specifications

| Symbol | Format | Pulse counts | Resolution | Wires |
|--------|----------|--------------|------------|-------|
| L | Absolute | 23-bit | 8388608 | 7 |

<Note>
When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

⑥ Design order

| Symbol | Specifications |
|--------|----------------|
| 1 | Standard |

⑦ Motor specifications: 100 mm sq. or more Encoder connector : JL10 IP67 MSMF, MHMF, MDMF, MGMF

| Symbol | | Shaft | | Holding brake | | Oil seal | | With protective lip |
|--------|---|-------|---------|---------------|------|----------|---------------------|---------------------|
| | | Round | Key-way | without | with | with | With protective lip | |
| C | 6 | ● | | ● | | ● | | |
| C | 8 | ● | | ● | | | ● | |
| D | 6 | ● | | | ● | ● | | |
| D | 8 | ● | | | ● | | ● | |
| G | 6 | | ● | ● | | ● | | |
| G | 8 | | ● | ● | | | ● | |
| H | 6 | | ● | | ● | ● | | |
| H | 8 | | ● | | ● | | ● | |

* Encoder connector JL10: Also applicable to screwed type

Servo Driver "Basic" and "RS485 communication" types are not available for G-Frame drivers.

M A D L N 1 5 S E * * * Special specifications

① ② ③ ④ ⑤ ⑥ ⑦

① Frame symbol

| Symbol | Frame | Symbol | Frame |
|--------|---------|--------|---------|
| MAD | A-Frame | MED | E-Frame |
| MBD | B-Frame | MFD | F-Frame |
| MCD | C-Frame | MGD | G-Frame |
| MDD | D-Frame | | |

④ Max. current rating

| Symbol | Current rating | Symbol | Current rating |
|--------|----------------|--------|----------------|
| 0 | 6 A | 8 | 60 A |
| 1 | 8 A | 9 | 80 A |
| 2 | 12 A | A | 100 A |
| 3 | 22 A | B | 120 A |
| 4 | 24 A | C | 160 A |
| 5 | 40 A | | |

⑥ I/f specifications

| Symbol (specification) | Symbol | Specification |
|------------------------|--------|--|
| S (Analog/Pulse) | E | Basic type (Pulse train only) |
| | F | Multi function type (Pulse, analog, full-closed) |
| | G | RS485 communication type (Pulse train only) |

⑦ Classification of type

② Series

| Symbol | Series name |
|--------|-------------|
| L | A6 Family |

③ Safety Function

| Symbol | Specifications |
|--------|-----------------------------|
| N | without the safety function |
| T | with the safety function |

⑤ Supply voltage specifications

| Symbol | Specifications |
|--------|----------------------|
| 3 | 3-phase 200 V |
| 5 | Single/3-phase 200 V |

<Cautions> Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

A6 Family
A6N Series
A6B Series
E Series
Information

| Motor | | | | | Driver | | | Power capacity (at rated load) (kVA) | Optional parts | | | | | | | | | | |
|--------------------------|--|--------------------------------------|--------------------|--|---|--|-----------|--|---|--|---------------------|-------------------------------|--------------------------|--------------------------------------|--------------------------------------|---|----------------|----------------|----------------|
| Motor series | Power supply | Output (W) | Part No. Note)1 | Rating/ Spec. Dimensions (page) | A6SF series Multi function type (Pulse, analog, full-closed) | A6 G series RS485 communication A6 SE series Basic (Pulse signal input) Note)2, Note)4 | Frame | | Encoder Cable Note)3 | | Motor Cable Note)3 | | Brake Cable Note)3 | External Regenerative Resistor | Reactor (Single phase 3-phase) | Noise Filter (Single phase 3-phase) | | | |
| | | | | | | | | | 23-bit Absolute | | without Brake | with Brake | | | | | Fixed cable | Movable cable | Movable cable |
| | | | | | | | | | Use in the absolute system (with battery box) Note)5 | Use in the Incremental system (without battery box) | | | | | | | | | |
| Low inertia | MSMF (Leadwire type) 3000 r/min IP65 | Single phase/ 3-phase 200 V | 50 | MSMF5AZL1 □ 2M | 211 253 | MADLT05SF | MADLN05S◇ | A-frame ★ | MFECA 0 * * 0EAE (For fixed) | MFECA 0 * * 0EAD (For fixed) | MFMCA 0 * * 0EED | MFMCB 0 * * 0GET Note)6 | DV0P4281 | DV0P227 DV0P220 | DV0P4170 DV0PM20042 | | | | |
| | | | 100 | MSMF012L1 □ 2M | 212 253 | MADLT05SF | MADLN05S◇ | | | | | | | | | | | | |
| | | | 200 | MSMF022L1 □ 2M | 213 254 | MADLT15SF | MADLN15S◇ | | | | | | | | | | | | |
| | | | 400 | MSMF042L1 □ 2M | 214 255 | MBDLT25SF | MBDLN25S◇ | | | | | | | | | B-frame ★ | Approx. 0.9 | | |
| | | | 750 | MSMF082L1 □ 2M | 215 255 | MCDLT35SF | MCDLN35S◇ | | | | | | | | | C-frame | | Approx. 1.8 | |
| | | | 1000 | MSMF092L1 □ 2M | 216 256 | MDDLT45SF | MDDLN45S◇ | | | | | | | | | D-frame | | | Approx. 2.4 |
| Middle inertia Flat type | MQMF (Leadwire type) 3000 r/min IP65 | Single phase/ 3-phase 200 V | 100 | MQMF012L1 □ 2M MQMF012L1 □ 4M | 223 261 | MADLT05SF | MADLN05S◇ | A-frame ★ | MFECA 0 * * 0EAE (For fixed) | MFECA 0 * * 0EAD (For fixed) | MFMCA 0 * * 0EED | MFMCB 0 * * 0GET Note)6 | DV0P4281 | DV0P227 DV0P220 | DV0P4170 DV0PM20042 | | | | |
| | | | 200 | MQMF022L1 □ 2M MQMF022L1 □ 4M | 224 263 | MADLT15SF | MADLN15S◇ | | | | | | | | | | | | |
| | | | 400 | MQMF042L1 □ 2M MQMF042L1 □ 4M | 225 265 | MBDLT25SF | MBDLN25S◇ | | | | | | | | | B-frame ★ | Approx. 0.9 | | |
| High inertia | MHMF (Leadwire type) 3000 r/min IP65 | Single phase/ 3-phase 200 V | 50 | MHMF5AZL1 □ 2M MHMF5AZL1 □ 4M | 226 267 | MADLT05SF | MADLN05S◇ | A-frame ★ | MFECA 0 * * 0EAE (For fixed) | MFECA 0 * * 0EAD (For fixed) | MFMCA 0 * * 0EED | MFMCB 0 * * 0GET Note)6 | DV0P4281 | DV0P227 DV0P220 | DV0P4170 DV0PM20042 | | | | |
| | | | 100 | MHMF012L1 □ 2M MHMF012L1 □ 4M | 227 269 | MADLT05SF | MADLN05S◇ | | | | | | | | | | | | |
| | | | 200 | MHMF022L1 □ 2M MHMF022L1 □ 4M | 228 271 | MADLT15SF | MADLN15S◇ | | | | | | | | | | | | |
| | | | 400 | MHMF042L1 □ 2M MHMF042L1 □ 4M | 229 273 | MBDLT25SF | MBDLN25S◇ | | | | | | | | | B-frame ★ | Approx. 0.9 | | |
| | | | 750 | MHMF082L1 □ 2M MHMF082L1 □ 4M | 230 275 | MCDLT35SF | MCDLN35S◇ | | | | | | | | | C-frame | | Approx. 1.8 | |
| | | | 1000 | MHMF092L1 □ 2M MHMF092L1 □ 4M | 231 277 | MDDLT55SF | MDDLN55S◇ | | | | | | | | | D-frame | | | Approx. 2.4 |

★ : Frame-A and B drivers are not equipped with regenerative resistors. When regeneration occurs, please prepare an optional external regenerative resistor.

Note)1 □ : Represents the motor specifications. (refer to "Model designation" P.204.)

Note)2 ◇ : Represents the driver specifications. (refer to "Model designation" P.204.)

Note)3 * * : Represents the cable length (03/3 m, 05/5 m, 10/10 m, 20/20 m). Example. 3 m/MFECA0030EAE

Note)4 Because A6SE series driver (dedicated for position control) does not support the absolute system specification, only incremental system can be used in combination.

Note)5 Please note that a battery is not supplied together with 23-bit absolute encoder cable (with battery box). Please buy the battery part number "DV0P2990" separately.

Note)6 Brake cable and motor cable are required for the motor with brake.

| Motor series | | Motor | | | Driver | | | Power capacity (at rated load) (kVA) | Optional parts ▶ refer to P.306 | | | | | | | | | | |
|--|--|---|-----------------------------------|----------------------------------|----------------------------------|---|--|--|---|---|--|--|--|--|----------------------------|----------------------------|----------|----------------------------|------------|
| | | Power supply | Output (W) | Part No. Note)1 | Rating/Spec. Dimensions (page) | A6 SF series Multi function type (Pulse, analog, full-closed) | A6 SG series RS485 communication A6 SE series Basic (Pulse signal input) Note)2, Note)4 | | Frame | Encoder Cable Note)3,5 JL10 (Large size) (One-touch lock type) N/MS screwed type | Motor Cable Note)3,5 JL10 (One-touch lock type) JL04 screwed type | External Regenerative Resistor | Reactor (Single phase / 3-phase) | Noise Filter | | | | | |
| | | | | | | | | 23-bit Absolute | | without Brake | with Brake | | | | | | | | |
| | | | | | | | | Use in the absolute system (with battery box) Note)7 | Use in the incremental system (without battery box) | | | | | | | | | | |
| | | | | | | | | Fixed cable | Movable cable | | | | | | | | | | |
| Low inertia | MSMF Large size JL10 type 3000 r/min IP67 | Single phase/ 3-phase 200 V | 1000 | MSMF102L1 □ 6M MSMF102L1 □ 8M | 217 257 | MDDL55SF | MDDL55S◇ | D-frame | Approx. 2.4 Approx. 2.9 | MFCEA 0 * * 0EPE MFCEA 0 * * 0ESE | MFCEA 0 * * 0EPD MFCEA 0 * * 0ESD | MFMC 0 * * 2EUD | MFMC 0 * * 2FUD | DV0P4284 | DV0P228 / DV0P222 | DV0P4220 | | | |
| | | | 1500 | MSMF152L1 □ 6M MSMF152L1 □ 8M | 218 257 | MDDL55SF | MDDL55S◇ | | | | | | | | DV0P2285 / DV0P222 | | | | |
| | | 3-phase 200 V | 2000 | MSMF202L1 □ 6M MSMF202L1 □ 8M | 219 258 | MEDLT83SF | MEDLN83S◇ | E-frame | Approx. 3.8 Approx. 5.2 Approx. 7.8 | | | MFMC 0 * * 2ECD | MFMC 0 * * 2FCD | DV0P4285 Note)6 | DV0P223 | DV0PM20043 | | | |
| | | | 3000 | MSMF302L1 □ 6M MSMF302L1 □ 8M | 220 259 | MFDLT3SF | MFDLN3S◇ | | | | | F-frame | MFMC 0 * * 3EUT | MFMC 0 * * 3FUT | DV0P4285 x2 in parallel | DV0P224 | DV0P3410 | | |
| | | | 4000 | MSMF402L1 □ 6M MSMF402L1 □ 8M | 221 259 | MFDLT3SF | MFDLN3S◇ | | | | | | MFMC 0 * * 3ECT | MFMC 0 * * 3FCT | | DV0P225 | | | |
| 5000 | MSMF502L1 □ 6M MSMF502L1 □ 8M | 222 260 | MFDLT3SF | MFDLN3S◇ | | | | | | | | | | | | | | | |
| Middle inertia | MDMF Large size JL10 type 2000 r/min IP67 | Single phase/ 3-phase 200 V | 1000 | MDMF102L1 □ 6M MDMF102L1 □ 8M | 239 283 | MDDL45SF | MDDL45S◇ | D-frame | Approx. 2.4 Approx. 2.9 | MFCEA 0 * * 0EPE MFCEA 0 * * 0ESE | MFCEA 0 * * 0EPD MFCEA 0 * * 0ESD | MFMC 0 * * 2EUD | MFMC 0 * * 2FUD | DV0P4284 | DV0P228 / DV0P222 | DV0P4220 | | | |
| | | | 1500 | MDMF152L1 □ 6M MDMF152L1 □ 8M | 240 284 | MDDL55SF | MDDL55S◇ | | | | | | | | DV0P2285 / DV0P222 | | | | |
| | | 3-phase 200 V | 2000 | MDMF202L1 □ 6M MDMF202L1 □ 8M | 241 285 | MEDLT83SF | MEDLN83S◇ | E-frame | Approx. 3.8 Approx. 5.2 Approx. 7.8 | | | MFMC 0 * * 2ECD | MFMC 0 * * 2FCD | DV0P4285 Note)6 | DV0P223 | DV0PM20043 | | | |
| | | | 3000 | MDMF302L1 □ 6M MDMF302L1 □ 8M | 242 285 | MFDLT3SF | MFDLN3S◇ | | | | | F-frame | MFMC 0 * * 3EUT | MFMC 0 * * 3FUT | DV0P4285 x2 in parallel | DV0P224 | DV0P3410 | | |
| | | | 4000 | MDMF402L1 □ 6M MDMF402L1 □ 8M | 243 286 | MFDLT3SF | MFDLN3S◇ | | | | | | MFMC 0 * * 3ECT | MFMC 0 * * 3FCT | | DV0P225 | | | |
| | | 5000 | MDMF502L1 □ 6M MDMF502L1 □ 8M | 245 287 | MFDLT3SF | MFDLN3S◇ | | | | | | | | | | | | | |
| | | MGMF Large size JL10 type (Low speed/ High torque type) 1500 r/min IP67 | Single phase/ 3-phase 200 V | 850 | MGMF092L1 □ 6M MGMF092L1 □ 8M | 246 288 | MDDL45SF | MDDL45S◇ | D-frame | | | Approx. 2.0 Approx. 2.6 | MFCEA 0 * * 0EPE MFCEA 0 * * 0ESE | MFCEA 0 * * 0EPD MFCEA 0 * * 0ESD | MFMC 0 * * 2EUD | MFMC 0 * * 2FUD | DV0P4284 | DV0P228 / DV0P221 | DV0P4220 |
| | | | | 1300 | MGMF132L1 □ 6M MGMF132L1 □ 8M | 247 289 | MDDL55SF | MDDL55S◇ | | | | | | | | | | DV0P2285 / DV0P222 | |
| | | | 3-phase 200 V | 1800 | MGMF182L1 □ 6M MGMF182L1 □ 8M | 248 289 | MEDLT83SF | MEDLN83S◇ | E-frame | | | Approx. 3.4 Approx. 4.5 Approx. 5.0 Approx. 7.0 | | | MFMC 0 * * 2ECD | MFMC 0 * * 2FCD | DV0P4285 | DV0P223 | DV0PM20043 |
| | | | | 2400 | MGMF242L1 □ 6M MGMF242L1 □ 8M | 249 290 | MEDLT93SF | MEDLN93S◇ | | | | | | | MFMC 0 * * 3EUT | MFMC 0 * * 3FUT | | DV0P4285 x2 in parallel | |
| 2900 | MGMF292L1 □ 6M MGMF292L1 □ 8M | | | 250 291 | MFDLT3SF | MFDLN3S◇ | MFMC 0 * * 3ECT | MFMC 0 * * 3FCT | | DV0P4285 x2 in parallel | DV0P225 | | | | | | | | |
| 4400 | MGMF442L1 □ 6M MGMF442L1 □ 8M | | | 251 291 | MFDLT3SF | MFDLN3S◇ | | | | | | | | | | | | | |
| MHMF Large size JL10 type 2000 r/min IP67 | Single phase/ 3-phase 200 V | 1000 | MHMF102L1 □ 6M MHMF102L1 □ 8M | 232 279 | MDDL45SF | MDDL45S◇ | D-frame | Approx. 2.4 Approx. 2.9 | MFCEA 0 * * 0EPE MFCEA 0 * * 0ESE | MFCEA 0 * * 0EPD MFCEA 0 * * 0ESD | MFMC 0 * * 2EUD | MFMC 0 * * 2FUD | DV0P4284 | DV0P228 / DV0P222 | DV0P4220 | | | | |
| | | 1500 | MHMF152L1 □ 6M MHMF152L1 □ 8M | 233 279 | MDDL55SF | MDDL55S◇ | | | | | | | | DV0P2285 / DV0P222 | | | | | |
| | 3-phase 200 V | 2000 | MHMF202L1 □ 6M MHMF202L1 □ 8M | 234 280 | MEDLT83SF | MEDLN83S◇ | E-frame | Approx. 3.8 Approx. 5.2 Approx. 7.8 | | | MFMC 0 * * 2ECD | MFMC 0 * * 2FCD | DV0P4285 Note)6 | DV0P223 | DV0PM20043 | | | | |
| | | 3000 | MHMF302L1 □ 6M MHMF302L1 □ 8M | 235 281 | MFDLT3SF | MFDLN3S◇ | | | | | F-frame | MFMC 0 * * 3EUT | | MFMC 0 * * 3FUT | | DV0P4285 x2 in parallel | DV0P224 | | |
| | | 4000 | MHMF402L1 □ 6M MHMF402L1 □ 8M | 236 281 | MFDLT3SF | MFDLN3S◇ | | | | | | MFMC 0 * * 3ECT | | MFMC 0 * * 3FCT | | | DV0P225 | | |
| 5000 | MHMF502L1 □ 6M MHMF502L1 □ 8M | 237 282 | MFDLT3SF | MFDLN3S◇ | | | | | | | | | | | | | | | |

Note)1 □ : Represents the motor specifications. (refer to "Model designation" P.204.)

Note)2 ◇ : Represents the driver specifications. (refer to "Model designation" P.204.)

Note)3 * * : Represents the cable length (03/3 m, 05/5 m, 10/10 m, 20/20 m). Example. 3 m/MFCEA0030EPE

Note)4 Because A6SE series driver (dedicated for position control) does not support the absolute system specification, only incremental system can be used in combination.

Note)5 Use of JL10 type encoder cables and motor cables enable one-touch lock connections. Conventional screwed type N/MS and JL04V type cables can also be used.

Note)6 For other possible combinations, refer to P.343.

Note)7 Please note that a battery is not supplied together with 23-bit absolute encoder cable (with battery box). Please buy the battery part number "DV0P2990" separately.

| Motor | | | | | Driver | | | | Optional parts ▶ refer to P.306 | | | | | | | |
|----------------|--|---|------------------|---|--|--|-------|--------------------------------------|---|----------------------------------|----------------------------------|--------|--------------------------------|----------------------------------|--|--|
| Motor series | Power supply | Output (W) | Part No. (Note)1 | Rating/Spec. Dimensions (page) | A6SF series Multi function type (Pulse, analog, full-closed) | A6SG series RS485 communication A6SE series Basic (Pulse signal input) | Frame | Power capacity (at rated load) (kVA) | Encoder Cable (Note)2,3 | | Motor Cable (Note)6 | | External Regenerative Resistor | Reactor (Single phase / 3-phase) | Noise Filter | |
| | | | | | | | | | JL10 (Large size) (One-touch lock type) (N/MS screwed type) | | 23-bit Absolute | | | | | without Brake |
| | | Use in the absolute system (with battery box) (Note)4 | | Use in the incremental system (without battery box) | | Fixed cable | | | | | | | | | | |
| Middle inertia | MDFM Large size JL10 type 1500 r/min IP67 | 3-phase 200 V | 7500 | MDMF752L1 □ 6M | 245 287 | MGDLTC3SF | — | G-frame | Approx. 11 | MFECA 0* *0EPE MFECA 0* *0ESE | MFECA 0* *0EPD MFECA 0* *0ESD | Note)6 | Note)6 | DV0P4285 x3 in parallel | — Note)5 | HF3080C-SZA (Recommended components) P.413 |
| | MGMF Large size JL10 type (Low speed/High torque type) 1500 r/min IP67 | 3-phase 200 V | 5500 | MGMF552L1 □ 6M | 252 292 | MGDLTC3SF | — | G-frame | Approx. 8.5 | MFECA 0* *0EPE MFECA 0* *0ESE | MFECA 0* *0EPD MFECA 0* *0ESD | Note)6 | Note)6 | DV0P4285 x3 in parallel | — Note)5 | HF3080C-SZA (Recommended components) P.413 |
| High inertia | MHMF Large size JL10 type 1500 r/min IP67 | 3-phase 200 V | 7500 | MHMF752L1 □ 6M | 238 283 | MGDLTC3SF | — | G-frame | Approx. 11 | MFECA 0* *0EPE MFECA 0* *0ESE | MFECA 0* *0EPD MFECA 0* *0ESD | Note)6 | Note)6 | — Note)5 | HF3080C-SZA (Recommended components) P.413 | |

■ About dynamic brake

G frame is built in / external, H frame is external
 Built-in / {external} The standard of the dynamic brake resistance's capability is up to three consecutive emergency stops from the rated speed at the maximum allowable inertia (load inertia moment ratio 10 times the rotor inertia moment). If it is used under more conditions, the resistance may be broken and the dynamic brake may not operate.

Recommended resistance: 1.2 Ω 400 W or more × 3 pieces
 For inquiries: Iwaki Musen Kenkyusho Co.,Ltd. Tel: +81-44-833-4311

■ Connector kit (option) Component parts (Note)6

| Motor | Driver | | Option No. Connector Kit for motor, encoder connection | Encoder Cable | | Motor Cable | | Brake Cable | |
|---|--------|---------------------|--|--|------------------|------------------------|--|------------------------|------------------------------|
| | Frame | Connection terminal | | Motor side | Driver side | Motor side | Driver side | Motor side | Power supply for brake |
| MDMF 7.5 kW MGMF 5.5 kW MHMF 7.5 kW | G | M5 | DV0PM20107 | Large size connector One-touch lock type | For Connector X6 | Connector Screwed type | (to be supplied by customer) M5 Round terminal | not included | (to be supplied by customer) |
| | | | DV0PM20108 | | | | | Connector Screwed type | |
| | | | DV0PM20111 | not included | | | | | |
| | | | DV0PM20112 | Connector Screwed type | | | | | |

- Note)1 □ : Represents the motor specifications. (refer to "Model designation" P.204.)
- Note)2 * * : Represents the cable length (03/3 m, 05/5 m, 10/10 m, 20/20 m). Example. 3 m/MFECA0030ETE
- Note)3 Use of JL10 type encoder cables and motor cables enable one-touch lock connections. Conventional screwed type N/MS and JL04V type cables can also be used.
- Note)4 Please note that a battery is not supplied together with 23-bit absolute encoder cable (with battery box). Please buy the battery part number "DV0P2990" separately.
- Note)5 Please prepare reactor for customer.
- Note)6 We recommend purchasing an optional connector kit.

Please contact us for more information.

Specifications

| | | AC200 V |
|---|---------------------------------------|---------------------------------|
| Motor model ¹ | | MSMF5AZL1□□M |
| Applicable driver | Model No. | Multifunction type MADLT05SF |
| | RS485 communication type ² | MADLN05SG |
| | Basic type ² | MADLN05SE |
| Frame symbol | | A-frame |
| Power supply capacity | (kVA) | 0.5 |
| Rated output | (W) | 50 |
| Rated torque | (N·m) | 0.16 |
| Continuous stall torque | (N·m) | 0.16 |
| Momentary Max. peak torque | (N·m) | 0.48 |
| Rated current | (A(rms)) | 1.1 |
| Max. current | (A(o-p)) | 4.7 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4281 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.026 |
| | With brake | 0.029 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|---------------|
| Static friction torque (N·m) | 0.294 or more |
| Engaging time (ms) | 35 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±1.2 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88.0 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 58.8 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.57.

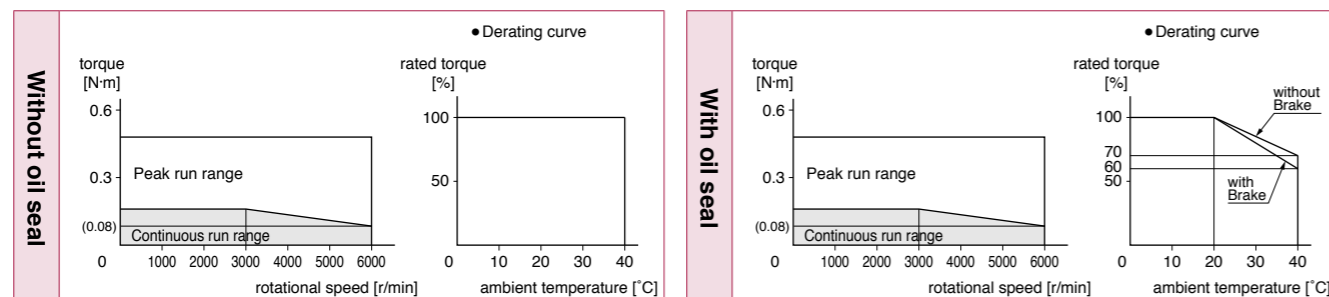
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.253 | | | P.253 | | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Please contact us for more information.

Specifications

| | | AC200 V |
|---|---------------------------------------|---------------------------------|
| Motor model ¹ | | MSMF012L1□□M |
| Applicable driver | Model No. | Multifunction type MADLT05SF |
| | RS485 communication type ² | MADLN05SG |
| | Basic type ² | MADLN05SE |
| Frame symbol | | A-frame |
| Power supply capacity | (kVA) | 0.5 |
| Rated output | (W) | 100 |
| Rated torque | (N·m) | 0.32 |
| Continuous stall torque | (N·m) | 0.32 |
| Momentary Max. peak torque | (N·m) | 0.95 |
| Rated current | (A(rms)) | 1.1 |
| Max. current | (A(o-p)) | 4.7 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4281 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.048 |
| | With brake | 0.051 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|---------------|
| Static friction torque (N·m) | 0.294 or more |
| Engaging time (ms) | 35 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±1.2 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88.0 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 58.8 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.57.

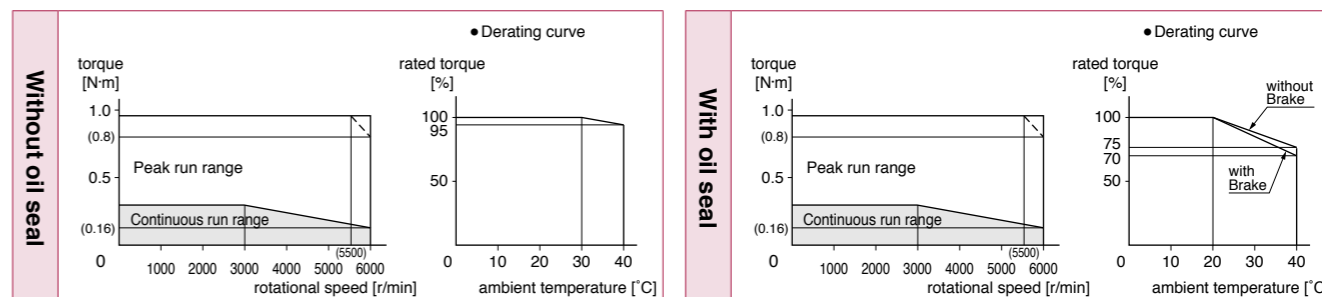
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.253 | | | P.254 | | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------------------|--|
| Motor model ¹ | | MSMF022L1□□M |
| Applicable driver | Model No. | Multifunction type RS485 communication type ² Basic type ² |
| | | MADLT15SF MADLN15SG MADLN15SE |
| | Frame symbol | A-frame |
| | | |
| Power supply capacity | (kVA) | 0.5 |
| Rated output | (W) | 200 |
| Rated torque | (N·m) | 0.64 |
| Continuous stall torque | (N·m) | 0.64 |
| Momentary Max. peak torque | (N·m) | 1.91 |
| Rated current | (A(rms)) | 1.5 |
| Max. current | (A(o-p)) | 6.5 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.14 |
| | With brake | 0.17 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 1.27 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 15 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±1.2 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98.0 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.57.

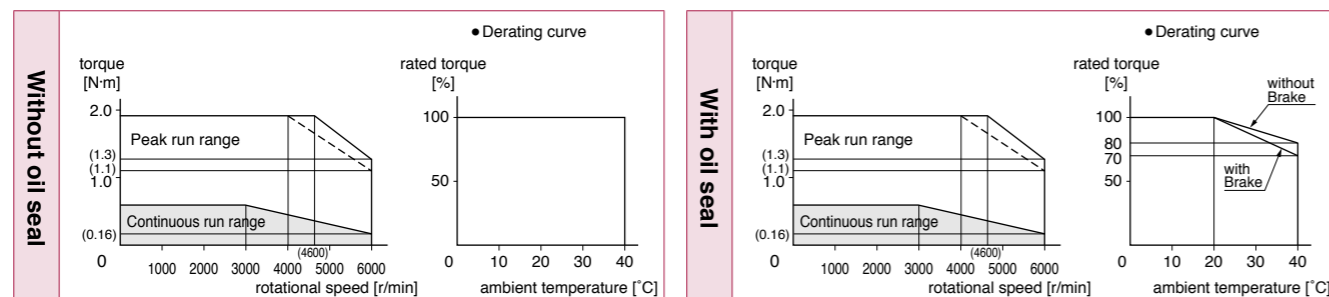
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.254 | | — | P.254 | | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------------------|--|
| Motor model ¹ | | MSMF042L1□□M |
| Applicable driver | Model No. | Multifunction type RS485 communication type ² Basic type ² |
| | | MBDLT25SF MBDLN25SG MBDLN25SE |
| | Frame symbol | B-frame |
| | | |
| Power supply capacity | (kVA) | 0.9 |
| Rated output | (W) | 400 |
| Rated torque | (N·m) | 1.27 |
| Continuous stall torque | (N·m) | 1.27 |
| Momentary Max. peak torque | (N·m) | 3.82 |
| Rated current | (A(rms)) | 2.4 |
| Max. current | (A(o-p)) | 10.2 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.27 |
| | With brake | 0.30 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 1.27 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 15 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±1.2 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98.0 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.57.

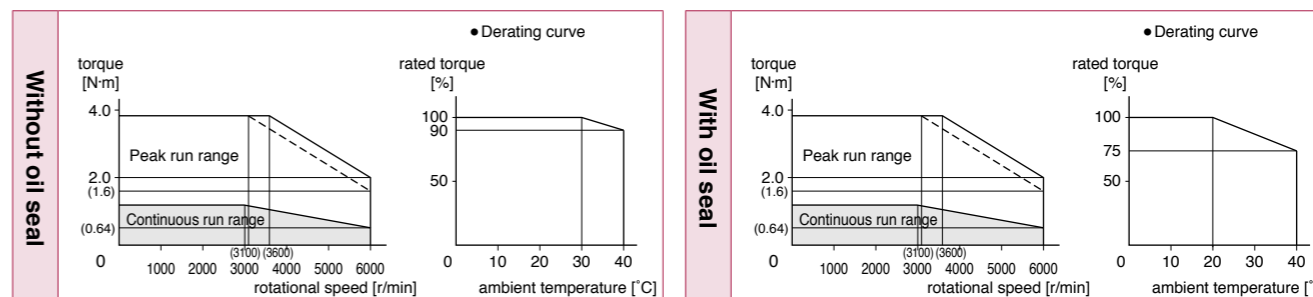
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.255 | | — | P.255 | | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------|--|
| Motor model *1 | | MSMF082L1□□M |
| Applicable driver | Model No. | Multifunction type MCDLT35SF |
| | | RS485 communication type *2 MCDLN35SG |
| | | Basic type *2 MCDLN35SE |
| Frame symbol | | C-frame |
| Power supply capacity (kVA) | | 1.8 |
| Rated output (W) | | 750 |
| Rated torque (N·m) | | 2.39 |
| Continuous stall torque (N·m) | | 2.39 |
| Momentary Max. peak torque (N·m) | | 7.16 |
| Rated current (A(rms)) | | 4.1 |
| Max. current (A(o-p)) | | 17.4 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4283 | No limit Note2 |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.96 |
| | With brake | 1.06 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 20 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 2.45 or more |
| Engaging time (ms) | 70 or less |
| Releasing time (ms) Note4 | 20 or less |
| Exciting current (DC) (A) | 0.42 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±1.2 |

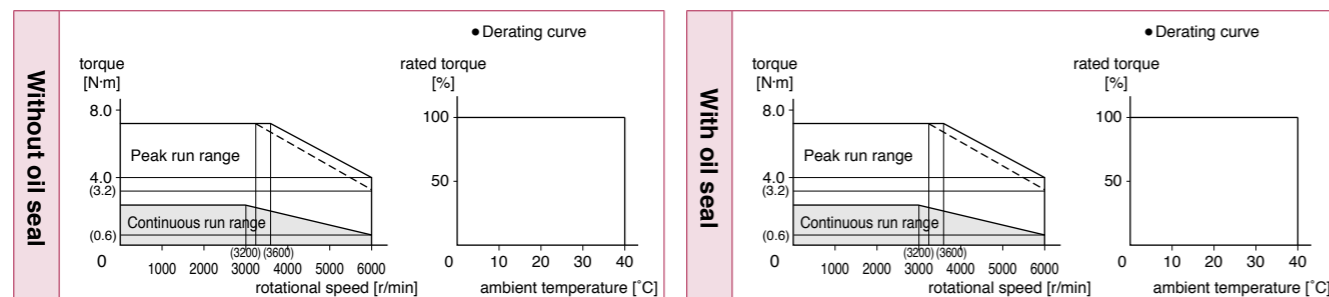
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 686 |
| | Thrust load A-direction (N) | 294 |
| | Thrust load B-direction (N) | 392 |
| During operation | Radial load P-direction (N) | 392 |
| | Thrust load A, B-direction (N) | 147 |

• For details of Note1 to Note4, refer to P.303.
• Dimensions of Driver, refer to P.58.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.255 | | | P.256 | | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------|---|
| Motor model *1 | | MSMF092L1□□M |
| Applicable driver | Model No. | Multifunction type MDDLTL45SF |
| | | RS485 communication type *2 MDDLNL45SG |
| | | Basic type *2 MDDLNL45SE |
| Frame symbol | | D-frame |
| Power supply capacity (kVA) | | 2.4 |
| Rated output (W) | | 1000 |
| Rated torque (N·m) | | 3.18 |
| Continuous stall torque (N·m) | | 3.18 |
| Momentary Max. peak torque (N·m) | | 9.55 |
| Rated current (A(rms)) | | 5.7 |
| Max. current (A(o-p)) | | 24.2 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4284 | No limit Note2 |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 1.26 |
| | With brake | 1.36 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 15 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 3.80 or more |
| Engaging time (ms) | 70 or less |
| Releasing time (ms) Note4 | 20 or less |
| Exciting current (DC) (A) | 0.42 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

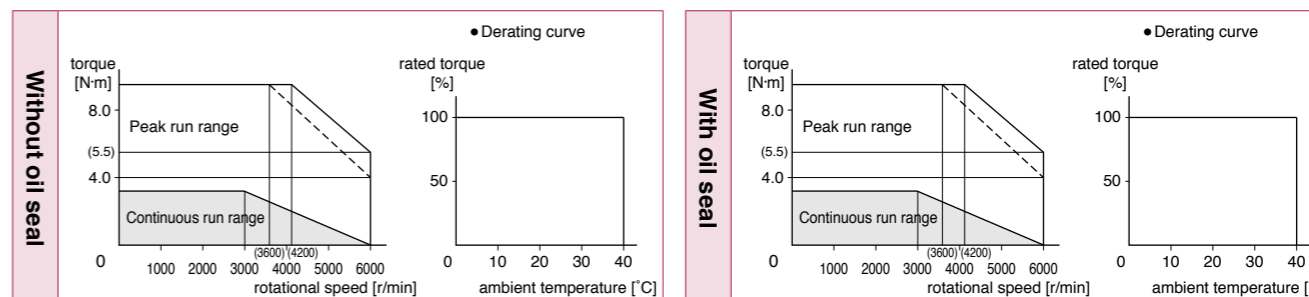
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 686 |
| | Thrust load A-direction (N) | 294 |
| | Thrust load B-direction (N) | 392 |
| During operation | Radial load P-direction (N) | 392 |
| | Thrust load A, B-direction (N) | 147 |

• For details of Note1 to Note4, refer to P.303.
• Dimensions of Driver, refer to P.58.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.256 | | | P.256 | | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Please contact us for more information.

Specifications

| | | AC200 V |
|---|---------------------------------------|--------------------------------|
| Motor model ¹ | | MSMF102L1□□M |
| Applicable driver | Model No. | Multifunction type MDDL55SF |
| | RS485 communication type ² | MDDL55SG |
| | Basic type ² | MDDL55SE |
| Frame symbol | | D-frame |
| Power supply capacity (kVA) | | 2.4 |
| Rated output (W) | | 1000 |
| Rated torque (N·m) | | 3.18 |
| Continuous stall torque (N·m) | | 3.82 |
| Momentary Max. peak torque (N·m) | | 9.55 |
| Rated current (A(rms)) | | 6.6 |
| Max. current (A(o-p)) | | 28 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 5000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 2.15 |
| | With brake | 2.47 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 8.0 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 15 or less |
| Exciting current (DC) (A) | 0.81 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

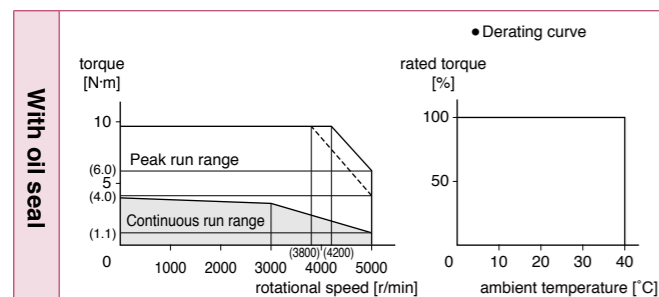
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.257 | | — | P.257 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
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Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

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Specifications

| | | AC200 V |
|---|---------------------------------------|--------------------------------|
| Motor model ¹ | | MSMF152L1□□M |
| Applicable driver | Model No. | Multifunction type MDDL55SF |
| | RS485 communication type ² | MDDL55SG |
| | Basic type ² | MDDL55SE |
| Frame symbol | | D-frame |
| Power supply capacity (kVA) | | 2.9 |
| Rated output (W) | | 1500 |
| Rated torque (N·m) | | 4.77 |
| Continuous stall torque (N·m) | | 5.72 |
| Momentary Max. peak torque (N·m) | | 14.3 |
| Rated current (A(rms)) | | 8.2 |
| Max. current (A(o-p)) | | 35 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 5000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 3.10 |
| | With brake | 3.45 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 8.0 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 15 or less |
| Exciting current (DC) (A) | 0.81 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

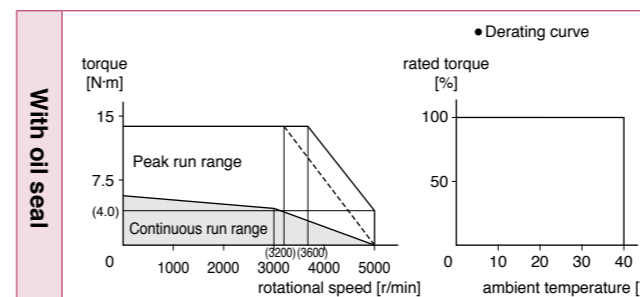
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.257 | | — | P.258 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|--|---------------------------------|
| Motor model ^{*1} | | MSMF202L1□□M |
| Applicable driver | Model No. | Multifunction type MEDLT83SF |
| | RS485 communication type ^{*2} | MEDLN83SG |
| | Basic type ^{*2} | MEDLN83SE |
| Frame symbol | | E-frame |
| Power supply capacity (kVA) | | 3.8 |
| Rated output (W) | | 2000 |
| Rated torque (N·m) | | 6.37 |
| Continuous stall torque (N·m) | | 7.64 |
| Momentary Max. peak torque (N·m) | | 19.1 |
| Rated current (A(rms)) | | 11.3 |
| Max. current (A(o-p)) | | 48 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 5000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 4.06 |
| | With brake | 4.41 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 8.0 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 15 or less |
| Exciting current (DC) (A) | 0.81 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.59.

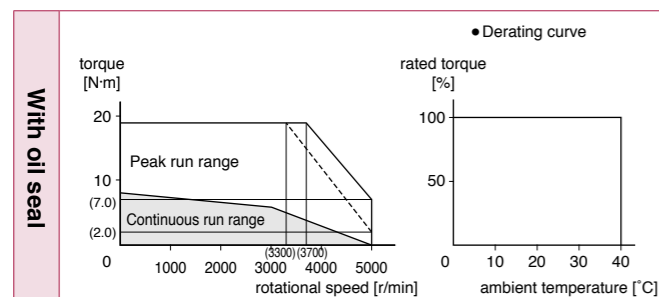
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.258 | | — | P.258 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|--|---------------------------------|
| Motor model ^{*1} | | MSMF302L1□□M |
| Applicable driver | Model No. | Multifunction type MFDLTA3SF |
| | RS485 communication type ^{*2} | MFDLNA3SG |
| | Basic type ^{*2} | MFDLNA3SE |
| Frame symbol | | F-frame |
| Power supply capacity (kVA) | | 5.2 |
| Rated output (W) | | 3000 |
| Rated torque (N·m) | | 9.55 |
| Continuous stall torque (N·m) | | 11.0 |
| Momentary Max. peak torque (N·m) | | 28.6 |
| Rated current (A(rms)) | | 18.1 |
| Max. current (A(o-p)) | | 77 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285×2 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 5000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 7.04 |
| | With brake | 7.38 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 12.0 or more |
| Engaging time (ms) | 80 or less |
| Releasing time (ms) ^{Note)4} | 15 or less |
| Exciting current (DC) (A) | 0.81 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.59.

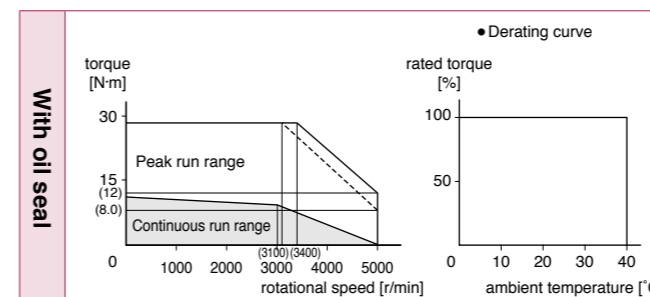
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.259 | | — | P.259 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|--|---------------------------------|
| Motor model ^{*1} | | MSMF402L1□□M |
| Applicable driver | Model No. | Multifunction type MFDLTB3SF |
| | RS485 communication type ^{*2} | MFDLNB3SG |
| | Basic type ^{*2} | MFDLNB3SE |
| Frame symbol | | F-frame |
| Power supply capacity | (kVA) | 7.8 |
| Rated output | (W) | 4000 |
| Rated torque | (N·m) | 12.7 |
| Continuous stall torque | (N·m) | 15.2 |
| Momentary Max. peak torque | (N·m) | 38.2 |
| Rated current | (A(rms)) | 19.6 |
| Max. current | (A(o-p)) | 83 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285×2 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 4500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 14.4 |
| | With brake | 15.6 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 16.2 or more |
| Engaging time (ms) | 110 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.90 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.59.

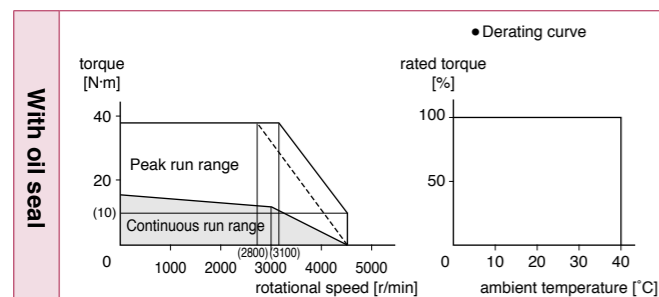
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.259 | | — | P.260 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|--|---------------------------------|
| Motor model ^{*1} | | MSMF502L1□□M |
| Applicable driver | Model No. | Multifunction type MFDLTB3SF |
| | RS485 communication type ^{*2} | MFDLNB3SG |
| | Basic type ^{*2} | MFDLNB3SE |
| Frame symbol | | F-frame |
| Power supply capacity | (kVA) | 7.8 |
| Rated output | (W) | 5000 |
| Rated torque | (N·m) | 15.9 |
| Continuous stall torque | (N·m) | 19.1 |
| Momentary Max. peak torque | (N·m) | 47.7 |
| Rated current | (A(rms)) | 24.0 |
| Max. current | (A(o-p)) | 102 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285×2 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 4500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 19.0 |
| | With brake | 20.2 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ^{*3} | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 22.0 or more |
| Engaging time (ms) | 110 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.90 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.59.

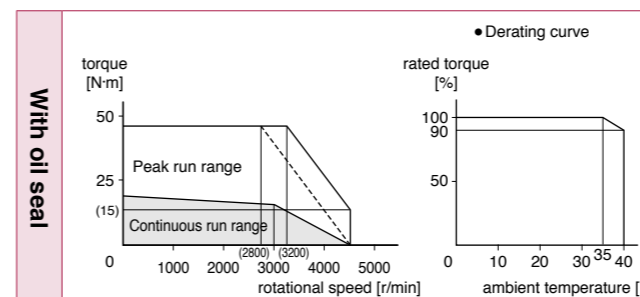
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.260 | | — | P.260 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------------------|--|
| Motor model *1 | | MQMF012L1□□M |
| Applicable driver | Model No. | Multifunction type RS485 communication type *2 Basic type *2 |
| | | MADLT05SF MADLN05SG MADLN05SE |
| | Frame symbol | A-frame |
| Power supply capacity | (kVA) | 0.5 |
| Rated output | (W) | 100 |
| Rated torque | (N·m) | 0.32 |
| Continuous stall torque | (N·m) | 0.33 |
| Momentary Max. peak torque | (N·m) | 1.11 |
| Rated current | (A(rms)) | 1.1 |
| Max. current | (A(o-p)) | 5.5 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4281 | No limit Note2 |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.15 |
| | With brake | 0.18 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 20 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 0.39 or more |
| Engaging time (ms) | 15 or less |
| Releasing time (ms) Note4 | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

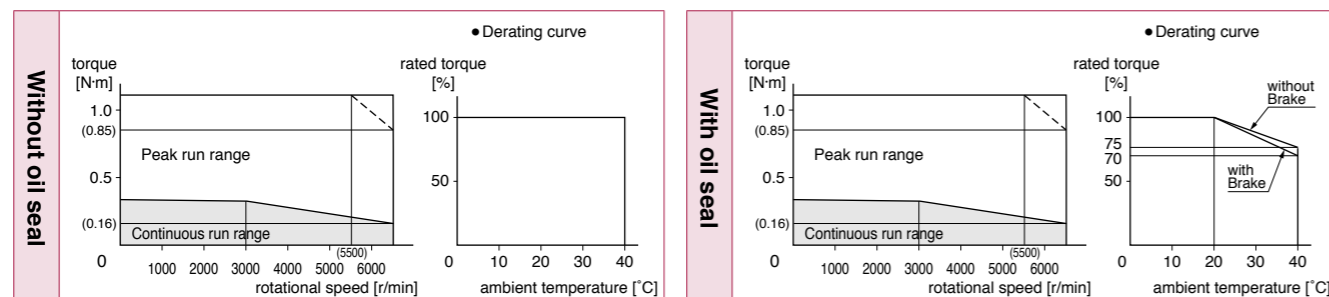
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 58.8 |

- For details of Note1 to Note4, refer to P.303.
- Dimensions of Driver, refer to P.57.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.261 | P.261 | P.261 | P.262 | P.262 | P.262 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------------------|--|
| Motor model *1 | | MQMF022L1□□M |
| Applicable driver | Model No. | Multifunction type RS485 communication type *2 Basic type *2 |
| | | MADLT15SF MADLN15SG MADLN15SE |
| | Frame symbol | A-frame |
| Power supply capacity | (kVA) | 0.5 |
| Rated output | (W) | 200 |
| Rated torque | (N·m) | 0.64 |
| Continuous stall torque | (N·m) | 0.76 |
| Momentary Max. peak torque | (N·m) | 2.23 |
| Rated current | (A(rms)) | 1.4 |
| Max. current | (A(o-p)) | 6.9 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4283 | No limit Note2 |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.50 |
| | With brake | 0.59 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 20 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|-------------|
| Static friction torque (N·m) | 1.6 or more |
| Engaging time (ms) | 70 or less |
| Releasing time (ms) Note4 | 20 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

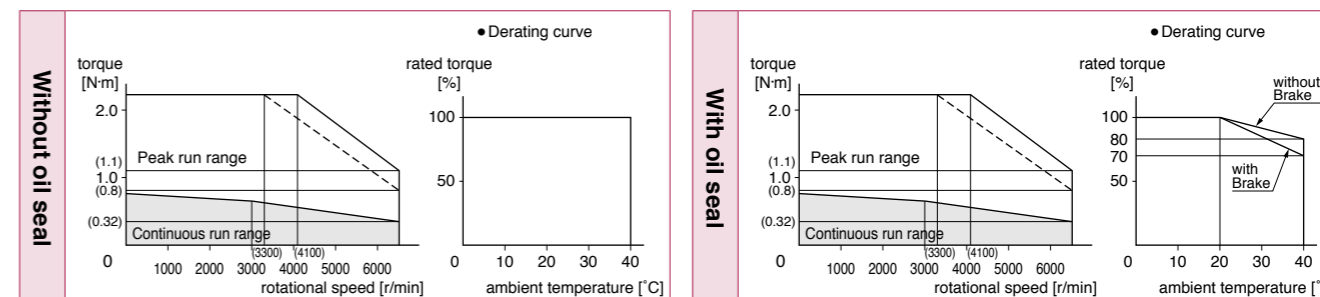
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98 |

- For details of Note1 to Note4, refer to P.303.
- Dimensions of Driver, refer to P.57.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.263 | P.263 | P.263 | P.264 | P.264 | P.264 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
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Specifications

| | | AC200 V |
|--|----------------|--|
| Motor model *1 | | MQMF042L1□□M |
| Applicable driver | Model No. | Multifunction type MBDLT25SF |
| | | RS485 communication type *2 MBDLN25SG |
| | | Basic type *2 MBDLN25SE |
| Frame symbol | | B-frame |
| Power supply capacity (kVA) | | 0.9 |
| Rated output (W) | | 400 |
| Rated torque (N·m) | | 1.27 |
| Continuous stall torque (N·m) | | 1.40 |
| Momentary Max. peak torque (N·m) | | 4.46 |
| Rated current (A(rms)) | | 2.1 |
| Max. current (A(o-p)) | | 10.4 |
| Regenerative brake frequency (times/min) Note)1 | Without option | No limit Note)2 |
| | DV0P4283 | No limit Note)2 |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.98 |
| | With brake | 1.06 |
| Recommended moment of inertia ratio of the load and the rotor Note)3 | | 20 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|-------------|
| Static friction torque (N·m) | 1.6 or more |
| Engaging time (ms) | 70 or less |
| Releasing time (ms) Note)4 | 20 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.57.

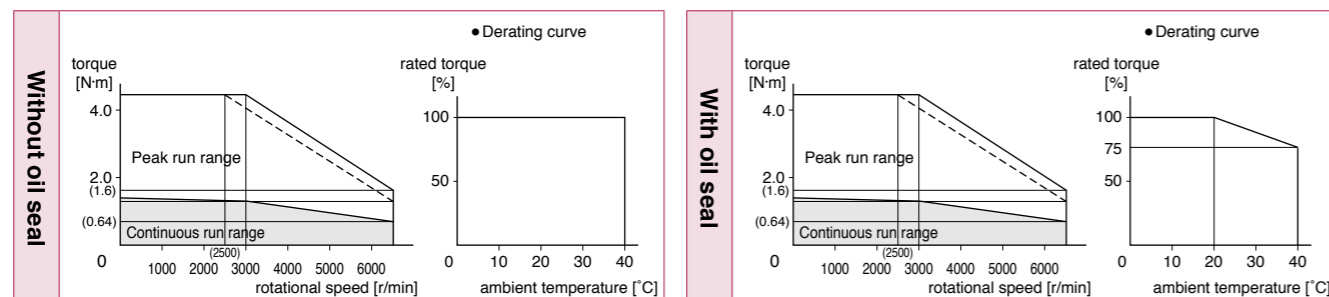
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10% less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.265 | P.265 | P.265 | P.266 | P.266 | P.266 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|--|----------------|--|
| Motor model *1 | | MHMF5AZL1□□M |
| Applicable driver | Model No. | Multifunction type MADLT05SF |
| | | RS485 communication type *2 MADLN05SG |
| | | Basic type *2 MADLN05SE |
| Frame symbol | | A-frame |
| Power supply capacity (kVA) | | 0.5 |
| Rated output (W) | | 50 |
| Rated torque (N·m) | | 0.16 |
| Continuous stall torque (N·m) | | 0.18 |
| Momentary Max. peak torque (N·m) | | 0.56 |
| Rated current (A(rms)) | | 1.1 |
| Max. current (A(o-p)) | | 5.5 |
| Regenerative brake frequency (times/min) Note)1 | Without option | No limit Note)2 |
| | DV0P4281 | No limit Note)2 |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.038 |
| | With brake | 0.042 |
| Recommended moment of inertia ratio of the load and the rotor Note)3 | | 30 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 0.38 or more |
| Engaging time (ms) | 35 or less |
| Releasing time (ms) Note)4 | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 49 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.57.

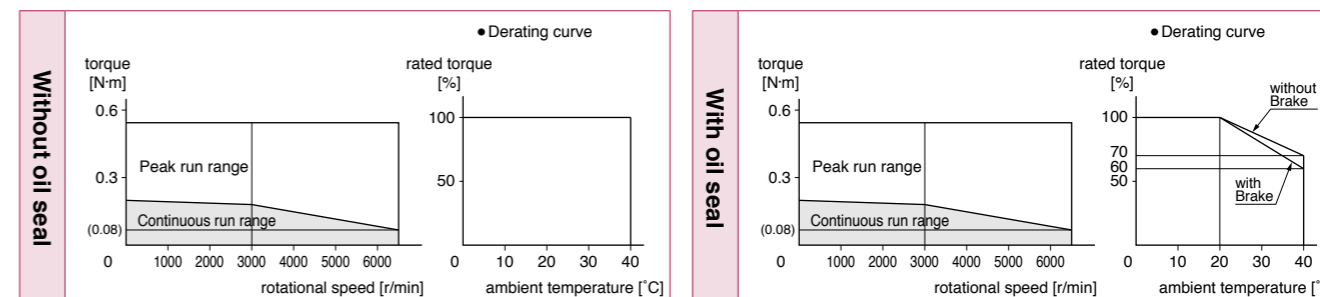
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10% less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.267 | P.267 | P.267 | P.268 | P.268 | P.268 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Please contact us for more information.

Specifications

| | | AC200 V |
|---|---------------------------------------|---------------------------------|
| Motor model ¹ | | MHMF012L1□□M |
| Applicable driver | Model No. | Multifunction type MADLT05SF |
| | RS485 communication type ² | MADLN05SG |
| | Basic type ² | MADLN05SE |
| Frame symbol | | A-frame |
| Power supply capacity | (kVA) | 0.5 |
| Rated output | (W) | 100 |
| Rated torque | (N·m) | 0.32 |
| Continuous stall torque | (N·m) | 0.33 |
| Momentary Max. peak torque | (N·m) | 1.11 |
| Rated current | (A(rms)) | 1.1 |
| Max. current | (A(o-p)) | 5.5 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4281 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.071 |
| | With brake | 0.074 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 0.38 or more |
| Engaging time (ms) | 35 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.30 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

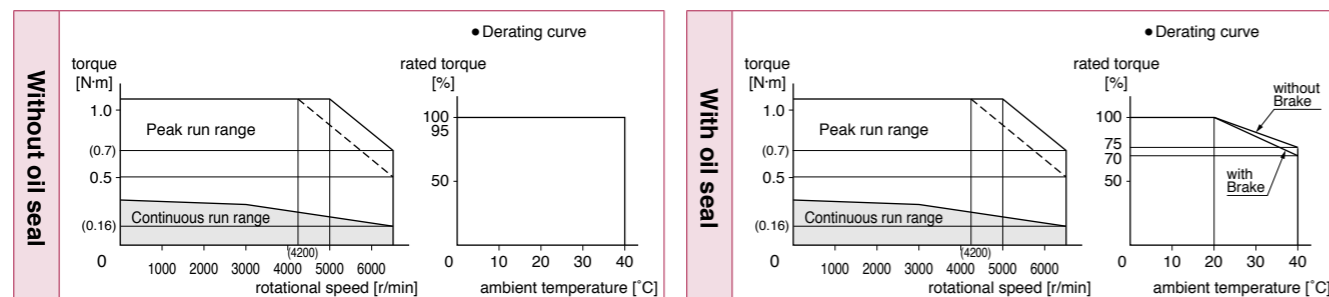
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-------|
| During assembly | Radial load P-direction (N) | 147 |
| | Thrust load A-direction (N) | 88 |
| | Thrust load B-direction (N) | 117.6 |
| During operation | Radial load P-direction (N) | 68.6 |
| | Thrust load A, B-direction (N) | 58.8 |

• For details of Note)1 to Note)4, refer to P.303.
• Dimensions of Driver, refer to P.57.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.269 | P.269 | P.269 | P.270 | P.270 | P.270 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Please contact us for more information.

Specifications

| | | AC200 V |
|---|---------------------------------------|---------------------------------|
| Motor model ¹ | | MHMF022L1□□M |
| Applicable driver | Model No. | Multifunction type MADLT15SF |
| | RS485 communication type ² | MADLN15SG |
| | Basic type ² | MADLN15SE |
| Frame symbol | | A-frame |
| Power supply capacity | (kVA) | 0.5 |
| Rated output | (W) | 200 |
| Rated torque | (N·m) | 0.64 |
| Continuous stall torque | (N·m) | 0.76 |
| Momentary Max. peak torque | (N·m) | 2.23 |
| Rated current | (A(rms)) | 1.4 |
| Max. current | (A(o-p)) | 6.9 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 3000 |
| Max. rotational speed | (r/min) | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.29 |
| | With brake | 0.31 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)
(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 1.6 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

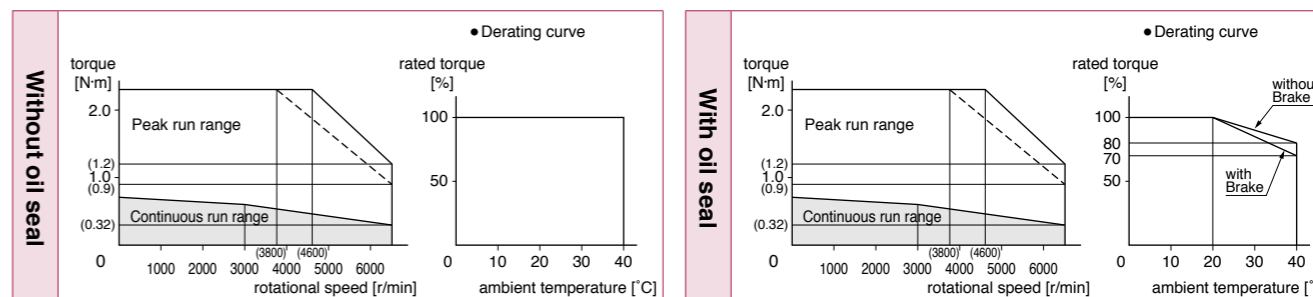
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98 |

• For details of Note)1 to Note)4, refer to P.303.
• Dimensions of Driver, refer to P.57.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.271 | P.271 | P.271 | P.272 | P.272 | P.272 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------|--|
| Motor model ¹ | | MHMF042L1□□M |
| Applicable driver | Model No. | Multifunction type MBDLT25SF |
| | | RS485 communication type ² MBDLN25SG |
| | | Basic type ² MBDLN25SE |
| Frame symbol | | B-frame |
| Power supply capacity (kVA) | | 0.9 |
| Rated output (W) | | 400 |
| Rated torque (N·m) | | 1.27 |
| Continuous stall torque (N·m) | | 1.40 |
| Momentary Max. peak torque (N·m) | | 4.46 |
| Rated current (A(rms)) | | 2.1 |
| Max. current (A(o-p)) | | 10.4 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6500 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.56 |
| | With brake | 0.58 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 30 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 1.6 or more |
| Engaging time (ms) | 50 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.36 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 392 |
| | Thrust load A-direction (N) | 147 |
| | Thrust load B-direction (N) | 196 |
| During operation | Radial load P-direction (N) | 245 |
| | Thrust load A, B-direction (N) | 98 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.57.

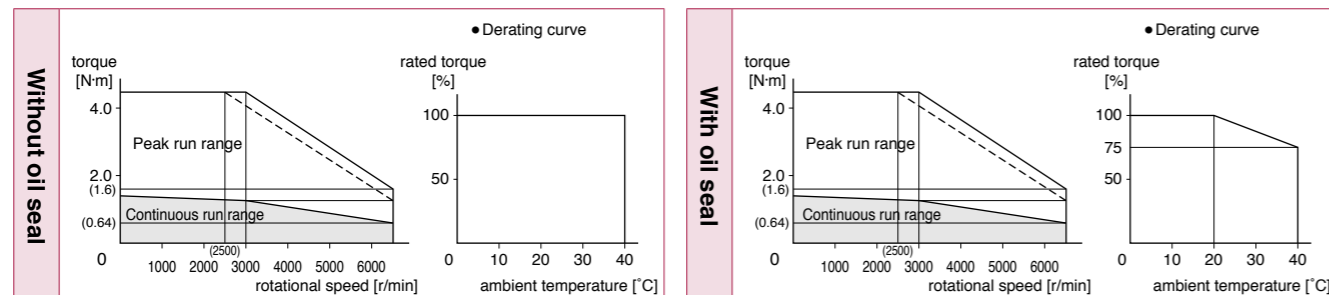
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.273 | P.273 | P.273 | P.274 | P.274 | P.274 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------|--|
| Motor model ¹ | | MHMF082L1□□M |
| Applicable driver | Model No. | Multifunction type MCDLT35SF |
| | | RS485 communication type ² MCDLN35SG |
| | | Basic type ² MCDLN35SE |
| Frame symbol | | C-frame |
| Power supply capacity (kVA) | | 1.8 |
| Rated output (W) | | 750 |
| Rated torque (N·m) | | 2.39 |
| Continuous stall torque (N·m) | | 2.86 |
| Momentary Max. peak torque (N·m) | | 8.36 |
| Rated current (A(rms)) | | 3.8 |
| Max. current (A(o-p)) | | 18.8 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4283 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 1.56 |
| | With brake | 1.66 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 20 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 3.8 or more |
| Engaging time (ms) | 70 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.42 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 686 |
| | Thrust load A-direction (N) | 294 |
| | Thrust load B-direction (N) | 392 |
| During operation | Radial load P-direction (N) | 392 |
| | Thrust load A, B-direction (N) | 147 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.58.

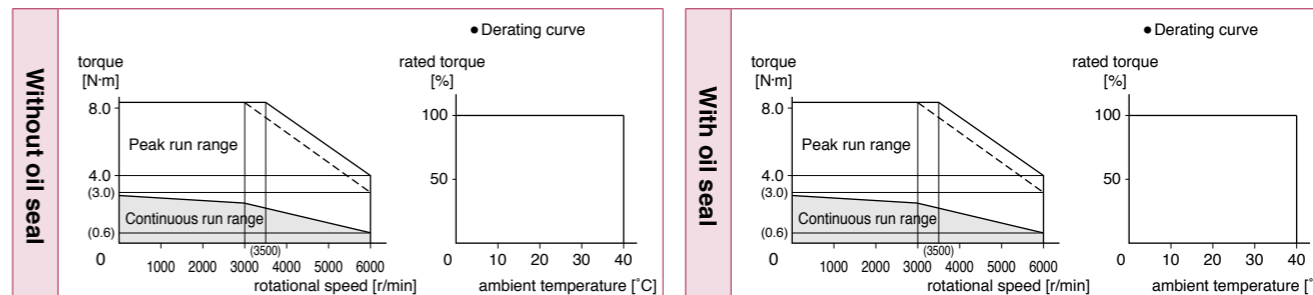
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.275 | P.275 | P.275 | P.276 | P.276 | P.276 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
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Specifications

| | | AC200 V |
|---|---------------------------------------|--------------------------------|
| Motor model ¹ | | MHMF092L1□□M |
| Applicable driver | Model No. | Multifunction type MDDL55SF |
| | RS485 communication type ² | MDDL55SG |
| | Basic type ² | MDDL55SE |
| Frame symbol | | D-frame |
| Power supply capacity (kVA) | | 2.4 |
| Rated output (W) | | 1000 |
| Rated torque (N·m) | | 3.18 |
| Continuous stall torque (N·m) | | 3.34 |
| Momentary Max. peak torque (N·m) | | 11.1 |
| Rated current (A(rms)) | | 5.7 |
| Max. current (A(o-p)) | | 28.2 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 3000 |
| Max. rotational speed (r/min) | | 6000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 2.03 |
| | With brake | 2.13 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 15 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|-------------|
| Static friction torque (N·m) | 3.8 or more |
| Engaging time (ms) | 70 or less |
| Releasing time (ms) ^{Note)4} | 20 or less |
| Exciting current (DC) (A) | 0.42 |
| Releasing voltage (DC) (V) | 1 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

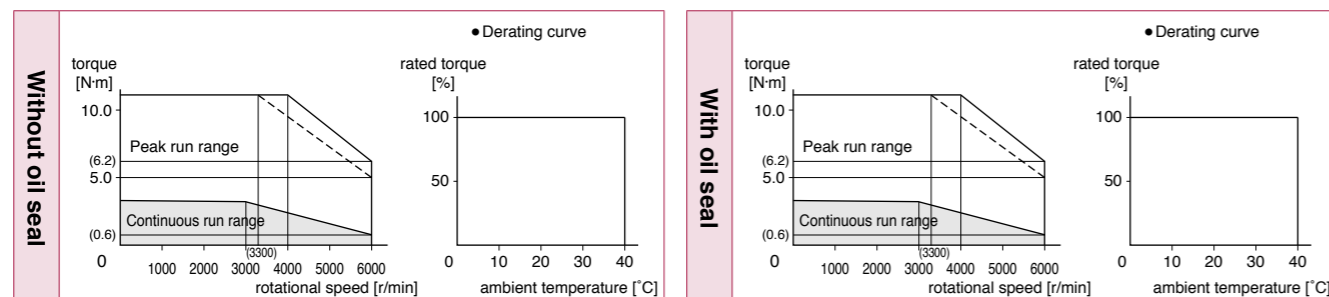
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 686 |
| | Thrust load A-direction (N) | 294 |
| | Thrust load B-direction (N) | 392 |
| During operation | Radial load P-direction (N) | 392 |
| | Thrust load A, B-direction (N) | 147 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Round shaft/ Key way, center tap shaft | | | | | |
|----------------------|--|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Leadwire type (IP65) | P.277 | P.277 | P.277 | P.278 | P.278 | P.278 |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|---------------------------------------|--------------------------------|
| Motor model ¹ | | MHMF102L1□□M |
| Applicable driver | Model No. | Multifunction type MDDL45SF |
| | RS485 communication type ² | MDDL45SG |
| | Basic type ² | MDDL45SE |
| Frame symbol | | D-frame |
| Power supply capacity (kVA) | | 2.4 |
| Rated output (W) | | 1000 |
| Rated torque (N·m) | | 4.77 |
| Continuous stall torque (N·m) | | 5.25 |
| Momentary Max. peak torque (N·m) | | 14.3 |
| Rated current (A(rms)) | | 5.2 |
| Max. current (A(o-p)) | | 22 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 2000 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 22.9 |
| | With brake | 24.1 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 5 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

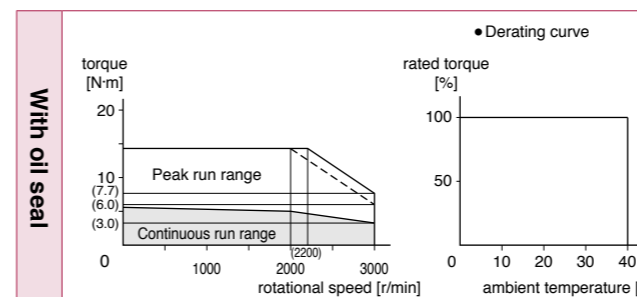
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.279 | | — | P.279 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Please contact us for more information.

Specifications

| | | AC200 V |
|---|---------------------------------------|----------------------------|
| Motor model ¹ | | MHMF152L1□□M |
| Applicable driver | Model No. | MDDL55SF |
| | Multifunction type | MDDL55SG |
| | RS485 communication type ² | MDDL55SE |
| Frame symbol | | D-frame |
| Power supply capacity | (kVA) | 2.9 |
| Rated output | (W) | 1500 |
| Rated torque | (N·m) | 7.16 |
| Continuous stall torque | (N·m) | 7.52 |
| Momentary Max. peak torque | (N·m) | 21.5 |
| Rated current | (A(rms)) | 8.0 |
| Max. current | (A(o-p)) | 34 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 33.4 |
| | With brake | 34.6 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 5 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

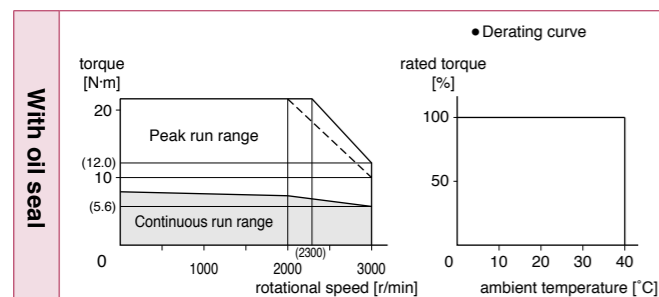
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.279 | | — | P.280 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Please contact us for more information.

Specifications

| | | AC200 V |
|---|---------------------------------------|----------------------------|
| Motor model ¹ | | MHMF202L1□□M |
| Applicable driver | Model No. | MEDLT83SF |
| | Multifunction type | MEDLN83SG |
| | RS485 communication type ² | MEDLN83SE |
| Frame symbol | | E-frame |
| Power supply capacity | (kVA) | 3.8 |
| Rated output | (W) | 2000 |
| Rated torque | (N·m) | 9.55 |
| Continuous stall torque | (N·m) | 11.5 |
| Momentary Max. peak torque | (N·m) | 28.6 |
| Rated current | (A(rms)) | 12.5 |
| Max. current | (A(o-p)) | 53 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 55.7 |
| | With brake | 61.0 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 5 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 25.0 or more |
| Engaging time (ms) | 80 or less |
| Releasing time (ms) ^{Note)4} | 25 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

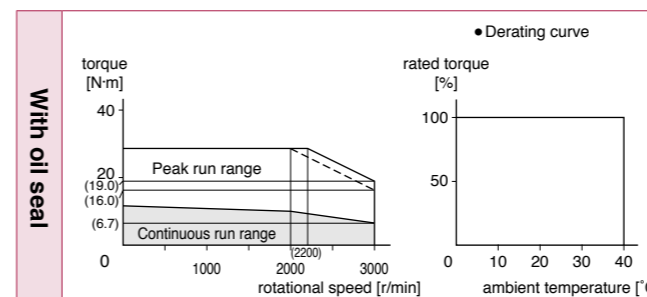
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.59.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.280 | | — | P.280 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Please contact us for more information.

Specifications

| | | AC200 V |
|---|-----------------------------|-----------------|
| Motor model *1 | | MHMF302L1□□M |
| Applicable driver | Model No. | MFDLTA3SF |
| | Multifunction type | MFDLNA3SG |
| | RS485 communication type *2 | MFDLNA3SE |
| | Basic type *2 | |
| | Frame symbol | F-frame |
| Power supply capacity | (kVA) | 5.2 |
| Rated output | (W) | 3000 |
| Rated torque | (N·m) | 14.3 |
| Continuous stall torque | (N·m) | 17.2 |
| Momentary Max. peak torque | (N·m) | 43.0 |
| Rated current | (A(rms)) | 17.0 |
| Max. current | (A(o-p)) | 72 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285x2 | No limit Note2 |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 85.3 |
| | With brake | 90.7 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 5 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 25.0 or more |
| Engaging time (ms) | 80 or less |
| Releasing time (ms) Note4 | 25 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

• For details of Note1 to Note4, refer to P.303.

• Dimensions of Driver, refer to P.59.

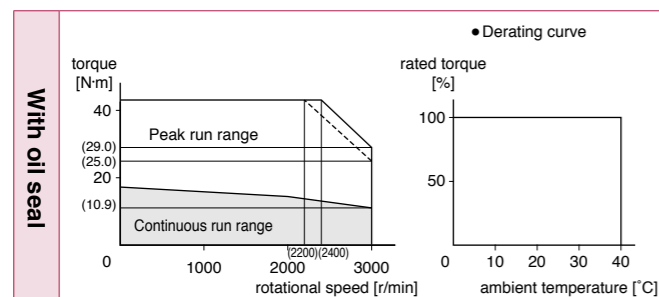
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.281 | | — | P.281 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

Please contact us for more information.

Specifications

| | | AC200 V |
|---|-----------------------------|-----------------|
| Motor model *1 | | MHMF402L1□□M |
| Applicable driver | Model No. | MFDLTB3SF |
| | Multifunction type | MFDLNB3SG |
| | RS485 communication type *2 | MFDLNB3SE |
| | Basic type *2 | |
| | Frame symbol | F-frame |
| Power supply capacity | (kVA) | 7.8 |
| Rated output | (W) | 4000 |
| Rated torque | (N·m) | 19.1 |
| Continuous stall torque | (N·m) | 22.0 |
| Momentary Max. peak torque | (N·m) | 57.3 |
| Rated current | (A(rms)) | 20 |
| Max. current | (A(o-p)) | 85 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285x2 | No limit Note2 |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 104 |
| | With brake | 110 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 5 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 25.0 or more |
| Engaging time (ms) | 80 or less |
| Releasing time (ms) Note4 | 25 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

• For details of Note1 to Note4, refer to P.303.

• Dimensions of Driver, refer to P.59.

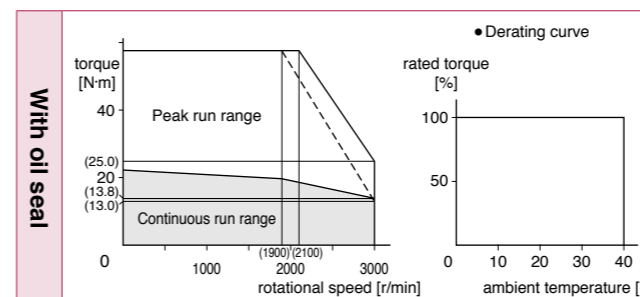
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.281 | | — | P.282 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|---------------------------------------|---------------------------------|
| Motor model ¹ | | MHMF502L1□□M |
| Applicable driver | Model No. | Multifunction type MFDLTB3SF |
| | RS485 communication type ² | MFDLNB3SG |
| | Basic type ² | MFDLNB3SE |
| Frame symbol | | F-frame |
| Power supply capacity | (kVA) | 7.8 |
| Rated output | (W) | 5000 |
| Rated torque | (N·m) | 23.9 |
| Continuous stall torque | (N·m) | 26.3 |
| Momentary Max. peak torque | (N·m) | 71.6 |
| Rated current | (A(rms)) | 23.3 |
| Max. current | (A(o-p)) | 99 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285x2 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 146 |
| | With brake | 151 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 5 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 44.1 or more |
| Engaging time (ms) | 150 or less |
| Releasing time (ms) ^{Note)4} | 30 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.59.

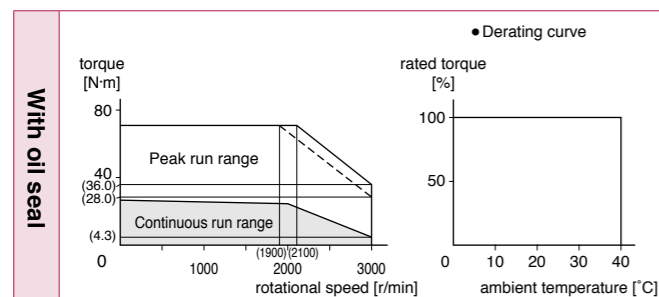
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.282 | | — | P.282 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

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Specifications

| | | AC200 V |
|---|---------------------------------------|---------------------------------|
| Motor model ¹ | | MHMF752L1□□M |
| Applicable driver | Model No. | Multifunction type MGDLTC3SF |
| | RS485 communication type ² | — |
| | Basic type ² | — |
| Frame symbol | | G-frame |
| Power supply capacity | (kVA) | 11 |
| Rated output | (W) | 7500 |
| Rated torque | (N·m) | 47.8 |
| Continuous stall torque | (N·m) | 47.8 |
| Momentary Max. peak torque | (N·m) | 125 |
| Rated current | (A(rms)) | 40.2 |
| Max. current | (A(o-p)) | 154 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4285x3 | No limit ^{Note)2} |
| Rated rotational speed | (r/min) | 1500 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 272 |
| | With brake | 279 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 5 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 63.0 or more |
| Engaging time (ms) | 200 or less |
| Releasing time (ms) ^{Note)4} | 80 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 2058 |
| | Thrust load A-direction (N) | 980 |
| | Thrust load B-direction (N) | 1176 |
| During operation | Radial load P-direction (N) | 1176 |
| | Thrust load A, B-direction (N) | 490 |

• For details of Note)1 to Note)4, refer to P.303.

• Dimensions of Driver, refer to P.60.

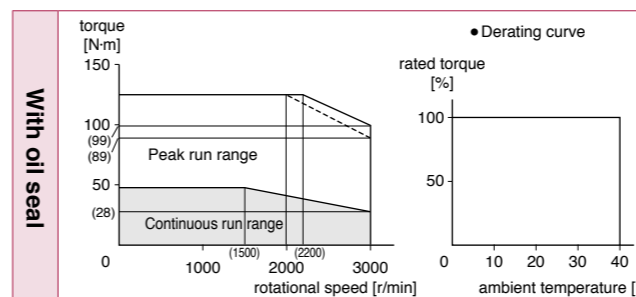
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.283 | — | — | P.283 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

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Specifications

| | | AC200 V |
|---|----------------|---|
| Motor model ¹ | | MDMF102L1□□M |
| Applicable driver | Model No. | Multifunction type MDDL45SF |
| | | RS485 communication type ² MDDL45SG |
| | | Basic type ² MDDL45SE |
| Frame symbol | | D-frame |
| Power supply capacity (kVA) | | 2.4 |
| Rated output (W) | | 1000 |
| Rated torque (N·m) | | 4.77 |
| Continuous stall torque (N·m) | | 5.25 |
| Momentary Max. peak torque (N·m) | | 14.3 |
| Rated current (A(rms)) | | 5.2 |
| Max. current (A(o-p)) | | 22 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 2000 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 6.18 |
| | With brake | 7.40 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 10 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

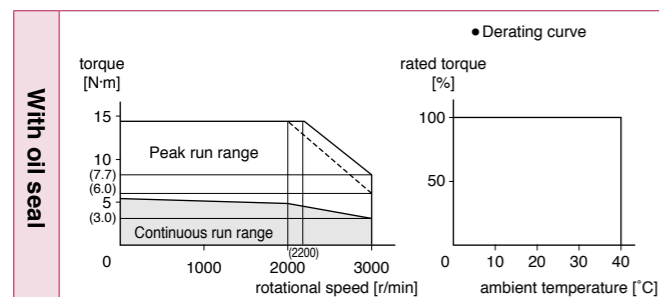
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.283 | | — | P.284 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------|---|
| Motor model ¹ | | MDMF152L1□□M |
| Applicable driver | Model No. | Multifunction type MDDL55SF |
| | | RS485 communication type ² MDDL55SG |
| | | Basic type ² MDDL55SE |
| Frame symbol | | D-frame |
| Power supply capacity (kVA) | | 2.9 |
| Rated output (W) | | 1500 |
| Rated torque (N·m) | | 7.16 |
| Continuous stall torque (N·m) | | 7.52 |
| Momentary Max. peak torque (N·m) | | 21.5 |
| Rated current (A(rms)) | | 8.0 |
| Max. current (A(o-p)) | | 34 |
| Regenerative brake frequency (times/min) ^{Note)1} | Without option | No limit ^{Note)2} |
| | DV0P4284 | No limit ^{Note)2} |
| Rated rotational speed (r/min) | | 2000 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 9.16 |
| | With brake | 10.4 |
| Recommended moment of inertia ratio of the load and the rotor ^{Note)3} | | 10 times or less |
| Rotary encoder specifications ³ | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|---------------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) ^{Note)4} | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

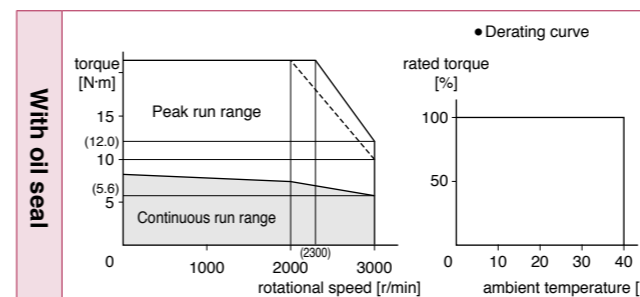
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note)1 to Note)4, refer to P.303.
- Dimensions of Driver, refer to P.58.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.284 | | — | P.284 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|-----------------------------|---------------------------------|
| Motor model *1 | | MDMF202L1□□M |
| Applicable driver | Model No. | Multifunction type MEDLT83SF |
| | RS485 communication type *2 | MEDLN83SG |
| | Basic type *2 | MEDLN83SE |
| Frame symbol | | E-frame |
| Power supply capacity | (kVA) | 3.8 |
| Rated output | (W) | 2000 |
| Rated torque | (N·m) | 9.55 |
| Continuous stall torque | (N·m) | 10.0 |
| Momentary Max. peak torque | (N·m) | 28.6 |
| Rated current | (A(rms)) | 9.9 |
| Max. current | (A(o-p)) | 42 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285 | No limit Note2 |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 12.1 |
| | With brake | 13.3 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) Note4 | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 490 |
| | Thrust load A, B-direction (N) | 196 |

• For details of Note1 to Note4, refer to P.303.

• Dimensions of Driver, refer to P.59.

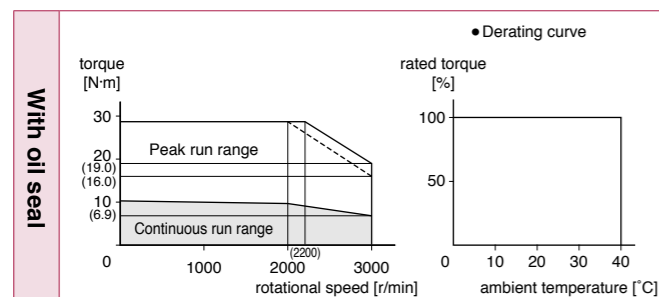
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.285 | | — | P.285 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|-----------------------------|---------------------------------|
| Motor model *1 | | MDMF302L1□□M |
| Applicable driver | Model No. | Multifunction type MFDLTA3SF |
| | RS485 communication type *2 | MFDLNA3SG |
| | Basic type *2 | MFDLNA3SE |
| Frame symbol | | F-frame |
| Power supply capacity | (kVA) | 5.2 |
| Rated output | (W) | 3000 |
| Rated torque | (N·m) | 14.3 |
| Continuous stall torque | (N·m) | 15.0 |
| Momentary Max. peak torque | (N·m) | 43.0 |
| Rated current | (A(rms)) | 16.4 |
| Max. current | (A(o-p)) | 70 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285×2 | No limit Note2 |
| Rated rotational speed | (r/min) | 2000 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 18.6 |
| | With brake | 19.6 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 22.0 or more |
| Engaging time (ms) | 110 or less |
| Releasing time (ms) Note4 | 50 or less |
| Exciting current (DC) (A) | 0.90 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

• For details of Note1 to Note4, refer to P.303.

• Dimensions of Driver, refer to P.59.

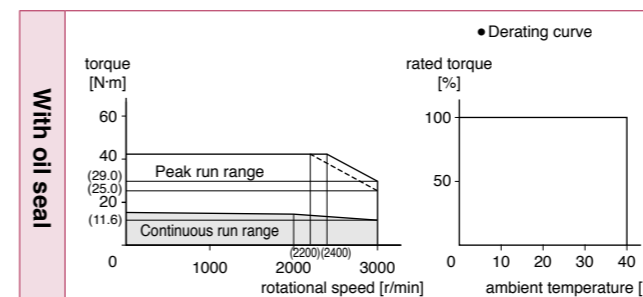
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.285 | | — | P.286 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------|--|
| Motor model *1 | | MDMF402L1□□M |
| Applicable driver | Model No. | Multifunction type MFDLTB3SF |
| | | RS485 communication type *2 MFDLNB3SG |
| | | Basic type *2 MFDLNB3SE |
| Frame symbol | | F-frame |
| Power supply capacity (kVA) | | 7.8 |
| Rated output (W) | | 4000 |
| Rated torque (N·m) | | 19.1 |
| Continuous stall torque (N·m) | | 22.0 |
| Momentary Max. peak torque (N·m) | | 57.3 |
| Rated current (A(rms)) | | 20.0 |
| Max. current (A(o-p)) | | 85 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285x2 | No limit Note2 |
| Rated rotational speed (r/min) | | 2000 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 46.9 |
| | With brake | 52.3 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 25.0 or more |
| Engaging time (ms) | 80 or less |
| Releasing time (ms) Note4 | 25 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

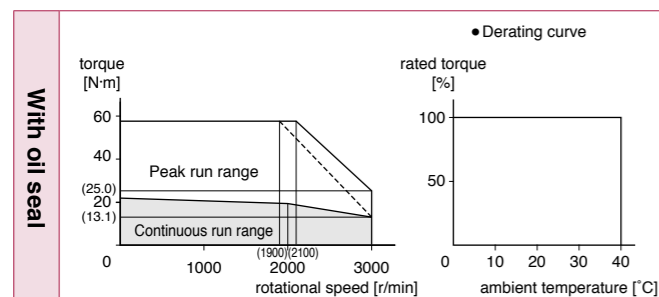
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

- For details of Note1 to Note4, refer to P.303.
- Dimensions of Driver, refer to P.59.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.286 | | — | P.286 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
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Specifications

| | | AC200 V |
|---|----------------|--|
| Motor model *1 | | MDMF502L1□□M |
| Applicable driver | Model No. | Multifunction type MFDLTB3SF |
| | | RS485 communication type *2 MFDLNB3SG |
| | | Basic type *2 MFDLNB3SE |
| Frame symbol | | F-frame |
| Power supply capacity (kVA) | | 7.8 |
| Rated output (W) | | 5000 |
| Rated torque (N·m) | | 23.9 |
| Continuous stall torque (N·m) | | 26.3 |
| Momentary Max. peak torque (N·m) | | 71.6 |
| Rated current (A(rms)) | | 23.3 |
| Max. current (A(o-p)) | | 99 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285x2 | No limit Note2 |
| Rated rotational speed (r/min) | | 2000 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 58.2 |
| | With brake | 63.0 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 44.1 or more |
| Engaging time (ms) | 150 or less |
| Releasing time (ms) Note4 | 30 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

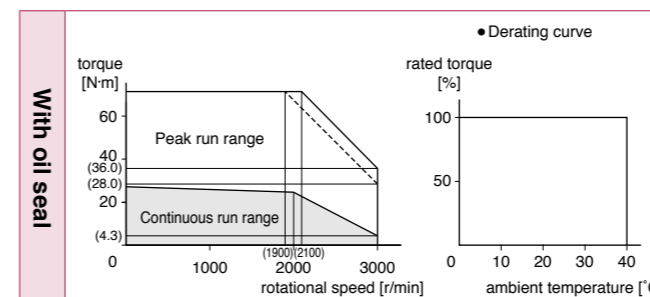
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 784 |
| | Thrust load A, B-direction (N) | 343 |

- For details of Note1 to Note4, refer to P.303.
- Dimensions of Driver, refer to P.59.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.287 | | — | P.287 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------|-----------------------------|
| Motor model *1 | | MDMF752L1□□M |
| Applicable driver | Model No. | Multifunction type |
| | | RS485 communication type *2 |
| | | Basic type *2 |
| Frame symbol | | G-frame |
| Power supply capacity (kVA) | | 11 |
| Rated output (W) | | 7500 |
| Rated torque (N·m) | | 47.8 |
| Continuous stall torque (N·m) | | 47.8 |
| Momentary Max. peak torque (N·m) | | 125 |
| Rated current (A(rms)) | | 40.2 |
| Max. current (A(o-p)) | | 154 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285x3 | No limit Note2 |
| Rated rotational speed (r/min) | | 1500 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 122 |
| | With brake | 127 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 63.0 or more |
| Engaging time (ms) | 200 or less |
| Releasing time (ms) Note4 | 80 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

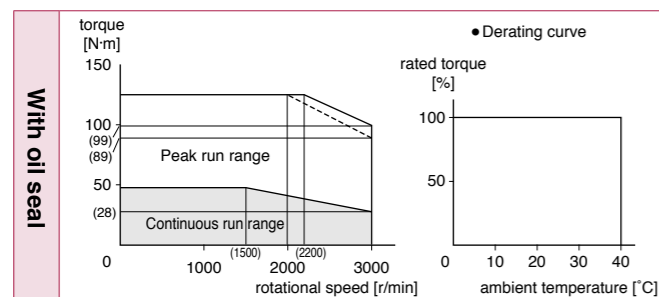
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 2058 |
| | Thrust load A-direction (N) | 980 |
| | Thrust load B-direction (N) | 1176 |
| During operation | Radial load P-direction (N) | 1176 |
| | Thrust load A, B-direction (N) | 490 |

- For details of Note1 to Note4, refer to P.303.
- Dimensions of Driver, refer to P.60.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.287 | — | — | P.288 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------|-----------------------------|
| Motor model *1 | | MGMF092L1□□M |
| Applicable driver | Model No. | Multifunction type |
| | | RS485 communication type *2 |
| | | Basic type *2 |
| Frame symbol | | D-frame |
| Power supply capacity (kVA) | | 2.0 |
| Rated output (W) | | 850 |
| Rated torque (N·m) | | 5.41 |
| Continuous stall torque (N·m) | | 5.41 |
| Momentary Max. peak torque (N·m) | | 14.3 |
| Rated current (A(rms)) | | 5.9 |
| Max. current (A(o-p)) | | 22 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4284 | No limit Note2 |
| Rated rotational speed (r/min) | | 1500 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 6.18 |
| | With brake | 7.40 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) Note4 | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

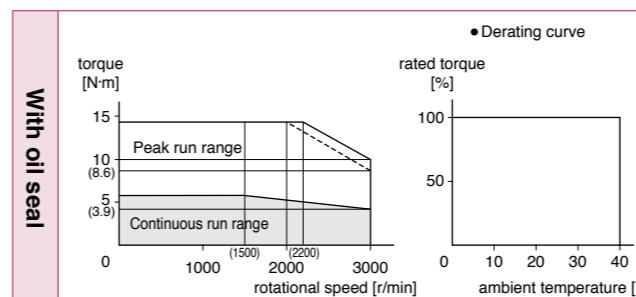
• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 686 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note1 to Note4, refer to P.303.
- Dimensions of Driver, refer to P.58.

- *1 □□ in the motor part number represents the motor specifications.
- *2 Basic type and RS485 communication type are "Position control type".
Detail of model designation, refer to P.204.
- *3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.288 | — | — | P.288 | — |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------|---|
| Motor model *1 | | MGMF132L1□□M |
| Applicable driver | Model No. | Multifunction type MDDL55SF |
| | | RS485 communication type *2 MDDL55SG |
| | | Basic type *2 MDDL55SE |
| Frame symbol | | D-frame |
| Power supply capacity (kVA) | | 2.6 |
| Rated output (W) | | 1300 |
| Rated torque (N·m) | | 8.28 |
| Continuous stall torque (N·m) | | 8.28 |
| Momentary Max. peak torque (N·m) | | 23.3 |
| Rated current (A(rms)) | | 9.3 |
| Max. current (A(o-p)) | | 37 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4284 | No limit Note2 |
| Rated rotational speed (r/min) | | 1500 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 9.16 |
| | With brake | 10.4 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) Note4 | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 686 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note1 to Note4, refer to P.303.
- Dimensions of Driver, refer to P.58.

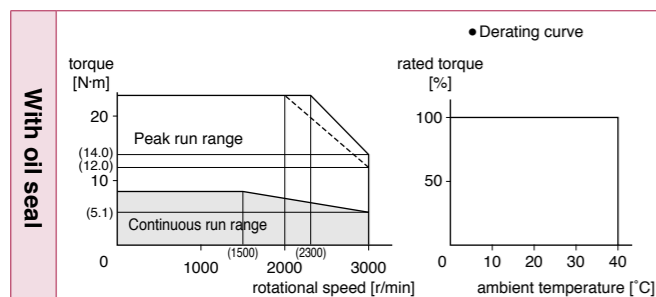
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.289 | | — | P.289 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------|--|
| Motor model *1 | | MGMF182L1□□M |
| Applicable driver | Model No. | Multifunction type MEDLT83SF |
| | | RS485 communication type *2 MEDLN83SG |
| | | Basic type *2 MEDLN83SE |
| Frame symbol | | E-frame |
| Power supply capacity (kVA) | | 3.4 |
| Rated output (W) | | 1800 |
| Rated torque (N·m) | | 11.5 |
| Continuous stall torque (N·m) | | 11.5 |
| Momentary Max. peak torque (N·m) | | 28.7 |
| Rated current (A(rms)) | | 11.8 |
| Max. current (A(o-p)) | | 42 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285×2 | No limit Note2 |
| Rated rotational speed (r/min) | | 1500 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 12.1 |
| | With brake | 13.3 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 13.7 or more |
| Engaging time (ms) | 100 or less |
| Releasing time (ms) Note4 | 50 or less |
| Exciting current (DC) (A) | 0.79 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|-----|
| During assembly | Radial load P-direction (N) | 980 |
| | Thrust load A-direction (N) | 588 |
| | Thrust load B-direction (N) | 686 |
| During operation | Radial load P-direction (N) | 686 |
| | Thrust load A, B-direction (N) | 196 |

- For details of Note1 to Note4, refer to P.303.
- Dimensions of Driver, refer to P.59.

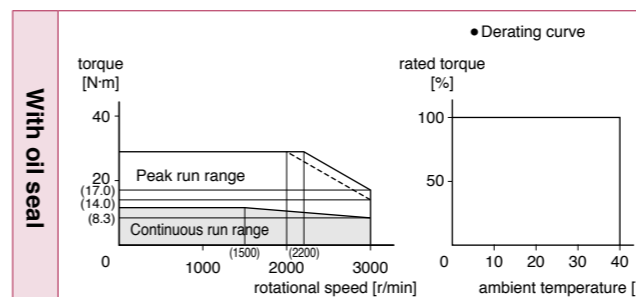
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.289 | | — | P.290 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------|--|
| Motor model *1 | | MGMF242L1□□M |
| Applicable driver | Model No. | Multifunction type MEDLT93SF |
| | | RS485 communication type *2 MEDLN93SG |
| | | Basic type *2 MEDLN93SE |
| Frame symbol | | E-frame |
| Power supply capacity (kVA) | | 4.5 |
| Rated output (W) | | 2400 |
| Rated torque (N·m) | | 15.3 |
| Continuous stall torque (N·m) | | 15.3 |
| Momentary Max. peak torque (N·m) | | 45.2 |
| Rated current (A(rms)) | | 16.0 |
| Max. current (A(o-p)) | | 67 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285x2 | No limit Note2 |
| Rated rotational speed (r/min) | | 1500 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 46.9 |
| | With brake | 52.3 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 25.0 or more |
| Engaging time (ms) | 80 or less |
| Releasing time (ms) Note4 | 25 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 1176 |
| | Thrust load A, B-direction (N) | 490 |

• For details of Note1) to Note4), refer to P.303.

• Dimensions of Driver, refer to P.59.

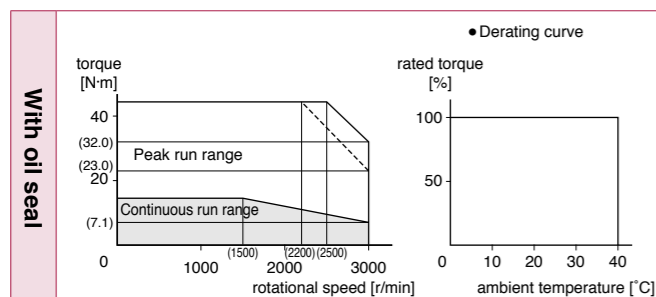
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.290 | | — | P.290 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|----------------|--|
| Motor model *1 | | MGMF292L1□□M |
| Applicable driver | Model No. | Multifunction type MFDLTB3SF |
| | | RS485 communication type *2 MFDLNB3SG |
| | | Basic type *2 MFDLNB3SE |
| Frame symbol | | F-frame |
| Power supply capacity (kVA) | | 5.0 |
| Rated output (W) | | 2900 |
| Rated torque (N·m) | | 18.5 |
| Continuous stall torque (N·m) | | 18.5 |
| Momentary Max. peak torque (N·m) | | 45.2 |
| Rated current (A(rms)) | | 19.3 |
| Max. current (A(o-p)) | | 67 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285x2 | No limit Note2 |
| Rated rotational speed (r/min) | | 1500 |
| Max. rotational speed (r/min) | | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 46.9 |
| | With brake | 52.3 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| Resolution per single turn | | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 25.0 or more |
| Engaging time (ms) | 80 or less |
| Releasing time (ms) Note4 | 25 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 1176 |
| | Thrust load A, B-direction (N) | 490 |

• For details of Note1) to Note4), refer to P.303.

• Dimensions of Driver, refer to P.59.

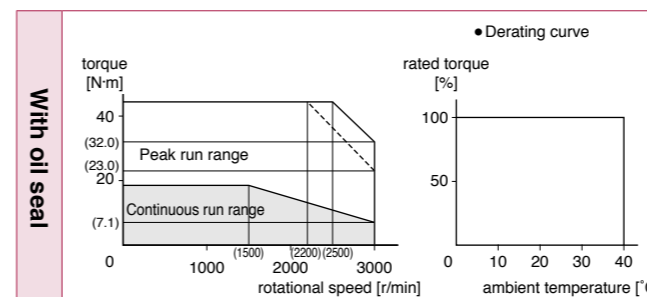
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.291 | | — | P.291 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|-----------------------------|------------------|
| Motor model *1 | | MGMF442L1□□M |
| Applicable driver | Model No. | MFDLTB3SF |
| | Multifunction type | MFDLNB3SG |
| | RS485 communication type *2 | MFDLNB3SE |
| | Basic type *2 | |
| | Frame symbol | F-frame |
| Power supply capacity | (kVA) | 7.0 |
| Rated output | (W) | 4400 |
| Rated torque | (N·m) | 28.0 |
| Continuous stall torque | (N·m) | 28.0 |
| Momentary Max. peak torque | (N·m) | 70.0 |
| Rated current | (A(rms)) | 27.2 |
| Max. current | (A(o-p)) | 96 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285x2 | No limit Note2 |
| Rated rotational speed | (r/min) | 1500 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 58.2 |
| | With brake | 63.0 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 44.1 or more |
| Engaging time (ms) | 150 or less |
| Releasing time (ms) Note4 | 30 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 1666 |
| | Thrust load A-direction (N) | 784 |
| | Thrust load B-direction (N) | 980 |
| During operation | Radial load P-direction (N) | 1470 |
| | Thrust load A, B-direction (N) | 490 |

• For details of Note1 to Note4, refer to P.303.

• Dimensions of Driver, refer to P.59.

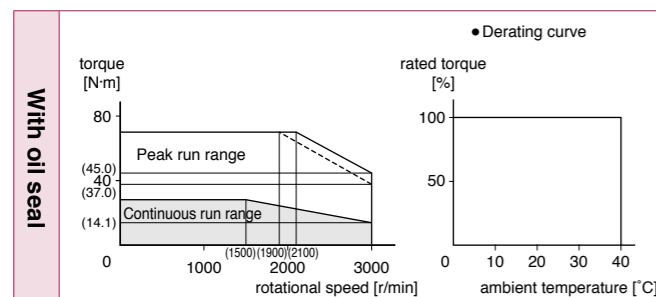
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.291 | | — | P.292 | |

<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
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Read the Instruction Manual carefully and understand all precautions and remarks before using the products.
Please avoid the motor, or equipment containing the motor to be distributed to Japan, or other regions through Japan.

• Please contact us for more information.

Specifications

| | | AC200 V |
|---|-----------------------------|------------------|
| Motor model *1 | | MGMF552L1□□M |
| Applicable driver | Model No. | MGDLTC3SF |
| | Multifunction type | — |
| | RS485 communication type *2 | — |
| | Basic type *2 | |
| | Frame symbol | G-frame |
| Power supply capacity | (kVA) | 8.5 |
| Rated output | (W) | 5500 |
| Rated torque | (N·m) | 35.0 |
| Continuous stall torque | (N·m) | 35.0 |
| Momentary Max. peak torque | (N·m) | 102 |
| Rated current | (A(rms)) | 39.8 |
| Max. current | (A(o-p)) | 164 |
| Regenerative brake frequency (times/min) Note1 | Without option | No limit Note2 |
| | DV0P4285x3 | No limit Note2 |
| Rated rotational speed | (r/min) | 1500 |
| Max. rotational speed | (r/min) | 3000 |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 83.0 |
| | With brake | 88.0 |
| Recommended moment of inertia ratio of the load and the rotor Note3 | | 10 times or less |
| Rotary encoder specifications *3 | | 23-bit Absolute |
| | Resolution per single turn | 8388608 |

• Brake specifications (For details, refer to P.305)

(This brake will be released when it is energized.)
(Do not use this for braking the motor in motion.)

| | |
|------------------------------|--------------|
| Static friction torque (N·m) | 63.0 or more |
| Engaging time (ms) | 200 or less |
| Releasing time (ms) Note4 | 80 or less |
| Exciting current (DC) (A) | 1.29 |
| Releasing voltage (DC) (V) | 2 or more |
| Exciting voltage (DC) (V) | 24±2.4 |

• Permissible load (For details, refer to P.304)

| | | |
|------------------|--------------------------------|------|
| During assembly | Radial load P-direction (N) | 2058 |
| | Thrust load A-direction (N) | 980 |
| | Thrust load B-direction (N) | 1176 |
| During operation | Radial load P-direction (N) | 1176 |
| | Thrust load A, B-direction (N) | 490 |

• For details of Note1 to Note4, refer to P.303.

• Dimensions of Driver, refer to P.60.

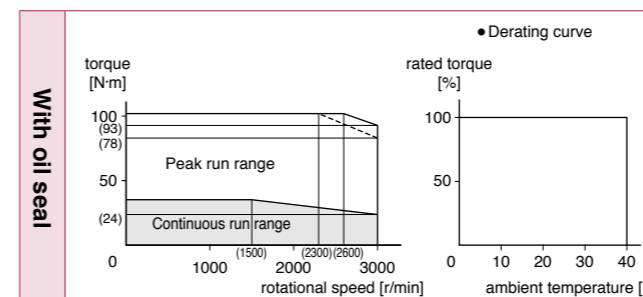
*1 □□ in the motor part number represents the motor specifications.

*2 Basic type and RS485 communication type are "Position control type".

Detail of model designation, refer to P.204.

*3 When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Torque characteristics (at AC200 V of power voltage <Dotted line represents the torque at 10 % less supply voltage.>)



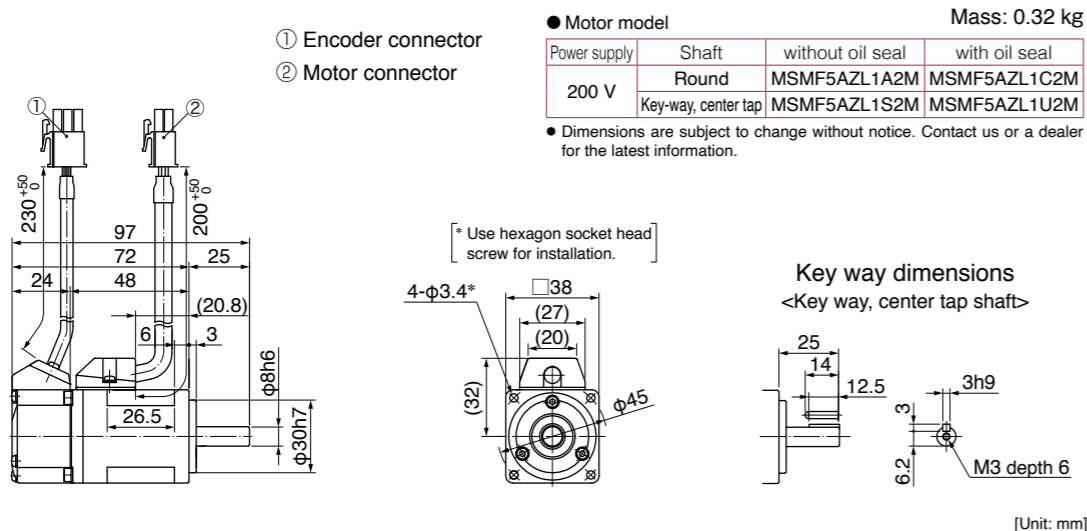
Dimensions

| Motor specifications | Key way shaft/ Round shaft | | | | | |
|--|----------------------------|---------------|------------------------------------|------------------|---------------|------------------------------------|
| | without brake | | | with brake | | |
| | without oil seal | with oil seal | with protective lip/ with oil seal | without oil seal | with oil seal | with protective lip/ with oil seal |
| Encoder connector Large size (JL10) type | — | P.292 | — | — | P.292 | — |

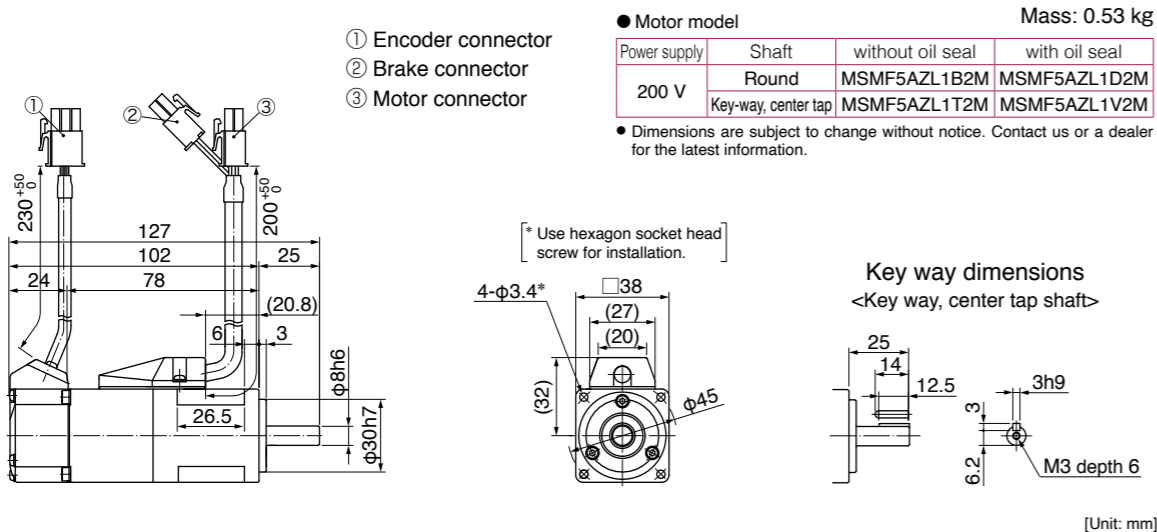
<Cautions> Reduce the moment of inertia ratio if high speed response operation is required.
Dimensions are subject to change without notice. Contact us or a dealer for the latest information.
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MSMF 50 W

Leadwire type (IP65) • without brake • without/with oil seal • Round shaft/ Key way, center tap shaft

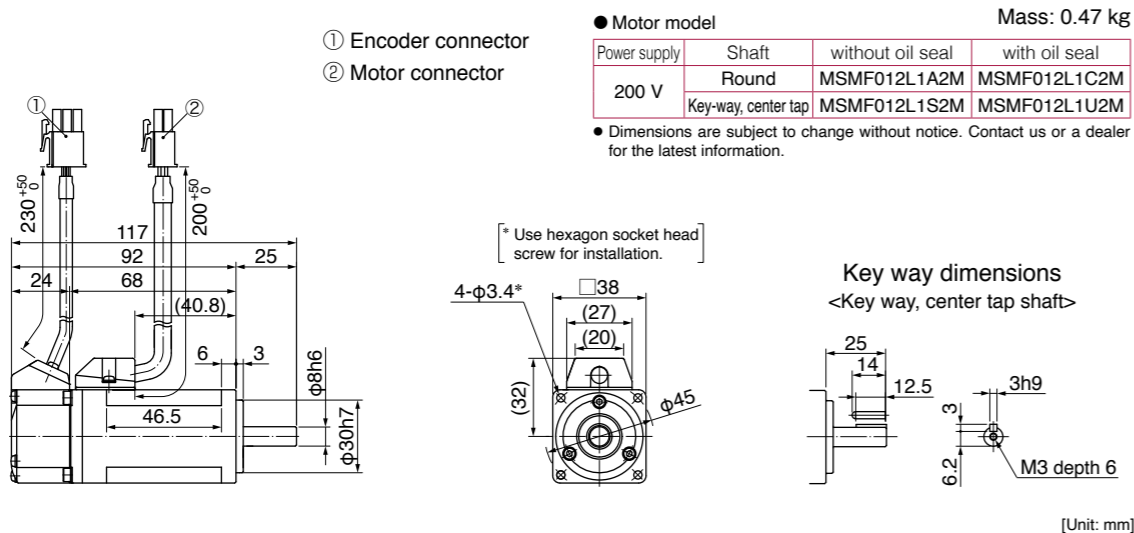


Leadwire type (IP65) • with brake • without/with oil seal • Round shaft/ Key way, center tap shaft



MSMF 100 W

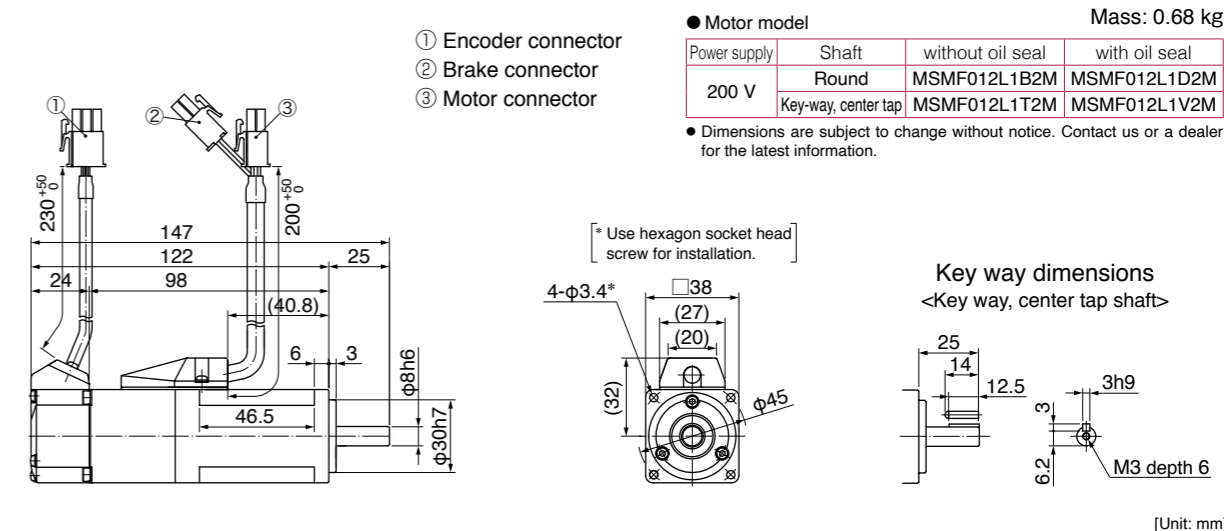
Leadwire type (IP65) • without brake • without/with oil seal • Round shaft/ Key way, center tap shaft



* For motors specifications, refer to P.211, P.212.

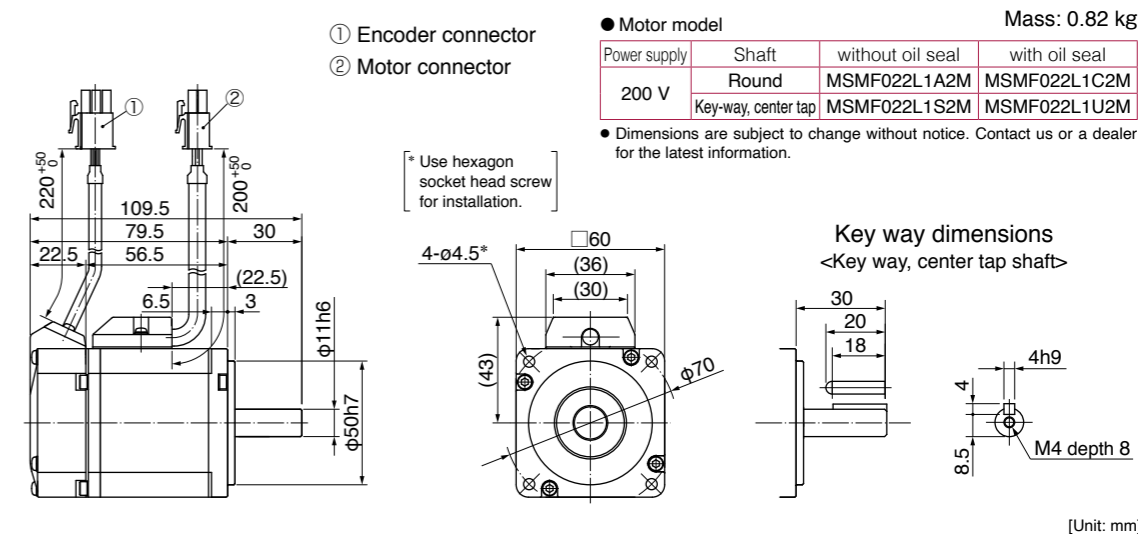
MSMF 100 W

Leadwire type (IP65) • with brake • without/with oil seal • Round shaft/ Key way, center tap shaft

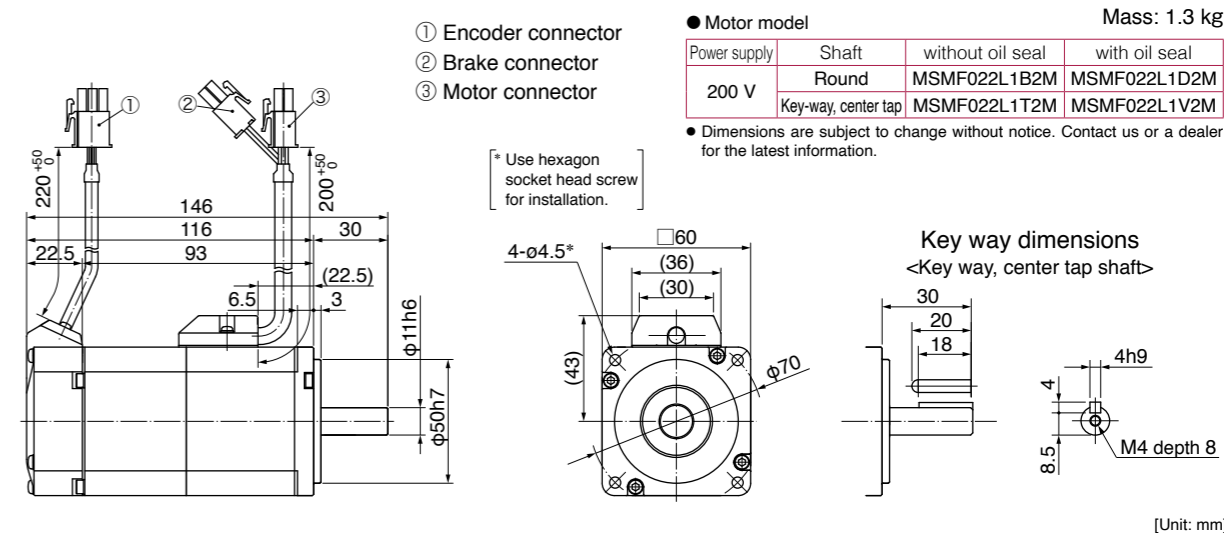


MSMF 200 W

Leadwire type (IP65) • without brake • without/with oil seal • Round shaft/ Key way, center tap shaft

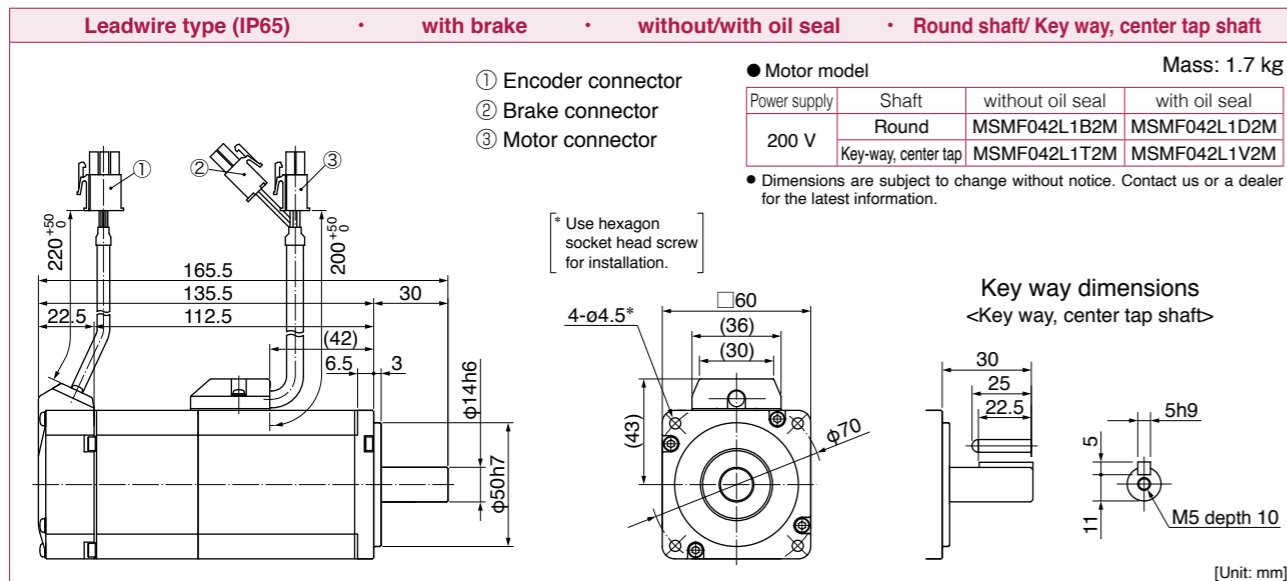
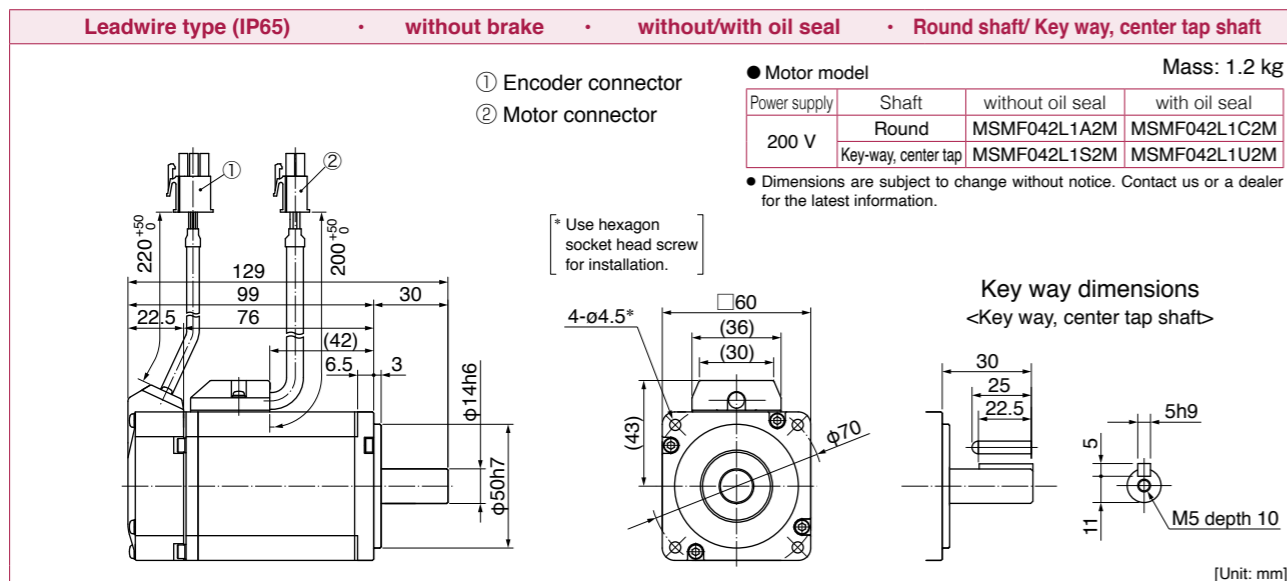


Leadwire type (IP65) • with brake • without/with oil seal • Round shaft/ Key way, center tap shaft

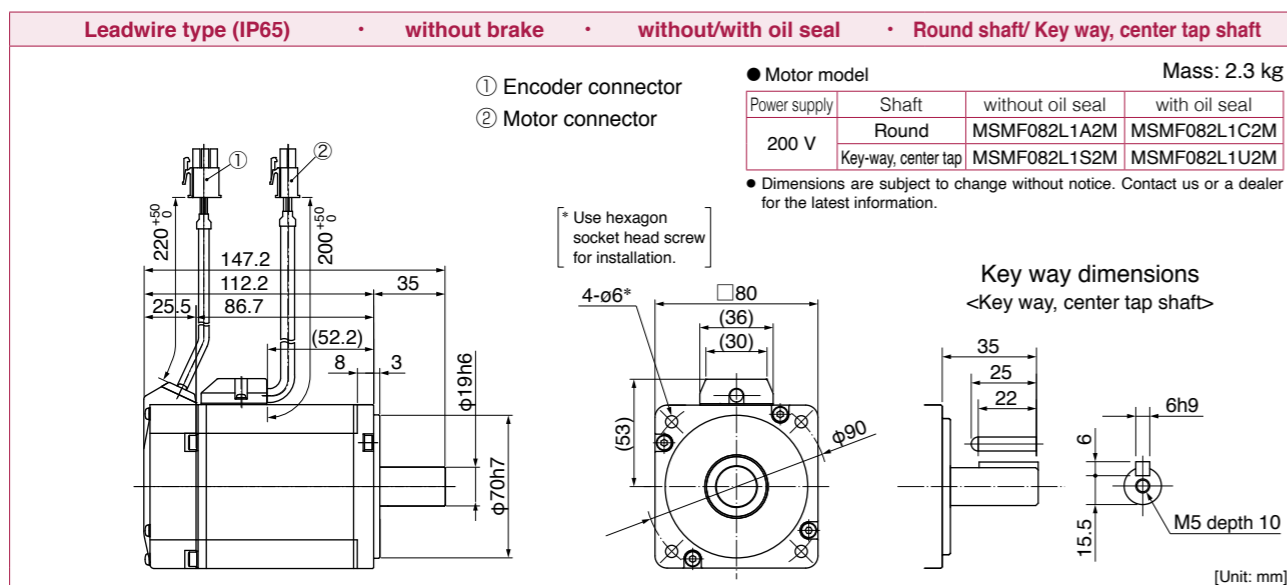


* For motors specifications, refer to P.212, P.213.

MSMF 400 W

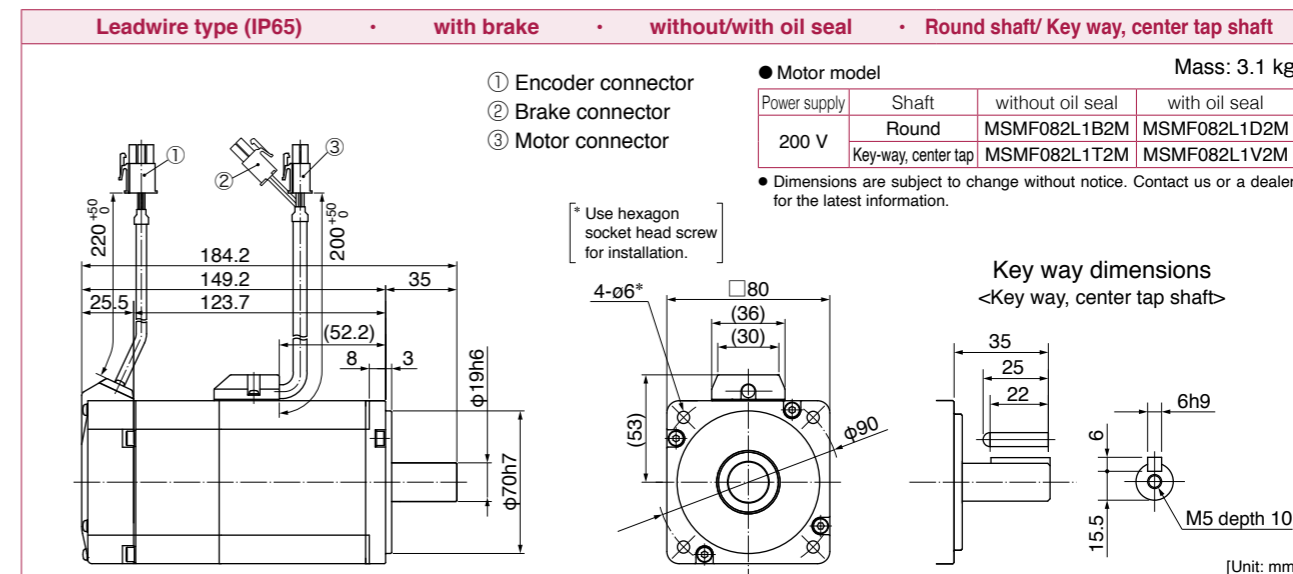


MSMF 750 W

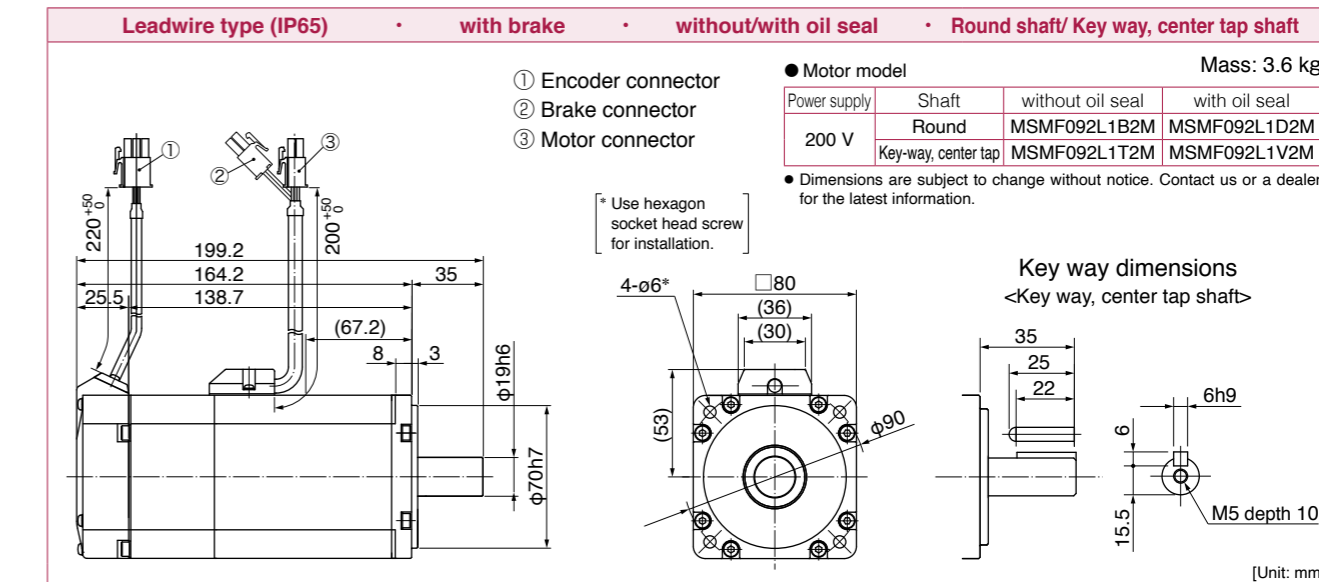
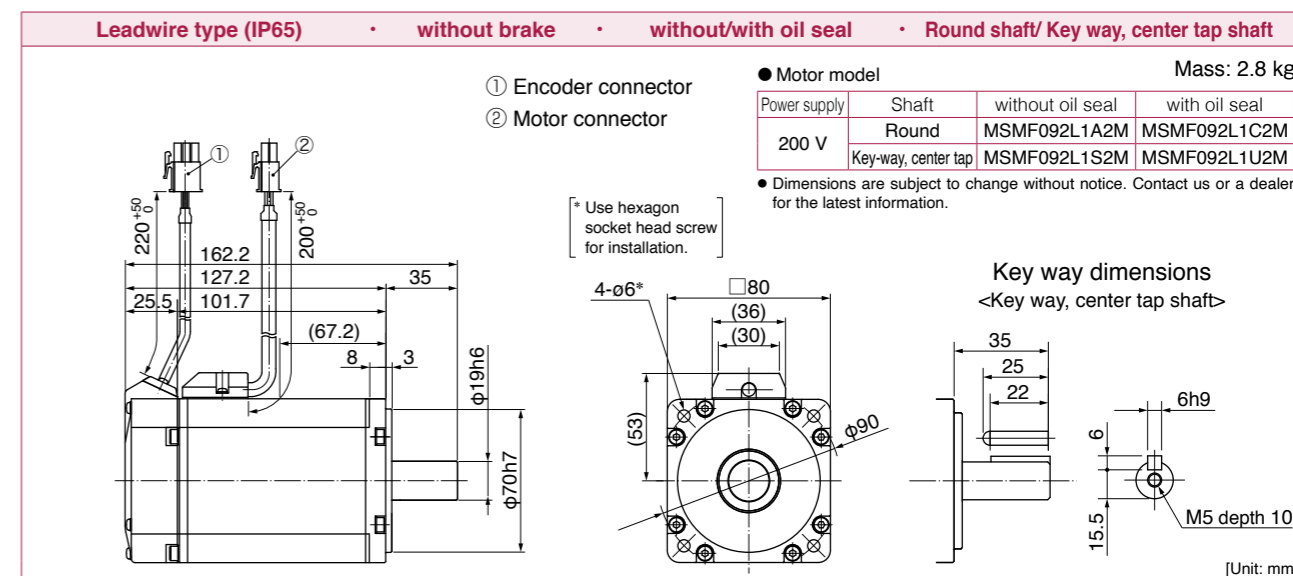


* For motors specifications, refer to P.214, P.215.

MSMF 750 W



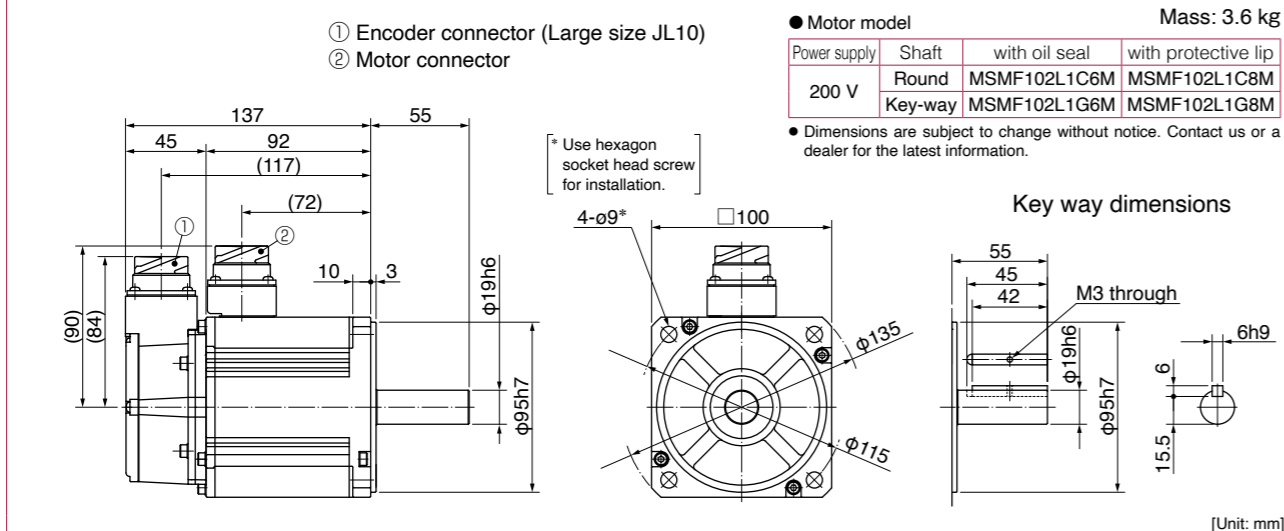
MSMF 1000 W



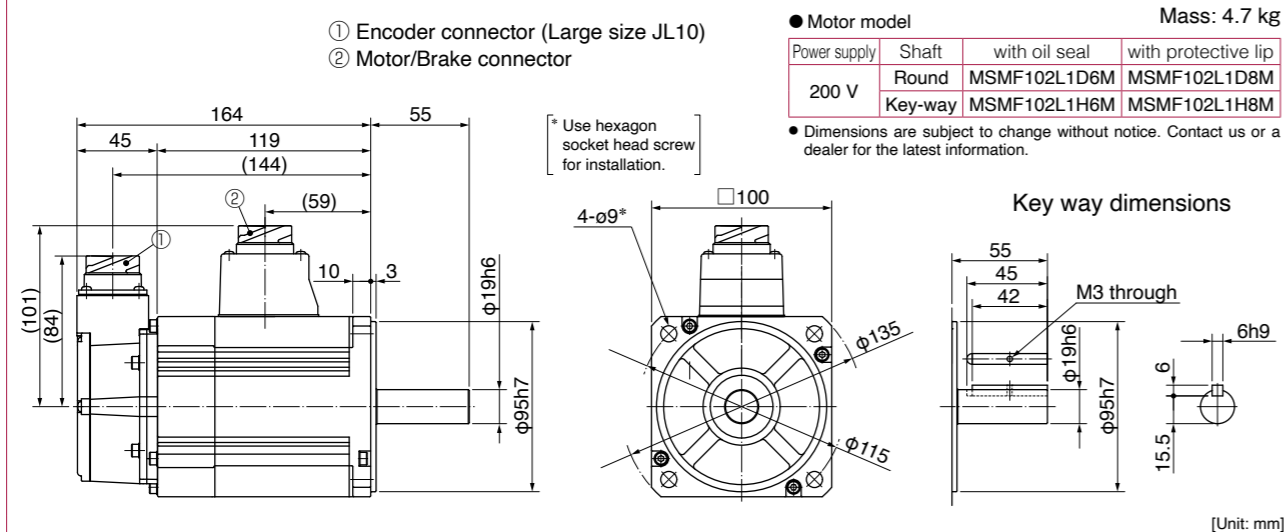
* For motors specifications, refer to P.215, P.216.

MSMF 1.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

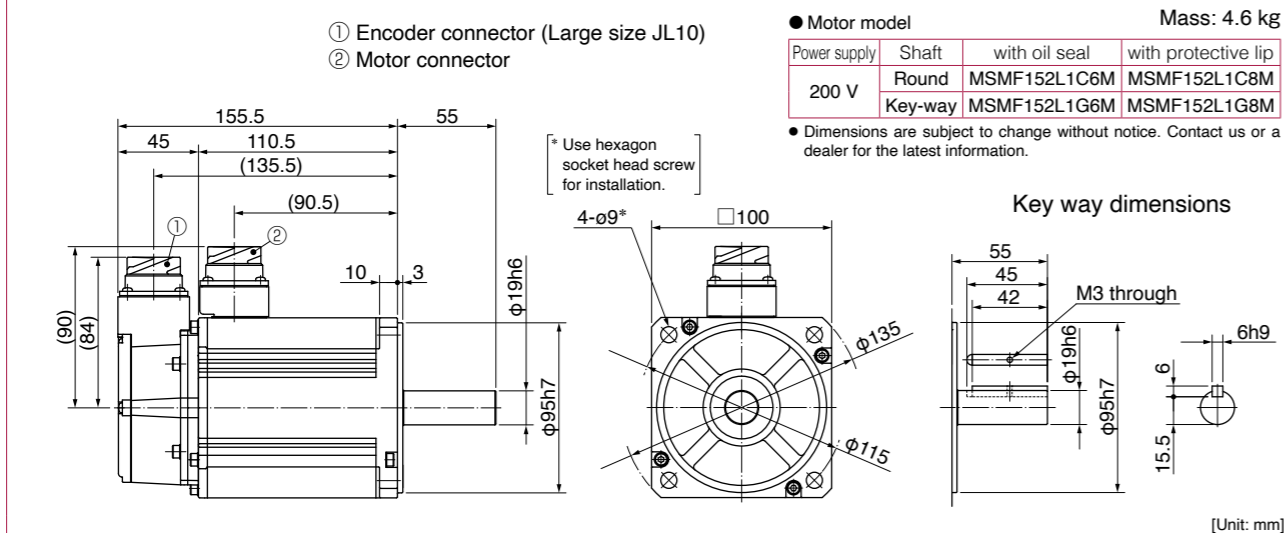


Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MSMF 1.5 kW

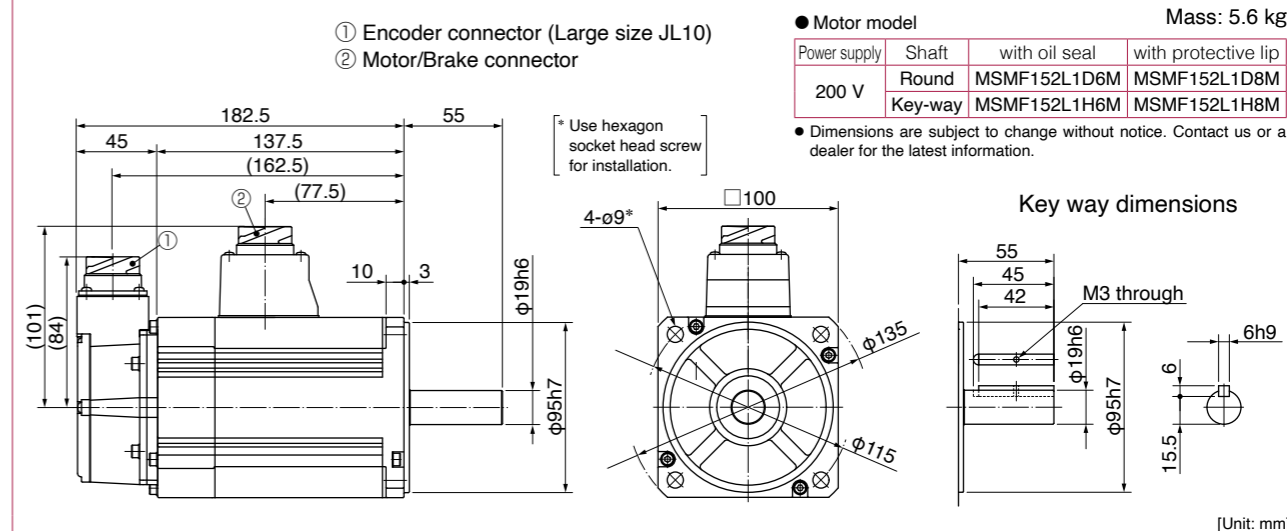
Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



* For motors specifications, refer to P.217, P.218.

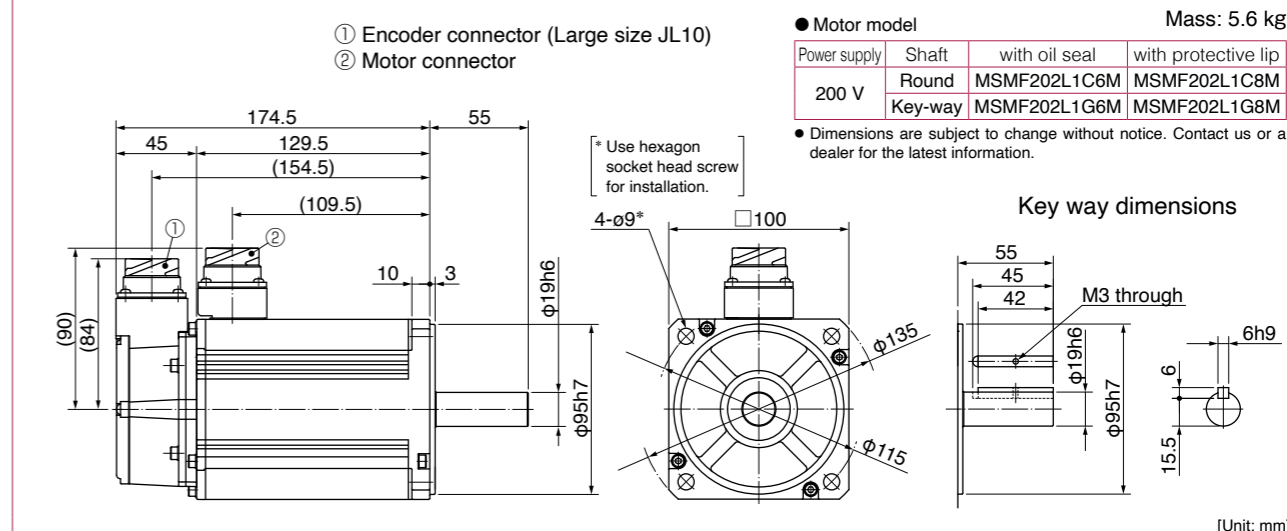
MSMF 1.5 kW

Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

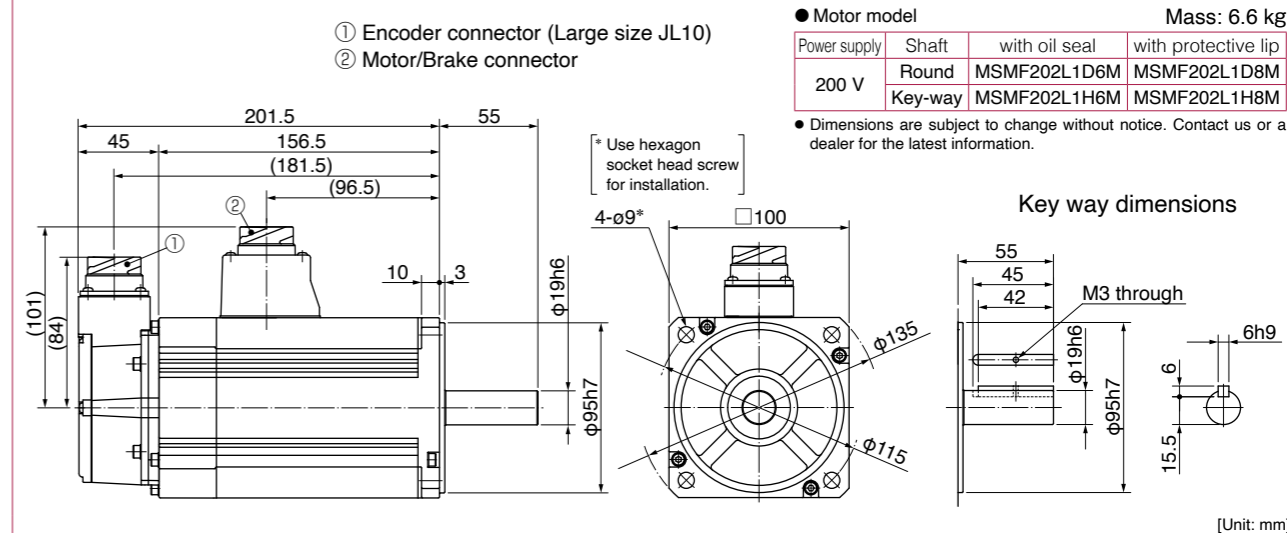


MSMF 2.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



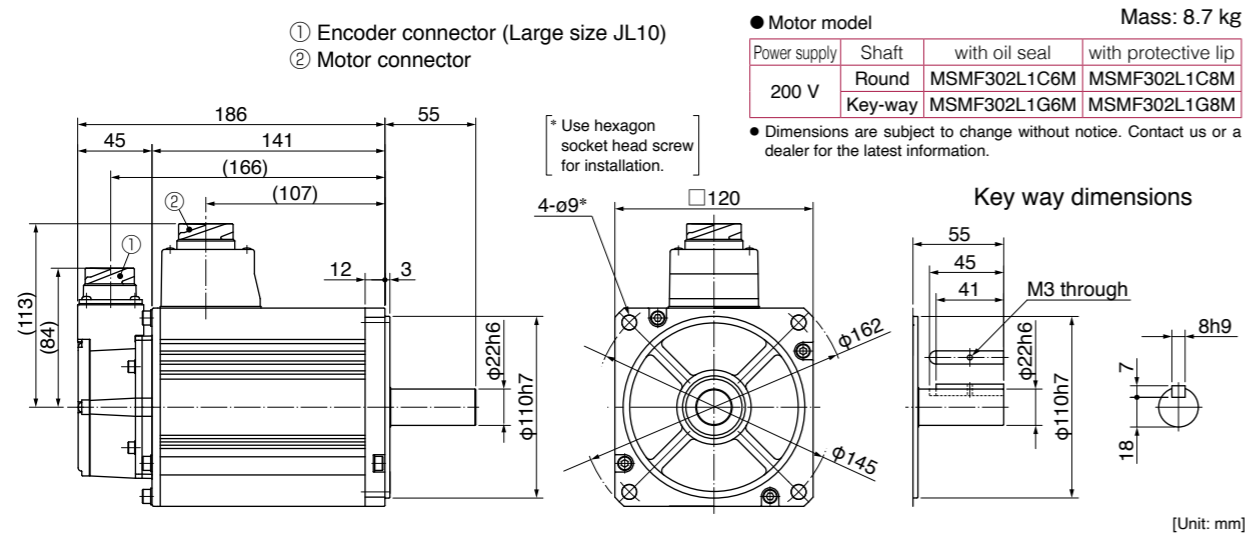
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



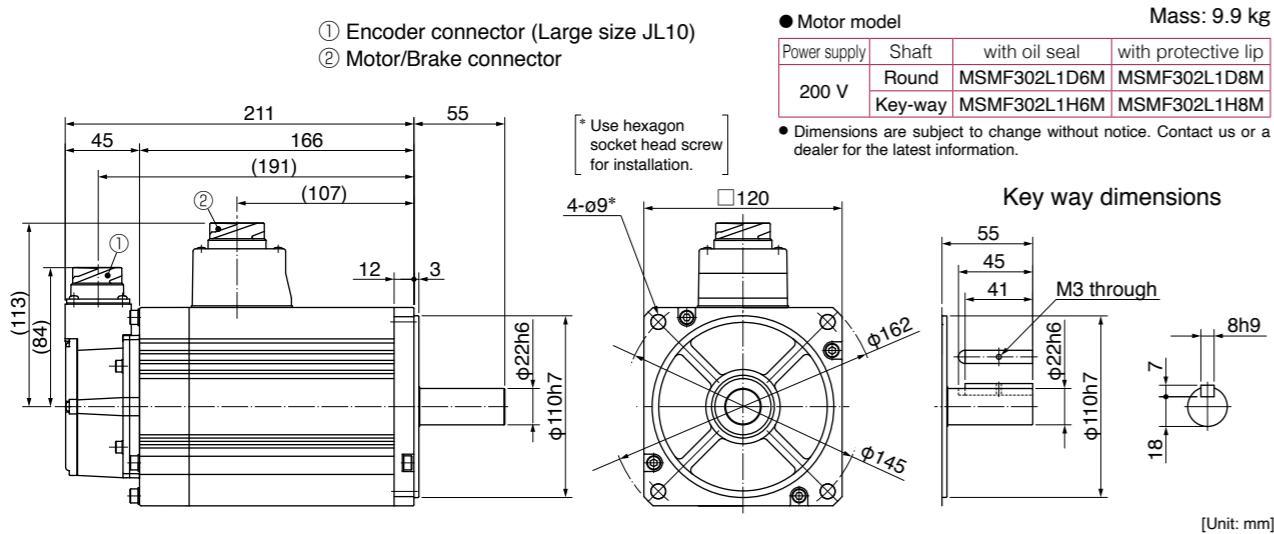
* For motors specifications, refer to P.218, P.219.

MSMF 3.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

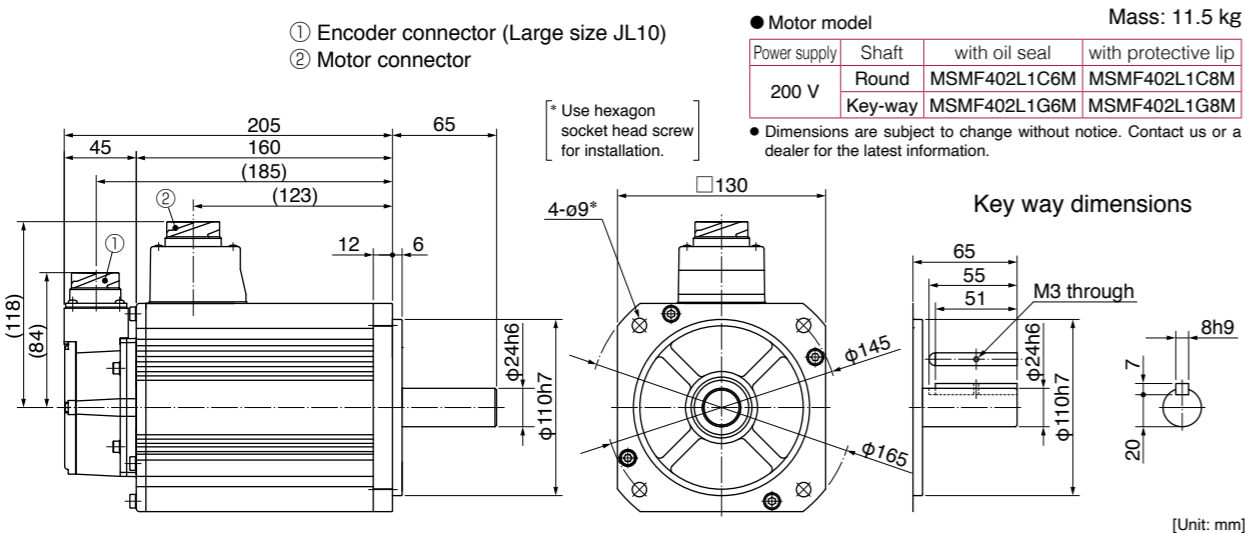


Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MSMF 4.0 kW

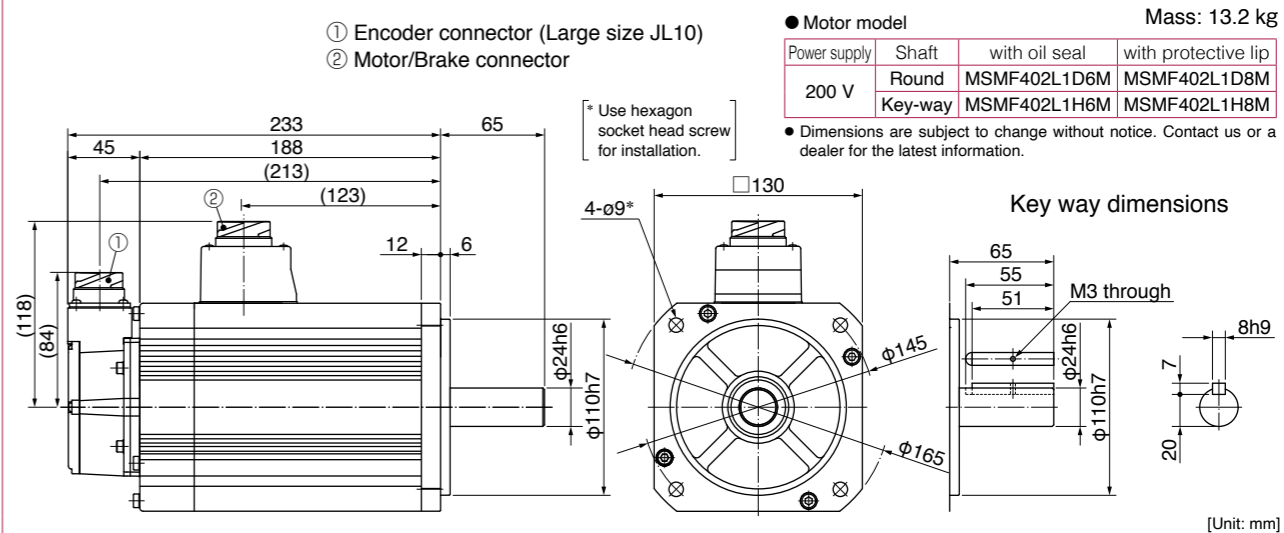
Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



* For motors specifications, refer to P.220, P.221.

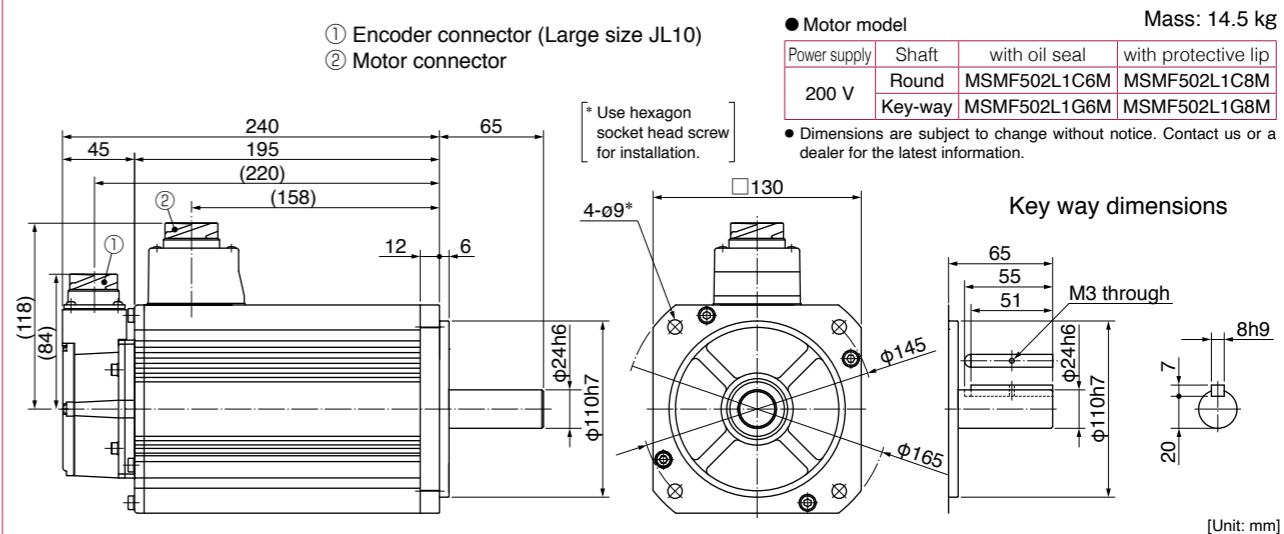
MSMF 4.0 kW

Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

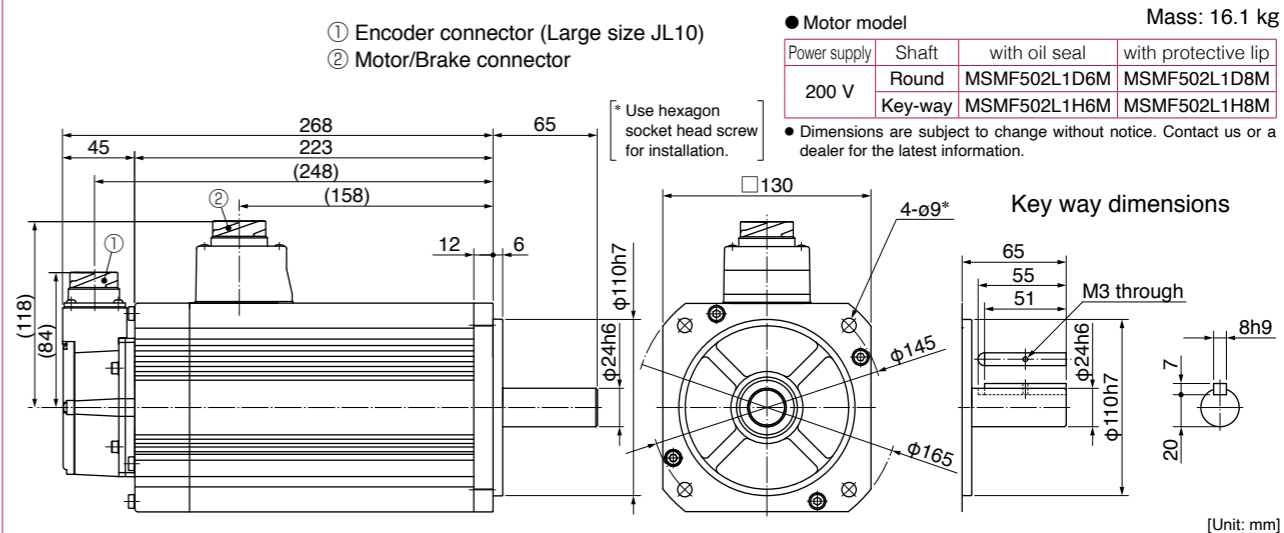


MSMF 5.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



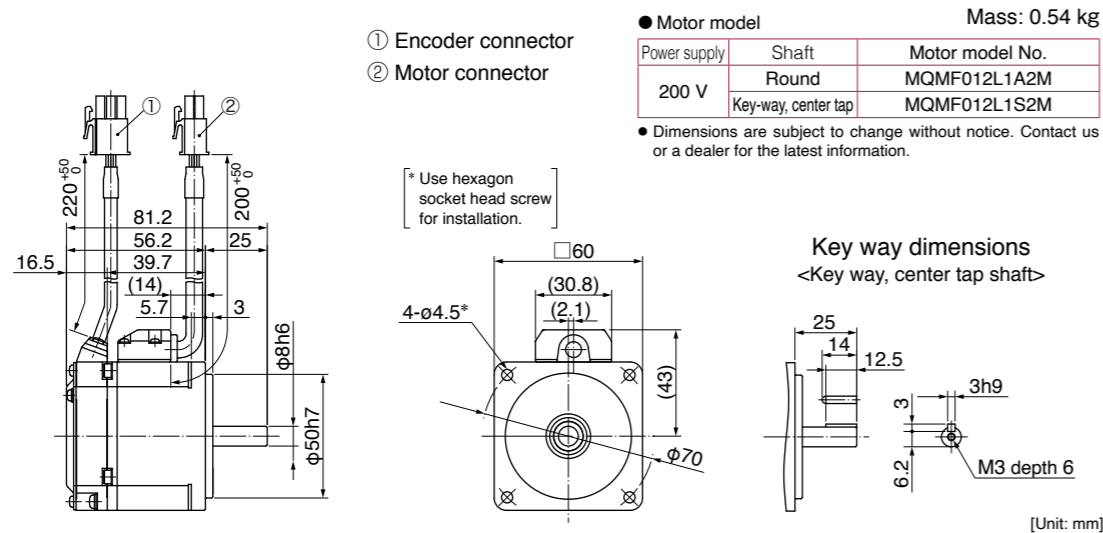
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



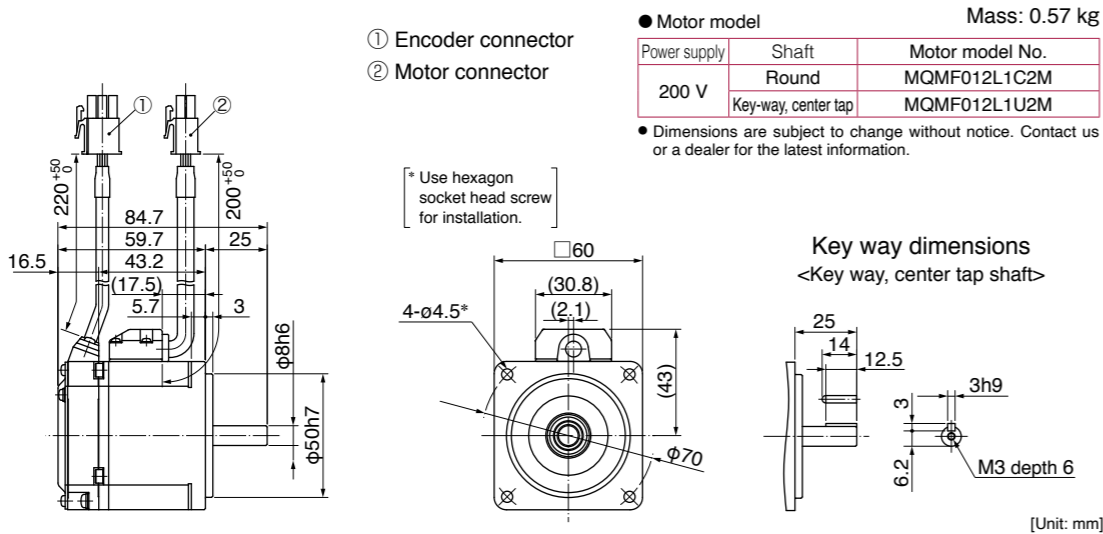
* For motors specifications, refer to P.221, P.222.

MQMF 100 W

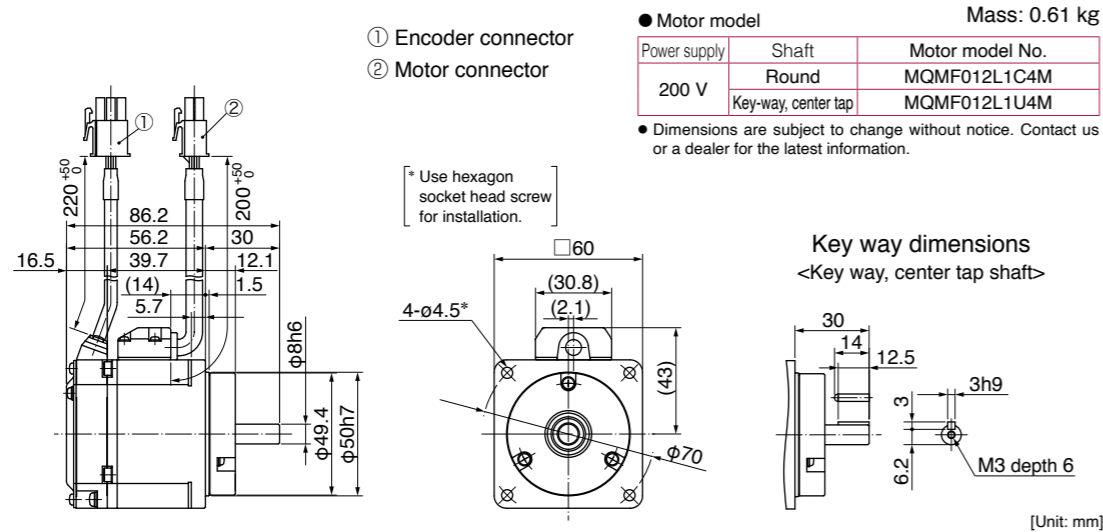
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



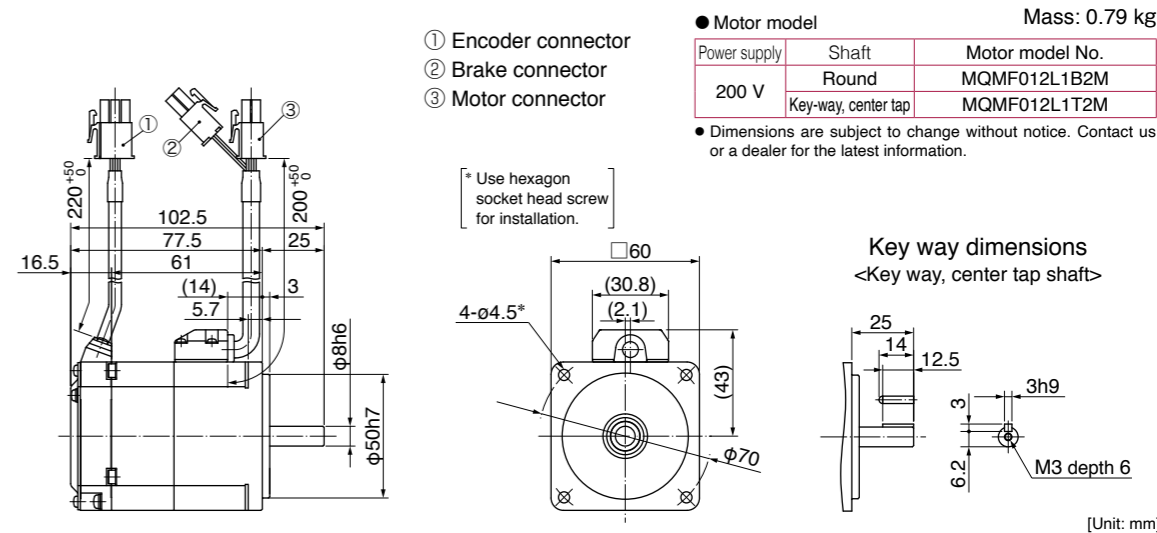
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



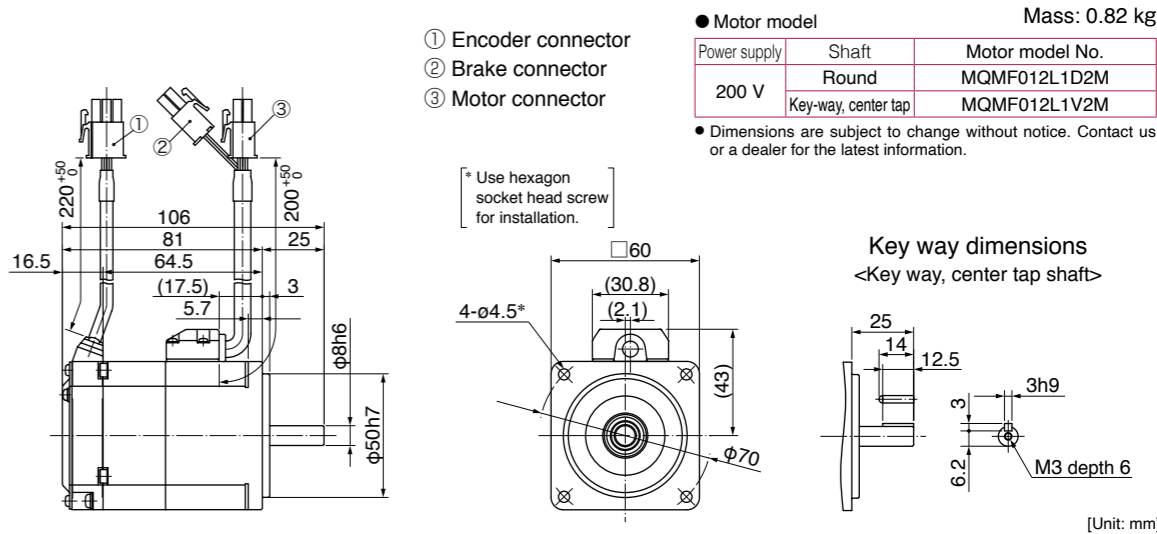
* For motors specifications, refer to P.223.

MQMF 100 W

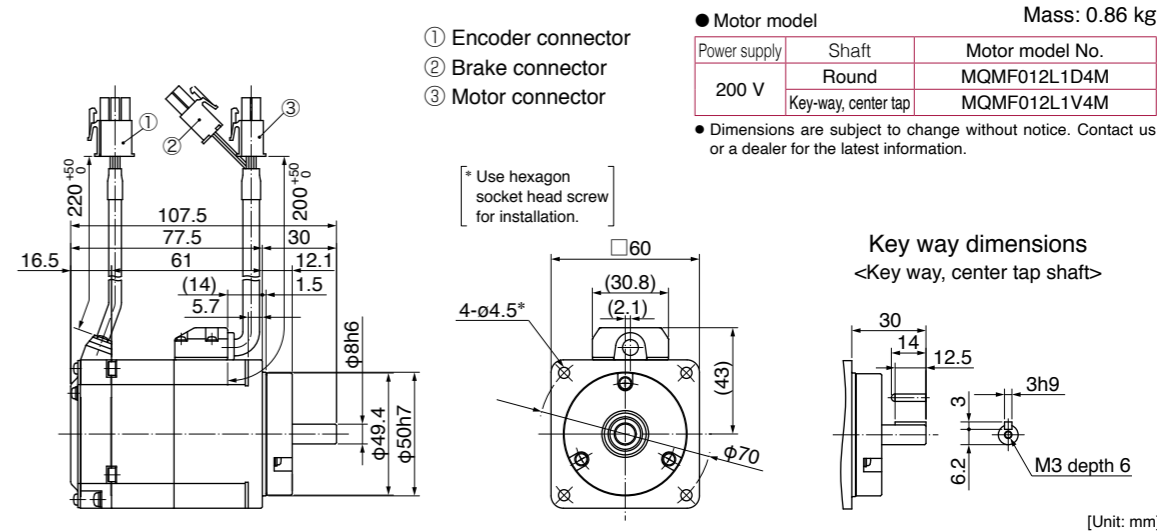
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



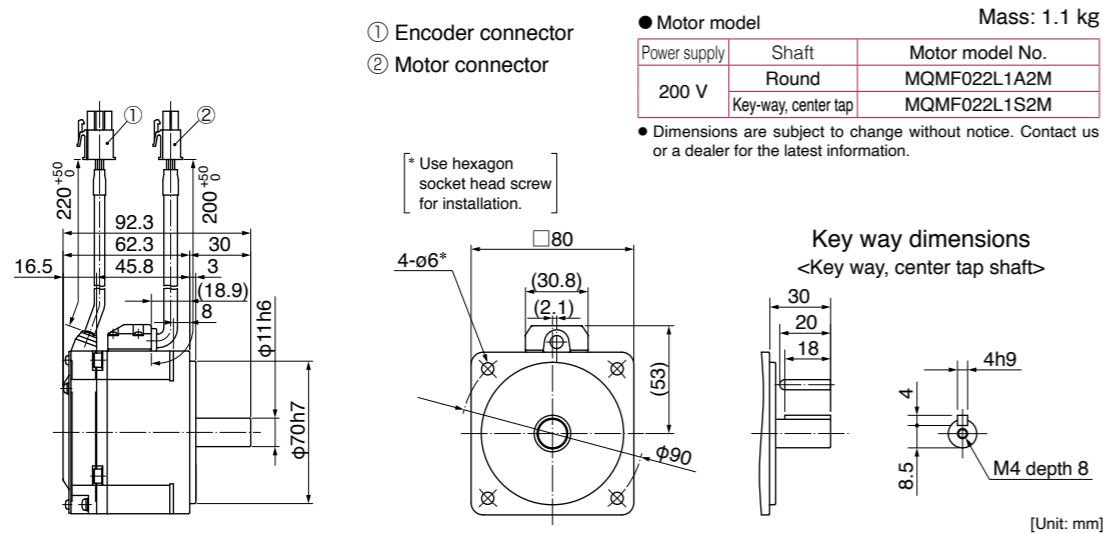
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



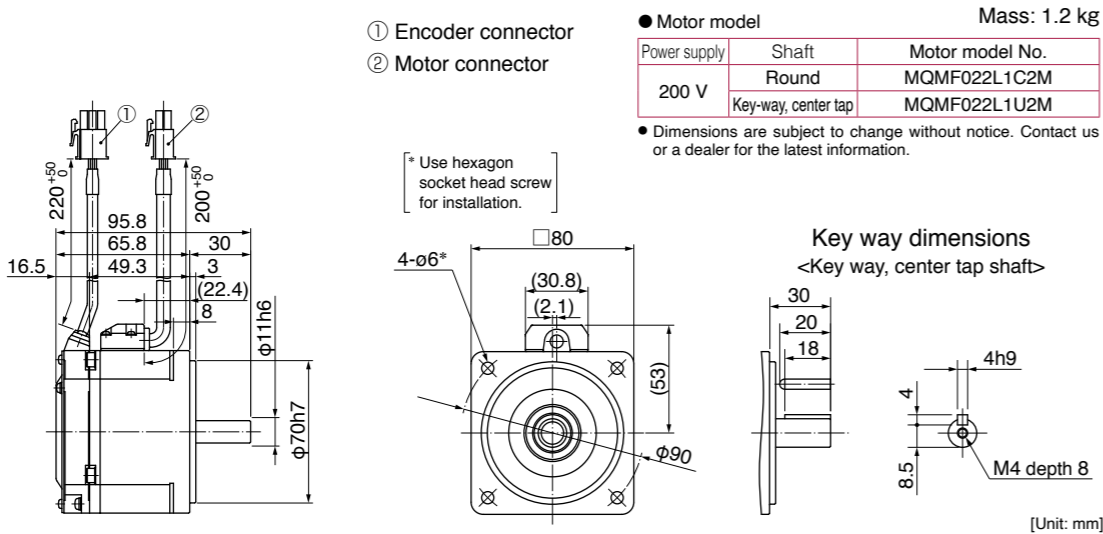
* For motors specifications, refer to P.223.

MQMF 200 W

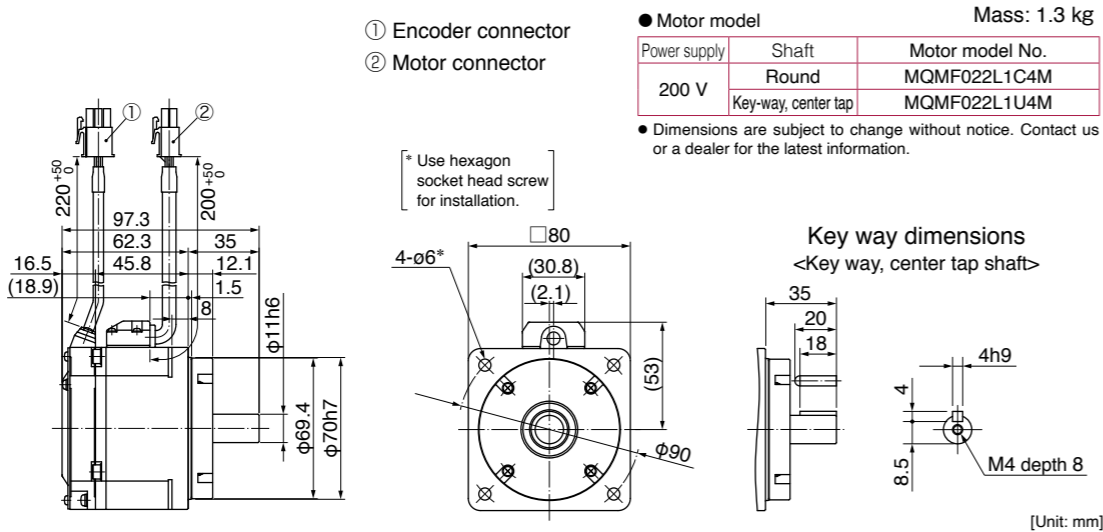
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



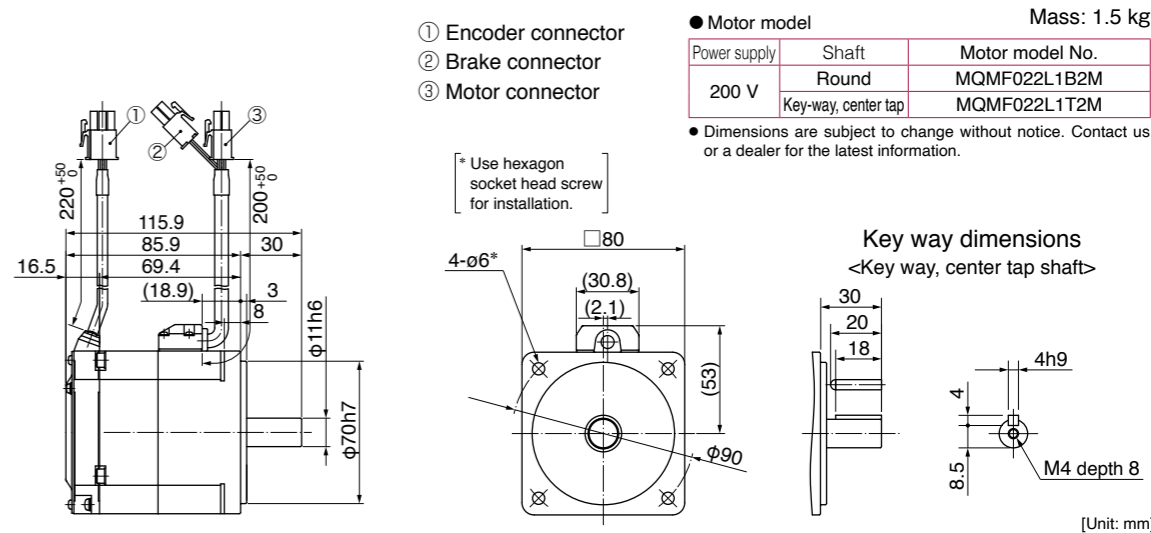
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



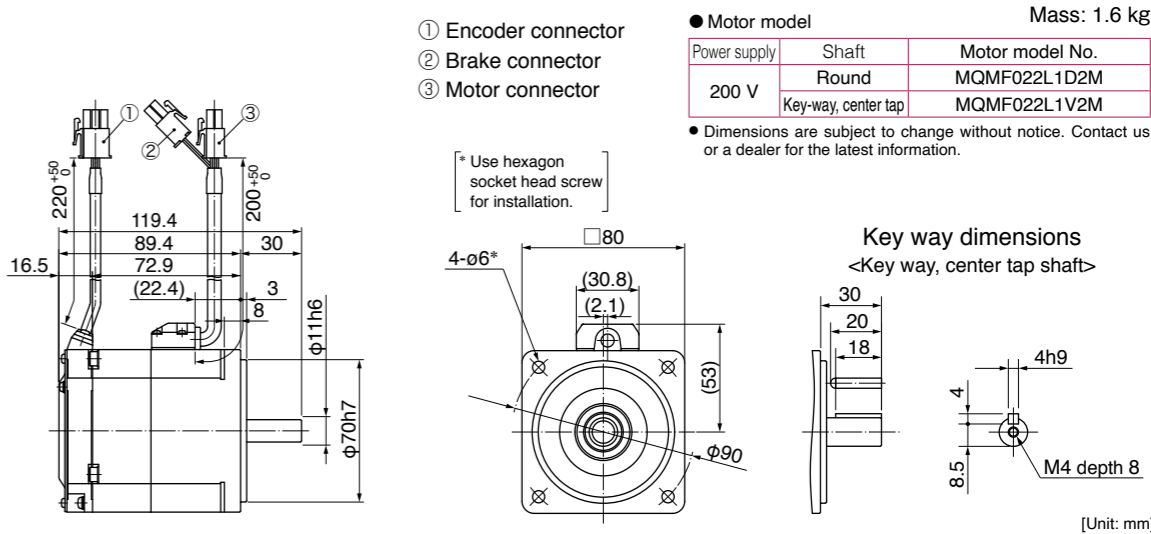
* For motors specifications, refer to P.224.

MQMF 200 W

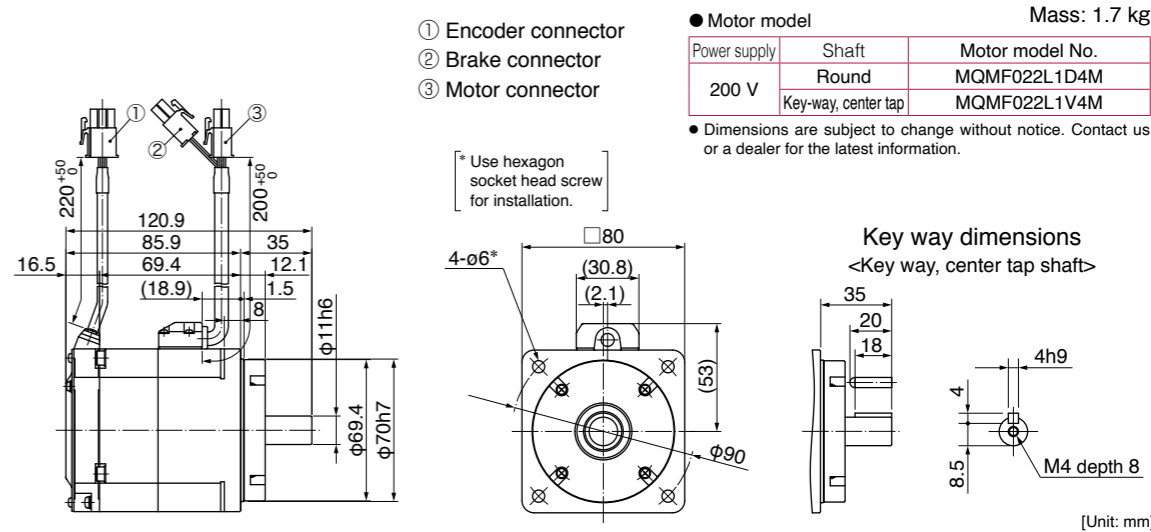
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



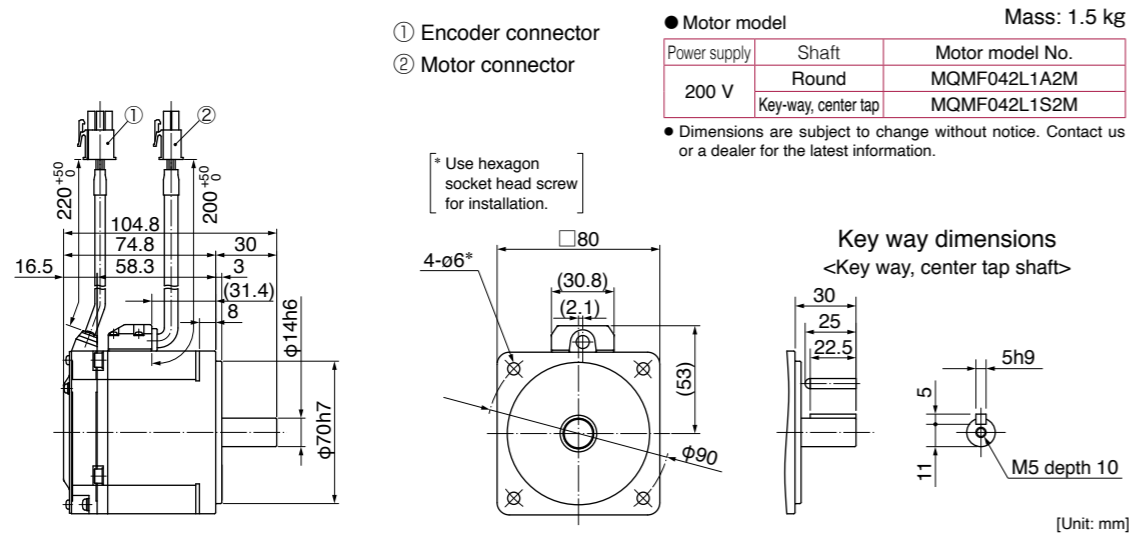
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



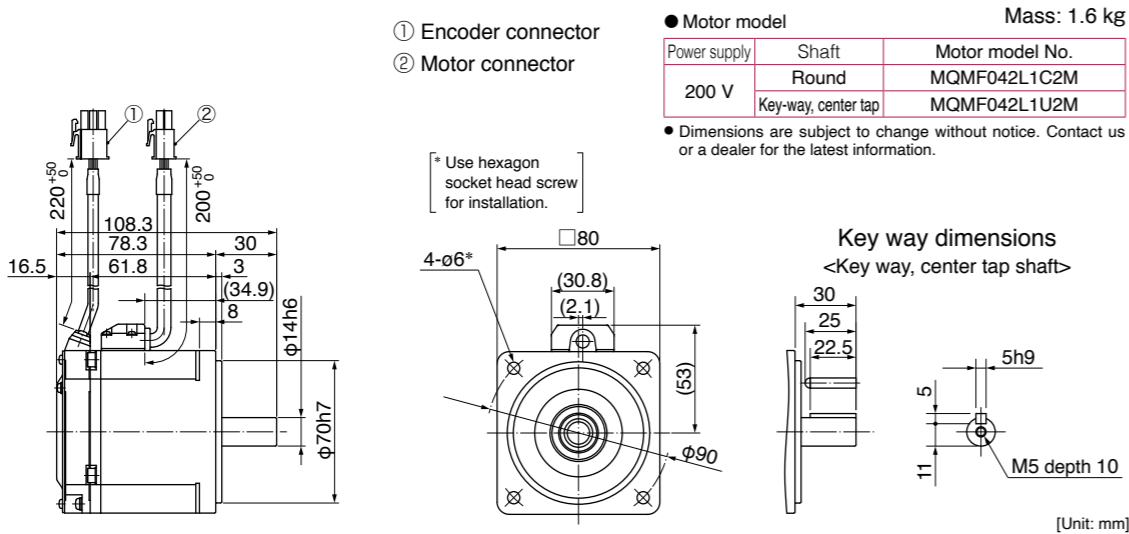
* For motors specifications, refer to P.224.

MQMF 400 W

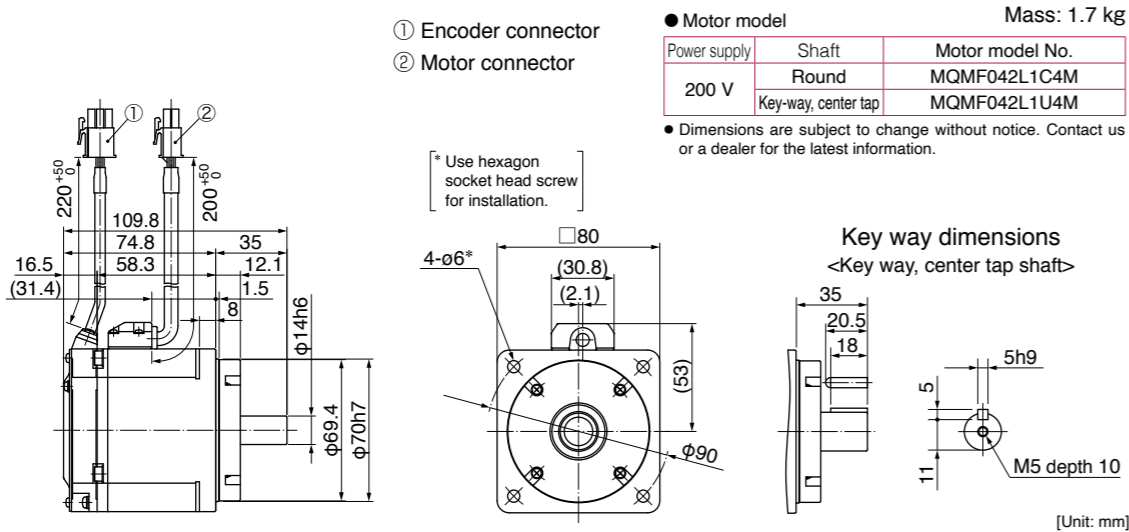
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



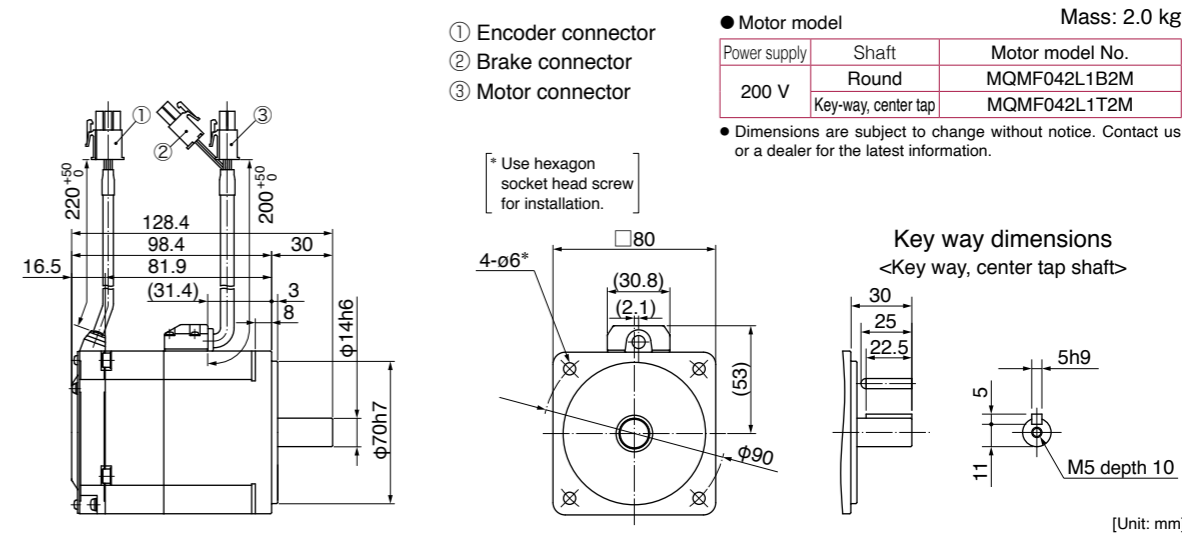
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



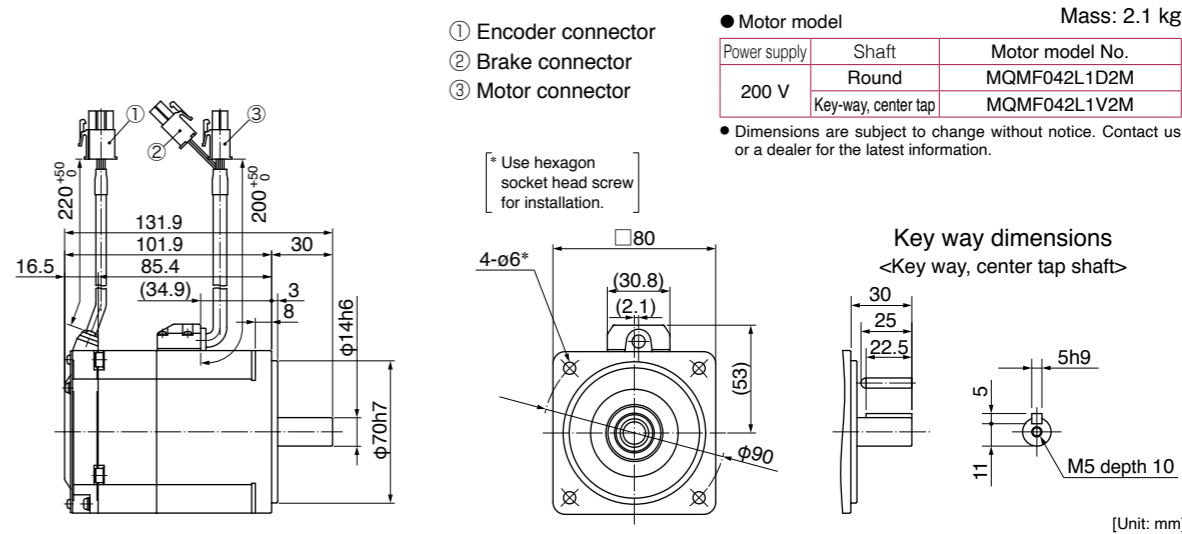
* For motors specifications, refer to P.225.

MQMF 400 W

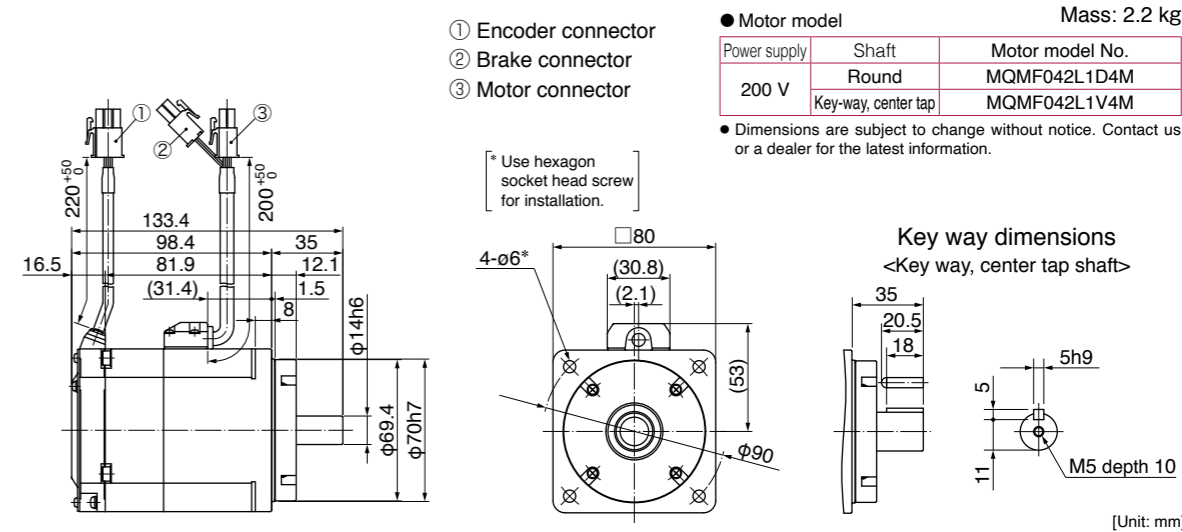
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



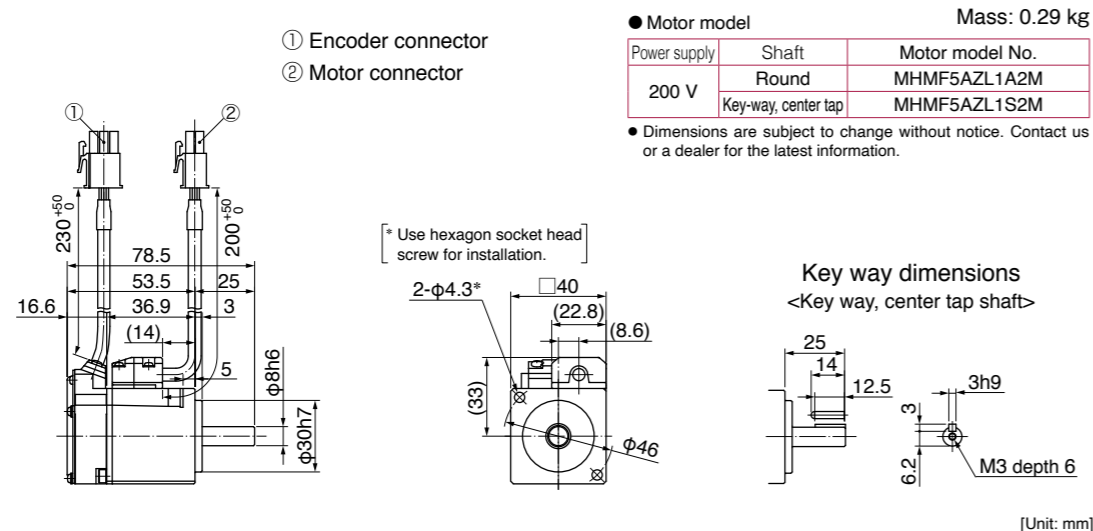
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



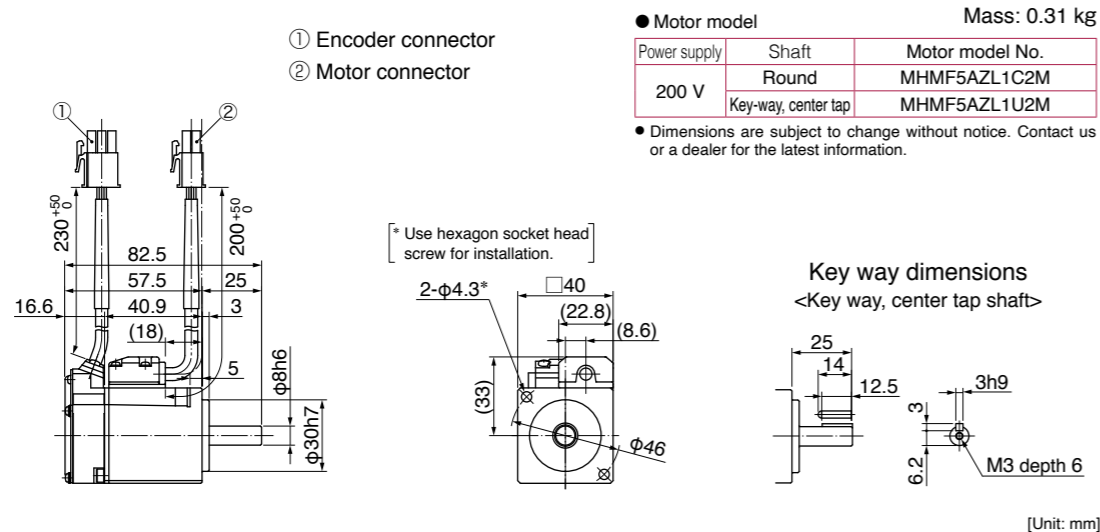
* For motors specifications, refer to P.225.

MHMF 50 W

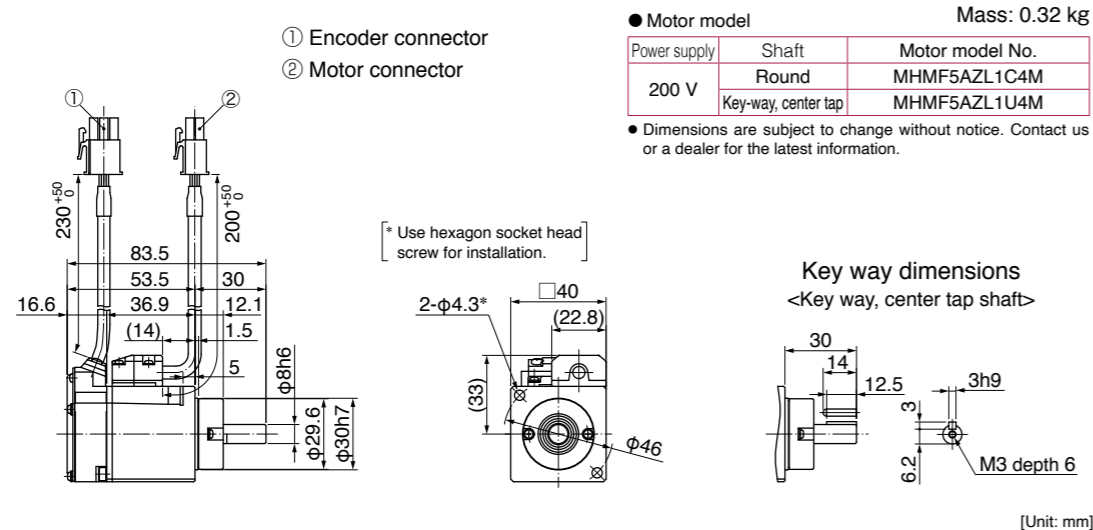
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



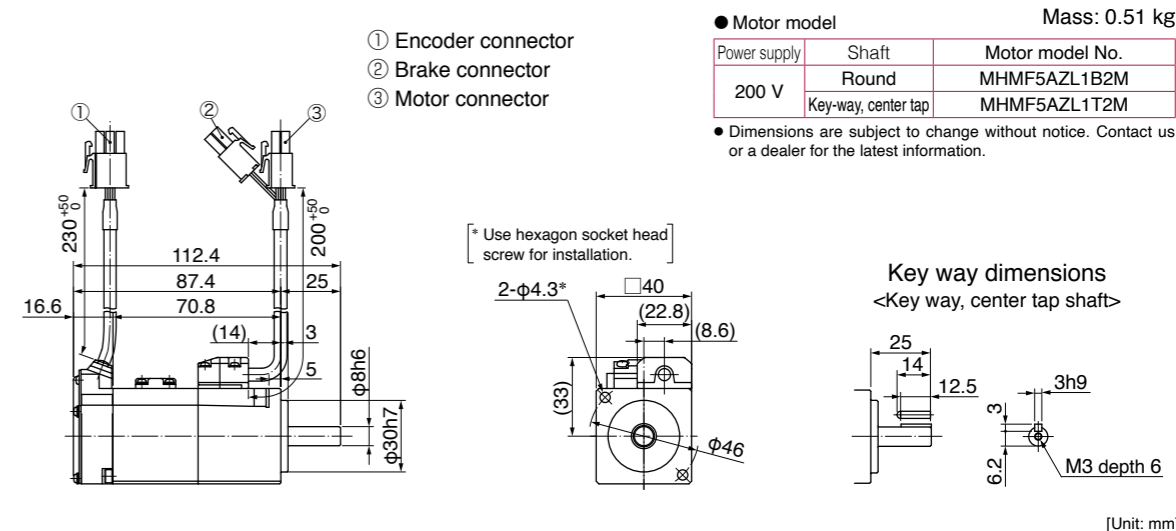
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



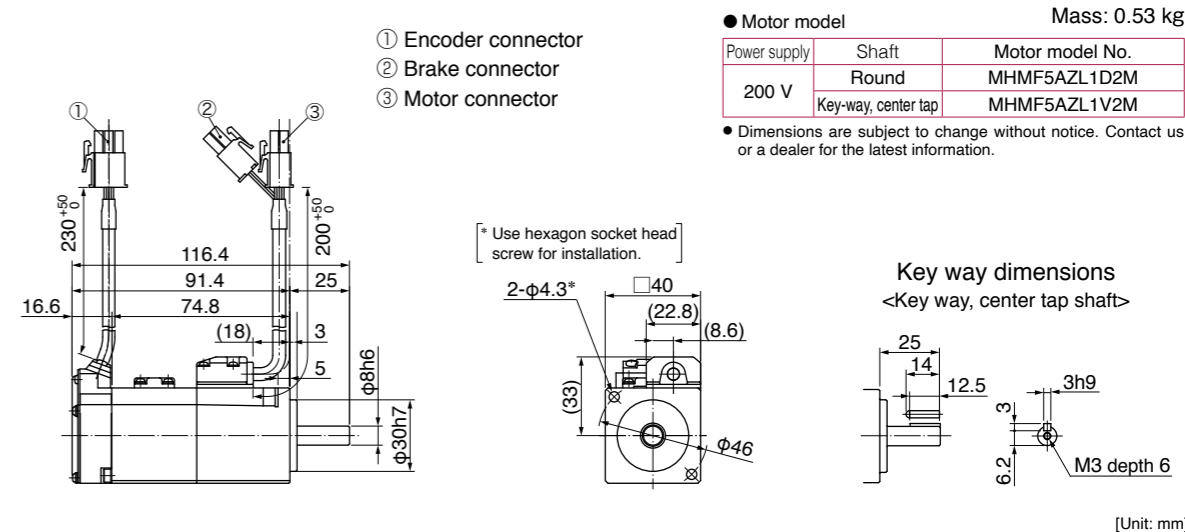
* For motors specifications, refer to P.226.

MHMF 50 W

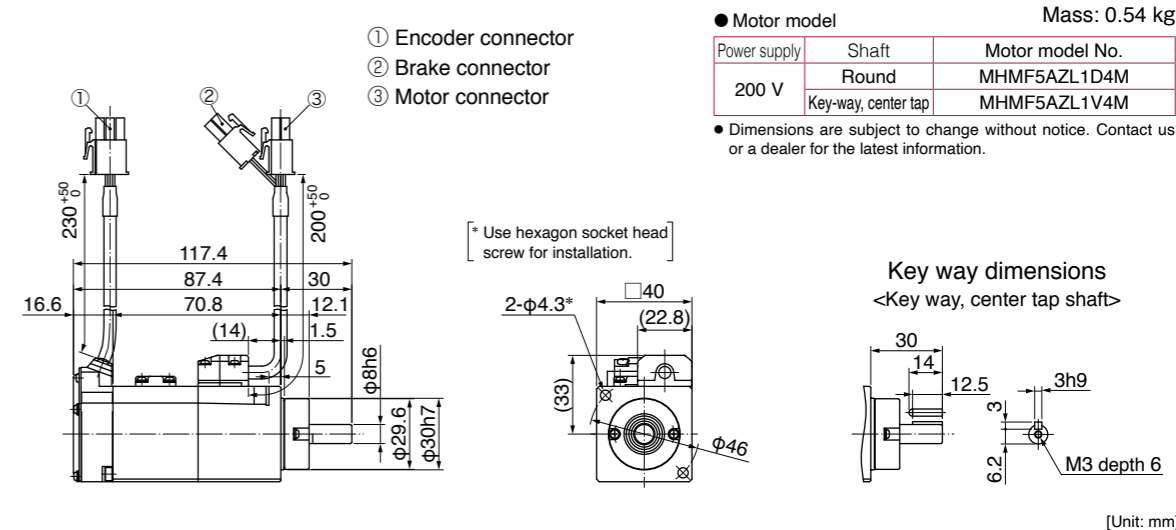
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



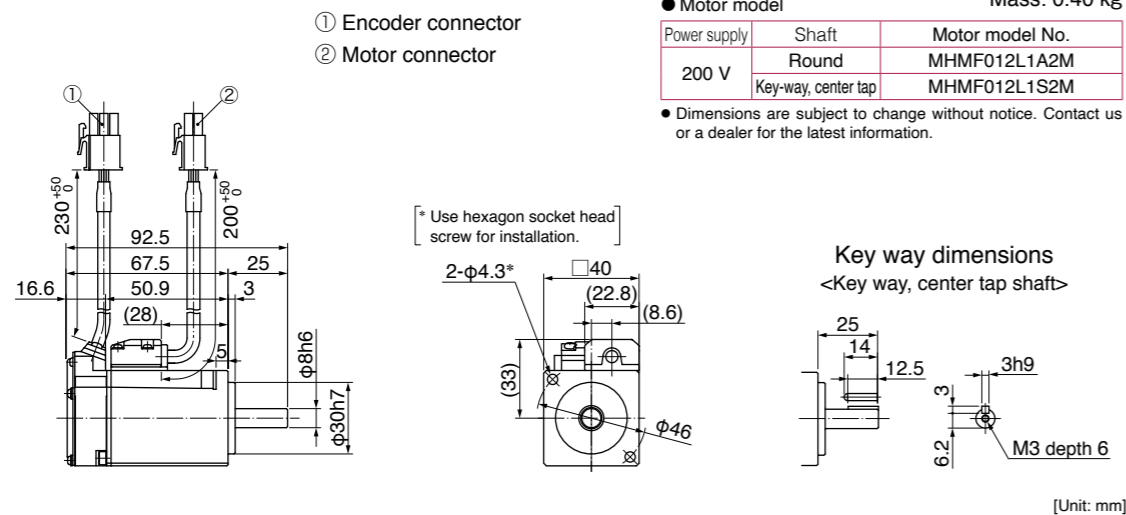
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



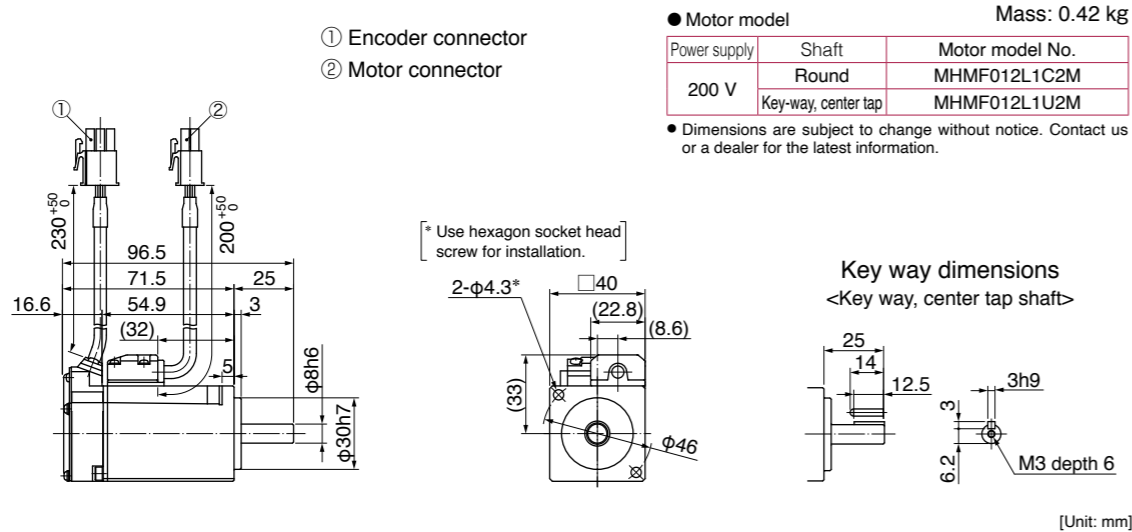
* For motors specifications, refer to P.226.

MHMF 100 W

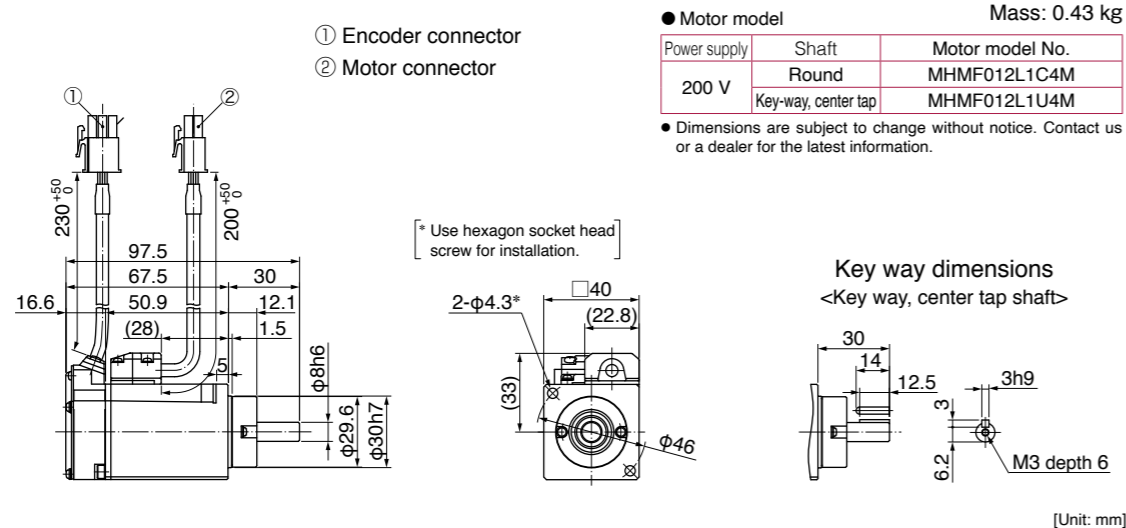
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



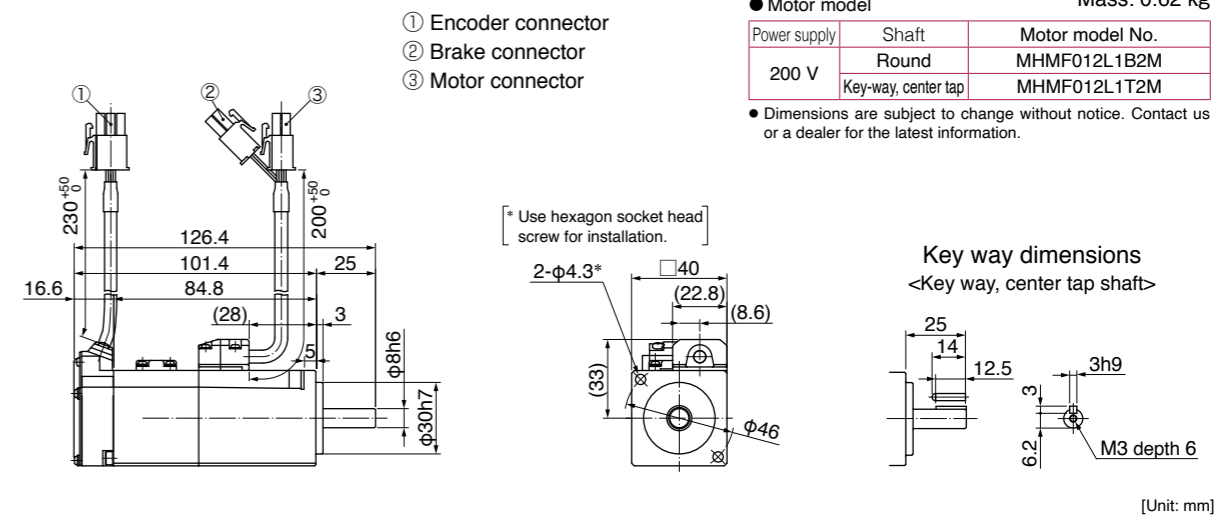
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



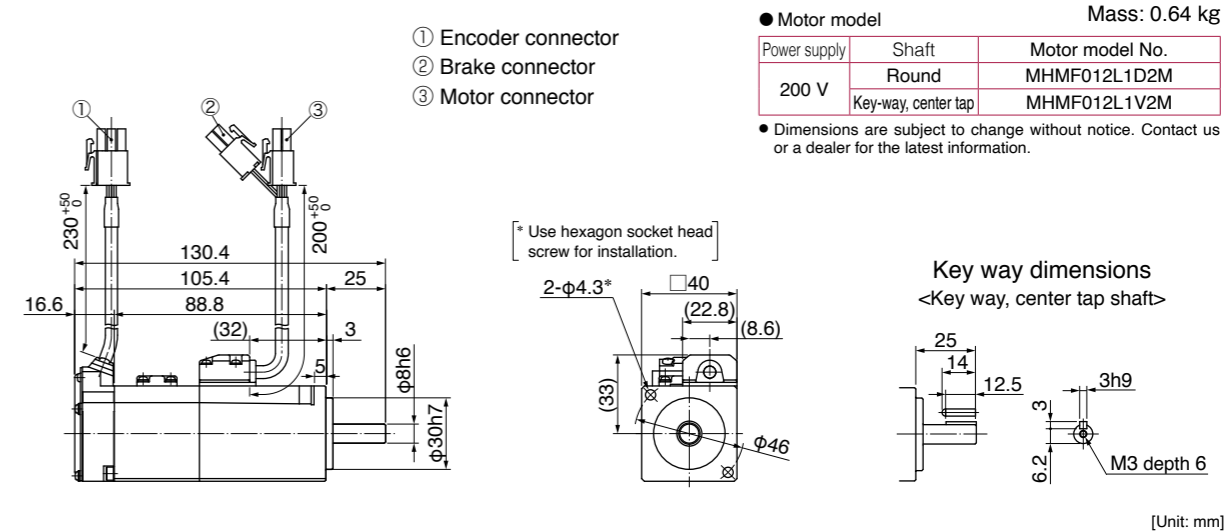
* For motors specifications, refer to P.227.

MHMF 100 W

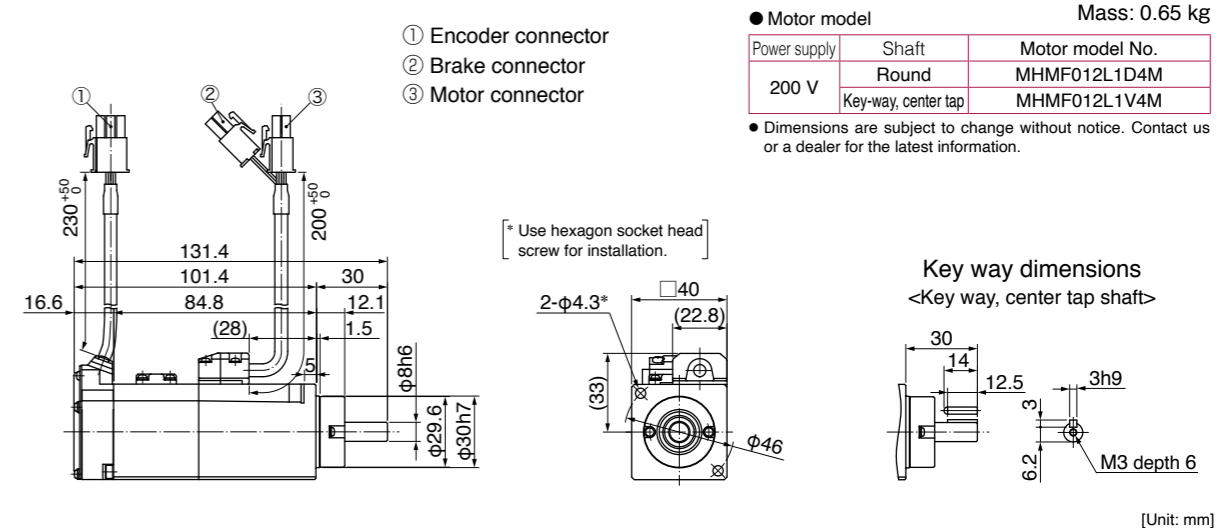
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



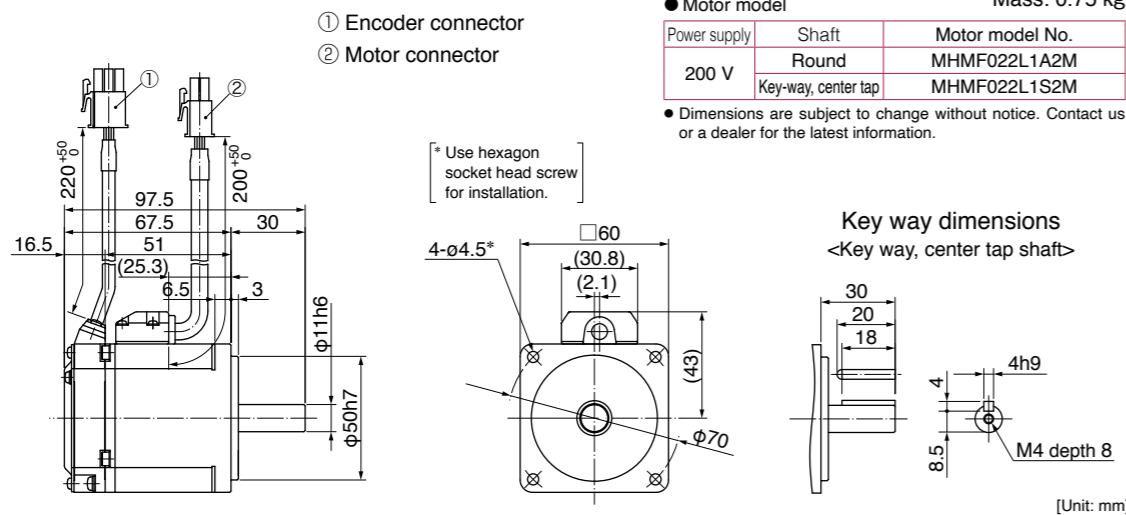
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



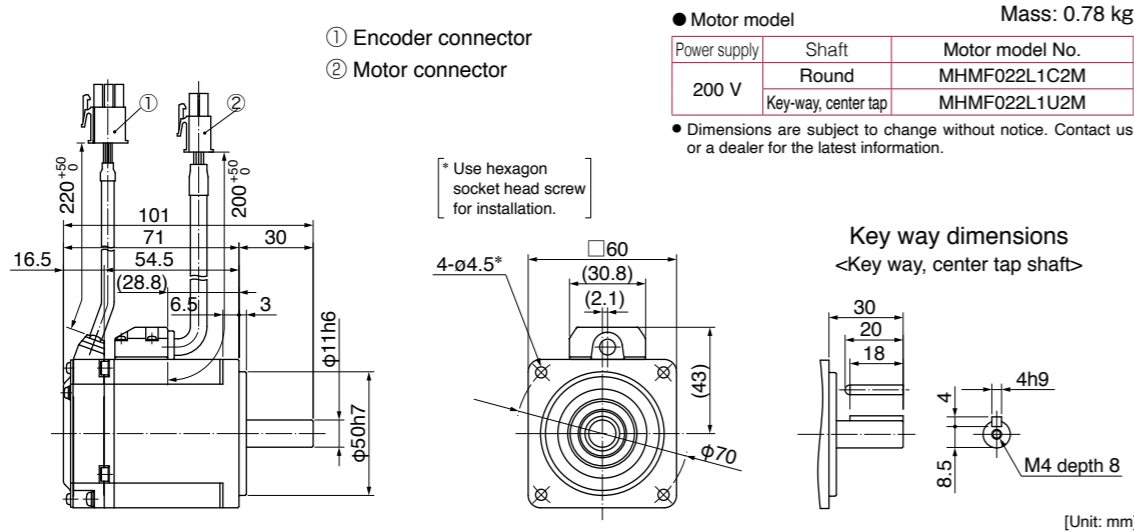
* For motors specifications, refer to P.227.

MHMF 200 W

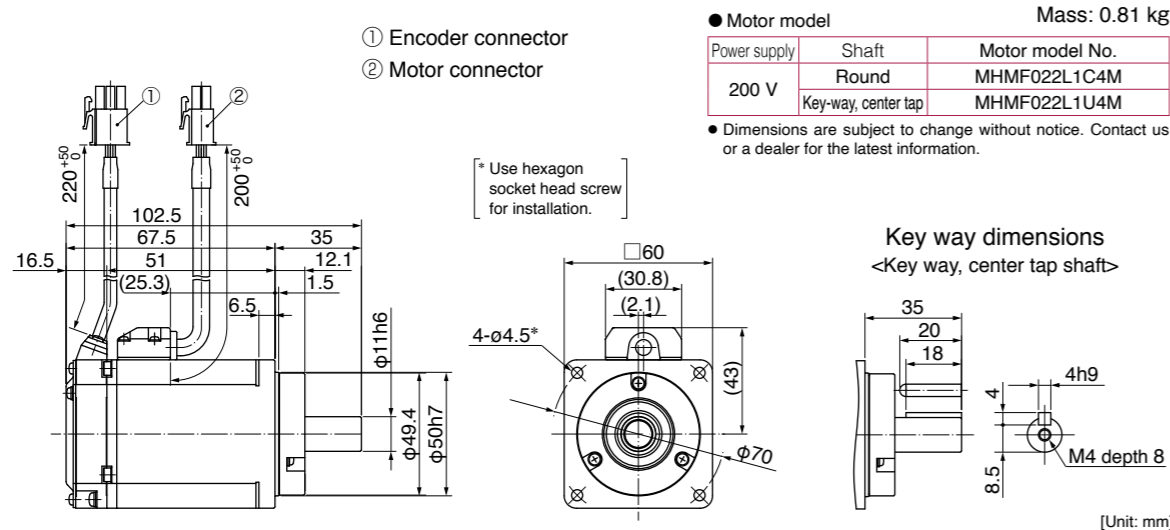
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



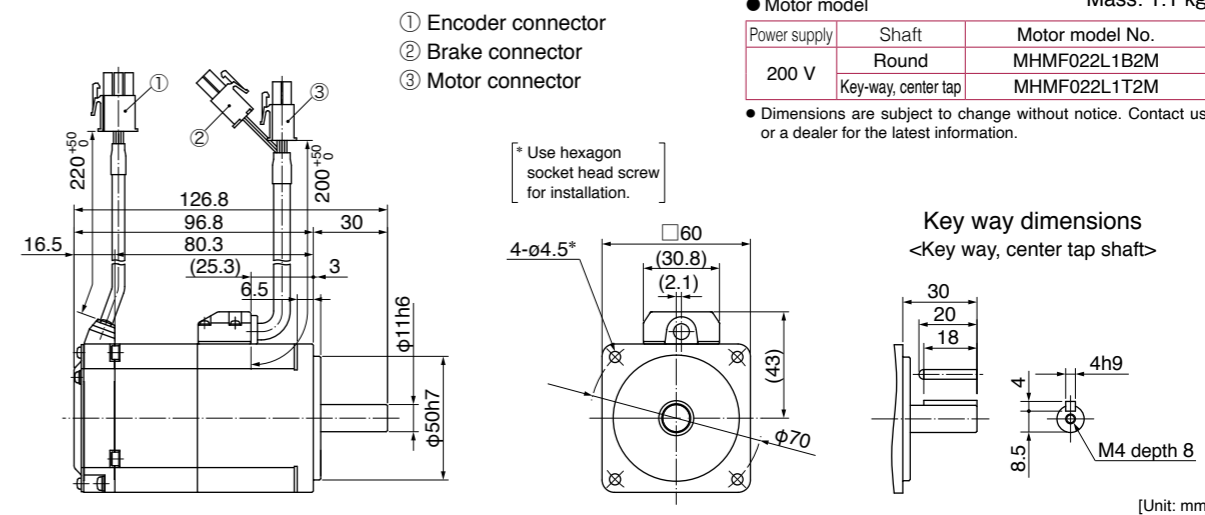
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



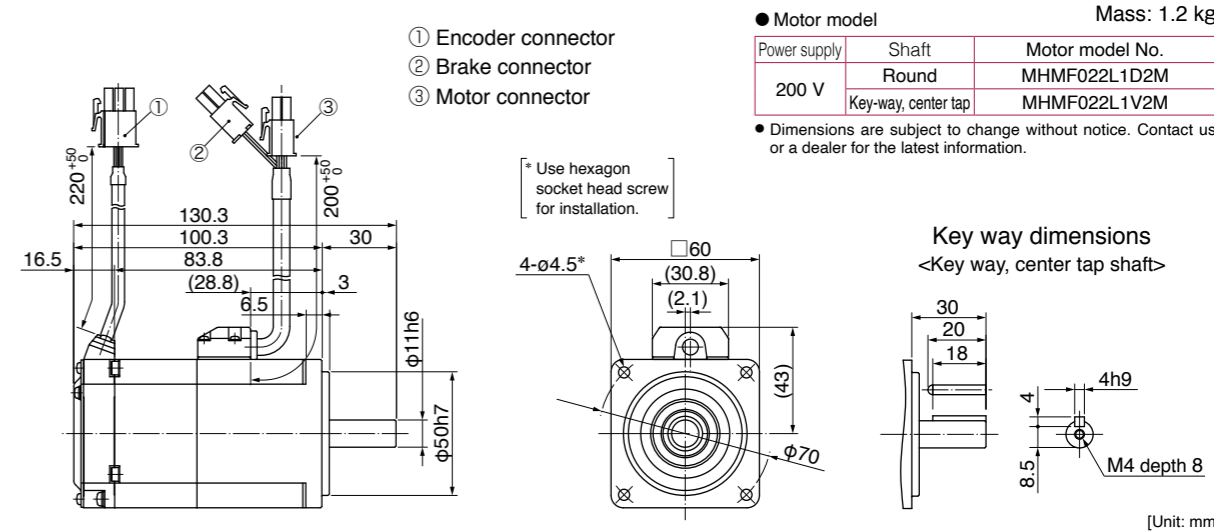
* For motors specifications, refer to P.228.

MHMF 200 W

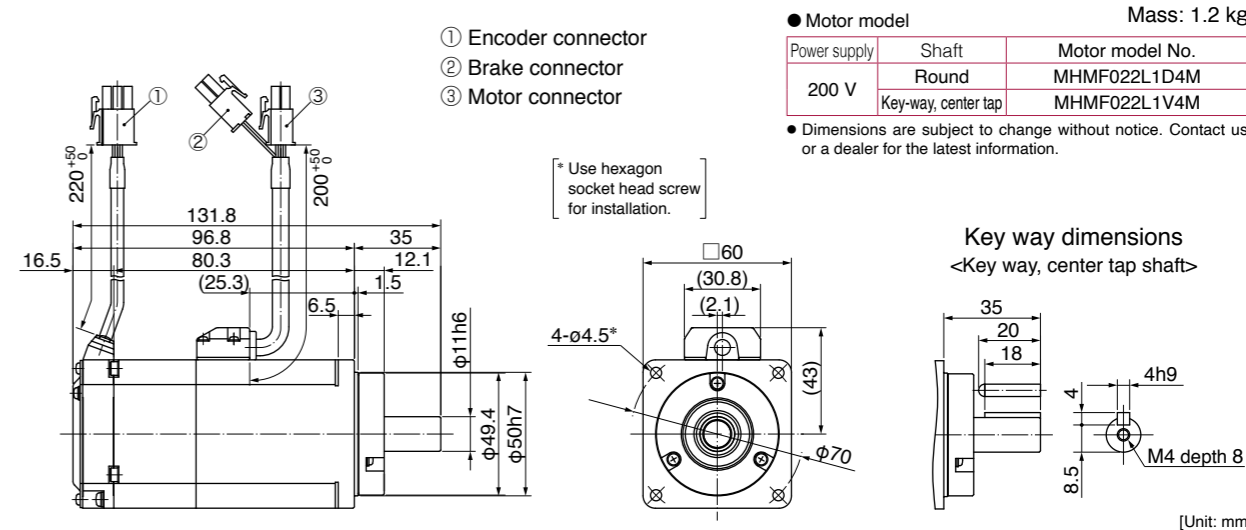
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



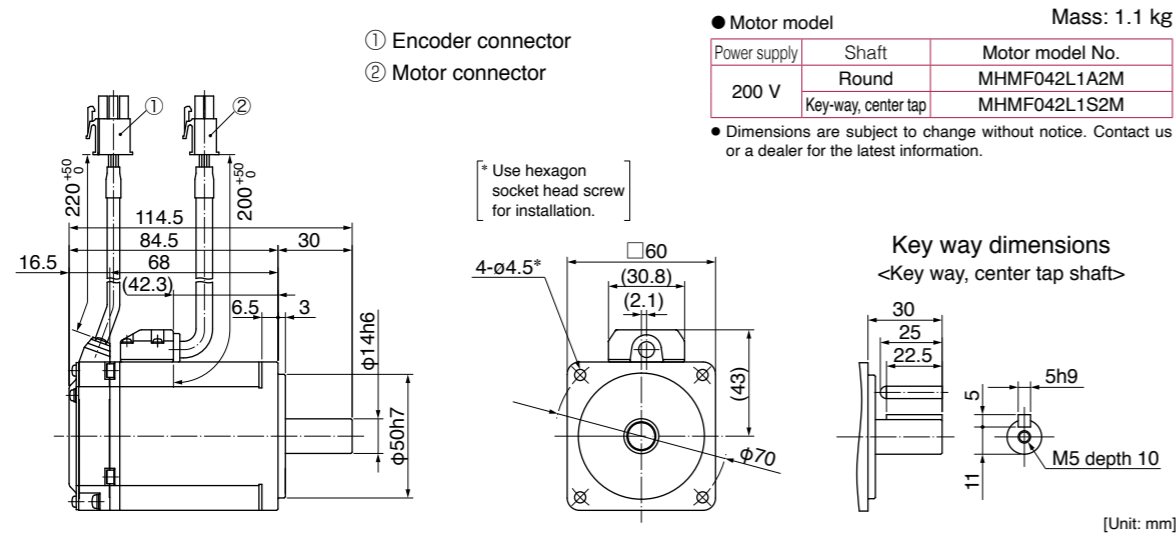
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



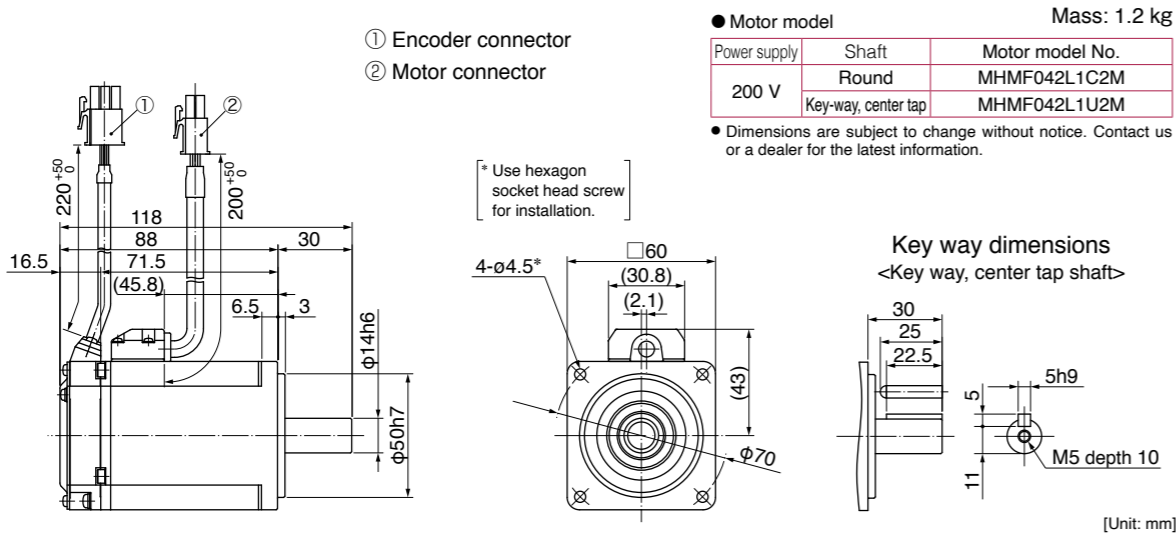
* For motors specifications, refer to P.228.

MHMF 400 W

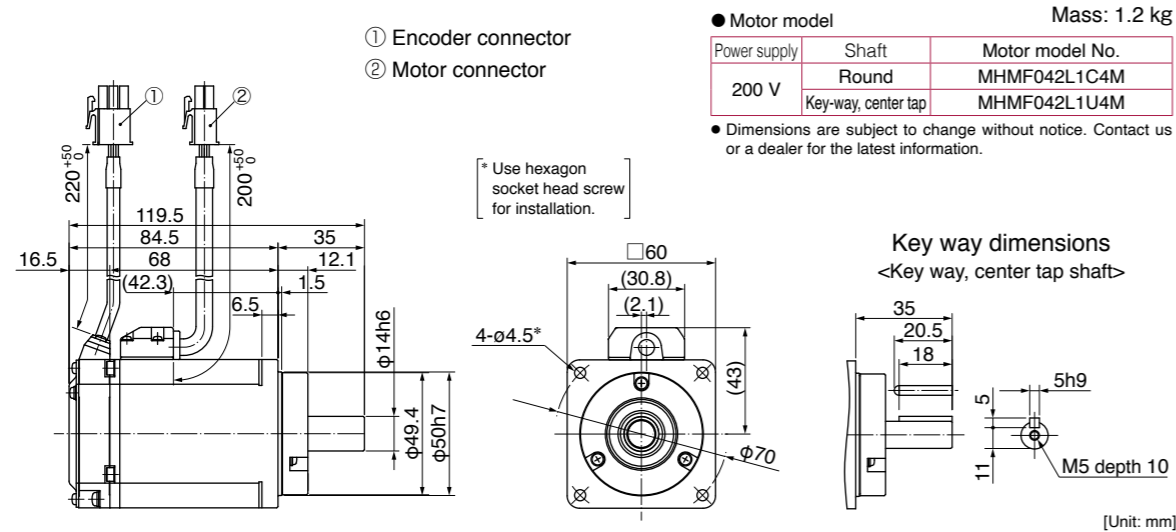
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



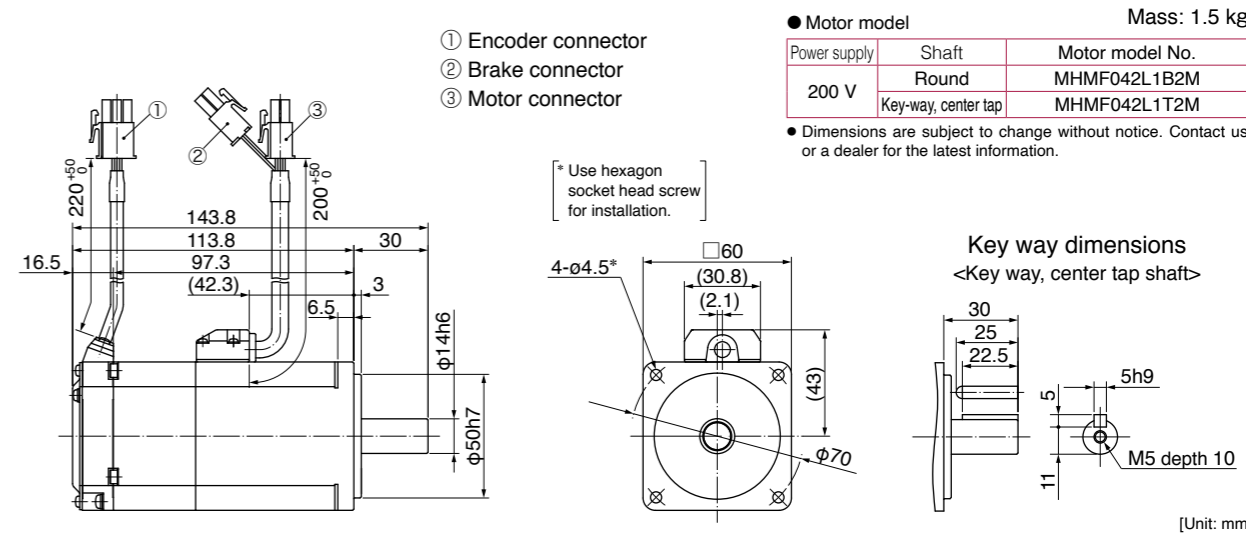
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



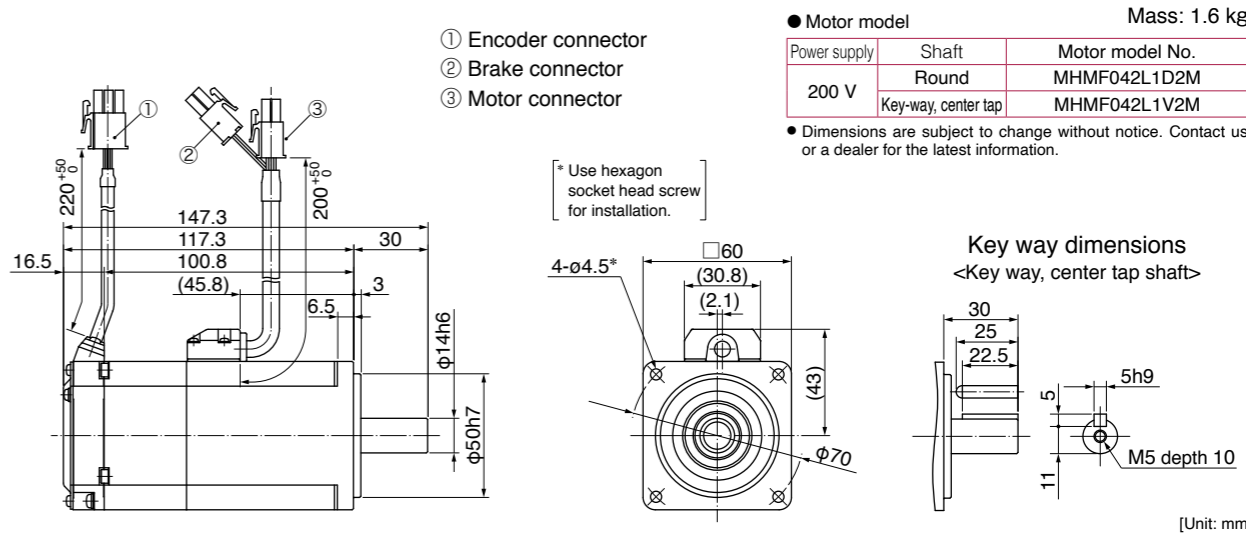
* For motors specifications, refer to P.229.

MHMF 400 W

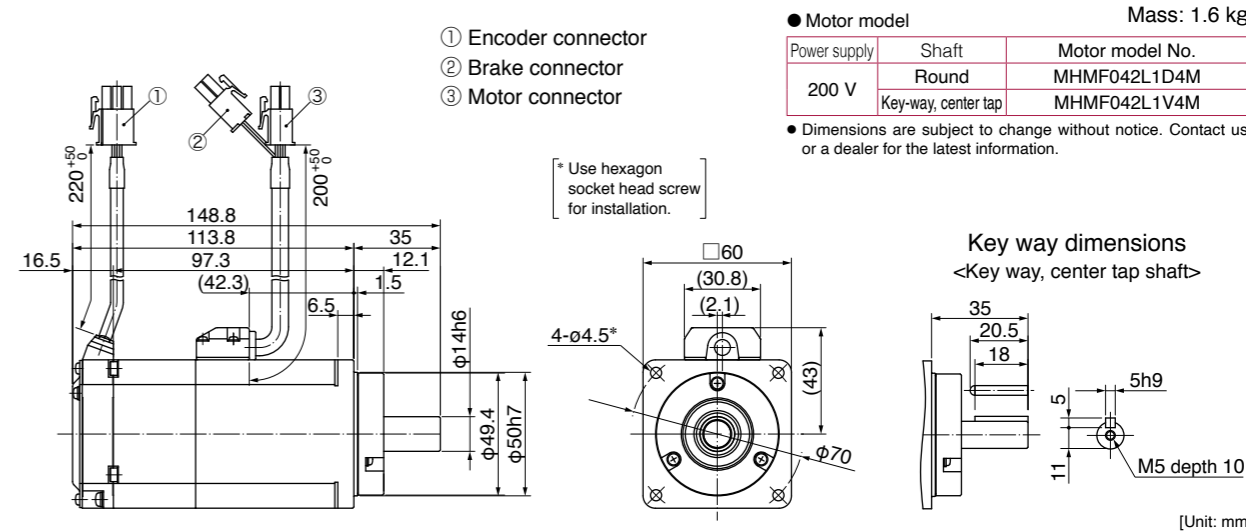
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



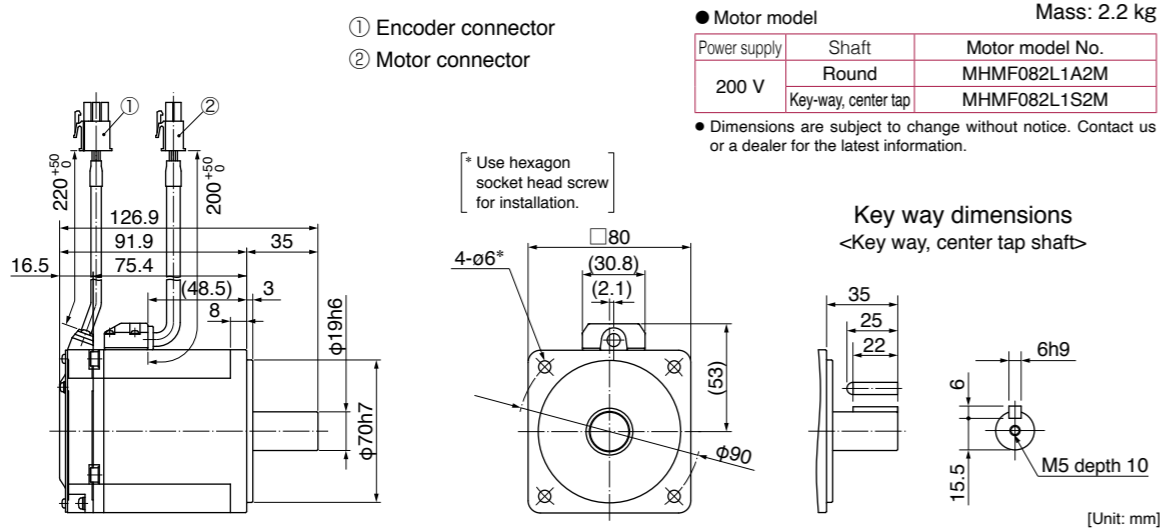
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



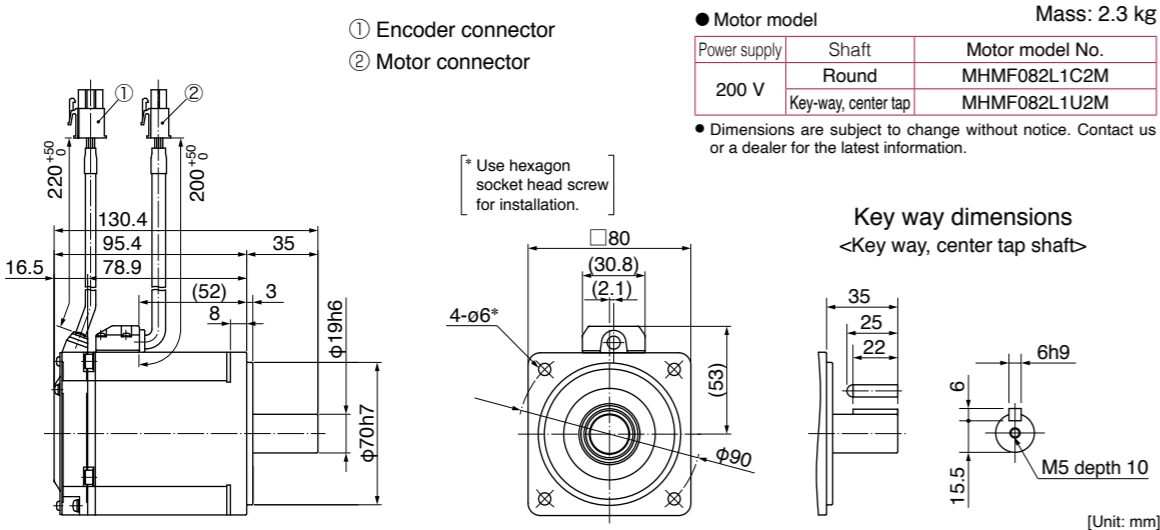
* For motors specifications, refer to P.229.

MHMF 750 W

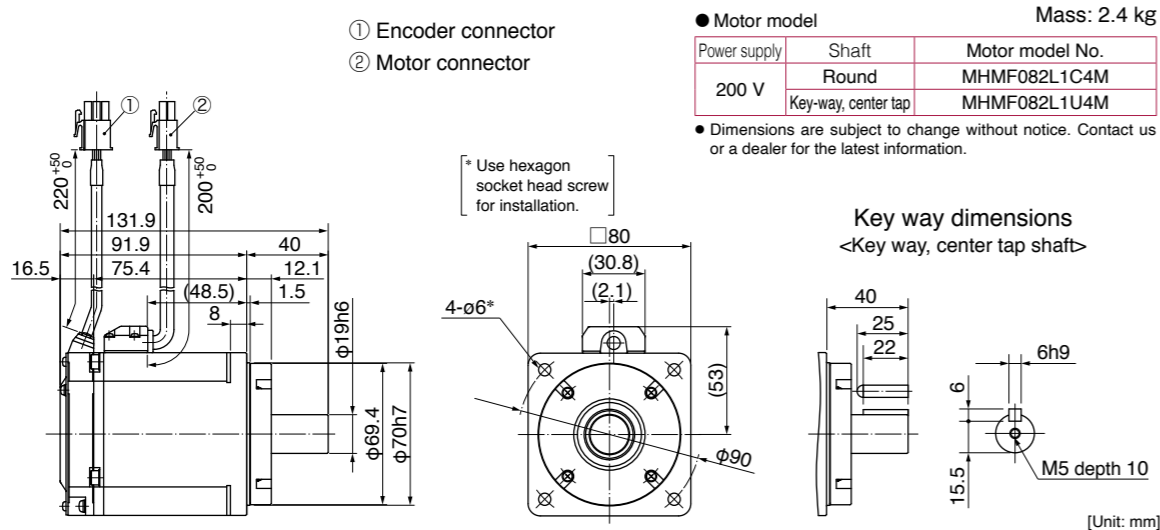
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



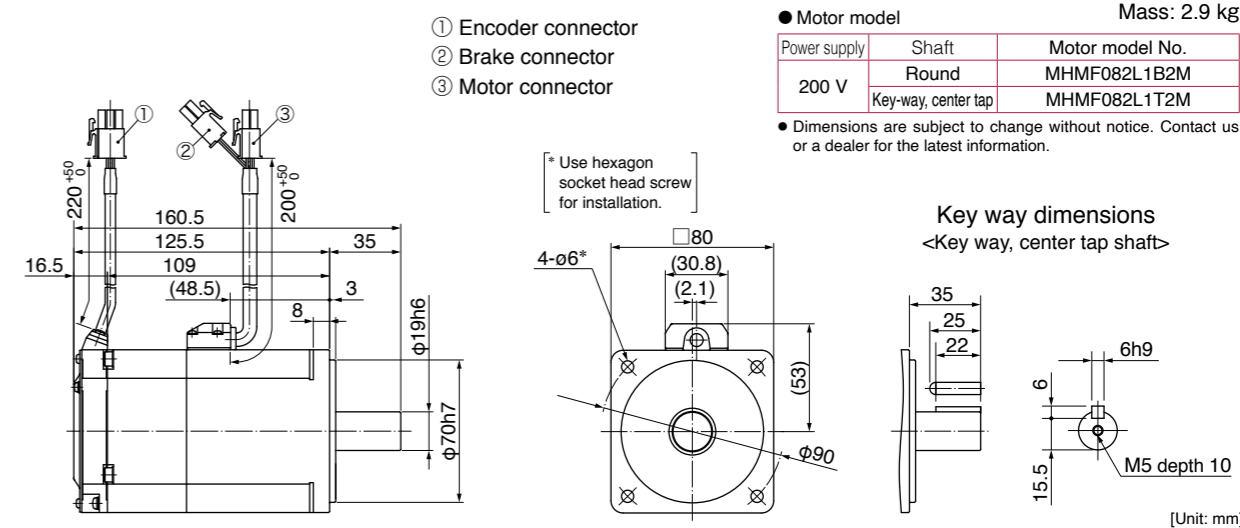
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



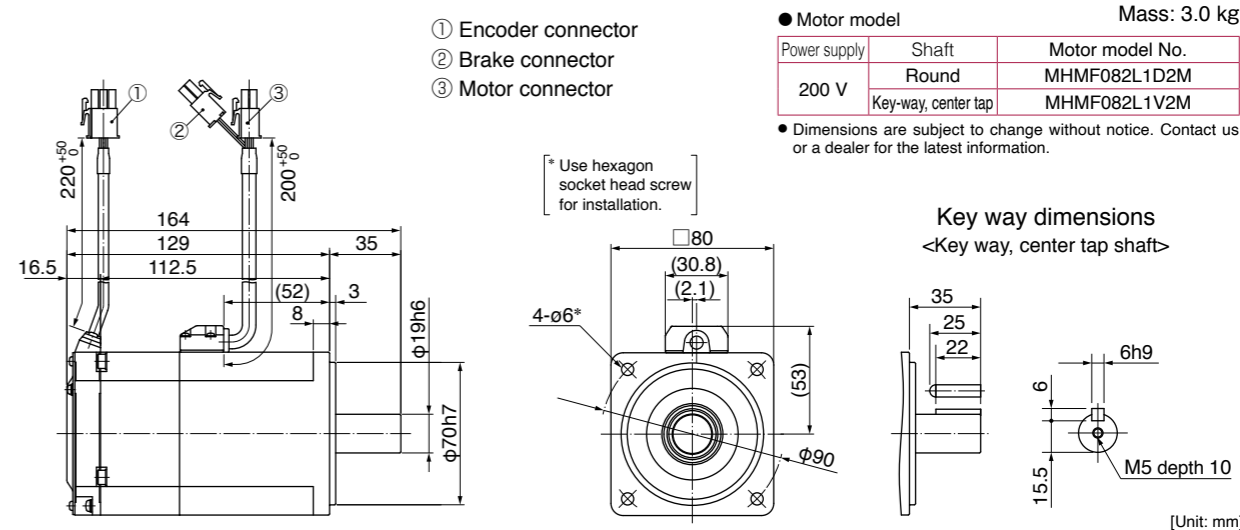
* For motors specifications, refer to P.230.

MHMF 750 W

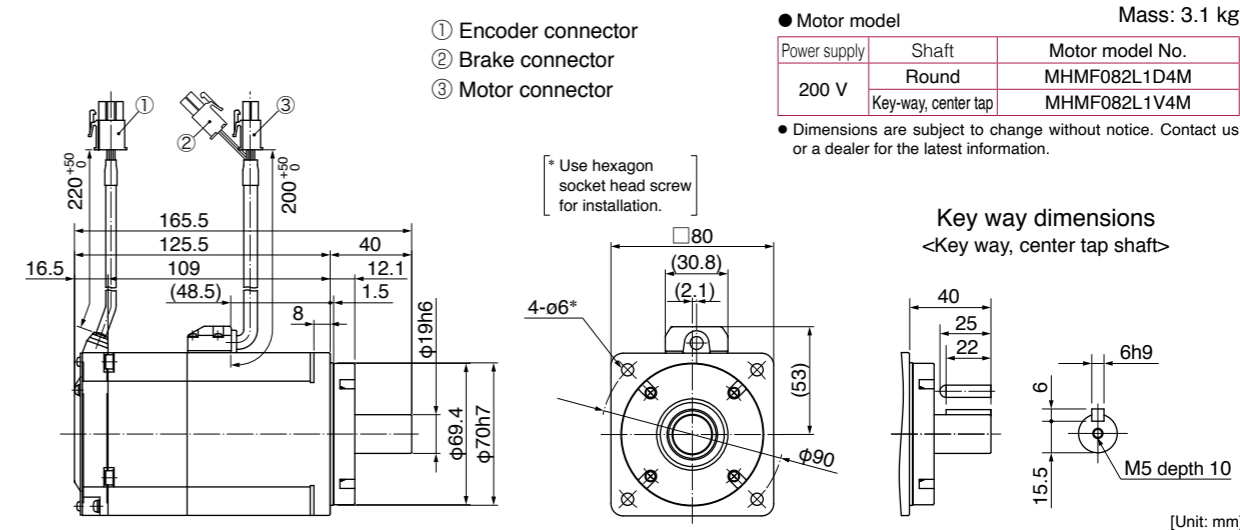
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



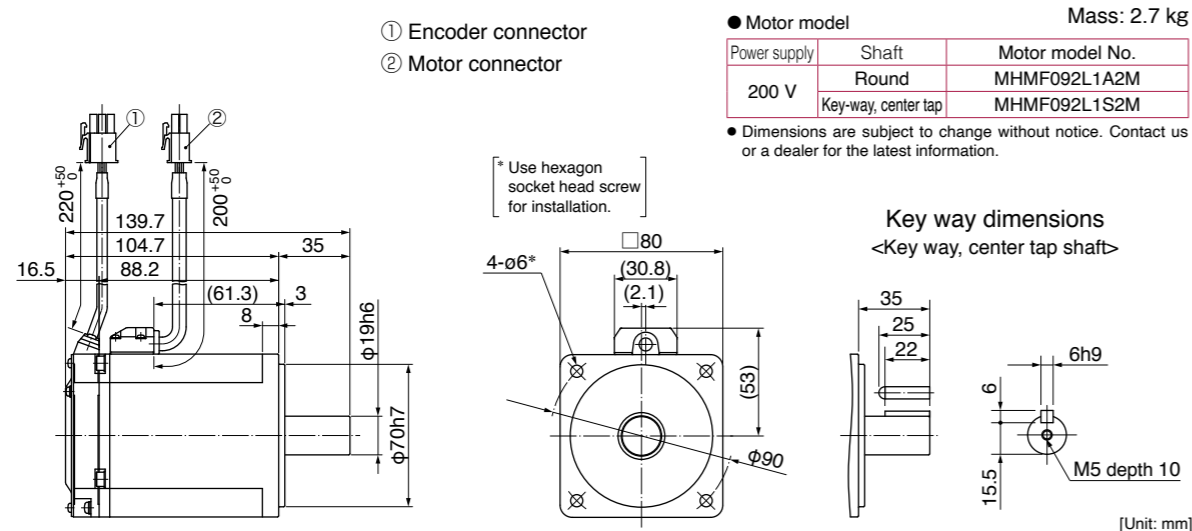
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



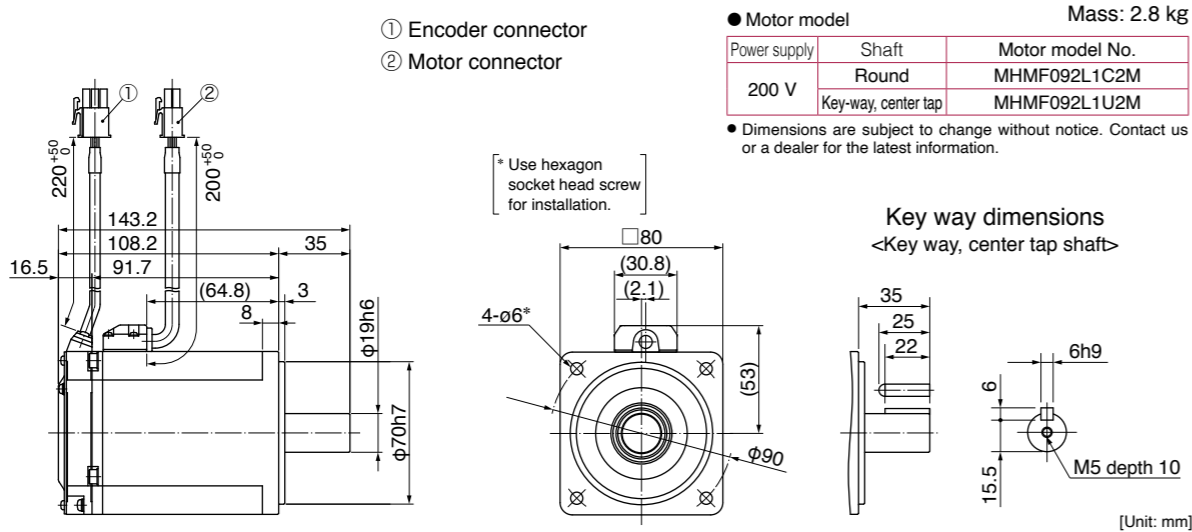
* For motors specifications, refer to P.230.

MHMF 1000 W

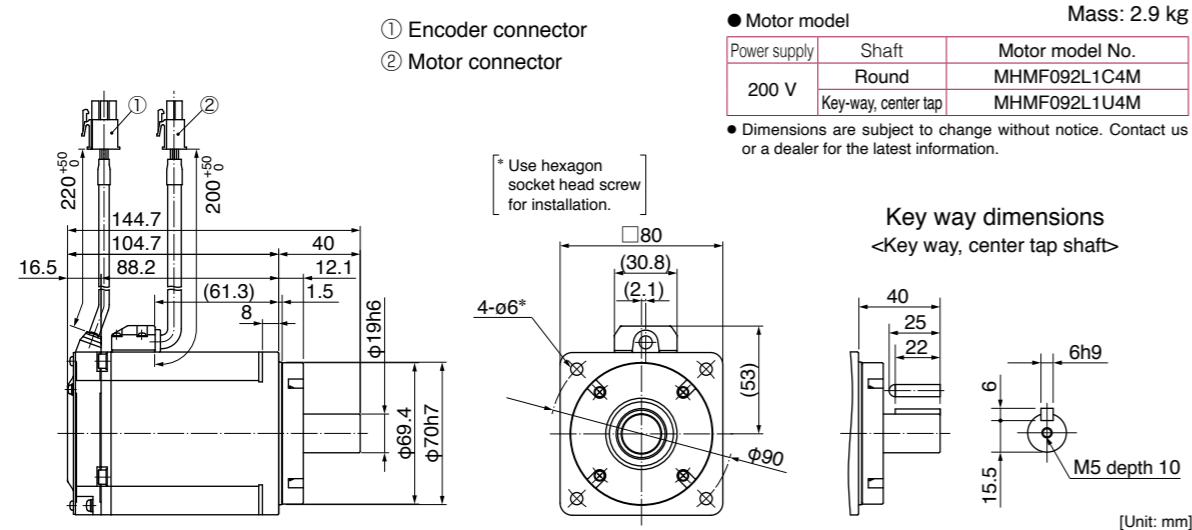
Leadwire type (IP65) • without brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • without brake • with oil seal • Round shaft/ Key way, center tap shaft



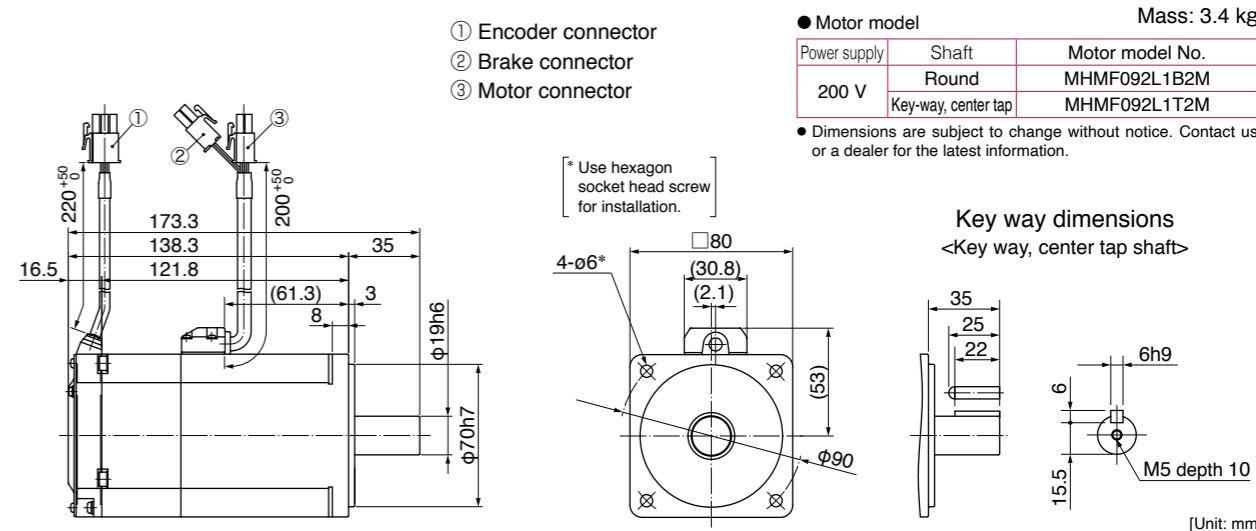
Leadwire type (IP65) • without brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



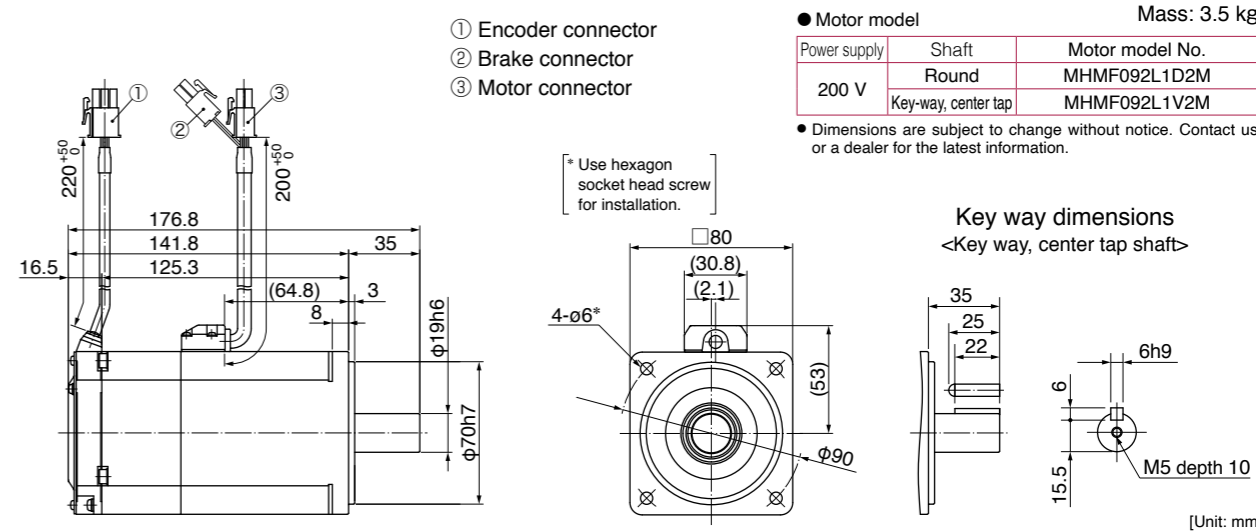
* For motors specifications, refer to P.231.

MHMF 1000 W

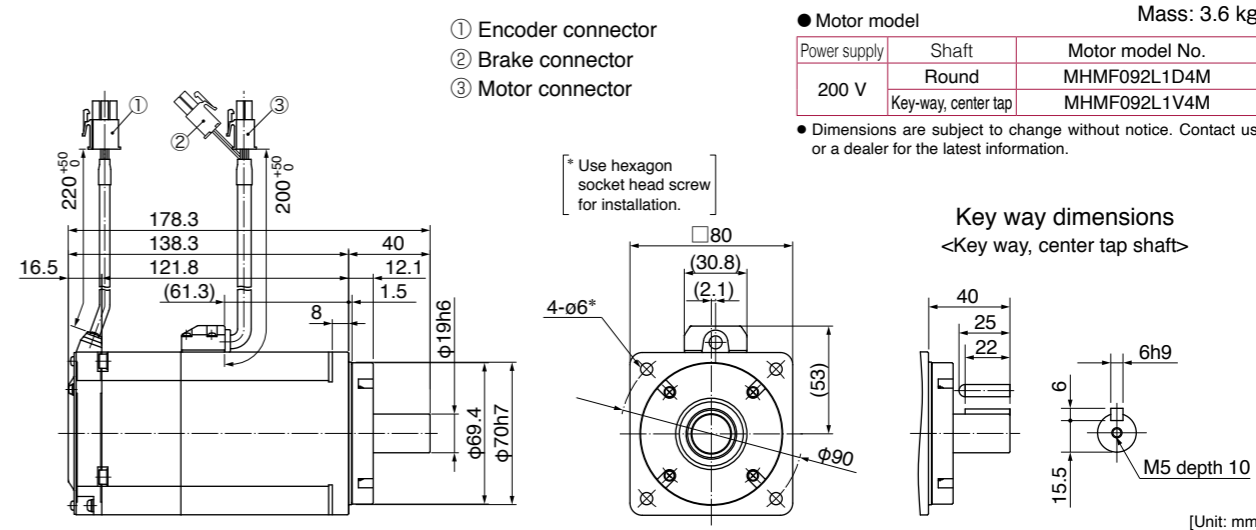
Leadwire type (IP65) • with brake • without oil seal • Round shaft/ Key way, center tap shaft



Leadwire type (IP65) • with brake • with oil seal • Round shaft/ Key way, center tap shaft



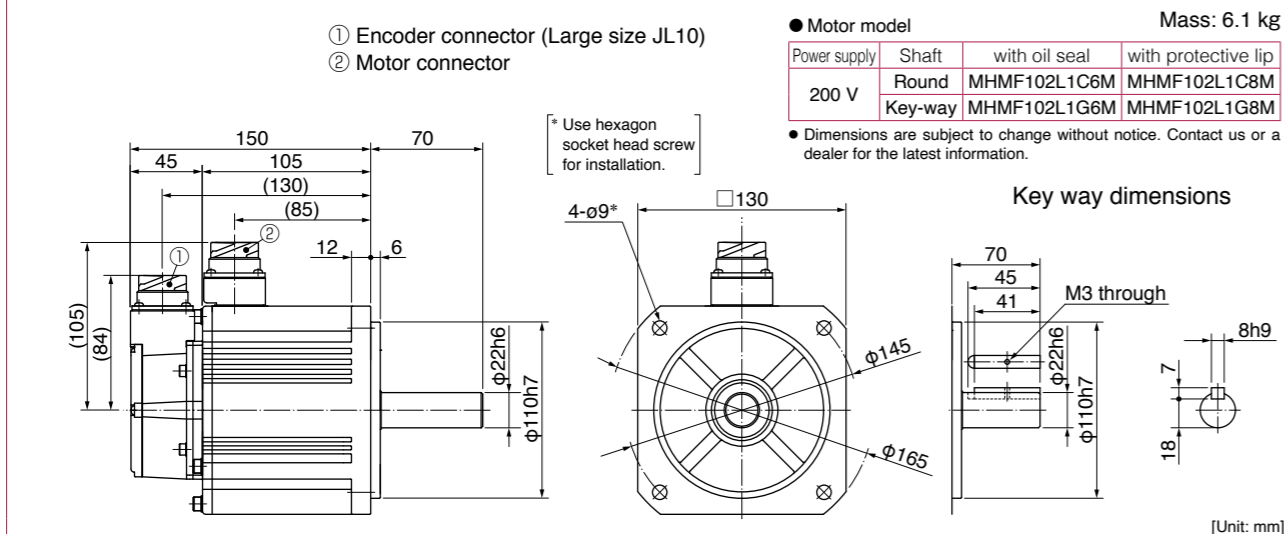
Leadwire type (IP65) • with brake • with protective lip/ with oil seal • Round shaft/ Key way, center tap shaft



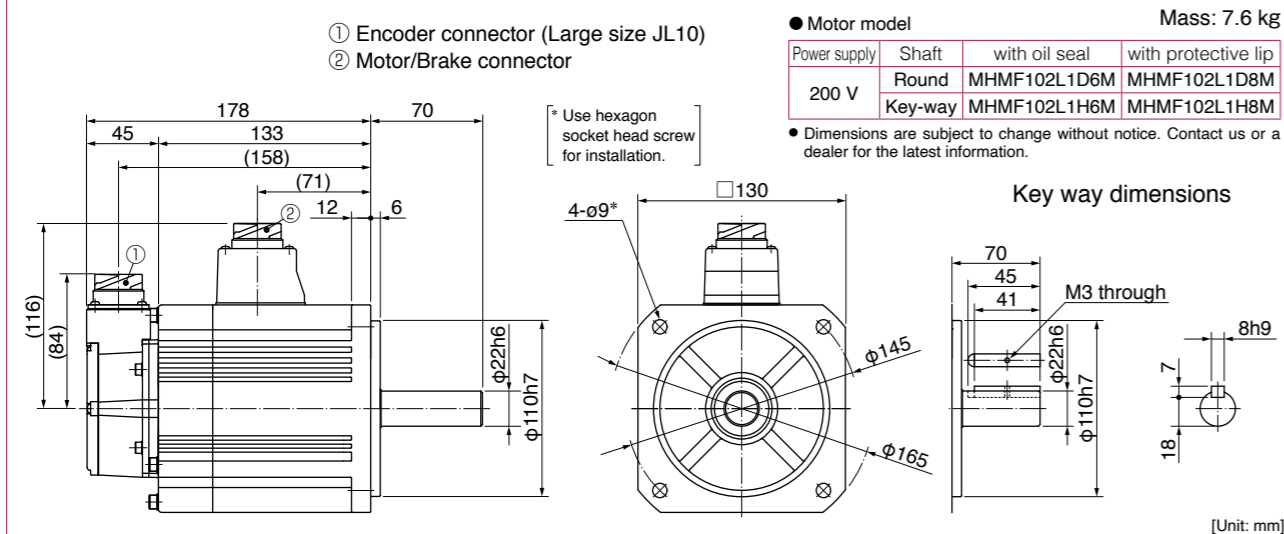
* For motors specifications, refer to P.231.

MHMF 1.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

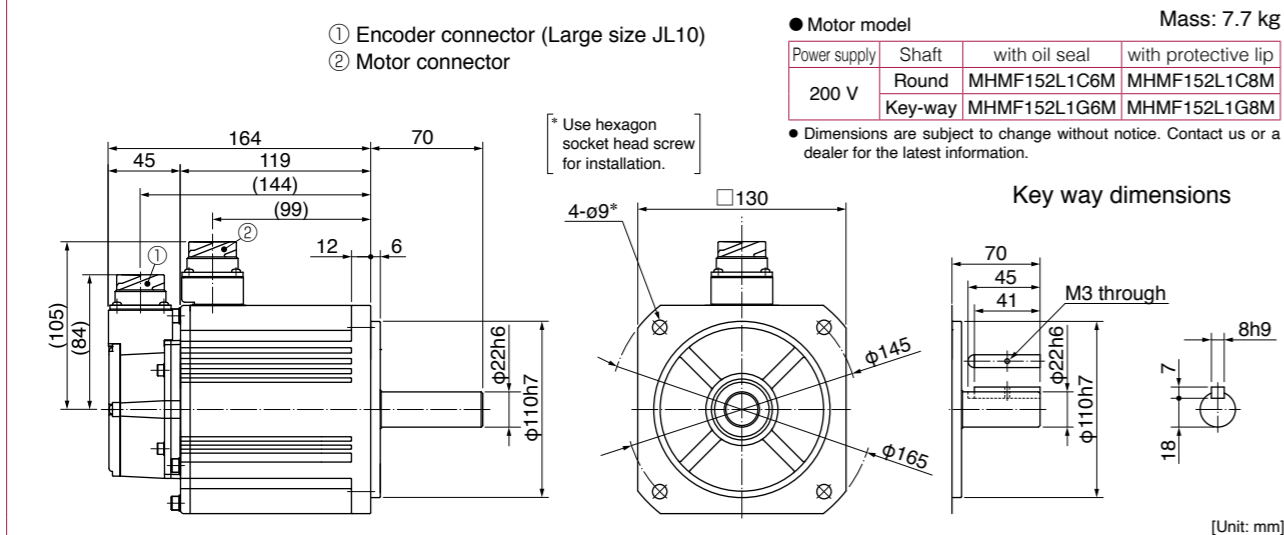


Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MHMF 1.5 kW

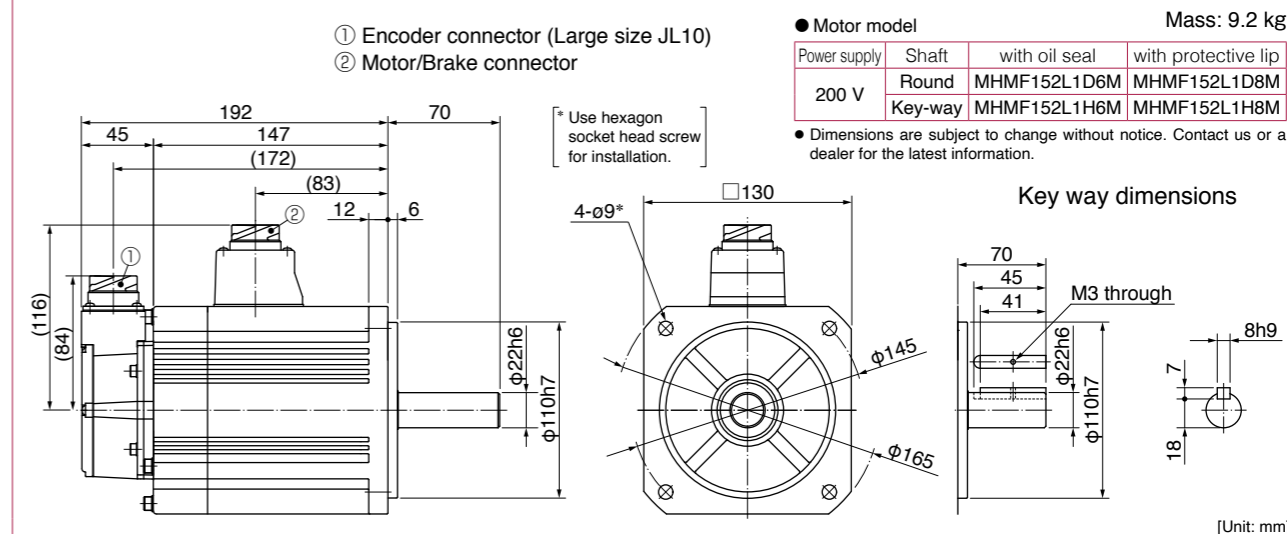
Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



* For motors specifications, refer to P232, P233.

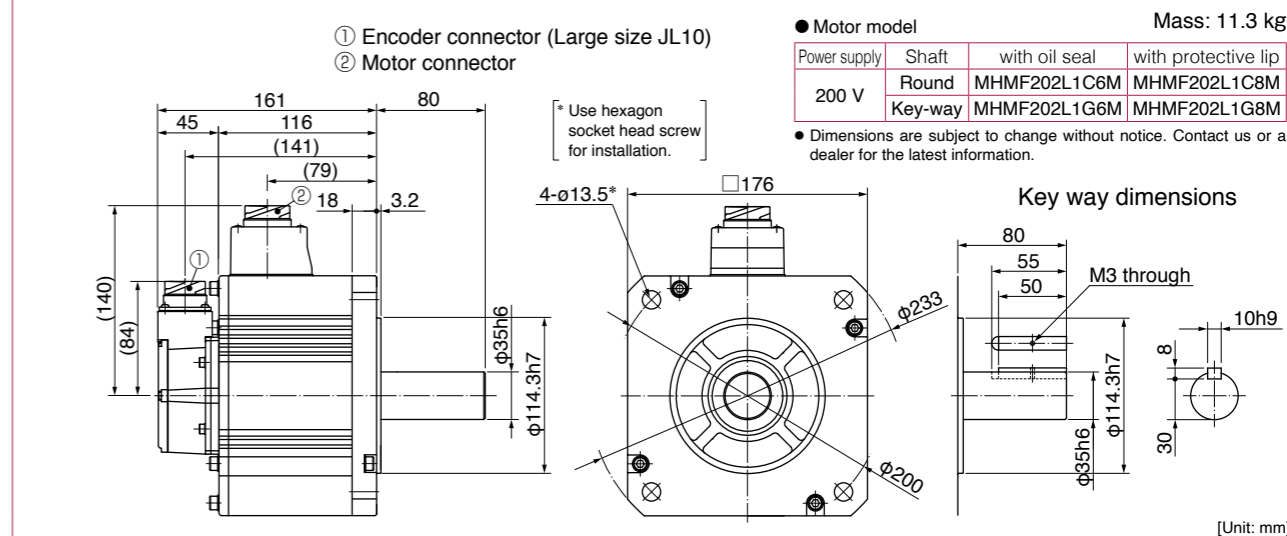
MHMF 1.5 kW

Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

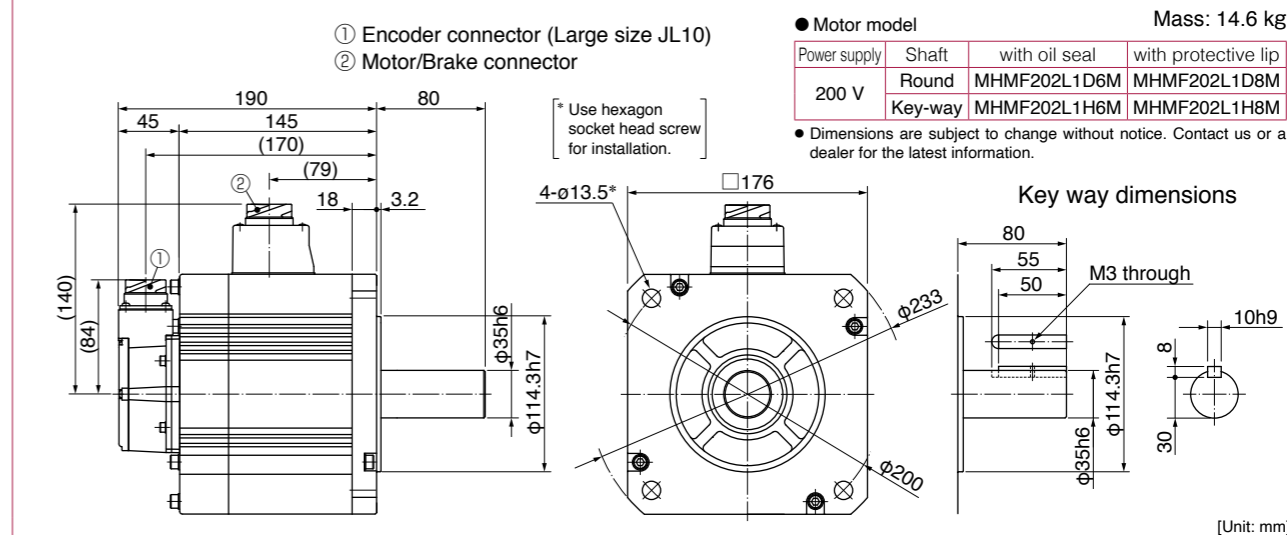


MHMF 2.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



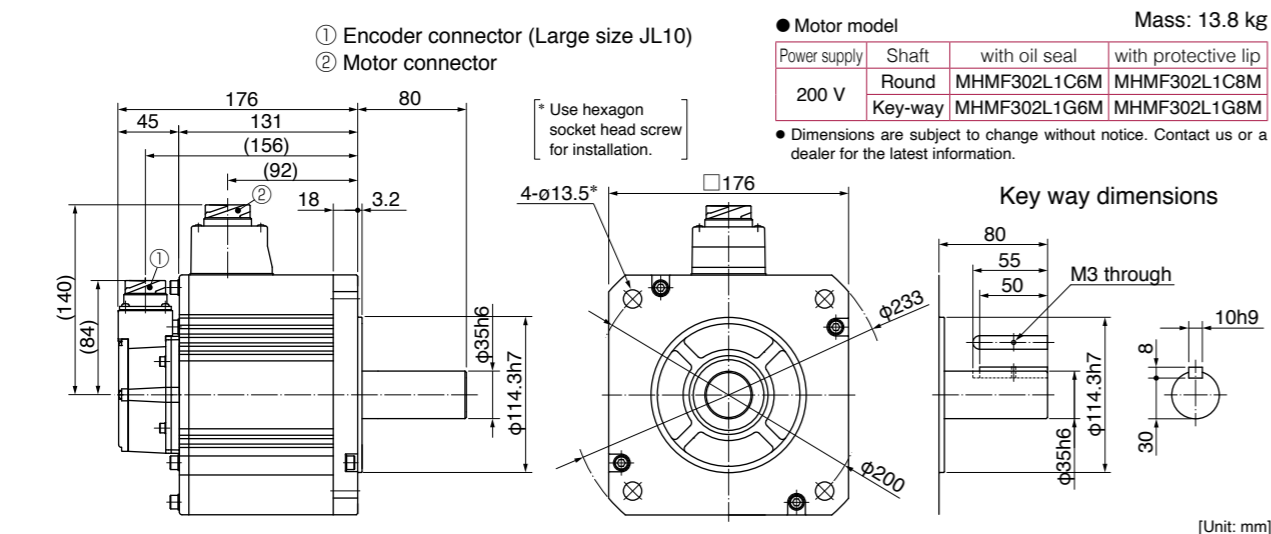
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



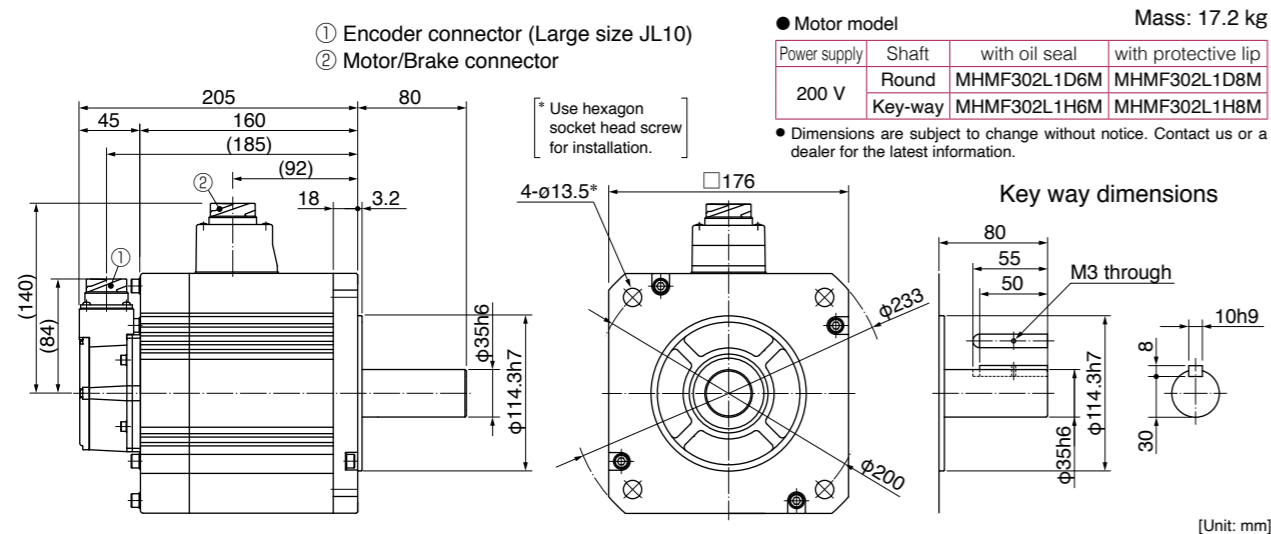
* For motors specifications, refer to P233, P234.

MHMF 3.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

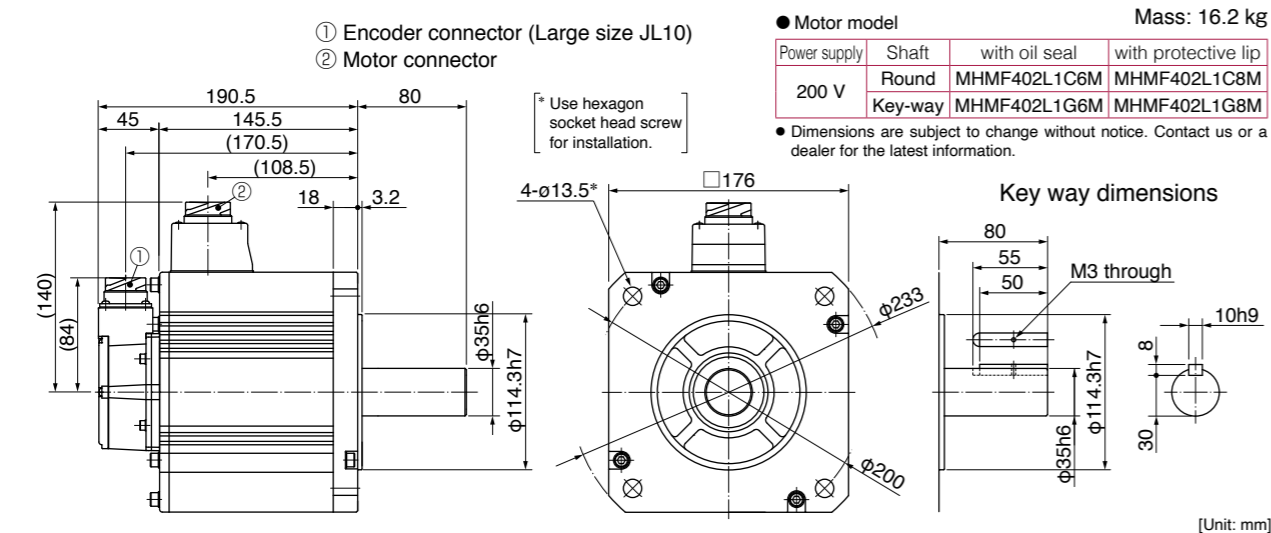


Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MHMF 4.0 kW

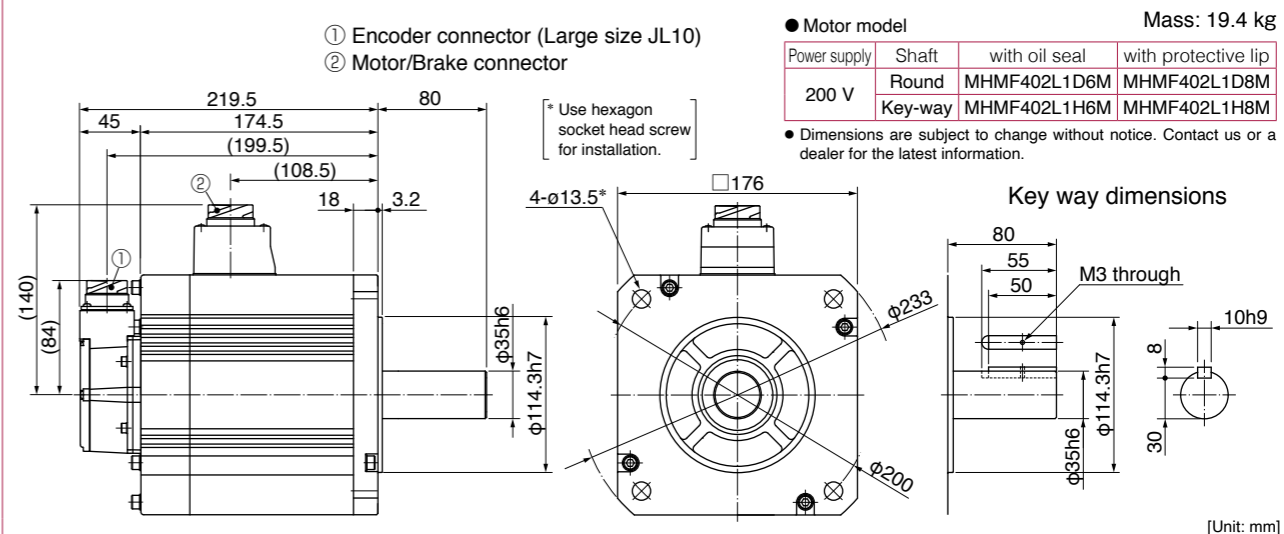
Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



* For motors specifications, refer to P.235, P.236.

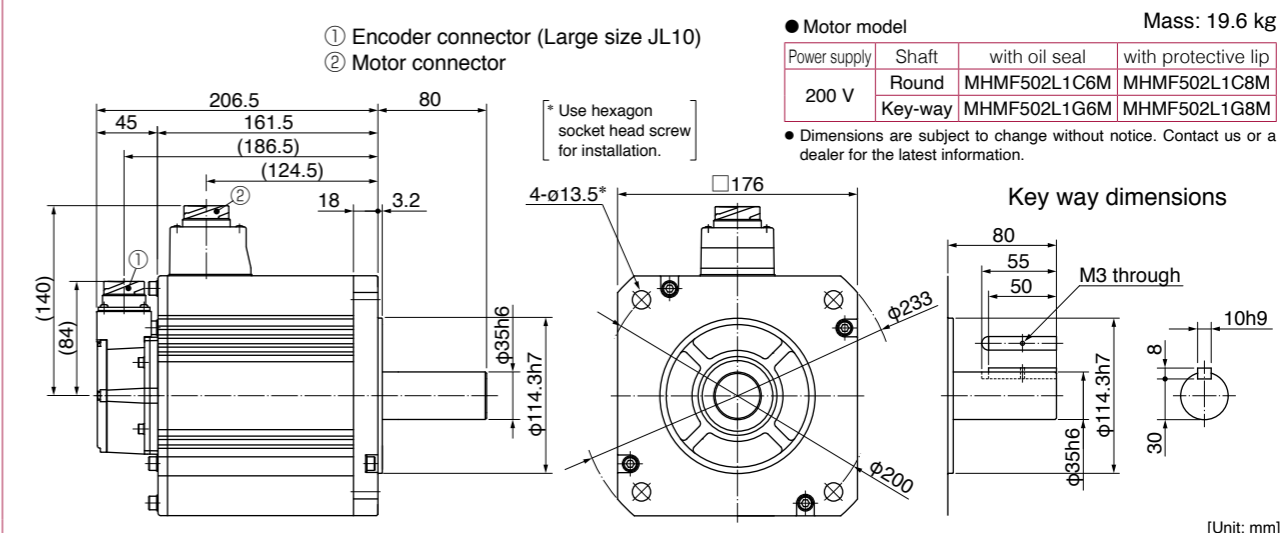
MHMF 4.0 kW

Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

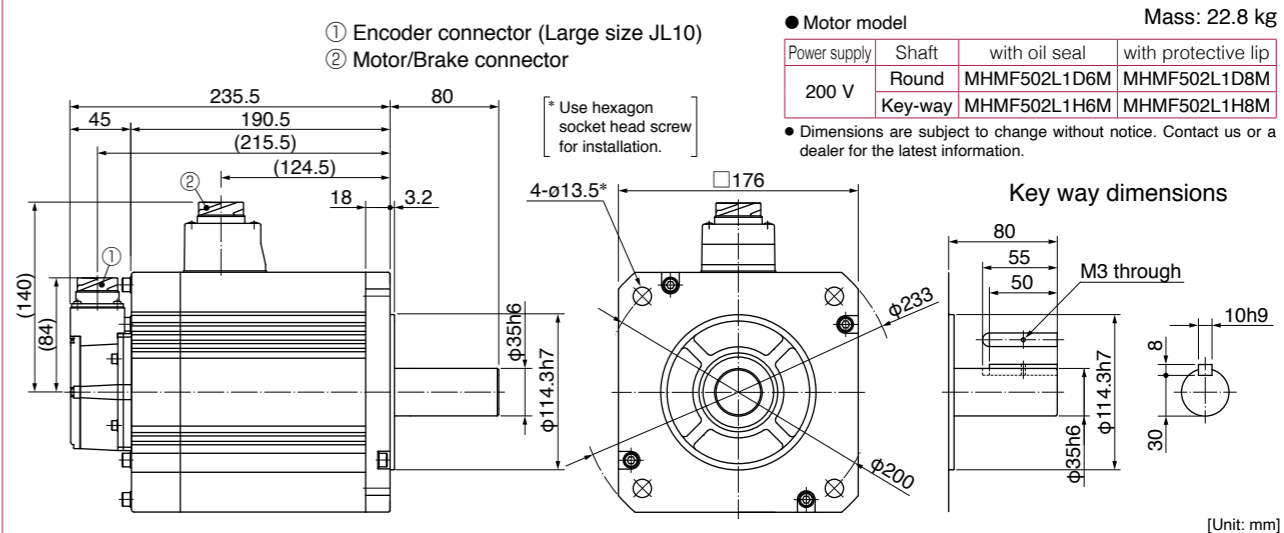


MHMF 5.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



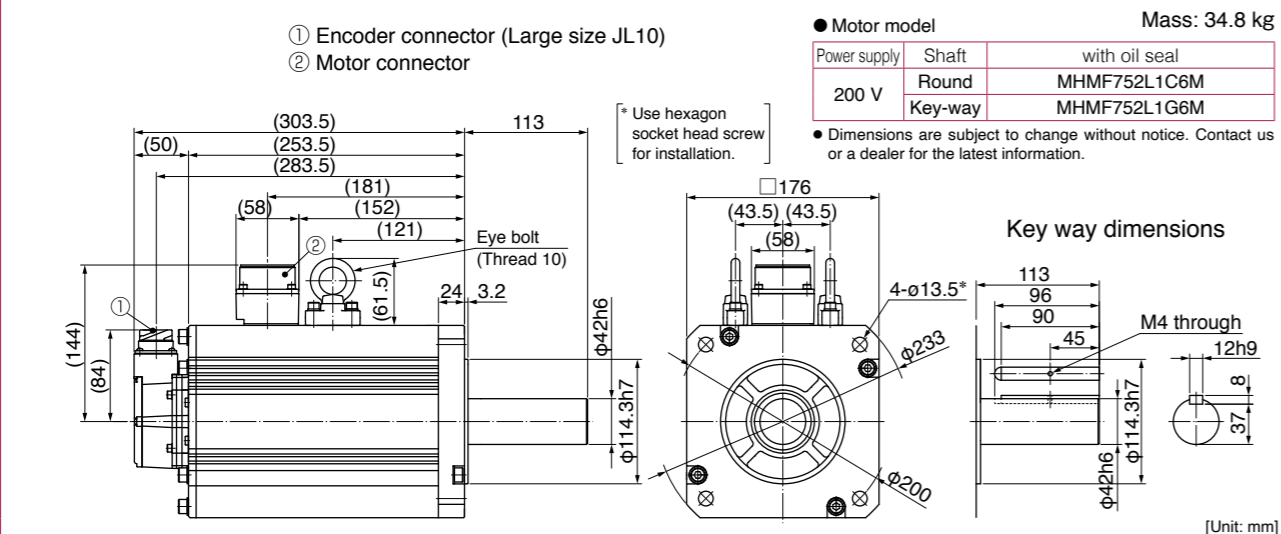
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



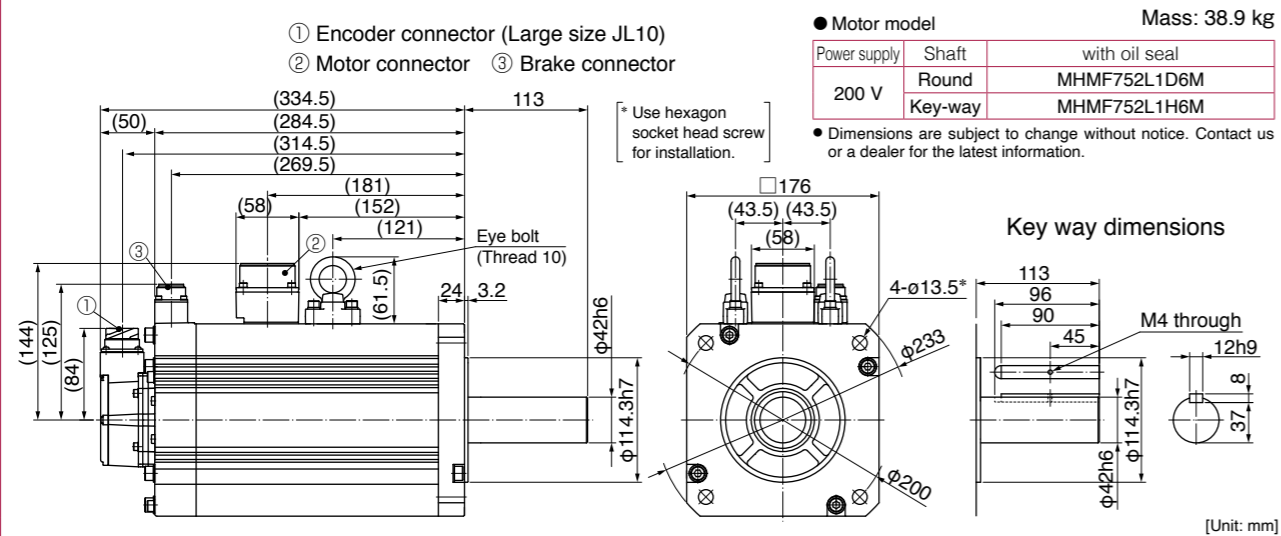
* For motors specifications, refer to P.236, P.237.

MHMF 7.5 kW

Large size connector (JL10) type • without brake • with oil seal • Key way shaft/ Round shaft

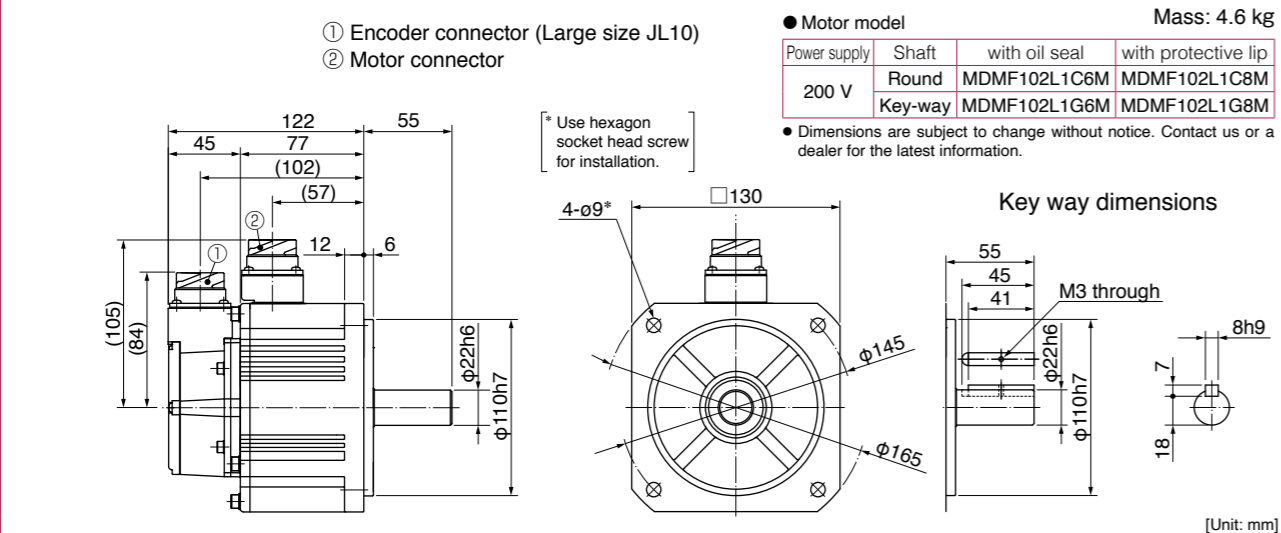


Large size connector (JL10) type • with brake • with oil seal • Key way shaft/ Round shaft



MDMF 1.0 kW

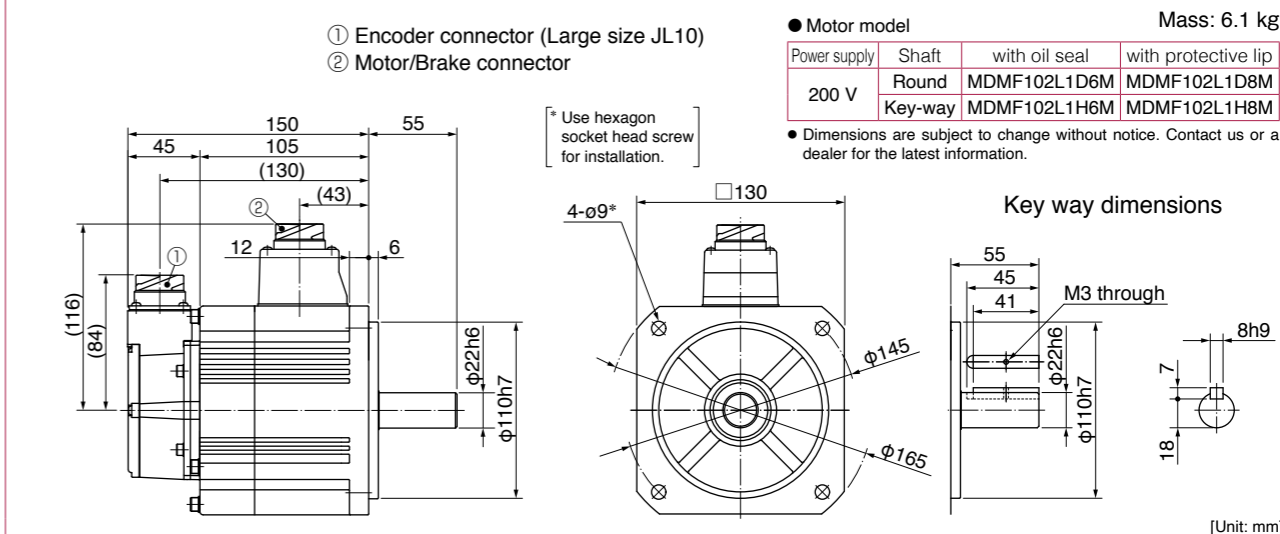
Large size connector (JL10) type • without brake • with oil seal/ with protective lip • Key way shaft/ Round shaft



* For motors specifications, refer to P.238, P.239.

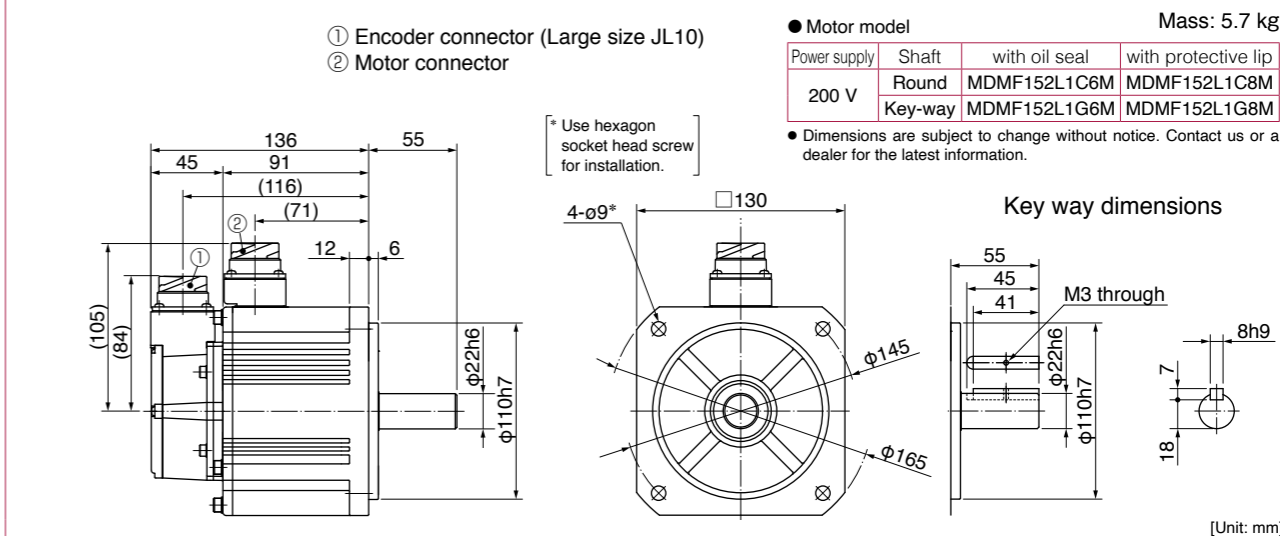
MDMF 1.0 kW

Large size connector (JL10) type • with brake • with oil seal/ with protective lip • Key way shaft/ Round shaft

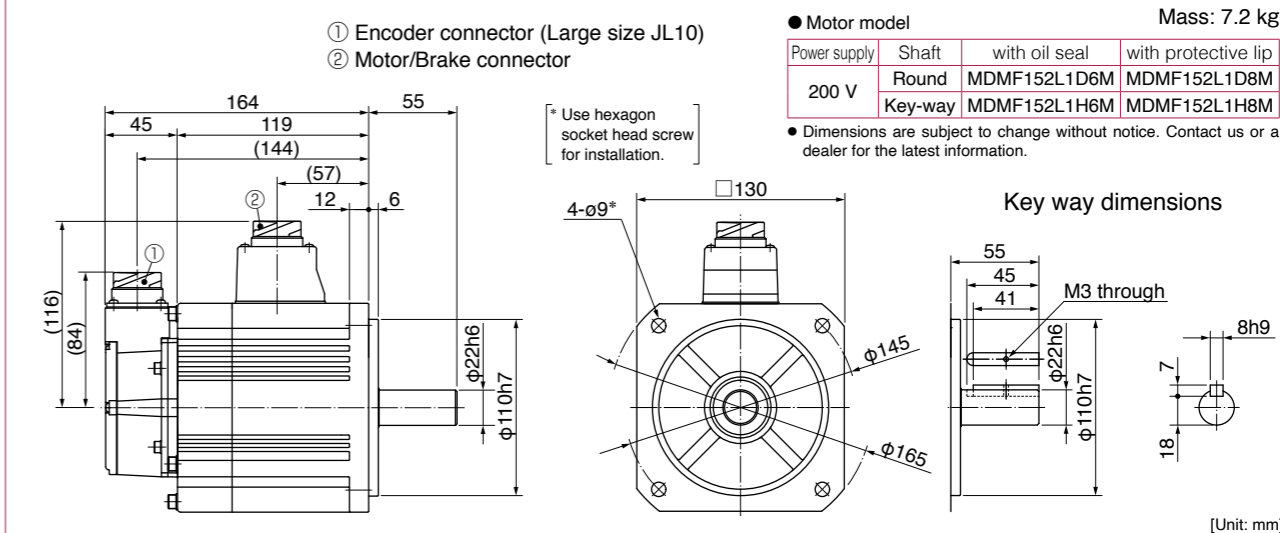


MDMF 1.5 kW

Large size connector (JL10) type • without brake • with oil seal/ with protective lip • Key way shaft/ Round shaft



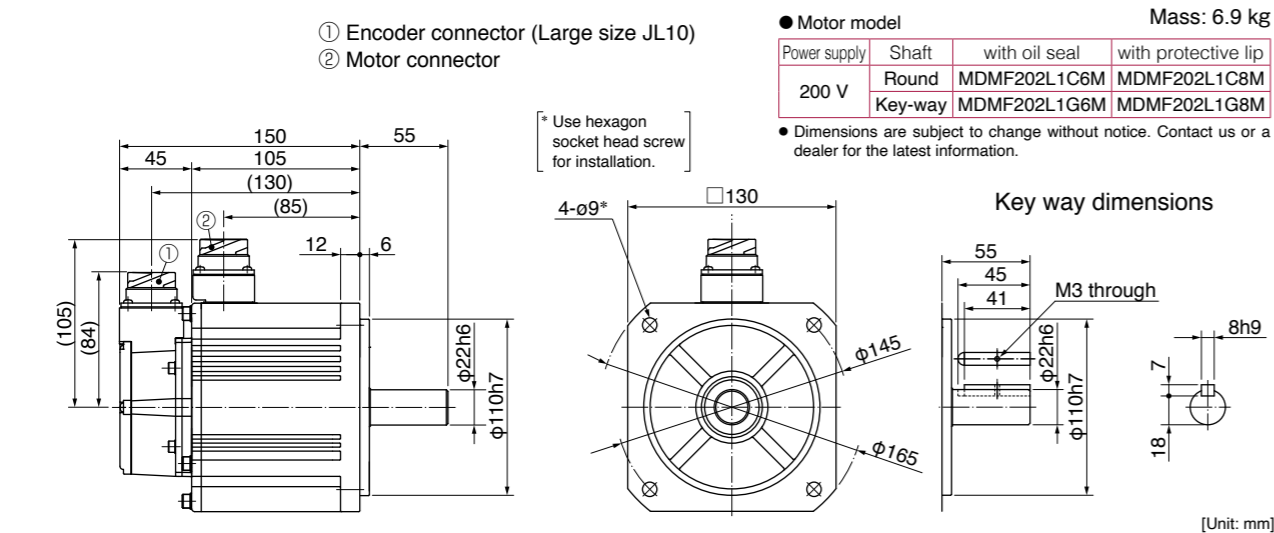
Large size connector (JL10) type • with brake • with oil seal/ with protective lip • Key way shaft/ Round shaft



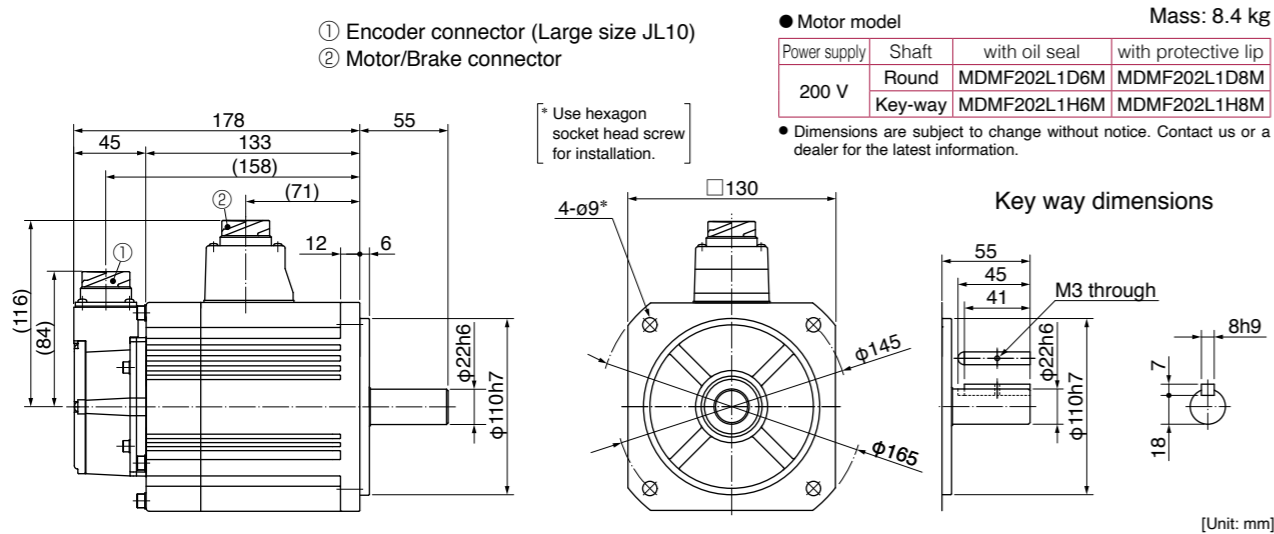
* For motors specifications, refer to P.239, P.240.

MDMF 2.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

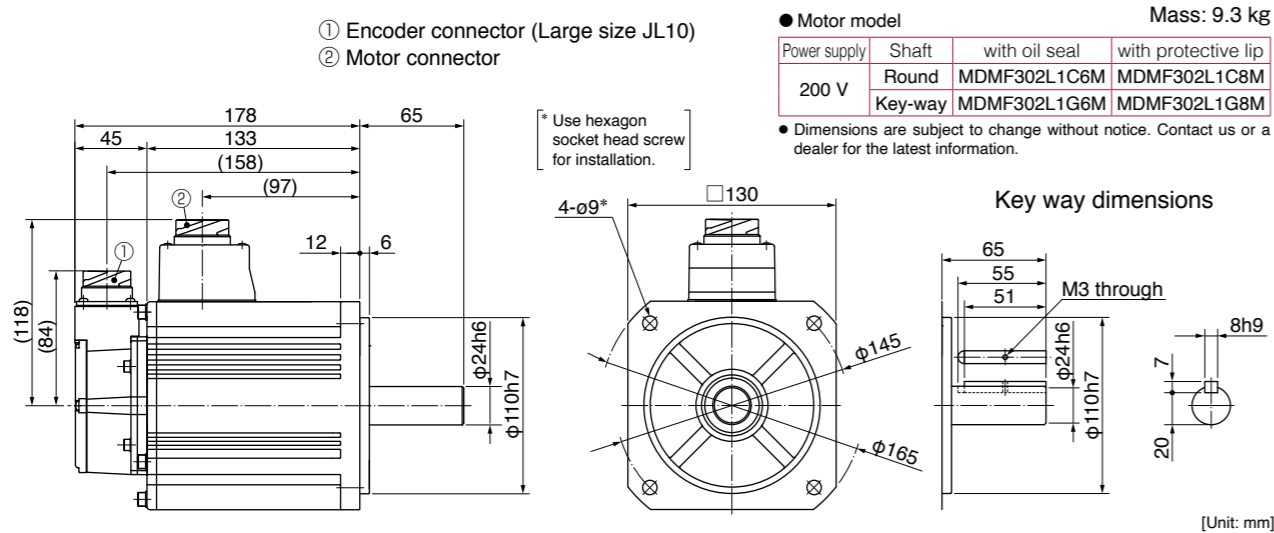


Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MDMF 3.0 kW

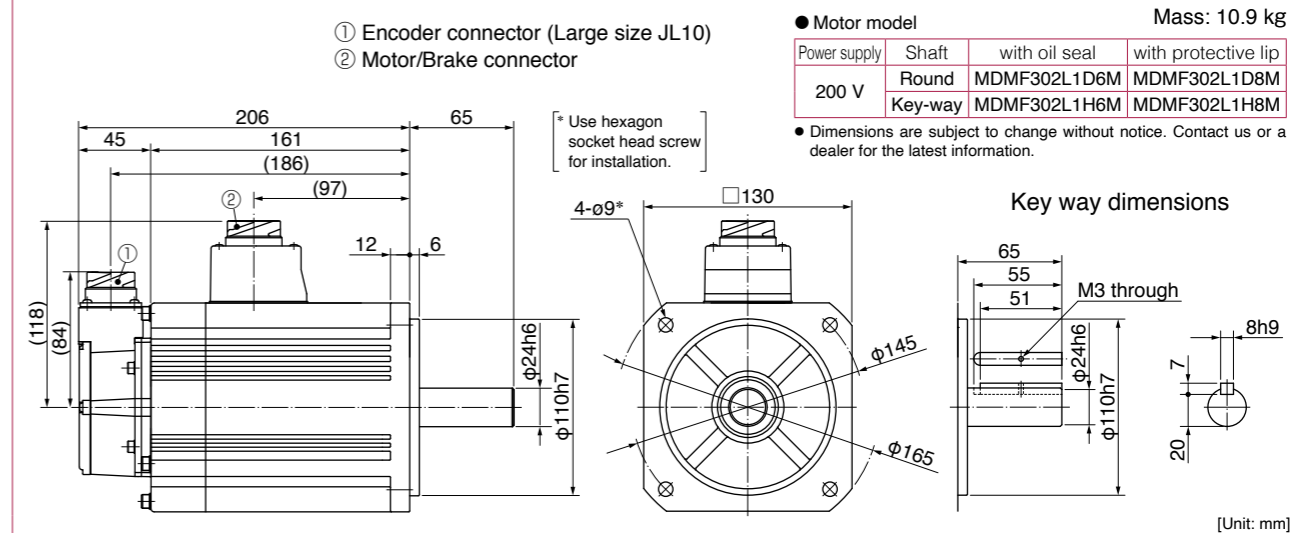
Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



* For motors specifications, refer to P.241, P.242.

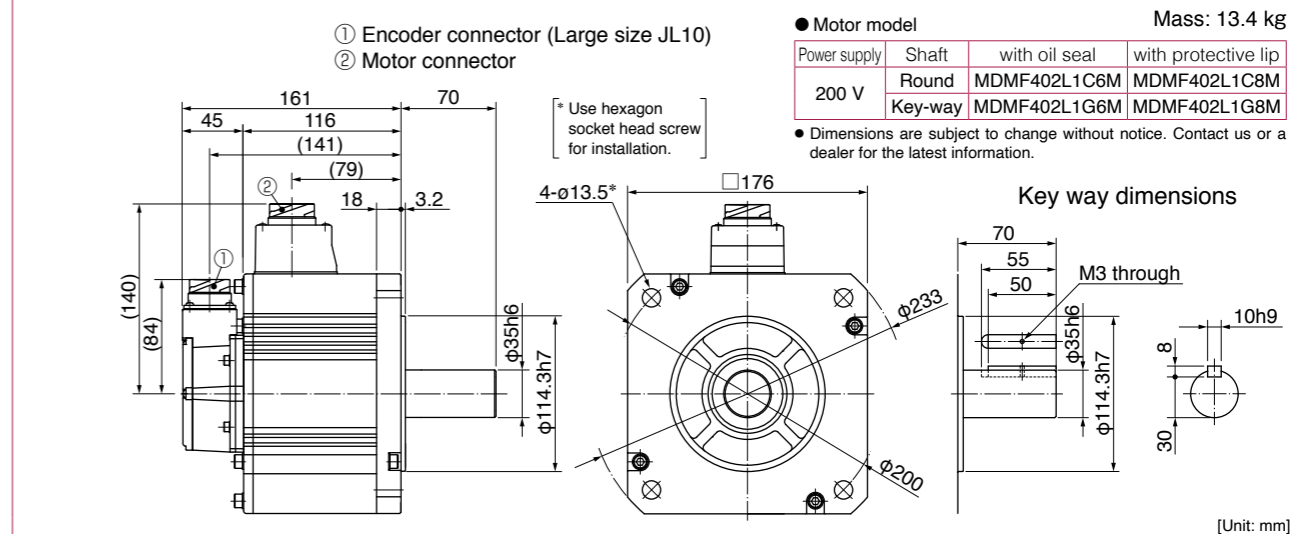
MDMF 3.0 kW

Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

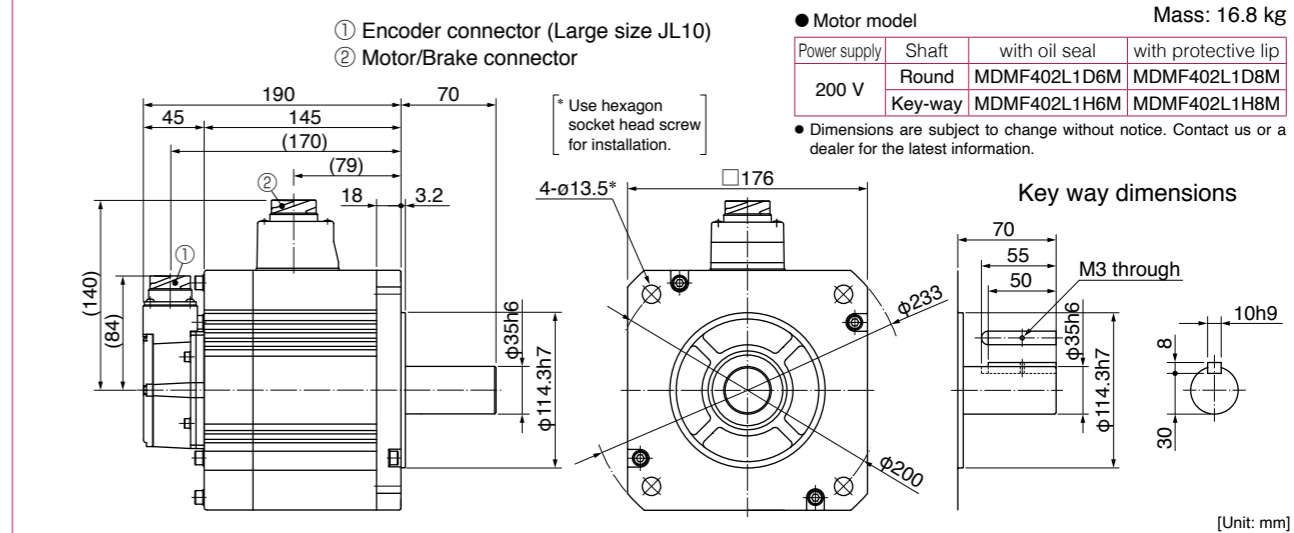


MDMF 4.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



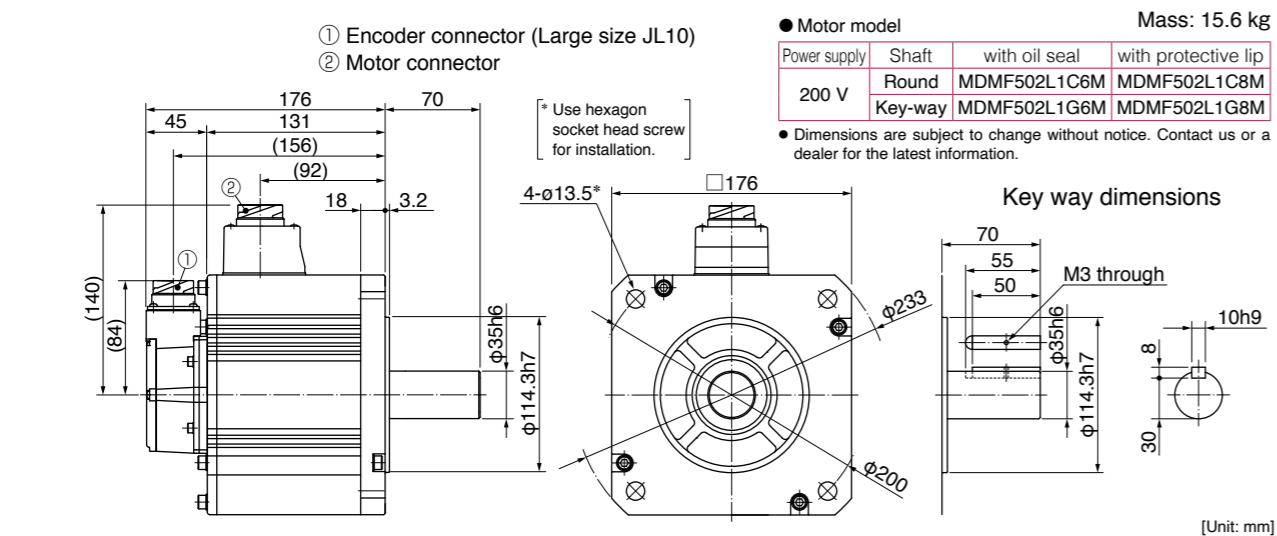
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



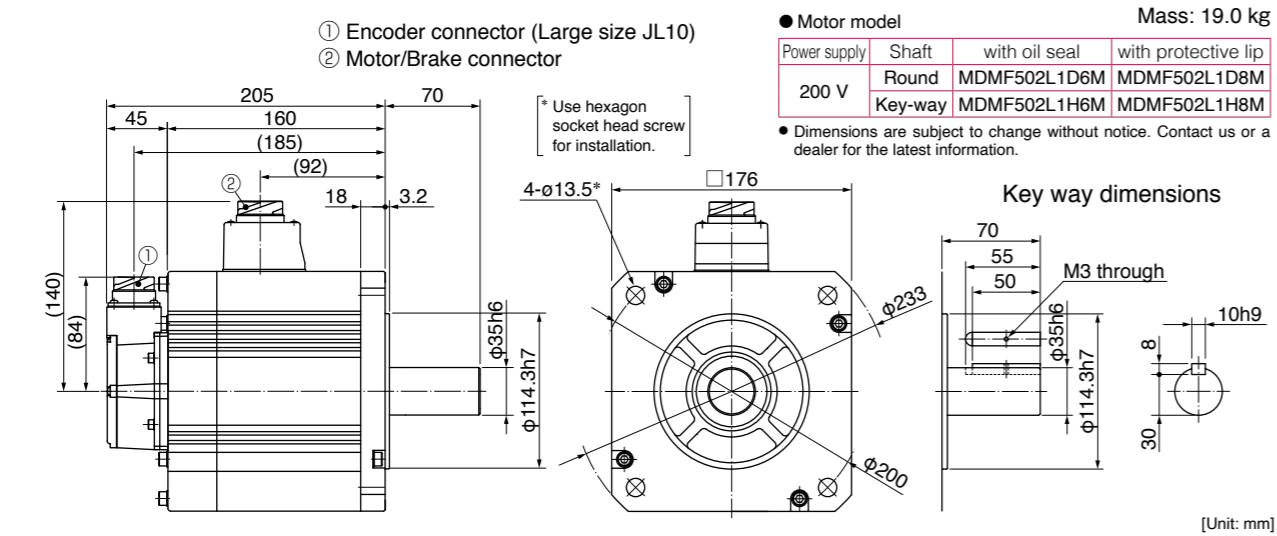
* For motors specifications, refer to P.242, P.243.

MDMF 5.0 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

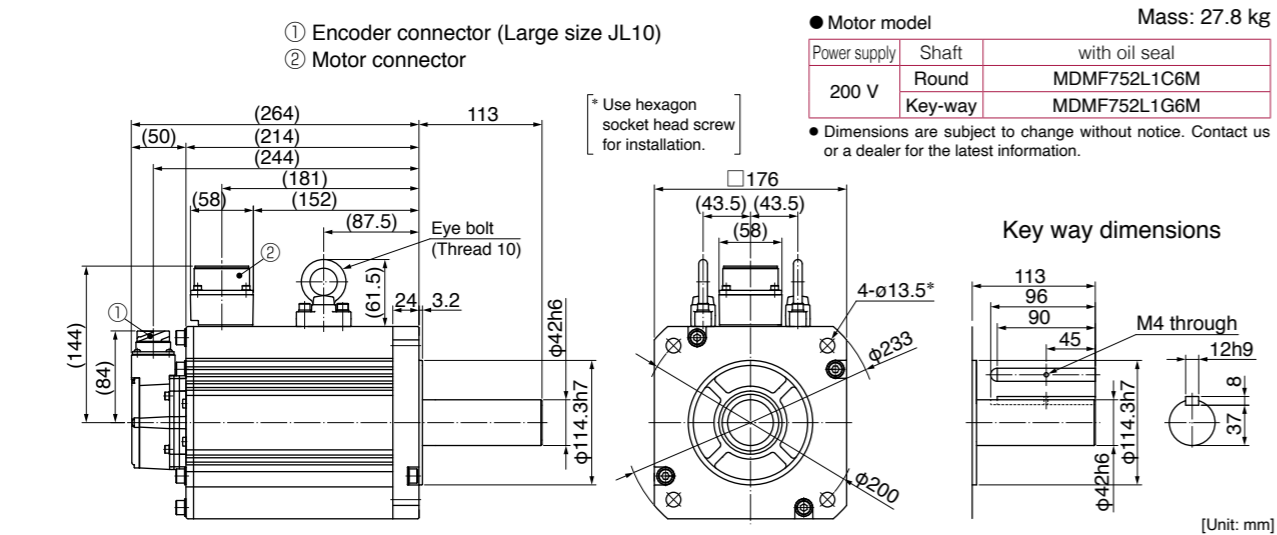


Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MDMF 7.5 kW

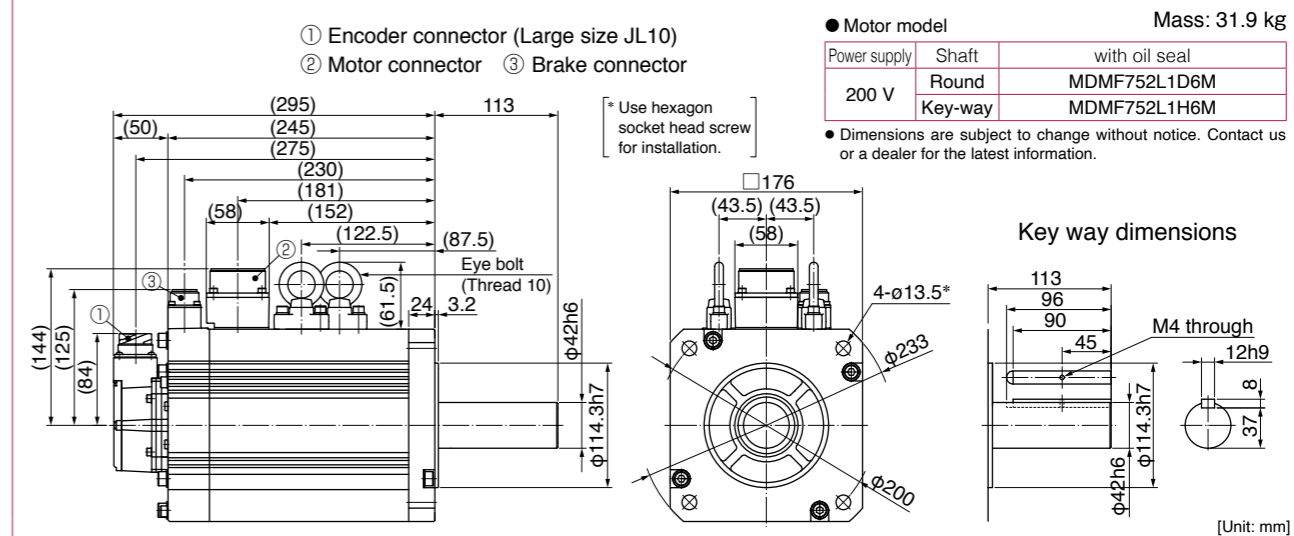
Large size connector (JL10) type · without brake · with oil seal · Key way shaft/ Round shaft



* For motors specifications, refer to P.244, P.245.

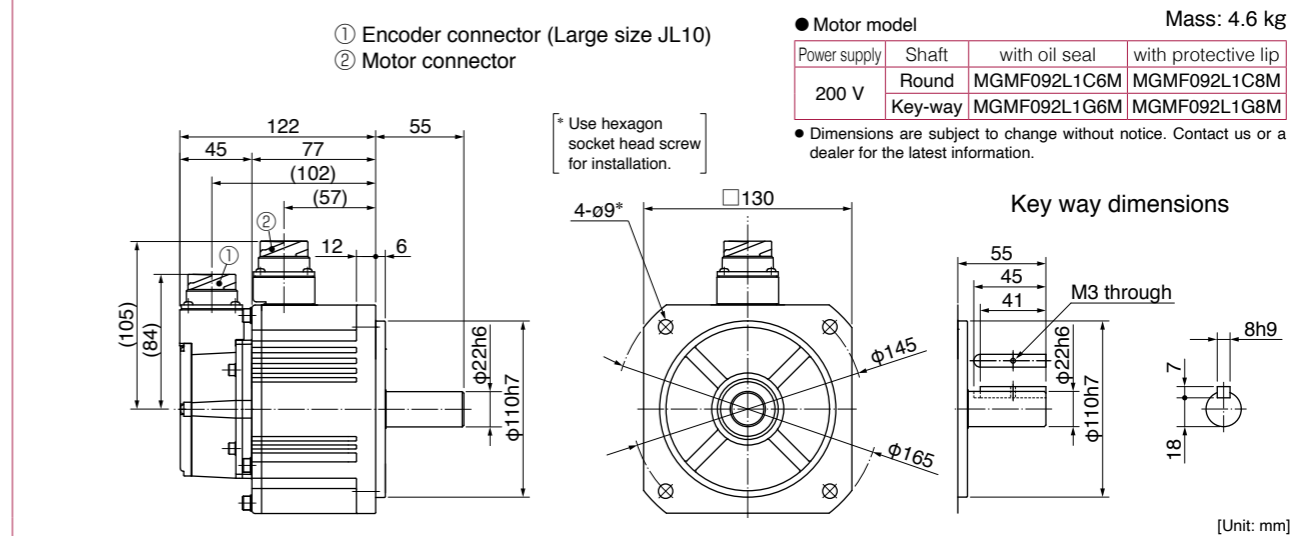
MDMF 7.5 kW

Large size connector (JL10) type · with brake · with oil seal · Key way shaft/ Round shaft

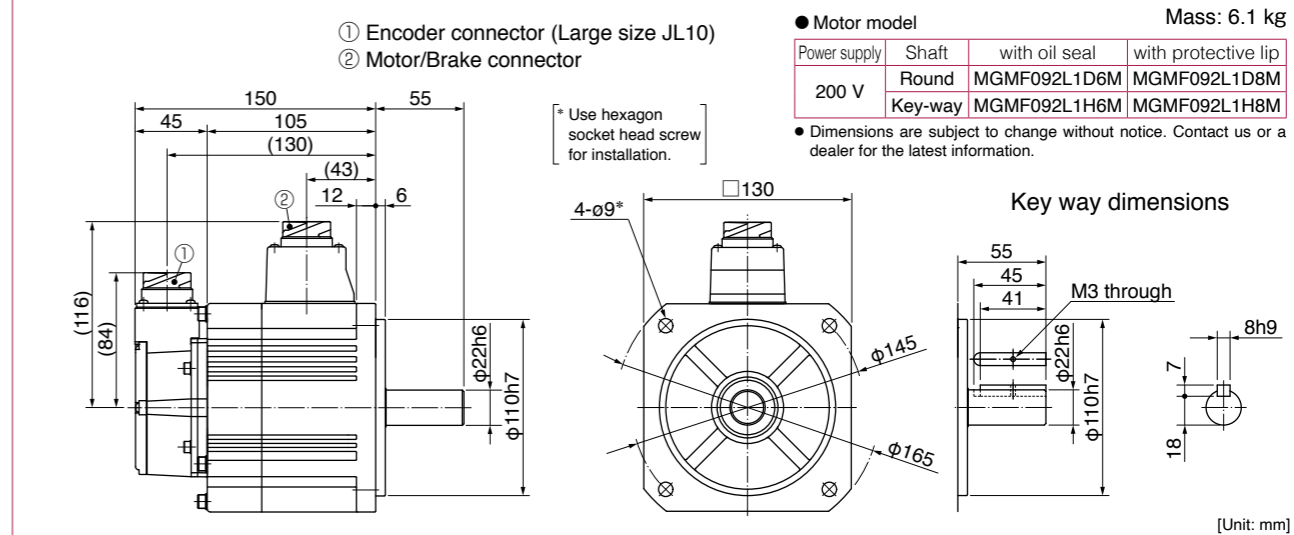


MGMF 0.85 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



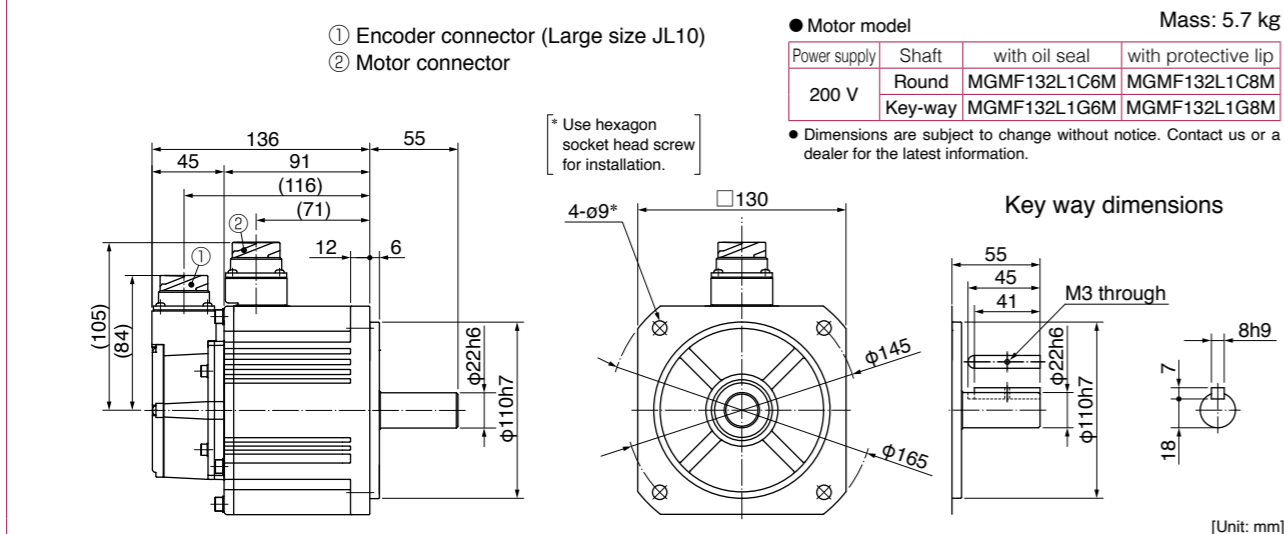
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



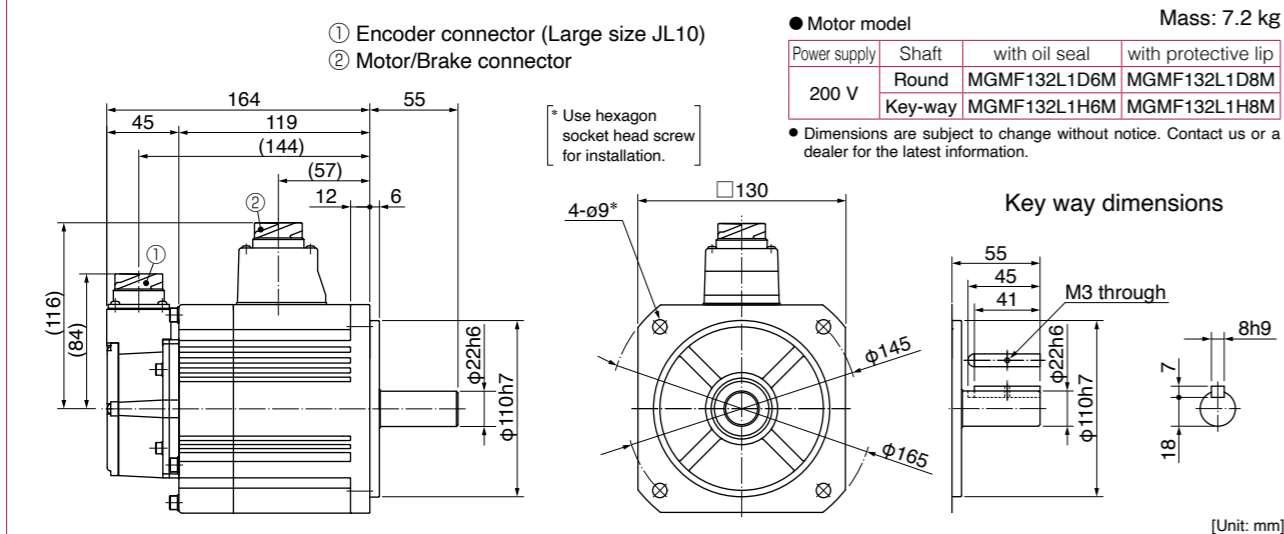
* For motors specifications, refer to P.245, P.246.

MGMF 1.3 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

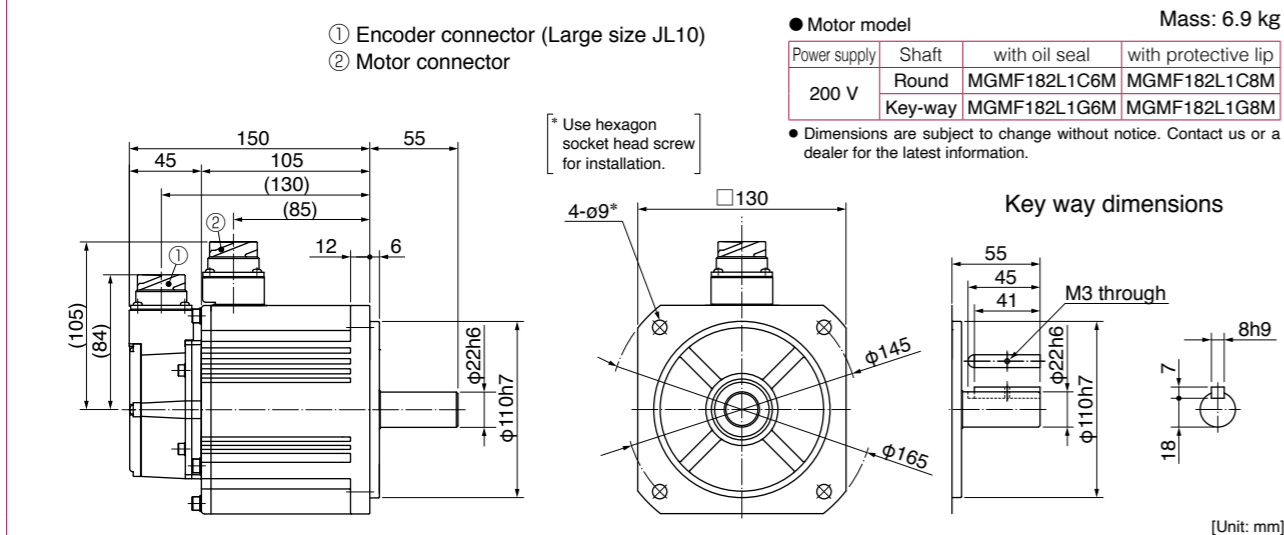


Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MGMF 1.8 kW

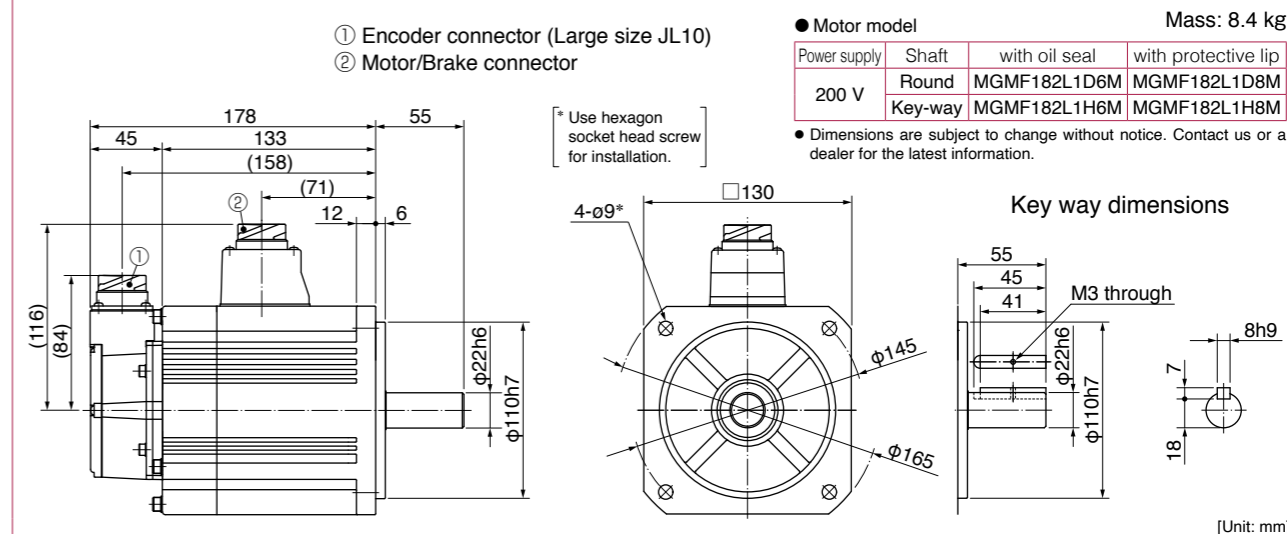
Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



* For motors specifications, refer to P247, P248.

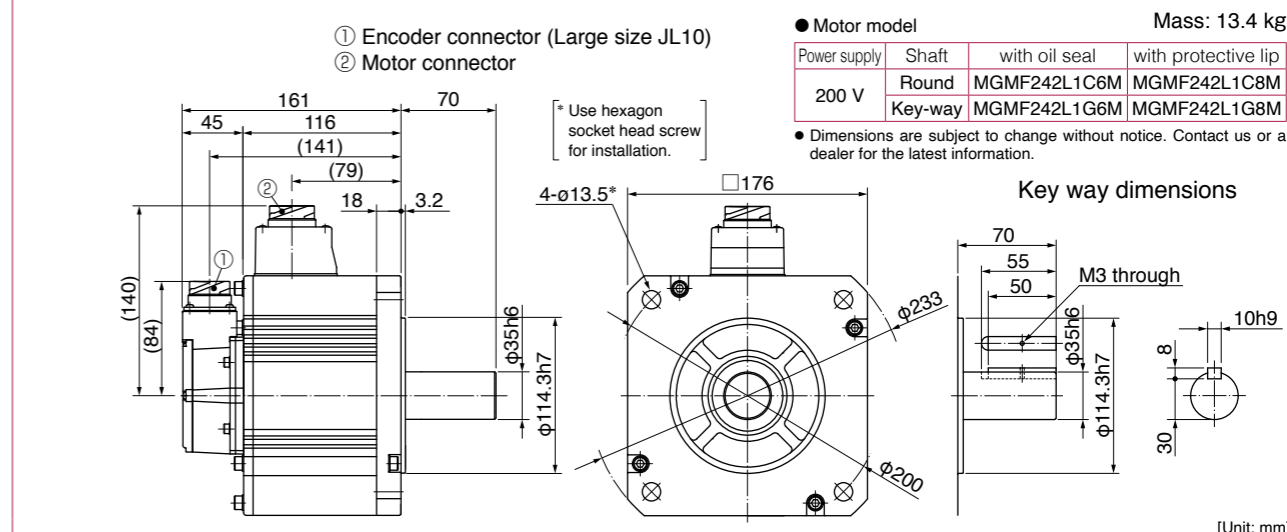
MGMF 1.8 kW

Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

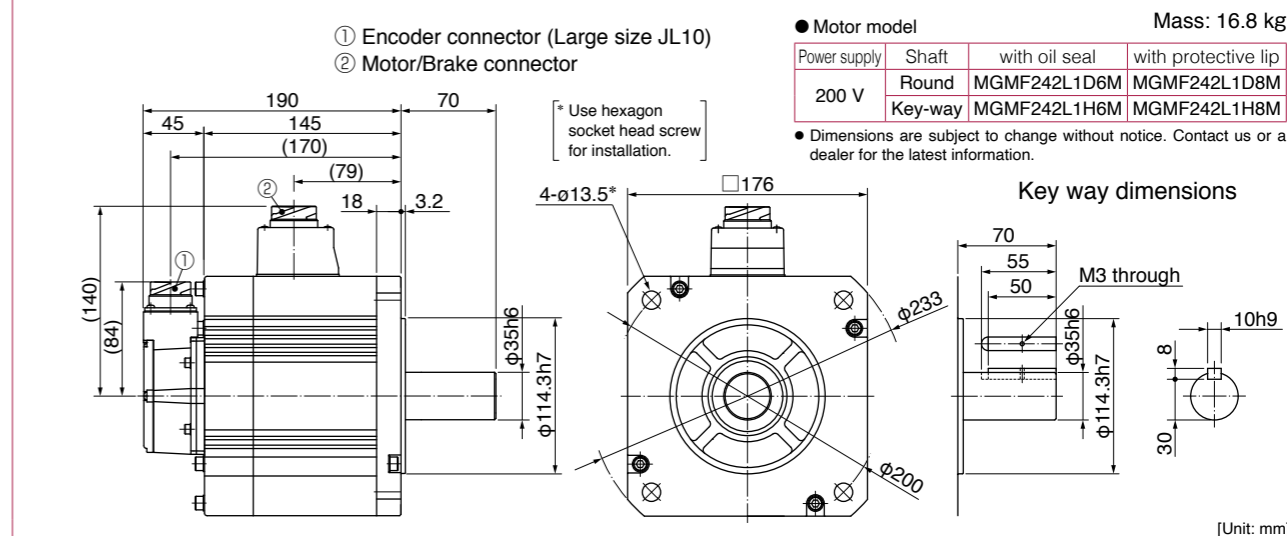


MGMF 2.4 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



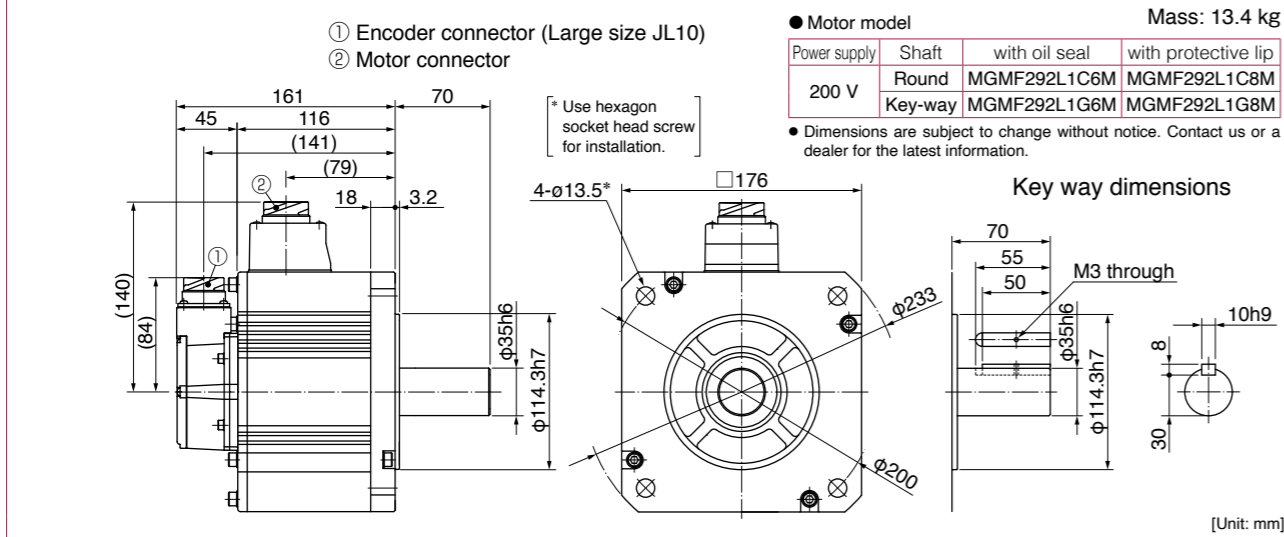
Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



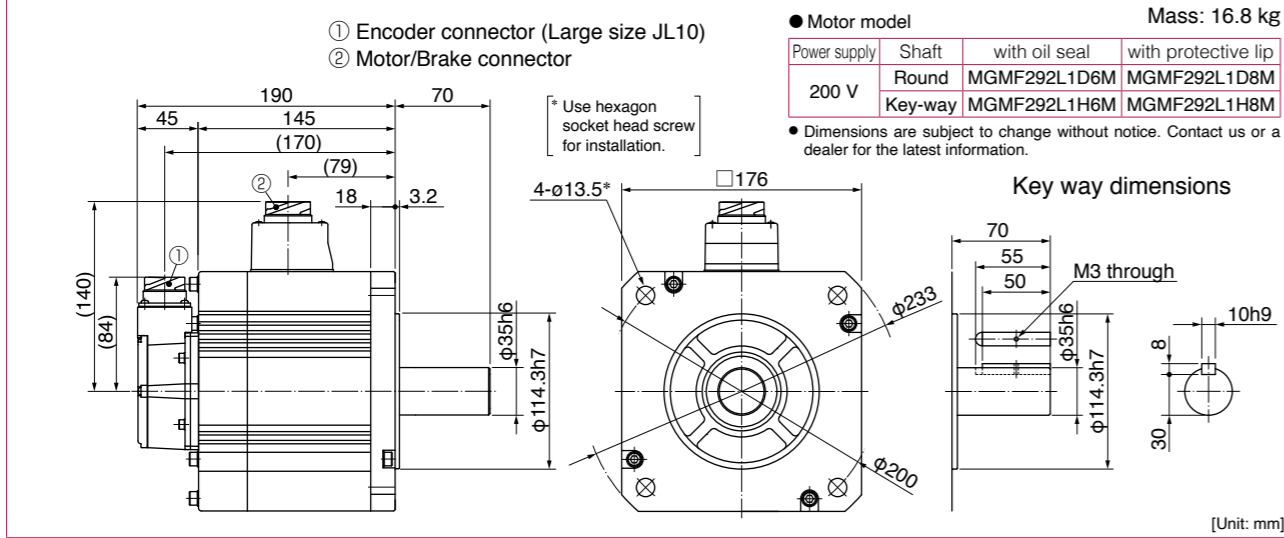
* For motors specifications, refer to P248, P249.

MGMF 2.9 kW

Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

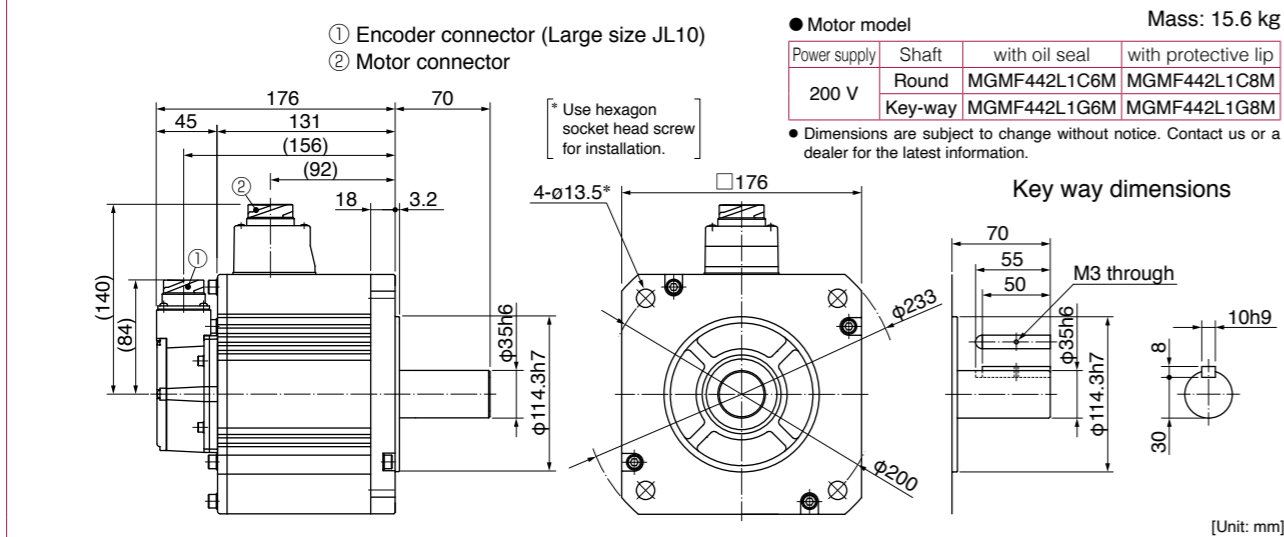


Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



MGMF 4.4 kW

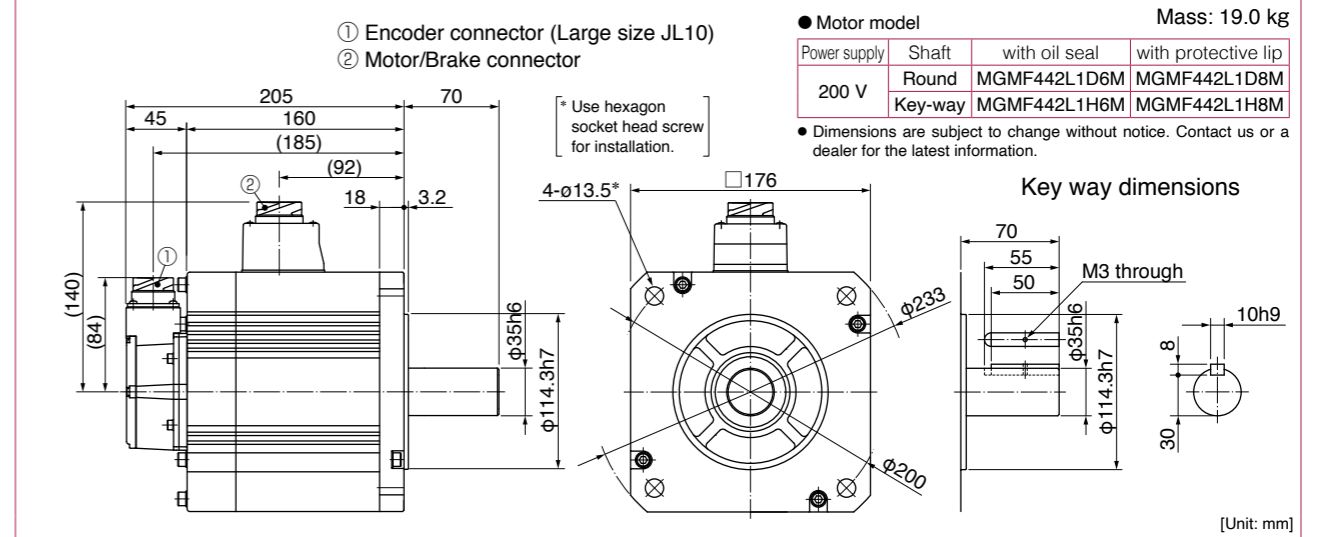
Large size connector (JL10) type · without brake · with oil seal/ with protective lip · Key way shaft/ Round shaft



* For motors specifications, refer to P.250, P.251.

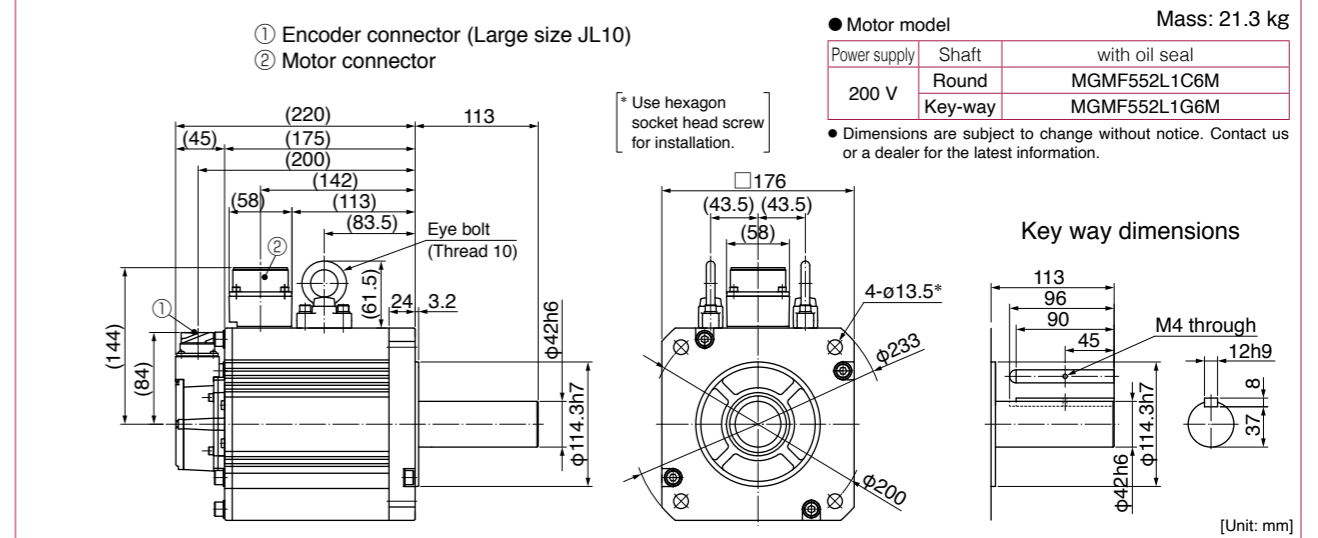
MGMF 4.4 kW

Large size connector (JL10) type · with brake · with oil seal/ with protective lip · Key way shaft/ Round shaft

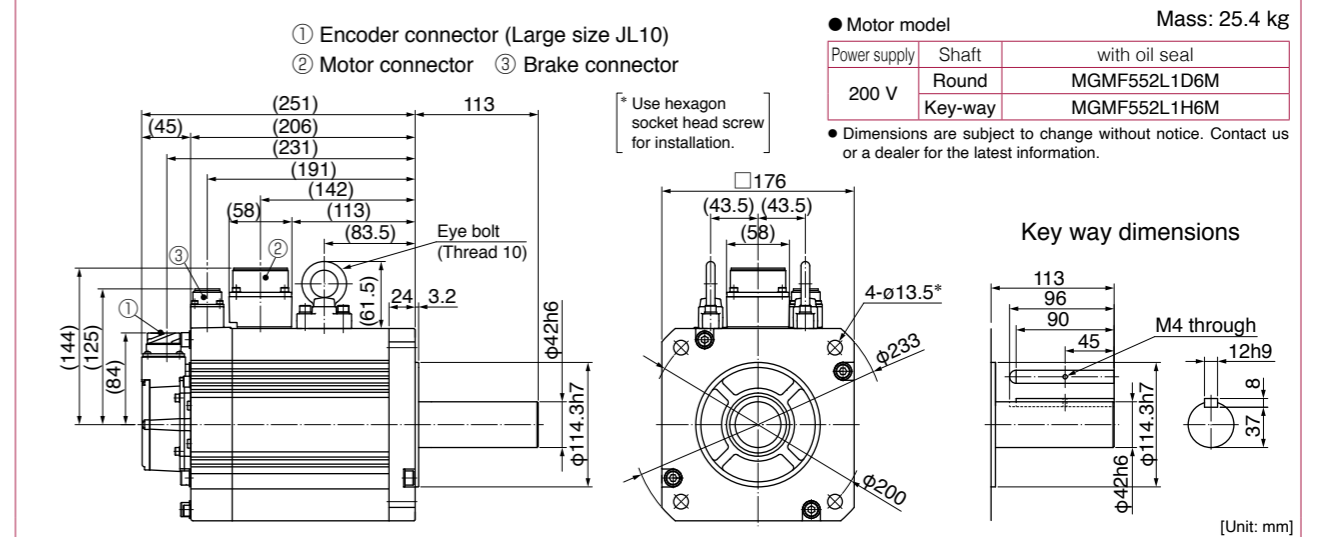


MGMF 5.5 kW

Large size connector (JL10) type · without brake · with oil seal · Key way shaft/ Round shaft

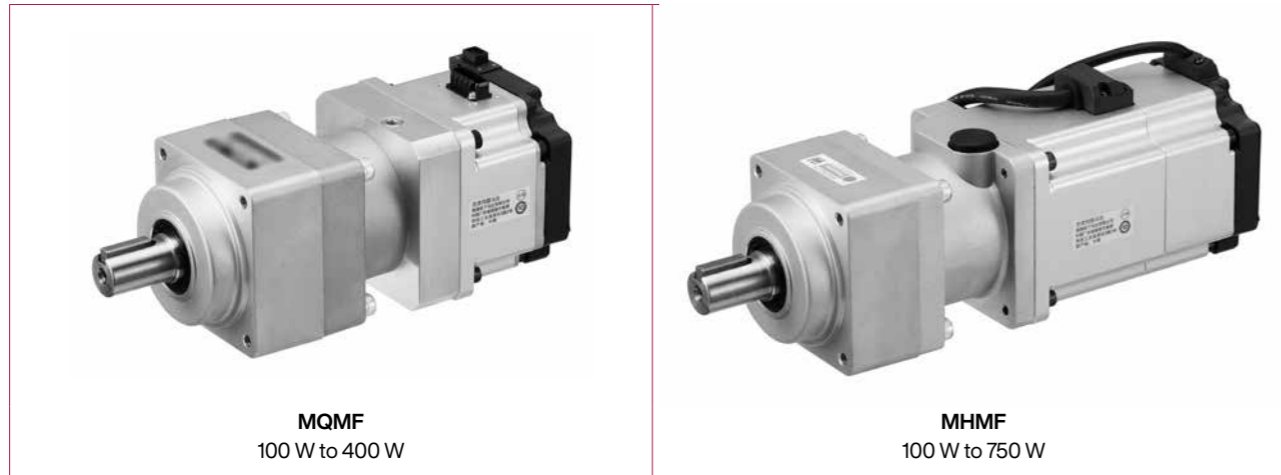


Large size connector (JL10) type · with brake · with oil seal · Key way shaft/ Round shaft



* For motors specifications, refer to P.251, P.252.

Motor Types with Gear Reducer



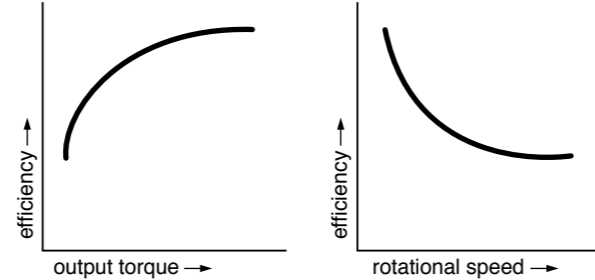
MQMF
100 W to 400 W

MHMF
100 W to 750 W

| Reduction ratio | Motor output (W) | | | | Type of reducer |
|-----------------|------------------|-----|-----|-----|--------------------|
| | 100 | 200 | 400 | 750 | |
| 1/5 | ● | ● | ● | ● | For high precision |
| 1/9 | ● | ● | ● | ● | |
| 1/15 | ● | ● | ● | ● | |
| 1/25 | ● | ● | ● | ● | |

* MQMF 750 W is not prepared.
* MHMF 100 W 1/25, 400 W 1/25 are not prepared.

Efficiency of the gear reducer show the following inclination in relation to output torque and rotational speed.



Specifications of Motor with Gear Reducer

| Items | Specifications |
|---|---|
| Backlash | 3 minutes or smaller (initial value) at output shaft of the reducer |
| Composition of gear | Planetary gear |
| Gear efficiency | 76 % to 87 % |
| Lubrication | Grease lubrication |
| Rotational direction at output shaft | Same direction as the motor output shaft |
| Mounting method | Flange mounting |
| Permissible moment of inertia of the load (conversion to the motor shaft) | 10 times or smaller than rotor moment of inertia of the motor |
| Enclosure rating | IP44 (at gear reducer) |
| Ambient temperature | 0 °C to 40 °C (free from freezing) |
| Storage temperature | -20 °C to 65 °C (Max. temperature guarantee: 80 °C for 72 hours free from condensation) |
| Ambient humidity, Storage humidity | 20 %RH to 85 %RH (free from condensation) |
| Vibration | Lower than 49 m/s ² (5G) at running, 24.5 m/s ² (2.5G) at stall |
| Impact | Lower than 98 m/s ² (10G) |
| Altitude | Lower than 1000 m |

* For combination of elements of model number, refer to Index P.448.

Model Designation

M Q M F 0 1 1 L 3 1 N

| Symbol | Type |
|--------|--|
| MQMF | Middle inertia Flat type 100 W to 400 W |
| MHMF | High inertia 100 W to 750 W |

| Symbol | Series |
|--------|-----------|
| F | A6 Family |

| Symbol | Specifications |
|--------|----------------|
| 01 | 100 W |
| 02 | 200 W |
| 04 | 400 W |
| 08 | 750 W |

| Symbol | Rated output |
|--------|--------------|
| 1 | 100 V |
| 2 | 200 V |

N: Standard

| Symbol | Reduction ratio | Motor output (W) | | | | Type of reducer |
|--------|-----------------|------------------|-----|-----|-----|--------------------|
| | | 100 | 200 | 400 | 750 | |
| 1N | 1/5 | ● | ● | ● | ● | For high precision |
| 2N | 1/9 | ● | ● | ● | ● | |
| 3N | 1/15 | ● | ● | ● | ● | |
| 4N | 1/25 | ● | ● | ● | ● | |

* MQMF 750 W is not prepared.
* MHMF 100 W 1/25, 400 W 1/25 are not prepared.

Rotary encoder specifications

| Symbol | Format | Pulse counts | Resolution | Wire |
|--------|----------|--------------|------------|------|
| L | Absolute | 23-bit | 8388608 | 7 |

<Note>

When using it as an incremental system (not using multi-turn data), do not connect the battery for absolute encoder.

Motor structure

| Symbol | Motor I/F | Shaft | | Holding brake | |
|--------|-----------|---------|---------|---------------|------|
| | | Key way | without | with | with |
| 3 | Connector | ● | ● | | |
| 4 | | ● | | | ● |
| 7 | Leadwire | ● | ● | | |
| 8 | | ● | | | ● |

The Combination of the Driver and the Motor

| Motor series | Motor | | | Driver | |
|-------------------------------------|-----------------------------------|------------|---------------|---------------------|-------------|
| | Power supply | Output (W) | Part No.* | A6SF series | A6SE series |
| | | | | Multi function type | Basic type |
| MQMF Middle inertia Flat type | Single phase 100 V | 100 | MQMF011L □□ N | MADLT11SF | MADLN11SE |
| | | 200 | MQMF021L □□ N | MBDLT21SF | MBDLN21SE |
| | | 400 | MQMF041L □□ N | MCDLT31SF | MCDLN31SE |
| | Single phase/ 3-phase 200 V | 100 | MQMF012L □□ N | MADLT05SF | MADLN05SE |
| | | 200 | MQMF022L □□ N | MADLT15SF | MADLN15SE |
| | | 400 | MQMF042L □□ N | MBDLT25SF | MBDLN25SE |
| MHMF High inertia | Single phase 100 V | 100 | MHMF011L □□ N | MADLT11SF | MADLN11SE |
| | | 200 | MHMF021L □□ N | MBDLT21SF | MBDLN21SE |
| | | 400 | MHMF041L □□ N | MCDLT31SF | MCDLN31SE |
| | Single phase/ 3-phase 200 V | 100 | MHMF012L □□ N | MADLT05SF | MADLN05SE |
| | | 200 | MHMF022L □□ N | MADLT15SF | MADLN15SE |
| | | 400 | MHMF042L □□ N | MBDLT25SF | MBDLN25SE |
| | | 750 | MHMF082L □□ N | MCDLT35SF | MCDLN35SE |

* The symbols of the motor structure and the gear reduction ratio are entered in □□ of the motor part number. Please refer to the above "Model Designation".

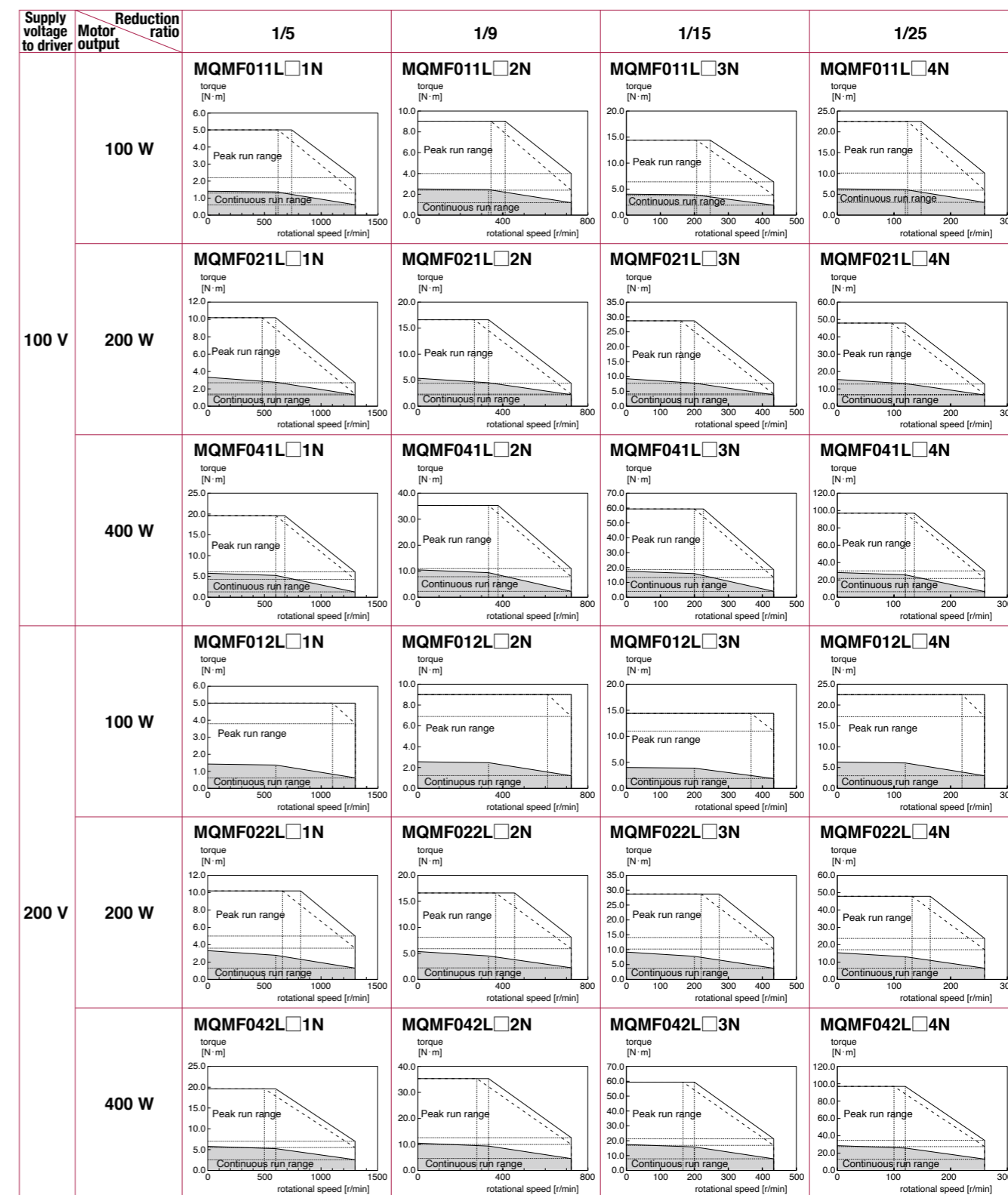
* Motor options: Please check the upper 9th digit of the motor part number. If the motor is connector type, refer to P.31 to P.32. And if the motor is leadwire type, refer to P.29 to P.30.

Table of Motor Specifications

| Part No.* | Motor Output (W) | Reduction ratio | Output (W) | Rated speed (r/min) | Max. speed (r/min) | Rated torque (N·m) | Peak max. torque (N·m) | Moment of inertia (motor + reducer/ converted to motor shaft) | | Mass | | Permissible radial load (N) | Permissible thrust load (N) |
|--------------------------------------|------------------|-----------------|------------|---------------------|--------------------|--------------------|------------------------|---|----------|-----------|----------|-----------------------------|-----------------------------|
| | | | | | | | | w/o brake | w/ brake | w/o brake | w/ brake | | |
| | | | | | | | | J (x10 ⁻⁴ kg·m ²) | | (kg) | | | |
| MQMF Middle inertia Flat type | | | | | | | | | | | | | |
| MQMF01□L□1N | 100 | 1/5 | 85 | 600 | 1300 | 1.36 | 5.01 | 0.210 | 0.240 | 1.2 | 1.4 | 490 | 245 |
| MQMF01□L□2N | | 1/9 | 85 | 333 | 722 | 2.45 | 9.02 | 0.200 | 0.230 | 1.2 | 1.4 | 588 | 294 |
| MQMF01□L□3N | | 1/15 | 81 | 200 | 433 | 3.89 | 14.4 | 0.207 | 0.237 | 1.4 | 1.7 | 784 | 392 |
| MQMF01□L□4N | | 1/25 | 76 | 120 | 260 | 6.08 | 22.5 | 0.287 | 0.317 | 2.6 | 2.9 | 1670 | 833 |
| MQMF02□L□1N | 200 | 1/5 | 175 | 600 | 1300 | 2.78 | 10.2 | 0.650 | 0.740 | 1.9 | 2.3 | 490 | 245 |
| MQMF02□L□2N | | 1/9 | 157 | 333 | 722 | 4.49 | 16.6 | 0.770 | 0.860 | 3.0 | 3.4 | 1180 | 588 |
| MQMF02□L□3N | | 1/15 | 163 | 200 | 433 | 7.78 | 28.7 | 0.800 | 0.890 | 3.4 | 3.8 | 1470 | 735 |
| MQMF02□L□4N | | 1/25 | 163 | 120 | 260 | 13.0 | 47.9 | 0.790 | 0.880 | 3.4 | 3.8 | 1670 | 833 |
| MQMF04□L□1N | 400 | 1/5 | 331 | 600 | 1300 | 5.27 | 19.6 | 1.35 | 1.43 | 3.4 | 3.9 | 980 | 490 |
| MQMF04□L□2N | | 1/9 | 331 | 333 | 722 | 9.49 | 35.3 | 1.25 | 1.33 | 3.4 | 3.9 | 1180 | 588 |
| MQMF04□L□3N | | 1/15 | 335 | 200 | 433 | 16.0 | 59.4 | 1.28 | 1.36 | 3.8 | 4.3 | 1470 | 735 |
| MQMF04□L□4N | | 1/25 | 327 | 120 | 260 | 26.0 | 96.9 | 1.31 | 1.39 | 5.4 | 5.9 | 2060 | 1030 |
| MHMF High inertia | | | | | | | | | | | | | |
| MHMF01□L□1N | 100 | 1/5 | 85 | 600 | 1300 | 1.36 | 5.01 | 0.131 | 0.134 | 1.0 | 1.2 | 490 | 245 |
| MHMF01□L□2N | | 1/9 | 85 | 333 | 722 | 2.45 | 9.02 | 0.121 | 0.124 | 1.0 | 1.2 | 588 | 294 |
| MHMF01□L□3N | | 1/15 | 81 | 200 | 433 | 3.89 | 14.4 | 0.124 | 0.127 | 1.1 | 1.3 | 784 | 392 |
| MHMF02□L□1N | 200 | 1/5 | 175 | 600 | 1300 | 2.78 | 10.2 | 0.437 | 0.457 | 1.5 | 1.8 | 490 | 245 |
| MHMF02□L□2N | | 1/9 | 157 | 333 | 722 | 4.49 | 16.6 | 0.563 | 0.583 | 2.5 | 2.8 | 1180 | 588 |
| MHMF02□L□3N | | 1/15 | 163 | 200 | 433 | 7.78 | 28.7 | 0.592 | 0.612 | 2.9 | 3.2 | 1470 | 735 |
| MHMF02□L□4N | 400 | 1/25 | 163 | 120 | 260 | 13.0 | 47.9 | 0.583 | 0.603 | 2.9 | 3.2 | 1670 | 833 |
| MHMF04□L□1N | | 1/5 | 339 | 600 | 1300 | 5.39 | 19.6 | 0.930 | 0.950 | 2.8 | 3.2 | 980 | 490 |
| MHMF04□L□2N | | 1/9 | 332 | 333 | 722 | 9.51 | 35.3 | 0.833 | 0.853 | 2.8 | 3.2 | 1180 | 588 |
| MHMF04□L□3N | 750 | 1/15 | 335 | 200 | 433 | 16.0 | 59.4 | 0.862 | 0.882 | 3.2 | 3.6 | 1470 | 735 |
| MHMF082L□1N | | 1/5 | 672 | 600 | 1200 | 10.7 | 38.4 | 2.38 | 2.48 | 4.3 | 5.0 | 980 | 490 |
| MHMF082L□2N | | 1/9 | 645 | 333 | 667 | 18.5 | 68.4 | 2.32 | 2.42 | 5.6 | 6.3 | 1470 | 735 |
| MHMF082L□3N | | 1/15 | 637 | 200 | 400 | 30.4 | 111 | 2.25 | 2.35 | 6.0 | 6.7 | 1760 | 882 |
| MHMF082L□4N | 750 | 1/25 | 637 | 120 | 240 | 50.7 | 186 | 2.22 | 2.32 | 6.0 | 6.7 | 2060 | 1030 |

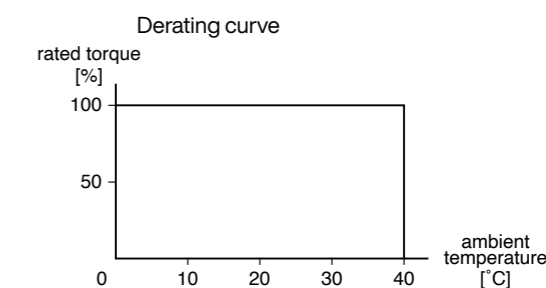
* The symbols of the voltage specifications and the motor structure are entered in □ of the motor part number. Please refer to "Model Designation" in P.294.

MQMF series (100 W to 400 W)

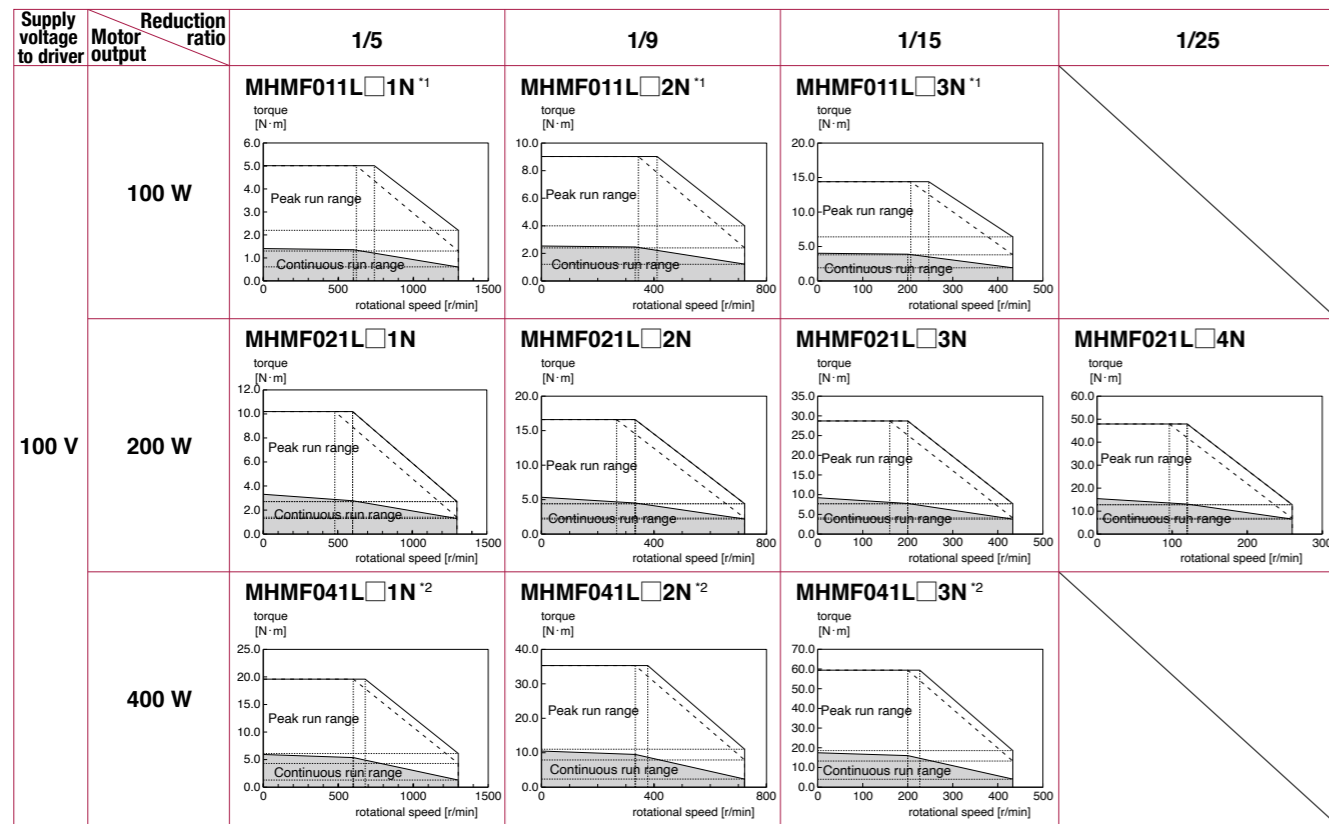


Dotted line represents the torque at 10% less supply voltage to driver.

* The symbols of the motor structure are entered in □ of the motor part number. Please refer to "Model Designation" in P.294.



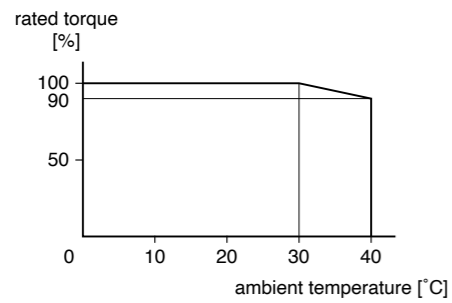
MHMF series (100 W to 750 W)



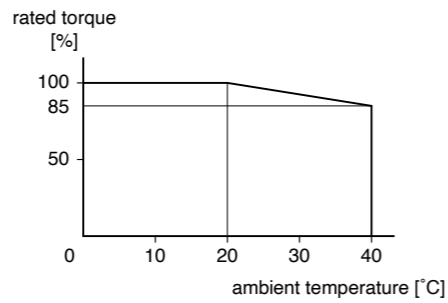
Dotted line represents the torque at 10 % less supply voltage to driver.

* The symbols of the motor structure are entered in □ of the motor part number. Please refer to "Model Designation" in P.294.

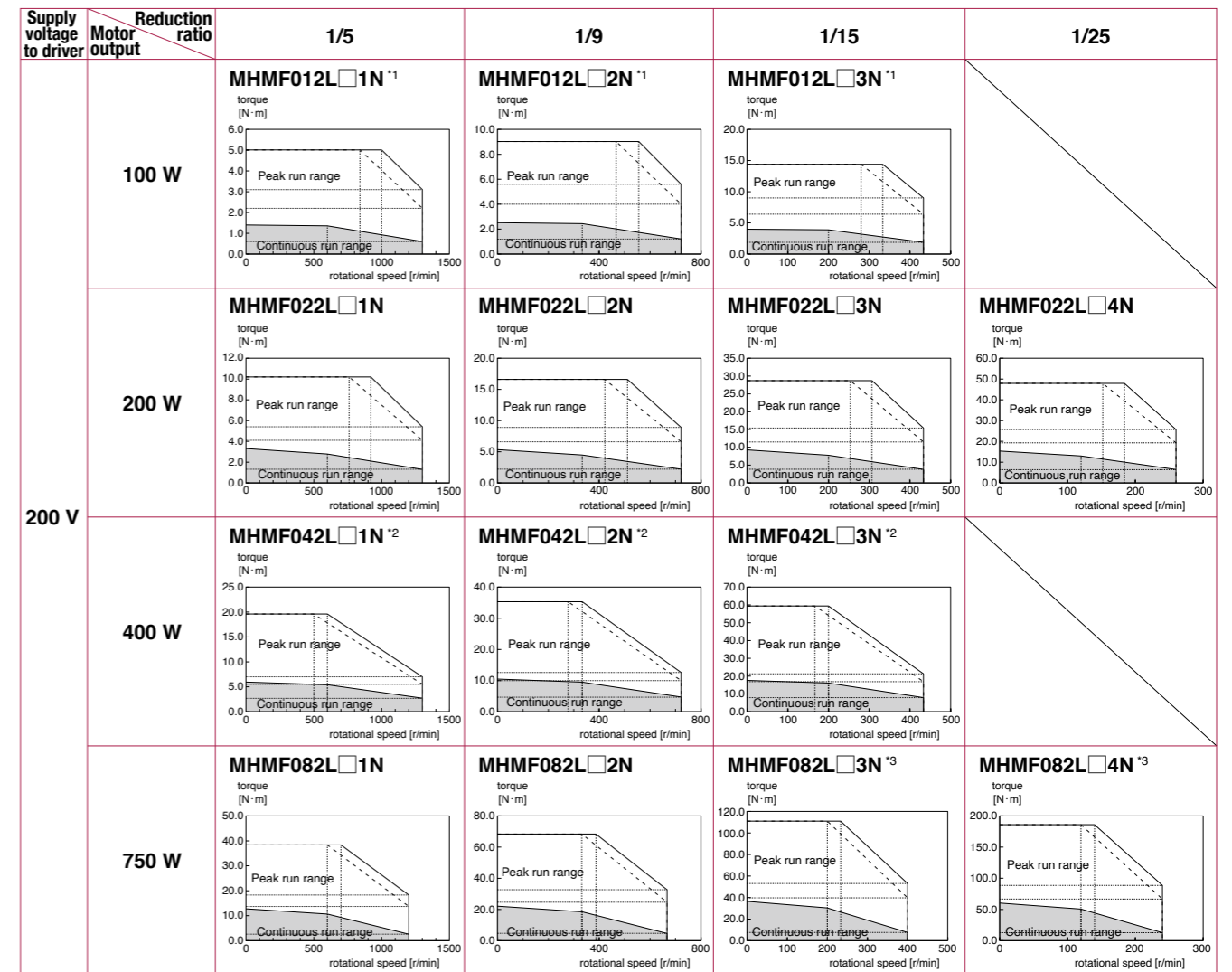
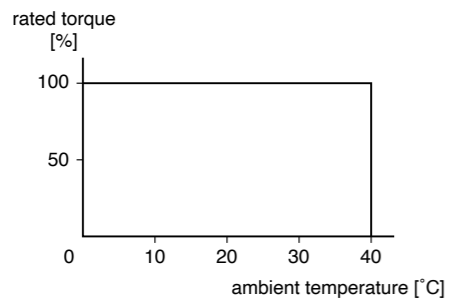
*1 Derating curve



*2 Derating curve



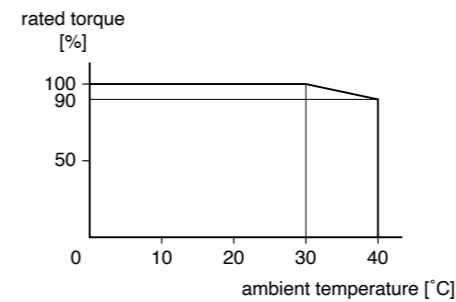
Motor number without *1, *2 Derating curve



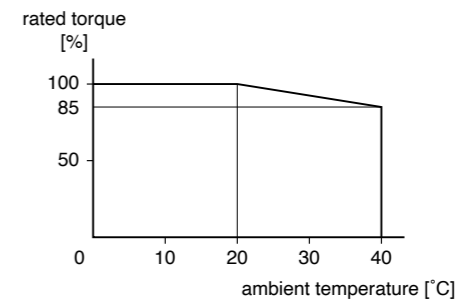
Dotted line represents the torque at 10 % less supply voltage to driver.

* The symbols of the motor structure are entered in □ of the motor part number. Please refer to "Model Designation" in P.294.

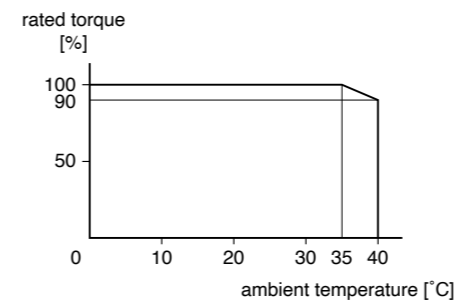
*1 Derating curve



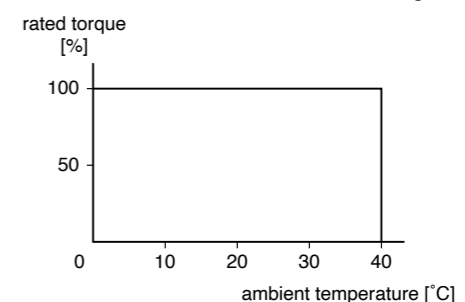
*2 Derating curve



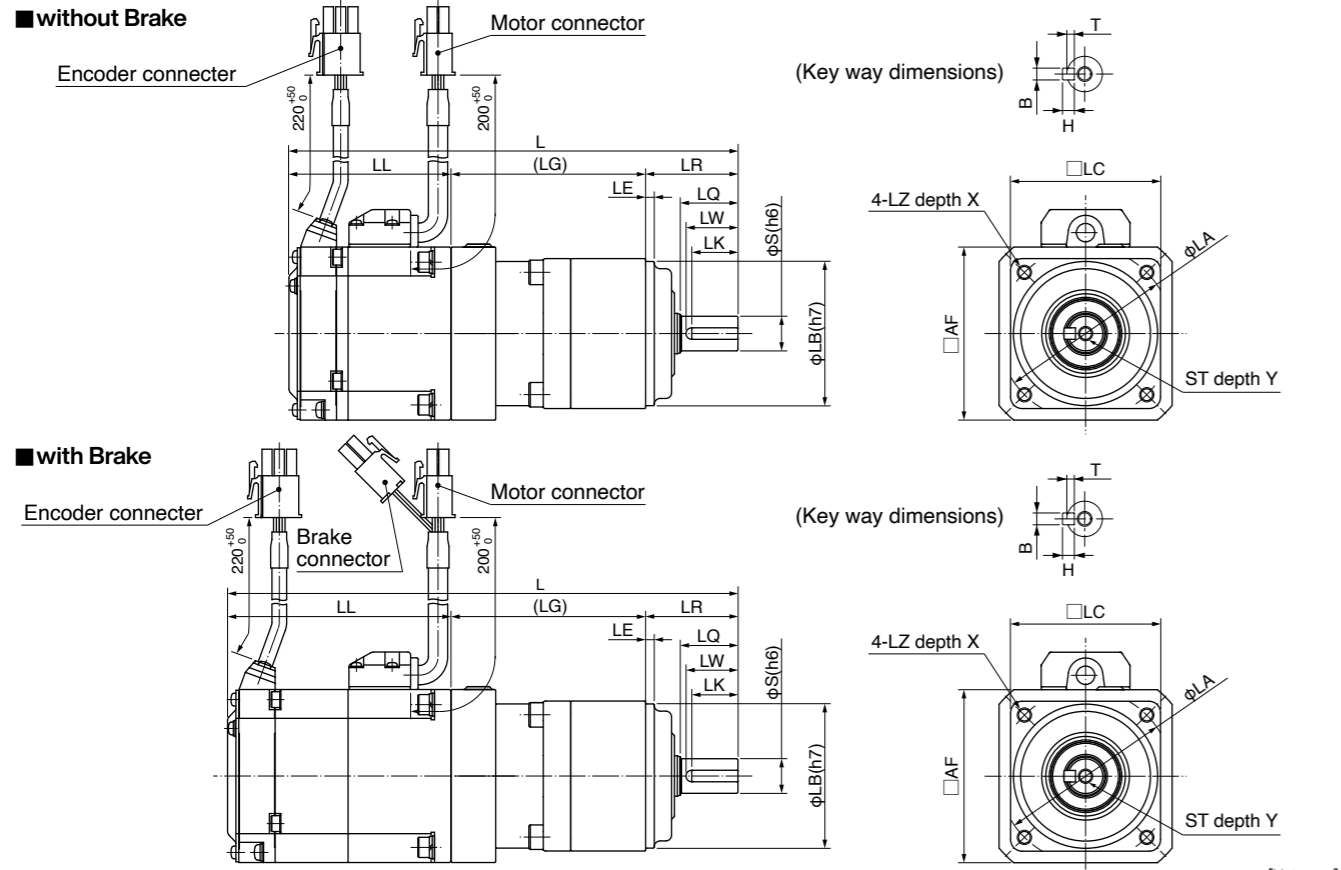
*3 Derating curve



Motor number without *1, *2, *3 Derating curve



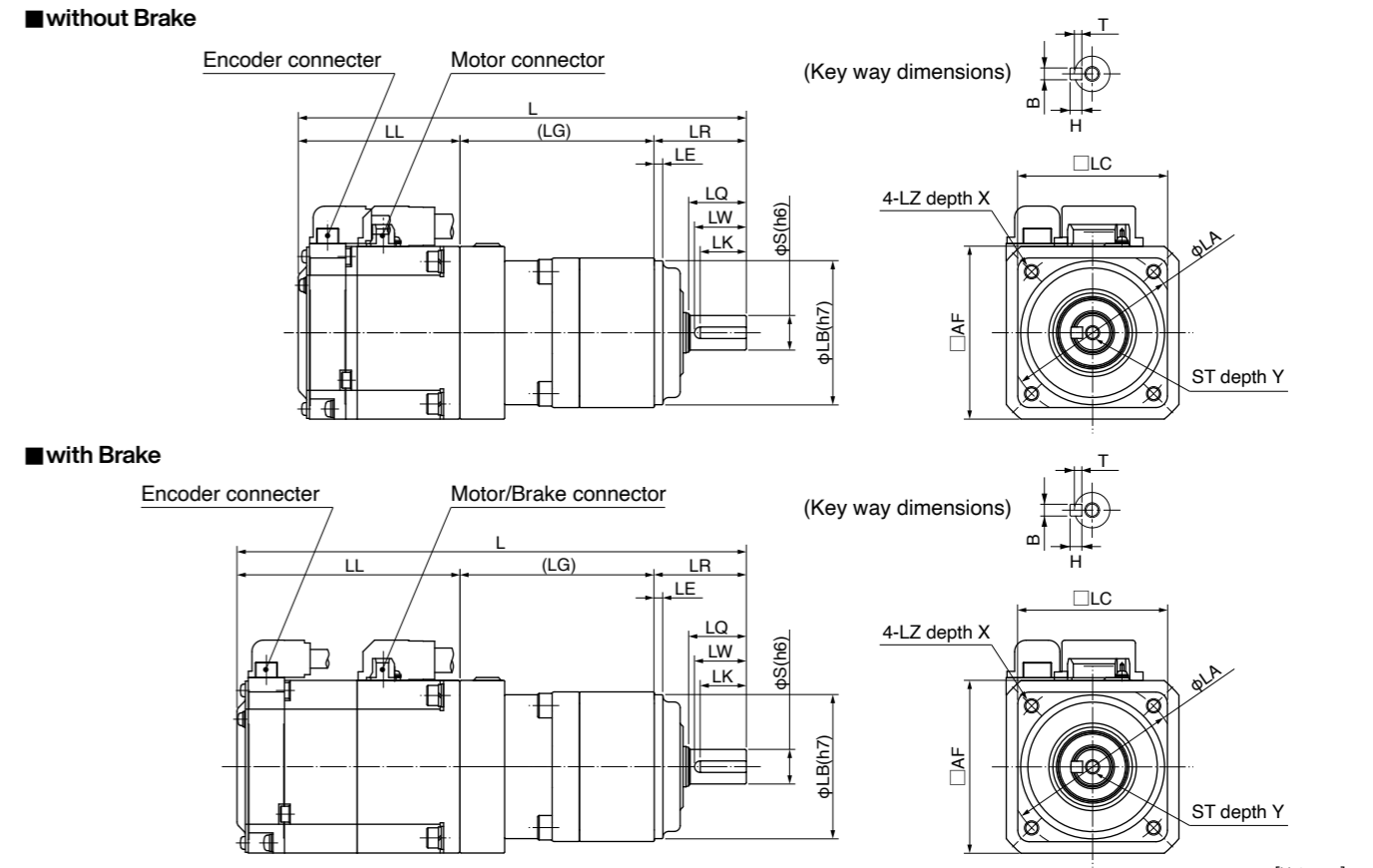
MQMF series (Leadwire type)



| Motor Part No. ^{*1} | Motor output (W) | Reduction ratio | L | without Brake with Brake | without Brake with Brake | (LG) | LR | LQ | LW | LK | S | BxT | H | ST | Y | LB | LA | LE | LZ | LC ^{*2} | X | AF ^{*2} |
|------------------------------|------------------|-----------------|-------|--------------------------|--------------------------|------|----|----|----|----|-------|-----|----|----|----|-----|----|----|----|------------------|----|------------------|
| MQMF01□L□1N | 100 | 1/5 | 155.7 | 56.2 | 67.5 | 32 | 20 | 18 | 16 | 12 | 4x2.5 | 4 | M5 | 10 | 50 | 60 | 3 | M5 | 52 | 12 | 60 | |
| | | | 177 | 77.5 | | | | | | | | | | | | | | | | | | |
| | | 1/9 | 155.7 | 56.2 | | | | | | | | | | | | | | | | | | |
| | | | 177 | 77.5 | | | | | | | | | | | | | | | | | | |
| MQMF01□L□2N | 100 | 1/15 | 171.7 | 56.2 | 83.5 | 50 | 30 | 26 | 22 | 19 | 6x3.5 | 6 | M6 | 12 | 70 | 90 | M6 | 78 | 20 | | | |
| | | | 193 | 77.5 | | | | | | | | | | | | | | | | | | |
| | | 1/25 | 199.7 | 56.2 | | | | | | | | | | | | | | | | | | |
| | | | 221 | 77.5 | | | | | | | | | | | | | | | | | | |
| MQMF01□L□3N | 100 | 1/5 | 166.8 | 62.3 | 72.5 | 32 | 20 | 18 | 16 | 12 | 4x2.5 | 4 | M5 | 10 | 50 | 60 | M5 | 52 | 12 | | | |
| | | | 190.4 | 85.9 | | | | | | | | | | | | | | | | | | |
| | | 1/9 | 201.8 | 62.3 | | | | | | | | | | | | | | | | | | |
| | | | 225.4 | 85.9 | | | | | | | | | | | | | | | | | | |
| MQMF01□L□4N | 100 | 1/15 | 212.3 | 62.3 | 89.5 | 50 | 30 | 26 | 22 | 19 | 6x3.5 | 6 | M6 | 12 | 70 | 90 | 3 | M6 | 78 | 20 | | |
| | | | 235.9 | 85.9 | | | | | | | | | | | | | | | | | | |
| | | 1/25 | 212.3 | 62.3 | | | | | | | | | | | | | | | | | | |
| | | | 235.9 | 85.9 | | | | | | | | | | | | | | | | | | |
| MQMF02□L□1N | 200 | 1/5 | 214.3 | 74.8 | 89.5 | 50 | 30 | 26 | 22 | 19 | 6x3.5 | 6 | M6 | 12 | 70 | 90 | 3 | M6 | 78 | | | |
| | | | 237.9 | 98.4 | | | | | | | | | | | | | | | | | | |
| | | 1/9 | 214.3 | 74.8 | | | | | | | | | | | | | | | | | | |
| | | | 237.9 | 98.4 | | | | | | | | | | | | | | | | | | |
| MQMF02□L□2N | 200 | 1/15 | 224.8 | 74.8 | 100 | 61 | 40 | 35 | 30 | 24 | 8x4 | 7 | M8 | 16 | 90 | 115 | 5 | M8 | 98 | | | |
| | | | 248.4 | 98.4 | | | | | | | | | | | | | | | | | | |
| | | 1/25 | 239.8 | 74.8 | | | | | | | | | | | | | | | | | | |
| | | | 263.4 | 98.4 | | | | | | | | | | | | | | | | | | |

*1 The symbols of the voltage specifications and the motor structure are entered in □ of the motor part number. Please refer to "Model Designation" in P294.
 *2 □LC: flange size of the reduction gear □, AF: □ flange size of the motor

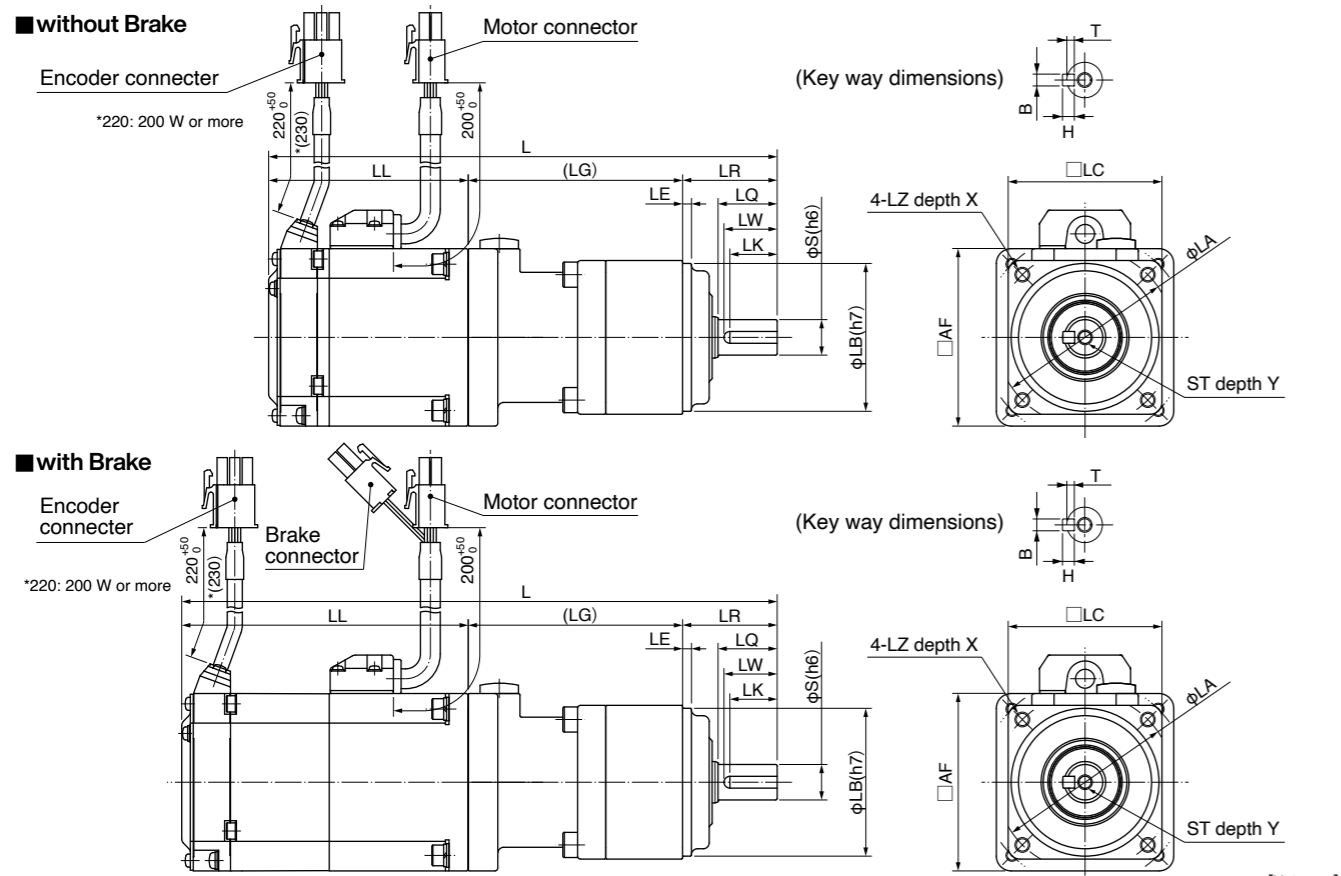
MQMF series (Connector type)



| Motor Part No. ^{*1} | Motor output (W) | Reduction ratio | L | without Brake with Brake | without Brake with Brake | (LG) | LR | LQ | LW | LK | S | BxT | H | ST | Y | LB | LA | LE | LZ | LC ^{*2} | X | AF ^{*2} |
|------------------------------|------------------|-----------------|-------|--------------------------|--------------------------|------|----|----|----|----|-------|-----|----|----|----|-----|----|----|----|------------------|----|------------------|
| MQMF01□L□1N | 100 | 1/5 | 155.7 | 56.2 | 67.5 | 32 | 20 | 18 | 16 | 12 | 4x2.5 | 4 | M5 | 10 | 50 | 60 | 3 | M5 | 52 | 12 | 60 | |
| | | | 177 | 77.5 | | | | | | | | | | | | | | | | | | |
| | | 1/9 | 155.7 | 56.2 | | | | | | | | | | | | | | | | | | |
| | | | 177 | 77.5 | | | | | | | | | | | | | | | | | | |
| MQMF01□L□2N | 100 | 1/15 | 171.7 | 56.2 | 83.5 | 50 | 30 | 26 | 22 | 19 | 6x3.5 | 6 | M6 | 12 | 70 | 90 | M6 | 78 | 20 | | | |
| | | | 193 | 77.5 | | | | | | | | | | | | | | | | | | |
| | | 1/25 | 199.7 | 56.2 | | | | | | | | | | | | | | | | | | |
| | | | 221 | 77.5 | | | | | | | | | | | | | | | | | | |
| MQMF01□L□3N | 100 | 1/5 | 166.8 | 62.3 | 72.5 | 32 | 20 | 18 | 16 | 12 | 4x2.5 | 4 | M5 | 10 | 50 | 60 | M5 | 52 | 12 | | | |
| | | | 190.4 | 85.9 | | | | | | | | | | | | | | | | | | |
| | | 1/9 | 201.8 | 62.3 | | | | | | | | | | | | | | | | | | |
| | | | 225.4 | 85.9 | | | | | | | | | | | | | | | | | | |
| MQMF01□L□4N | 100 | 1/15 | 212.3 | 62.3 | 89.5 | 50 | 30 | 26 | 22 | 19 | 6x3.5 | 6 | M6 | 12 | 70 | 90 | 3 | M6 | 78 | 20 | | |
| | | | 235.9 | 85.9 | | | | | | | | | | | | | | | | | | |
| | | 1/25 | 212.3 | 62.3 | | | | | | | | | | | | | | | | | | |
| | | | 235.9 | 85.9 | | | | | | | | | | | | | | | | | | |
| MQMF02□L□1N | 200 | 1/5 | 214.3 | 74.8 | 89.5 | 50 | 30 | 26 | 22 | 19 | 6x3.5 | 6 | M6 | 12 | 70 | 90 | 3 | M6 | 78 | | | |
| | | | 237.9 | 98.4 | | | | | | | | | | | | | | | | | | |
| | | 1/9 | 214.3 | 74.8 | | | | | | | | | | | | | | | | | | |
| | | | 237.9 | 98.4 | | | | | | | | | | | | | | | | | | |
| MQMF02□L□2N | 200 | 1/15 | 224.8 | 74.8 | 100 | 61 | 40 | 35 | 30 | 24 | 8x4 | 7 | M8 | 16 | 90 | 115 | 5 | M8 | 98 | | | |
| | | | 248.4 | 98.4 | | | | | | | | | | | | | | | | | | |
| | | 1/25 | 239.8 | 74.8 | | | | | | | | | | | | | | | | | | |
| | | | 263.4 | 98.4 | | | | | | | | | | | | | | | | | | |

*1 The symbols of the voltage specifications and the motor structure are entered in □ of the motor part number. Please refer to "Model Designation" in P294.
 *2 □LC: flange size of the reduction gear □, AF: □ flange size of the motor

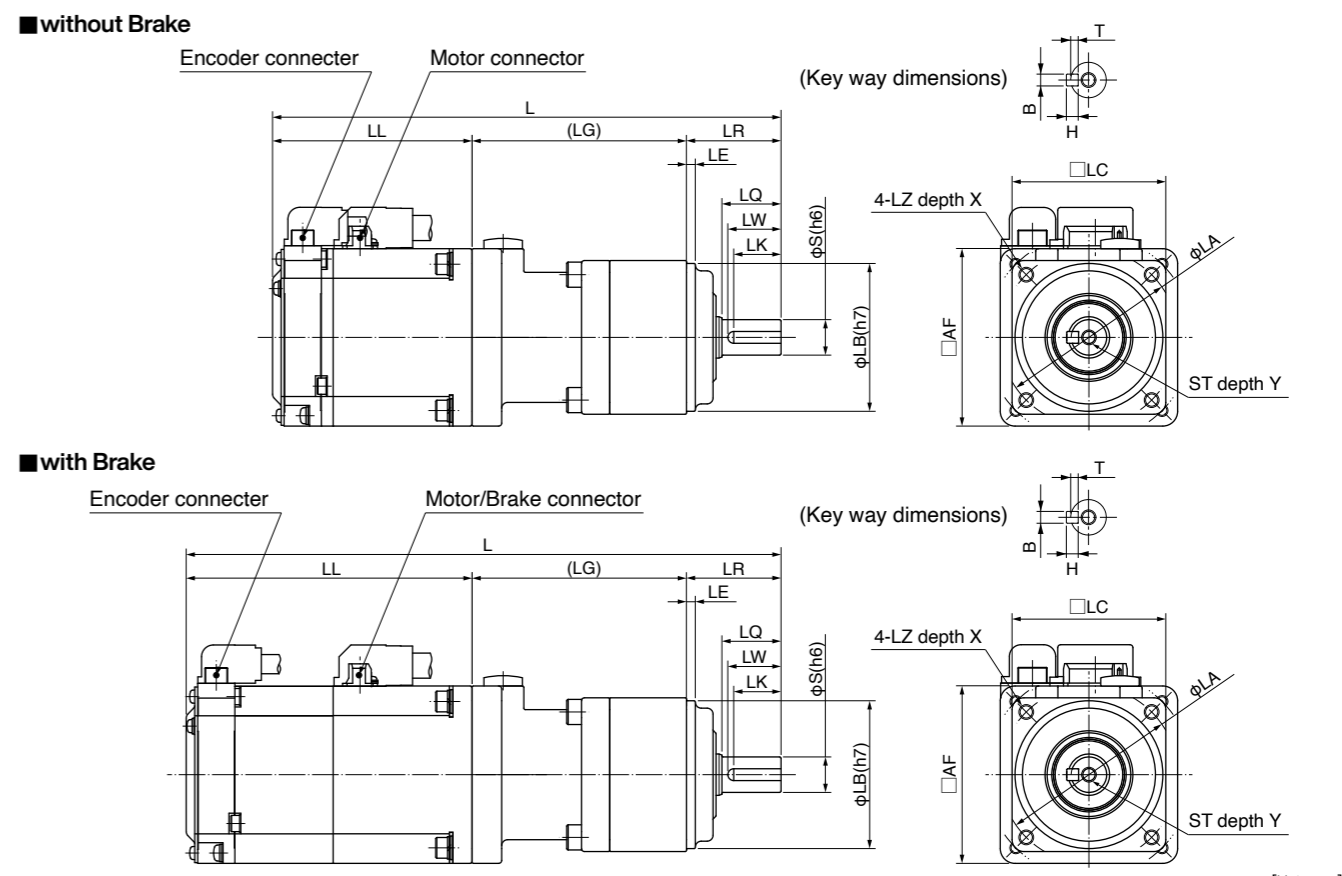
MHMF series (Leadwire type)



| Motor Part No.*1 | Motor output (W) | Reduction ratio | L | without Brake with Brake | LL | (LG) | LR | LQ | LW | LK | S | BxT | H | ST | Y | LB | LA | LE | LZ | LC | X | AF |
|------------------|------------------|-----------------|-------|--------------------------|------|------|----|----|----|----|----|-------|---|----|----|----|----|----|----|----|----|----|
| MHMF01□L□1N | 100 | 1/5 | 167 | 67.5 | 67.5 | 78 | 32 | 20 | 18 | 16 | 12 | 4x2.5 | 4 | M5 | 10 | 50 | 60 | 3 | M5 | 52 | 12 | 40 |
| MHMF01□L□2N | | 1/9 | 200.9 | 101.4 | | | | | | | | | | | | | | | | | | |
| MHMF01□L□3N | | 1/15 | 211.4 | 101.4 | | | | | | | | | | | | | | | | | | |
| MHMF02□L□1N | 200 | 1/5 | 172 | 67.5 | 89.5 | 100 | 32 | 20 | 18 | 16 | 12 | 4x2.5 | 4 | M5 | 10 | 50 | 60 | 3 | M5 | 52 | 12 | 60 |
| MHMF02□L□2N | | 1/9 | 207 | 67.5 | | | | | | | | | | | | | | | | | | |
| MHMF02□L□3N | | 1/15 | 217.5 | 67.5 | | | | | | | | | | | | | | | | | | |
| MHMF02□L□4N | | 1/25 | 246.8 | 96.8 | | | | | | | | | | | | | | | | | | |
| MHMF04□L□1N | 400 | 1/5 | 224 | 84.5 | 89.5 | 100 | 50 | 30 | 26 | 22 | 19 | 6x3.5 | 6 | M6 | 12 | 70 | 90 | 3 | M6 | 78 | 20 | 60 |
| MHMF04□L□2N | | 1/9 | 253.3 | 113.8 | | | | | | | | | | | | | | | | | | |
| MHMF04□L□3N | | 1/15 | 263.8 | 113.8 | | | | | | | | | | | | | | | | | | |
| MHMF082L□1N | 750 | 1/5 | 235.4 | 91.9 | 97.5 | 110 | 50 | 30 | 26 | 22 | 19 | 6x3.5 | 6 | M6 | 12 | 70 | 90 | 3 | M6 | 78 | 20 | 80 |
| MHMF082L□2N | | 1/9 | 250.4 | 91.9 | | | | | | | | | | | | | | | | | | |
| MHMF082L□3N | | 1/15 | 262.9 | 91.9 | | | | | | | | | | | | | | | | | | |
| MHMF082L□4N | | 1/25 | 296.5 | 125.5 | | | | | | | | | | | | | | | | | | |

*1 The symbols of the voltage specifications and the motor structure are entered in □ of the motor part number. Please refer to "Model Designation" in P294.
 *2 □LC: flange size of the reduction gear □, AF: □ flange size of the motor

MHMF series (Connector type)



| Motor Part No.*1 | Motor output (W) | Reduction ratio | L | without Brake with Brake | LL | (LG) | LR | LQ | LW | LK | S | BxT | H | ST | Y | LB | LA | LE | LZ | LC | X | AF |
|------------------|------------------|-----------------|-------|--------------------------|------|------|----|----|----|----|----|-------|---|----|----|----|----|----|----|----|----|----|
| MHMF01□L□1N | 100 | 1/5 | 167 | 67.5 | 67.5 | 78 | 32 | 20 | 18 | 16 | 12 | 4x2.5 | 4 | M5 | 10 | 50 | 60 | 3 | M5 | 52 | 12 | 40 |
| MHMF01□L□2N | | 1/9 | 200.9 | 101.4 | | | | | | | | | | | | | | | | | | |
| MHMF01□L□3N | | 1/15 | 211.4 | 101.4 | | | | | | | | | | | | | | | | | | |
| MHMF02□L□1N | 200 | 1/5 | 172 | 67.5 | 89.5 | 100 | 32 | 20 | 18 | 16 | 12 | 4x2.5 | 4 | M5 | 10 | 50 | 60 | 3 | M5 | 52 | 12 | 60 |
| MHMF02□L□2N | | 1/9 | 207 | 67.5 | | | | | | | | | | | | | | | | | | |
| MHMF02□L□3N | | 1/15 | 217.5 | 67.5 | | | | | | | | | | | | | | | | | | |
| MHMF02□L□4N | | 1/25 | 246.8 | 96.8 | | | | | | | | | | | | | | | | | | |
| MHMF04□L□1N | 400 | 1/5 | 224 | 84.5 | 89.5 | 100 | 50 | 30 | 26 | 22 | 19 | 6x3.5 | 6 | M6 | 12 | 70 | 90 | 3 | M6 | 78 | 20 | 60 |
| MHMF04□L□2N | | 1/9 | 253.3 | 113.8 | | | | | | | | | | | | | | | | | | |
| MHMF04□L□3N | | 1/15 | 263.8 | 113.8 | | | | | | | | | | | | | | | | | | |
| MHMF082L□1N | 750 | 1/5 | 235.4 | 91.9 | 97.5 | 110 | 50 | 30 | 26 | 22 | 19 | 6x3.5 | 6 | M6 | 12 | 70 | 90 | 3 | M6 | 78 | 20 | 80 |
| MHMF082L□2N | | 1/9 | 250.4 | 91.9 | | | | | | | | | | | | | | | | | | |
| MHMF082L□3N | | 1/15 | 262.9 | 91.9 | | | | | | | | | | | | | | | | | | |
| MHMF082L□4N | | 1/25 | 296.5 | 125.5 | | | | | | | | | | | | | | | | | | |

*1 The symbols of the voltage specifications and the motor structure are entered in □ of the motor part number. Please refer to "Model Designation" in P294.
 *2 □LC: flange size of the reduction gear □, AF: □ flange size of the motor

Environmental Conditions

| Item | Conditions |
|-------------------------------|---|
| Ambient temperature *1 | 0 °C to 40 °C (free from freezing) |
| Ambient humidity | 20 %RH to 85 %RH (free from condensation *5*6) |
| Storage temperature *2 | -20 °C to 65 °C (Max.temperature guarantee: 80 °C for 72 hours free from condensation *5) |
| Storage humidity | 20 %RH to 85 %RH (free from condensation *5*6) |
| Vibration | Motor only Lower than 49 m/s ² (5 G) at running, 24.5 m/s ² (2.5 G) at stall*7 |
| Impact | Motor only Lower than 98 m/s ² (10 G) |
| Enclosure rating (Motor only) | IP65 *3 MSMF, MQMF, MHMF (except rotating portion of output shaft and leadwire end.) (MSMF, MQMF, MHMF In case of leadwire type.) |
| | IP67 *3*4 IP67 motor (except rotating portion of output shaft and connecting pin part of the motor connector and the encoder connector) |
| | IP44 *3 Excludes output shaft rotating part, connector connection pin part, and motor lead hole part of terminal box. |
| Altitude | Lower than 1000 m |

- *1 Ambient temperature to be measured at 5 cm away from the motor.
- *2 Permissible temperature for short duration such as transportation.
- *3 These motors conform to the test conditions specified in EN standards (EN60529, EN60034-5). Do not use these motors in application where water proof performance is required such as continuous wash-down operation.
- *4 This condition is applied when the connector mounting screw are tightened to the recommended tightening torque.
- *5 Air containing water vapor will become saturated with water vapor as the temperature falls, causing dew.
- *6 The terminal block of MDMFD22L1□□ is between 45%RH to 85%RH.
- *7 For motors with rated output capacity of 5.5 kW or more, both motor rotation and stop will be 24.5 m/s² (2.5 G) or less.

<Note>
Initial setup of rotational direction: positive = CCW and negative = CW. Pay an extra attention.

| IP65 | IP67 |
|-------------------------------------|------------------|
| (1000 W or less) <Leadwire type> | <Connector type> |

Notes on [Motor specification] page

Note) 1. Regenerative resistors are not built in drivers of A and B frames. When regeneration occurs, prepare an optional external regenerative resistor.

[At AC100 V of power voltage]

Regenerative brake frequency represents the frequency of the motor's stops from the rated speed with deceleration without load.

- If the load is connected, frequency will be defines as 1/(m+1), where m=load moment of inertia/rotor moment of inertia.
- When the motor speed exceeds the rated speed, regenerative brake frequency is in inverse proportion to the square of (running speed/rated speed).
- Power supply voltage is AC115 V (at 100 V of the main voltage).
If the supply voltage fluctuates, frequency is in inverse proportion to the square of (Running supply voltage/115) relative to the value in the table.
- When regeneration occurs continuously such cases as running speed frequently changes or vertical feeding, consult us or a dealer.

[At AC200 V of power voltage]

Regenerative brake frequency represents the frequency of the motor's stops from the rated speed with deceleration without load.

- If the load is connected, frequency will be defines as 1/(m+1), where m=load moment of inertia/rotor moment of inertia.
- When the motor speed exceeds the rated speed, regenerative brake frequency is in inverse proportion to the square of (running speed/rated speed).
- Power supply voltage is AC230 V (at 200 V of the main voltage).
If the supply voltage fluctuates, frequency is in inverse proportion to the square of (Running supply voltage/230) relative to the value in the table.

- When regeneration occurs continuously such cases as running speed frequently changes or vertical feeding, consult us or a dealer.

Note) 2. If the effective torque is within the rated torque, there is no limit in generative brake.

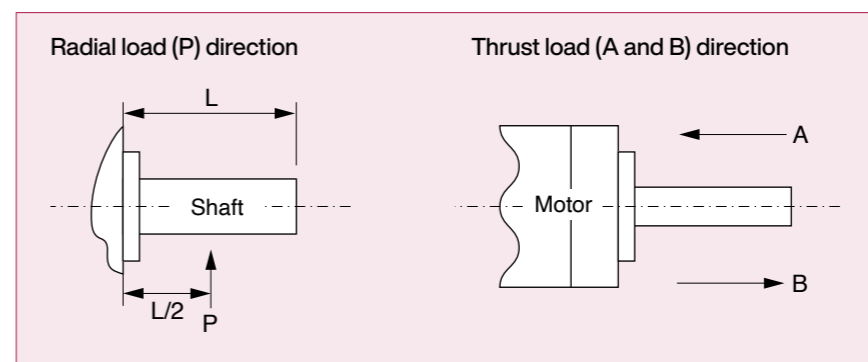
Note) 3. Consult us or a dealer if the load moment of inertia exceeds the specified value.

Note) 4. Releasing time values represent the ones with DC-cutoff using a varistor.

Permissible Load at Output Shaft

The radial load is defined as a load applied to the output shaft in the right-angle direction. This load is generated when the gear head is coupled to the machine using a chain, belt, etc., but not when the gear head is directly connected to the coupling. As shown in the right figure, the permissible value is determined based on the load applied to the L/2 position of the output shaft. The thrust load is defined as a load applied to the output shaft in the axial direction.

Because the radial load and thrust load significantly affect the life of the bearing, take care not to allow the load during operation to exceed the permissible radial load and thrust load shown in the table below.



Built-in Holding Brake

In the applications where the motor drives the vertical axis, this brake would be used to hold and prevent the work (moving load) from falling by gravity while the power to the servo is shut off.

Use this built-in brake for "Holding" purpose only, that is to hold the stalling status. Never use this for "Brake" purpose to stop the load in motion.

• Output Timing of BRK-OFF Signal

- For the brake release timing at power-on, or braking timing at Servo-OFF/Servo-Alarm while the motor is in motion, refer to the Operating Instructions (Overall).
- With the parameter, Pr4.38 (Setup of mechanical brake action while the motor is in motion), you can set up a time between when the motor enters to a free-run from energized status and when BRK-OFF signal turns off (brake will be engaged), when the Servo-OFF or alarm occurs while the motor is in motion. For details, download a copy of the instruction manual from our website.

<Note>

1. The lining sound of the brake (chattering and etc.) might be generated while running the motor with built-in brake, however this does not affect any functionality.
2. Magnetic flux might be generated through the motor shaft while the brake coil is energized (brake is open). Pay an extra attention when magnetic sensors are used nearby the motor.

● Specifications of Built-in Holding Brake

| Motor series | Motor output | Static friction torque N·m | Rotor inertia × 10 ⁻⁴ kg·m ² | Engaging time ms | Releasing time ms | Exciting current DC A (at cool-off) | Releasing voltage DC V / Exciting voltage DC V | Permissible work (J) per one braking | Permissible total work × 10 ³ J | Permissible angular acceleration rad/s ² | |
|---------------------------------|-------------------------|----------------------------|--|------------------|-------------------|-------------------------------------|--|--------------------------------------|--|---|------|
| MSMF (80 mm sq.) or less | 50 W, 100 W | 0.294 or more | 0.002 | 35 or less | 20 or less | 0.30 | 1 or more | 39.2 | 4.9 | 30000 | |
| | 200 W, 400 W | 1.27 or more | 0.018 | 50 or less | 15 or less | 0.36 | 24±1.2 | 137 | 44.1 | | |
| | 750 W | 2.45 or more | 0.075 | 70 or less | 20 or less | 0.42 | 1 or more | 185 | 147 | | |
| | 1000 W | 3.80 or more | | | | | 24±2.4 | 80.0 | | | |
| MSMF (100 mm sq.) or more | 1.0 kW, 1.5 kW, 2.0 kW | 8.0 or more | 0.175 | 50 or less | 15 or less | 0.81 | 2 or more | 600 | 50 | 10000 | |
| | 3.0 kW | 12.0 or more | | 80 or less | | | | 900 | | | |
| | 4.0 kW | 16.2 or more | 1.12 | 110 or less | 50 or less | 0.90 | 24±2.4 | 1470 | 2160 | | |
| | 5.0 kW | 22.0 or more | | | | | 1545 | 2000 | | | |
| MQMF (80 mm sq.) or less | 100 W | 0.39 or more | 0.018 | 15 or less | 20 or less | 0.30 | 1 or more | 105 | 44.1 | 30000 | |
| | 200 W, 400 W | 1.6 or more | 0.075 | 70 or less | | 0.36 | 24±2.4 | 185 | 80 | | |
| MHMF (80 mm sq.) or less | 50 W, 100 W | 0.38 or more | 0.002 | 35 or less | 20 or less | 0.30 | 1 or more | 39.2 | 4.9 | 30000 | |
| | 200 W, 400 W | 1.6 or more | 0.018 | 50 or less | | 0.36 | | 105 | 44.1 | | |
| | 750 W, 1000 W | 3.8 or more | 0.075 | 70 or less | | 0.42 | | 24±2.4 | 185 | | 80 |
| MHMF (100 mm sq.) or more | 1.0 kW, 1.5 kW | 13.7 or more | 1.12 | 100 or less | 50 or less | 0.79 | 2 or more | 1470 | 2160 | 10000 | |
| | 2.0 kW, 3.0 kW, 4.0 kW | 25.0 or more | 4.7 | 80 or less | 25 or less | 1.29 | | 24±2.4 | 1800 | 3000 | 5440 |
| | 5.0 kW | 44.1 or more | 4.1 | 150 or less | 30 or less | | | | | 3100 | 5108 |
| | 7.5 kW | 63.0 or more | 3.9 | 200 or less | 80 or less | | | | | | |
| MDMF (100 mm sq.) or more | 1.0 kW, 1.5 kW, 2.0 kW | 13.7 or more | 1.12 | 100 or less | 50 or less | 0.79 | 2 or more | 1470 | 2160 | 10000 | |
| | 3.0 kW | 22.0 or more | | 110 or less | | 0.90 | | 1545 | 2000 | | |
| | 4.0 kW | 25.0 or more | 4.7 | 80 or less | 25 or less | 1.29 | | 24±2.4 | 1800 | 3000 | 5440 |
| | 5.0 kW | 44.1 or more | 4.1 | 150 or less | 30 or less | | | | | 3100 | 5108 |
| | 7.5 kW | 63.0 or more | 3.9 | 200 or less | 80 or less | | | | | | |
| | 11.0 kW | 100 or more | 7.1 | 300 or less | 140 or less | 1.08 | | 2000 | 4000 | 3000 | |
| | 15.0 kW | | | | 150 or less | 1.72 | | 3000 | | | |
| 22.0 kW | 200 or more | 28 | 150 or less | 1.72 | 3000 | 3000 | | | | | |
| MGMF (100 mm sq.) or more | 0.85 kW, 1.3 kW, 1.8 kW | 13.7 or more | 1.12 | 100 or less | 50 or less | 0.79 | 2 or more | 1470 | 2160 | 10000 | |
| | 2.9 kW | 25.0 or more | 4.7 | 80 or less | 25 or less | 1.29 | | 24±2.4 | 1800 | 3000 | 5440 |
| | 4.4 kW | 44.1 or more | 3.93 | 150 or less | 30 or less | | | | | 3100 | 5108 |
| | 5.5 kW | 63.0 or more | 3.9 | 200 or less | 80 or less | | | | | | |

- The engaging time and releasing time represent the delay time of the brake operation.
- Releasing time values represent the ones with DC-cutoff using a varistor.
- Above values (except static friction torque, releasing voltage and exciting voltage) represent typical values.
- Backlash of the built-in holding brake is kept 2° or smaller at ex-factory point.
- Service life of the number of acceleration/deceleration with the above permissible angular acceleration is more than 10 million times. (Life end is defined as when the brake backlash drastically changes.)
- The motor brake power supply must be different from the power supply for the driver's connectors X1, X2, X3, X4, X5, X6.

Options

Contents

| | |
|--|-----|
| Specifications of Motor connector | 307 |
| Encoder Cable | 309 |
| Motor Cable | 313 |
| Brake Cable | 321 |
| Interface Cable | 322 |
| Connector Kit | 323 |
| Battery for Absolute Encoder | 338 |
| Surge Absorber for Motor Brake | 339 |
| Mounting Bracket | 340 |
| Reactor | 342 |
| External Regenerative Resistor | 343 |
| Daisy Chain | 345 |
| Cable part No. Designation | 346 |
| List of Peripheral Devices Manufacturers | 347 |

50 W to 1000 W 80 mm sq. or less

• When the motors of <MSMF, MQMF, MHMF (Leadwire type)> are used, they are connected as shown below.
Connector: Tyco Electronics Japan G.K. (The figures below show connectors for the motor.)

[Connector for encoder]

Connector for encoder
Connector for brake
Connector for motor

172169-1
23-bit Absolute

| PIN No. | Application |
|---------|-------------|
| 1 | BAT+* |
| 2 | BAT-* |
| 3 | FG(SHIELD) |
| 4 | PS |
| 5 | PS |
| 6 | NC |
| 7 | E5V |
| 8 | EOV |
| 9 | NC |

* Connector pin diagram is viewed from the direction of the arrow.

* When using the motor as an incremental system, BAT+ and BAT- can be left unconnected.

<Remarks>
Do not connect anything to NC.

[Connector for motor]

172167-1

| PIN No. | Application |
|---------|-------------|
| 1 | U-phase |
| 2 | V-phase |
| 3 | W-phase |
| 4 | Ground |

* Connector pin diagram is viewed from the direction of the arrow.

[Connector for Brake]

172165-1

| PIN No. | Application |
|---------|-------------|
| 1 | Brake |
| 2 | Brake |

* Electromagnetic brake is a nonpolar device.

* Connector pin diagram is viewed from the direction of the arrow.

• When the motors of <MSMF, MQMF, MHMF (Connector type)> are used, they are connected as shown below.
Connector: Made by Japan Aviation Electronics Industry, Ltd. (The figures below show connectors for the motor.)

Connector for encoder
Connector for motor

23-bit Absolute

| PIN No. | Application |
|---------|-------------|
| 1 | FG(SHIELD) |
| 2 | BAT-* |
| 3 | EOV |
| 4 | PS |
| 5 | BAT+* |
| 6 | E5V |
| 7 | PS |

JN6CR07PM2
JN6CR07PM4

* Top view of the motor.

Tightening torque of the screw (M2)
0.19 N·m to 0.21 N·m

* Be sure to use only the screw supplied with the connector, to avoid damage.

* When using the motor as an incremental system, BAT+ and BAT- can be left unconnected.

<MSMF>

JN8AT04NJ1

* Top view of the motor.

| PIN No. | Application |
|---------|-------------|
| 1 | U-phase |
| 2 | V-phase |
| 3 | W-phase |
| PE | Ground |

Tightening torque of the screw (M2)
0.085 N·m to 0.095 N·m (screwed to plastic)

* Be sure to use only the screw supplied with the connector, to avoid damage.

* Secure the gasket in place without removing it from the connector.

<MHMF 50 W, 100 W>

JN11AH06NN2

* Top view of the motor.

| without Brake | | with Brake | |
|---------------|-------------|------------|-------------|
| PIN No. | Application | PIN No. | Application |
| 1 | U-phase | 1 | U-phase |
| 2 | V-phase | 2 | V-phase |
| 3 | W-phase | 3 | W-phase |
| 4 | NC | 4 | Brake |
| 5 | NC | 5 | Brake |
| PE | Ground | PE | Ground |

<MQMF, MHMF 200 W to 1000 W>

JN11AH06NN1

* Top view of the motor.

Tightening torque of the screw (M2)
0.085 N·m to 0.095 N·m

* Electromagnetic brake is a nonpolar device.

* Be sure to use only the screw supplied with the connector, to avoid damage.

* Secure the gasket in place without removing it from the connector.

<Remarks> Do not connect anything to NC.

[Motor with brake] <MSMF>

Connector for brake

JN4AT02PJM-R

* Top view of the motor.

| PIN No. | Application |
|---------|-------------|
| 1 | Brake |
| 2 | Brake |

Tightening torque of the screw (M2)
0.19 N·m to 0.21 N·m

* Electromagnetic brake is a nonpolar device.

* Be sure to use only the screw supplied with the connector, to avoid damage.

* Secure the gasket in place without removing it from the connector.

0.85 kW to 5.0 kW 100 mm sq. or more

• When the motors of <MSMF, MDMF, MGMF, MHMF> are used, they are connected as shown below.
Connector: Made by Japan Aviation Electronics Industry, Ltd. (The figures below show connectors for the motor.)

• Connector for encoder

<Large size Encoder connector> <Small size Encoder connector>

IP67 motor Connector for encoder (Large size)

JL10-2A20-29P
23-bit Absolute

| PIN No. | Application | PIN No. | Application |
|---------|-------------|---------|-------------|
| A | NC | K | PS |
| B | NC | L | PS |
| C | NC | M | NC |
| D | NC | N | NC |
| E | NC | P | NC |
| F | NC | R | NC |
| G | E0V | S | BAT-* |
| H | E5V | T | BAT+* |
| J | FG(SHIELD) | | |

IP67 motor Connector for encoder (Small size)

JN2AS10ML3-R
23-bit Absolute

| PIN No. | Application |
|---------|-------------|
| 1 | E0V |
| 2 | NC |
| 3 | PS |
| 4 | E5V |
| 5 | BAT-* |
| 6 | BAT+* |
| 7 | PS |
| 8 | NC |
| 9 | FG(SHIELD) |
| 10 | NC |

<Remarks>
Do not connect anything to NC.

* When using the motor as an incremental system, BAT+ and BAT- can be left unconnected.

• Connector for motor/brake
Table for motor connector and brake connector

| Motor part No. | Motor output | 200 V | |
|----------------|-------------------|---------------|------------|
| | | without Brake | with Brake |
| MSMF | 1.0 kW to 2.0 kW | A | C |
| | 3.0 kW to 5.0 kW | B | D |
| MDMF | 1.0 kW to 2.0 kW | A | C |
| | 3.0 kW to 5.0 kW | B | D |
| | 7.5 kW to 15.0 kW | E | E, F |
| MGMF | 22.0 kW | G | G, F |
| | 0.85 kW to 1.8 kW | A | C |
| MGMF | 2.4 kW to 4.4 kW | B | D |
| | 5.5 kW | E | E, F |
| MHMF | 1.0 kW to 1.5 kW | A | C |
| | 2.0 kW to 5.0 kW | B | D |
| MHMF | 7.5 kW | E | E, F |

Connector for motor/brake

* Electromagnetic brake is a nonpolar device.

A JL10-2E20-4PE-B
JL10-2E22-22PE-B

| PIN No. | Application |
|---------|--|
| G | with Brake: Brake without Brake: NC |
| H | with Brake: Brake without Brake: NC |
| A | NC |
| F | U-phase |
| I | V-phase |
| B | W-phase |
| E | Ground |
| D | Ground |
| C | NC |

C JL10-2E20-18PE-B

| PIN No. | Application |
|---------|--|
| G | with Brake: Brake without Brake: NC |
| H | with Brake: Brake without Brake: NC |
| A | NC |
| F | U-phase |
| I | V-phase |
| B | W-phase |
| E | Ground |
| D | Ground |
| C | NC |

D JL10-2E24-11PE-B

| PIN No. | Application |
|---------|--|
| A | with Brake: Brake without Brake: NC |
| B | with Brake: Brake without Brake: NC |
| C | NC |
| D | U-phase |
| E | V-phase |
| F | W-phase |
| G | Ground |
| H | Ground |
| I | NC |

<Remarks> Do not connect anything to NC.

Connector for motor

Connector for brake

Terminal box for motor

<Motor>

E JL04V-2E32-17PE-B-R

| PIN No. | Application |
|---------|-------------|
| A | U-phase |
| B | V-phase |
| C | W-phase |
| D | Ground |

<Brake>

F N/MS3102A 14S-2P

| PIN No. | Application |
|---------|-------------|
| A | Brake |
| B | Brake |
| C | NC |
| D | NC |

<Terminal block>

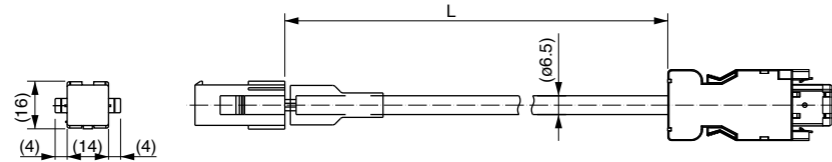
| Terminal | Application |
|----------|-------------|
| U | U-phase |
| V | V-phase |
| W | W-phase |
| Ground | Ground |

* U, V, W, Earth screw
Nominal: M8
Tightening torque: 12.0 N·m

* Electromagnetic brake is a nonpolar device.

| | | | | |
|----------------|---|---------------------------------------|--|---------------------|
| Part No. | MFECA0 ** 0EAD | 80 mm sq. or less Applicable model | MSMF 50 W to 1000 W, MHMF 50 W to 1000 W (Leadwire type) | MQMF 100 W to 400 W |
| Specifications | 23-bit absolute encoder When used in incremental system (without battery box) | | | |

[Unit: mm]

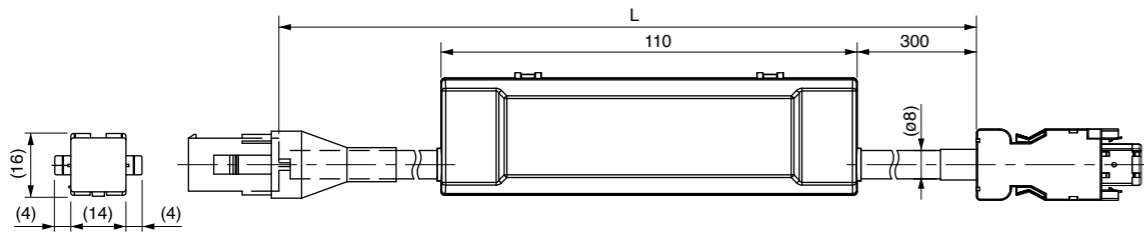


| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|-------------------------|-----------------------------------|--------------------------------|-------|---------------|
| Connector (Driver side) | 3E206-0100 KV | 3M Japan (or equivalent) | 3 | MFECA0030EAD |
| Shell kit | 3E306-3200-008 | | 5 | MFECA0050EAD |
| Connector (Motor side) | 172161-1 | Tyco Electronics Japan G.K. | 10 | MFECA0100EAD |
| Connector pin | 170365-1 | | 20 | MFECA0200EAD |
| Cable | 0.20 mm ² ×3P (6-wire) | Ok Electric Cable Co., Ltd. | | |

| | | | | |
|----------------|---|---------------------------------------|--|---------------------|
| Part No. | MFECA0 ** 0EAE | 80 mm sq. or less Applicable model | MSMF 50 W to 1000 W, MHMF 50 W to 1000 W (Leadwire type) | MQMF 100 W to 400 W |
| Specifications | 23-bit absolute encoder When used in absolute system (with battery box) * | | | |

* Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.

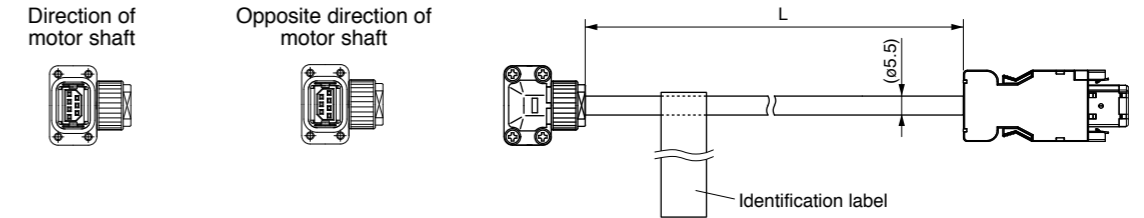
[Unit: mm]



| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|-------------------------|-----------------------------------|--------------------------------|-------|---------------|
| Connector (Driver side) | 3E206-0100 KV | 3M Japan (or equivalent) | 3 | MFECA0030EAE |
| Shell kit | 3E306-3200-008 | | 5 | MFECA0050EAE |
| Connector (Motor side) | 172161-1 | Tyco Electronics Japan G.K. | 10 | MFECA0100EAE |
| Connector pin | 170365-1 | | 20 | MFECA0200EAE |
| Cable | 0.20 mm ² ×4P (8-wire) | Ok Electric Cable Co., Ltd. | | |

| | | | |
|----------------|---|---------------------------------------|---|
| Part No. | MFECA0 ** 0MJD (Highly bendable type, Direction of motor shaft) | 80 mm sq. or less Applicable model | MSMF 50 W to 1000 W MQMF 100 W to 400 W MHMF 50 W to 1000 W (Connector type) |
| | MFECA0 ** 0MKD (Highly bendable type, Opposite direction of motor shaft) | | |
| | MFECA0 ** 0TJD (Standard bendable type, Direction of motor shaft) | | |
| | MFECA0 ** 0TKD (Standard bendable type, Opposite direction of motor shaft) | | |
| Specifications | 23-bit absolute encoder When used in incremental system (without battery box) | | |

[Unit: mm]

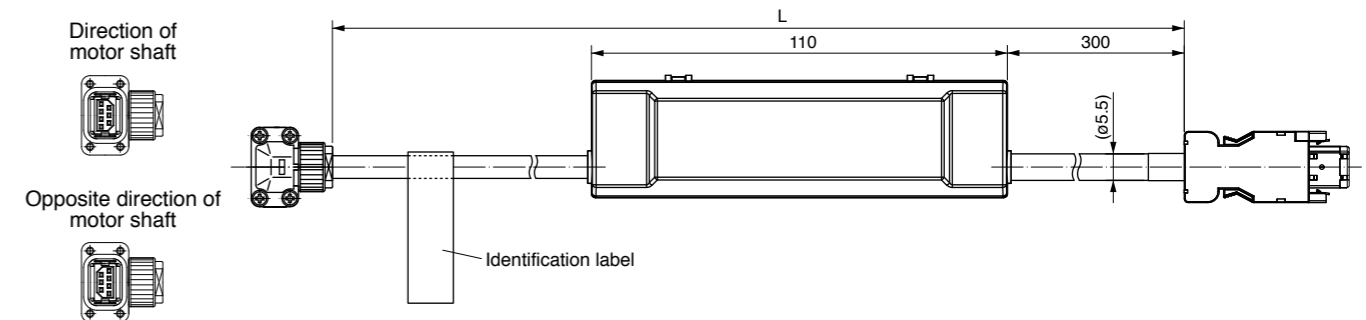


| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|-------------------------|-----------------------------------|------------------------------------|-------|---------------|
| Connector (Driver side) | 3E206-0100 KV | 3M Japan (or equivalent) | 3 | MFECA0030MJD |
| Shell kit | 3E306-3200-008 | | 5 | MFECA0050MJD |
| Connector (Motor side) | JN6FR07SM1 | Japan Aviation Electronics Ind. | 10 | MFECA0100MJD |
| Connector pin | LY10-C1-A1-10000 | | 20 | MFECA0200MJD |
| Cable | AWG24 4-wire, AWG22 2-wire (ø5.5) | Proterial, Ltd. | | |

| | | | |
|----------------|--|---------------------------------------|---|
| Part No. | MFECA0 ** 0MJE (Highly bendable type, Direction of motor shaft) | 80 mm sq. or less Applicable model | MSMF 50 W to 1000 W MQMF 100 W to 400 W MHMF 50 W to 1000 W (Connector type) |
| | MFECA0 ** 0MKE (Highly bendable type, Opposite direction of motor shaft) | | |
| | MFECA0 ** 0TJE (Standard bendable type, Direction of motor shaft) | | |
| | MFECA0 ** 0TKE (Standard bendable type, Opposite direction of motor shaft) | | |
| Specifications | 23-bit absolute encoder When used in absolute system (with battery box) * | | |

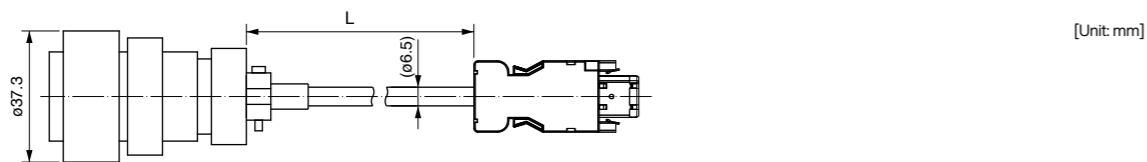
* Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.

[Unit: mm]



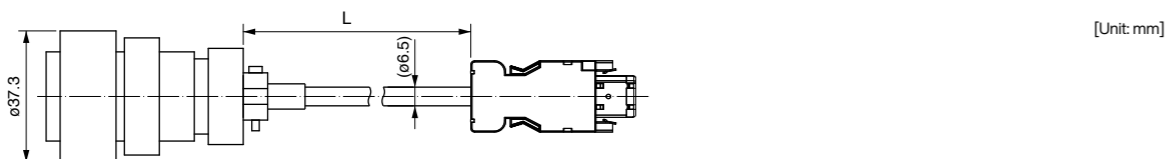
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|-------------------------|-----------------------------------|------------------------------------|-------|---------------|
| Connector (Driver side) | 3E206-0100 KV | 3M Japan (or equivalent) | 3 | MFECA0030MJE |
| Shell kit | 3E306-3200-008 | | 5 | MFECA0050MJE |
| Connector (Motor side) | JN6FR07SM1 | Japan Aviation Electronics Ind. | 10 | MFECA0100MJE |
| Connector pin | LY10-C1-A1-10000 | | 20 | MFECA0200MJE |
| Cable | AWG24 4-wire, AWG22 2-wire (ø5.5) | Proterial, Ltd. | | |

| | | | |
|-----------------------|--|---|--------------------|
| Part No. | MFECA0 ** OEPD | 100 mm sq. or more Applicable motor output | 0.85 kW to 22.0 kW |
| Specifications | 23-bit absolute encoder When used in incremental system (without battery box) <Large one-touch lock type> | | |



| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|-------------------------|----------------------------------|---------------------------------|-------|---------------|
| Connector (Driver side) | 3E206-0100 KV | 3M Japan | 3 | MFECA0030EPD |
| Shell kit | 3E306-3200-008 | (or equivalent) | 5 | MFECA0050EPD |
| Connector (Motor side) | JL10-6A20-29S-EB | Japan Aviation Electronics Ind. | 10 | MFECA0100EPD |
| Cable clamp | JL04-2022CK(09)-R | | 20 | MFECA0200EPD |
| Cable | 0.2 mm ² x3P (6-wire) | Ok Electric Cable Co., Ltd. | | |

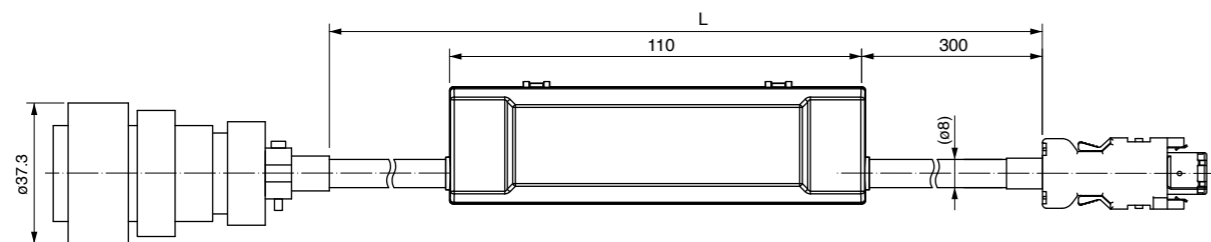
| | | | |
|-----------------------|---|---|--------------------|
| Part No. | MFECA0 ** OESD | 100 mm sq. or more Applicable motor output | 0.85 kW to 22.0 kW |
| Specifications | 23-bit absolute encoder When used in incremental system (without battery box) <Large screwed type> | | |



| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|-------------------------|----------------------------------|---------------------------------|-------|---------------|
| Connector (Driver side) | 3E206-0100 KV | 3M Japan | 3 | MFECA0030ESD |
| Shell kit | 3E306-3200-008 | (or equivalent) | 5 | MFECA0050ESD |
| Connector (Motor side) | N/MS3106B20-29S | Japan Aviation Electronics Ind. | 10 | MFECA0100ESD |
| Cable clamp | N/MS3057-12A | | 20 | MFECA0200ESD |
| Cable | 0.2 mm ² x3P (6-wire) | Ok Electric Cable Co., Ltd. | | |

| | | | |
|-----------------------|--|---|---------------------------------|
| Part No. | MFECA0 ** OEPE | 100 mm sq. or more Applicable motor output | 0.85 kW to 22.0 kW (IP67 motor) |
| Specifications | 23-bit absolute encoder When used in absolute system (with battery box) * <Large one-touch lock type> | | |

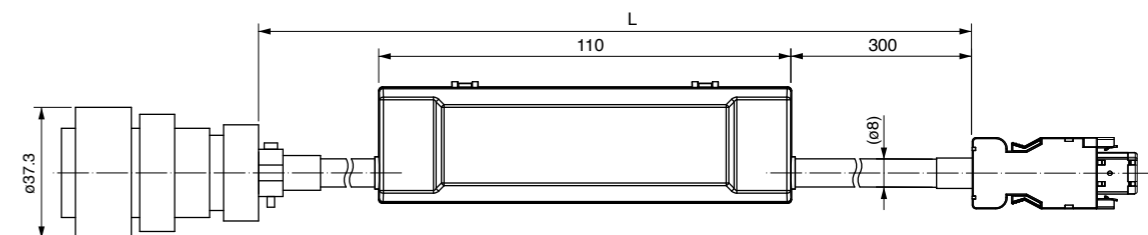
* Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.



| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|-------------------------|----------------------------------|---------------------------------|-------|---------------|
| Connector (Driver side) | 3E206-0100 KV | 3M Japan | 3 | MFECA0030EPE |
| Shell kit | 3E306-3200-008 | (or equivalent) | 5 | MFECA0050EPE |
| Connector (Motor side) | JL10-6A20-29S-EB | Japan Aviation Electronics Ind. | 10 | MFECA0100EPE |
| Cable clamp | JL04-2022CK(09)-R | | 20 | MFECA0200EPE |
| Cable | 0.2 mm ² x3P (6-wire) | Ok Electric Cable Co., Ltd. | | |

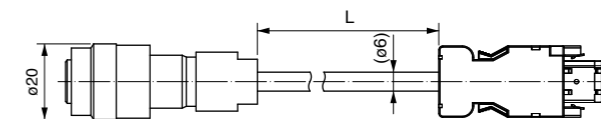
| | | | |
|-----------------------|---|---|---------------------------------|
| Part No. | MFECA0 ** OESE | 100 mm sq. or more Applicable motor output | 0.85 kW to 22.0 kW (IP67 motor) |
| Specifications | 23-bit absolute encoder When used in absolute system (with battery box) * <Large screwed type> | | |

* Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.



| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|-------------------------|----------------------------------|---------------------------------|-------|---------------|
| Connector (Driver side) | 3E206-0100 KV | 3M Japan | 3 | MFECA0030ESE |
| Shell kit | 3E306-3200-008 | (or equivalent) | 5 | MFECA0050ESE |
| Connector (Motor side) | N/MS3106B20-29S | Japan Aviation Electronics Ind. | 10 | MFECA0100ESE |
| Cable clamp | N/MS3057-12A | | 20 | MFECA0200ESE |
| Cable | 0.2 mm ² x4P (8-wire) | Ok Electric Cable Co., Ltd. | | |

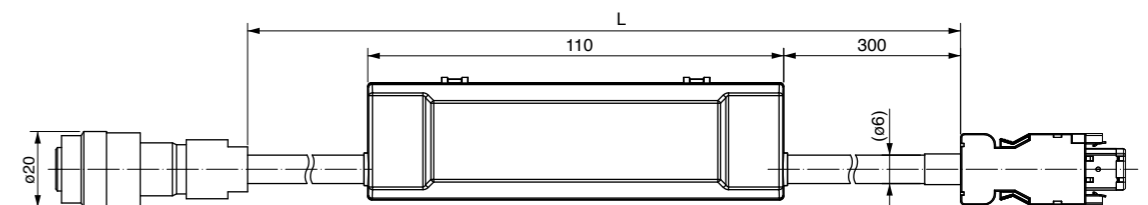
| | | | |
|-----------------------|--|---|---------------------------------|
| Part No. | MFECA0 ** OETD | 100 mm sq. or more Applicable motor output | 0.85 kW to 22.0 kW (IP67 motor) |
| Specifications | 23-bit absolute encoder When used in incremental system (without battery box) <Small one-touch lock type> | | |



| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|-------------------------|----------------------------------|---------------------------------|-------|---------------|
| Connector (Driver side) | 3E206-0100 KV | 3M Japan | 3 | MFECA0030ETD |
| Shell kit | 3E306-3200-008 | (or equivalent) | 5 | MFECA0050ETD |
| Connector (Motor side) | JN2DS10SL1-R | Japan Aviation Electronics Ind. | 10 | MFECA0100ETD |
| Connector pin | JN1-22-22S-PKG100 | | 20 | MFECA0200ETD |
| Cable | 0.2 mm ² x3P (6-wire) | Ok Electric Cable Co., Ltd. | | |

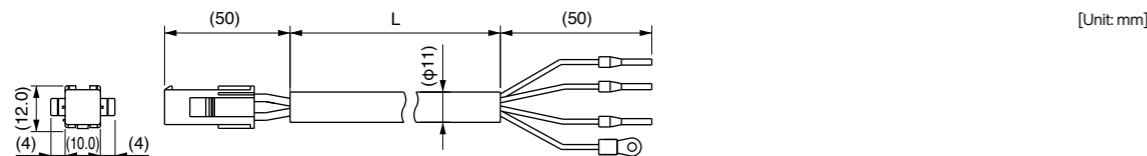
| | | | |
|-----------------------|--|---|---------------------------------|
| Part No. | MFECA0 ** OETE | 100 mm sq. or more Applicable motor output | 0.85 kW to 22.0 kW (IP67 motor) |
| Specifications | 23-bit absolute encoder When used in absolute system (with battery box) * <Small one-touch lock type> | | |

* Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.



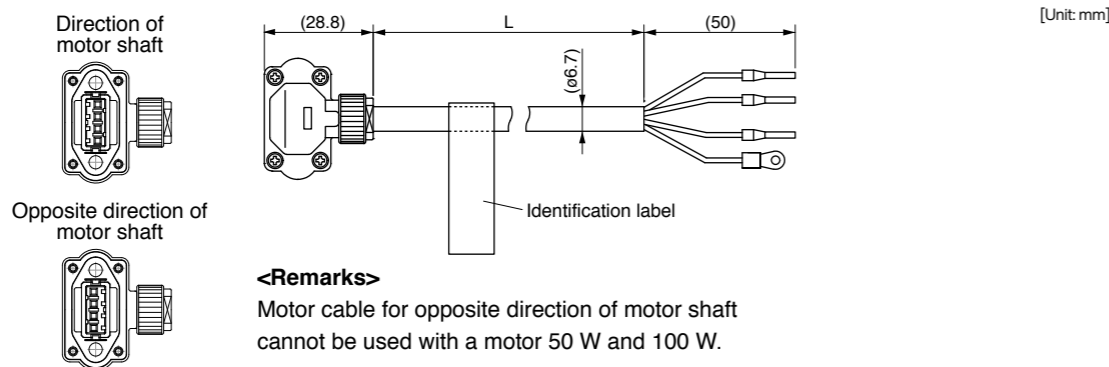
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|-------------------------|----------------------------------|---------------------------------|-------|---------------|
| Connector (Driver side) | 3E206-0100 KV | 3M Japan | 3 | MFECA0030ETE |
| Shell kit | 3E306-3200-008 | (or equivalent) | 5 | MFECA0050ETE |
| Connector (Motor side) | JN2DS10SL1-R | Japan Aviation Electronics Ind. | 10 | MFECA0100ETE |
| Connector pin | JN1-22-22S-PKG100 | | 20 | MFECA0200ETE |
| Cable | 0.2 mm ² x3P (6-wire) | Ok Electric Cable Co., Ltd. | | |

| | | | | |
|----------|----------------|---------------------------------------|--|---------------------|
| Part No. | MFMCAO ** OEED | 80 mm sq. or less Applicable model | MSMF 50 W to 1000 W, | MQMF 100 W to 400 W |
| | | | MHMF 50 W to 1000 W (Leadwire type) | |



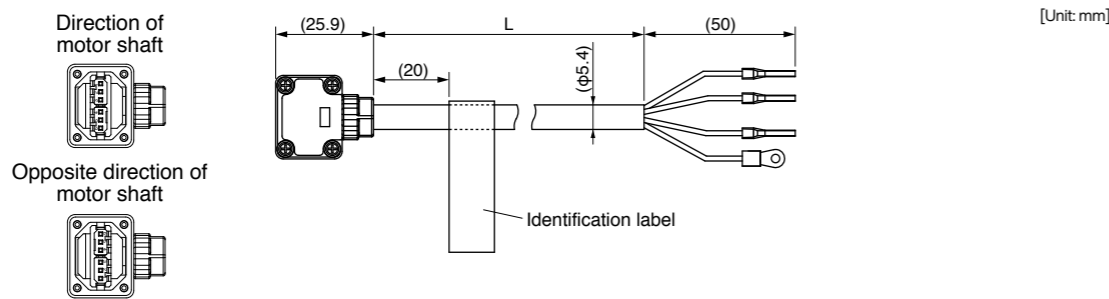
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|---|-----------------------------|-------|---------------|
| Connector | 172159-1 | Tyco Electronics Japan G.K. | 3 | MFMCA0030EED |
| Cable clamp | 170366-1 | | 5 | MFMCA0050EED |
| Rod terminal | AI0.75-8GY | PHOENIX CONTACT | 10 | MFMCA0100EED |
| Nylon insulated round terminal | N1.25-M4 | J.S.T Mfg. Co., Ltd. | 20 | MFMCA0200EED |
| Cable | ROBO-TOP 600V 0.75 mm ² 4-wire | DYDEN CORPORATION | | |

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|----------|--|---------------------------------------|----------------------|------------------|
| Part No. | MFMCAO ** ONJD (Highly bendable type, Direction of motor shaft) | 80 mm sq. or less Applicable model | MSMF 50 W to 1000 W | (Connector type) |
| | MFMCAO ** ORJD (Standard bendable type, Direction of motor shaft) | | | |
| | MFMCAO ** ONKD (Highly bendable type, Opposite direction of motor shaft) | | MSMF 200 W to 1000 W | |
| | MFMCAO ** ORKD (Standard bendable type, Opposite direction of motor shaft) | | (Connector type) | |



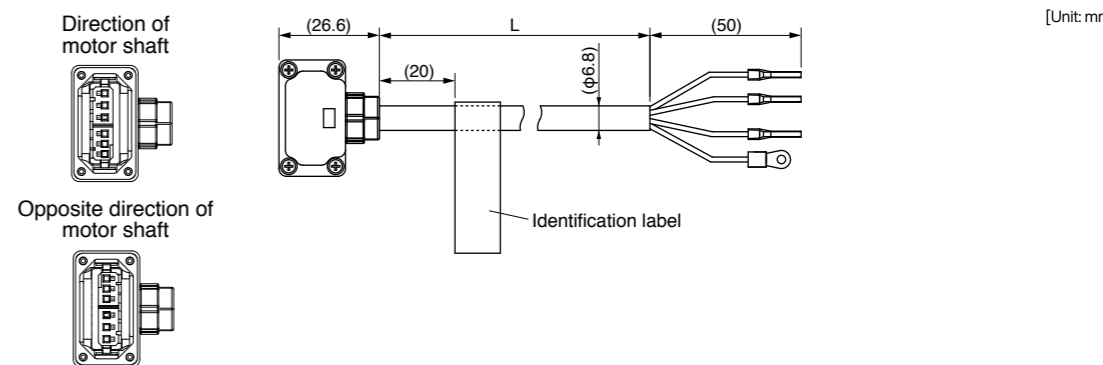
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|------------------------|---------------------------------|-------|---------------|
| Connector | JN8FT04SJ1 | Japan Aviation Electronics Ind. | 3 | MFMCA0030NJD |
| Cable clamp | ST-TMH-S-C1B-3500 | | 5 | MFMCA0050NJD |
| Rod terminal | AI0.75-8GY | PHOENIX CONTACT | 10 | MFMCA0100NJD |
| Nylon insulated round terminal | N1.25-M4 | J.S.T Mfg. Co., Ltd. | 20 | MFMCA0200NJD |
| Cable | AWG18 4-wire (φ6.7 mm) | Proterial, Ltd. | | |

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| Part No. | MFMCAO ** 7UFD (Movable/fixed common-use, direction of motor shaft) | 80 mm sq. or less Applicable model | MHMF 50 W, 100 W | (Connector type) |
| | MFMCAO ** 7UGD (Movable/fixed common-use, opposite direction of motor shaft) | | | |



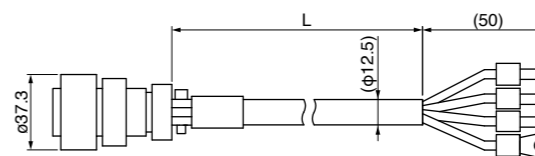
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|------------------------|---------------------------------|-------|---------------|
| Connector | JN11FH06SN2 | Japan Aviation Electronics Ind. | 3 | MFMCA0037UFD |
| Cable clamp | JN11S10K4A1 | | 5 | MFMCA0057UFD |
| Rod terminal | AI0.34-8TQ | PHOENIX CONTACT | 10 | MFMCA0107UFD |
| Nylon insulated round terminal | N1.25-M4 | J.S.T Mfg. Co., Ltd. | 20 | MFMCA0207UFD |
| Cable | AWG22 6-wire (φ5.4 mm) | NIKKO ELECTRIC WIRE CO.,LTD | | |

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|----------|--|---------------------------------------|---------------------|--|
| Part No. | MFMCAO ** OUFD (Highly bendable type, Direction of motor shaft) | 80 mm sq. or less Applicable model | MQMF 100 W to 400 W | MHMF 200 W to 1000 W (Connector type) |
| | MFMCAO ** OUGD (Highly bendable type, Opposite direction of motor shaft) | | | |
| | MFMCAO ** OWFD (Standard bendable type, Direction of motor shaft) | | | |
| | MFMCAO ** OWGD (Standard bendable type, Opposite direction of motor shaft) | | | |



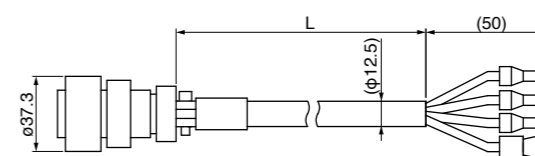
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|---------------------|---------------------------------|-------|---------------|
| Connector | JN11FH06SN1 | Japan Aviation Electronics Ind. | 3 | MFMCA0030UFD |
| Cable clamp | JN11S35H3A1 | | 5 | MFMCA0050UFD |
| Rod terminal | AI0.75-8GY | PHOENIX CONTACT | 10 | MFMCA0100UFD |
| Nylon insulated round terminal | N1.25-M4 | J.S.T Mfg. Co., Ltd. | 20 | MFMCA0200UFD |
| Cable | AWG18 6-wire (φ6.8) | NIKKO ELECTRIC WIRE CO.,LTD | | |

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|----------|----------------|--|---|------------------------|
| Part No. | MFMCDO ** 2EUD | 100 mm sq. or more Applicable model | MSMF 1.0 kW to 2.0 kW, | MDMF 1.0 kW to 2.0 kW |
| | | | MHMF 1.0 kW, 1.5 kW, <One-touch lock type> | MGMF 0.85 kW to 1.8 kW |



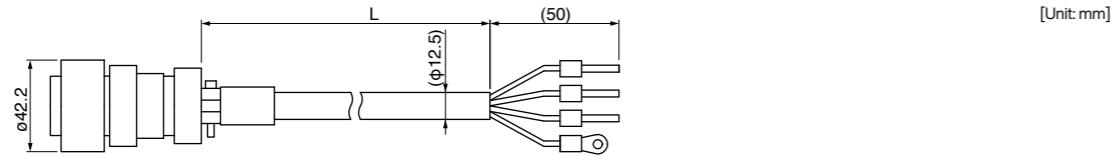
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|---|---------------------------------|-------|---------------|
| Connector | JL10-6A20-4SE-EB | Japan Aviation Electronics Ind. | 3 | MFMCD0032EUD |
| Cable clamp | JL04-2022CK(14)-R | | 5 | MFMCD0052EUD |
| Rod terminal | NTUB-2 | J.S.T Mfg. Co., Ltd. | 10 | MFMCD0102EUD |
| Nylon insulated round terminal | N2-M4 | J.S.T Mfg. Co., Ltd. | 20 | MFMCD0202EUD |
| Cable | ROBO-TOP 600V 2.0mm ² 4-wire | DYDEN CORPORATION | | |

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|----------|----------------|--|--|------------------------|
| Part No. | MFMCDO ** 2ECD | 100 mm sq. or more Applicable model | MSMF 1.0 kW to 2.0 kW, | MDMF 1.0 kW to 2.0 kW |
| | | | MHMF 1.0 kW, 1.5 kW, <Screwed type> | MGMF 0.85 kW to 1.8 kW |



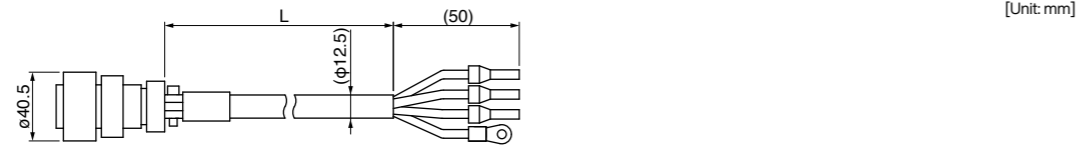
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|---|---------------------------------|-------|---------------|
| Connector | JL04V-6A20-4SE-EB-RK | Japan Aviation Electronics Ind. | 3 | MFMCD0032ECD |
| Cable clamp | JL04-2022CK(14)-R | | 5 | MFMCD0052ECD |
| Rod terminal | NTUB-2 | J.S.T Mfg. Co., Ltd. | 10 | MFMCD0102ECD |
| Nylon insulated round terminal | N2-M4 | J.S.T Mfg. Co., Ltd. | 20 | MFMCD0202ECD |
| Cable | ROBO-TOP 600V 2.0mm ² 4-wire | DYDEN CORPORATION | | |

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| Part No. | MFMCEO ** 2EUD | 100 mm sq. or more Applicable model | MHMF 2.0 kW <One-touch lock type> |
|----------|-----------------------|--|-----------------------------------|



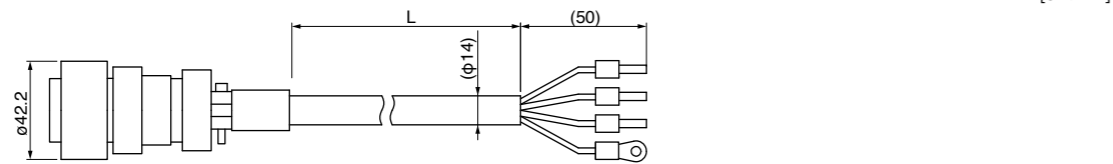
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|--|---------------------------------|-------|---------------|
| Connector | JL10-6A22-22SE-EB | Japan Aviation Electronics Ind. | 3 | MFMCE0032EUD |
| Cable clamp | JL04-2022CK(14)-R | Japan Aviation Electronics Ind. | 5 | MFMCE0052EUD |
| Rod terminal | NTUB-2 | J.S.T Mfg. Co., Ltd. | 10 | MFMCE0102EUD |
| Nylon insulated round terminal | N2-M4 | J.S.T Mfg. Co., Ltd. | 20 | MFMCE0202EUD |
| Cable | ROBO-TOP DP6/2501 2.0 mm ² 4-wire | DYDEN CORPORATION | | |

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| Part No. | MFMCEO ** 2ECD | 100 mm sq. or more Applicable model | MHMF 2.0 kW <Screwed type> |
|----------|-----------------------|--|----------------------------|



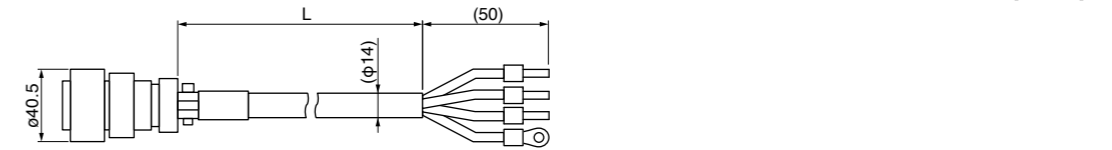
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|--|---------------------------------|-------|---------------|
| Connector | JL04V-6A22-22SE-EB-R | Japan Aviation Electronics Ind. | 3 | MFMCE0032ECD |
| Cable clamp | JL04-2022CK(14)-R | Japan Aviation Electronics Ind. | 5 | MFMCE0052ECD |
| Rod terminal | NTUB-2 | J.S.T Mfg. Co., Ltd. | 10 | MFMCE0102ECD |
| Nylon insulated round terminal | N2-M4 | J.S.T Mfg. Co., Ltd. | 20 | MFMCE0202ECD |
| Cable | ROBO-TOP 600V 2.0 mm ² 4-wire | DYDEN CORPORATION | | |

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|----------|-----------------------|--|-----------------------------------|
| Part No. | MFMCEO ** 3EUT | 100 mm sq. or more Applicable model | MGMF 2.4 kW <One-touch lock type> |
|----------|-----------------------|--|-----------------------------------|



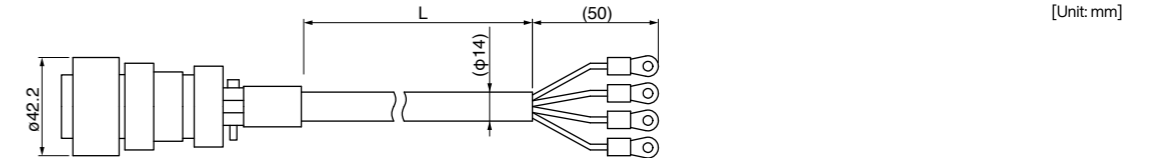
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|--|---------------------------------|-------|---------------|
| Connector | JL10-6A22-22SE-EB | Japan Aviation Electronics Ind. | 3 | MFMCE0033EUT |
| Cable clamp | JL04-2022CK(14)-R | Japan Aviation Electronics Ind. | 5 | MFMCE0053EUT |
| Rod terminal | TMENTC3.5-11S | NICHIFU Co., Ltd. | 10 | MFMCE0103EUT |
| Nylon insulated round terminal | N5.5-5 | J.S.T Mfg. Co., Ltd. | 20 | MFMCE0203EUT |
| Cable | ROBO-TOP DP6/2501 3.5 mm ² 4-wire | DYDEN CORPORATION | | |

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| Part No. | MFMCEO ** 3ECT | 100 mm sq. or more Applicable model | MGMF 2.4 kW <Screwed type> |
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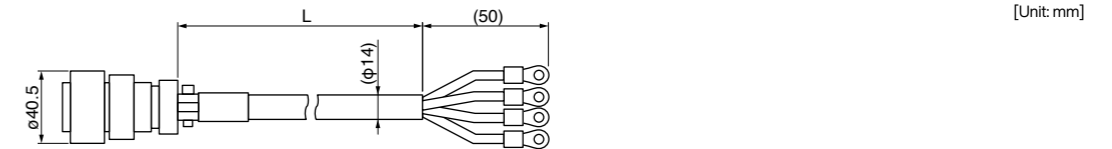
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|--|---------------------------------|-------|---------------|
| Connector | JL04V-6A22-22SE-EB-R | Japan Aviation Electronics Ind. | 3 | MFMCE0033ECT |
| Cable clamp | JL04-2022CK(14)-R | Japan Aviation Electronics Ind. | 5 | MFMCE0053ECT |
| Rod terminal | TMENTC3.5-11S | NICHIFU Co., Ltd. | 10 | MFMCE0103ECT |
| Nylon insulated round terminal | N5.5-5 | J.S.T Mfg. Co., Ltd. | 20 | MFMCE0203ECT |
| Cable | ROBO-TOP 600V 3.5 mm ² 4-wire | DYDEN CORPORATION | | |

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|----------|-----------------------|--|---|--|
| Part No. | MFMCAO ** 3EUT | 100 mm sq. or more Applicable model | MSMF 3.0 kW to 5.0 kW, MHMF 3.0 kW to 5.0 kW, <One-touch lock type> | MDMF 3.0 kW to 5.0 kW MGMF 2.9 kW to 4.4 kW |
|----------|-----------------------|--|---|--|



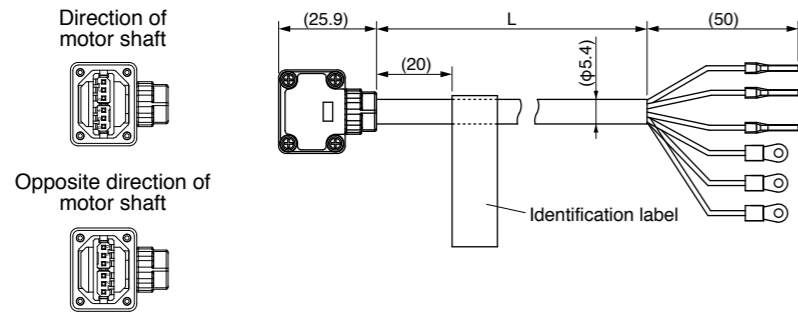
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|--|---------------------------------|-------|---------------|
| Connector | JL10-6A22-22SE-EB | Japan Aviation Electronics Ind. | 3 | MFMCA0033EUT |
| Cable clamp | JL04-2022CK(14)-R | Japan Aviation Electronics Ind. | 5 | MFMCA0053EUT |
| Nylon insulated round terminal | N5.5-5 | J.S.T Mfg. Co., Ltd. | 10 | MFMCA0103EUT |
| Cable | ROBO-TOP DP6/2501 3.5 mm ² 4-wire | DYDEN CORPORATION | 20 | MFMCA0203EUT |

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|----------|-----------------------|--|--|--|
| Part No. | MFMCAO ** 3ECT | 100 mm sq. or more Applicable model | MSMF 3.0 kW to 5.0 kW, MHMF 3.0 kW to 5.0 kW, <Screwed type> | MDMF 3.0 kW to 5.0 kW MGMF 2.9 kW to 4.4 kW |
|----------|-----------------------|--|--|--|



| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|--|---------------------------------|-------|---------------|
| Connector | JL04V-6A22-22SE-EB-R | Japan Aviation Electronics Ind. | 3 | MFMCA0033ECT |
| Cable clamp | JL04-2022CK(14)-R | Japan Aviation Electronics Ind. | 5 | MFMCA0053ECT |
| Nylon insulated round terminal | N5.5-5 | J.S.T Mfg. Co., Ltd. | 10 | MFMCA0103ECT |
| Cable | ROBO-TOP 600V 3.5 mm ² 4-wire | DYDEN CORPORATION | 20 | MFMCA0203ECT |

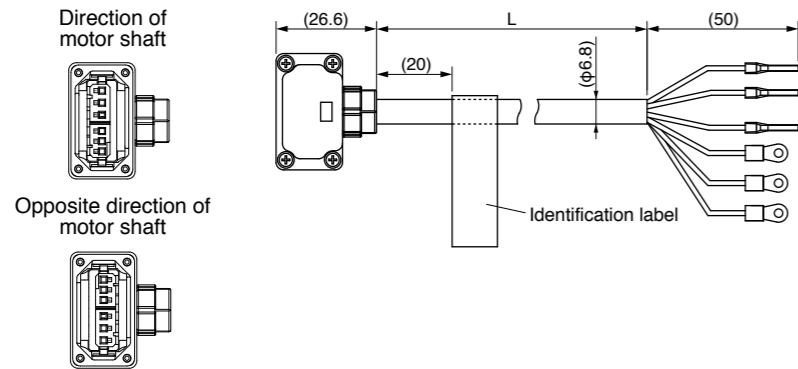
| | | | | |
|----------|-----------------------|---|---------------------------------------|--------------------------------------|
| Part No. | MFMCA0 ** 7VFD | (Movable/fixed common-use, direction of motor shaft) | 80 mm sq. or less Applicable model | MHMF 50 W, 100 W (Connector type) |
| | MFMCA0 ** 7VGD | (Movable/fixed common-use, opposite direction of motor shaft) | | |



[Unit: mm]

| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|------------------------|---------------------------------|-------|---------------|
| Connector | JN11FH06SN2 | Japan Aviation Electronics Ind. | 3 | MFMCA0037VFD |
| Cable clamp | JN11S10K4A1 | PHOENIX CONTACT | 5 | MFMCA0057VFD |
| Rod terminal | A10.34-8TQ | J.S.T Mfg. Co., Ltd. | 10 | MFMCA0107VFD |
| Nylon insulated round terminal | N1.25-M4 | NIKKO ELECTRIC WIRE CO.,LTD | 20 | MFMCA0207VFD |
| Cable | AWG22 6-wire (φ5.4 mm) | | | |

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|----------|-----------------------|---|---------------------------------------|---|
| Part No. | MFMCA0 ** 0VFD | (Highly bendable type, Direction of motor shaft) | 80 mm sq. or less Applicable model | MQMF 100 W to 400 W MHMF 200 W to 1000 W (Connector type) |
| | MFMCA0 ** 0VGD | (Highly bendable type, Opposite direction of motor shaft) | | |
| | MFMCA0 ** 0XFD | (Standard bendable type, Direction of motor shaft) | | |
| | MFMCA0 ** 0XGD | (Standard bendable type, Opposite direction of motor shaft) | | |

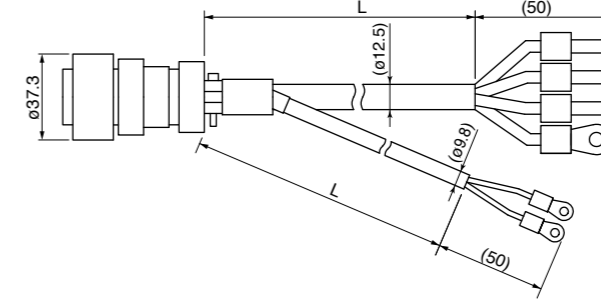


[Unit: mm]

| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|------------------------|---------------------------------|-------|---------------|
| Connector | JN11FH06SN1 | Japan Aviation Electronics Ind. | 3 | MFMCA0030VFD |
| Cable clamp | JN11S35H3A1 | PHOENIX CONTACT | 5 | MFMCA0050VFD |
| Rod terminal | A10.75-8GY | J.S.T Mfg. Co., Ltd. | 10 | MFMCA0100VFD |
| Nylon insulated round terminal | N1.25-M4 | NIKKO ELECTRIC WIRE CO.,LTD | 20 | MFMCA0200VFD |
| Cable | AWG18 6-wire (φ6.8 mm) | | | |

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| Part No. | MFMCA0 ** 2FUD | 100 mm sq. or more Applicable model | MSMF 1.0 kW to 2.0 kW, MHMF 1.0 kW to 1.5 kW, <One-touch lock type> | MDMF 1.0 kW to 2.0 kW MGMF 0.85 kW to 1.8 kW |
|----------|-----------------------|--|---|---|

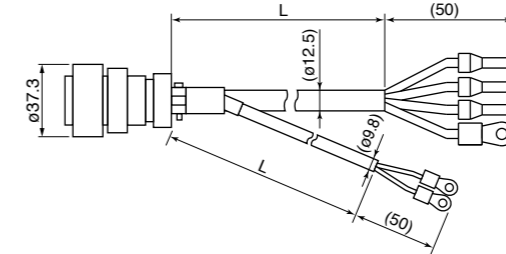
[Unit: mm]



| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|---|---------------------------------|-------|---------------|
| Connector | JL10-6A20-18SE-EB | Japan Aviation Electronics Ind. | 3 | MFMCA0032FUD |
| Cable clamp | JL042022CK(14)-R | J.S.T Mfg. Co., Ltd. | 5 | MFMCA0052FUD |
| Rod terminal | NTUB-2 | J.S.T Mfg. Co., Ltd. | 10 | MFMCA0102FUD |
| Nylon insulated round terminal | Earth: N2-M4 Brake: N1.25-M4 | J.S.T Mfg. Co., Ltd. | 20 | MFMCA0202FUD |
| Cable | ROBO-TOP 600V 2.0 mm ² 4-wire ROBO-TOP 600V 0.75 mm ² 2-wire | DYDEN CORPORATION | | |

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|----------|-----------------------|--|--|---|
| Part No. | MFMCA0 ** 2FCD | 100 mm sq. or more Applicable model | MSMF 1.0 kW to 2.0 kW, MHMF 1.0 kW to 1.5 kW, <Screwed type> | MDMF 1.0 kW to 2.0 kW MGMF 0.85 kW to 1.8 kW |
|----------|-----------------------|--|--|---|

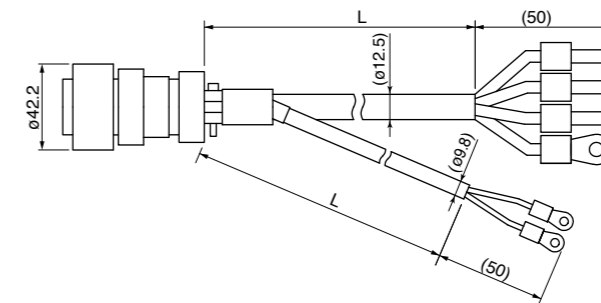
[Unit: mm]



| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|---|---------------------------------|-------|---------------|
| Connector | JL04V-6A20-18SE-EB-RK | Japan Aviation Electronics Ind. | 3 | MFMCA0032FCD |
| Cable clamp | JL04-2022CK(14)-R | J.S.T Mfg. Co., Ltd. | 5 | MFMCA0052FCD |
| Rod terminal | NTUB-2 | J.S.T Mfg. Co., Ltd. | 10 | MFMCA0102FCD |
| Nylon insulated round terminal | Earth: N2-M4 Brake: N1.25-M4 | J.S.T Mfg. Co., Ltd. | 20 | MFMCA0202FCD |
| Cable | ROBO-TOP 600V 2.0 mm ² 4-wire ROBO-TOP 600V 0.75 mm ² 2-wire | DYDEN CORPORATION | | |

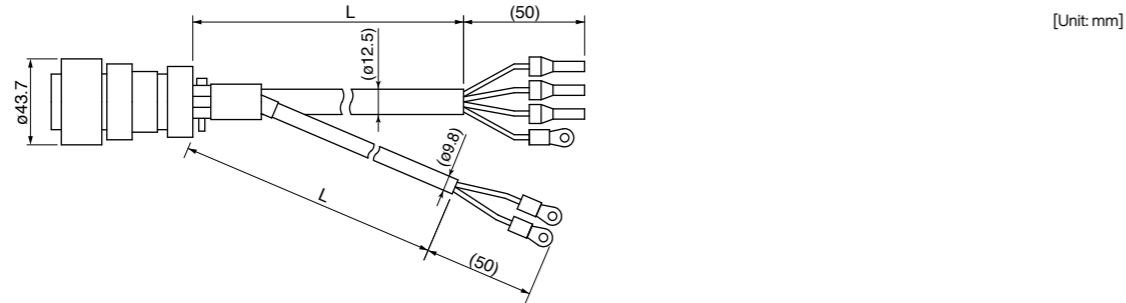
| | | | |
|----------|-----------------------|--|-----------------------------------|
| Part No. | MFMCE0 ** 2FUD | 100 mm sq. or more Applicable model | MHMF 2.0 kW <One-touch lock type> |
|----------|-----------------------|--|-----------------------------------|

[Unit: mm]



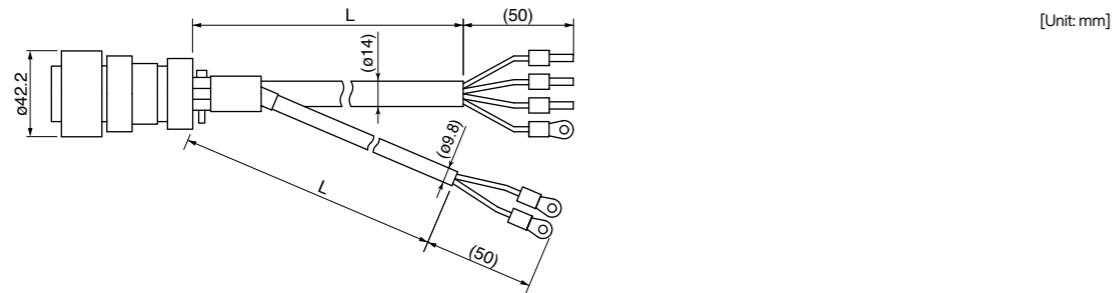
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|---|---------------------------------|-------|---------------|
| Connector | JL10-6A24-11SE-EB | Japan Aviation Electronics Ind. | 3 | MFMCE0032FUD |
| Cable clamp | JL04-2428CK(17)-R | J.S.T Mfg. Co., Ltd. | 5 | MFMCE0052FUD |
| Rod terminal | NTUB-2 | J.S.T Mfg. Co., Ltd. | 10 | MFMCE0102FUD |
| Nylon insulated round terminal | Earth: N2-M4 Brake: N1.25-M4 | J.S.T Mfg. Co., Ltd. | 20 | MFMCE0202FUD |
| Cable | ROBO-TOP DP6/2501 2.0 mm ² 4-wire ROBO-TOP DP6/2501 0.75 mm ² 2-wire | DYDEN CORPORATION | | |

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| Part No. | MFMCCE0 ** 2FCD | 100 mm sq. or more Applicable model | MHMF 2.0 kW <Screwed type> |
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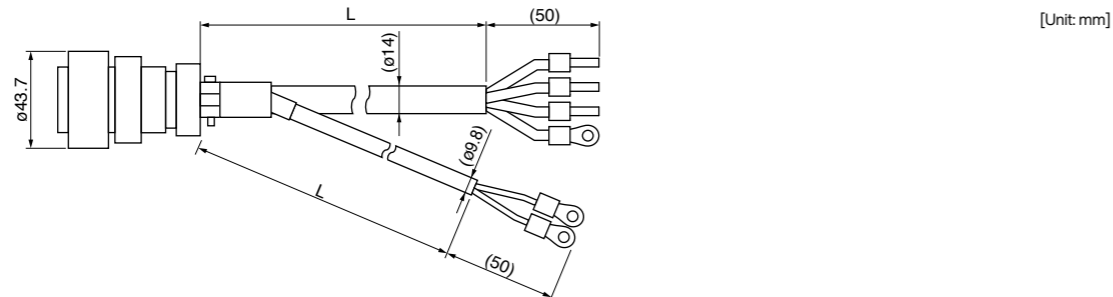
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|---|---------------------------------|-------|---------------|
| Connector | JL04V-6A24-11SE-EB-R | Japan Aviation Electronics Ind. | 3 | MFMCCE0032FCD |
| Cable clamp | JL04-2428CK(17)-R | Japan Aviation Electronics Ind. | 5 | MFMCCE0052FCD |
| Rod terminal | NTUB-2 | J.S.T Mfg. Co., Ltd. | 10 | MFMCCE0102FCD |
| Nylon insulated round terminal | Earth N2-M4 Brake N1.25-M4 | J.S.T Mfg. Co., Ltd. | 20 | MFMCCE0202FCD |
| Cable | ROBO-TOP 600V 2.0 mm ² 4-wire ROBO-TOP 600V 0.75 mm ² 2-wire | DYDEN CORPORATION | | |

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| Part No. | MFMCDO ** 3FUT | 100 mm sq. or more Applicable model | MGMF 2.4 kW <One-touch lock type> |
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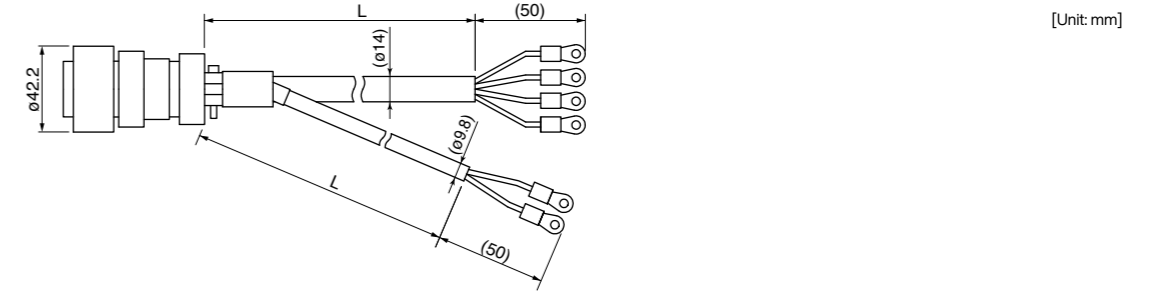
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|---|---------------------------------|-------|---------------|
| Connector | JL10-6A24-11SE-EB | Japan Aviation Electronics Ind. | 3 | MFMCDO0033FUT |
| Cable clamp | JL04-2428CK(17)-R | Japan Aviation Electronics Ind. | 5 | MFMCDO0053FUT |
| Rod terminal | TMENTC3.5-11S | NICHIFU Co., Ltd. | 10 | MFMCDO0103FUT |
| Nylon insulated round terminal | Earth N5.5-5 Brake N1.25-M4 | J.S.T Mfg. Co., Ltd. | 20 | MFMCDO0203FUT |
| Cable | ROBO-TOP DP6/2501 3.5 mm ² 4-wire ROBO-TOP DP6/2501 0.75 mm ² 2-wire | DYDEN CORPORATION | | |

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|----------|-----------------------|--|----------------------------|
| Part No. | MFMCDO ** 3FCT | 100 mm sq. or more Applicable model | MGMF 2.4 kW <Screwed type> |
|----------|-----------------------|--|----------------------------|



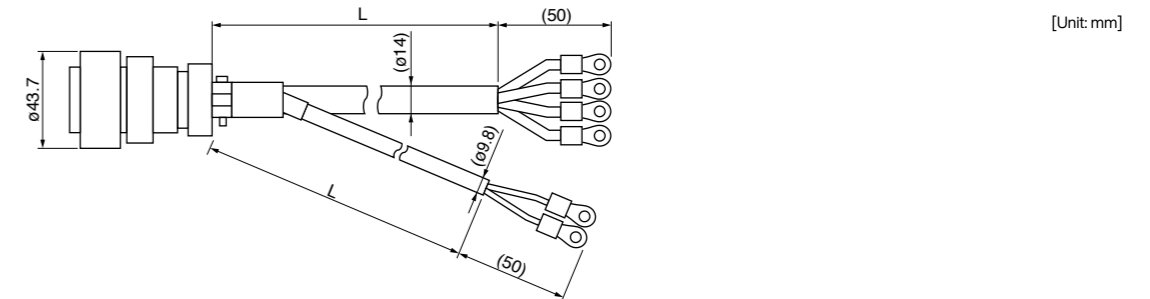
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|---|---------------------------------|-------|---------------|
| Connector | JL04V-6A24-11SE-EB-R | Japan Aviation Electronics Ind. | 3 | MFMCDO0033FCT |
| Cable clamp | JL04-2428CK(17)-R | Japan Aviation Electronics Ind. | 5 | MFMCDO0053FCT |
| Rod terminal | TMENTC3.5-11S | NICHIFU Co., Ltd. | 10 | MFMCDO0103FCT |
| Nylon insulated round terminal | Earth N5.5-5 Brake N1.25-M4 | J.S.T Mfg. Co., Ltd. | 20 | MFMCDO0203FCT |
| Cable | ROBO-TOP 600V 3.5 mm ² 4-wire ROBO-TOP 600V 0.75 mm ² 2-wire | DYDEN CORPORATION | | |

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|----------|-----------------------|--|---|--|
| Part No. | MFMCA0 ** 3FUT | 100 mm sq. or more Applicable model | MSMF 3.0 kW to 5.0 kW, MHMF 3.0 kW to 5.0 kW, <One-touch lock type> | MDMF 3.0 kW to 5.0 kW MGMF 2.9 kW, 4.4 kW |
|----------|-----------------------|--|---|--|



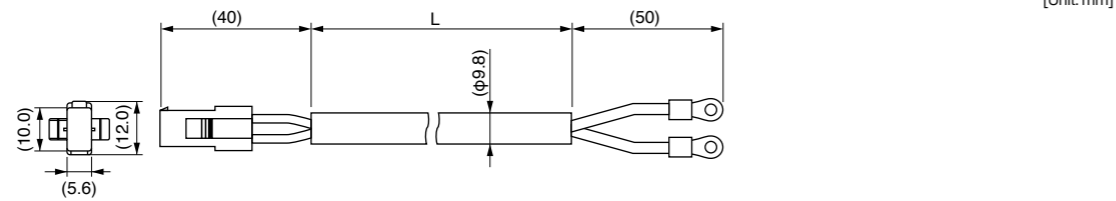
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|---|---------------------------------|-------|---------------|
| Connector | JL10-6A24-11SE-EB | Japan Aviation Electronics Ind. | 3 | MFMCA00033FUT |
| Cable clamp | JL04-2428CK(17)-R | Japan Aviation Electronics Ind. | 5 | MFMCA00053FUT |
| Nylon insulated round terminal | Earth N5.5-5 Brake N1.25-M4 | J.S.T Mfg. Co., Ltd. | 10 | MFMCA0103FUT |
| 20 | MFMCA0203FUT | | | |
| Cable | ROBO-TOP DP6/2501 3.5 mm ² 4-wire ROBO-TOP DP6/2501 0.75 mm ² 2-wire | DYDEN CORPORATION | | |

| | | | | |
|----------|-----------------------|--|--|--|
| Part No. | MFMCA0 ** 3FCT | 100 mm sq. or more Applicable model | MSMF 3.0 kW to 5.0 kW, MHMF 3.0 kW to 5.0 kW, <Screwed type> | MDMF 3.0 kW to 5.0 kW MGMF 2.9 kW, 4.4 kW |
|----------|-----------------------|--|--|--|



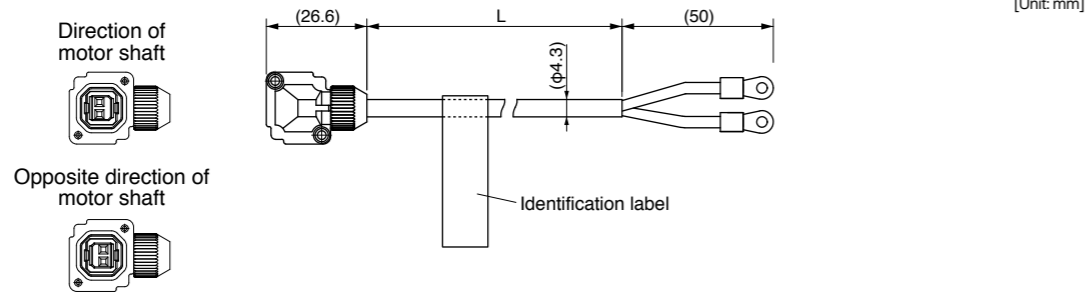
| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|---|---------------------------------|-------|---------------|
| Connector | JL04V-6A24-11SE-EB-R | Japan Aviation Electronics Ind. | 3 | MFMCA00033FCT |
| Cable clamp | JL04-2428CK(17)-R | Japan Aviation Electronics Ind. | 5 | MFMCA00053FCT |
| Nylon insulated round terminal | Earth N5.5-5 Brake N1.25-M4 | J.S.T Mfg. Co., Ltd. | 10 | MFMCA0103FCT |
| 20 | MFMCA0203FCT | | | |
| Cable | ROBO-TOP 600V 3.5 mm ² 4-wire ROBO-TOP 600V 0.75 mm ² 2-wire | DYDEN CORPORATION | | |

| | | | | |
|----------|----------------|---------------------------------------|--|---------------------|
| Part No. | MFMCB0 ** OGET | 80 mm sq. or less Applicable model | MSMF 50 W to 1000 W, MHMF 50 W to 1000 W (Leadwire type) | MQMF 100 W to 400 W |
|----------|----------------|---------------------------------------|--|---------------------|



| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|---|------------------------|-------|---------------|
| Connector | 172157-1 | Tyco Electronics Japan | 3 | MFMCB0030GET |
| Connector pin | 170366-1, 170362-1 | G.K. | 5 | MFMCB0050GET |
| Nylon insulated round terminal | N1.25-M4 | J.S.T Mfg. Co., Ltd. | 10 | MFMCB0100GET |
| Cable | ROBO-TOP 600V 0.75 mm ² 2-wire | DYDEN CORPORATION | 20 | MFMCB0200GET |

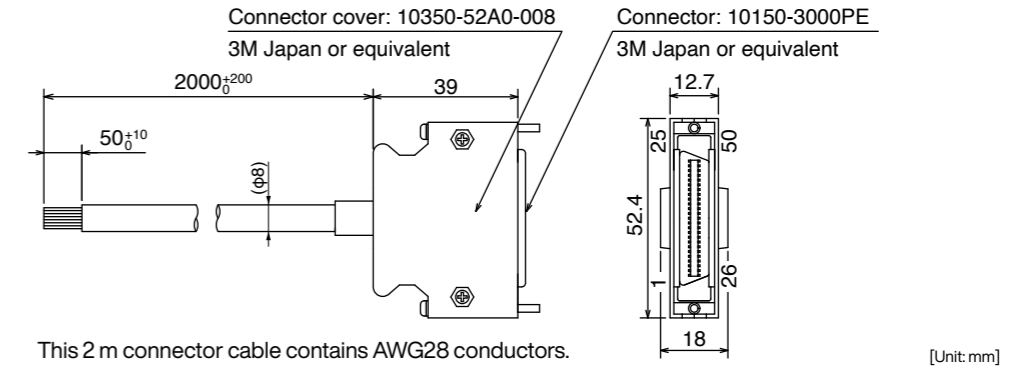
| | | | |
|----------|--|---------------------------------------|---|
| Part No. | MFMCB0 ** OPJT (Highly bendable type, Direction of motor shaft) | 80 mm sq. or less Applicable model | MSMF 50 W to 1000 W (Connector type) |
| | MFMCB0 ** OPKT (Highly bendable type, Opposite direction of motor shaft) | | |
| | MFMCB0 ** OSJT (Standard bendable type, Direction of motor shaft) | | |
| | MFMCB0 ** OSKT (Standard bendable type, Opposite direction of motor shaft) | | |



| Title | Part No. | Manufacturer | L (m) | Part No.(ex.) |
|--------------------------------|---------------------|---------------------------------|-------|---------------|
| Connector | JN4FT02SJMR | Japan Aviation Electronics Ind. | 3 | MFMCB0030PJT |
| Connector pin | ST-TMH-S-C1B-3500 | | 5 | MFMCB0050PJT |
| Nylon insulated round terminal | N1.25-M4 | J.S.T Mfg. Co., Ltd. | 10 | MFMCB0100PJT |
| Cable | AWG22 2-wire (φ4.3) | Proterial, Ltd. | 20 | MFMCB0200PJT |

Cable for Interface

| | |
|----------|----------|
| Part No. | DVOP4360 |
|----------|----------|



This 2 m connector cable contains AWG28 conductors.

Table for wiring

| Pin No. | color | Pin No. | color | Pin No. | color | Pin No. | color | Pin No. | color | Pin No. | color |
|---------|-----------------|---------|------------------------|---------|-----------------|---------|-----------------|---------|-----------------|---------|-------|
| 1 | Orange (Red1) | 11 | Orange (Black2) | 21 | Orange (Red3) | 31 | Orange (Red4) | 41 | Orange (Red5) | | |
| 2 | Orange (Black1) | 12 | Yellow (Black1) | 22 | Orange (Black3) | 32 | Orange (Black4) | 42 | Orange (Black5) | | |
| 3 | Gray (Red1) | 13 | Gray (Red2) | 23 | Gray (Red3) | 33 | Gray (Red4) | 43 | Gray (Red5) | | |
| 4 | Gray (Black1) | 14 | Gray (Black2) | 24 | Gray (Black3) | 34 | White (Red4) | 44 | White (Red5) | | |
| 5 | White (Red1) | 15 | White (Red2) | 25 | White (Red3) | 35 | White (Black4) | 45 | White (Black5) | | |
| 6 | White (Black1) | 16 | Yellow (Red2) | 26 | White (Black3) | 36 | Yellow (Red4) | 46 | Yellow (Red5) | | |
| 7 | Yellow (Red1) | 17 | Yel (Blk2)/Pink (Blk2) | 27 | Yellow (Red3) | 37 | Yellow (Black4) | 47 | Yellow (Black5) | | |
| 8 | Pink (Red1) | 18 | Pink (Red2) | 28 | Yellow (Black3) | 38 | Pink (Red4) | 48 | Pink (Red5) | | |
| 9 | Pink (Black1) | 19 | White (Black2) | 29 | Pink (Red3) | 39 | Pink (Black4) | 49 | Pink (Black5) | | |
| 10 | Orange (Red2) | 20 | - | 30 | Pink (Black3) | 40 | Gray (Black4) | 50 | Gray (Black5) | | |

<Remarks>
Color designation of the cable e.g.) Pin-1
Cable color : Orange
(Red1) : One red dot on the cable

<Caution>

Cable pin No. 50 is not connected to the connector shell (housing) or shielded wire (net wire).
Pin No. 50 of the Driver is connected to the shell (housing) of the connector.
The shielded wire (net wire) of the cable is connected to the shell (housing) of the connector of the cable, and by connecting the connector of the optional cable to the Driver, pin No. 50 of the cable and the shielded wire (net wire) of the cable gets connected via the Driver.

Interface Conversion Cable

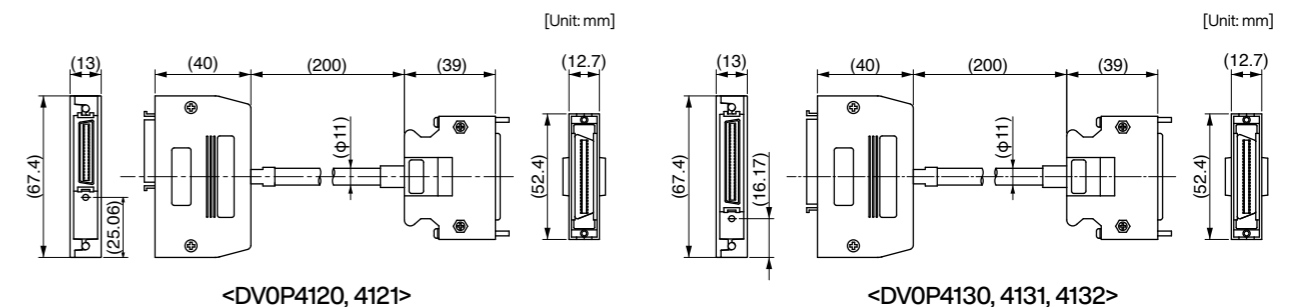
| | |
|----------|----------------------------------|
| Part No. | DVOP4120, 4121, 4130, 4131, 4132 |
|----------|----------------------------------|

Interface cables for old product (XX series or V series) can be connected to the current product by using the connector conversion cable shown below.

| | |
|----------|--|
| DVOP4120 | MINAS XX → A6 series (A5II, A5, A4, A series) for position control/ velocity control |
| DVOP4121 | MINAS XX → A6 series (A5II, A5, A4, A series) for torque control |
| DVOP4130 | MINAS V → A6 series (A5II, A5, A4, A series) for position control |
| DVOP4131 | MINAS V → A6 series (A5II, A5, A4, A series) for velocity control |
| DVOP4132 | MINAS V → A6 series (A5II, A5, A4, A series) for torque control |

* For details of wiring, contact our sales department.

Converts 36-pin configuration to 50-pin.



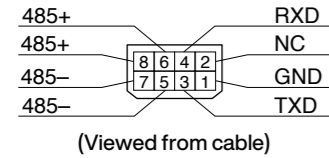
Connector Kit for Communication Cable (for RS485, RS232) (Excluding A6SE, A6NE, A6BE Series)

Part No. DV0PM20102

• Components

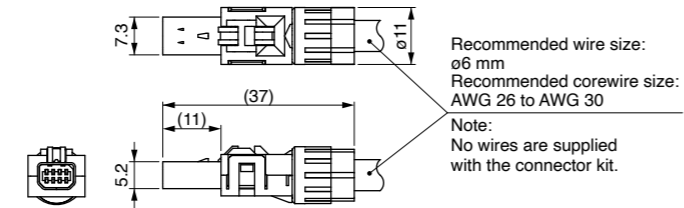
| Title | Part No. | Manufacturer | Note |
|-----------|-------------------|----------------------|---------------------------|
| Connector | CIF-PCNS08KK-072R | J.S.T Mfg. Co., Ltd. | For Connector X2 (8-pins) |

• Pin disposition of connector, connector X2



Shell: FG
 <Remarks>
 Do not connect anything to NC.

• Dimensions



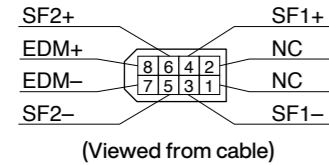
Connector Kit for Safety (Excluding A6SE, A6SG, A6NE, A6BE Series)

Part No. DV0PM20103

• Components

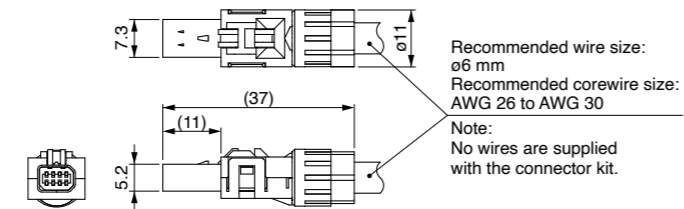
| Title | Part No. | Manufacturer | Note |
|-----------|-------------------|----------------------|---------------------------|
| Connector | CIF-PCNS08KK-071R | J.S.T Mfg. Co., Ltd. | For Connector X3 (8-pins) |

• Pin disposition of connector, connector X3



Shell: FG
 <Remarks>
 Do not connect anything to NC.

• Dimensions



Safety bypass plug (Excluding A6SE, A6SG, A6NE, A6BE Series)

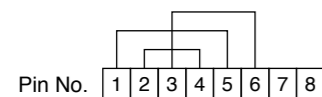
Part No. DV0PM20094

• Components

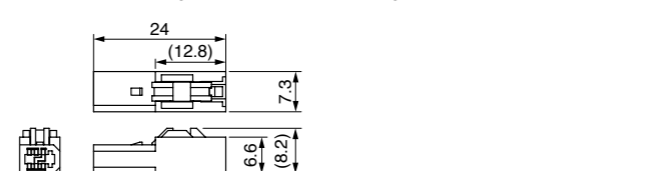
| Title | Part No. | Manufacturer | Note |
|-----------|-----------------|----------------------|------------------|
| Connector | CIF-PB08AK-GF1R | J.S.T Mfg. Co., Ltd. | For Connector X3 |

• Internal wiring

(Wiring of the following has been applied inside the plug.)



• Dimensions (Resin color : black)



<Remarks>
 • For the crimping tools required for cable production, please check the manufacturer's website or contact the manufacturer. For manufacturer inquiries, refer to P.347 "Peripheral Device Manufacturers List".

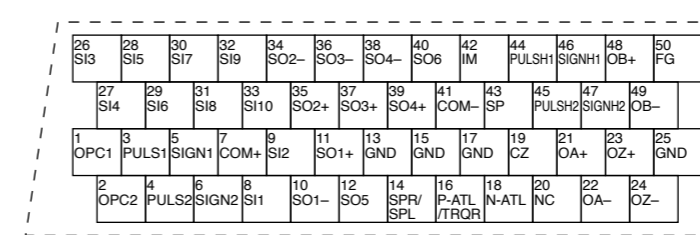
Connector Kit for Interface

Part No. DV0P4350

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-----------------|----------------|--------|--------------------------|----------------------------|
| Connector | 10150-3000PE | 1 | 3M Japan (or equivalent) | For Connector X4 (50-pins) |
| Connector cover | 10350-52A0-008 | 1 | | |

• Pin disposition (50 pins) (viewed from the soldering side)



- 1) Check the stamped pin-No. on the connector body while making a wiring.
- 2) For the function of each signal title or its symbol, refer to the operating manual.
- 3) Do not connect anything to NC pins in the above table.

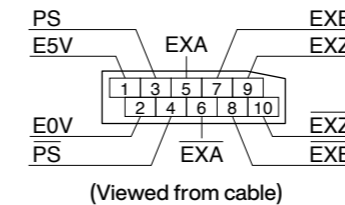
Connector Kit for External Scale (Excluding A6SE, A6SG, A6NE, A6BE Series)

Part No. DV0PM20026

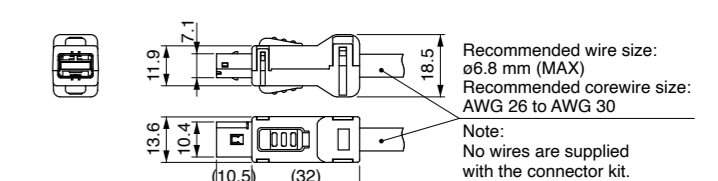
• Components

| Title | Part No. | Manufacturer | Note |
|-----------|-------------|----------------------|----------------------------|
| Connector | MUF-PK10K-X | J.S.T Mfg. Co., Ltd. | For Connector X5 (10-pins) |

• Pin disposition of connector, connector X5



• Dimensions



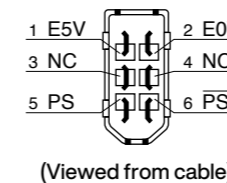
Connector Kit for Encoder

Part No. DV0PM20010

• Components

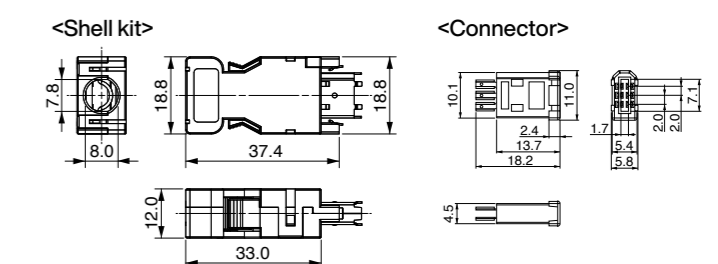
| Title | Part No. | Manufacturer | Note |
|-------------------------|----------------|--------------------------|------------------|
| Connector (Driver side) | 3E206-0100 KV | 3M Japan (or equivalent) | For Connector X6 |
| Shell kit | 3E306-3200-008 | | |

• Pin disposition of connector, connector X6



Shell: FG
 <Remarks>
 Do not connect anything to NC.

• Dimensions



<Remarks>
 Connector X1: use with commercially available cable.
 • Configuration of connector X1: USB mini-B

Connector Kit for Power Supply Input

Part No. DV0PM20032 (For A-frame to D-frame: Single row type) ● Please refer to the Dimensions of driver P.57 for connector XA.

• Components

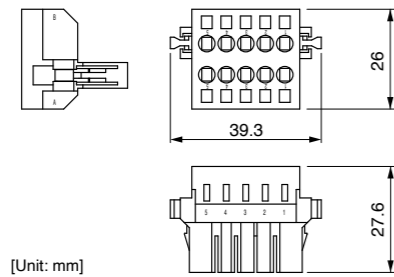
| Title | Part No. | Number | Manufacturer | Note |
|--------------|------------------|--------|----------------------|------------------|
| Connector | 05JFAT-SAXGGKK-A | 1 | J.S.T Mfg. Co., Ltd. | For Connector XA |
| Handle lever | J-FAT-OT | 2 | | |

Part No. DV0PM20033 (For A-frame to D-frame: Double row type)

• Components

| Title | Part No. | Number | Manufacturer | Note |
|--------------|-----------------|--------|----------------------|------------------|
| Connector | 05JFAT-SAXGSA-C | 1 | J.S.T Mfg. Co., Ltd. | For Connector XA |
| Handle lever | J-FAT-OT | 2 | | |

• Dimensions



| Driver part No. | Power supply | Rated input current |
|-----------------|----------------------------|---------------------|
| MADL * 01 * * | Single phase 100 V | 1.7 A |
| MADL * 11 * * | Single phase 100 V | 2.0 A |
| MADL * 05 * * | Single phase/3-phase 200 V | 1.6 A/0.9 A |
| MADL * 15 * * | Single phase/3-phase 200 V | 2.0 A/1.1 A |
| MBDL * 21 * * | Single phase 100 V | 4.5 A |
| MBDL * 25 * * | Single phase/3-phase 200 V | 3.7 A/2.1 A |
| MCDL * 31 * * | Single phase 100 V | 7.0 A |
| MCDL * 35 * * | Single phase/3-phase 200 V | 6.4 A/3.4 A |
| MDDL * 45 * * | Single phase/3-phase 200 V | 7.9 A/4.6 A |
| MDDL * 55 * * | Single phase/3-phase 200 V | 13.6 A/7.2 A |

* When connection multiple axes in series, make sure the sum of the current value does not exceed the rated current (11.25 A) of DV0PM20033.

Remarks

When using drivers MDDL * 55 * * in single-phase power supply, do not use DV0PM20033.

Part No. DV0PM20044 (For E-frame)

• Components

| Title | Part No. | Number | Manufacturer | Note |
|--------------|-----------------|--------|----------------------|------------------|
| Connector | 05JFAT-SAXGSA-L | 1 | J.S.T Mfg. Co., Ltd. | For Connector XA |
| Handle lever | J-FAT-OT-L | 2 | | |

Connector Kit for Regenerative Resistor Connection

Part No. DV0PM20045 (For E-frame)

• Components

| Title | Part No. | Number | Manufacturer | Note |
|--------------|-----------------|--------|----------------------|---|
| Connector | 04JFAT-SAXGSA-L | 1 | J.S.T Mfg. Co., Ltd. | 200 V: For Connector XC * Jumper wire is included. |
| Handle lever | J-FAT-OT-L | 2 | | |

<Remarks>

• For the crimping tools required for cable production, please check the manufacturer's website or contact the manufacturer. For manufacturer inquiries, refer to P.347 "Peripheral Device Manufacturers List".

Connector Kit for Motor Connection (Driver side)

Part No. DV0PM20034 (For A-frame to D-frame) ● Please refer to the Dimensions of driver P.57 for connector XB.

• Components

| Title | Part No. | Number | Manufacturer | Note |
|--------------|------------------|--------|----------------------|--|
| Connector | 06JFAT-SAXGGKK-A | 1 | J.S.T Mfg. Co., Ltd. | For Connector XB * Jumper wire is included. |
| Handle lever | J-FAT-OT | 2 | | |

Part No. DV0PM20046 (For E-frame) ● Please refer to the Dimensions of driver P.59 for connector XB.

• Components

| Title | Part No. | Number | Manufacturer | Note |
|--------------|-----------------|--------|----------------------|------------------|
| Connector | 03JFAT-SAXGSA-L | 1 | J.S.T Mfg. Co., Ltd. | For Connector XB |
| Handle lever | J-FAT-OT-L | 2 | | |

Connector Kit for Motor/Encoder Connection

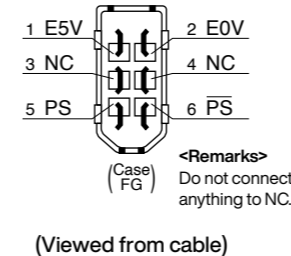
* When IP65 or IP67 are necessary, the customer must give appropriate processing.

| Part No. | DV0P4290 | 80 mm sq. or less Applicable model | MSMF 50 W to 1000 W *, MQMF 100 W to 400 W MHMF 50 W to 1000 W * (Leadwire type IP65) |
|----------------------------|----------|------------------------------------|---|
| * MSMF092□1□2, MHMF092□1□□ | | | |

• Components

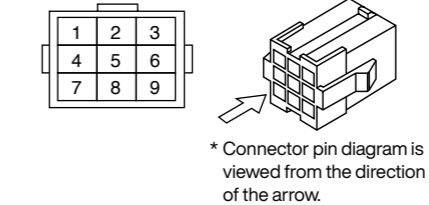
| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|----------------|--------|--------------------------------|-------------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan (or equivalent) | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | | |
| Connector | 172161-1 | 1 | Tyco Electronics Japan G.K. | For Encoder cable (9-pins) |
| Connector pin | 170365-1 | 9 | | |
| Connector | 172159-1 | 1 | Tyco Electronics Japan G.K. | For Motor cable (4-pins) |
| Connector pin | 170366-1 | 4 | | |

• Pin disposition of connector, connector X6



(Viewed from cable)

• Pin disposition of connector for encoder cable

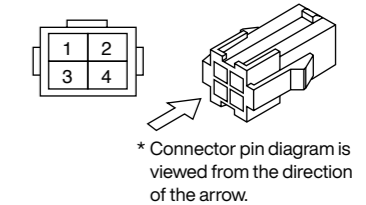


| PIN No. | Application |
|---------|-------------|
| 1 | BAT+* |
| 2 | BAT-* |
| 3 | FG(SHIELD) |
| 4 | PS |
| 5 | PS |
| 6 | NC |
| 7 | E5V |
| 8 | E0V |
| 9 | NC |

* When using the motor as an incremental system, BAT+ and BAT- can be left unconnected.

<Remarks> Do not connect anything to NC.

• Pin disposition of connector for motor cable



| PIN No. | Application |
|---------|-------------|
| 1 | U-phase |
| 2 | V-phase |
| 3 | W-phase |
| 4 | Ground |

* When you connect the battery for absolute encoder, refer to P.338, "When you make your own cable for 23-bit absolute encoder"

<Remarks>

• For the crimping tools required for cable production, please check the manufacturer's website or contact the manufacturer. For manufacturer inquiries, refer to P.347 "Peripheral Device Manufacturers List".

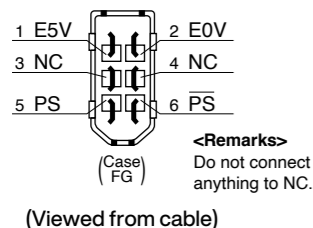
| | | | |
|----------|------------|---------------------------------------|---|
| Part No. | DV0PM20035 | 80 mm sq. or less Applicable model | MSMF 50 W to 1000 W * (Connector type IP67) |
|----------|------------|---------------------------------------|---|

* MSMF092L1□1

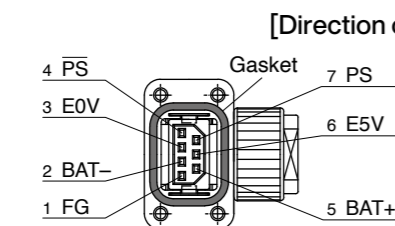
• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-------------------|--------|------------------|----------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JN6FR07SM1 | 1 | Japan Aviation | For Encoder cable (7-pins) |
| Socket contact | LY10-C1-A1-10000 | 7 | Electronics Ind. | |
| Motor connector | JN8FT04SJ1 | 1 | Japan Aviation | For Motor cable (4-pins) |
| Socket contact | ST-TMH-S-C1B-3500 | 4 | Electronics Ind. | |

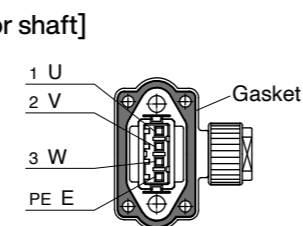
• Pin disposition of connector connector X6



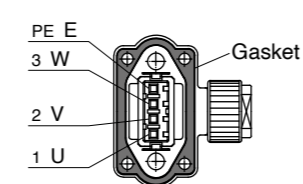
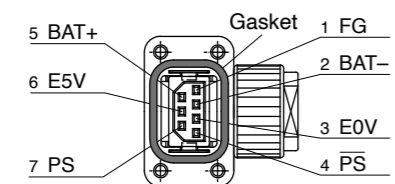
• Pin disposition of connector for encoder cable



• Pin disposition of connector for motor cable



[Opposite direction of motor shaft]



<Remarks>
Secure the gasket in place without removing it from the connector. Otherwise, the degree of protection of IP67 will not be guaranteed.

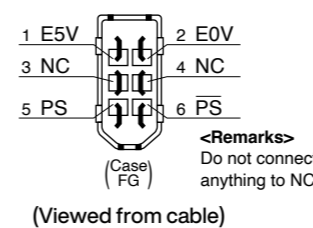
* Pins 2 and 5 are left unused (NC) when used in incremental system.

| | | | | |
|----------|------------|---------------------------------------|--|-------------------------------|
| Part No. | DV0PM24581 | 80 mm sq. or less Applicable model | MHMF 50 W, 100 W (Connector type IP67) | with/without brake common use |
|----------|------------|---------------------------------------|--|-------------------------------|

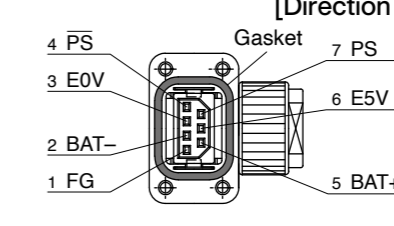
• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|------------------|--------|------------------|----------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JN6FR07SM1 | 1 | Japan Aviation | For Encoder cable (7-pins) |
| Socket contact | LY10-C1-A1-10000 | 7 | Electronics Ind. | |
| Motor connector | JN11FH06SN2 | 1 | Japan Aviation | For Motor cable (6-pins) |
| Socket contact | JN11S10K4A1 | 6 | Electronics Ind. | |

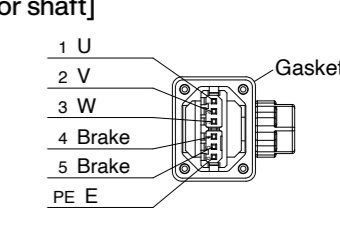
• Pin disposition of connector connector X6



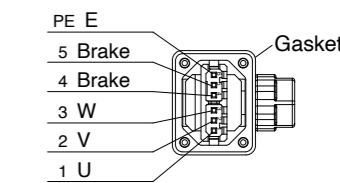
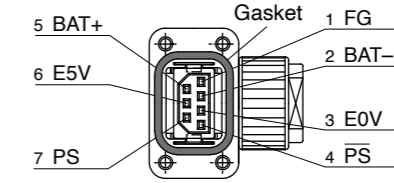
• Pin disposition of connector for encoder cable



• Pin disposition of connector for motor cable



[Opposite direction of motor shaft]



<Remarks>
Secure the gasket in place without removing it from the connector. Otherwise, the degree of protection of IP67 will not be guaranteed.

* Pins 2 and 5 are left unused (NC) when used in incremental system.

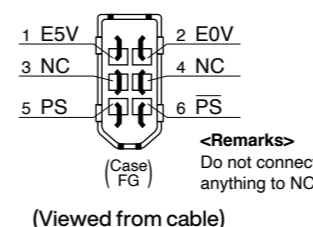
* 4-pin and 5-pin are not used in case of no brake.

| | | | | |
|----------|------------|---------------------------------------|---|-------------------------------|
| Part No. | DV0PM24582 | 80 mm sq. or less Applicable model | MQMF 100 W to 400 W, MHMF 200 W to 1000 W (Connector type IP67) | with/without brake common use |
|----------|------------|---------------------------------------|---|-------------------------------|

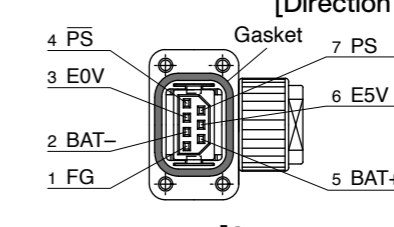
• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|------------------|--------|------------------|----------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JN6FR07SM1 | 1 | Japan Aviation | For Encoder cable (7-pins) |
| Socket contact | LY10-C1-A1-10000 | 7 | Electronics Ind. | |
| Motor connector | JN11FH06SN1 | 1 | Japan Aviation | For Motor cable (6-pins) |
| Socket contact | JN11S35H3A1 | 6 | Electronics Ind. | |

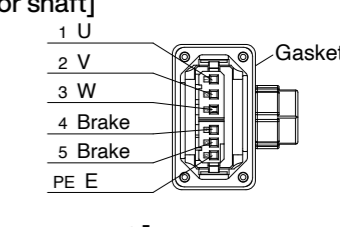
• Pin disposition of connector connector X6



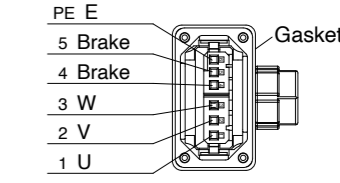
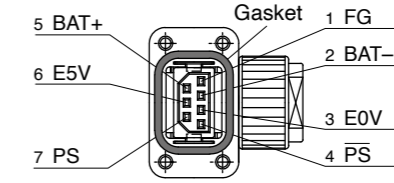
• Pin disposition of connector for encoder cable



• Pin disposition of connector for motor cable



[Opposite direction of motor shaft]



<Remarks>
Secure the gasket in place without removing it from the connector. Otherwise, the degree of protection of IP67 will not be guaranteed.

* Pins 2 and 5 are left unused (NC) when used in incremental system.

* 4-pin and 5-pin are not used in case of no brake.

<Remarks>
• For the crimping tools required for cable production, please check the manufacturer's website or contact the manufacturer. For manufacturer inquiries, refer to P.347 "Peripheral Device Manufacturers List".

Connector Kit for Motor/Encoder Connection

* When IP65 or IP67 are necessary, the customer must give appropriate processing.

| | | | | |
|----------|------------|--|--|------------------|
| Part No. | DV0PM24583 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JN2 <Small size connector> MSMF 1.0 kW * to 2.0 kW, MDMF 1.0 kW to 2.0 kW MHMF 1.0 kW *, 1.5 kW, MGMF 0.85 kW to 1.8 kW | Without brake |
|----------|------------|--|--|------------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-------------------|--------|---------------------------------|---------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JN2DS10SL1-R | 1 | Japan Aviation Electronics Ind. | For Encoder cable |
| Connector pin | JN1-22-22S-PKG100 | 5 | | (One-touch lock type) |
| Motor connector | JL10-6A20-4SE-EB | 1 | Japan Aviation Electronics Ind. | For Motor cable |
| Cable clamp | JL04-2022CK(14)-R | 1 | | (One-touch lock type) |

* MSMF102□□□, MHMF102□□□

| | | | | |
|----------|------------|--|--|---------------|
| Part No. | DV0PM24585 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JN2 <Small size connector> MSMF 1.0 kW * to 2.0 kW, MDMF 1.0 kW to 2.0 kW MHMF 1.0 kW *, 1.5 kW, MGMF 0.85 kW to 1.8 kW | With brake |
|----------|------------|--|--|---------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-------------------|--------|---------------------------------|---------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JN2DS10SL1-R | 1 | Japan Aviation Electronics Ind. | For Encoder cable |
| Connector pin | JN1-22-22S-PKG100 | 5 | | (One-touch lock type) |
| Motor connector | JL10-6A20-18SE-EB | 1 | Japan Aviation Electronics Ind. | For Motor cable |
| Cable clamp | JL04-2022CK(14)-R | 1 | | (One-touch lock type) |

* MSMF102□□□, MHMF102□□□

| | | | | |
|----------|------------|--|---|------------------|
| Part No. | DV0PM24587 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JL10 <Large size connector> MSMF 1.0 kW * to 2.0 kW, MDMF 1.0 kW to 2.0 kW MHMF 1.0 kW *, 1.5 kW, MGMF 0.85 kW to 1.8 kW | Without brake |
|----------|------------|--|---|------------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-------------------|--------|---------------------------------|---------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JL10-6A20-29S-EB | 1 | Japan Aviation Electronics Ind. | For Encoder cable |
| Cable clamp | JL04-2022CK(09)-R | 1 | | (One-touch lock type) |
| Motor connector | JL10-6A20-4SE-EB | 1 | Japan Aviation Electronics Ind. | For Motor cable |
| Cable clamp | JL04-2022CK(14)-R | 1 | | (One-touch lock type) |

* MSMF102L1□□, MHMF102L1□□

| | | | | |
|----------|------------|--|---|---------------|
| Part No. | DV0PM24589 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JL10 <Large size connector> MSMF 1.0 kW * to 2.0 kW, MDMF 1.0 kW to 2.0 kW MHMF 1.0 kW *, 1.5 kW, MGMF 0.85 kW to 1.8 kW | With brake |
|----------|------------|--|---|---------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-------------------|--------|---------------------------------|---------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JL10-6A20-29S-EB | 1 | Japan Aviation Electronics Ind. | For Encoder cable |
| Cable clamp | JL04-2022CK(09)-R | 1 | | (One-touch lock type) |
| Motor connector | JL10-6A20-18SE-EB | 1 | Japan Aviation Electronics Ind. | For Motor cable |
| Cable clamp | JL04-2022CK(14)-R | 1 | | (One-touch lock type) |

* MSMF102L1□□, MHMF102L1□□

<Remarks>

• For the crimping tools required for cable production, please check the manufacturer's website or contact the manufacturer. For manufacturer inquiries, refer to P.347 "Peripheral Device Manufacturers List".

| | | | | |
|----------|------------|--|---|------------------|
| Part No. | DV0PM24584 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JN2 <Small size connector> MSMF 3.0 kW to 5.0 kW, MDMF 3.0 kW to 5.0 kW MHMF 2.0 kW to 5.0 kW, MGMF 2.4 kW to 4.4 kW | Without brake |
|----------|------------|--|---|------------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-------------------|--------|---------------------------------|---------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JN2DS10SL1-R | 1 | Japan Aviation Electronics Ind. | For Encoder cable |
| Connector pin | JN1-22-22S-PKG100 | 5 | | (One-touch lock type) |
| Motor connector | JL10-6A22-22SE-EB | 1 | Japan Aviation Electronics Ind. | For Motor cable |
| Cable clamp | JL04-2022CK(14)-R | 1 | | (One-touch lock type) |

| | | | | |
|----------|------------|--|---|---------------|
| Part No. | DV0PM24586 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JN2 <Small size connector> MSMF 3.0 kW to 5.0 kW, MDMF 3.0 kW to 5.0 kW MHMF 2.0 kW to 5.0 kW, MGMF 2.4 kW to 4.4 kW | With brake |
|----------|------------|--|---|---------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-------------------|--------|---------------------------------|---------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JN2DS10SL1-R | 1 | Japan Aviation Electronics Ind. | For Encoder cable |
| Connector pin | JN1-22-22S-PKG100 | 5 | | (One-touch lock type) |
| Motor connector | JL10-6A24-11SE-EB | 1 | Japan Aviation Electronics Ind. | For Motor cable |
| Cable clamp | JL04-2428CK(17)-R | 1 | | (One-touch lock type) |

| | | | | |
|----------|------------|--|--|------------------|
| Part No. | DV0PM24588 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JL10 <Large size connector> MSMF 3.0 kW to 5.0 kW, MDMF 3.0 kW to 5.0 kW MHMF 2.0 kW to 5.0 kW, MGMF 2.4 kW to 4.4 kW | Without brake |
|----------|------------|--|--|------------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-------------------|--------|---------------------------------|---------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JL10-6A20-29S-EB | 1 | Japan Aviation Electronics Ind. | For Encoder cable |
| Cable clamp | JL04-2022CK(09)-R | 1 | | (One-touch lock type) |
| Motor connector | JL10-6A22-22SE-EB | 1 | Japan Aviation Electronics Ind. | For Motor cable |
| Cable clamp | JL04-2022CK(14)-R | 1 | | (One-touch lock type) |

| | | | | |
|----------|------------|--|--|---------------|
| Part No. | DV0PM24590 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JL10 <Large size connector> MSMF 3.0 kW to 5.0 kW, MDMF 3.0 kW to 5.0 kW MHMF 2.0 kW to 5.0 kW, MGMF 2.4 kW to 4.4 kW | With brake |
|----------|------------|--|--|---------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-------------------|--------|---------------------------------|---------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JL10-6A20-29S-EB | 1 | Japan Aviation Electronics Ind. | For Encoder cable |
| Cable clamp | JL04-2022CK(09)-R | 1 | | (One-touch lock type) |
| Motor connector | JL10-6A24-11SE-EB | 1 | Japan Aviation Electronics Ind. | For Motor cable |
| Cable clamp | JL04-2428CK(17)-R | 1 | | (One-touch lock type) |

<Remarks>

• For the crimping tools required for cable production, please check the manufacturer's website or contact the manufacturer. For manufacturer inquiries, refer to P.347 "Peripheral Device Manufacturers List".

Connector Kit for Motor/Encoder Connection

* When IP65 or IP67 are necessary, the customer must give appropriate processing.

| | | | | |
|-----------------|-------------------|--|--|------------------|
| Part No. | DV0PM20036 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JN2 <Small size connector> MSMF 1.0 kW * to 2.0 kW, MDMF 1.0 kW to 2.0 kW MHMF 1.0 kW *, 1.5 kW, MGMF 0.85 kW to 1.8 kW | Without brake |
|-----------------|-------------------|--|--|------------------|

* MSMF102□□□, MHMF102□□□

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|----------------------|--------|---------------------------------|---|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JN2DS10SL1-R | 1 | Japan Aviation Electronics Ind. | For Encoder cable (One-touch lock type) |
| Connector pin | JN1-22-22S-PKG100 | 5 | | |
| Motor connector | JL04V-6A20-4SE-EB-RK | 1 | Japan Aviation Electronics Ind. | For Motor cable (Screwed type) |
| Cable clamp | JL04-2022CK(14)-R | 1 | | |

| | | | | |
|-----------------|-------------------|--|--|---------------|
| Part No. | DV0PM20038 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JN2 <Small size connector> MSMF 1.0 kW * to 2.0 kW, MDMF 1.0 kW to 2.0 kW MHMF 1.0 kW *, 1.5 kW, MGMF 0.85 kW to 1.8 kW | With brake |
|-----------------|-------------------|--|--|---------------|

* MSMF102□□□, MHMF102□□□

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-----------------------|--------|---------------------------------|---|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JN2DS10SL1-R | 1 | Japan Aviation Electronics Ind. | For Encoder cable (One-touch lock type) |
| Connector pin | JN1-22-22S-PKG100 | 5 | | |
| Motor connector | JL04V-6A20-18SE-EB-RK | 1 | Japan Aviation Electronics Ind. | For Motor cable (Screwed type) |
| Cable clamp | JL04-2022CK(14)-R | 1 | | |

| | | | | |
|-----------------|-----------------|--|---|------------------|
| Part No. | DV0P4310 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JL10 <Large size connector> MSMF 1.0 kW * to 2.0 kW, MDMF 1.0 kW to 2.0 kW MHMF 1.0 kW *, 1.5 kW, MGMF 0.85 kW to 1.8 kW | Without brake |
|-----------------|-----------------|--|---|------------------|

* MSMF102L1□□, MHMF102L1□□

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-----------------|--------|---------------------------------|----------------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | N/MS3106B20-29S | 1 | Japan Aviation Electronics Ind. | For Encoder cable (Screwed type) |
| Cable clamp | N/MS3057-12A | 1 | | |
| Motor connector | N/MS3106B20-4S | 1 | Japan Aviation Electronics Ind. | For Motor cable (Screwed type) |
| Cable clamp | N/MS3057-12A | 1 | | |

| | | | | |
|-----------------|-----------------|--|---|---------------|
| Part No. | DV0P4330 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JL10 <Large size connector> MSMF 1.0 kW * to 2.0 kW, MDMF 1.0 kW to 2.0 kW MHMF 1.0 kW *, 1.5 kW, MGMF 0.85 kW to 1.8 kW | With brake |
|-----------------|-----------------|--|---|---------------|

* MSMF102L1□□, MHMF102L1□□

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-----------------|--------|---------------------------------|----------------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | N/MS3106B20-29S | 1 | Japan Aviation Electronics Ind. | For Encoder cable (Screwed type) |
| Cable clamp | N/MS3057-12A | 1 | | |
| Motor connector | N/MS3106B20-18S | 1 | Japan Aviation Electronics Ind. | For Motor cable (Screwed type) |
| Cable clamp | N/MS3057-12A | 1 | | |

<Remarks>

• For the crimping tools required for cable production, please check the manufacturer's website or contact the manufacturer. For manufacturer inquiries, refer to P.347 "Peripheral Device Manufacturers List".

| | | | | |
|-----------------|-------------------|--|---|------------------|
| Part No. | DV0PM20037 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JN2 <Small size connector> MSMF 3.0 kW to 5.0 kW, MDMF 3.0 kW to 5.0 kW MHMF 2.0 kW to 5.0 kW, MGMF 2.4 kW to 4.4 kW | Without brake |
|-----------------|-------------------|--|---|------------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|----------------------|--------|---------------------------------|---|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JN2DS10SL1-R | 1 | Japan Aviation Electronics Ind. | For Encoder cable (One-touch lock type) |
| Connector pin | JN1-22-22S-PKG100 | 5 | | |
| Motor connector | JL04V-6A22-22SE-EB-R | 1 | Japan Aviation Electronics Ind. | For Motor cable (Screwed type) |
| Cable clamp | JL04-2022CK(14)-R | 1 | | |

| | | | | |
|-----------------|-------------------|--|---|---------------|
| Part No. | DV0PM20039 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JN2 <Small size connector> MSMF 3.0 kW to 5.0 kW, MDMF 3.0 kW to 5.0 kW MHMF 2.0 kW to 5.0 kW, MGMF 2.4 kW to 4.4 kW | With brake |
|-----------------|-------------------|--|---|---------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|----------------------|--------|---------------------------------|---|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JN2DS10SL1-R | 1 | Japan Aviation Electronics Ind. | For Encoder cable (One-touch lock type) |
| Connector pin | JN1-22-22S-PKG100 | 5 | | |
| Motor connector | JL04V-6A24-11SE-EB-R | 1 | Japan Aviation Electronics Ind. | For Motor cable (Screwed type) |
| Cable clamp | JL04-2428CK(17)-R | 1 | | |

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|-----------------|-----------------|--|--|------------------|
| Part No. | DV0P4320 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JL10 <Large size connector> MSMF 3.0 kW to 5.0 kW, MDMF 3.0 kW to 5.0 kW MHMF 2.0 kW to 5.0 kW, MGMF 2.4 kW to 4.4 kW | Without brake |
|-----------------|-----------------|--|--|------------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-----------------|--------|---------------------------------|----------------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | N/MS3106B20-29S | 1 | Japan Aviation Electronics Ind. | For Encoder cable (Screwed type) |
| Cable clamp | N/MS3057-12A | 1 | | |
| Motor connector | N/MS3106B22-22S | 1 | Japan Aviation Electronics Ind. | For Motor cable (Screwed type) |
| Cable clamp | N/MS3057-12A | 1 | | |

| | | | | |
|-----------------|-----------------|--|--|---------------|
| Part No. | DV0P4340 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JL10 <Large size connector> MSMF 3.0 kW to 5.0 kW, MDMF 3.0 kW to 5.0 kW MHMF 2.0 kW to 5.0 kW, MGMF 2.4 kW to 4.4 kW | With brake |
|-----------------|-----------------|--|--|---------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-----------------|--------|---------------------------------|----------------------------------|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | N/MS3106B20-29S | 1 | Japan Aviation Electronics Ind. | For Encoder cable (Screwed type) |
| Cable clamp | N/MS3057-12A | 1 | | |
| Motor connector | N/MS3106B24-11S | 1 | Japan Aviation Electronics Ind. | For Motor cable (Screwed type) |
| Cable clamp | N/MS3057-16A | 1 | | |

<Remarks>

• For the crimping tools required for cable production, please check the manufacturer's website or contact the manufacturer. For manufacturer inquiries, refer to P.347 "Peripheral Device Manufacturers List".

Connector Kit for Motor/Encoder Connection

* When IP65 or IP67 are necessary, the customer must give appropriate processing.

| | | | | |
|----------|------------|--|--|------------------|
| Part No. | DV0PM20107 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JL10 <Large size connector> MDMF 7.5 kW to 15.0 kW MGMF 5.5 kW, MHMF 7.5 kW | Without brake |
|----------|------------|--|--|------------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|--------------------------------|--------|---------------------------------|---------------------------|
| Connector (Driver side) | 3E206-0100KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JL10-6A20-29S-EB | 1 | Japan Aviation Electronics Ind. | For Encoder cable |
| Cable clamp | JL04-2022CK(09)-R | 1 | | (One-touch lock type) |
| Motor connector | JL04V-6A32-17SE-EB-RK | 1 | Japan Aviation Electronics Ind. | For Motor cable |
| Cable clamp | JL04-32CK(24)-RK ^{*1} | 1 | | (Screwed type) |

*1 Casing size: φ 22 to φ 25. There is no specified cable wire material. Prepare a wire according to the connector used by the customer.

| | | | | |
|----------|------------|--|--|---------------|
| Part No. | DV0PM20108 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JL10 <Large size connector> MDMF 7.5 kW to 15.0 kW MGMF 5.5 kW, MHMF 7.5 kW | With brake |
|----------|------------|--|--|---------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|--------------------------------|--------|---------------------------------|---------------------------|
| Connector (Driver side) | 3E206-0100KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JL10-6A20-29S-EB | 1 | Japan Aviation Electronics Ind. | For Encoder cable |
| Cable clamp | JL04-2022CK(09)-R | 1 | | (One-touch lock type) |
| Motor connector | JL04V-6A32-17SE-EB-RK | 1 | Japan Aviation Electronics Ind. | For Motor cable |
| Cable clamp | JL04-32CK(24)-RK ^{*1} | 1 | | (Screwed type) |
| Brake connector | N/MS3106B14S-2S | 1 | Japan Aviation Electronics Ind. | For Brake cable |
| Cable clamp | N/MS3057-6A | 1 | | (Screwed type) |

*1 Casing size: φ 22 to φ 25. There is no specified cable wire material. Prepare a wire according to the connector used by the customer.

| | | | | |
|----------|------------|--|--|------------------|
| Part No. | DV0PM20111 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JL10 <Large size connector> MDMF 7.5 kW to 15.0 kW MGMF 5.5 kW, MHMF 7.5 kW | Without brake |
|----------|------------|--|--|------------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|--------------------------------|--------|---------------------------------|---------------------------|
| Connector (Driver side) | 3E206-0100KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | N/MS3106B20-29S | 1 | Japan Aviation Electronics Ind. | For Encoder cable |
| Cable clamp | N/MS3057-12A | 1 | | (Screwed type) |
| Motor connector | JL04V-6A32-17SE-EB-RK | 1 | Japan Aviation Electronics Ind. | For Motor cable |
| Cable clamp | JL04-32CK(24)-RK ^{*1} | 1 | | (Screwed type) |

*1 Casing size: φ 22 to φ 25. There is no specified cable wire material. Prepare a wire according to the connector used by the customer.

<Remarks>

- For the crimping tools required for cable production, please check the manufacturer's website or contact the manufacturer. For manufacturer inquiries, refer to P.347 "Peripheral Device Manufacturers List".

| | | | | |
|----------|------------|--|--|---------------|
| Part No. | DV0PM20112 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JL10 <Large size connector> MDMF 7.5 kW to 15.0 kW MGMF 5.5 kW, MHMF 7.5 kW | With brake |
|----------|------------|--|--|---------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|--------------------------------|--------|---------------------------------|---------------------------|
| Connector (Driver side) | 3E206-0100KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | N/MS3106B20-29S | 1 | Japan Aviation Electronics Ind. | For Encoder cable |
| Cable clamp | N/MS3057-12A | 1 | | (Screwed type) |
| Motor connector | JL04V-6A32-17SE-EB-RK | 1 | Japan Aviation Electronics Ind. | For Motor cable |
| Cable clamp | JL04-32CK(24)-RK ^{*1} | 1 | | (Screwed type) |
| Brake connector | N/MS3106B14S-2S | 1 | Japan Aviation Electronics Ind. | For Brake cable |
| Cable clamp | N/MS3057-6A | 1 | | (Screwed type) |

*1 Casing size: φ 22 to φ 25. There is no specified cable wire material. Prepare a wire according to the connector used by the customer.

| | | | | |
|----------|------------|--|---|------------------|
| Part No. | DV0PM20056 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JN2 <Small size connector> MDMF 7.5 kW to 15.0 kW MGMF 5.5 kW, MHMF 7.5 kW | Without brake |
|----------|------------|--|---|------------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|--------------------------------|--------|---------------------------------|---------------------------|
| Connector (Driver side) | 3E206-0100KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JN2DS10SL1-R | 1 | Japan Aviation Electronics Ind. | For Encoder cable |
| Connector pin | JN1-22-22S-PKG100 | 5 | | (One-touch lock type) |
| Motor connector | JL04V-6A32-17SE-EB-RK | 1 | Japan Aviation Electronics Ind. | For Motor cable |
| Cable clamp | JL04-32CK(24)-RK ^{*1} | 1 | | (Screwed type) |

*1 Casing size: φ 22 to φ 25. There is no specified cable wire material. Prepare a wire according to the connector used by the customer.

| | | | | |
|----------|------------|--|---|---------------|
| Part No. | DV0PM20057 | 100 mm sq. or more Applicable model | (IP67 motor) Encoder JN2 <Small size connector> MDMF 7.5 kW to 15.0 kW MGMF 5.5 kW, MHMF 7.5 kW | With brake |
|----------|------------|--|---|---------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|--------------------------------|--------|---------------------------------|---------------------------|
| Connector (Driver side) | 3E206-0100KV | 1 | 3M Japan | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | (or equivalent) | |
| Encoder connector | JN2DS10SL1-R | 1 | Japan Aviation Electronics Ind. | For Encoder cable |
| Connector pin | JN1-22-22S-PKG100 | 5 | | (One-touch lock type) |
| Motor connector | JL04V-6A32-17SE-EB-RK | 1 | Japan Aviation Electronics Ind. | For Motor cable |
| Cable clamp | JL04-32CK(24)-RK ^{*1} | 1 | | (Screwed type) |
| Brake connector | N/MS3106B14S-2S | 1 | Japan Aviation Electronics Ind. | For Brake cable |
| Cable clamp | N/MS3057-6A | 1 | | (Screwed type) |

*1 Casing size: φ 22 to φ 25. There is no specified cable wire material. Prepare a wire according to the connector used by the customer.

<Remarks>

- For the crimping tools required for cable production, please check the manufacturer's website or contact the manufacturer. For manufacturer inquiries, refer to P.347 "Peripheral Device Manufacturers List".

Connector Kit for Motor/Encoder Connection

* When IP44 is necessary, the customer must give appropriate processing.

| | | | | |
|----------|------------|--|--|------------------|
| Part No. | DV0PM20109 | 100 mm sq. or more Applicable model | (IP44 motor) Encoder JL10 <Large size connector> MDMF 22.0 kW | Without brake |
|----------|------------|--|--|------------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-------------------|--------|------------------------------------|--|
| Connector (Driver side) | 3E206-0100KV | 1 | 3M Japan (or equivalent) | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | | |
| Encoder connector | JL10-6A20-29S-EB | 1 | Japan Aviation Electronics Ind. | For Encoder cable (One-touch lock type) |
| Cable clamp | JL04-2022CK(09)-R | 1 | | |

| | | | | |
|----------|------------|--|--|---------------|
| Part No. | DV0PM20110 | 100 mm sq. or more Applicable model | (IP44 motor) Encoder JL10 <Large size connector> MDMF 22.0 kW | With brake |
|----------|------------|--|--|---------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-------------------|--------|------------------------------------|--|
| Connector (Driver side) | 3E206-0100KV | 1 | 3M Japan (or equivalent) | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | | |
| Encoder connector | JL10-6A20-29S-EB | 1 | Japan Aviation Electronics Ind. | For Encoder cable (One-touch lock type) |
| Cable clamp | JL04-2022CK(09)-R | 1 | | |
| Brake connector | N/MS3106B14S-2S | 1 | Japan Aviation Electronics Ind. | For Brake cable (Screwed type) |
| Cable clamp | N/MS3057-6A | 1 | | |

| | | | | |
|----------|------------|--|--|------------------|
| Part No. | DV0PM20113 | 100 mm sq. or more Applicable model | (IP44 motor) Encoder JL10 <Large size connector> MDMF 22.0 kW | Without brake |
|----------|------------|--|--|------------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-----------------|--------|------------------------------------|-------------------------------------|
| Connector (Driver side) | 3E206-0100KV | 1 | 3M Japan (or equivalent) | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | | |
| Encoder connector | N/MS3106B20-29S | 1 | Japan Aviation Electronics Ind. | For Encoder cable (Screwed type) |
| Cable clamp | N/MS3057-12A | 1 | | |

| | | | | |
|----------|------------|--|--|---------------|
| Part No. | DV0PM20114 | 100 mm sq. or more Applicable model | (IP44 motor) Encoder JL10 <Large size connector> MDMF 22.0 kW | With brake |
|----------|------------|--|--|---------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-----------------|--------|------------------------------------|-------------------------------------|
| Connector (Driver side) | 3E206-0100KV | 1 | 3M Japan (or equivalent) | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | | |
| Encoder connector | N/MS3106B20-29S | 1 | Japan Aviation Electronics Ind. | For Encoder cable (Screwed type) |
| Cable clamp | N/MS3057-12A | 1 | | |
| Brake connector | N/MS3106B14S-2S | 1 | Japan Aviation Electronics Ind. | For Brake cable (Screwed type) |
| Cable clamp | N/MS3057-6A | 1 | | |

| | | | | |
|----------|------------|--|---|------------------|
| Part No. | DV0PM20115 | 100 mm sq. or more Applicable model | (IP44 motor) Encoder JN2 <Small size connector> MDMF 22.0 kW | Without brake |
|----------|------------|--|---|------------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-------------------|--------|------------------------------------|--|
| Connector (Driver side) | 3E206-0100KV | 1 | 3M Japan (or equivalent) | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | | |
| Encoder connector | JN2DS10SL1-R | 1 | Japan Aviation Electronics Ind. | For Encoder cable (One-touch lock type) |
| Connector pin | JN1-22-22S-PKG100 | 5 | | |

| | | | | |
|----------|------------|--|---|---------------|
| Part No. | DV0PM20116 | 100 mm sq. or more Applicable model | (IP44 motor) Encoder JN2 <Small size connector> MDMF 22.0 kW | With brake |
|----------|------------|--|---|---------------|

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|-------------------|--------|------------------------------------|--|
| Connector (Driver side) | 3E206-0100KV | 1 | 3M Japan (or equivalent) | For Connector X6 (6-pins) |
| Shell kit | 3E306-3200-008 | 1 | | |
| Encoder connector | JN2DS10SL1-R | 1 | Japan Aviation Electronics Ind. | For Encoder cable (One-touch lock type) |
| Connector pin | JN1-22-22S-PKG100 | 5 | | |
| Brake connector | N/MS3106B14S-2S | 1 | Japan Aviation Electronics Ind. | For Brake cable (Screwed type) |
| Cable clamp | N/MS3057-6A | 1 | | |

* The motor / encoder connection connector kit for MDMF 22.0 kW does not include the connection parts for motor cable (terminal block). Please prepare a round terminal by yourself. (For details, see P.27)

<Remarks>
 • For the crimping tools required for cable production, please check the manufacturer's website or contact the manufacturer. For manufacturer inquiries, refer to P.347 "Peripheral Device Manufacturers List".

<Remarks>
 • For the crimping tools required for cable production, please check the manufacturer's website or contact the manufacturer. For manufacturer inquiries, refer to P.347 "Peripheral Device Manufacturers List".

* When IP65 or IP67 are necessary, the customer must give appropriate processing.

Connector Kit for Motor/Brake Connection

| | | | |
|----------|------------|---------------------------------------|---|
| Part No. | DV0PM20040 | 80 mm sq. or less Applicable model | MSMF 50 W to 1000 W * (Connector type IP67) |
|----------|------------|---------------------------------------|---|

* MSMF092L1□1

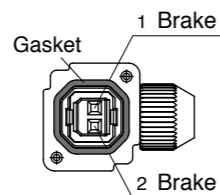
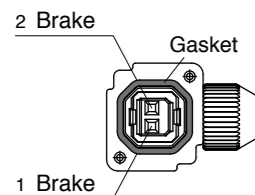
• Components

| Title | Part No. | Number | Manufacturer | Note |
|----------------|-------------------|--------|---------------------------------|-----------------|
| Connector | JN4FT02SJM-R | 1 | Japan Aviation Electronics Ind. | For brake cable |
| Socket contact | ST-TMH-S-C1B-3500 | 2 | | |

• Pin disposition of connector for brake cable

[Direction of motor shaft]

[Opposite direction of motor shaft]



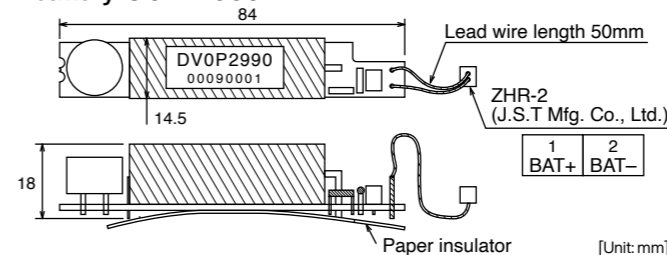
<Remarks>

Secure the gasket in place without removing it from the connector. Otherwise, the degree of protection of IP67 will not be guaranteed.

Battery for Absolute Encoder

| | |
|----------|----------|
| Part No. | DV0P2990 |
|----------|----------|

• Lithium battery: 3.6 V 2000 mAh



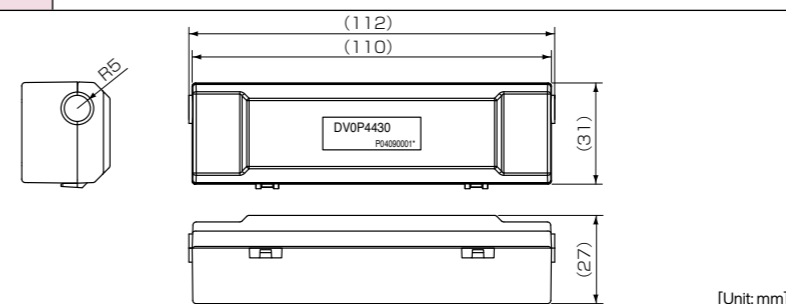
<Caution>

This battery is categorized as hazardous substance, and you may be required to present an application of hazardous substance when you transport by air (both passenger and cargo airlines).

Battery Box for Absolute Encoder *

* Battery is not included. Please buy the absolute encoder battery "DV0P2990" separately.

| | |
|----------|----------|
| Part No. | DV0P4430 |
|----------|----------|



When making a cable for 23-bit absolute encoder by yourself

When you make your own cable for 23-bit absolute encoder, connect the optional battery for absolute encoder, DV0P2990 as per the wiring diagram below. Connector of the battery for absolute encoder shall be provided by customer as well.

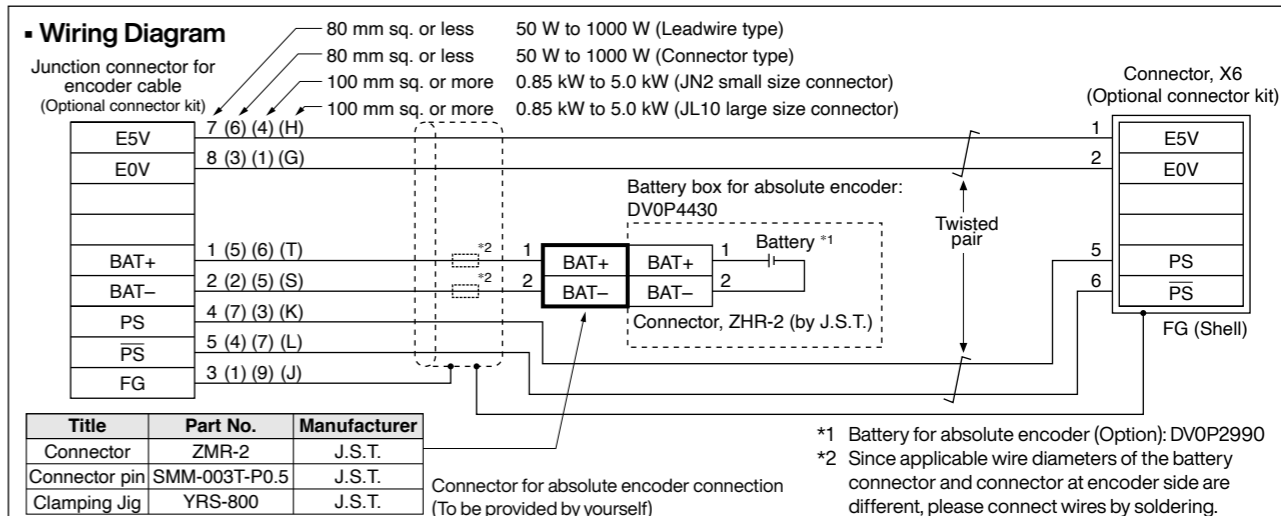
<Caution>

Install and fix the battery securely. If the installation and fixing of the battery is not appropriate, it may cause the wire breakdown or damage of the battery.

Refer to the instruction manual of the battery for handling the battery.

• Installation Place of Battery

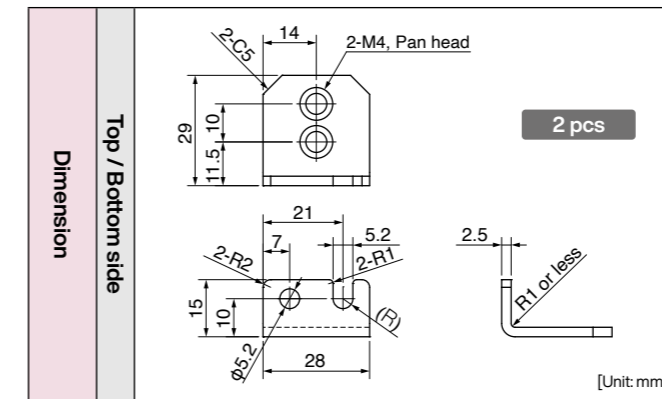
- 1) Indoors, where the products are not subjected to rain or direct sun beam.
- 2) Where the products are not subjected to corrosive atmospheres such as hydrogen sulfide, sulfurous acid, chlorine, ammonia, chloric gas, sulfuric gas, acid, alkaline and salt and so on, and are free from splash of inflammable gas, grinding oil, oil mist, iron powder or chips and etc.
- 3) Well-ventilated and humid and dust-free place.
- 4) Vibration-free place



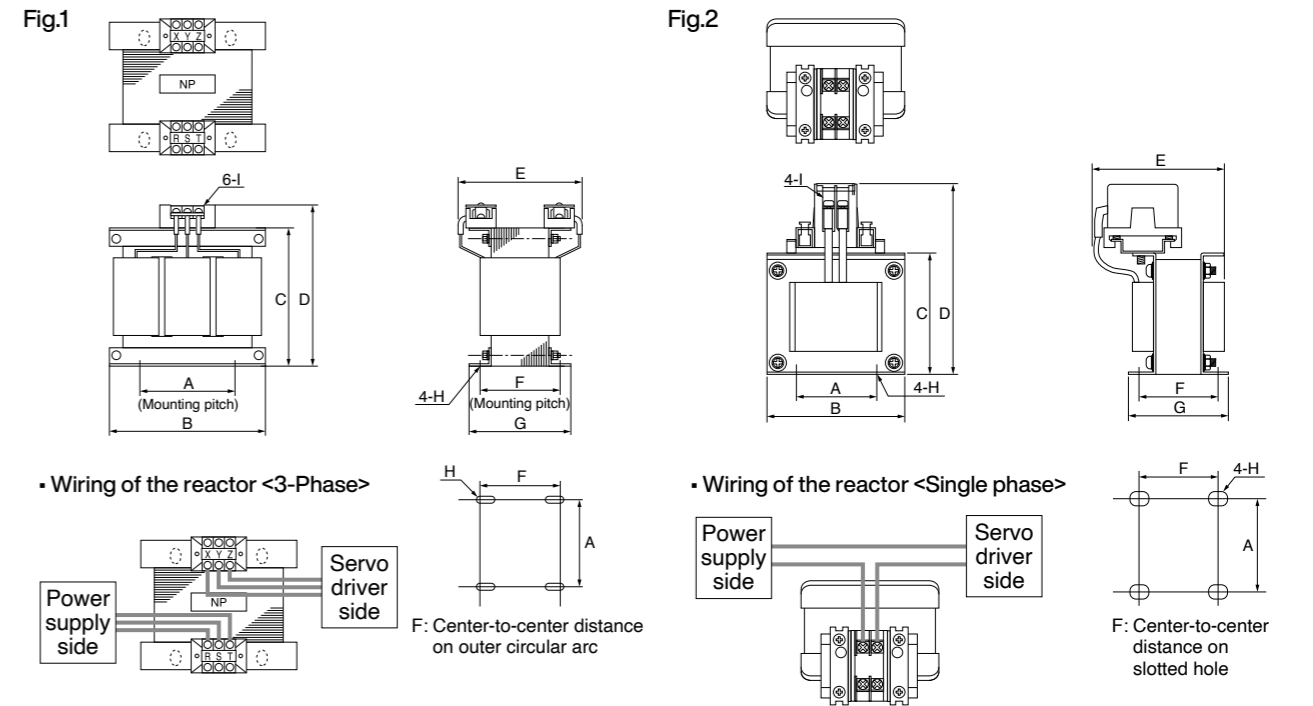
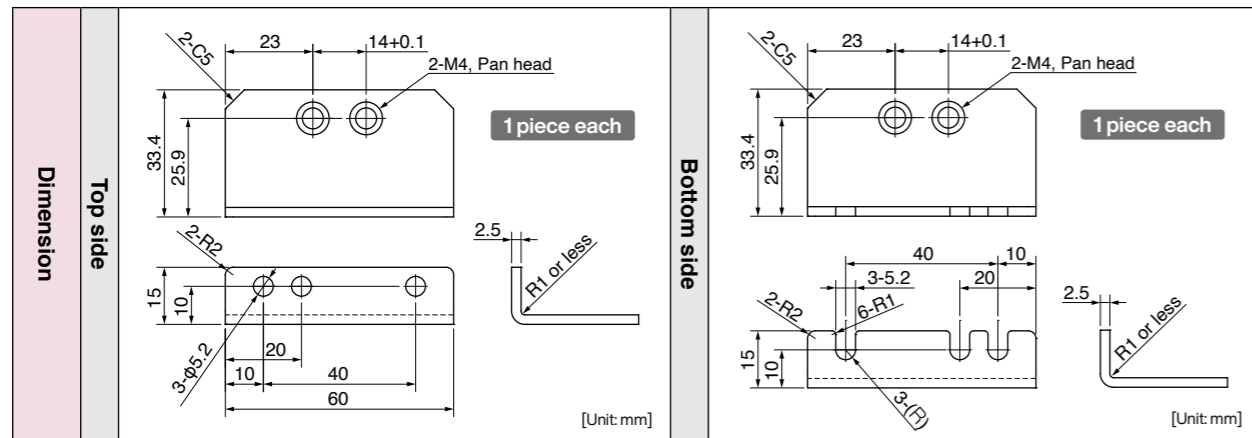
Recommended components

| Motor | | Part No. | Manufacturer |
|-------|-------------------|-------------|------------------------------|
| MSMF | 50 W to 1000 W | TND14V-271K | NIPPON CHEMI-CON CORPORATION |
| | 1.0 kW to 3.0 kW | Z15D151 | SEMITEC Corporation |
| | 4.0 kW, 5.0 kW | NVD07SCD082 | KOA Corporation |
| MQMF | 100W to 400 W | TND14V-271K | NIPPON CHEMI-CON CORPORATION |
| MHMF | 50 W to 1000 W | | |
| | 1.0 kW, 1.5 kW | | |
| | 2.0 kW to 4.0 kW | Z15D151 | SEMITEC Corporation |
| MDMF | 5.0 kW, 7.5 kW | NVD07SCD082 | KOA Corporation |
| | 1.0 kW to 3.0 kW | NVD07SCD082 | KOA Corporation |
| | 4.0 kW | Z15D151 | SEMITEC Corporation |
| MGMF | 5.0 kW to 22.0 kW | NVD07SCD082 | KOA Corporation |
| | 0.85 kW to 1.8 kW | NVD07SCD082 | KOA Corporation |
| MGMF | 2.4 kW, 2.9 kW | Z15D151 | SEMITEC Corporation |
| | 4.4 kW, 5.5 kW | NVD07SCD082 | KOA Corporation |

| | | | | | |
|----------|------------|-----------------------------------|--------------------|-----------------------------|-----------------------|
| Part No. | DVOPM20100 | Frame symbol of applicable driver | A-frame B-frame | Mounting screw (comes with) | M4 × L6 Pan head 4pcs |
|----------|------------|-----------------------------------|--------------------|-----------------------------|-----------------------|



| | | | | | |
|----------|------------|-----------------------------------|--------------------|-----------------------------|-----------------------|
| Part No. | DV0PM20101 | Frame symbol of applicable driver | C-frame D-frame | Mounting screw (comes with) | M4 × L6 Pan head 4pcs |
|----------|------------|-----------------------------------|--------------------|-----------------------------|-----------------------|



[Unit: mm]

| | Part No. | A | B | C | D | E(Max) | F | G | H | I | Inductance (mH) | Rated current (A) |
|-------|------------|--------|--------|--------|--------------------|--------|----------|-------|---------|------|-----------------|-------------------|
| Fig.1 | DV0P220 | 65±1 | 125±1 | (93) | 136 _{Max} | 155 | 70+3/-0 | 85±2 | 4-7φ×12 | M4 | 6.81 | 3 |
| | DV0P221 | 60±1 | 150±1 | (113) | 155 _{Max} | 130 | 60+3/-0 | 75±2 | 4-7φ×12 | M4 | 4.02 | 5 |
| | DV0P222 | 60±1 | 150±1 | (113) | 155 _{Max} | 140 | 70+3/-0 | 85±2 | 4-7φ×12 | M4 | 2 | 8 |
| | DV0P223 | 60±1 | 150±1 | (113) | 155 _{Max} | 150 | 79+3/-0 | 95±2 | 4-7φ×12 | M4 | 1.39 | 11 |
| | DV0P224 | 60±1 | 150±1 | (113) | 160 _{Max} | 155 | 84+3/-0 | 100±2 | 4-7φ×12 | M5 | 0.848 | 16 |
| Fig.2 | DV0P225 | 60±1 | 150±1 | (113) | 160 _{Max} | 170 | 100+3/-0 | 115±2 | 4-7φ×12 | M5 | 0.557 | 25 |
| | DV0P227 | 55±0.7 | 76.5±1 | 66.5±1 | 110 _{Max} | 90 | 43.6±2 | 56±2 | 4-5φ×10 | M3.5 | 4.02 | 5 |
| | DV0P228 | 55±0.7 | 76.5±1 | 66.5±1 | 110 _{Max} | 95 | 48.0±2 | 61±2 | 4-5φ×10 | M3.5 | 2 | 8 |
| | DV0PM20047 | 55±0.7 | 76.5±1 | 66.5±1 | 110 _{Max} | 105 | 58.6±2 | 71±2 | 4-5φ×10 | M4 | 1.39 | 11 |

* For application, refer to P.29 to P.42 and P.205 to P.210 "Table of Part Numbers and Options".

Harmonic restraint

Harmonic restraint measures are not common to all countries. Therefore, prepare the measures that meet the requirements of the destination country.
When installing a product for Japan, refer to the instruction manual available on our website.

[Panasonic Industry Co., Ltd. web site]
industrial.panasonic.com/ac/e/

<Remarks>

When using a reactor, be sure to install one reactor to one servo driver.

| Part No. | Manufacturer's part No. | Specifications | | | | | Activation temperature of built-in thermal protector |
|----------|-------------------------|----------------|--------------------------------------|--------|---------------------------------------|----------|--|
| | | Resistance | cable core outside diameter | Weight | Rated power (reference) ^{*1} | | |
| | | | | | Free air | with fan | |
| Ω | mm | kg | W | W | | | |
| DV0P4280 | RF70M | 50 | φ1.27 (AWG18 stranded wire) | 0.1 | 10 | 25 | 140±5 °C B-contact Open/Close capacity (resistance load) 1 A 125 VAC 6000 times 0.5 A 250 VAC 10000 times |
| DV0P4281 | RF70M | 100 | | 0.1 | 10 | 25 | |
| DV0P4282 | RF180B | 25 | | 0.4 | 17 | 50 | |
| DV0P4283 | RF180B | 50 | | 0.2 | 17 | 50 | |
| DV0P4284 | RF240 | 30 | | 0.5 | 40 | 100 | |
| DV0P4285 | RH450F | 20 | | 1.2 | 52 | 130 | |

Manufacturer : Iwaki Musen Kenkyusho

*1 Power with which the driver can be used without activating the built-in thermal protector.

A built-in thermal fuse and a thermal protector are provided for safety.

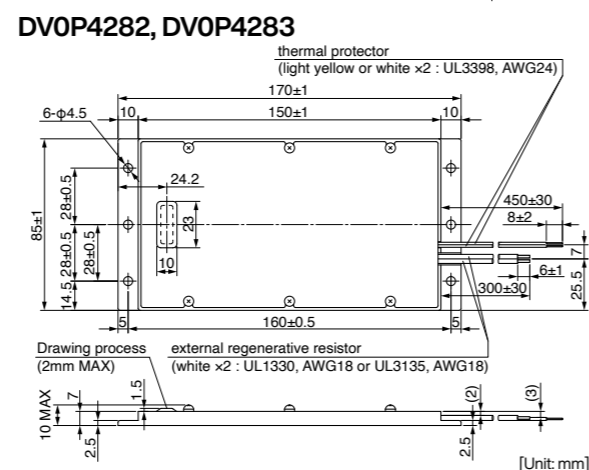
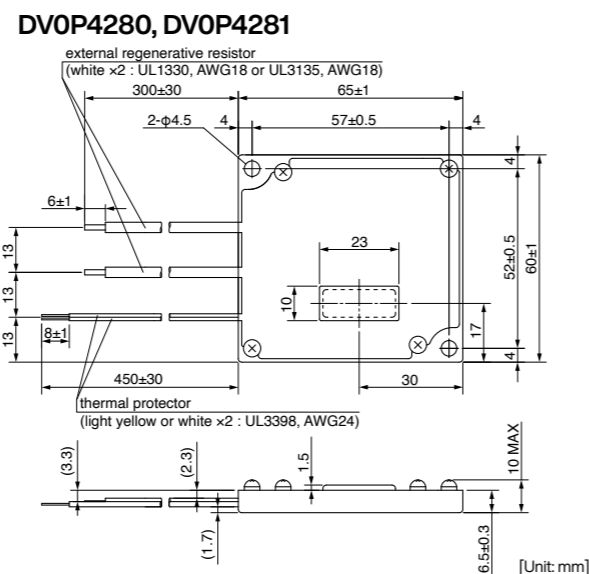
The circuit should be so designed that the power supply will be turned off as the thermal protector operates.

The built-in thermal fuse blows depending on changes in heat dissipation condition, operating temperature limit, power supply voltage or load.

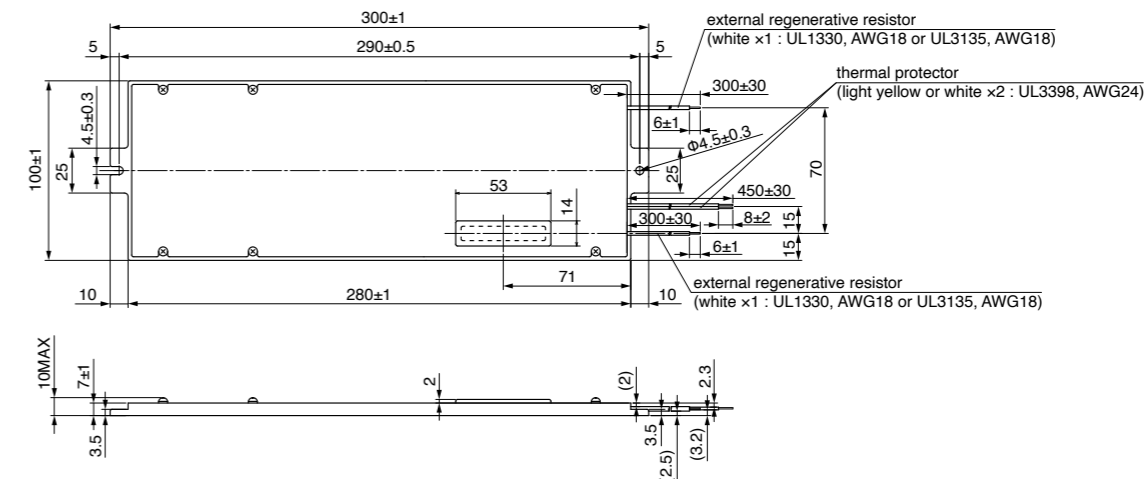
Mount the regenerative resistor on a machine operating under aggressive regenerating condition (high power supply voltage, large load inertia, shorter deceleration time, etc.) and make sure that the surface temperature will not exceed 100 °C.

*2 If the wind speed is 1m / s by the fan.

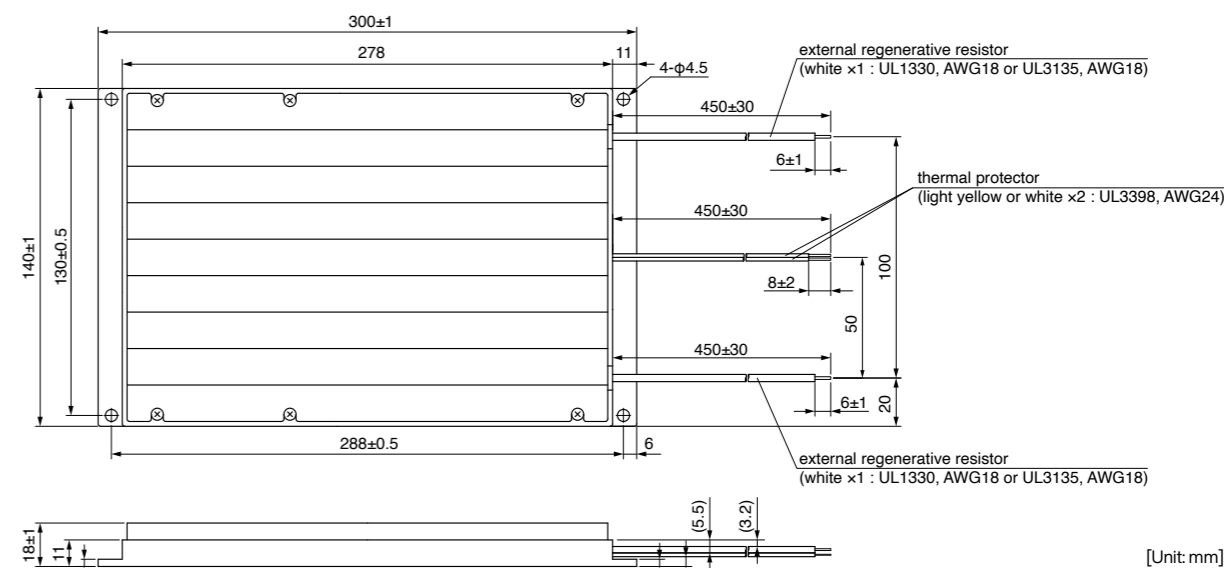
| Frame | Power supply | |
|-------|---------------------|--|
| | Single phase, 100 V | Single phase, 200 V 3-phase, 200 V |
| A | DV0P4280 | DV0P4281 (100 W or less) DV0P4283 (200 W) |
| B | DV0P4283 | DV0P4283 |
| C | DV0P4282 | |
| D | | DV0P4284 |
| E | | DV0P4284 × 2 in parallel or DV0P4285 |
| F | | DV0P4285 × 2 in parallel |
| G | | DV0P4285 × 3 in parallel |
| H | | DV0P4285 × 6 in parallel |



DV0P4284



DV0P4285



<Caution when using external regenerative resistor>

Regenerative resistor gets very hot.

Configure a circuit so that a power supply shuts down when built-in thermal protector of the regenerative resistor works. Because it is automatic reset thermal protector, please apply a self-holding circuit to the outside in order to maintain safety in case of sudden activation. During the failure of the driver, the surface temperature of the regenerative resistor may exceed the operating temperature before thermal protector starts to work.

Built-in thermal fuse of regenerative resistor is intended to prevent from ignition during the failure of the driver and not intended to suppress the surface temperature of the resistor.

- Be attached the regenerative resistance to non-combustible material such as metal.
- Built-in thermal fuse of regenerative resistor is intended to prevent from ignition during the failure of the driver and not intended to suppress the surface temperature of the resistor.
- Do not install the regenerative resistor near flammable materials.

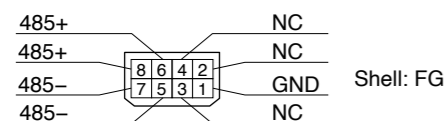
Daisy Chain (Excluding A6SE, A6NE, A6BE Series)

Part No. **DV0PM24610**

• Components

| Title | Part No. | Manufacturer | Note |
|-----------|--------------------------|----------------------|---------------------------|
| Connector | CIF-PCNS08KK-072R | J.S.T Mfg. Co., Ltd. | For Connector X2 (2-pins) |
| Cable | 3-core cable with shield | — | Core diameter AWG24 |

• Pin disposition of connector, connector X2



(Viewed from cable)

<Remarks>

- Do not connect anything to NC.
- The braided wire of the cable is connected to the shell (housing) of the connector.

• Table for wiring

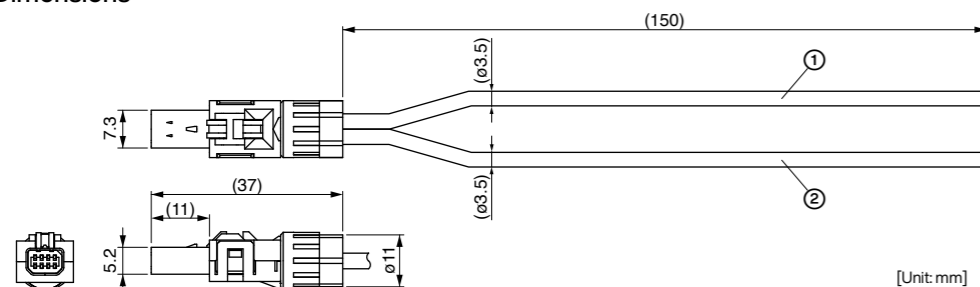
Cable ①

| Pin No. | Signal name | Core color |
|---------|-------------|------------|
| 8 | 485+ | Red |
| 7 | 485- | Yellow |
| 1 | GND | White |

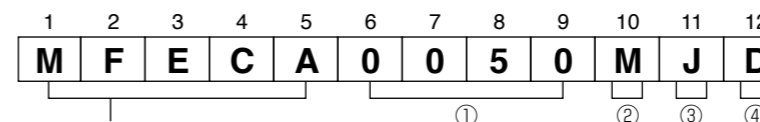
Cable ②

| Pin No. | Signal name | Core color |
|---------|-------------|------------|
| 6 | 485+ | Red |
| 5 | 485- | Yellow |
| 1 | GND | White |

• Dimensions



Encoder Cable For available optional items, please refer to P.309 to P.312.



Type classification

MFECA: Encoder cable

① Cable length

| | |
|------|------|
| 0030 | 3 m |
| 0050 | 5 m |
| 0100 | 10 m |
| 0200 | 20 m |

② Cable type

| | |
|---|--|
| E | PVC cable with shield by Oki Electric Cable Co., 0.20 mm ² × 4P(8-wire), 3P(6-wire) |
| M | Proterial, Ltd. Highly bendable type |
| T | Proterial, Ltd. Standard bendable type |

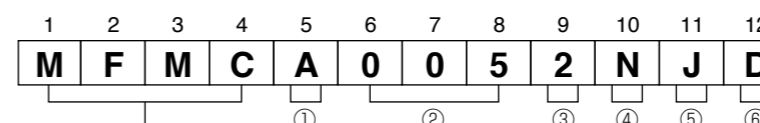
③ Cable end (Encoder side)

| | |
|---|---|
| A | Tyco Electronics Japan G.K. connector |
| J | Japan Aviation Electronics Industry, Ltd. connector (Direction of motor shaft) |
| K | Japan Aviation Electronics Industry, Ltd. connector (Opposite direction of motor shaft) |
| P | Japan Aviation Electronics Industry, Ltd. plug connector |
| S | "S" shaped cannonplug |
| T | Japan Aviation Electronics Industry, Ltd. plug connector |

④ Cable end (Driver side)

| | |
|---|---------------------------------|
| D | Connector (Without battery box) |
| E | Connector (With battery box) |

Motor Cable, Brake Cable For available optional items, please refer to P.309 to P.312.



AC servo motor cable

① Type classification

| | |
|---|--------------|
| A | Standard |
| B | Special |
| : | Design order |

② Cable length

| | |
|-----|------|
| 003 | 3 m |
| 005 | 5 m |
| 010 | 10 m |
| 020 | 20 m |

③ Sectional area of cable core

| | |
|---|----------------------|
| 0 | 0.75 mm ² |
| 1 | 1.25 mm ² |
| 2 | 2.0 mm ² |
| 3 | 3.5 mm ² |
| 7 | 0.3 mm ² |

④ Cable type

ROBO-TOP® is a trade mark of DYDEN CORPORATION

| | |
|---|--|
| E | ROBO-TOP® 4-wire by DYDEN CORPORATION |
| F | ROBO-TOP® 6-wire by DYDEN CORPORATION |
| G | ROBO-TOP® 2-wire by DYDEN CORPORATION |
| N | 4-wire by Proterial, Ltd. (Highly bendable type) |
| P | 4-wire by Proterial, Ltd. (Standard bendable type) |
| R | 2-wire by Proterial, Ltd. (Highly bendable type) |
| S | 2-wire by Proterial, Ltd. (Standard bendable type) |
| U | 4-wire for A6 series small motor* (Highly bendable type) |
| V | 6-wire for A6 series small motor* (Highly bendable type) |
| W | 4-wire for A6 series small motor* (Standard bendable type) |
| X | 6-wire for A6 series small motor* (Standard bendable type) |

* 80 mm sq. or less

⑤ Cable end at motor side

| | |
|---|---|
| C | S type cannon plug |
| E | Tyco Electronics Japan G.K. connector |
| F | Japan Aviation Electronics Industry, Ltd. connector (Direction of motor shaft) |
| G | Japan Aviation Electronics Industry, Ltd. connector (Opposite direction of motor shaft) |
| J | Japan Aviation Electronics Industry, Ltd. connector (Direction of motor shaft) |
| K | Japan Aviation Electronics Industry, Ltd. connector (Opposite direction of motor shaft) |
| U | Japan Aviation Electronics Industry, Ltd. plug connector |

⑥ Cable end at driver side

| | |
|---|----------------|
| D | Rod terminal |
| T | Clamp terminal |

Communication cycle **0.0625 ms**

Ultra-high-speed network driver

RTEX
Realtime Express

Realtime Express(RTEX)
AC servo motor & driver

MINAS A6N Series

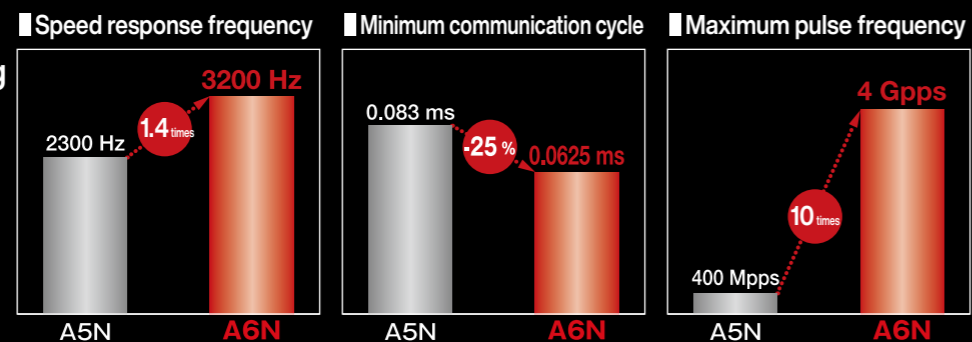


INDEX

| | |
|-----------------------------------|-----|
| Features..... | 349 |
| Advantages of RTEX..... | 351 |
| Model designation..... | 353 |
| Driver appearance..... | 354 |
| System configuration..... | 354 |
| Table of parts numbers..... | 355 |
| Driver..... | 359 |
| Driver common specifications..... | 359 |
| Dimensions of driver..... | 363 |
| Options..... | 368 |
| Interface cable..... | 368 |
| Interface connector Kit..... | 368 |

Pursuit of ultimate real-time processing

Pursuit of ultimate real-time processing



Multifunctional capabilities to match various needs

- ◎ Supports all positions, speeds and torque modes (w/built-in positioning function)
- ◎ High-precision position latch and comparison
- ◎ Communication cycle can be set to any time between 2 ms and 62.5 μs.

● Easy setup with setup support software "PANATERM".

Simple network

- ◎ Satisfies both high performance and low cost requirements
- ◎ Synchronization established by communication IC
- ◎ Easier development of compatible equipment

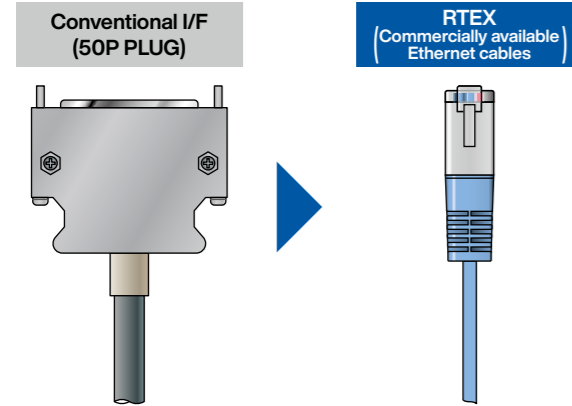
* For options other than for Interface cable and connector kit for interface, see P.29 to P.42.

● Realtime Express and RTEX are registered trademarks of Panasonic Holdings Corporation..

●The "Conventional I/F" used in this document means a pulse train and analog I/F.

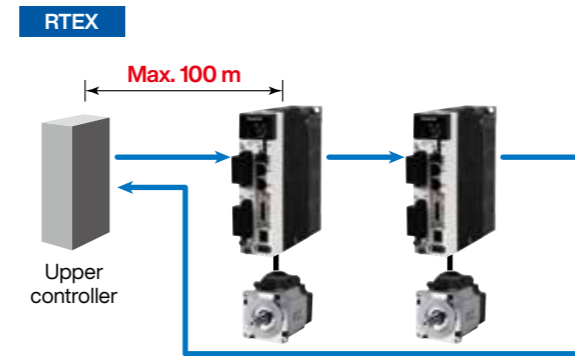
Wire-saving

Wire-saving reduces various troubles relating to wires. The cables used are widely available Ethernet cables, which are easy to obtain and inexpensive.



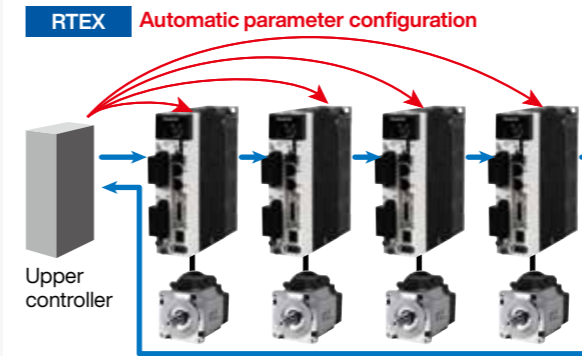
Maximum length of the node-to-node cable is 100 m.

Flexibility increases in the layout of an upper controller and servo motors. The RTEXs can also support large-scale systems.



Configurable parameter settings

Upper controllers can configure servo parameters. This enables parameters to be configured automatically instead by human at installation.



* Parameters can be changed even during operation

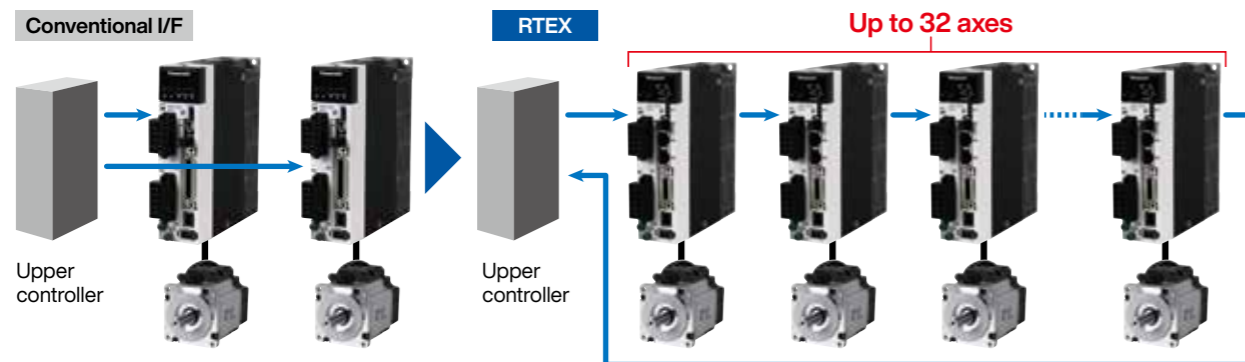
Real time monitoring is enabled.

Upper controllers can monitor various information, such as position, speed, and torque, etc. in real time. Since alarm codes can also be read out, analysis can be performed promptly at trouble occurrence.



Up to 32 axes can be controlled.

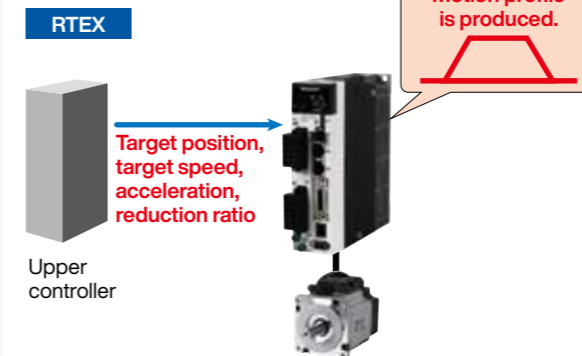
In comparison with conventional I/Fs, the number of axes increases that can be controlled by next upper controllers.



* If devices other than servo motors are also connected, up to 32 nodes can be connected as entire slaves including the servo motors. Actual number of controllable axes depends on the specification of an upper controller.

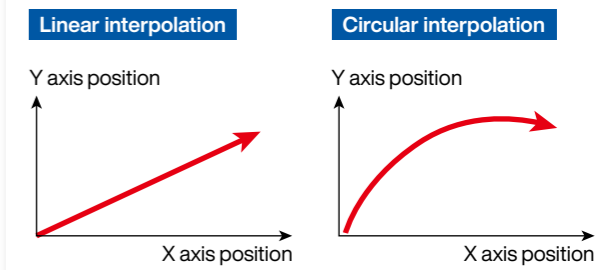
Profile position mode is supported

Profile position mode is supported for PTP control as well as cyclic position, speed, and torque. The processing done by upper controllers can be simplified.



High synchronization capability among axes

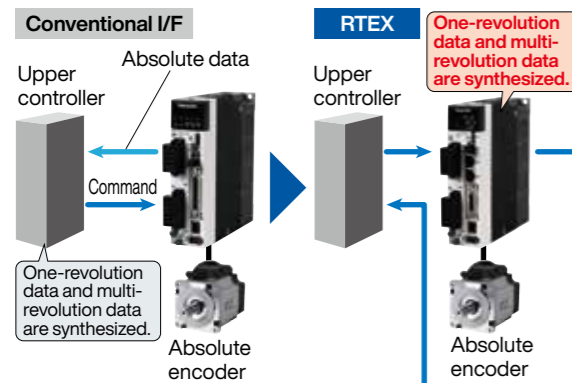
Upper controllers synchronize with entire servo motor axes at high accuracy. With the synchronization capability higher than that of conventional I/F, the RTEX is best suitable for machine tools, robots, gantry systems, and others.



* Interpolation depends on the specification of upper controllers. This is not the function of individual servo motor.

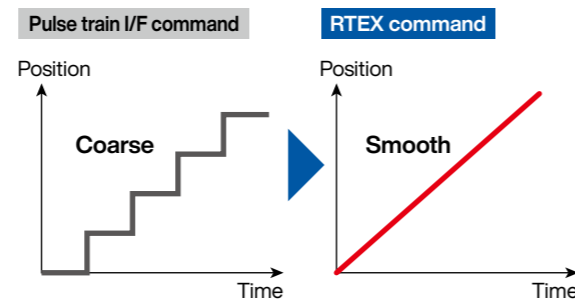
Absolute system can easily be built.

Conventional I/F requires an additional wire to transmit absolute data, while the RTEX doesn't. Each servo motor synthesizes one-revolution data and multi-revolution data to produce an actual position, so that the amount of work to be done by an upper controller is decreased.



High resolution command is enabled

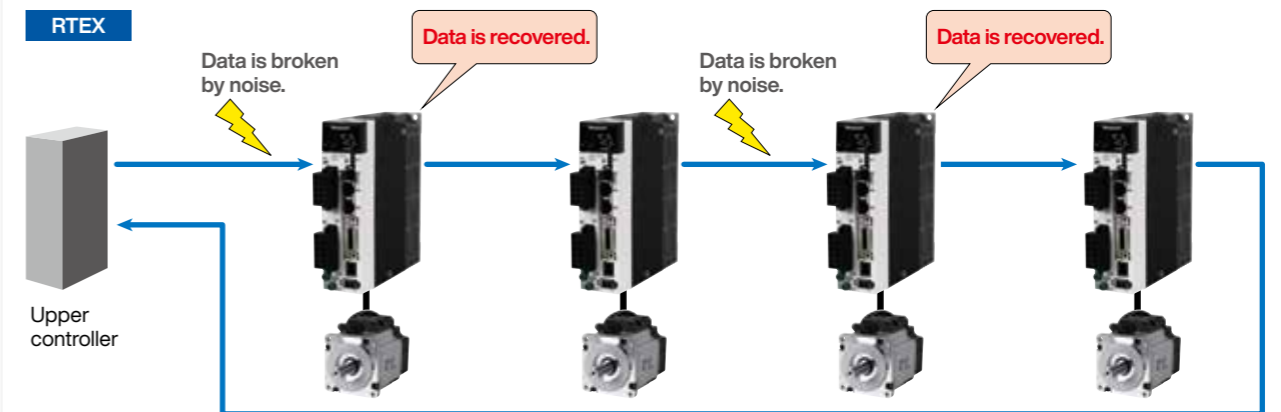
The position command rate of max. 8 Mpps* in a pulse train I/F is improved to 4 Gpps* in the RTEX. Vibrations are reduced due to a smooth command sent to a servo motor using the advantage of the high-resolution encoder.



* Max. 8 Mpps is a rate when A6 servo driver is used. Max. 4 Gpps is a rate when A6N servo driver is used.

High noise-proof property

With a patented error correction function, noise-proof property is at least 2.5 KV. This conforms to IEC61000-4-4 standard.



* The error correction function has a limit. Unrecovered broken data causes a communication error.

* For combination of elements of model number, refer to Index P.448.

Servo Motor

M S M F 5 A Z L 1 A 1 * ——— Special specifications

① Type

| Symbol | Type |
|--------|------------------------------------|
| MSM | Low inertia (50 W to 5.0 kW) |
| MQM | Middle inertia (100 W to 400 W) |
| MDM | Middle inertia (1.0 kW to 22.0 kW) |
| MGM | Middle inertia (0.85 kW to 5.5 kW) |
| MHM | High inertia (50 W to 7.5 kW) |

② Series

| Symbol | Series name |
|--------|-------------|
| F | A6 Family |

⑦ Motor specifications: 80 mm sq. or less MSMF 50 W to 1000 W

| Symbol | Shaft | Holding brake | | Oil seal | | Motor encoder terminal ^{*1} | |
|--------|---------------------|---------------|------|----------|------|--------------------------------------|-----------|
| | | without | with | without | with | Connector JN | Lead wire |
| A 1 | Round | • | • | • | • | • | • |
| A 2 | Key-way, center tap | • | • | • | • | • | • |
| B 1 | Round | • | • | • | • | • | • |
| B 2 | Key-way, center tap | • | • | • | • | • | • |
| C 1 | Round | • | • | • | • | • | • |
| C 2 | Key-way, center tap | • | • | • | • | • | • |
| D 1 | Round | • | • | • | • | • | • |
| D 2 | Key-way, center tap | • | • | • | • | • | • |
| S 1 | Round | • | • | • | • | • | • |
| S 2 | Key-way, center tap | • | • | • | • | • | • |
| T 1 | Round | • | • | • | • | • | • |
| T 2 | Key-way, center tap | • | • | • | • | • | • |
| U 1 | Round | • | • | • | • | • | • |
| U 2 | Key-way, center tap | • | • | • | • | • | • |
| V 1 | Round | • | • | • | • | • | • |
| V 2 | Key-way, center tap | • | • | • | • | • | • |

③ Motor rated output

| Symbol | Rated output | Symbol | Rated output | Symbol | Rated output |
|--------|--|--------|--------------|--------|--------------|
| 5A | 50 W | 13 | 1.3 kW | 44 | 4.4 kW |
| 01 | 100 W | 15 | 1.5 kW | 50 | 5.0 kW |
| 02 | 200 W | 18 | 1.8 kW | 55 | 5.5 kW |
| 04 | 400 W | 20 | 2.0 kW | 75 | 7.5 kW |
| 08 | 750 W | 24 | 2.4 kW | C1 | 11.0 kW |
| 09 | 0.85 kW, 1000 W (130 mm sq.) (80 mm sq.) | 29 | 2.9 kW | C5 | 15.0 kW |
| | | 30 | 3.0 kW | D2 | 22.0 kW |
| 10 | 1.0 kW | 40 | 4.0 kW | | |

④ Voltage specifications

| Symbol | Specifications |
|--------|----------------------------------|
| 1 | 100 V |
| 2 | 200 V |
| Z | 100 V / 200 V common (50 W only) |

⑥ Design order

| Symbol | Specifications |
|--------|----------------|
| 1 | Standard |

<Note>
When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

⑤ Rotary encoder specifications

| Symbol | Format | Pulse counts | Resolution | Wires |
|--------|----------|--------------|------------|-------|
| L | Absolute | 23-bit | 8388608 | 7 |

⑦ Motor specifications: IP67² 100 mm sq. to 220 mm sq. MSMF, MHMF, MDMF, MGMF

| Symbol | Shaft | | Holding brake | | Oil seal | | Encoder terminal | |
|--------|-------|---------|---------------|------|----------|---------------------|----------------------------|---|
| | Round | Key-way | without | with | with | With protective lip | Connector JN2 (Small size) | Connector JL10 (Large size) ^{*3} |
| C 5 | • | • | • | • | • | • | • | • |
| C 6 | • | • | • | • | • | • | • | • |
| C 7 | • | • | • | • | • | • | • | • |
| C 8 | • | • | • | • | • | • | • | • |
| D 5 | • | • | • | • | • | • | • | • |
| D 6 | • | • | • | • | • | • | • | • |
| D 7 | • | • | • | • | • | • | • | • |
| D 8 | • | • | • | • | • | • | • | • |
| G 5 | • | • | • | • | • | • | • | • |
| G 6 | • | • | • | • | • | • | • | • |
| G 7 | • | • | • | • | • | • | • | • |
| G 8 | • | • | • | • | • | • | • | • |
| H 5 | • | • | • | • | • | • | • | • |
| H 6 | • | • | • | • | • | • | • | • |
| H 7 | • | • | • | • | • | • | • | • |
| H 8 | • | • | • | • | • | • | • | • |

⑦ Motor specifications: 80 mm sq. or less MHMF 50 W to 1000 W MQMF 100 W to 400 W

| Symbol | Shaft | | Holding brake | | Oil seal | | Motor encoder terminal ^{*1} | | |
|--------|-------|---------------------|---------------|------|----------|------|--------------------------------------|--------------|-----------|
| | Round | Key-way, center tap | without | with | without | with | With protective lip | Connector JN | Lead wire |
| A 1 | • | • | • | • | • | • | • | • | • |
| A 2 | • | • | • | • | • | • | • | • | • |
| B 1 | • | • | • | • | • | • | • | • | • |
| B 2 | • | • | • | • | • | • | • | • | • |
| C 1 | • | • | • | • | • | • | • | • | • |
| C 2 | • | • | • | • | • | • | • | • | • |
| C 3 | • | • | • | • | • | • | • | • | • |
| C 4 | • | • | • | • | • | • | • | • | • |
| D 1 | • | • | • | • | • | • | • | • | • |
| D 2 | • | • | • | • | • | • | • | • | • |
| D 3 | • | • | • | • | • | • | • | • | • |
| D 4 | • | • | • | • | • | • | • | • | • |
| S 1 | • | • | • | • | • | • | • | • | • |
| S 2 | • | • | • | • | • | • | • | • | • |
| T 1 | • | • | • | • | • | • | • | • | • |
| T 2 | • | • | • | • | • | • | • | • | • |
| U 1 | • | • | • | • | • | • | • | • | • |
| U 2 | • | • | • | • | • | • | • | • | • |
| U 3 | • | • | • | • | • | • | • | • | • |
| U 4 | • | • | • | • | • | • | • | • | • |
| V 1 | • | • | • | • | • | • | • | • | • |
| V 2 | • | • | • | • | • | • | • | • | • |
| V 3 | • | • | • | • | • | • | • | • | • |
| V 4 | • | • | • | • | • | • | • | • | • |

*1 Connector type: IP67, Lead wire type: IP65 *2 22.0 kW: IP44
*3 Connector on the motor side encoder. (Also applicable to screwed type.)

Servo Driver

M A D L N 1 5 N E * * * ——— Special specifications

① Frame symbol

| Symbol | Frame | Symbol | Frame |
|--------|---------|--------|---------|
| MAD | A-Frame | MED | E-Frame |
| MBD | B-Frame | MFD | F-Frame |
| MCD | C-Frame | MGD | G-Frame |
| MDD | D-Frame | MHD | H-Frame |

② Series

| Symbol | Series name |
|--------|-------------|
| L | A6 Family |

③ Safety Function^{*4}

| Symbol | Specifications |
|--------|-----------------------------|
| N | without the safety function |
| T | with the safety function |

④ Max. current rating

| Symbol | Current rating | Symbol | Current rating |
|--------|----------------|--------|----------------|
| 0 | 6 A | 9 | 80 A |
| 1 | 8 A | A | 100 A |
| 2 | 12 A | B | 120 A |
| 3 | 22 A | C | 160 A |
| 4 | 24 A | E | 240 A |
| 5 | 40 A | F | 360 A |
| 8 | 60 A | | |

⑤ Supply voltage specifications

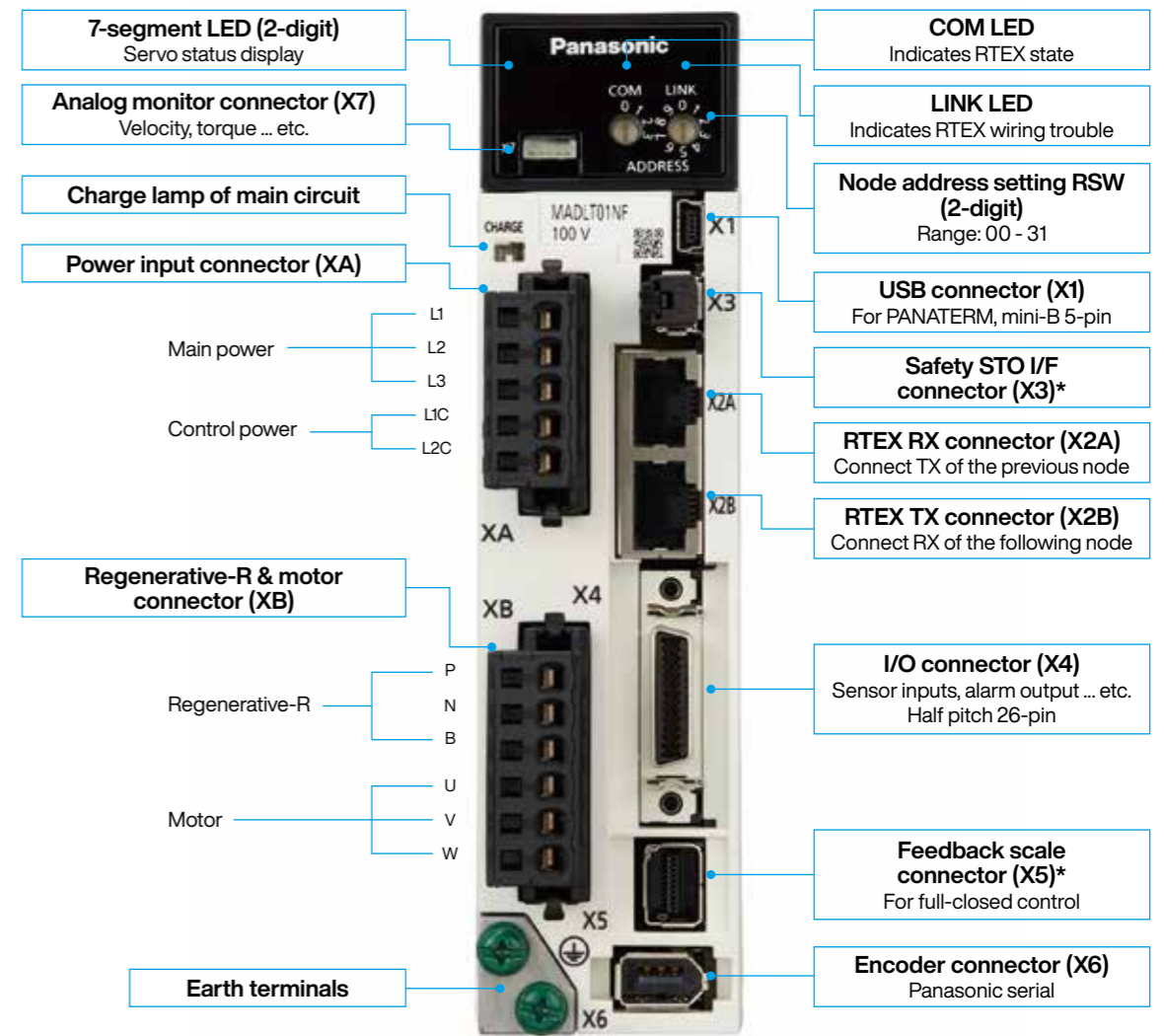
| Symbol | Specifications |
|--------|----------------------|
| 1 | Single phase 100 V |
| 3 | 3-phase 200 V |
| 5 | Single/3-phase 200 V |

⑥ I/f specifications

| Symbol (specification) | Symbol | Specification |
|------------------------|--------|---|
| N (RTEX) | E | Standard for rotary motor |
| | F | Multifunction for rotary motor |
| | L | Standard for linear/DD motor Special Order Product |
| | M | Multifunction for linear/DD motor Special Order Product |

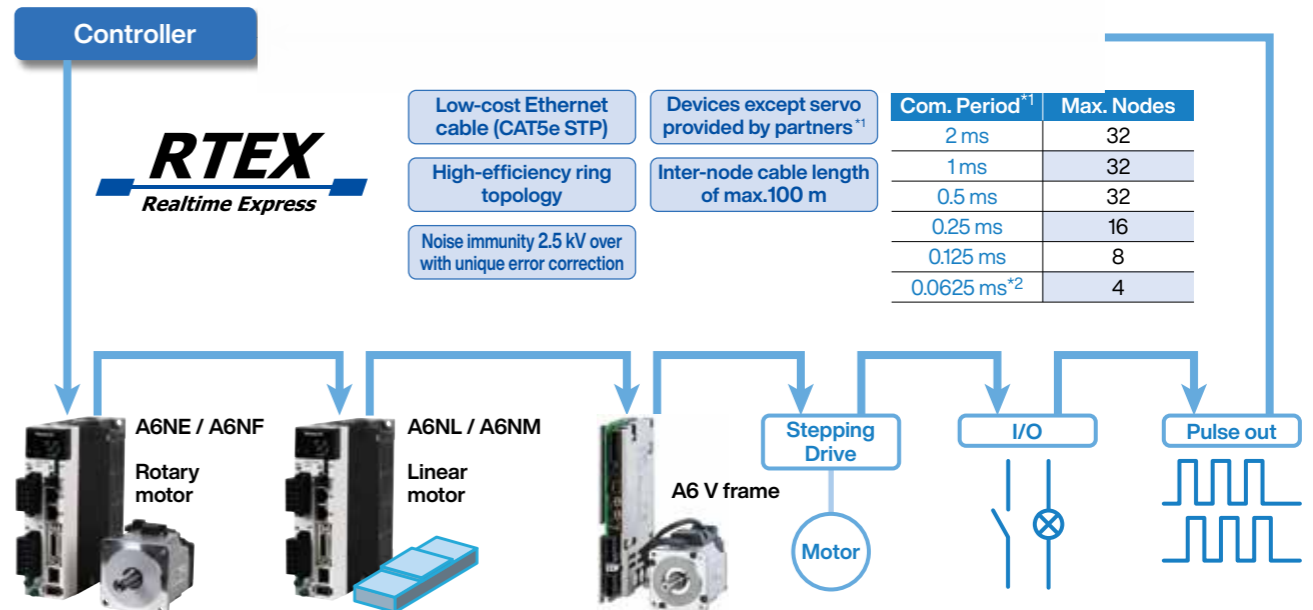
*4 Standard type (with a part number ending in E or L) has no safety function. Multi-function type (with a part number ending in F or M) has a safety function.

Appearance



* The photo is A6NF series. There are no X3 and X5 connectors in the A6NE series.

Typical system configuration



*1: The communication period and connection of slave devices depend on the controller specification.
*2: For communication period 0.0625 ms, command update period is 0.125 ms only.

● 80 mm sq. or less 50 W to 1000 W MSMF, MQMF, MHMF Leadwire type IP65

| Motor | | | | Driver | | Power capacity (at rated load) |
|--|-----------------------------------|------------|----------------|---------------------|-----------------|--------------------------------|
| Motor series | Power supply | Output (W) | Part No. | A6N series Part No. | Dimension Frame | |
| MSMF (Leadwire type) 3000 r/min Low inertia | Single phase 100 V | 50 | MSMF5AZL1 □ 2 | MADL☆01N☆ | A-frame | Approx. 0.4 kVA |
| | | 100 | MSMF011L1 □ 2 | MADL☆11N☆ | | |
| | | 200 | MSMF021L1 □ 2 | MBDL☆21N☆ | B-frame | |
| | | 400 | MSMF041L1 □ 2 | MCDL☆31N☆ | C-frame | |
| | Single phase/ 3-phase 200 V | 50 | MSMF5AZL1 □ 2* | MADL☆05N☆ | A-frame | Approx. 0.5 kVA |
| | | 100 | MSMF012L1 □ 2* | | | |
| | | 200 | MSMF022L1 □ 2* | MADL☆15N☆ | | |
| | | 400 | MSMF042L1 □ 2* | MBDL☆25N☆ | B-frame | |
| | | 750 | MSMF082L1 □ 2* | MCDL☆35N☆ | C-frame | |
| | | 1000 | MSMF092L1 □ 2* | MDDL☆45N☆ | D-frame | |
| MQMF (Leadwire type) 3000 r/min Middle inertia Flat type | Single phase 100 V | 100 | MQMF011L1 □ □ | MADL☆11N☆ | A-frame | Approx. 0.4 kVA |
| | | 200 | MQMF021L1 □ □ | MBDL☆21N☆ | B-frame | Approx. 0.5 kVA |
| | | 400 | MQMF041L1 □ □ | MCDL☆31N☆ | C-frame | Approx. 0.9 kVA |
| | Single phase/ 3-phase 200 V | 100 | MQMF012L1 □ □* | MADL☆05N☆ | A-frame | Approx. 0.5 kVA |
| | | 200 | MQMF022L1 □ □* | MADL☆15N☆ | | |
| | | 400 | MQMF042L1 □ □* | MBDL☆25N☆ | | |
| MHMF (Leadwire type) 3000 r/min High inertia | Single phase 100 V | 50 | MHMF5AZL1 □ □ | MADL☆01N☆ | A-frame | Approx. 0.4 kVA |
| | | 100 | MHMF011L1 □ □ | MADL☆11N☆ | | |
| | | 200 | MHMF021L1 □ □ | MBDL☆21N☆ | B-frame | |
| | | 400 | MHMF041L1 □ □ | MCDL☆31N☆ | C-frame | |
| | Single phase/ 3-phase 200 V | 50 | MHMF5AZL1 □ □* | MADL☆05N☆ | A-frame | Approx. 0.5 kVA |
| | | 100 | MHMF012L1 □ □* | | | |
| | | 200 | MHMF022L1 □ □* | MADL☆15N☆ | | |
| | | 400 | MHMF042L1 □ □* | MBDL☆25N☆ | B-frame | |
| | | 750 | MHMF082L1 □ □* | MCDL☆35N☆ | C-frame | |
| | | 1000 | MHMF092L1 □ □* | MDDL☆55N☆ | D-frame | |

□ ☆ * : For more information, refer to "Model Designation" on P.353.

● 80 mm sq. or less 50 W to 1000 W MSMF, MQMF, MHMF Connector type IP67

| Motor | | | | Driver | | Power capacity (at rated load) |
|---|-----------------------------------|------------|---------------|---------------------|-----------------|--------------------------------|
| Motor series | Power supply | Output (W) | Part No. | A6N series Part No. | Dimension Frame | |
| MSMF (Connector type) 3000 r/min Low inertia | Single phase 100 V | 50 | MSMF5AZL1 □ 1 | MADL☆01N☆ | A-frame | Approx. 0.4 kVA |
| | | 100 | MSMF011L1 □ 1 | MADL☆11N☆ | | |
| | | 200 | MSMF021L1 □ 1 | MBDL☆21N☆ | B-frame | |
| | | 400 | MSMF041L1 □ 1 | MCDL☆31N☆ | C-frame | |
| | Single phase/ 3-phase 200 V | 50 | MSMF5AZL1 □ 1 | MADL☆05N☆ | A-frame | Approx. 0.5 kVA |
| | | 100 | MSMF012L1 □ 1 | | | |
| | | 200 | MSMF022L1 □ 1 | MADL☆15N☆ | | |
| | | 400 | MSMF042L1 □ 1 | MBDL☆25N☆ | B-frame | |
| | | 750 | MSMF082L1 □ 1 | MCDL☆35N☆ | C-frame | |
| | | 1000 | MSMF092L1 □ 1 | MDDL☆45N☆ | D-frame | |
| MQMF (Connector type) 3000 r/min Middle inertia Flat type | Single phase 100 V | 100 | MQMF011L1 □ □ | MADL☆11N☆ | A-frame | Approx. 0.4 kVA |
| | | 200 | MQMF021L1 □ □ | MBDL☆21N☆ | B-frame | Approx. 0.5 kVA |
| | | 400 | MQMF041L1 □ □ | MCDL☆31N☆ | C-frame | Approx. 0.9 kVA |
| | Single phase/ 3-phase 200 V | 100 | MQMF012L1 □ □ | MADL☆05N☆ | A-frame | Approx. 0.5 kVA |
| | | 200 | MQMF022L1 □ □ | MADL☆15N☆ | | |
| | | 400 | MQMF042L1 □ □ | MBDL☆25N☆ | | |
| MHMF (Connector type) 3000 r/min High inertia | Single phase 100 V | 50 | MHMF5AZL1 □ □ | MADL☆01N☆ | A-frame | Approx. 0.4 kVA |
| | | 100 | MHMF011L1 □ □ | MADL☆11N☆ | | |
| | | 200 | MHMF021L1 □ □ | MBDL☆21N☆ | B-frame | |
| | | 400 | MHMF041L1 □ □ | MCDL☆31N☆ | C-frame | |
| | Single phase/ 3-phase 200 V | 50 | MHMF5AZL1 □ □ | MADL☆05N☆ | A-frame | Approx. 0.5 kVA |
| | | 100 | MHMF012L1 □ □ | | | |
| | | 200 | MHMF022L1 □ □ | MADL☆15N☆ | | |
| | | 400 | MHMF042L1 □ □ | MBDL☆25N☆ | B-frame | |
| | | 750 | MHMF082L1 □ □ | MCDL☆35N☆ | C-frame | |
| | | 1000 | MHMF092L1 □ □ | MDDL☆55N☆ | D-frame | |

□ ☆ * : For more information, refer to "Model Designation" on P.353.

● **100 mm sq. or more 0.85 kW to 5.0 kW MSMF, MDMF, MGMF, MHMF**
Encoder connector (Large size JL10)^{*1} type IP67

| Motor | | | | Driver | | Power capacity (at rated load) |
|--|--------------------------------|------------|----------------|---------------------|-----------------|--------------------------------|
| Motor series | Power supply | Output (W) | Part No. | A6N series Part No. | Dimension Frame | |
| MSMF (Large size JL10 type) 3000 r/min Low inertia IP67 | Single phase/ 3-phase 200 V | 1000 | MSMF102L1 □□ * | MDDL☆55N☆ | D-frame | Approx. 2.9 kVA |
| | | 1500 | MSMF152L1 □□ * | | | |
| | 3-phase 200 V | 2000 | MSMF202L1 □□ * | MEDL☆83N☆ | E-frame | Approx. 3.8 kVA |
| | | 3000 | MSMF302L1 □□ * | MFDL☆A3N☆ | F-frame | Approx. 5.2 kVA |
| | | 4000 | MSMF402L1 □□ * | MFDL☆B3N☆ | | Approx. 7.8 kVA |
| 5000 | MSMF502L1 □□ * | | | | | |
| MDMF (Large size JL10 type) 2000 r/min Middle inertia IP67 | Single phase/ 3-phase 200 V | 1000 | MDMF102L1 □□ * | MDDL☆45N☆ | D-frame | Approx. 2.4 kVA |
| | | 1500 | MDMF152L1 □□ * | MDDL☆55N☆ | | Approx. 2.9 kVA |
| | 3-phase 200 V | 2000 | MDMF202L1 □□ * | MEDL☆83N☆ | E-frame | Approx. 3.8 kVA |
| | | 3000 | MDMF302L1 □□ * | MFDL☆A3N☆ | F-frame | Approx. 5.2 kVA |
| | | 4000 | MDMF402L1 □□ * | MFDL☆B3N☆ | | Approx. 7.8 kVA |
| 5000 | MDMF502L1 □□ * | | | | | |
| MGMF (Large size JL10 type) [Low speed/ High torque type] 1500 r/min Middle inertia IP67 | Single phase/ 3-phase 200 V | 850 | MGMF092L1 □□ * | MDDL☆45N☆ | D-frame | Approx. 2.4 kVA |
| | | 1300 | MGMF132L1 □□ * | MDDL☆55N☆ | | Approx. 2.9 kVA |
| | 3-phase 200 V | 1800 | MGMF182L1 □□ * | MEDL☆83N☆ | E-frame | Approx. 3.8 kVA |
| | | 2400 | MGMF242L1 □□ * | MEDL☆93N☆ | F-frame | Approx. 4.5 kVA |
| | | 2900 | MGMF292L1 □□ * | MFDL☆B3N☆ | | Approx. 7.8 kVA |
| 4400 | MGMF442L1 □□ * | | | | | |
| MHMF (Large size JL10 type) 2000 r/min High inertia IP67 | Single phase/ 3-phase 200 V | 1000 | MHMF102L1 □□ * | MDDL☆45N☆ | D-frame | Approx. 2.4 kVA |
| | | 1500 | MHMF152L1 □□ * | MDDL☆55N☆ | | Approx. 2.9 kVA |
| | 3-phase 200 V | 2000 | MHMF202L1 □□ * | MEDL☆83N☆ | E-frame | Approx. 3.8 kVA |
| | | 3000 | MHMF302L1 □□ * | MFDL☆A3N☆ | F-frame | Approx. 5.2 kVA |
| | | 4000 | MHMF402L1 □□ * | MFDL☆B3N☆ | | Approx. 7.8 kVA |
| 5000 | MHMF502L1 □□ * | | | | | |

□ ☆ * : For more information, refer to "Model Designation" on P.353.

● **100 mm sq. or more 0.85 kW to 5.0 kW MSMF, MDMF, MGMF, MHMF**
Encoder connector (Small size JN2)^{*2} type IP67

| Motor | | | | Driver | | Power capacity (at rated load) |
|---|--------------------------------|------------|--------------|---------------------|-----------------|--------------------------------|
| Motor series | Power supply | Output (W) | Part No. | A6N series Part No. | Dimension Frame | |
| MSMF (Small size JN2 type) 3000 r/min Low inertia IP67 | Single phase/ 3-phase 200 V | 1000 | MSMF102L1 □□ | MDDL☆55N☆ | D-frame | Approx. 2.9 kVA |
| | | 1500 | MSMF152L1 □□ | | | |
| | 3-phase 200 V | 2000 | MSMF202L1 □□ | MEDL☆83N☆ | E-frame | Approx. 3.8 kVA |
| | | 3000 | MSMF302L1 □□ | MFDL☆A3N☆ | F-frame | Approx. 5.2 kVA |
| | | 4000 | MSMF402L1 □□ | MFDL☆B3N☆ | | Approx. 7.8 kVA |
| 5000 | MSMF502L1 □□ | | | | | |
| MDMF (Small size JN2 type) 2000 r/min Middle inertia IP67 | Single phase/ 3-phase 200 V | 1000 | MDMF102L1 □□ | MDDL☆45N☆ | D-frame | Approx. 2.4 kVA |
| | | 1500 | MDMF152L1 □□ | MDDL☆55N☆ | | Approx. 2.9 kVA |
| | 3-phase 200 V | 2000 | MDMF202L1 □□ | MEDL☆83N☆ | E-frame | Approx. 3.8 kVA |
| | | 3000 | MDMF302L1 □□ | MFDL☆A3N☆ | F-frame | Approx. 5.2 kVA |
| | | 4000 | MDMF402L1 □□ | MFDL☆B3N☆ | | Approx. 7.8 kVA |
| 5000 | MDMF502L1 □□ | | | | | |
| MGMF (Small size JN2 type) [Low speed/ High torque type] 1500 r/min Middle inertia IP67 | Single phase/ 3-phase 200 V | 850 | MGMF092L1 □□ | MDDL☆45N☆ | D-frame | Approx. 2.4 kVA |
| | | 1300 | MGMF132L1 □□ | MDDL☆55N☆ | | Approx. 2.9 kVA |
| | 3-phase 200 V | 1800 | MGMF182L1 □□ | MEDL☆83N☆ | E-frame | Approx. 3.8 kVA |
| | | 2400 | MGMF242L1 □□ | MEDL☆93N☆ | F-frame | Approx. 4.5 kVA |
| | | 2900 | MGMF292L1 □□ | MFDL☆B3N☆ | | Approx. 7.8 kVA |
| 4400 | MGMF442L1 □□ | | | | | |
| MHMF (Small size JN2 type) 2000 r/min High inertia IP67 | Single phase/ 3-phase 200 V | 1000 | MHMF102L1 □□ | MDDL☆45N☆ | D-frame | Approx. 2.4 kVA |
| | | 1500 | MHMF152L1 □□ | MDDL☆55N☆ | | Approx. 2.9 kVA |
| | 3-phase 200 V | 2000 | MHMF202L1 □□ | MEDL☆83N☆ | E-frame | Approx. 3.8 kVA |
| | | 3000 | MHMF302L1 □□ | MFDL☆A3N☆ | F-frame | Approx. 5.2 kVA |
| | | 4000 | MHMF402L1 □□ | MFDL☆B3N☆ | | Approx. 7.8 kVA |
| 5000 | MHMF502L1 □□ | | | | | |

□ ☆ * : For more information, refer to "Model Designation" on P.353.

● **176 mm sq. or more 5.5 kW or more MDMF, MGMF, MHMF**
Encoder connector (Large size JL10)^{*1} type IP67

| Motor | | | | Driver | | Power capacity (at rated load) |
|--|------------------|---------------------|-----------------|---------------------|-----------------|--------------------------------|
| Motor series | Power supply | Output (W) | Part No. | A6N series Part No. | Dimension Frame | |
| MDMF (Large size JL10 type) 1500 r/min Middle inertia IP67 ^{*3} | 3-phase 200 V | 7500 | MDMF752L1 □ 6 * | MGDLTC3NF | G-frame | Approx. 11 kVA |
| | | 11000 | MDMFC12L1 □ 6 | MHDLTE3NF | | H-frame |
| | | 15000 | MDMFC52L1 □ 6 | MHDLTE3NF | Approx. 20 kVA | |
| | | 22000 ^{*3} | MDMFD22L1 □ 6 | MHDLTF3NF | Approx. 28 kVA | |
| MGMF (Large size JL10 type) [Low speed/ High torque type] 1500 r/min Middle inertia IP67 | 3-phase 200 V | 5500 | MGMF552L1 □ 6 * | MGDLTC3NF | G-frame | Approx. 8.5 kVA |
| MHMF (Large size JL10 type) 1500 r/min High inertia IP67 | 3-phase 200 V | 7500 | MHMF752L1 □ 6 * | MGDLTC3NF | G-frame | Approx. 11 kVA |

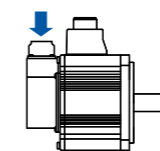
□ ☆ * : For more information, refer to "Model Designation" on P.353.

● **176 mm sq. or more 5.5 kW or more MDMF, MGMF, MHMF**
Encoder connector (Small size JN2)^{*2} type IP67

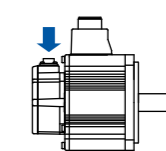
| Motor | | | | Driver | | Power capacity (at rated load) |
|---|------------------|---------------------|---------------|---------------------|-----------------|--------------------------------|
| Motor series | Power supply | Output (W) | Part No. | A6N series Part No. | Dimension Frame | |
| MDMF (Small size JN2 type) 1500 r/min Middle inertia IP67 ^{*3} | 3-phase 200 V | 7500 | MDMF752L1 □ 5 | MGDLTC3NF | G-frame | Approx. 11 kVA |
| | | 11000 | MDMFC12L1 □ 5 | MHDLTE3NF | | H-frame |
| | | 15000 | MDMFC52L1 □ 5 | MHDLTE3NF | Approx. 20 kVA | |
| | | 22000 ^{*3} | MDMFD22L1 □ 5 | MHDLTF3NF | Approx. 28 kVA | |
| MGMF (Small size JN2 type) [Low speed/ High torque type] 1500 r/min Middle inertia IP67 | 3-phase 200 V | 5500 | MGMF552L1 □ 5 | MGDLTC3NF | G-frame | Approx. 8.5 kVA |
| MHMF (Small size JN2 type) 1500 r/min High inertia IP67 | 3-phase 200 V | 7500 | MHMF752L1 □ 5 | MGDLTC3NF | G-frame | Approx. 11 kVA |

□ ☆ * : For more information, refer to "Model Designation" on P.353.

*1: Encoder connector (Large size JL10)



*2: Encoder connector (Small size JN2)



*3: 22.0 kW motor is IP44.

| | | | | | | | | |
|-------------------------|--|---|---|--------------------|---|--|--|---------------|
| Basic Specifications | Input power | 100 V | Main circuit | Single phase | 100 V ^{+10 %} _{-15 %} | to 120 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz | |
| | | | Control circuit | Single phase | 100 V ^{+10 %} _{-15 %} | to 120 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz | |
| | | 200 V | Main circuit | A-frame to D-frame | Single/3-phase | 200 V ^{+10 %} _{-15 %} | to 240 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz |
| | | | | E-frame to H-frame | 3-phase | 200 V ^{+10 %} _{-15 %} | to 240 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz |
| | | | Control circuit | A-frame to D-frame | Single phase | 200 V ^{+10 %} _{-15 %} | to 240 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz |
| | | | | E-frame to H-frame | Single phase | 200 V ^{+10 %} _{-15 %} | to 240 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz |
| | Environment | temperature | Ambient temperature: 0 °C to 55 °C (free from freezing) Storage temperature: -20 °C to 65 °C (Max.temperature guarantee: 80 °C for 72 hours free from condensation*1) | | | | | |
| | | humidity | Both operating and storage : 20 %RH to 85 %RH (free from condensation*1) | | | | | |
| | | Altitude | Lower than 1000 m | | | | | |
| | | Vibration | 5.88 m/s ² or less, 10 Hz to 60 Hz | | | | | |
| Control method | IGBT PWM Sinusoidal wave drive | | | | | | | |
| Encoder feedback | 23-bit (8388608 resolution) absolute encoder, 7-wire serial * When using it as an incremental system (not using multi-turn data), do not connect the battery for absolute encoder. Parameter Pr. 0.15 must be set to "1" (factory settings). | | | | | | | |
| External scale feedback | A/B phase, homing signal differential input. Serial communication is also supported. Manufacturers that support serial communication scale: Fagor Automation S.Coop., HEIDENHAIN, Magnescale Co., Ltd., Mitutoyo Corporation Nidec Instruments Corporation, Renishaw plc | | | | | | | |
| Interface connector | Control signal | Input | Each 8 input can be assigned by the parameter. | | | | | |
| | | Output | Each 3 output can be assigned by the parameter. | | | | | |
| | Analog signal | Output | 2 outputs for analog monitors 1 and 2 | | | | | |
| Communication | Realtime Express (RTEX) | Communication for transmission of a real-time operation command, the parameter setting, or the status monitoring. | | | | | | |
| | USB | USB interface to connect to computers (setup support software PANATERM) for parameter setting or status monitoring. | | | | | | |
| Safety terminal | Terminal to support safety function. | | | | | | | |
| Front panel | (1) 7 segment LED (double digits) (2) Network status LED(LINK,COM) (3) Rotary switch for node address setting (4) Analog monitor output(Analog monitors 1 and 2) | | | | | | | |
| Regeneration | Size A, B, G and H: Without built-in regenerative resistor (use external resistor) Size C to F: Built-in regenerative resistor (External regenerative resistor is also available) | | | | | | | |
| Dynamic brake | A to G frame: built-in H frame: External resistor only | | | | | | | |
| Control mode | (1) Semi-closed control Position control: Profile position control (PP), Cyclic position control (CP) Velocity control: Cyclic velocity control (CV) Torque control: Cyclic torque control (CT) (2) Full-closed control Position control: Profile position control (PP), Cyclic position control (CP) • The two modes, [1] and [2] above are switched by parameters. • Switch PP/CP/CV/CT mode according to the RTEX communication command. | | | | | | | |

*1 Air containing water vapor will become saturated with water vapor as the temperature falls, causing dew.

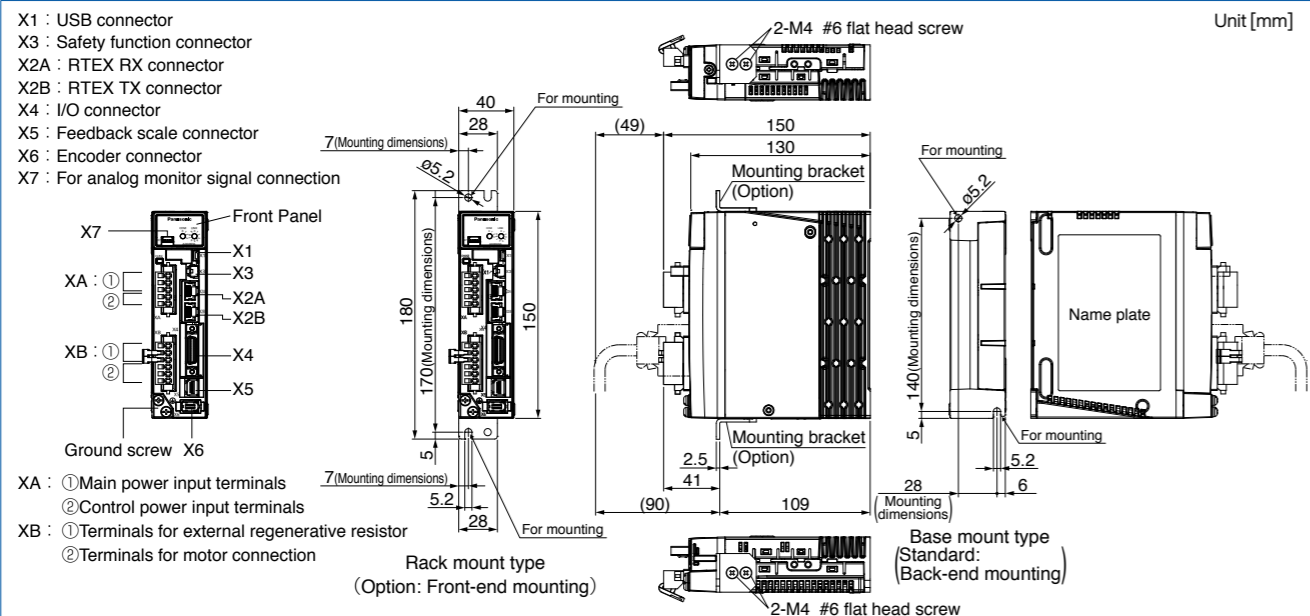
| | | | | | | | |
|---|--|---|--|--|--|--|--|
| Position control | Control input | Positive direction drive inhibit input, Negative direction drive inhibit, Latch signal, Near home position, etc | | | | | |
| | Control output | Positioning completion etc. | | | | | |
| | Position command input | Input mode | Command type by RTEX command | | | | |
| | | Smoothing filter | Either a primary delay filter or a FIR type filter can be selected against command input. | | | | |
| | Damping control | Available (Up to 3 frequency settings,out of 4 settings in total,can be used simultaneously.) | | | | | |
| | Model type damping filter | Available (2 filter available used simultaneously) | | | | | |
| | Feed forward function | Available (speed/torque) | | | | | |
| | Load variation suppression control | Available | | | | | |
| | Gain 3 switching function | Available | | | | | |
| | Quadrant glitch inhibit function | Available | | | | | |
| Speed control | Two-degree-of-freedom control mode | Available | | | | | |
| | Motor operatable setup function | Available | | | | | |
| | External scale position information monitor | Available | | | | | |
| | Other available functions | Friction torque compensation, Torque limit switching function, Torque saturation protection function, Single-turn absolute function, Continuous rotating absolute encoder function | | | | | |
| | Control input | Positive direction drive inhibit input , Negative direction drive inhibit, Latch signal, etc | | | | | |
| | Control output | At speed etc. | | | | | |
| | Position command input | Input mode | Command type by RTEX command | | | | |
| | | Smoothing filter | 0 s to 10 s / 1000 r/min Acceleration and deceleration can be set separately. S-curve acceleration/deceleration is also available. | | | | |
| | Soft start/slowdown function | Available (torque) | | | | | |
| | Feed forward function | Available (standard type) | | | | | |
| Load variation suppression control | Available | | | | | | |
| Two-degree-of-freedom control mode | Available | | | | | | |
| External scale position information monitor | Available | | | | | | |
| Other available functions | Friction torque compensation, Torque limit switching function, Torque saturation protection function, Single-turn absolute function, Continuous rotating absolute encoder function | | | | | | |
| Torque control | Control input | Positive direction drive inhibit input, Negative direction drive inhibit, Latch signal, etc | | | | | |
| | Control output | At speed etc. | | | | | |
| | Position command input | Input mode | Command type by RTEX command | | | | |
| | | Smoothing filter | Speed limit value can be set by parameter. (Switched by RTEX command.) | | | | |
| | Speed limit function | Available | | | | | |
| External scale position information monitor | Available | | | | | | |
| Other available functions | Single-turn absolute function Continuous rotating absolute encoder function | | | | | | |
| Full-closed control | Control input | Positive direction drive inhibit input , Negative direction drive inhibit, Latch signal, Near home position , etc | | | | | |
| | Control output | Positioning completion etc. | | | | | |
| | Position command input | Input mode | Command type by RTEX command | | | | |
| | | Smoothing filter | Either a primary delay filter or a FIR type filter can be selected against command input. | | | | |
| | Setting range of external scale division/multiplication. | 1/40 times to 125200 times Although the ratio of the encoder pulse (numerator) and external scale pulse (denominator) can be set anywhere between the range of 1 to 2 ²³ for the numerator and 1 to 2 ³⁰ for the denominator, Please use within the range indicated above. | | | | | |
| | Damping control | Available(Up to 3 frequency settings,out of 4 settings in total,can be used simultaneously.) | | | | | |
| | Feed forward function | Available (speed/torque) | | | | | |
| | Load variation suppression control | Available | | | | | |
| | Gain 3 switching function | Available | | | | | |
| | Hybrid vibration suppression function | Available | | | | | |
| Quadrant glitch inhibit function | Available | | | | | | |
| Common | Two-degree-of-freedom control mode | Available (standard type) | | | | | |
| | Motor operatable setup function | Available | | | | | |
| | External scale position information monitor | Available | | | | | |
| | Other available functions | Friction torque compensation, Torque limit switching function, Torque saturation protection function | | | | | |
| | Electronic gear ratio setting | Applicable scaling ratio: 1/1000 to 8000 Although any value of 1 to 2 ³⁰ (numerator) and any value of 1 to 2 ³⁰ (denominator) can be used,resulting value should be within the range shown above. | | | | | |
| | Auto tuning | Identifies the load inertia real-time and automatically sets up the gain that meets the stiffness setting when the motor is running with upper and internal operation commands. | | | | | |
| | Notch filter | Available (5 filters available) | | | | | |
| | Gain switching function | Available | | | | | |
| | 2-step torque filter | Available | | | | | |
| | Position comparison output function | Available | | | | | |
| Protective function | Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current, encoder error, excess position deviation, EEPROM error etc. | | | | | | |
| Alarm data trace back function | Tracing back of alarm data is available | | | | | | |
| Deterioration diagnosis function | Available | | | | | | |

| | | | | | | | | |
|----------------------|-------------------------|--|---|--------------------|---|--|--|---------------|
| Basic Specifications | Input power | 100 V | Main circuit | Single phase | 100 V ^{+10 %} _{-15 %} | to 120 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz | |
| | | | Control circuit | Single phase | 100 V ^{+10 %} _{-15 %} | to 120 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz | |
| | | 200 V | Main circuit | A-frame to D-frame | Single/3-phase | 200 V ^{+10 %} _{-15 %} | to 240 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz |
| | | | | E-frame, F-frame | 3-phase | 200 V ^{+10 %} _{-15 %} | to 240 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz |
| | | | Control circuit | A-frame to D-frame | Single phase | 200 V ^{+10 %} _{-15 %} | to 240 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz |
| | | | | E-frame, F-frame | Single phase | 200 V ^{+10 %} _{-15 %} | to 240 V ^{+10 %} _{-15 %} | 50 Hz / 60 Hz |
| | Environment | temperature | Ambient temperature: 0 °C to 55 °C (free from freezing) Storage temperature: -20 °C to 65 °C (Max.temperature guarantee: 80 °C for 72 hours free from condensation*1) | | | | | |
| | | humidity | Both operating and storage : 20 %RH to 85 %RH (free from condensation*1) | | | | | |
| | | Altitude | Lower than 1000 m | | | | | |
| | | Vibration | 5.88 m/s ² or less, 10 Hz to 60 Hz | | | | | |
| Control method | | IGBT PWM Sinusoidal wave drive | | | | | | |
| Encoder feedback | | 23-bit (8388608 resolution) absolute encoder, 7-wire serial * When using it as an incremental system (not using multi-turn data), do not connect the battery for absolute encoder. Parameter Pr. 0.15 must be set to "1" (factory settings). | | | | | | |
| Interface connector | Control signal | Input | Each 8 input can be assigned by the parameter. | | | | | |
| | | Output | Each 3 output can be assigned by the parameter. | | | | | |
| | Analog signal | Output | 2 outputs for analog monitors 1 and 2 | | | | | |
| | Pulse signal | Output | Line driver output for encoder pulses (A/B phase signal). | | | | | |
| Communication | Realtime Express (RTEX) | Communication for transmission of a real-time operation command, the parameter setting, or the status monitoring. | | | | | | |
| | USB | USB interface to connect to computers (setup support software PANATERM) for parameter setting or status monitoring. | | | | | | |
| Front panel | | (1) 7 segment LED (double digits) (2) Network status LED(LINK,COM) (3) Rotary switch for node address setting (4) Analog monitor output(Analog monitors 1 and 2) | | | | | | |
| Regeneration | | Size A and B: Without built-in regenerative resistor (use external resistor) Size C to F: Built-in regenerative resistor (External regenerative resistor is also available) | | | | | | |
| Dynamic brake | | A to F frame: built-in | | | | | | |
| Control mode | | (1) Semi-closed control Position control: Profile position control (PP), Cyclic position control (CP) Velocity control: Cyclic velocity control (CV) Torque control: Cyclic torque control (CT) • Switch PP/CP/CV/CT mode according to the RTEX communication command. | | | | | | |

*1 Air containing water vapor will become saturated with water vapor as the temperature falls, causing dew.

| | | | | | | | |
|------------------------------------|-------------------------------------|--|--|--|--|--|--|
| Position control | Control input | | Positive direction drive inhibit input, Negative direction drive inhibit, Latch signal, Near home position , etc | | | | |
| | Control output | | Positioning completion etc. | | | | |
| | Position command input | Input mode | Command type by RTEX command | | | | |
| | | Smoothing filter | Either a primary delay filter or a FIR type filter can be selected against command input. | | | | |
| | Damping control | | Available(Up to 3 frequency settings,out of 4 settings in total,can be used simultaneously.) | | | | |
| | Model type damping filter | | Available(2 filter available used simultaneously) | | | | |
| | Feed forward function | | Available (speed/torque) | | | | |
| | Load variation suppression control | | Available | | | | |
| | Gain 3 switching function | | Available | | | | |
| | Quadrant glitch inhibit function | | Available | | | | |
| Two-degree-of-freedom control mode | | Available | | | | | |
| Motor operatable setup function | | Available | | | | | |
| Other available functions | | Friction torque compensation, Torque limit switching function, Torque saturation protection function, Single-turn absolute function, Continuous rotating absolute encoder function | | | | | |
| Speed control | Control input | | Positive direction drive inhibit input , Negative direction drive inhibit, Latch signal, etc | | | | |
| | Control output | | At speed etc. | | | | |
| | Position command input | Input mode | Command type by RTEX command | | | | |
| | | Soft start/slowdown function | 0 s to 10 s / 1000 r/min Acceleration and deceleration can be set separately. S-curve acceleration/deceleration is also available. | | | | |
| | Feed forward function | | Available (torque) | | | | |
| | Load variation suppression control | | Available | | | | |
| Two-degree-of-freedom control mode | | Available (standard type) | | | | | |
| Other available functions | | Friction torque compensation, Torque limit switching function, Torque saturation protection function, Single-turn absolute function, Continuous rotating absolute encoder function | | | | | |
| Torque control | Control input | | Positive direction drive inhibit input, Negative direction drive inhibit, Latch signal, etc | | | | |
| | Control output | | At speed etc. | | | | |
| | Position command input | Input mode | Command type by RTEX command | | | | |
| | | Speed limit function | Speed limit value can be set by parameter. (Switched by RTEX command.) | | | | |
| Other available functions | | Single-turn absolute function Continuous rotating absolute encoder function | | | | | |
| Common | Electronic gear ratio setting | | Applicable scaling ratio: 1/1000 to 8000 Although any value of 1 to 2 ³⁰ (numerator) and any value of 1 to 2 ³⁰ (denominator) can be used,resulting value should be within the range shown above. | | | | |
| | Auto tuning | | Identifies the load inertia real-time and automatically sets up the gain that meets the stiffness setting when the motor is running with upper and internal operation commands. | | | | |
| | Notch filter | | Available (5 filters available) | | | | |
| | Gain switching function | | Available | | | | |
| | 2-step torque filter | | Available | | | | |
| | Position comparison output function | | Available | | | | |
| | Protective function | | Over-voltage, under-voltage, over-speed, over-load, over-heat, over-current, encoder error, excess position deviation, EEPROM error etc. | | | | |
| | Alarm data trace back function | | Tracing back of alarm data is available | | | | |
| | Deterioration diagnosis function | | Available | | | | |

A-frame



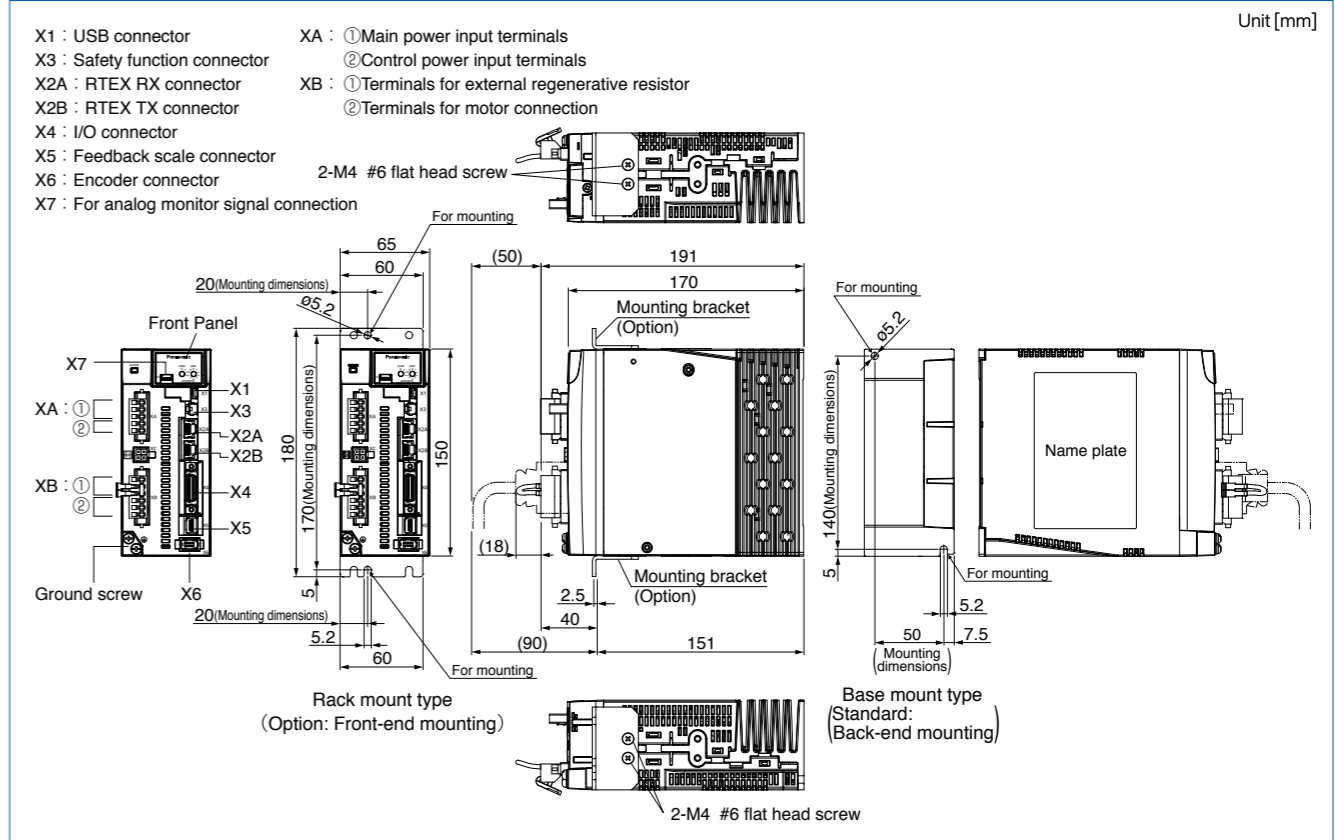
| A-frame: Connector of driver side | | | Multifunction type | Basic type |
|-----------------------------------|------------------------------------|---------------------------------|--------------------|------------|
| Connector XA | S05B-F32SK-GGXR (or equivalent) | J.S.T. Mfg. Co., Ltd. | ● | ● |
| Connector XB | S06B-F32SK-GGXR (or equivalent) | J.S.T. Mfg. Co., Ltd. | ● | ● |
| Connector X1 | UB-M5BR-S14-4S (or equivalent) | J.S.T. Mfg. Co., Ltd. | ● | ● |
| Connector X3 | CIF-HS08SS-071-TB (or equivalent) | J.S.T. Mfg. Co., Ltd. | ● | - |
| Connector X2A | MOD-WR.J88LY1G-TP+ (or equivalent) | HTK | ● | ● |
| Connector X2B | MOD-WR.J88LY1G-TP+ (or equivalent) | HTK | ● | ● |
| Connector X4 | DF02R026NA2 (or equivalent) | Japan Aviation Electronics Ind. | ● | ● |
| Connector X5 | MUF-RS10SK-GKX-TB (or equivalent) | J.S.T. Mfg. Co., Ltd. | ● | - |
| Connector X6 | 3E106-2230KV (or equivalent) | 3M Japan | ● | ● |
| Connector X7 | 533984005 (5pin) | Molex | ● | ● |

Mass: 0.8 kg

<Attached to the driver>

| Connector of power and motor side | | |
|-----------------------------------|------------------|-----------------------|
| Connector XA | 05JFAT-SAXGGKK-A | J.S.T. Mfg. Co., Ltd. |
| Connector XB | 06JFAT-SAXGGKK-A | J.S.T. Mfg. Co., Ltd. |

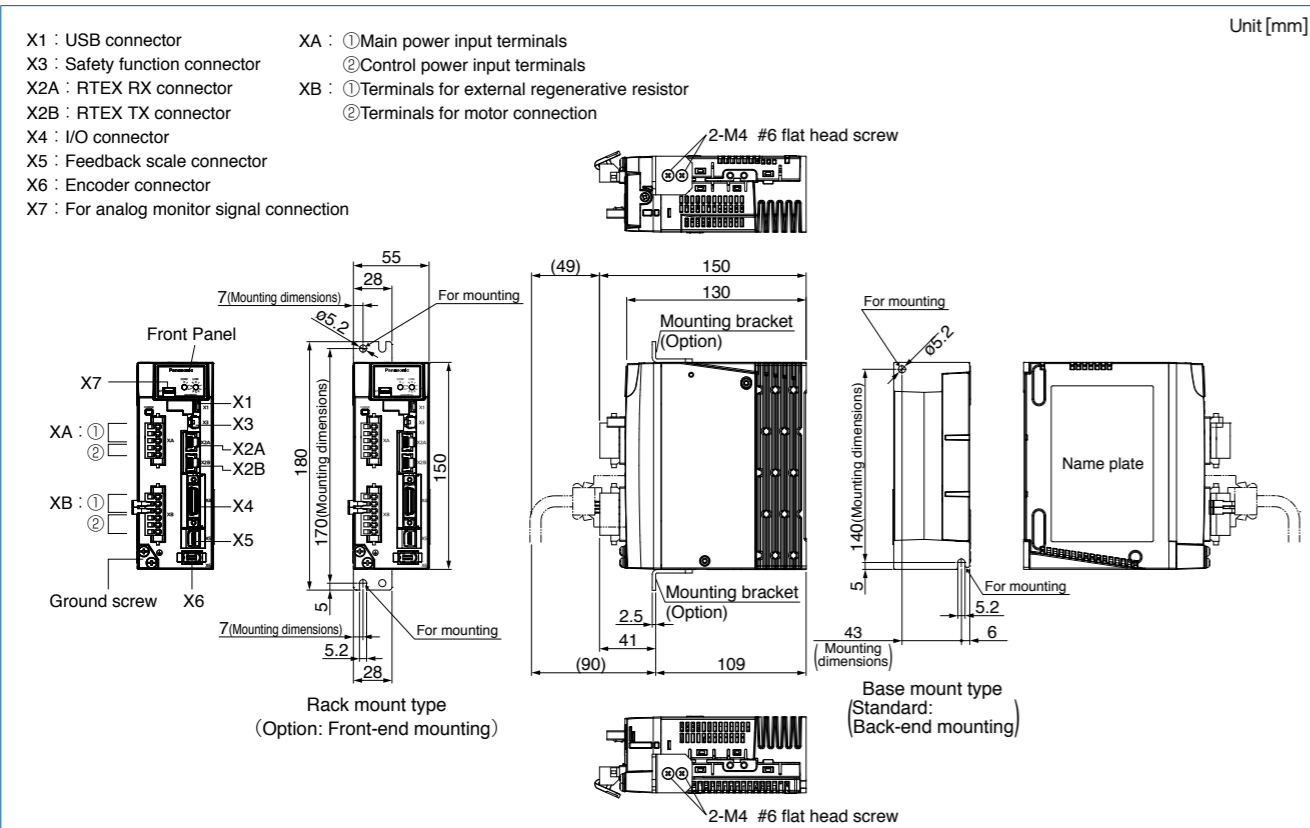
C-frame



* For connectors X1 to X7, refer to the list provided in the A-frame table because both frames use the same connectors.

Mass: 1.6 kg

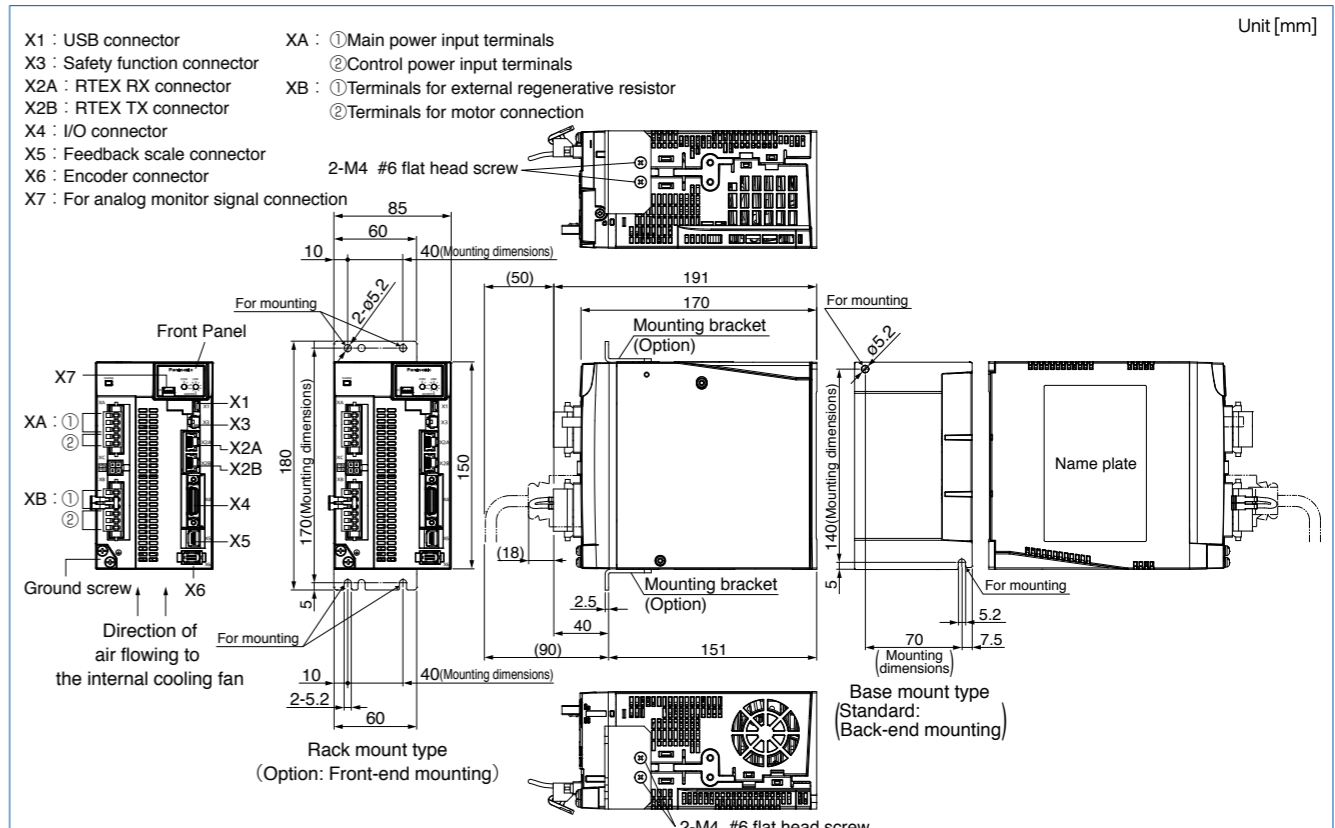
B-frame



* For connectors X1 to X7, refer to the list provided in the A-frame table because both frames use the same connectors.

Mass: 1.0 kg

D-frame (200 V)



* For connectors X1 to X7, refer to the list provided in the A-frame table because both frames use the same connectors.

Mass: 2.1 kg

E-frame (200 V)

Unit [mm]

X1 : USB connector
 X3 : Safety function connector
 X2A : RTEX RX connector
 X2B : RTEX TX connector
 X4 : I/O connector
 X5 : Feedback scale connector
 X6 : Encoder connector
 X7 : For analog monitor signal connection

XA : ① Main power input terminals
 ② Control power input terminals
 XB : Terminals for motor connection
 XC : Terminals for external regenerative resistor

2-M4 #6 flat head screw

Mounting bracket (If re-positioned from front end)

196.5

85 (Mounting dimensions)

50

2-5.2

For mounting

198 (Mounting dimensions)

168

70

2.5

3.5

160

2.5

33

70

Name plate

52

18

216

Mounting bracket (If re-positioned from front end)

2-M4 #6 flat head screw

Direction of air flowing to the internal cooling fan

Ground screw

| E-frame: Connector of driver side | | |
|-----------------------------------|------------------------------------|-----------------------|
| Connector XA | S05B-JTSLSK-GSANXR (or equivalent) | J.S.T. Mfg. Co., Ltd. |
| Connector XB | S03B-JTSLSK-GSANXR (or equivalent) | J.S.T. Mfg. Co., Ltd. |
| Connector XC | S04B-JTSLSS-GSANXR (or equivalent) | J.S.T. Mfg. Co., Ltd. |

<Attached to the driver>

| E-frame: Connector of power and motor side | | |
|--|---------------------------------|-----------------------|
| Connector XA | O5JFAT-SAXGSA-L (or equivalent) | J.S.T. Mfg. Co., Ltd. |
| Connector XB | O3JFAT-SAXGSA-L (or equivalent) | J.S.T. Mfg. Co., Ltd. |
| Connector XC | O4JFAT-SAXGSA-L (or equivalent) | J.S.T. Mfg. Co., Ltd. |

* For connectors X1 to X7, refer to the list provided in the A-frame table because both frames use the same connectors.

Mass: 2.7 kg

F-frame (200 V)

Unit [mm]

X1 : USB connector
 X3 : Safety function connector
 X2A : RTEX RX connector
 X2B : RTEX TX connector
 X4 : I/O connector
 X5 : Feedback scale connector
 X6 : Encoder connector
 X7 : For analog monitor signal connection

① Main power input terminals
 ② Control power input terminals
 ③ Terminals for external regenerative resistor
 ④ Terminals for motor connection

2-M4 #6 flat head screw

Mounting bracket (If re-positioned from front end)

219.5

100 (Mounting dimensions)

130

2-5.2

For mounting

250 (Mounting dimensions)

220

20

2.5

3.5

169

47

2.5

20

Name plate

56

169

Mounting bracket (If re-positioned from front end)

2-M4 #6 flat head screw

Direction of air flowing to the internal cooling fan

①

②

③

④

2-5.2

100 (Mounting dimensions)

2-5.2

67

169

Mounting bracket (If re-positioned from front end)

2-M4 #6 flat head screw

Mass: 5.2 kg

G-frame (200 V) (A6NE series are not available.)

Unit [mm]

X1 : USB connector
 X3 : Safety function connector
 X2A : RTEX RX connector
 X2B : RTEX TX connector
 X4 : I/O connector
 X5 : Feedback scale connector
 X6 : Encoder connector
 XE : Connector for external dynamic brake signal
 XS : Built-in dynamic brake switch

X7 : For analog monitor signal connection

3-M4 #6 flat head screw

3-M4 #6 flat head screw

Direction of air flowing to the internal cooling fan

184

90 (Mounting dimensions)

47

2-6.2

For mounting

257

50

2.5

Mounting bracket (If re-positioned from front end)

197

56

50

Name plate

257

220

241 (Mounting dimensions)

8

2-6.2

47 (Mounting dimensions)

90

106

56

199

Mounting bracket (If re-positioned from front end)

3-M4 #6 flat head screw

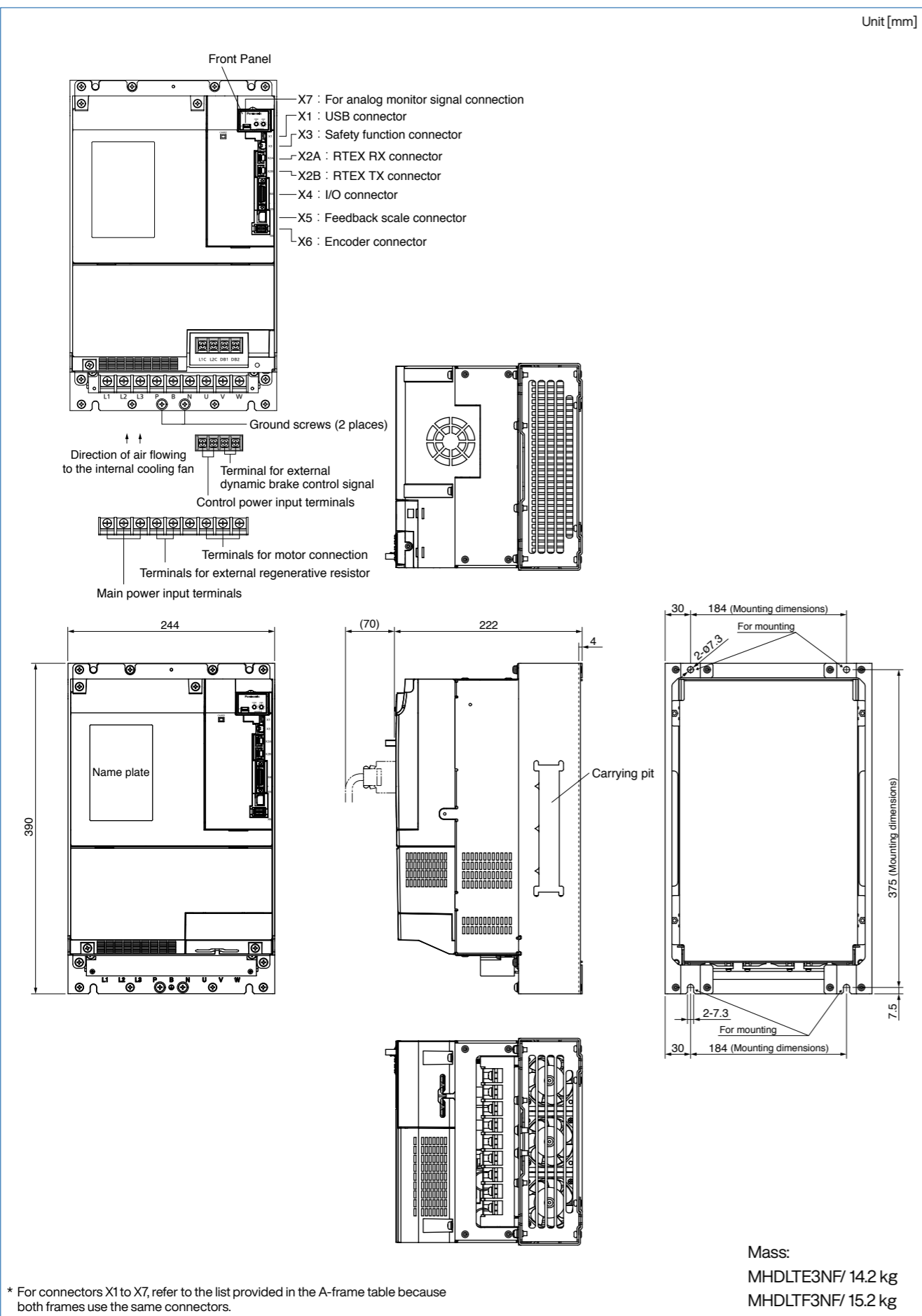
3-M4 #6 flat head screw

| Connector of driver side | Control side (customer prepares) |
|--------------------------------------|----------------------------------|
| Connector XE : 5569-04A2-210 (Molex) | Connector : 5557-04R-210 (Molex) |
| | Pin : 5556PBT |

* For connectors X1 to X7, refer to the list provided in the A-frame table because both frames use the same connectors.

Mass: 8.2 kg

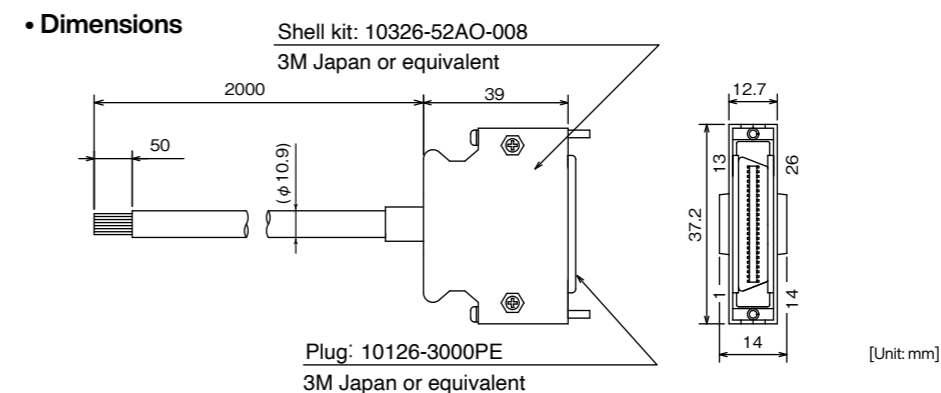
H-frame (200 V) (A6NE series are not available.)



Refer to P.29 to P.42 for other options than the interface cable and interface connector kit.

Cable for Interface

Part No. DVOP0800 Cable length 2 m, core wire AWG 26 is connected.



• Table for wiring

| Pin No. | Signal name | color | Pin No. | Signal name | color | Pin No. | Signal name | color |
|---------|-------------|-----------------|---------|-------------|-----------------|---------|-------------|-----------------|
| 1* | BRK-OFF+ | Orange (Red1) | 10* | HOME | Pink (Black1) | 19 | OB-/OCMP2- | Pink (Red2) |
| 2* | BRK-OFF- | Orange (Black1) | 11* | EXT2 | Orange (Red2) | 20 | OB+/OCMP2+ | Pink (Black2) |
| 3* | ALM+ | Gray (Red1) | 12* | EXT3 | Orange (Black2) | 21 | OCMP3+ | Orange (Red3) |
| 4* | ALM- | Gray (Black1) | 13* | SI-MON4 | Gray (Red2) | 22 | OCMP3- | Gray (Red3) |
| 5* | SI-MON5 | White (Red1) | 14 | BTP-I | Gray (Black2) | 23 | - | Gray (Black3) |
| 6 | I-COM | White (Black1) | 15 | BTN-I | White (Red2) | 24 | - | White (Red3) |
| 7* | POT | Yellow (Red1) | 16 | GND | White (Black2) | 25* | EX-OUT1+ | White (Black3) |
| 8* | NOT | Yellow (Black1) | 17 | OA+/OCMP1+ | Yellow (Red2) | 26* | EX-OUT1- | Orange (Black3) |
| 9* | SI-MON1 | Pink (Red1) | 18 | OA-/OCMP1- | Yellow (Black2) | | | |

The signals allocated to the pin No. with "*" in the table are factory default.

<Remarks>

Color designation of the cable e.g.) Pin-1 Cable color : Orange (Red1) : One red dot on the cable

<Caution>

The shield of this cable is not connected to the terminal of the connector.
The shielded wire of the cable is connected to the connector shell of the cable, and is connected to the FG via the connector shell on the Driver side. When connecting the shielded wire of the cable to GND, use the connector kit DVOP0770 for the interface. At that time, please note that if you connect the shield and the connector shell on the cable side and process it, FG and GND will be connected.

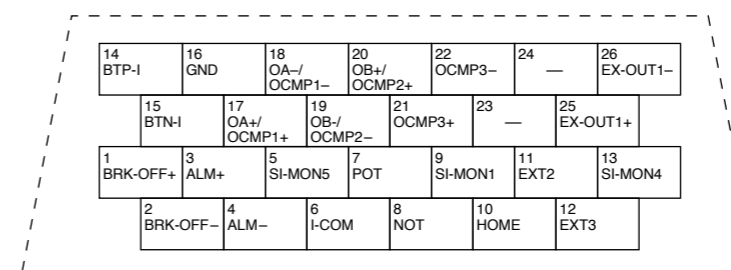
Connector Kit for Interface

Part No. DVOP0770

• Components

| Title | Part No. | Number | Manufacturer | Note |
|-----------------|----------------|--------|--------------------------|---------------------|
| Connector | 10126-3000PE | 1 | 3M Japan (or equivalent) | For CN X4 (26-pins) |
| Connector cover | 10326-52AO-008 | 1 | | |

• Pin disposition: Connector X4 (26 pins) (viewed from the soldering side)



<Remarks>

1. Check the stamped pin-No. on the connector body while making a wiring.
2. For the symbols representing the signal names or the functions of the signals in the figure above, refer to the operation manual.

Servo driver with EtherCAT open network

EtherCAT  **EtherCAT**
AC servo motor & driver

MINAS A6B Series Special Order Product



A6BE Series
A6BF Series

Quickly

Response frequency 3200 Hz & communication rate 100 Mbps enable fast and highly accurate operation.
Configurable even for motors with a maximum rotating speed 6500 r/min.*

* MDMF and MQMF types with a maximum wattage 400 W

Wisely

New algorithm “Two-degree-of-freedom control method” is used to improve machining accuracy and productivity.

Easily

Easy and speedy set-up with set-up support software “PANATERM”

● Fully-featured EtherCAT application (7 control modes, 32 origin-return modes, 2 synchronous modes, and an asynchronous mode.) ● Capable of system upgrade with various slaves. ● Capable of establishing PC-based systems without needing dedicated hardware. ● Planned to pass official EtherCAT Conformance Test. ● A6BF with safety I/F*2 corresponding to international standard, and A6BL/A6BM supporting linear motors *2 : IEC61800-5-2 STO, IEC61508 SIL3.

● The EtherCAT is a registered trademark of patented technology licensed from Beckhoff Automation GmbH in Germany.

INDEX

| | |
|---------------------------|-----|
| Features..... | 369 |
| Driver appearance..... | 371 |
| System configuration..... | 371 |
| Driver..... | 372 |
| Dimensions of driver..... | 372 |

MINAS A6B Series

Model Designation Special Order Product

For more information, please visit our website or request to our distributors separately.

Servo Driver

M A D L N 1 5 B E * * * Special specifications

① Frame symbol

| Symbol | Frame | Symbol | Frame |
|--------|---------|--------|---------|
| MAD | A-Frame | MED | E-Frame |
| MBD | B-Frame | MFD | F-Frame |
| MCD | C-Frame | MGD | G-Frame |
| MDD | D-Frame | MHD | H-Frame |

② Series

| Symbol | Series name |
|--------|-------------|
| L | A6 Family |

③ Safety Function*1

| Symbol | Specifications |
|--------|-----------------------------|
| N | without the safety function |
| T | with the safety function |

④ Max. current rating

| Symbol | Current rating | Symbol | Current rating |
|--------|----------------|--------|----------------|
| 0 | 6 A | 9 | 80 A |
| 1 | 8 A | A | 100 A |
| 2 | 12 A | B | 120 A |
| 3 | 22 A | C | 160 A |
| 4 | 24 A | E | 240 A |
| 5 | 40 A | F | 360 A |
| 8 | 60 A | | |

⑤ Supply voltage specifications

| Symbol | Specifications |
|--------|----------------------|
| 1 | Single phase 100 V |
| 3 | 3-phase 200 V |
| 5 | Single/3-phase 200 V |

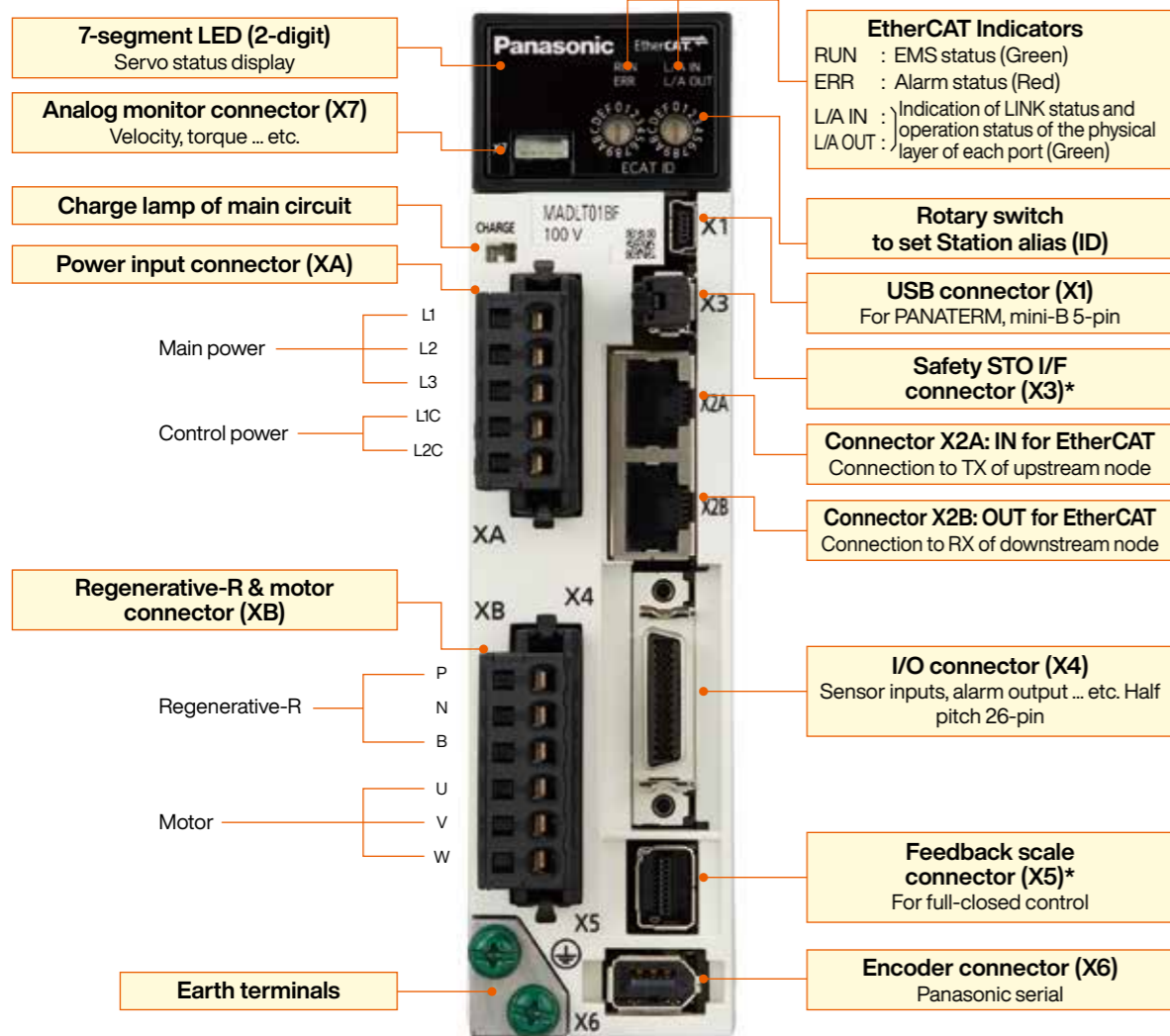
⑥ I/f specifications

| Symbol (specification) | Symbol | Specification |
|------------------------|--------|---|
| B (EtherCAT) | E | Standard for rotary motor Special Order Product |
| | F | Multifunction for rotary motor Special Order Product |
| | L | Standard for linear/ DD motor Special Order Product |
| | M | Multifunction for linear/ DD motor Special Order Product |

⑦ Classification of type*1

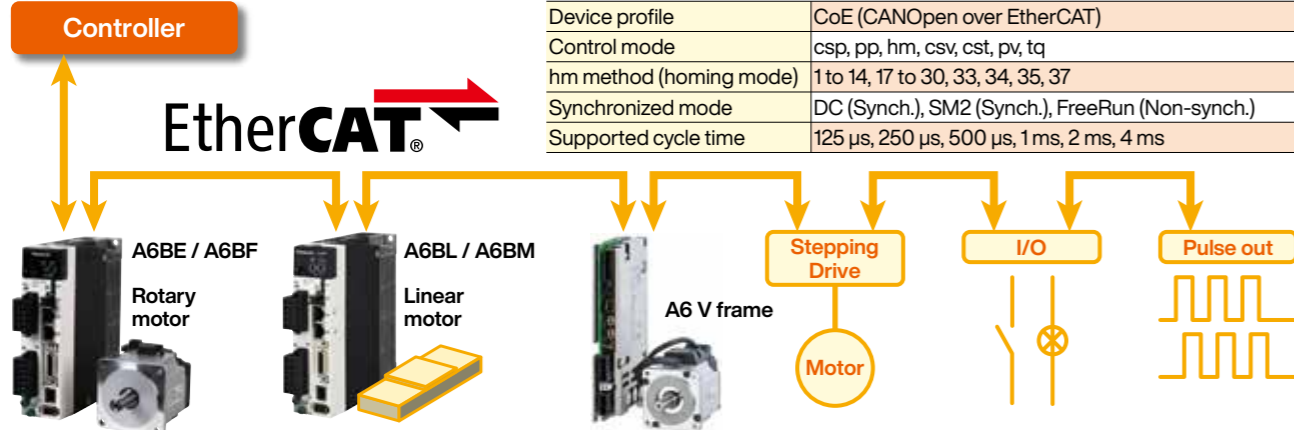
*1 Standard type (with a part number ending in E or L) has no safety function. Multi-function type (with a part number ending in F or M) has a safety function.

Appearance



* The photo is A6BF series. There are no X3 and X5 connectors in the A6BE series.

Typical system configuration



Applicable motor Please refer to P.29 to P.42 of the A6 series.

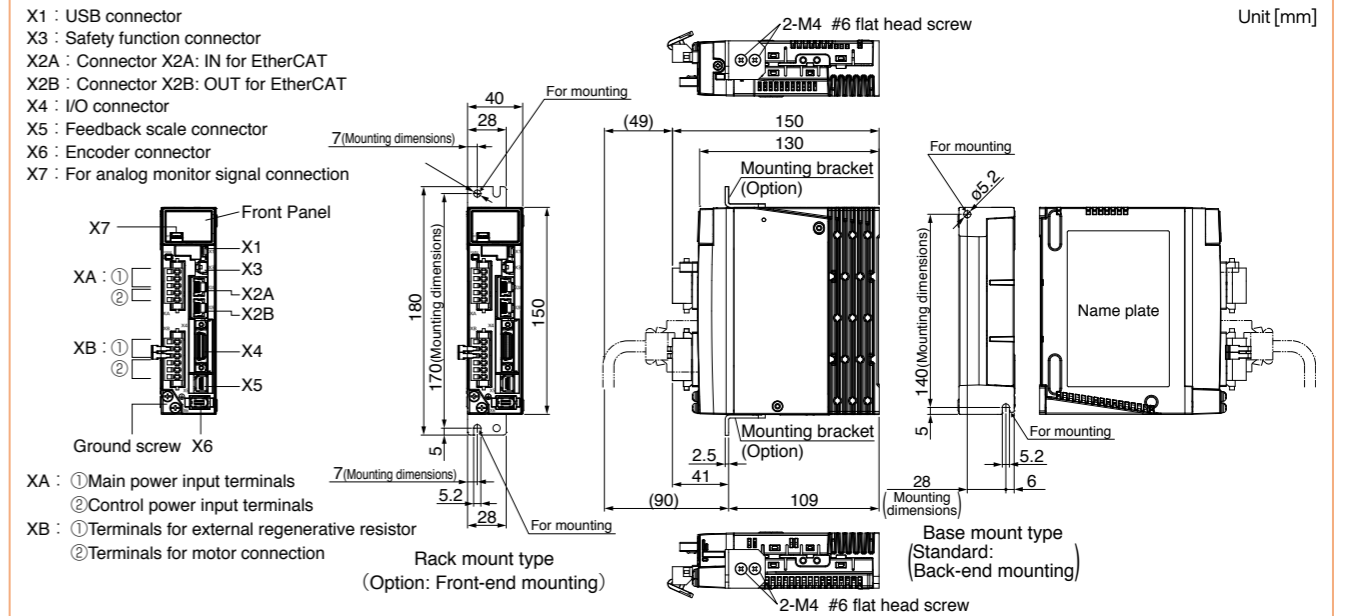
Applicable option

| | |
|--|--|
| Interface cable | DV0P0800 |
| Interface connector kit | DV0P0770 |
| Options other than interface cables and interface connectors | Please refer to P.29 to P.42 of the A6 series. |

* Refer to P.368 of the A6N series for the "parallel I/O connector (X4)" option. The "signal names" and "pin assignments" for the parallel I/O connector (X4) option "interface cable" and "interface connector kit" are different from those described on P.368. For details, please refer to the specifications of the A6B series.

* All dimensions shown in this catalog are for the A6BF series, but outer dimensions are the same as the A6BE series.

A-frame



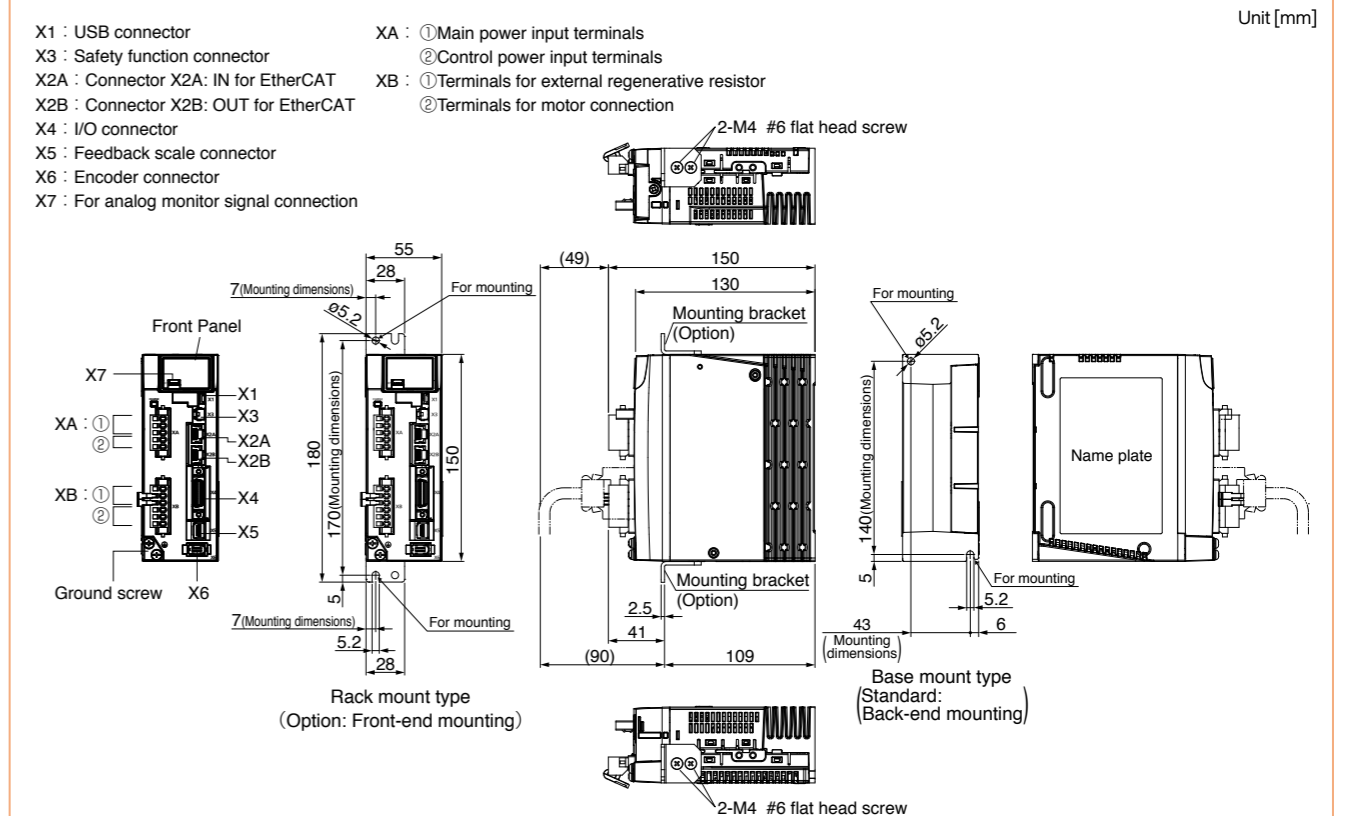
| A-frame: Connector of driver side | | | Multifunction type | Basic type |
|-----------------------------------|-----------------------------------|---------------------------------|--------------------|------------|
| Connector XA | S05B-F32SK-GGXR (or equivalent) | J.S.T. Mfg. Co., Ltd. | ● | ● |
| Connector XB | S06B-F32SK-GGXR (or equivalent) | J.S.T. Mfg. Co., Ltd. | ● | ● |
| Connector X1 | UB-M5BR-S14-4S (or equivalent) | J.S.T. Mfg. Co., Ltd. | ● | ● |
| Connector X3 | CIF-HS08SS-071-TB (or equivalent) | J.S.T. Mfg. Co., Ltd. | ● | - |
| Connector X2A | MOD-WRJ88LY1G-TP+ (or equivalent) | HTK | ● | ● |
| Connector X2B | MOD-WRJ88LY1G-TP+ (or equivalent) | HTK | ● | ● |
| Connector X4 | DF02R026NA2 (or equivalent) | Japan Aviation Electronics Ind. | ● | ● |
| Connector X5 | MUF-RS10SK-GKX-TB (or equivalent) | J.S.T. Mfg. Co., Ltd. | ● | - |
| Connector X6 | 3E106-2230KV (or equivalent) | 3M Japan | ● | ● |
| Connector X7 | 533984005 (5pin) | Molex | ● | ● |

Mass: 0.8 kg

<Attached to the driver>

| Connector of power and motor side | |
|-----------------------------------|--|
| Connector XA | 05JFAT-SAXGGKK-A J.S.T. Mfg. Co., Ltd. |
| Connector XB | 06JFAT-SAXGGKK-A J.S.T. Mfg. Co., Ltd. |

B-frame



* For connectors X1 to X7, refer to the list provided in the A-frame table because both frames use the same connectors.

Mass: 1.0 kg

C-frame

Unit [mm]

X1 : USB connector
X3 : Safety function connector
X2A : Connector X2A: IN for EtherCAT
X2B : Connector X2B: OUT for EtherCAT
X4 : I/O connector
X5 : Feedback scale connector
X6 : Encoder connector
X7 : For analog monitor signal connection

XA : ① Main power input terminals
② Control power input terminals
XB : ① Terminals for external regenerative resistor
② Terminals for motor connection

2-M4 #6 flat head screw

For mounting

Front Panel

Mounting bracket (Option)

Name plate

Mounting bracket (Option)

Base mount type (Standard: Back-end mounting)

Rack mount type (Option: Front-end mounting)

2-M4 #6 flat head screw

Mass: 1.6 kg

* For connectors X1 to X7, refer to the list provided in the A-frame table because both frames use the same connectors.

E-frame (200 V)

Unit [mm]

X1 : USB connector
X3 : Safety function connector
X2A : Connector X2A: IN for EtherCAT
X2B : Connector X2B: OUT for EtherCAT
X4 : I/O connector
X5 : Feedback scale connector
X6 : Encoder connector
X7 : For analog monitor signal connection

XA : ① Main power input terminals
② Control power input terminals
XB : Terminals for motor connection
XC : Terminals for external regenerative resistor

2-M4 #6 flat head screw

For mounting

Front Panel

Mounting bracket (If re-positioned from front end)

Name plate

Mounting bracket (If re-positioned from front end)

Mounting bracket (If re-positioned from front end)

2-M4 #6 flat head screw

Mass: 2.7 kg

* For connectors X1 to X7, refer to the list provided in the A-frame table because both frames use the same connectors.

| E-frame: Connector of driver side | | |
|-----------------------------------|------------------------------------|-----------------------|
| Connector XA | S05B-JTSLSK-GSANXR (or equivalent) | J.S.T. Mfg. Co., Ltd. |
| Connector XB | S03B-JTSLSK-GSANXR (or equivalent) | J.S.T. Mfg. Co., Ltd. |
| Connector XC | S04B-JTSLSS-GSANXR (or equivalent) | J.S.T. Mfg. Co., Ltd. |

| E-frame: Connector of power and motor side | | |
|--|---------------------------------|-----------------------|
| Connector XA | 05JFAT-SAXGSA-L (or equivalent) | J.S.T. Mfg. Co., Ltd. |
| Connector XB | 03JFAT-SAXGSA-L (or equivalent) | J.S.T. Mfg. Co., Ltd. |
| Connector XC | 04JFAT-SAXGSA-L (or equivalent) | J.S.T. Mfg. Co., Ltd. |

<Attached to the driver>

D-frame (200 V)

Unit [mm]

X1 : USB connector
X3 : Safety function connector
X2A : Connector X2A: IN for EtherCAT
X2B : Connector X2B: OUT for EtherCAT
X4 : I/O connector
X5 : Feedback scale connector
X6 : Encoder connector
X7 : For analog monitor signal connection

XA : ① Main power input terminals
② Control power input terminals
XB : ① Terminals for external regenerative resistor
② Terminals for motor connection

2-M4 #6 flat head screw

For mounting

Front Panel

Mounting bracket (Option)

Name plate

Mounting bracket (Option)

Base mount type (Standard: Back-end mounting)

Rack mount type (Option: Front-end mounting)

2-M4 #6 flat head screw

Mass: 2.1 kg

* For connectors X1 to X7, refer to the list provided in the A-frame table because both frames use the same connectors.

F-frame (200 V)

Unit [mm]

X1 : USB connector
X3 : Safety function connector
X2A : Connector X2A: IN for EtherCAT
X2B : Connector X2B: OUT for EtherCAT
X4 : I/O connector
X5 : Feedback scale connector
X6 : Encoder connector
X7 : For analog monitor signal connection

① Main power input terminals
② Control power input terminals
③ Terminals for external regenerative resistor
④ Terminals for motor connection

2-M4 #6 flat head screw

For mounting

Front Panel

Mounting bracket (If re-positioned from front end)

Name plate

Mounting bracket (If re-positioned from front end)

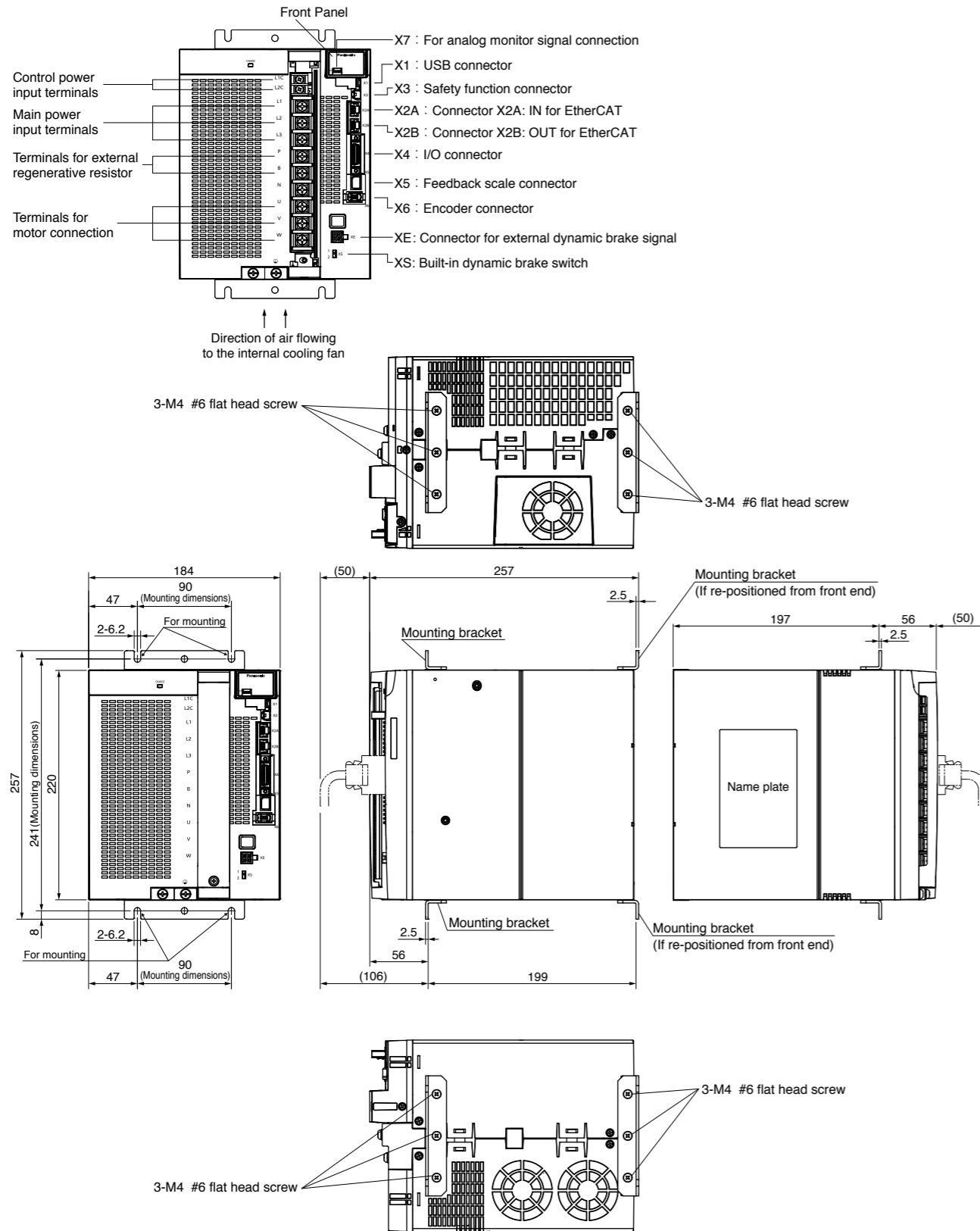
2-M4 #6 flat head screw

Mass: 5.2 kg

* For connectors X1 to X7, refer to the list provided in the A-frame table because both frames use the same connectors.

G-frame (200 V) (A6BE series are not available.)

Unit [mm]



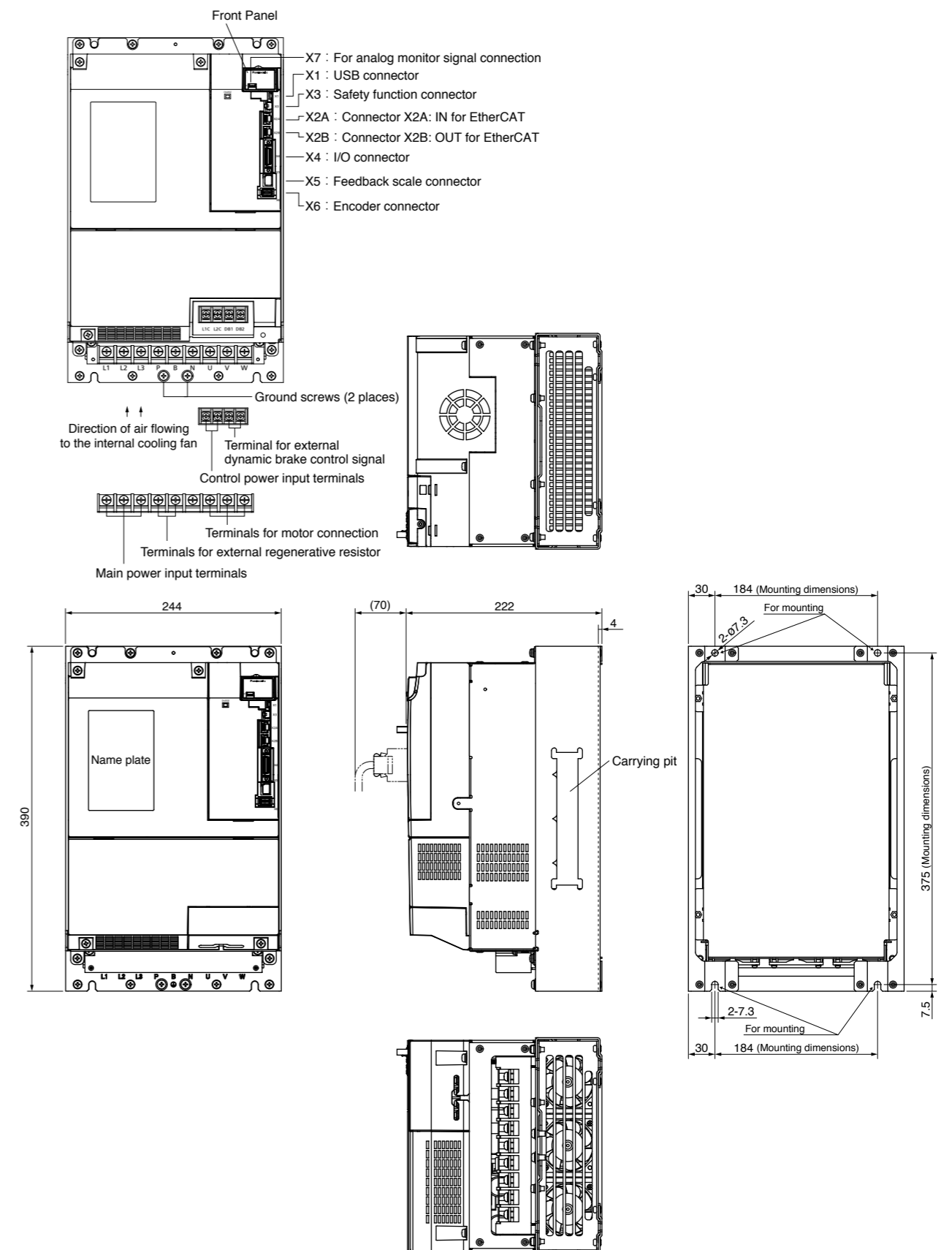
| Connector of driver side | Controlor side (customer prepares) |
|--------------------------------------|---|
| Connector XE : 5569-04A2-210 (Molex) | Connector : 5557-04R-210 (Molex) Pin : 5556PBT |

* For connectors X1 to X7, refer to the list provided in the A-frame table because both frames use the same connectors.

Mass: 8.2 kg

H-frame (200 V) (A6BE series are not available.)

Unit [mm]



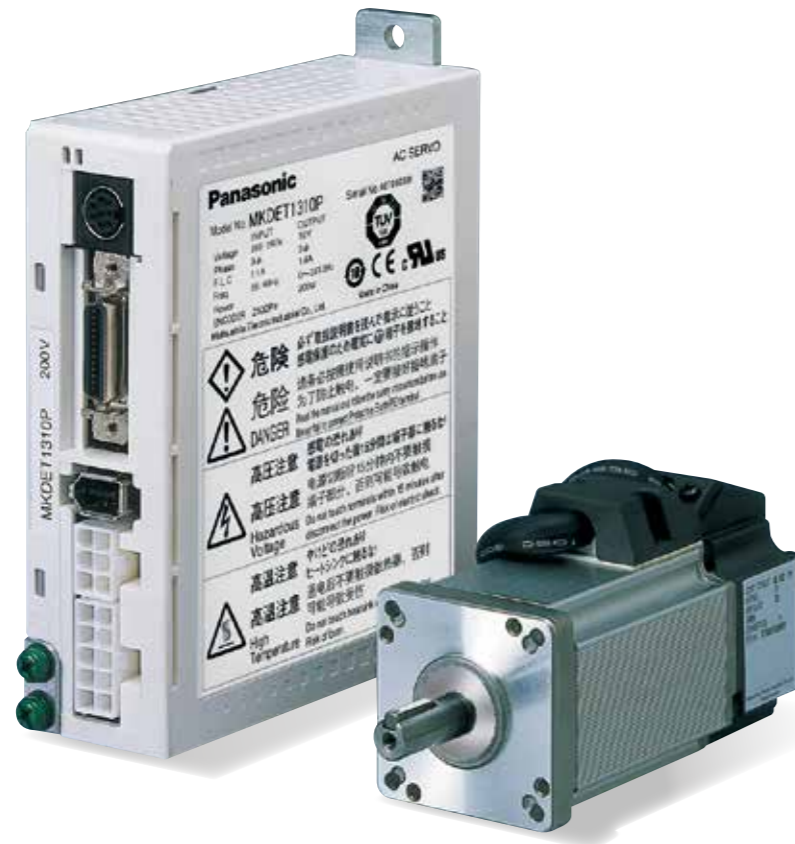
* For connectors X1 to X7, refer to the list provided in the A-frame table because both frames use the same connectors.

Mass:
MHDLTE3BF/ 14.2 kg
MHDLTF3BF/ 15.2 kg

Compact Servo Only for Position Control.

Ultra compact position control type

MINAS E Series Planned end of orders: April 30, 2025



1 Best Fit to Small Drives

- Further evolution in down-sizing, by 47% in size. ^(Note)
- Exclusively designed for position control.

(Note) Compared to MUDS043A1

2 Easy to Handle, Easy to Use

- DIN-rail mounting unit (option) improves handling/installation.
- User-friendly Console makes the setup easy.
- High functionality Real-Time Auto-Gain Tuning enables adjustment-free operation.



3 High-Speed Positioning with Resonance Suppression Filters

- Built-in notch filter suppresses resonance of the machine.
- Built-in adaptive filter detect resonance frequency and suppress vibration.

4 Smoother operation for Low Stiffness Machine

- Damping control function suppresses vibration during acceleration/deceleration

Contents

| | |
|--|-----|
| Features..... | 377 |
| Motor Line-up..... | 381 |
| Model Designation..... | 382 |
| Overall Wiring..... | 383 |
| Driver and List of Applicable Peripheral Devices..... | 383 |
| Driver..... | 385 |
| Driver Specifications..... | 385 |
| Standard Wiring Example of Main Circuit..... | 386 |
| Encoder Wiring Diagram..... | 386 |
| Control Circuit Standard Wiring Example..... | 387 |
| Dimensions of Driver..... | 388 |
| Motor..... | 389 |
| Specifications/Model designation/Torque Characteristics..... | 389 |
| Dimensions of Motor..... | 393 |
| Motors with Gear Reducer..... | 394 |
| Options..... | 398 |
| Setup Support Software..... | 398 |
| Cable part No. Designation..... | 399 |
| Cable Set..... | 400 |
| Encoder Cable..... | 400 |
| Motor Cable..... | 400 |
| Brake Cable..... | 400 |
| Connector Kit..... | 401 |
| Interface Cable..... | 403 |
| Communication Cable..... | 403 |
| Console..... | 403 |
| DIN Rail Mounting Unit..... | 404 |
| External Regenerative Resistor..... | 404 |
| Reactor..... | 405 |
| Surge Absorber for Motor Brake..... | 405 |
| List of Peripheral Devices..... | 406 |

A6 Series

A6N Series

A6B Series
Special Order Product

E Series

Information

1. Easy to Handle, Easy to Use

High-functionality Real-Time Auto-Gain Tuning (Note 1)

- Offers real automatic gain tuning for low and high stiffness machines with a combination of an adaptive filter.
- Supports the vertical axis application where the load torque is different in rotational direction.

DIN-rail mounting unit (option)

- DIN-rail mounting unit allows parallel mounting with small control devices such as PLC.
- Easy to mount and easy to dismount.

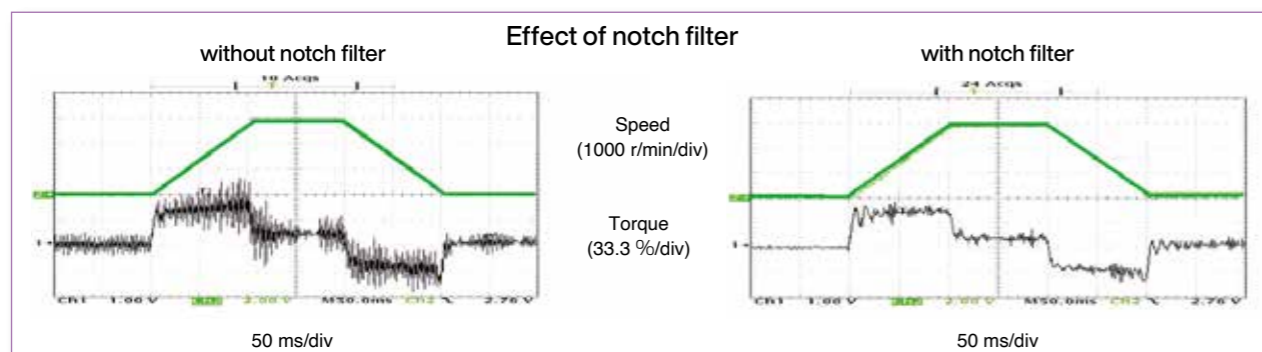
2. Further Reduction of Vibration

Adaptive filter (Note1)

- Makes the notch filter frequency automatically follow the machine resonance frequency in real-time auto-gain tuning.
- Suppression of "Judder" noise of the machine, which is caused by variation of the machines or resonance frequency due to aging, can be expected.

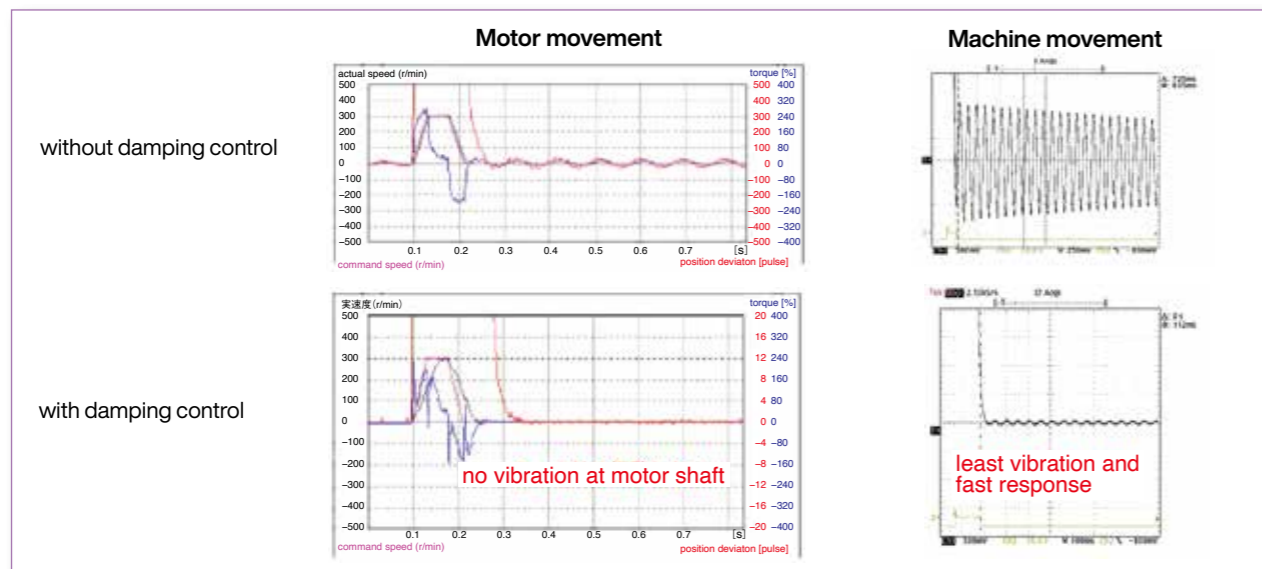
Notch filter (Note1)

- 1-channel notch filter is equipped in the driver independent from adaptive filter.
- Each of 2 filters can set up frequency and notch width, and frequency in 1Hz unit. Suppression of "Judder" noise of the machine which has multiple resonance points can be expected.



Damping control (Note1)

- You can suppress vibration occurring at both starting and stopping in low stiffness machine, by manually setting up vibration frequency in 0.1 Hz unit. Note) Only applies to manual adjustment



(Note1) Select at positioning action mode.
 • At high speed positioning mode (Pr02=0) Select either one of notch filter, damping control or high-functionality real-time auto-gain tuning. Not possible to use them all at the same time. Adaptive filter cannot be used.
 • At high-functionality positioning mode (Pr02=1) All of notch filter, damping control, high-functionality real-time auto-gain tuning and adaptive filter can be used at the same time.

3. Further Flexibility and Multiplicity

Console (Option)

- You can set up parameters, copy and make a JOG run.
- Convenient for maintenance at site.
- Refer to P.403, Options.

Command control modes

- Offers 2 command modes, "Position control" and "Internal velocity control".
- You can make a 4-speed running at preset values with parameter at internal velocity control mode.

Inrush current suppressing function

- Inrush suppressing resistor, which prevent the circuit breaker shutdown of the power supply caused by inrush current at power-on, is equipped in this driver.
- Prevents unintentional shutdown of the power supply circuit breaker in multi axis application and does not give load to the power line.

Regeneration discharging function

- Discharges the regenerative energy with external resistor, where energy is generated while stopping the load with large moment of inertia, or use in up-down operation, and is returned to the driver from the motor.
- No regenerative resistor is installed in the driver.
- It is highly recommended to install an external regenerative resistor (option).

Built-in dynamic brake

- You can select the dynamic brake action which short the servo motor windings of U, V and W, at Servo-OFF, CW/CCW over-travel inhibition, power shutdown and trip.
- You can select the action sequence depending on the machine requirement.

Setup support software (Option)

- With the setup support software, "PANATERM" via RS232 / RS485 communication port, you can monitor the running status of the driver and set up parameters. Note) Refer to P.398 for setup support software.

Key-way shaft and tapped shaft end

- Easy pulley attachment and easy maintenance
- Attache screw to the tapped shaft to prevent key or pulley from being pulled out.

Wave-form graphic function

- With the setup support software, "PANATERM", you can monitor the "Command speed", "Actual speed", "Torque", "Position deviation" and "Positioning complete signal".
- Helps you to analyze the machine and shorten the setup time. Note) Refer to P.398 for setup support software.

Frequency analyzing function

- You can confirm the response frequency characteristics of total machine mechanism including the servo motor with the setup support software, "PANATERM".
- Helps you to analyze the machine and shorten the setup time. Note) Refer to P.398 for setup support software.

Torque limit switching function

- You can select 2 preset torque limit value from external input.
- Use this function for tension control or press-hold control.

Conformity to CE and UL Standards




| Subject | Standard conformed | | |
|------------------|------------------------------------|---|---|
| Motor | IEC60034-1 | IEC60034-5 UL1004 CSA22.2 No.100 | Conforms to EU Low Voltage Directives/UK Low Voltage Regulation |
| | | UL508C CSA22.2 No. 14 | |
| Motor and driver | EN55011 | Radio Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment | Conforms to references by EU EMC Directives/UK EMC Regulation |
| | EN61000-6-2 | Immunity for Industrial Environments | |
| | EC61000-4-2 | Electrostatic Discharge Immunity Test | |
| | IEC61000-4-3 | Radio Frequency Electromagnetic Field Immunity Test | |
| | IEC61000-4-4 | Electric High-Speed Transition Phenomenon/Burst Immunity Test | |
| | IEC61000-4-5 | Lightening Surge Immunity Test | |
| | IEC61000-4-6 | High Frequency Conduction Immunity Test | |
| IEC61000-4-11 | Instantaneous Outage Immunity Test | | |

IEC : International Electrotechnical Commission
 EN : Europaischen Normen
 EMC : Electromagnetic Compatibility
 UL : Underwriters Laboratories
 CSA : Canadian Standards Association

Pursuant to at the directive 2004/108/EC, article 9(2)

* When exporting this product, follow statutory provisions of the destination country.

| Motor series | Rated output (kW) | Rated rotational speed (Max. speed) (r/min) | Rotary encoder | | Brake | Gear | UL/CSA | Enclosure | Features | Applications |
|--|--------------------|---|----------------------|----------------------------|---------|----------------|--------|--|-------------------------------------|--|
| | | | 2500 P/r incremental | 17bit absolute/incremental | Holding | High precision | | | | |
| MUMA  | 0.05 to 0.4 | 3000 (5000) | ○ | — | ○ | ○ | ○ | IP65 Except shaft throughhole and connector | Small capacity Ultra low inertia | SMT machines Inserters High repetitive positioning application |
| | 0.05 | | | | | | | | | |
| | 0.1 | | | | | | | | | |
| | 0.2 | | | | | | | | | |
| | 0.4 | | | | | | | | | |

■ Servo Motor

M U M A 5 A Z P 1 S * *

| Symbol | Series |
|--------|-----------------------------------|
| MUMA | Ultra low inertia (50 W to 400 W) |

Motor rated output

| Symbol | Rated output |
|--------|--------------|
| 5A | 50 W |
| 01 | 100 W |
| 02 | 200 W |
| 04 | 400 W |

Voltage specifications

| Symbol | Specifications |
|--------|--------------------------------|
| 1 | 100 V |
| 2 | 200 V |
| Z | 100 V/200 V common (50 W only) |

Special specifications

Motor structure

| Symbol | Shaft | Holding brake | | Oil seal | |
|--------|---------------------|---------------|------|----------|-------|
| | Key-way, center tap | without | with | without | with* |
| S | ● | ● | | ● | |
| T | ● | | ● | ● | |

* Motor with oil seal is manufactured by order.

Design order

| Symbol | Specifications |
|--------|----------------|
| 1 | Standard |

Rotary encoder specifications

| Symbol | Format | Pulse counts | Resolution | Wires |
|--------|-------------|--------------|------------|-------|
| P | Incremental | 2500 P/r | 10000 | 5 |

See P.389 for motor specifications

■ Motor with gear reducer

M U M A 0 1 1 P 3 1 N

| Symbol | Series |
|--------|------------------------------------|
| MUMA | Ultra low inertia (100 W to 400 W) |

Motor rated output

| Symbol | Rated output |
|--------|--------------|
| 01 | 100 W |
| 02 | 200 W |
| 04 | 400 W |

Voltage specifications

| Symbol | Specifications |
|--------|----------------|
| 1 | 100 V |
| 2 | 200 V |

Gear reduction ratio, gear type

| Symbol | Gear reduction ratio | Motor output (W) | | | Gear type |
|--------|----------------------|------------------|-----|-----|-------------------|
| | | 100 | 200 | 400 | |
| 1N | 1/5 | ● | ● | ● | For high accuracy |
| 2N | 1/9 | ● | ● | ● | |
| 4N | 1/25 | ● | ● | ● | |

Motor structure

| Symbol | Shaft | Holding brake | |
|--------|---------|---------------|------|
| | Key-way | without | with |
| 3 | ● | ● | |
| 4 | ● | | ● |

Rotary encoder specifications

| Symbol | Format | Pulse counts | Resolution | Wires |
|--------|-------------|--------------|------------|-------|
| P | Incremental | 2500 P/r | 10000 | 5 |

See P.394 for motor with gear reducer specifications

■ Servo Driver

M K D E T 1 3 1 0 P * *

Frame symbol

| Symbol | Frame |
|--------|-------------------|
| MKDE | E series, K-frame |
| MLDE | E series, L-frame |

Power device Max. current rating

| Symbol | Current rating |
|--------|----------------|
| T1 | 10 A |
| T2 | 15 A |

Supply voltage specifications

| Symbol | Specifications |
|--------|-----------------------|
| 1 | Single phase, 100 V |
| 2 | Single phase, 200 V |
| 3 | 3-phase, 200 V |
| 5 | Single/3-phase, 200 V |

Special specifications

Control mode

| Symbol | Specifications |
|--------|----------------|
| P | Pulse train |

Current detector current rating

| Symbol | Current rating |
|--------|----------------|
| 05 | 5 A |
| 10 | 10 A |

See P.385 for driver specifications

- Wiring of main circuit

Circuit Breaker (MCCB)

Protects the power lines. Shuts off the circuit when overcurrent passes.

Noise Filter (NF)

Prevents external noise from the power lines. And reduces an effect of the noise generated by the servo driver.

Magnetic Contactor (MC)

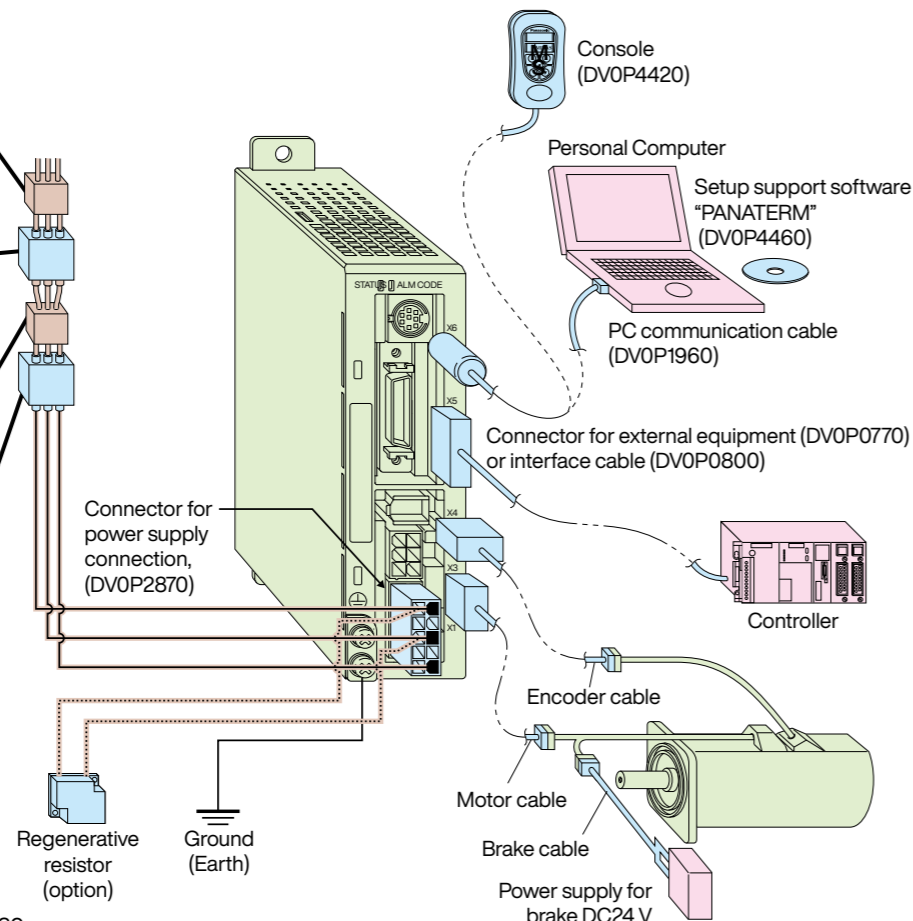
Turns on/off the main power of the servo driver. Surge absorber to be used together with this.

Reactor (L)

Reduces harmonic current of the main power.

Pin-5 and Pin-3 of CN POWER

Connect an external regenerative resistor (option) between P(pin-5) and B(pin-3) of connector, CN X1, when regenerative energy is large. (Refer to P.404 for regenerative resistor.)



| | |
|---------------------------|----------|
| Motor | to P.389 |
| Driver | to P.385 |
| Option | to P.398 |
| Recommended equipments | |
| Parts customer to prepare | |

List of recommended peripheral devices

| Power supply | Motor | | Power capacity (at rated output) | Circuit Breaker (Rated current) | Noise Filter | Magnetic Contactor Contact Composition | Wire diameter (L1, L2, L3, U, V and W) |
|---------------------|--------|--------|----------------------------------|---------------------------------|--------------|--|--|
| | Series | Output | | | | | |
| Single phase, 100 V | MUMA | 50 W | 0.3 kVA | 5 A | DVOP4160 | 10 A (3P+1a) | 0.75 mm ² to 0.85 mm ² AWG18 |
| | | 100 W | 0.4 kVA | 10 A | | | |
| | | 200 W | 0.5 kVA | 10 A | | | |
| Single phase, 200 V | MUMA | 50 W | 0.3 kVA | 5 A | DVOP4160 | 15 A (3P+1a) | 0.75 mm ² to 0.85 mm ² AWG18 |
| | | 100 W | 0.3 kVA | 5 A | | | |
| | | 200 W | 0.5 kVA | 10 A | | | |
| 3-phase 200 V | MUMA | 50 W | 0.3 kVA | 5 A | DVOP4160 | 10 A (3P+1a) | 0.75 mm ² to 0.85 mm ² AWG18 |
| | | 100 W | 0.3 kVA | 5 A | | | |
| | | 200 W | 0.5 kVA | 10 A | | | |

- * Select the single and 3-phase common specifications corresponding to the power supplies.
- To conform to EU Directives/UK Regulation, install a circuit breaker which conforms to IEC and UL Standards (Listed, marked) between noise filter and power supply.
- For details of the noise filters, refer to 416.

<Remarks>

- Use a copper conductor cables with temperature rating of 60 °C or higher for main power connector and ground terminal wiring. Use a cable for ground with diameter of 2.0 mm² (AWG14) or larger.

Fastening torque list

| Ground terminal screw | | Connector to host controller[X5] | |
|-----------------------|--|----------------------------------|--|
| Nominal size | Fastening torque (N·m) ^(Note 3) | Nominal size | Fastening torque (N·m) ^(Note 3) |
| M4 | 0.7~0.8 | M2.6 | 0.2±0.05 |

(Note 3) <Caution>

- Applying fastening torque larger than the maximum value may result in damage to the product.

<Remarks>

- To check for looseness, conduct periodic inspection of fastening torque once a year.

Carrying page

| Options | Part No. | Carrying page | |
|--|---------------------------|---------------|-----|
| Console | DVOP4420 | 403 | |
| Setup Support Software, PANATERM | Japanese | 398 | |
| | English | | |
| RS232 Communication Cable (for Connection with PC) | DVOP1960 | 403 | |
| Interface Cable | DVOP0800 | 403 | |
| Connector Kit for Interface | DVOP0770 | 402 | |
| Connector Kit for Motor and Encoder | DVOP3670 | 401 | |
| Connector Kit for Driver Power Supply | DVOP2870 | 401 | |
| Encoder Cable | MFECA0 * * 0EAM | 400 | |
| Motor Cable | MFMCA0 * * 0AEB | 400 | |
| Brake Cable | MFMCB0 * * 0GET | 400 | |
| Cable Set (3 m) ^(Note 4) | DVOP37300 | 400 | |
| Cable Set (5 m) ^(Note 4) | DVOP39200 | 400 | |
| DIN Rail Mount Unit | DVOP3811 | 404 | |
| External Regenerative Resistor | 100 V 50 Ω 10 W | DVOP2890 | 404 |
| | 200 V 100 Ω 10 W | DVOP2891 | |
| Reactor | 100 V | DVOP227 | 405 |
| | | DVOP228 | |
| | 200 V | DVOP220 | |
| Noise Filter | | DVOP4160 | 416 |
| Surge Absorber | Single phase 100 V, 200 V | DVOP4190 | 416 |
| | 3-phase 200 V | DVOP1450 | |
| Ferrite core | | DVOP1460 | 416 |

- (Note 4) Cable set (3 m) contains,
- 1) Interface cable: DVOP0800
 - 2) Encoder cable (3 m): MFECA0030EAM
 - 3) Motor cable (3 m): MFMCA0030AEB
 - 4) Connector kit for driver power supply connection: DVOP2870
- Cable set (5 m) contains,
- 1) Interface cable: DVOP0800
 - 2) Encoder cable (5 m): MFECA0050EAM
 - 3) Motor cable (5 m): MFMCA0050AEB
 - 4) Connector kit for driver power supply connection: DVOP2870

Table of Part Numbers and Options

| Power supply | Output (W) | 2500P/r, Incremental | | | | Option | | | | | |
|--------------------|------------|-------------------------|---------------------|--------------------------|---------------------------|---------------------------------|-------------------------------|-------------------------------|--------------------------------|---------|--------------|
| | | Motor ^{Note 1} | Rating/Spec. (page) | Driver | Dimensions (Frame symbol) | Encoder Cable ^{Note 2} | Motor Cable ^{Note 2} | Brake Cable ^{Note 2} | External Regenerative Resistor | Reactor | Noise Filter |
| Single phase 100 V | 50 | MUMA5AZP1 □ | 389 | MKDET1105P | 388 (K) | MFECA0 * * 0EAM | MFMCA0 * * 0AEB | | DVOP2890 | DVOP227 | DVOP4160 |
| | 100 | MUMA011P1 □ | 389 | MKDET1110P | 388 (K) | | | | | | |
| | 200 | MUMA021P1 □ | 389 | MLDET2110P | 388 (L) | | | | | | |
| Single phase 200 V | 50 | MUMA5AZP1 □ | 391 | MKDET1505P | 388 (K) | | | | | | |
| | 100 | MUMA012P1 □ | 391 | MKDET1505P | 388 (K) | | | | | | |
| | 200 | MUMA022P1 □ | 391 | MLDET2210P | 388 (L) | | | | | | |
| | 400 | MUMA042P1 □ | 391 | MLDET2510P | 388 (L) | | | | | | |
| 3-phase 200 V | 50 | MUMA5AZP1 □ | 391 | MKDET1505P | 388 (K) | | | | | | |
| | 100 | MUMA012P1 □ | 391 | MKDET1505P | 388 (K) | | | | | | |
| | 200 | MUMA022P1 □ | 391 | MKDET1310P | 388 (K) | | | | | | |
| | 400 | MUMA042P1 □ | 391 | MLDET2510P MLDET2310P | 388 (L) | | | | | | |

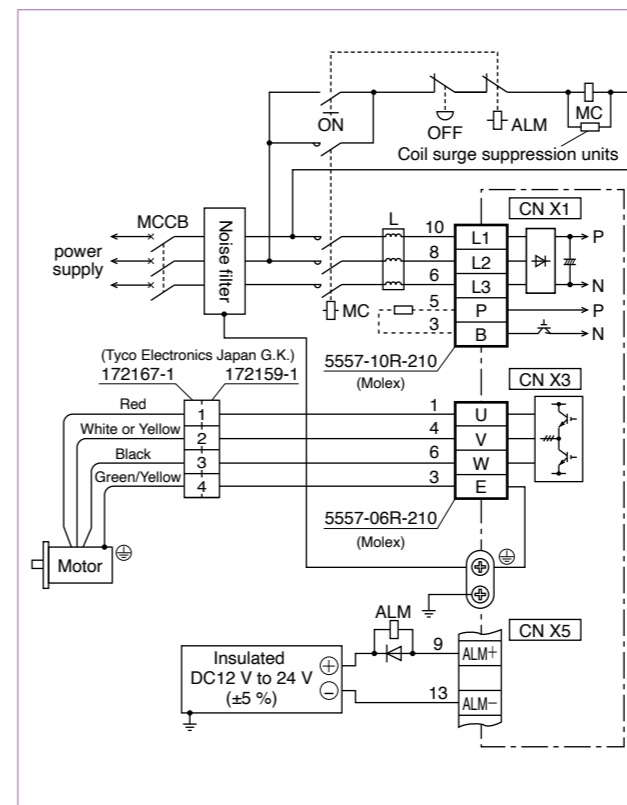
- Note) 1 Motor model number suffix: □
 S: Key way with center tap, without brake
 T: Key way with center tap, with brake
 Note) 2 * * represents cable length. For details, refer to P.399.

A6 Series
 A6N Series
 A6B Series
 E Series
 Information

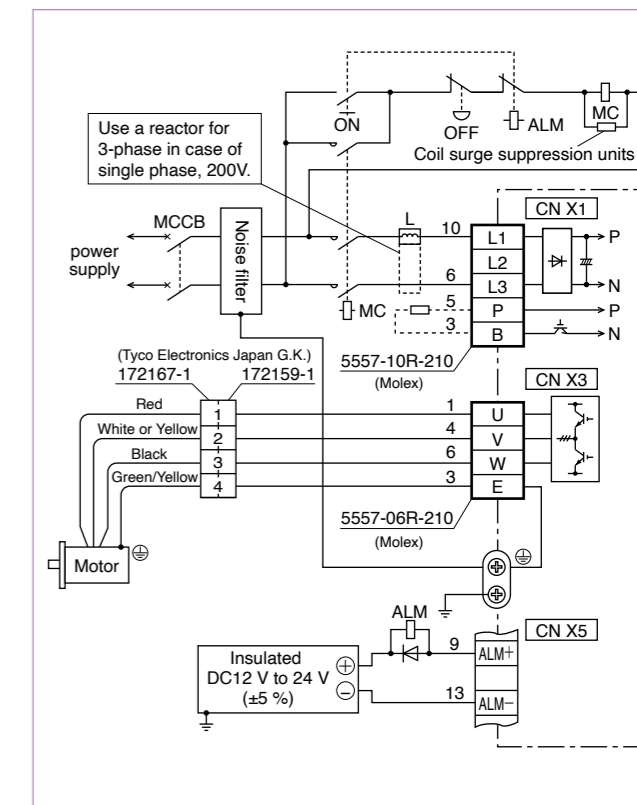
| | | | | | |
|------------------------|---|--|--|-------------|--|
| Basic Specifications | Input power | Single phase, 100 V | Single phase, 100 V to 115 V +10% -15% | 50 Hz/60 Hz | |
| | | Single phase, 200 V | Single phase, 200 V to 240 V +10% -15% | 50 Hz/60 Hz | |
| | | 3-phase, 200 V | 3-phase, 200 V to 240 V +10% -15% | 50 Hz/60 Hz | |
| | Environment | Temperature | Operating : 0 °C to 55 °C, Storage : -20 °C to 65 °C (Max.temperature guarantee 80 °C for 72 hours <Normal temperature>) | | |
| | | Humidity | Both operating and storage : 90 %RH or less (free from condensation) | | |
| | | Altitude | 1000 m or lower | | |
| | | Vibration | 5.88 m/s ² or less, 10 Hz to 60 Hz (No continuous use at resonance frequency) | | |
| | | Withstand voltage | Should be 1500 VAC (Sensed current: 20 mA) for 1 minute between Primary and Ground. | | |
| | Control method | IGBT PWM Sinusoidal wave drive | | | |
| | Encoder feedback | 2500 P/r (10000 resolution) incremental encoder | | | |
| | Control signal | Input | 7 inputs (1) Servo-ON, (2) Alarm clear and other inputs vary depending on the control mode. | | |
| | | Output | 4 outputs (1) Servo alarm, (2) Alarm, (3) Release signal of external brake and other outputs vary depending on the control mode. | | |
| | Pulse signal | Input | 2 inputs Supports both line driver I/F and open collector I/F. | | |
| | | Output | 4 outputs Feed out the encoder pulse (A, B and Z-phase) in line driver. Z-phase pulse is also feed out in open collector. | | |
| | Communication function | RS232 | 1 : 1 communication to a host with RS232 interface is enabled. | | |
| Display LED | (1) Status LED (STATUS), (2) Alarm code LED (ALM-CODE) | | | | |
| Regeneration | No built-in regenerative resistor (external resistor only) | | | | |
| Dynamic brake | Built-in | | | | |
| Control mode | 3 modes of (1) High-speed position control, (2) Internal velocity control and (3) High-functionality positioning control are selectable with parameter. | | | | |
| Position control | Control input | (1) CW over-travel inhibition, (2) CCW over-travel inhibition, (3) Deviation counter clear, (4) Gain switching, (5) Electronic gear switching | | | |
| | Control output | (1) Positioning complete (In-position) | | | |
| | Pulse input | Max. command pulse frequency | Line driver : 500 kpps, Open collector : 200 kpps | | |
| | | Type of input pulse train | Differential input. Selectable with parameter, ((1) CW/CCW, (2) A and B-phase, (3) Command and Direction) | | |
| | | Electronic gear (Division/Multiplication) of command pulse | Setup of electronic gear ratio Setup range of (1-10000) × 2 ⁽⁰⁻¹⁷⁾ /(1-10000) | | |
| Smoothing filter | Primary delay filter or FIR type filter is selectable to the command input. | | | | |
| Internal speed control | Control input | (1) CW over-travel inhibition, (2) CCW over-travel inhibition, (3) Selection 1 of internal command speed, (4) Selection 2 of internal command speed, (5) Speed zero clamp | | | |
| | Control output | (1) Speed arrival (at-speed) | | | |
| | Internal speed command | Internal 4-speed is selectable with control input. | | | |
| | Soft-start/down function | Individual setup of acceleration and deceleration are enabled, with 0 s to 10 s/1000 r/min. Sigmoid acceleration/deceleration is also enabled. | | | |
| | Zero-speed clamp | 0-clamp of internal speed command with speed zero clamp input is enabled. | | | |
| Auto-gain tuning | Real-time | Estimates the load inertia in real-time in actual operation and sets up the gain automatically corresponding to the machine stiffness. Useable at (1) High-response position control, (2) Internal speed control and (3) High-functionality position control. | | | |
| | Normal mode | Estimates the load inertia with an action command inside of the driver, and sets up the gain automatically corresponding to setup of the machine stiffness. Useable at (1) High-response position control, (2) Internal speed control and (3) High-functionality position control. | | | |
| Common | Masking of unnecessary input | Masking of the following input signal is enabled. (1) Over-travel inhibition, (2) Speed zero clamp, (3) Torque limit switching | | | |
| | Division of encoder feedback pulse | 1 P/r to 2500 P/r (encoder pulses count is the max.). | | | |
| | Protective function | Hardware error | Over-voltage, under-voltage, over-speed over-load, over-heat, over-current and encoder error etc. | | |
| | | Software error | Excess position deviation, command pulse division error, EEPROM error etc. | | |
| | Traceability of alarm data | Traceable up to past 14 alarms including the present one. | | | |
| | Damping control function | Manual setup with parameter | | | |
| | Setup | Manual | Console | | |
| Setup support software | | PANATERM (Supporting OS : Windows98, Windows ME, Windows2000, and WindowsXP) | | | |

Standard Wiring Example of Main Circuit

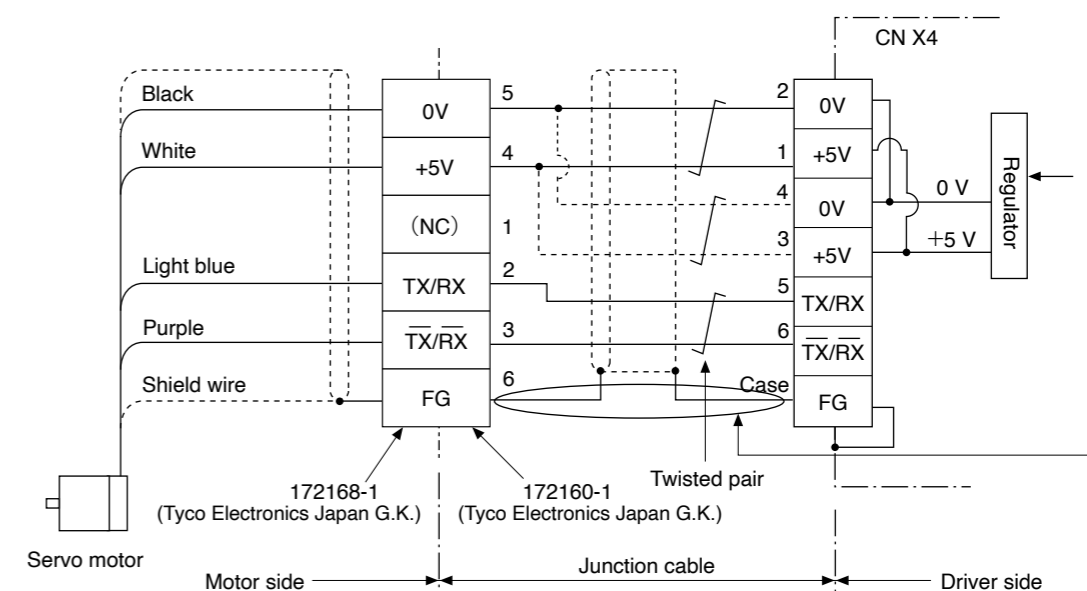
3-Phase, 200 V



Single Phase, 100 V / 200 V



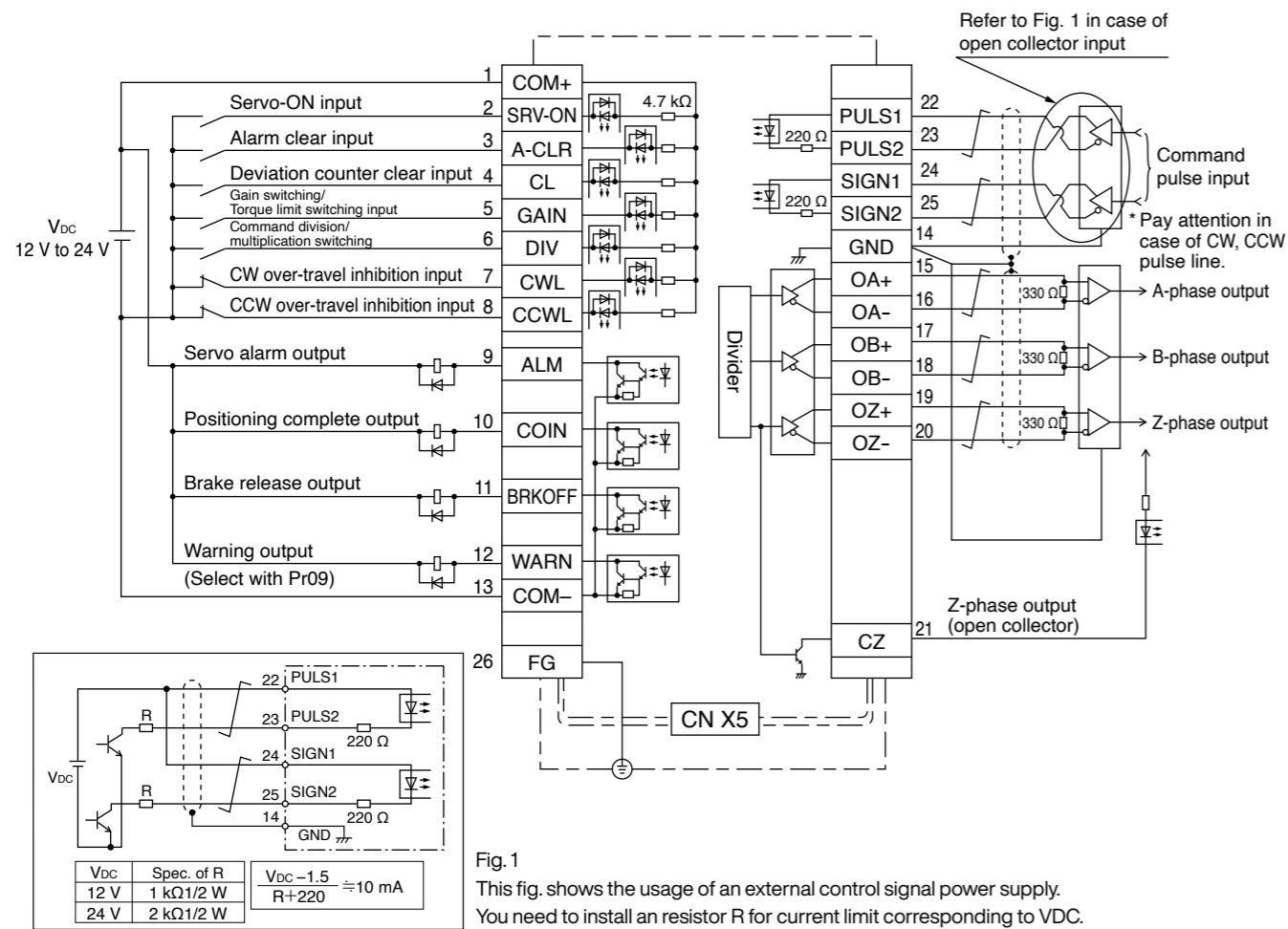
Encoder Wiring Diagram



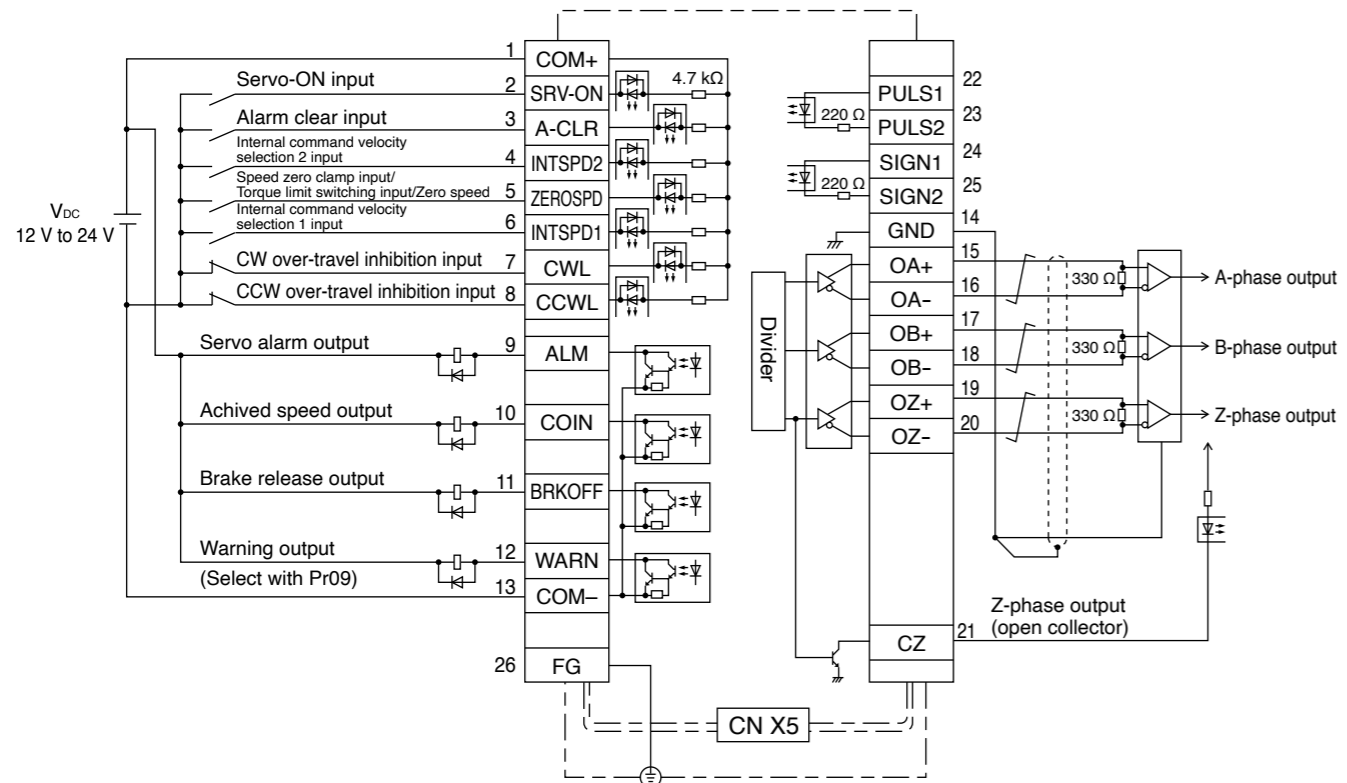
When you make your own junction cable for encoder (Refer to P.401, P.402 "Options" for connector.)

- 1) Refer the wiring diagram.
- 2) Use the twisted pair wire with shield, with core diameter of 0.18 mm² (AWG24) or larger, with higher bending resistance.
- 3) Use the twisted pair wire for the corresponding signal and power supply.
- 4) Shielding
Connect the shield of the driver to the case of CN X4.
Connect the shield of the motor to Pin-6.

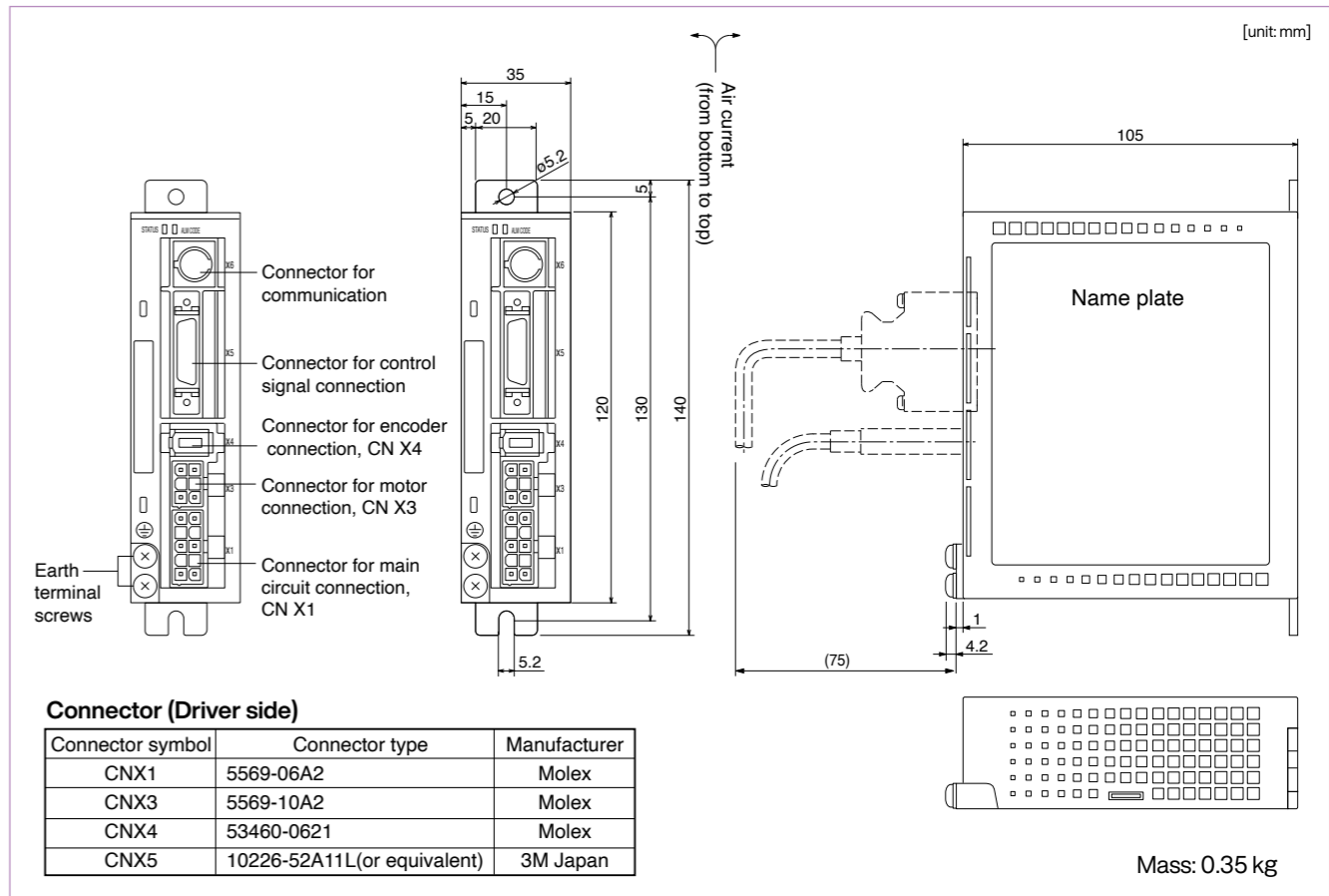
CN X 5 Wiring Example at Position Control Mode



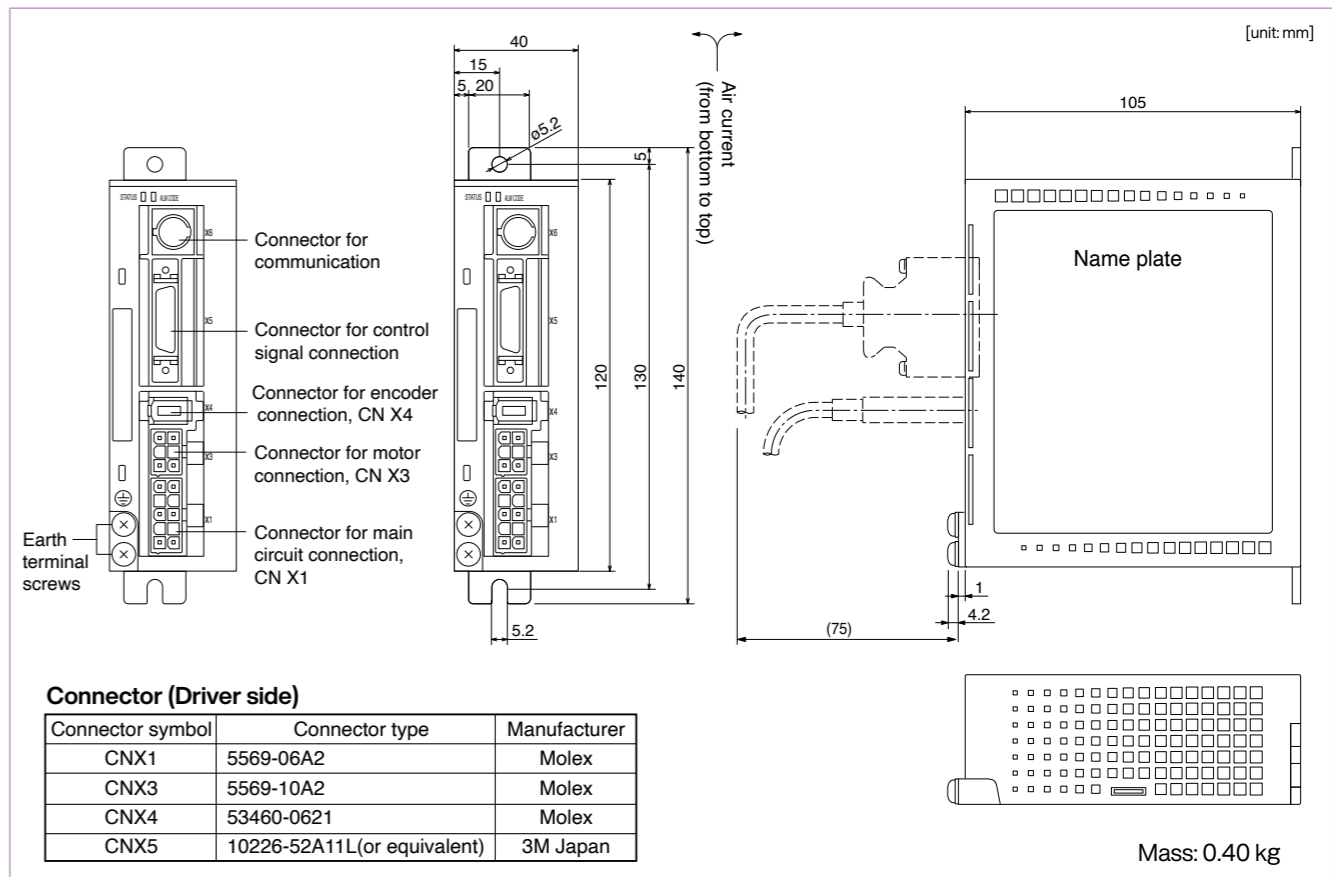
CN X 5 Wiring Example at Internal Velocity Control Mode



Frame K



Frame L



| | | AC100 V | | | |
|--|-----------------------|---|------------|-----------------|--------|
| Motor model | | MUMA | 5AZP1□ | 011P1□ | 021P1□ |
| Applicable driver | Model No. | MKDET1105P | MKDET1110P | MLDET2110P | |
| | Frame symbol | Frame K | | Frame L | |
| Power supply capacity (kVA) | | 0.3 | 0.4 | 0.5 | |
| Rated output (W) | | 50 | 100 | 200 | |
| Rated torque (N·m) | | 0.16 | 0.32 | 0.64 | |
| Momentary Max. peak torque (N·m) | | 0.48 | 0.95 | 1.91 | |
| Rated current (Arms) | | 1.0 | 1.6 | 2.5 | |
| Max. current (Ao-p) | | 4.3 | 6.9 | 11.7 | |
| Regenerative brake frequency (times/min) Note)1 | Without option | No limit Note)2 | | No limit Note)2 | |
| | DV0P2890 | No limit Note)2 | | No limit Note)2 | |
| Rated rotational speed (r/min) | | 3000 | | | |
| Max. rotational speed (r/min) | | 5000 | | | |
| Moment of inertia of rotor ($\times 10^{-4}$ kg·m ²) | Without brake | 0.021 | 0.032 | 0.10 | |
| | With brake | 0.026 | 0.036 | 0.13 | |
| Recommended moment of inertia ratio of the load and the rotor Note)3 | | 30 times or less | | | |
| Rotary encoder specifications | | 2500 P/r | | | |
| | | Incremental | | | |
| Resolution per single turn | | 10000 | | | |
| Protective enclosure rating | | IP65 (except rotating portion of output shaft and lead wire end) | | | |
| Environment | Ambient temperature | 0 °C to 40 °C (free from freezing), Storage : -20 °C to 65 °C (Max.temperature guarantee 80 °C for 72 hours <nomal humidity>) | | | |
| | Ambient humidity | 85 %RH or lower (free from condensing) | | | |
| | Installation location | Indoors (no direct sunlight), free from corrosive gas, inflammable gas, oil mist and dust | | | |
| | Altitude | 1000 m or lower | | | |
| | Vibration resistance | 49 m/s ² or less | | | |
| Mass (kg), () represents holding brake type | | 0.4 (0.6) | 0.5 (0.7) | 0.96 (1.36) | |

Brake specifications (This brake will be released when it is energized. Do not use this for braking the motor in motion.)

| | | |
|------------------------------|--------------------|----------|
| Static friction torque (N·m) | 0.29 | 1.27 |
| Engaging time (ms) | 25 | 50 |
| Releasing time (ms) Note)4 | 20 (30) | 15 (100) |
| Exciting current (DC) (A) | 0.26 | 0.36 |
| Releasing voltage | DC 1 V or more | |
| Exciting voltage | DV 24 V \pm 10 % | |

| Permissible load | | | |
|------------------|-----------------------------|-----|-----|
| During assembly | Radial load P-direction (N) | 147 | 392 |
| | Thrust load A-direction (N) | 88 | 147 |
| | Thrust load B-direction (N) | 117 | 196 |
| During operation | Radial load P-direction (N) | 68 | 245 |
| | Thrust load A-direction (N) | 58 | 98 |
| | Thrust load B-direction (N) | 58 | 98 |

For motor dimensions, refer to P.393, and for the driver, refer to P.388.

Model Designation

e.g.) **M U M A 5 A Z P 1 S**

| Symbol | Series |
|--------|-----------------------------------|
| MUMA | Ultra low inertia (50 W to 200 W) |

| Motor rated output | |
|--------------------|--------------|
| Symbol | Rated output |
| 5A | 50 W |
| 01 | 100 W |
| 02 | 200 W |

| Voltage specifications | |
|------------------------|-----------------------|
| Symbol | Specifications |
| 1 | 100 V |
| Z | 100/200 V (50 W only) |

Design order 1: Standard

Motor structure

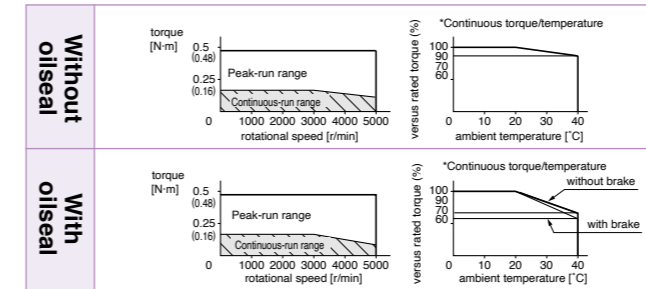
| Symbol | Shaft | Holding brake | | Oil seal | |
|--------|---------------------|---------------|------|----------|------|
| | Key-way, center tap | without | with | without | with |
| S | ● | ● | | ● | |
| T | ● | | ● | ● | |

Rotary encoder specifications

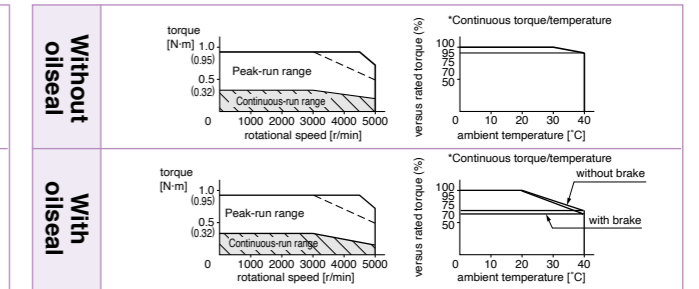
| Symbol | Format | Pulse counts | Resolution | Wires |
|--------|-------------|--------------|------------|-------|
| P | Incremental | 2500 P/r | 10000 | 5 |

Torque Characteristics [at AC100 V of power voltage (Dotted line represents the torque at 10 % less supply voltage.)]

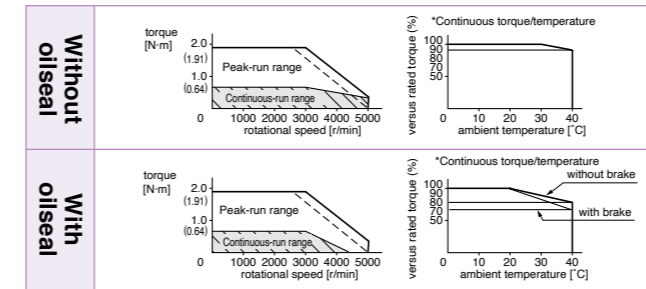
MUMA5AZP1□



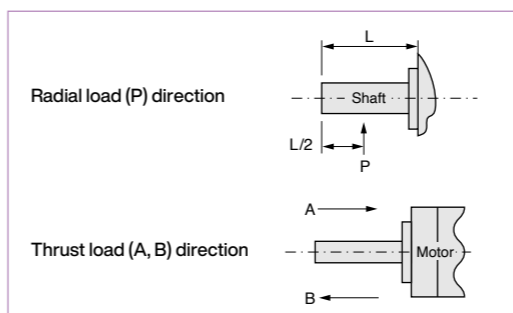
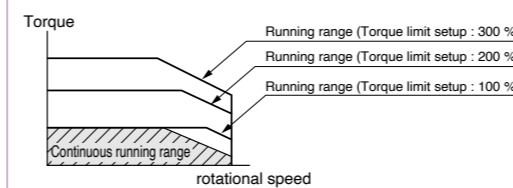
MUMA011P1□



MUMA021P1□



*When you lower the torque limit setup (Pr5E and 5F), running range at high speed might be lowered as well.



- Note) 1. Regenerative brake frequency represents the frequency of the motor's stops from the rated speed with deceleration without load.
- If the load is connected, frequency will be defined as $1/(m+1)$, where $m = (\text{load moment of inertia}) / (\text{rotor moment of inertia})$.
 - When the motor speed exceeds the rated speed, regenerative brake frequency is in inverse proportion to the square of (running speed/rated speed).
 - Power supply voltage is AC115 V (at 100 V of the main voltage). If the supply voltage fluctuates, frequency is in inverse proportion to the square of (Running supply voltage/115) relative to the value in the table.
 - When regeneration occurs continuously such cases as running speed frequently changes or vertical feeding, consult us or a dealer.
2. If the effective torque is within the rated torque, there is no limit in regenerative brake.
 3. Consult us or a dealer if the load moment of inertia exceeds the specified value.
 4. Specified releasing time is obtained with the use of surge absorber for brake (Z15D151 by SEMITEC Corporation or equivalent). () represents the actually measured value using a diode (200 V, 1 A or equivalent)

| | | AC200 V | | | |
|---|----------------------------|---|-----------|--------------------|------------|
| Motor model | MUMA | 5AZP1□ | 012P1□ | 022P1□ | 042P1□ |
| Applicable driver | Model No. | MKDET1505P | | MKDET1310P | MLDET2310P |
| | Frame symbol | Frame K | | Frame K Frame L | Frame L |
| Power supply capacity (kVA) | | 0.3 | 0.3 | 0.5 | 0.9 |
| Rated output (W) | | 50 | 100 | 200 | 400 |
| Rated torque (N · m) | | 0.16 | 0.32 | 0.64 | 1.3 |
| Momentary Max. peak torque (N · m) | | 0.48 | 0.95 | 1.91 | 3.8 |
| Rated current (Arms) | | 1.0 | 1.0 | 1.6 | 2.5 |
| Max. current (A _{o-p}) | | 4.3 | 4.3 | 7.5 | 11.7 |
| Regenerative brake frequency (times/min) | Without option | No limit Note)2 | | No limit Note)2 | |
| | Note)1 DV0P2891 | No limit Note)2 | | No limit Note)2 | |
| Rated rotational speed (r/min) | | 3000 | | | |
| Max. rotational speed (r/min) | | 5000 | | | |
| Moment of inertia of rotor (×10 ⁻⁴ kg·m ²) | Without brake | 0.021 | 0.032 | 0.10 | 0.17 |
| | With brake | 0.026 | 0.036 | 0.13 | 0.20 |
| Recommended moment of inertia ratio of the load and the rotor | Note)3 | 30 times or less | | | |
| Rotary encoder specifications | | 2500 P/r Incremental | | | |
| | Resolution per single turn | 10000 | | | |
| Protective enclosure rating | | IP65 (except rotating portion of output shaft and lead wire end) | | | |
| Environment | Ambient temperature | 0 °C to 40 °C (free from freezing), Storage : -20 °C to 65 °C (Max. temperature guarantee 80 °C for 72 hours <normal humidity>) | | | |
| | Ambient humidity | 85 %RH or lower (free from condensing) | | | |
| | Installation location | Indoors (no direct sunlight), free from corrosive gas, inflammable gas, oil mist and dust | | | |
| | Altitude | 1000 m or lower | | | |
| Vibration resistance | | 49 m/s ² or less | | | |
| Mass (kg), () represents holding brake type | | 0.4 (0.6) | 0.5 (0.7) | 0.96 (1.36) | 1.5 (1.9) |

| Brake specifications (This brake will be released when it is energized. Do not use this for braking the motor in motion.) | | |
|---|----------------|----------|
| Static friction torque (N · m) | 0.29 | 1.27 |
| Engaging time (ms) | 25 | 50 |
| Releasing time (ms) Note)4 | 20 (30) | 15 (100) |
| Exciting current (DC) (A) | 0.26 | 0.36 |
| Releasing voltage | DC 1 V or more | |
| Exciting voltage | DV 24 V ±10 % | |

| Permissible load | | | |
|------------------|-----------------------------|-----|-----|
| During assembly | Radial load P-direction (N) | 147 | 392 |
| | Thrust load A-direction (N) | 88 | 147 |
| | Thrust load B-direction (N) | 117 | 196 |
| During operation | Radial load P-direction (N) | 68 | 245 |
| | Thrust load A-direction (N) | 58 | 98 |
| | Thrust load B-direction (N) | 58 | 98 |

For motor dimensions, refer to P.393, and for the driver, refer to P.388.
 Note) Driver for 50 W and 100 W has a common power supply of single phase and 3-phase 200 V.
 Driver for 200 W, the upper row is the power supply of 3-phase 200 V, and lower is the power supply of single-phase 200 V.
 Driver for 400 W, the upper row is the power supply of 3-phase 200 V, and lower is the common power supply of single-phase and 3-phase 200 V.

Model Designation

e.g.) **M U M A 5 A Z P 1 S**

| Symbol | Series |
|--------|-----------------------------------|
| MUMA | Ultra low inertia (50 W to 400 W) |

| Symbol | Rated output |
|--------|--------------|
| 5A | 50 W |
| 01 | 100 W |
| 02 | 200 W |
| 04 | 400 W |

| Symbol | Specifications |
|--------|-----------------------|
| 2 | 200 V |
| Z | 100/200 V (50 W only) |

Design order
1: Standard

Motor structure

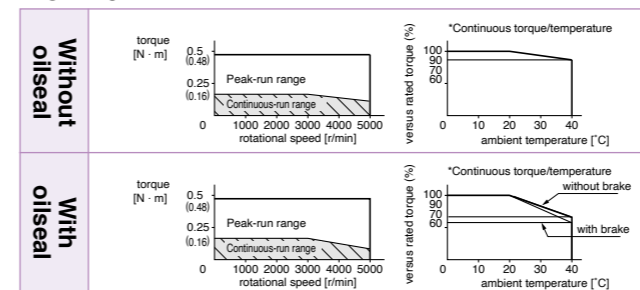
| Symbol | Shaft Key-way, center tap | Holding brake without | Holding brake with | Oil seal without | Oil seal with |
|--------|---------------------------|-----------------------|--------------------|------------------|---------------|
| S | ● | ● | ● | ● | ● |
| T | ● | ● | ● | ● | ● |

Rotary encoder specifications

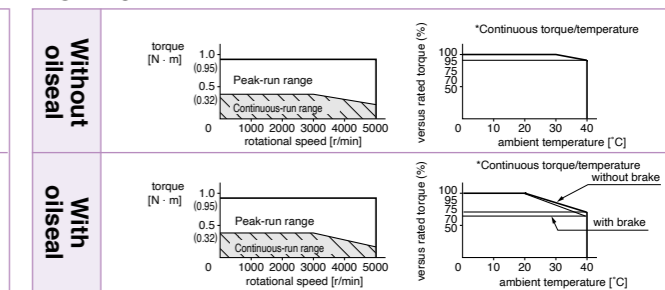
| Symbol | Format | Pulse counts | Resolution | Wires |
|--------|-------------|--------------|------------|-------|
| P | Incremental | 2500 P/r | 10000 | 5 |

Torque Characteristics [at AC200 V of power voltage (Dotted line represents the torque at 10 % less supply voltage.)]

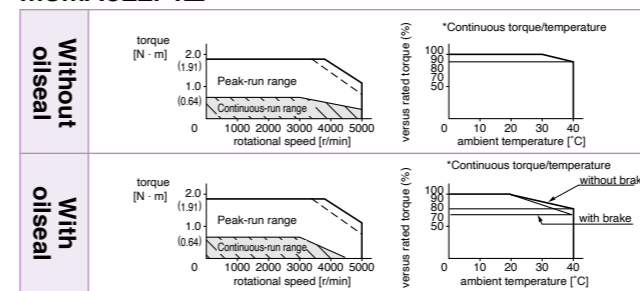
MUMA5AZP1□



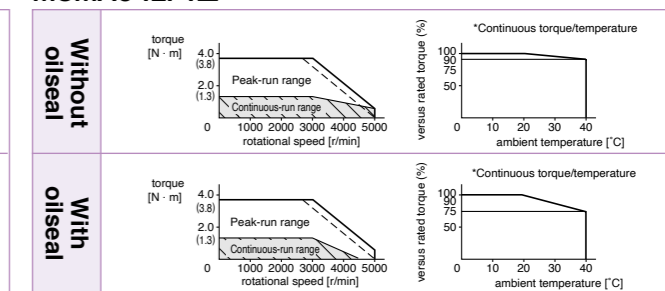
MUMA012P1□



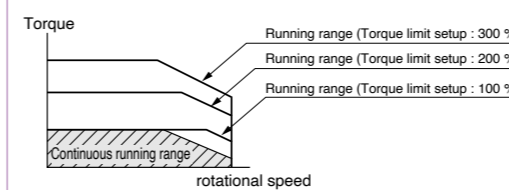
MUMA022P1□



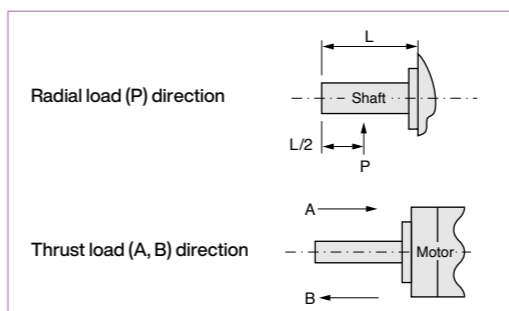
MUMA042P1□

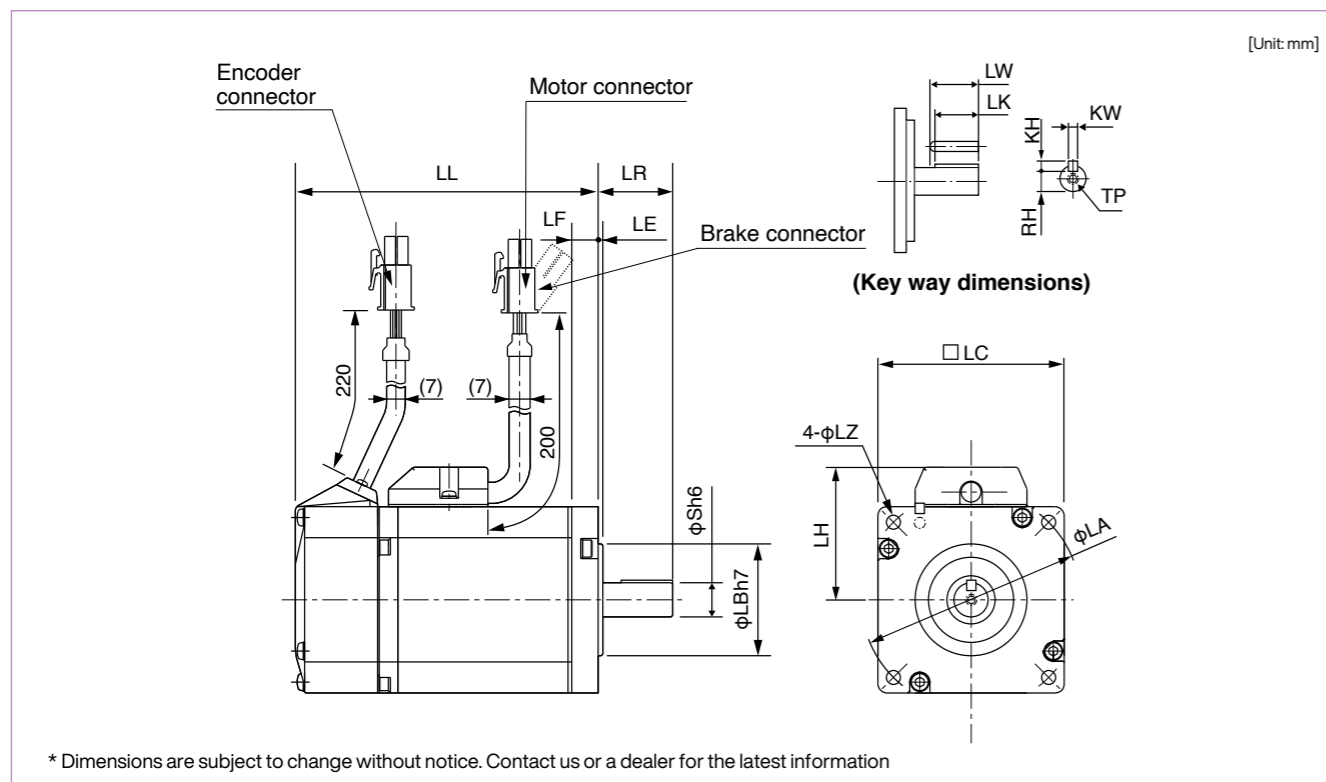


*When you lower the torque limit setup (Pr5E and 5F), running range at high speed might be lowered as well.



- Note) 1. Regenerative brake frequency represents the frequency of the motor's stops from the rated speed with deceleration without load.
- If the load is connected, frequency will be defined as 1/(m+1), where m = (load moment of inertia) / (rotor moment of inertia).
 - When the motor speed exceeds the rated speed, regenerative brake frequency is in inverse proportion to the square of (running speed/rated speed).
 - Power supply voltage is AC240 V (at 200 V of the main voltage). If the supply voltage fluctuates, frequency is in inverse proportion to the square of (Running supply voltage/240) relative to the value in the table.
 - When regeneration occurs continuously such as running speed frequently changes or vertical feeding, consult us or a dealer.
- If the effective torque is within the rated torque, there is no limit in regenerative brake.
 - Consult us or a dealer if the load moment of inertia exceeds the specified value.
 - Specified releasing time is obtained with the use of surge absorber for brake (Z15D151 by SEMITEC Corporation or equivalent).
- () represents the actually measured value using a diode (200 V, 1 A or equivalent)





| | | MUMA series (Ultra low inertia) | | | |
|-------------------------------|---------------|---------------------------------|-------------------------|-------------------------|-------------------------|
| Motor output | | 50 W | 100 W | 200 W | 400 W |
| Motor model | MUMA | 5A□P1□ | 01□P1□ | 02□P1□ | 04□P1□ |
| Rotary encoder specifications | | 2500 P/r Incremental | 2500 P/r Incremental | 2500 P/r Incremental | 2500 P/r Incremental |
| LL | Without brake | 75.5 | 92.5 | 96 | 123.5 |
| | With brake | 107 | 124 | 129 | 156.5 |
| LR | | 24 | 24 | 30 | 30 |
| S | | 8 | 8 | 11 | 14 |
| LA | | 48 | 48 | 70 | 70 |
| LB | | 22 | 22 | 50 | 50 |
| LC | | 42 | 42 | 60 | 60 |
| LE | | 2 | 2 | 3 | 3 |
| LF | | 7 | 7 | 7 | 7 |
| LH | | 34 | 34 | 43 | 43 |
| LZ | | 3.4 | 3.4 | 4.5 | 4.5 |
| Key way | LW | 14 | 14 | 20 | 25 |
| | LK | 12.5 | 12.5 | 18 | 22.5 |
| | KW | 3h9 | 3h9 | 4h9 | 5h9 |
| | KH | 3 | 3 | 4 | 5 |
| | RH | 6.2 | 6.2 | 8.5 | 11 |
| | TP | M3 x 6 (depth) | M3 x 6 (depth) | M4 x 8 (depth) | M5 x 10 (depth) |
| Mass (kg) | Without brake | 0.40 | 0.50 | 0.96 | 1.5 |
| | With brake | 0.60 | 0.70 | 1.36 | 1.9 |
| Connector/Plug specifications | | refer to Options, P.401, P.402. | | | |

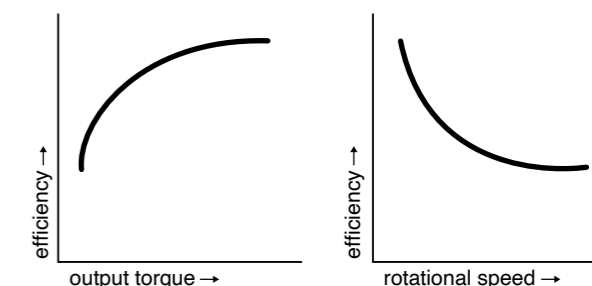
<Cautions>
 Reduce the moment of inertia ratio if high speed response operation is required.
 Read the Instruction Manual carefully and understand all precautions and remarks before using the products.

MINAS E Series Motors with Gear Reducer

Motor Types with Gear Reducer

| Reduction ratio | Motor output (W) | | | Type of reducer |
|-----------------|------------------|-----|-----|--------------------|
| | 100 | 200 | 400 | |
| 1/5 | ● | ● | ● | For high precision |
| 1/9 | ● | ● | ● | |
| 1/25 | ● | ● | ● | |

Efficiency of the gear reducer shows the following inclination in relation to output torque and rotational speed.



Model No. Designation

e.g.) **M U M A 0 1 1 P 3 1 N**

| Symbol | Series |
|--------|----------------------------|
| MUMA | Low inertia (100 to 400 W) |

| Motor rated output | |
|--------------------|--------------|
| Symbol | Rated output |
| 01 | 100 W |
| 02 | 200 W |
| 04 | 400 W |

| Voltage specifications | |
|------------------------|----------------|
| Symbol | Specifications |
| 1 | 100 V |
| 2 | 200 V |

| Rotary encoder specifications | | | | |
|-------------------------------|-------------|--------------|--------------|------|
| Symbol | Format | Pulse counts | Pulse counts | Wire |
| P | Incremental | 2500 P/r | 10000 | 5 |

| Motor types with gear reducer | | | | | |
|-------------------------------|-----------------|--------------|-----|-----|--------------------|
| Symbol | Reduction ratio | Motor output | | | Type of reducer |
| | | 100 | 200 | 400 | |
| 1N | 1/5 | ● | ● | ● | For High precision |
| 2N | 1/9 | ● | ● | ● | |
| 4N | 1/25 | ● | ● | ● | |

| Motor structure | | | |
|-----------------|---------|---------------|------|
| Symbol | Shaft | Holding brake | |
| | Key-way | without | with |
| 3 | ● | ● | |
| 4 | ● | | ● |

Specifications of Motor with Gear Reducer

| Motor series | | MUMA |
|--------------|---|---|
| Gear reducer | Backlash | 3 minutes or smaller (initial value) at output shaft of the reducer |
| | Composition of gear | Planetary gear |
| | Gear efficiency | 65 % to 85 % |
| | Rotational direction at output shaft (of reducer) | Same direction as the motor output shaft |
| | Composition of gear | Planetary gear |
| | Mounting method | Flange mounting |
| Environment | Permissible moment of inertia of the load (conversion to the motor shaft) | 10 times or smaller than rotor moment of inertia of the motor |
| | Protective structure | IP44 (at gear reducer) |
| | Ambient temperature | 0 °C to 40 °C |
| | Ambient humidity | 85 %RH (free from condensation) or less |
| | Vibration resistance | 49 m/s ² or less (at motor frame) |
| | Impact resistance | 98 m/s ² or less |

Table of Motor with Gear Reducer Specifications

| Model | Motor | | MUMA with gear reducer | | | | | | | | | | |
|-------------|------------|-----------------|------------------------|---------------------|--------------------|--------------------|------------------------|--|----------|-----------|----------|-----------------------------|-----------------------------|
| | Output (W) | Reduction ratio | Output (W) | Rated speed (r/min) | Max. speed (r/min) | Rated torque (N·m) | Peak max. torque (N·m) | Moment of inertia (motor + reducer/converted to motor shaft) J (× 10 ⁻⁴ kg·m ²) | | Mass (kg) | | Permissible radial load (N) | Permissible thrust load (N) |
| | | | | | | | | w/o brake | w/ brake | w/o brake | w/ brake | | |
| MUMA01□P□1N | 100 | 1/5 | 75 | 600 | 1000 | 1.18 | 3.72 | 0.072 | 0.076 | 1.05 | 1.25 | 490 | 245 |
| MUMA01□P□2N | | 1/9 | 80 | 333 | 555 | 2.25 | 6.86 | 0.0663 | 0.0703 | 1.05 | 1.25 | 588 | 294 |
| MUMA01□P□4N | | 1/25 | 80 | 120 | 200 | 6.27 | 19.0 | 0.0645 | 0.0685 | 2.20 | 2.40 | 1670 | 833 |
| MUMA02□P□1N | 200 | 1/5 | 170 | 600 | 1000 | 2.65 | 8.04 | 0.218 | 0.248 | 1.68 | 2.08 | 490 | 245 |
| MUMA02□P□2N | | 1/9 | 132 | 333 | 555 | 3.72 | 11.3 | 0.368 | 0.398 | 2.66 | 3.06 | 1180 | 588 |
| MUMA02□P□4N | | 1/25 | 140 | 120 | 200 | 11.1 | 33.3 | 0.388 | 0.418 | 2.66 | 3.06 | 1670 | 833 |
| MUMA042P□1N | 400 | 1/5 | 340 | 600 | 1000 | 5.39 | 16.2 | 0.533 | 0.563 | 3.2 | 3.6 | 980 | 490 |
| MUMA042P□2N | | 1/9 | 332 | 333 | 555 | 9.51 | 28.5 | 0.438 | 0.468 | 3.2 | 3.6 | 1180 | 588 |
| MUMA042P□4N | | 1/25 | 332 | 120 | 200 | 26.4 | 79.2 | 0.470 | 0.500 | 4.7 | 5.1 | 2060 | 1030 |

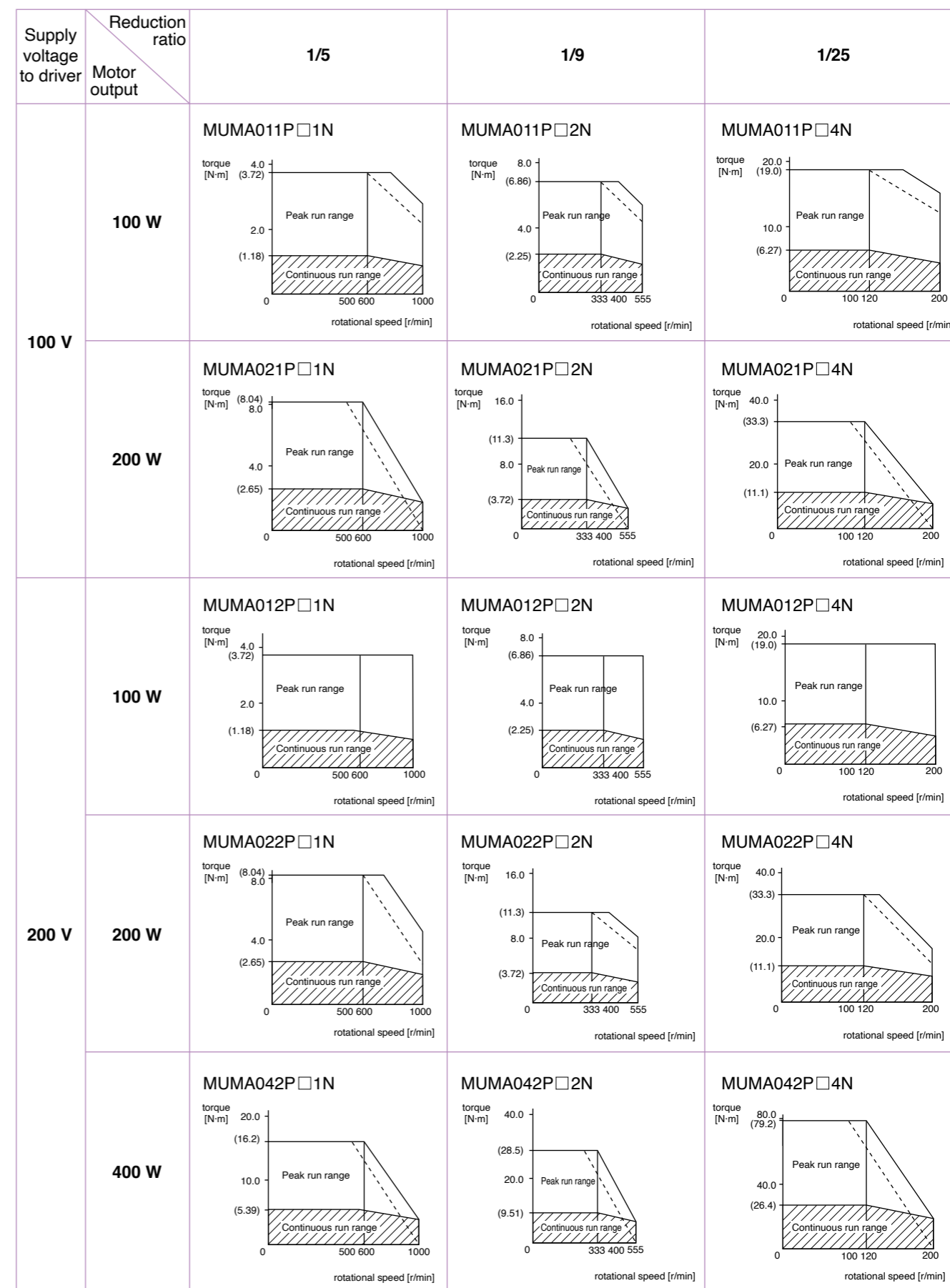
For dimensions, refer to P.397.

The Combination of the Driver and the Motor with Gear Reducer

| Combination with driver | | 100 V | | | 200 V | | |
|-------------------------|--------------|-------------------------------------|---------------------|-------------------------------------|--------------------------|---------------------|--|
| Encoder | Motor output | Part No. of motor with gear reducer | Single phase, 100 V | Part No. of motor with gear reducer | 3-phase, 200 V | Single phase, 200 V | |
| | | | Part No. of driver | | Part No. of driver | Part No. of driver | |
| 2500 P/r Incremental | 100 W | MUMA011P□□N | MKDET1110P | MUMA012P□□N | MKDET1505P | MKDET1505P | |
| | 200 W | MUMA021P□□N | MLDET2110P | MUMA022P□□N | MKDET1310P | MLDET2210P | |
| | 400 W | - | - | MUMA042P□□N | MLDET2510P MLDET2310P | MLDET2510P | |

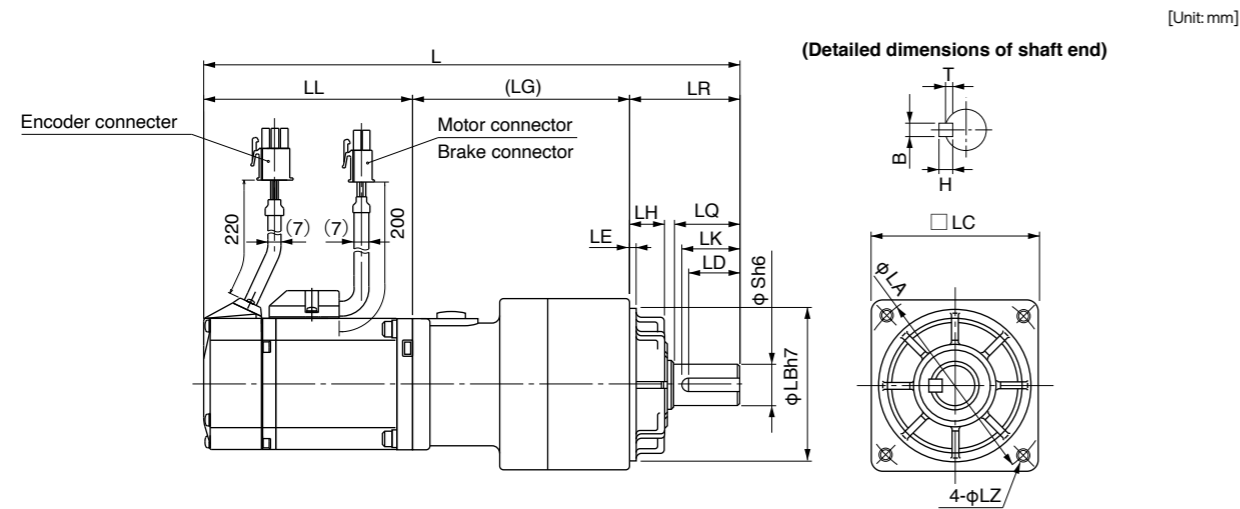
For dimensions of driver, refer to P.388.

For High Precision (MUMA Series 100 W to 400 W)



Dotted line represents the torque at 10 % less supply voltage.

MUMA series with Gear Reducer



2500 P/r Encoder

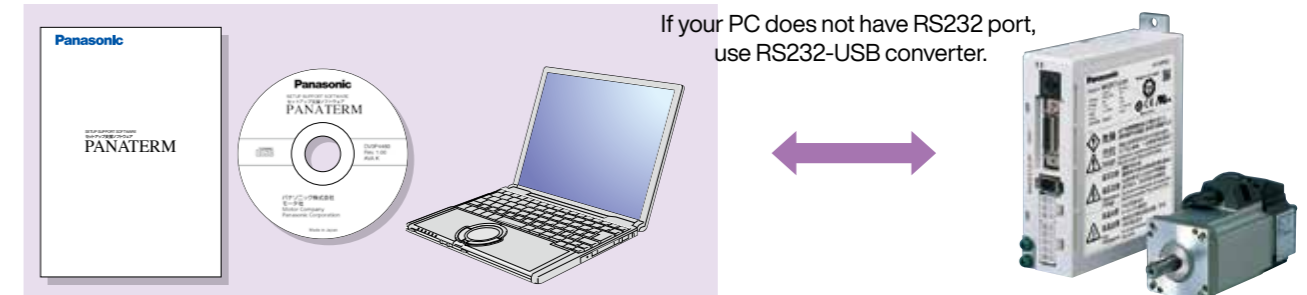
| Model | Motor output | Reduction ratio | L | LL | LR | LQ | LC | LB | LA | S | LH | LZ | LK | (LG) | LE | Key way B×H×LD | T | |
|-------------|--------------|-----------------|-------|-------|-------|----|----|----|----|-----|----|----------------|----------------|------|-----|----------------|--------|-------|
| MUMA01□P□1N | 100 W | 1 / 5 | 192 | 92.5 | 32 | 20 | 52 | 50 | 60 | 12 | 10 | M5 (Depth: 12) | 18 | 67.5 | 3 | 4×4×16 | 2.5 | |
| | | | 223.5 | 124 | | | | | | | | | | | | | | |
| MUMA01□P□2N | | 1 / 9 | | 192 | 92.5 | | | | | | | | | | | | | |
| | | | | 223.5 | 124 | | | | | | | | | | | | | |
| MUMA01□P□4N | | 1/25 | | 234.5 | 92.5 | 50 | 30 | 78 | 70 | 90 | 19 | 17 | M6 (Depth: 20) | 26 | 92 | | 6×6×22 | 3.5 |
| | | | | 266 | 124 | | | | | | | | | | | | | |
| MUMA02□P□1N | 200 W | 1 / 5 | 200.5 | 96 | 32 | 20 | 52 | 50 | 60 | 12 | 10 | M5 (Depth: 12) | 18 | 72.5 | 3 | 4×4×16 | 2.5 | |
| | | | | 233.5 | | | | | | | | | | | | | | 129 |
| MUMA02□P□2N | | 1 / 9 | | 235.5 | 96 | | | | | | | | | | | | | |
| | | | | 268.5 | 129 | | | | | | | | | | | | | |
| MUMA02□P□4N | | 1/25 | | 246 | 96 | 50 | 30 | 78 | 70 | 90 | 19 | 17 | M6 (Depth: 20) | 26 | 100 | 6×6×22 | 3.5 | |
| | | | | 279 | 129 | | | | | | | | | | | | | |
| MUMA042P□1N | 400 W | 1 / 5 | 263 | 123.5 | 50 | 30 | 78 | 70 | 90 | 19 | 17 | M6 (Depth: 20) | 26 | 89.5 | 5 | 8×7×30 | 4 | |
| | | | | 296 | | | | | | | | | | | | | | 156.5 |
| MUMA042P□2N | | 1 / 9 | | 263 | 123.5 | | | | | | | | | | | | | |
| | | | | 296 | 156.5 | | | | | | | | | | | | | |
| MUMA042P□4N | | 1/25 | | 288.5 | 123.5 | 61 | 40 | 98 | 90 | 115 | 24 | 18 | M8 (Depth: 20) | 35 | 104 | | | |
| | | | | 321.5 | 156.5 | | | | | | | | | | | | | |

Upper column : without brake
Lower column : with brake

Setup Support Software "PANATERM" for MINAS series AC Servo Motor & Driver

Part No. DV0P4460 (Japanese/English version)

The PANATERM assists users in setting parameters, monitoring control conditions, setup support, and analyzing mechanical operation data on the PC screen, when installed in a commercially available personal computer, and connected to the MINAS A4 series, E series through the RS232 serial interface.



Basic Function

Parameter setup

- After a parameter is defined on the screen, it will be sent to the driver immediately.
- Once you register parameters you frequently use, they can be easily set up on the screen.

Monitoring Control Conditions

Monitor

- Control conditions: Control mode, velocity, torque, error and warning
- Driver input signal
- Load conditions: Total count of command/feedback pulses, Load ratio, Regenerative resistor load ratio

Alarm

- Displays the numbers and contents of the current alarm and up to 14 error events in the past.
- Clears the numbers and contents of the current alarm and up to 14 error events in the past.

Setup

Auto tuning

- Gain adjustment and inertia ratio measurement

Graphic waveform display

- The graphic display shows command velocity, actual velocity, torque, and error waveforms.

Absolute encoder setup

- Clears absolute encoder at the origin.
- Displays single revolution/multi-revolution data.
- Displays absolute encoder status.

Analysis of Mechanical Operation Data

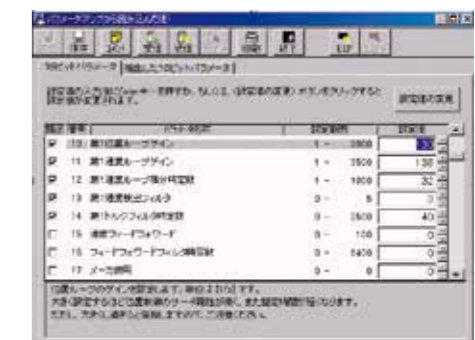
Frequency analysis

- Measures frequency characteristics of the machine, and displays Bode diagram.

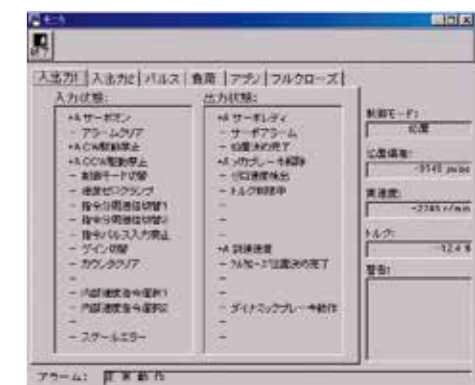
Can not use with A5, A6 Family.

Hardware configuration

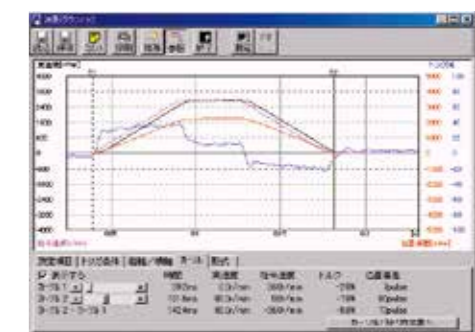
- Personal computer** : CPU : Pentium 100MHz or more • Memory : 16 MB or more (32 MB recommended)
- Hard disk capacity (vacancy of 25 MB or more recommended) • OS : Windows® 98, Windows® Me, Windows® 2000, Windows® XP (US version)
- Communication speed of serial communication port : 2400 bps or more (The software may not operate normally using USB-to-Serial adapter.)
- Display** : Resolution : 640*480 (VGA) or more (desirably 1024*768) • Number of colors : 256 colors or more
- CD-ROM drive** : CD-ROM drive operable on the above-mentioned personal computer



Parameter

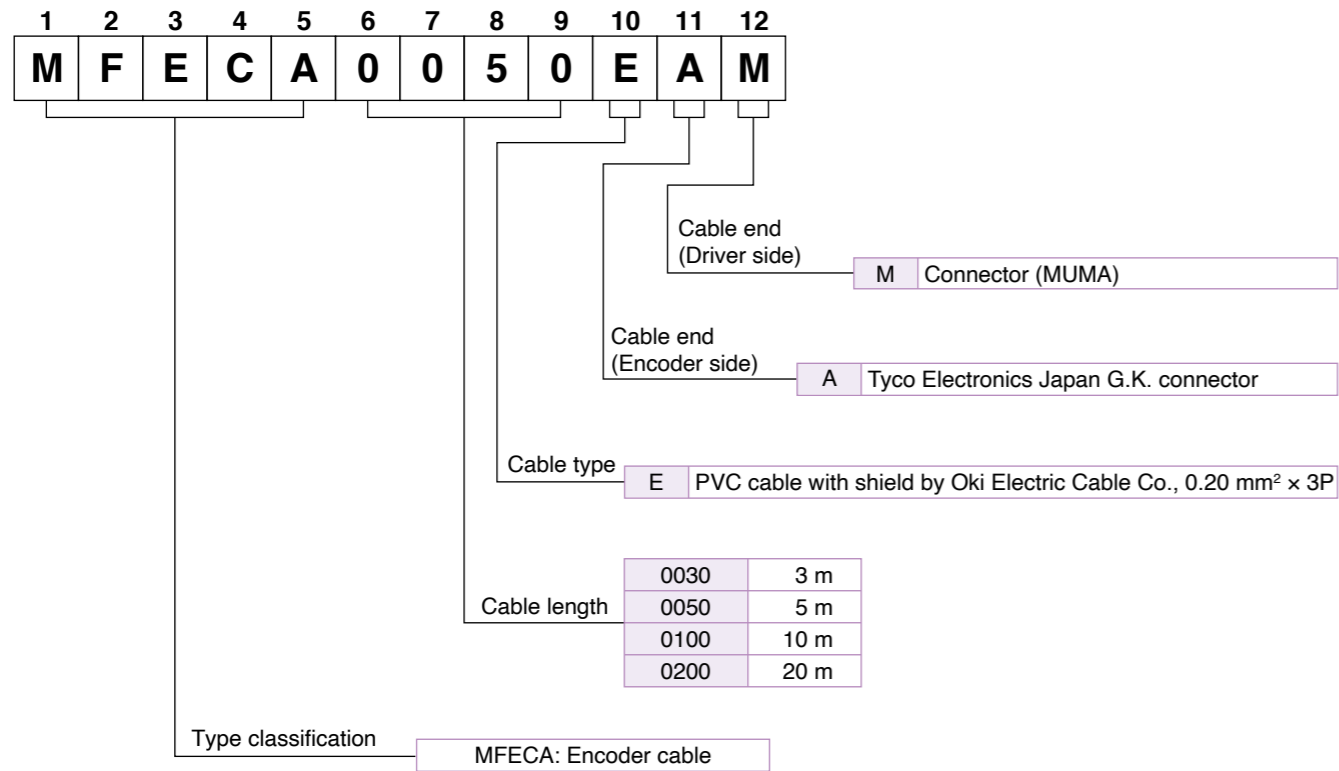


Monitor

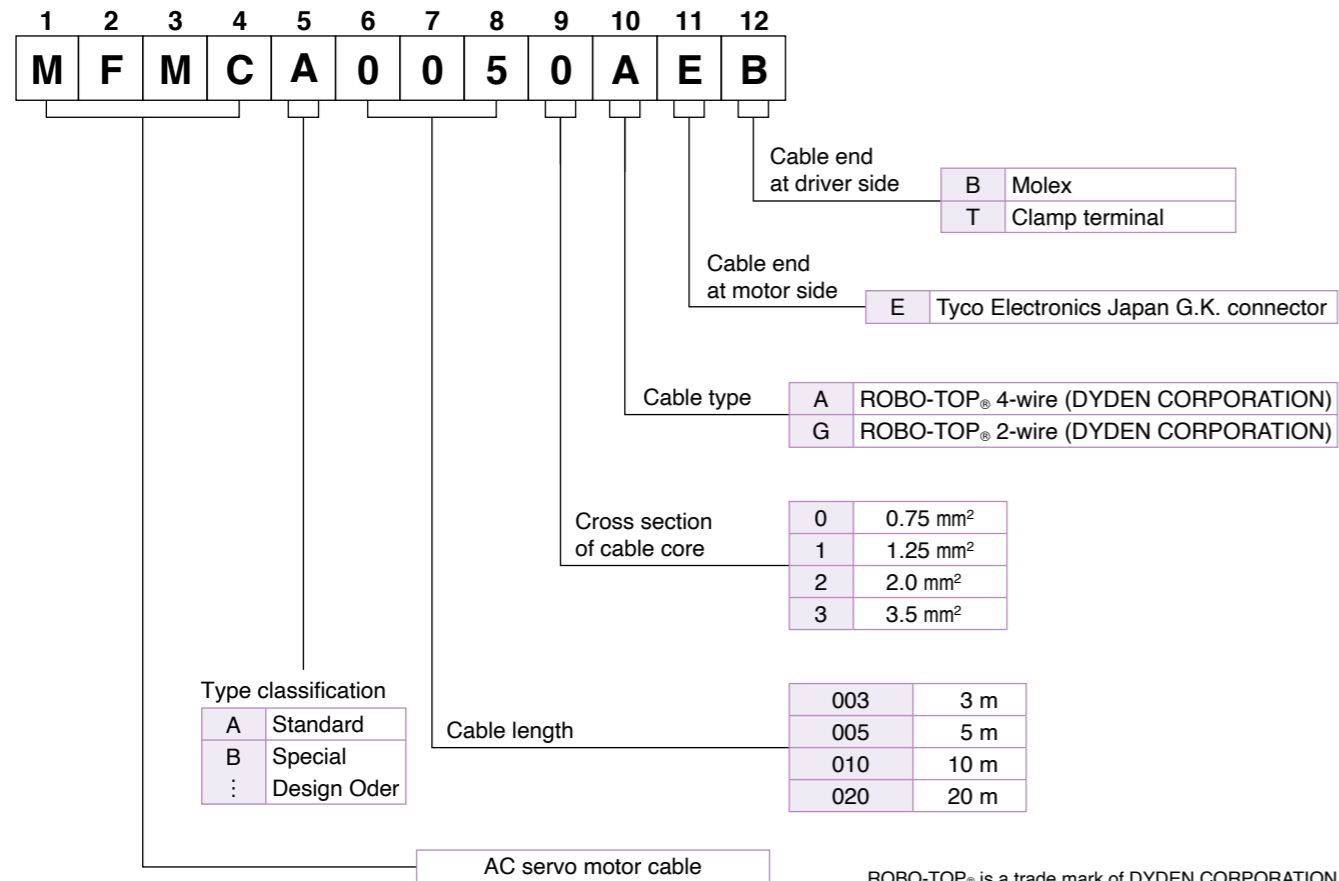


Graphic waveform display

Encoder Cable For available optional items, please refer to P.400.

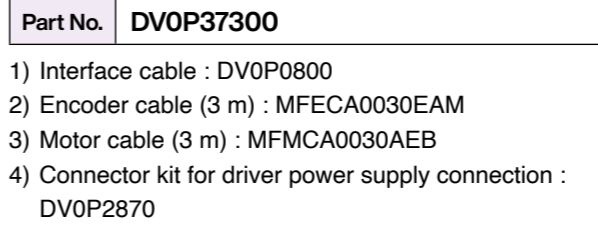


Motor Cable, Brake Cable For available optional items, please refer to P.400.

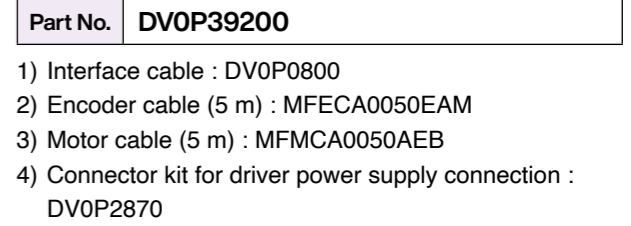


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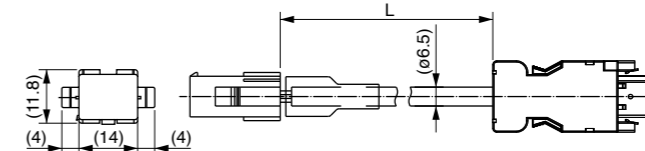
Cable Set (3 m)



Cable Set (5 m)



Encoder Cable

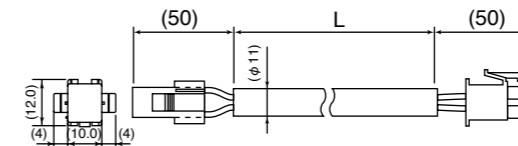


[Unit: mm]

| Title | Part No. | Manufacturer | L (m) | Part No. |
|-------------------------|---------------------------|------------------------------|-------|--------------|
| Connector (Driver side) | 3E206-0100KV | 3M Japan or equivalent | 3 | MFECA0030EAM |
| Shell kit | 3E306-3200-008 | | 5 | MFECA0050EAM |
| Connector | 172160-1 | Tyco Electronics | 10 | MFECA0100EAM |
| Connector Pin | 170365-1 | | 20 | MFECA0200EAM |
| Cable | 0.20 mm ² × 3P | Oki Electric Cable Co., Ltd. | | |

Motor Cable (ROBO-TOP® 105 °C 600 V . DP)

ROBO-TOP® is a trade mark of DYDEN CORPORATION

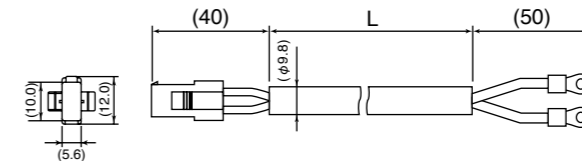


[Unit: mm]

| Title | Part No. | Manufacturer | L (m) | Part No. |
|---------------|-------------------------------------|------------------|-------|--------------|
| Connector | 172159-1 | Tyco Electronics | 3 | MFMCA0030AEB |
| Connector Pin | 170362-1, 170366-1 | | 5 | MFMCA0050AEB |
| Connector | 5557-06R-210 | Molex | 10 | MFMCA0100AEB |
| Connector Pin | 5556T | | 20 | MFMCA0200AEB |
| Cable | ROBO-TOP 600 V 0.75 mm ² | Daiden Co.,Ltd. | | |

Brake Cable (ROBO-TOP® 105 °C 600V . DP)

ROBO-TOP® is a trade mark of DYDEN CORPORATION



[Unit: mm]

| Title | Part No. | Manufacturer | L (m) | Part No. |
|--------------------------------|-------------------------------------|----------------------|-------|--------------|
| Connector | 172157-1 | Tyco Electronics | 3 | MFMCB0030GET |
| Connector Pin | 170362-1, 170366-1 | | 5 | MFMCB0050GET |
| Nylon insulated round terminal | N1.25-M4 | J.S.T Mfg. Co., Ltd. | 10 | MFMCB0100GET |
| Cable | ROBO-TOP 600 V 0.75 mm ² | Daiden Co.,Ltd. | 20 | MFMCB0200GET |

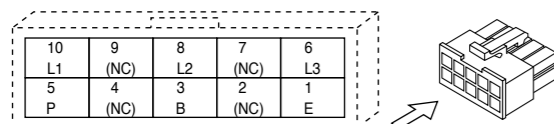
Connector Kit for Power Supply Connection

| | |
|----------|----------|
| Part No. | DV0P2870 |
|----------|----------|

● Parts composition

| Title | Part No. | Number | Manufacturer | Note |
|---------------------|--------------|--------|--------------|--------------------------------|
| Connector (10 pins) | 5557-10R-210 | 1 | Molex | For connector, CN X1 (10 pins) |
| Connector pin | 5556PBTL | 6 | | |

● Pin configuration of connector CN X1



● Recommended manual crimping tool (to be prepared by customer)

| Part No. | Cable material |
|------------|----------------|
| 57026-5000 | UL1007 |
| 57027-5000 | UL1015 |

<Cautions>

1. The above pin disposition is shown when viewed from the terminal inserting direction. Make a correct wiring by checking the stamped pin numbers on the connector itself.
2. Refer to P.386 for wiring and connection.
3. Do not connect anything to pins marked "NC".

Connector Kit for Motor/Encoder Connection

| | |
|----------|---|
| Part No. | DV0P3670 (Incremental 2500 pulse, 5-wire) |
|----------|---|

This option is required when you make your own encoder cable and motor cable. (Brake cable is required for brake.)

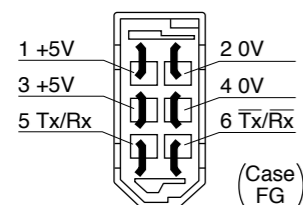
● Parts composition

| Title | Part No. | Number | Manufacturer | Note |
|-------------------------|----------------|--------|------------------------|--|
| Connector (Driver side) | 3E206-0100 KV | 1 | 3M Japan or equivalent | For connector, CN X4 (6 pins) |
| Shell kit | 3E306-3200-008 | 1 | | |
| Connector (6 pins) | 172160-1 | 1 | Tyco Electronics | For junction to encoder cable (6 pins) |
| Connector pin | 170365-1 | 6 | | |
| Connector (4 pins) | 172159-1 | 1 | Tyco Electronics | For junction to motor power cable (4 pins) |
| Connector pin | 170366-1 | 4 | | |
| Connector (6 pins) | 5557-06R-210 | 1 | Molex | For connector, CN X3 (6 pins) |
| Connector pin | 5556PBTL | 4 | | |

<Remarks>

We may use parts equivalent to the above for shell and connector cover.

● Pin configuration of connector CN X4 plug



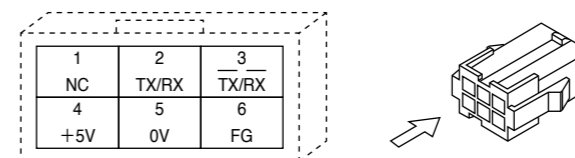
● Recommended manual crimping tool (to be prepared by customer)

| Title | Part No. | Manufacturer | Cable material |
|--------------------------------|------------|------------------|----------------|
| For encoder cable junction | 755330-1 | Tyco Electronics | — |
| For motor power cable junction | 755331-1 | | |
| For Connector CN X3 | 57026-5000 | Molex | UL1007 |
| | 57027-5000 | | UL1015 |

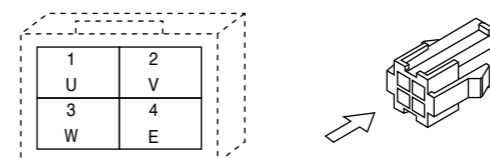
<Remarks>

1. The above pin configuration is shown when viewed from the pin-soldering direction. Make a correct wiring by checking the stamped pin numbers on the connector itself.
2. Connect the shield of the wire to the case (FG) without fail.
3. For wiring and connection, refer to P.386.

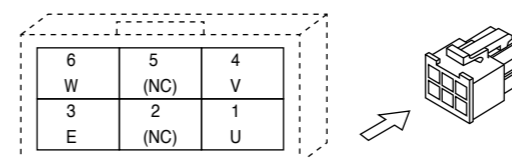
● Pin configuration of encoder cable junction



● Pin configuration of motor power cable junction



● Pin configuration of mating connector to CN X3 connector



<Cautions>

1. The above pin configuration is shown when viewed from the terminal inserting direction. Make a correct wiring by checking the stamped pin numbers on the connector itself.
2. Refer to P.386 for wiring and connection.

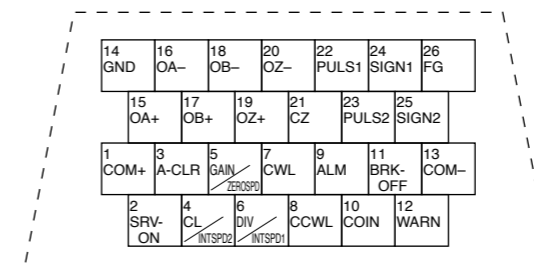
Connector Kit for Interface

| | |
|----------|----------|
| Part No. | DV0P0770 |
|----------|----------|

● Parts composition

| Title | Part No. | Number | Manufacturer | Note |
|-----------------|----------------|--------|------------------------|--------------------------------|
| Connector | 10126-3000PE | 1 | 3M Japan or equivalent | For connector, CN X5 (26 pins) |
| Connector cover | 10326-52A0-008 | 1 | | |

● Pin configuration of connector CN X5 (26 pins) (viewed from the soldering side)



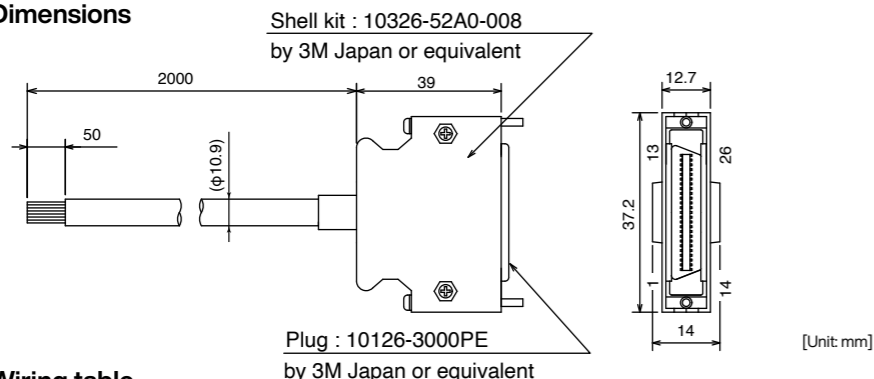
<Cautions>

1. Make a correct wiring by checking the stamped pin numbers on the connector itself.
2. Refer to P.387 for symbols and functions of the above signals.

Interface Cable

Part No. DV0P0800 Cable of 2 m is connected.

● Dimensions



● Wiring table

| Pin No. | Title of signal | Color or cable | Pin No. | Title of signal | Color or cable | Pin No. | Title of signal | Color or cable |
|---------|-----------------|------------------|---------|-----------------|------------------|---------|-----------------|------------------|
| 1 | COM+ | Orange (Red 1) | 10 | COIN | Pink (Black 1) | 19 | OZ+ | Pink (Red 2) |
| 2 | SRV-ON | Orange (Black 1) | 11 | BRK-OFF | Orange (Red 2) | 20 | OZ- | Pink (Black 2) |
| 3 | A-CLR | Gray (Red 1) | 12 | WARN | Orange (Black 2) | 21 | CZ | Orange (Red 3) |
| 4 | CL/INTSPD2 | Gray (Black 1) | 13 | COM- | Gray (Red 2) | 22 | PULS1 | Gray (Red 3) |
| 5 | GAIN/ZEROSPD | White (Red 1) | 14 | GND | Gray (Black 2) | 23 | PULS2 | Gray (Black 3) |
| 6 | DIV/INTSPD1 | White (Black 1) | 15 | OA+ | White (Red 2) | 24 | SIGN1 | White (Red 3) |
| 7 | CWL | Yellow (Red 1) | 16 | OA- | White (Black 2) | 25 | SIGN2 | White (Black 3) |
| 8 | CCWL | Yellow (Black 1) | 17 | OB+ | Yellow (Red 2) | 26 | FG | Orange (Black 3) |
| 9 | ALM | Pink (Red 1) | 18 | OB- | Yellow (Black 2) | | | |

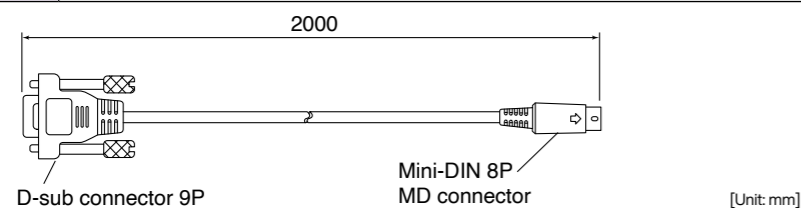
<Notes>
e. g. of Pin No. designation :
Pin No. 1... Wire color is orange, and one red dot.
Pin No. 12... Wire color is orange, and two black dot.

<Caution>

Cable pin No. 26 is not connected to the connector shell (housing) or shielded wire (net wire).
Pin No. 26 of the Driver is connected to the shell (housing) of the connector.
The shielded wire (net wire) of the cable is connected to the shell (housing) of the connector of the cable, and by connecting the connector of the optional cable to the Driver, pin No. 26 of the cable and the shielded wire (net wire) of the cable gets connected via the Driver.

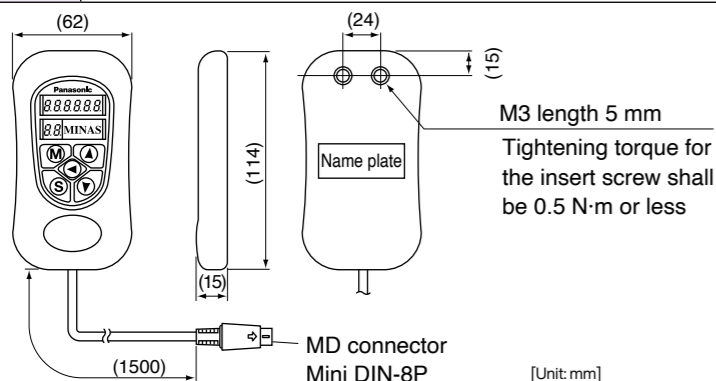
Communication Cable (For Connection with PC)

Part No. DV0P1960



Console

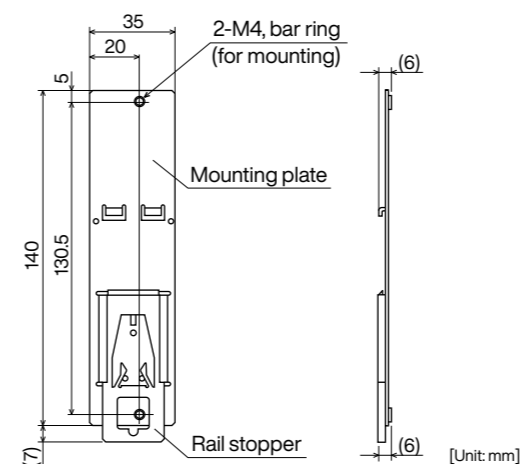
Part No. DV0P4420



DIN Rail Mounting Unit

Part No. DV0P3811

● Dimensions

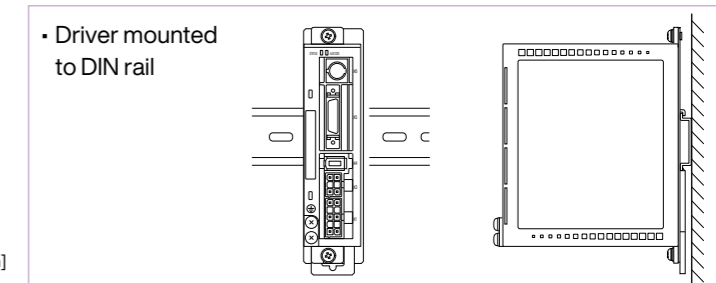


<Notes>

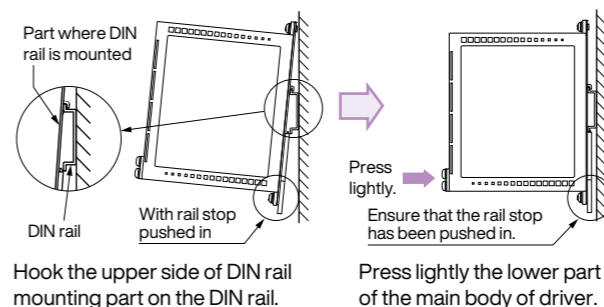
2 mounting screws (M4 X L8, Pan head) are attached.
Rail stopper can be extended to max. 10 mm.

<Cautions>

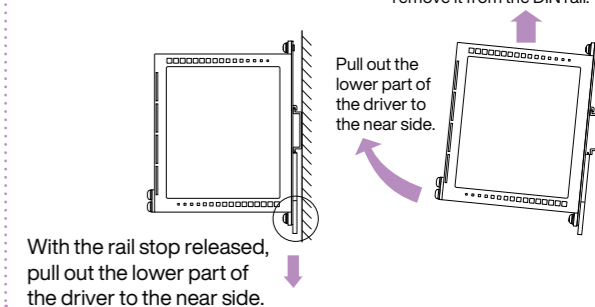
Please read carefully operation manual before using this product.
In addition, please do not apply excessive stress to the product.



• How to Install



• Removing from DIN Rail

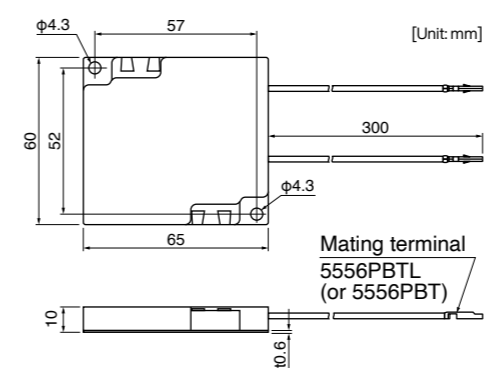


External Regenerative Resistor

| Part No. | Manufacturer's Part No. | Specifications | | | Note (Input Power of drive) |
|----------|-------------------------|-----------------|------------------|---|-----------------------------|
| | | Resistance Ω | Rated power W | Activation temperature of built-in fuse °C | |
| DV0P2890 | 45M03 | 50 | 10 | 137 ⁺³ / ₋₂ | Single phase, 100 V |
| DV0P2891 | 45M03 | 100 | 10 | 137 ⁺³ / ₋₂ | Single/3-phase, 200 V |

Manufactured by Iwaki Musen Kenkyusho Co., Ltd.

● Dimensions



<Caution of when using external regeneration resistor>

Since it becomes high temperature, external regeneration resistor must be installed according to the contents shown below.

- Attach to incombustibles, such as metal.
 - Install in the place which cannot touch directly by covering with incombustibles etc.
 - Do not install near the combustibles.
- Although the thermal cutoff is built in external regeneration resistor, the skin temperature of regeneration resistor may become high exceeding the operating temperature of thermal cutoff by the time the thermal cutoff operates in driver failure.
The thermal cutoff is for preventing ignition of the regeneration resistor in driver failure, and is not for controlling the skin temperature of resistor.

<Remarks>

Thermal fuse is installed for safety.
The thermal fuse may blow due to heat dissipating condition, working temperature, supply voltage or load fluctuation.
Make it sure that the surface temperature of the resistor may not exceed 100 °C at the worst running conditions with the machine, which brings large regeneration (such case as high supply voltage, load inertia is large or deceleration time is short) Please carry out air cooling if needed.

Reactor

| Frame symbol of driver | Power supply specifications | Rated output | Part No. | Fig. |
|------------------------|-----------------------------|----------------|----------|------|
| MKDE | Single phase, 100 V | 50 W to 100 W | DV0P227 | 1 |
| | Single phase, 200 V | 50 W to 100 W | DV0P220 | 2 |
| | 3-phase, 200 V | 50 W to 200 W | | |
| MLDE | Single phase, 100 V | 200 W | DV0P228 | 1 |
| | Single phase, 200 V | 200 W to 400 W | DV0P220 | 2 |
| | 3-phase, 200 V | 400 W | | |

Fig.1

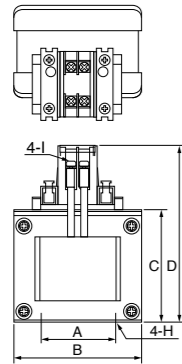
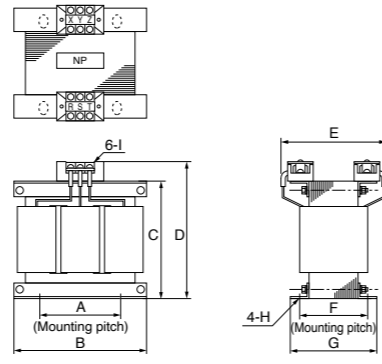
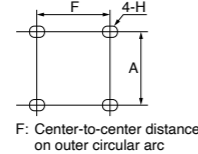
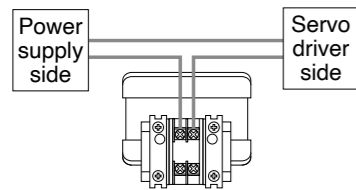


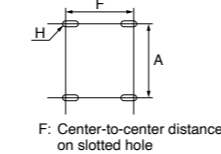
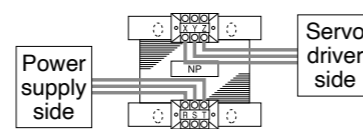
Fig.2



• Wiring of the reactor <Single phase>



• Wiring of the reactor <3-Phase>



[Unit: mm]

| | Part No. | A | B | C | D | E(Max) | F | G | H | I | Inductance (mH) | Rated current (A) |
|-------|----------|--------|--------|--------|---------|--------|---------|------|---------|----|-----------------|-------------------|
| Fig.1 | DV0P227 | 55±0.7 | 76.5±1 | 66.5±1 | 110 Max | 90 | 43.6±2 | 56±2 | 4-5φ×10 | M4 | 4.02 | 5 |
| | DV0P228 | 55±0.7 | 76.5±1 | 66.5±1 | 110 Max | 95 | 48.0±2 | 61±2 | 4-5φ×10 | M4 | 2 | 8 |
| Fig.2 | DV0P220 | 65±1 | 125±1 | (93) | 136 Max | 155 | 70+3/-0 | 85±2 | 4-7φ×12 | M4 | 6.81 | 3 |

Harmonic restraint

Harmonic restraint measures are not common to all countries. Therefore, prepare the measures that meet the requirements of the destination country.

When installing a product for Japan, refer to the instruction manual available on our website.

[Panasonic Industry Co., Ltd. web site]

industrial.panasonic.com/ac/e/

<Remarks>

When using a reactor, be sure to install one reactor to one servo driver.

Recommended devices

Surge Absorber for Motor Brake

| Motor | Surge absorber for motor brake | |
|--------------------|--------------------------------|---------------------|
| | Part No. (Manufacturer's) | Manufacturer |
| MUMA 50 W to 400 W | Z15D151 | SEMITEC Corporation |

List of Peripheral Devices

| Manufacturer | Tel No. / Home Page | Peripheral devices |
|------------------------------------|--|--------------------------------|
| Iwaki Musen Kenkyusho Co., Ltd. | +81-44-833-4311 http://www.iwakimusen.co.jp/ | Regenerative resistor |
| SEMITEC Corporation | +81-3-3621-2703 http://www.semitec.co.jp/english2/ | Surge absorber for motor brake |
| TDK Corporation | +81-3-5201-7229 http://www.global.tdk.com/ | Ferrite core |
| Okaya Electric Industries Co. Ltd. | +81-3-4544-7040 http://www.okayaelec.co.jp/english/index.html | Surge absorber Noise filter |
| 3M Japan Limited | +81-3-5716-7290 http://solutions.3m.com/wps/portal/3M/ja_JP/WW2/Country/ | Connector |
| Tyco Electronics Japan G.K. | +81-44-844-8052 http://www.te.com/ja/home.html | |
| Molex Japan LLC | +81-462-65-2313 http://www.molex.co.jp | Cable |
| DYDEN CORPORATION | +81-3-5805-5880 http://www.dyden.co.jp/english/index.htm | |

* The above list is for reference only. We may change the manufacturer without notice.

MEMO

A series of horizontal dashed lines for writing.

Contents

| | |
|---|------------|
| A6 Family | 409 |
| EU Directives/ UK Regulation/ Conformity to UL Standards/ KC..... | 409 |
| Composition of Peripheral Devices..... | 411 |
| E Series | 415 |
| Compliance to EU/ UK Regulation and EMC Directives..... | 415 |
| Composition of Peripheral Components..... | 416 |
| Motor Capacity Selection Software | 417 |
| AC Servo Motor Capacity Selection Software..... | 417 |
| Option Selection Software for AC Servo Motor..... | 417 |
| Guide to the International System of Units (SI) | 418 |
| Selecting Motor Capacity | 420 |
| Request Sheet for Motor Selection | 426 |
| Connection Between Driver and Controller | 434 |
| Connection Between A6 Family Driver and Controller..... | 434 |
| Replacing Old Model Servo Driver with MINAS A6 series..... | 439 |
| Connection Between E Series Driver and Controller..... | 443 |
| Index | 448 |
| Sales Office of Overseas | 462 |

EU Directives/ UK Regulation

The EU Directives/ UK Regulation apply to all such electronic products as those having specific functions and have been exported to EU and directly sold to general consumers. Those products are required to conform to the EU unified standards and to furnish the CE marking on the products. However, our AC servos meet the relevant EU Directives for EU Low Voltage Directives/UK Low Voltage Regulation Equipment so that the machine or equipment comprising our AC servos can meet EU Directives.

EU EMC Directives/UK EMC Regulation

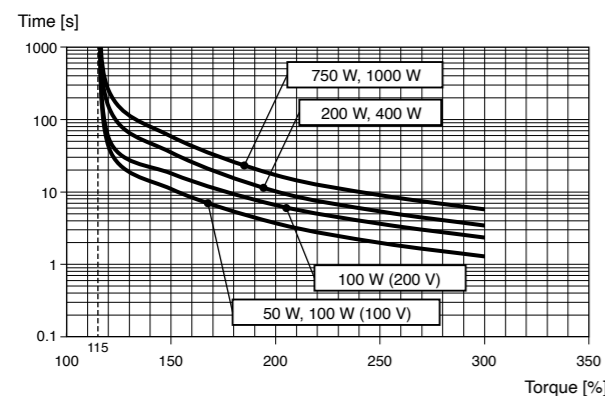
MINAS Servo System conforms to relevant standard under EU EMC Directives/UK EMC Regulation setting up certain model (condition) with certain locating distance and wiring of the servo motor and the driver. And actual working condition often differs from this model condition especially in wiring and grounding. Therefore, in order for the machine to conform to the EU EMC Directives/UK EMC Regulation, especially for noise emission and noise terminal voltage, it is necessary to examine the machine incorporating our servos.

Conformity to UL Standards

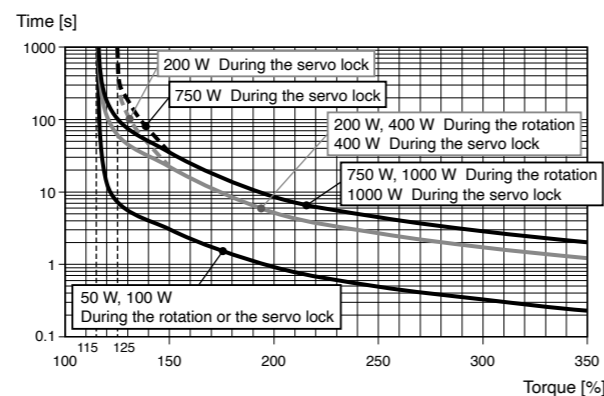
- Observe the following conditions of (1) and (2) to make the system conform to UL508C (E164620).
- Use the driver in an environment of Pollution Degree 2 or 1 prescribed in IEC60664-1. (e.g. Install in the control box with IP54 enclosure.)
 - Make sure to install a circuit breaker or fuse which are UL recognized (Listed marked) between the power supply and the noise filter. For rated current of circuit breaker and fuse, refer to P.27 "Driver and List of Applicable Peripheral Devices". Use a copper cable with temperature rating of 75 °C or higher.
 - Over-load protection level
Over-load protective function will be activated when the effective current exceeds 115 % or more than the rated current based on the time characteristics (see the graph). Confirm that the effective current of the driver does not exceed the rated current. Set up the peak permissible current with Pr0.13 (Setup of 1st torque limit) and Pr5.22 (Setup 2nd torque limit).

Overload protection time characteristics

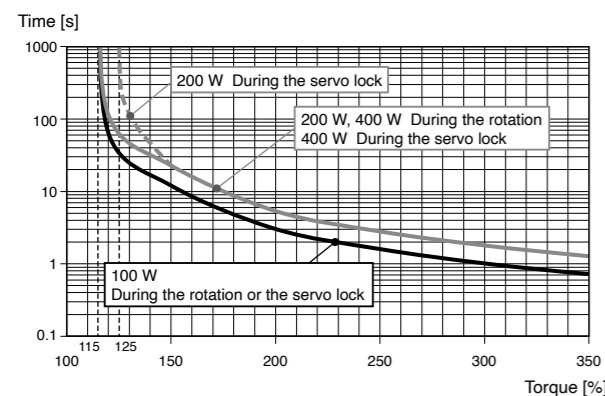
Motor type: 80 mm sq. or less MSMF



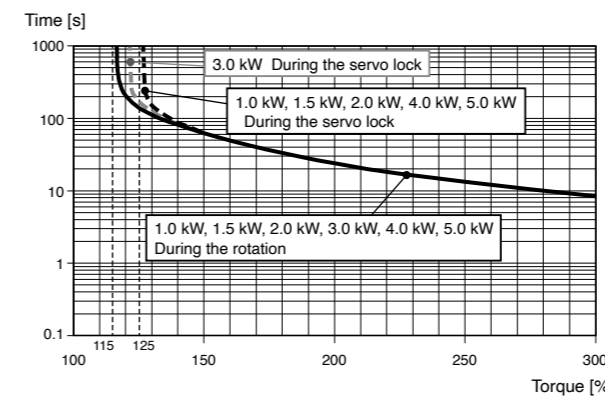
Motor type: 80 mm sq. or less MHMF



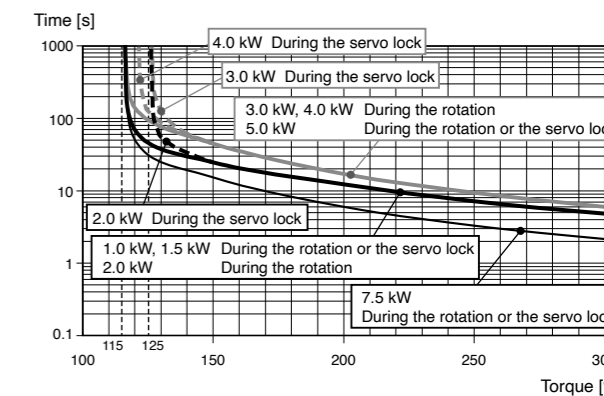
Motor type: 80 mm sq. or less MQMF



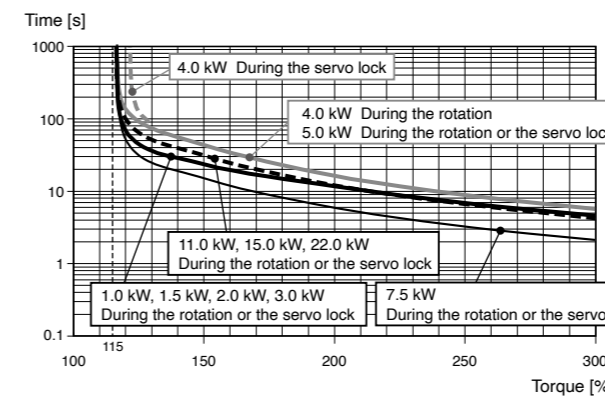
Motor type: 100 mm sq. or more MSMF



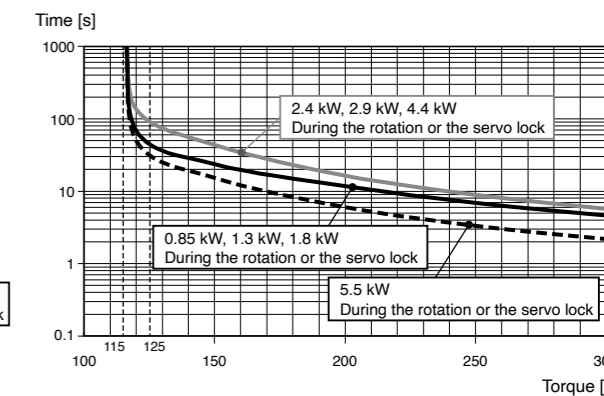
Motor type: 100 mm sq. or more MHMF



Motor type: 100 mm sq. or more MDMF



Motor type: 100 mm sq. or more MGMF



Conformed Standards

| | Driver | Motor |
|---------------------------------------|--|--|
| EU/UK Standards | EU EMC Directives/ UK EMC Regulation | EN55011 EN61000-6-2 EN61000-6-4 EN61800-3 |
| | EU Low Voltage Directives/ UK Low Voltage Regulation | EN61800-5-1 EN60034-1 EN60034-5 |
| | Machinery (Functional safety *1) | ISO13849-1(PL e, Cat.3) EN61508(SIL3) EN62061(SILCL 3) EN61800-5-2(SIL3, STO) |
| UL Standards | UL61800-5-1 (E164620) | UL1004-1, UL1004-6 (E327868) |
| CSA Standards | C22.2 No.14 | C22.2 No.100 |
| Radio Waves Act (South Korea) (KC) *2 | KN11 KN61000-4-2,3,4,5,6,8,11 | - |

IEC : International Electrotechnical Commission
 EN : Europaischen Normen
 EMC : Electromagnetic Compatibility
 UL : Underwriters Laboratories
 CSA : Canadian Standards Association
 Pursuant to the directive 2004/108/EC, article 9(2)

● When export this product, follow statutory provisions of the destination country.

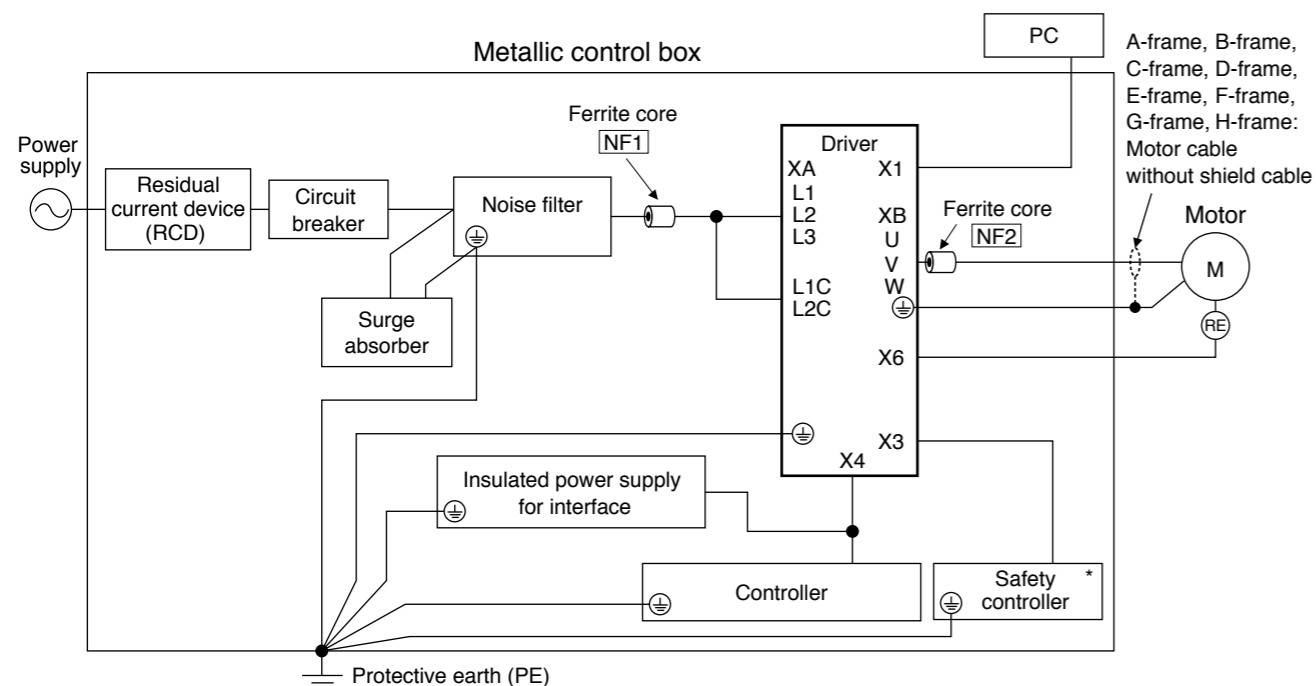
*1 A6SE, A6SG, A6NE, A6BE series doesn't correspond to the functional safety standard.

*2 Information related to the Korea Radio Law
 This servo driver is a Class A commercial broadcasting radio wave generator not designed for home use. The user and dealer should be aware of this fact.

A 급 기기 (업무용 방송통신기자재)
 이 기기는 업무용(A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.
 (대상기종 : Servo Driver)

Installation Environment

Use the servo driver in the environment of Pollution Degree 1 or 2 prescribed in IEC-60664-1 (e.g. Install the driver in control panel with IP54 protection structure.)



For [NF1] to [NF2], refer to the Table "Ferrite core" (P.414).
 * A6SE, A6SG, A6NE, A6BE is not provided with X3 terminal.

<Caution>

Use options correctly after reading Operating Instructions of the options to better understand the precautions. Take care not to apply excessive stress to each optional part.

Power Supply

| | | |
|---------------------------------|--|-------------|
| 100 V type (A-frame to C-frame) | Single phase, 100 V +10% to -15% to 120 V +10% to -15% | 50 Hz/60 Hz |
| 200 V type (A-frame to D-frame) | Single/3-phase, 200 V +10% to -15% to 240 V +10% to -15% | 50 Hz/60 Hz |
| 200 V type (E-frame to H-frame) | 3-phase, 200 V +10% to -15% to 240 V +10% to -15% | 50 Hz/60 Hz |

- (1) This product is designed to be used in over-voltage category (installation category) III of EN 61800-5-1:2007.
- (2) Use an insulated power supply of DC12 V to 24 V which has CE marking or complies with EN60950.

Circuit Breaker

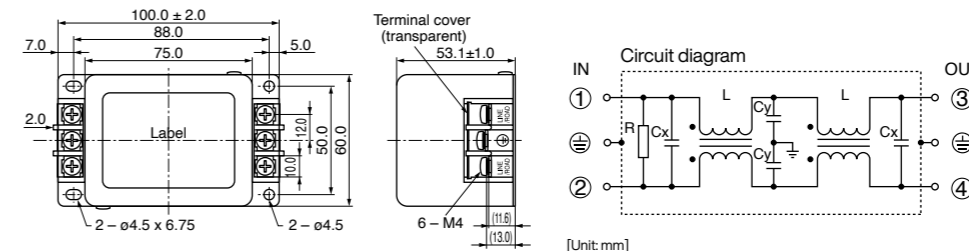
Install a circuit breaker which complies with IEC Standards and UL recognized (Listed and marked) between power supply and noise filter. The short-circuit protection circuit on the product is not for protection of branch circuit. The branch circuit should be protected in accordance with NEC and the applicable local regulations in your area.

Noise Filter

When you install one noise filter at the power supply for multi-axes application, contact the manufacturer of the noise filter. If noise margin is required, connect 2 filters in series to emphasize effectiveness.

Options

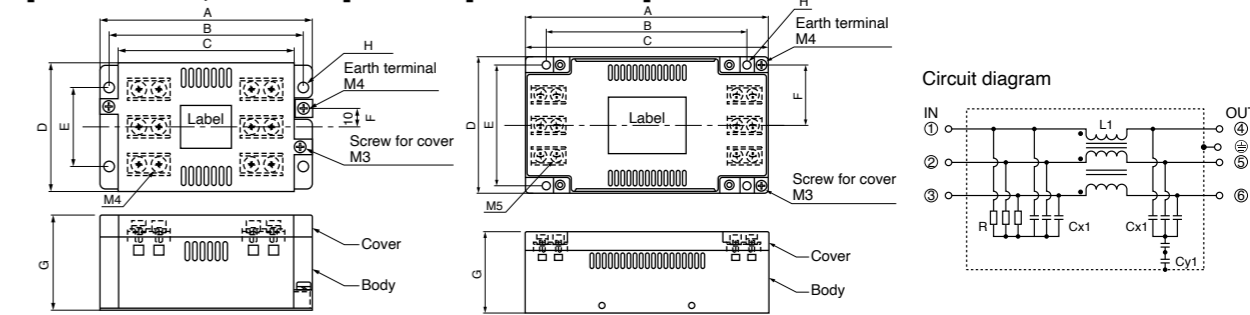
| Option part No. | Voltage specifications for driver | Manufacturer's part No. | Applicable driver (frame) | Manufacturer |
|-----------------|-----------------------------------|-------------------------|---------------------------|---------------------|
| DV0P4170 | Single phase 100 V, 200 V | SUP-EK5-ER-6 | A-frame and B-frame | Okaya Electric Ind. |



| Option part No. | Voltage specifications for driver | Manufacturer's part No. | Applicable driver (frame) | Manufacturer |
|-----------------|-----------------------------------|-------------------------|---------------------------|---------------------|
| DV0PM20042 | 3-phase 200 V | 3SUP-HU10-ER-6 | A-frame and B-frame | Okaya Electric Ind. |
| DV0P4220 | Single phase 100 V, 200 V | | C-frame | |
| DV0PM20043 | 3-phase 200 V | 3SUP-HU30-ER-6 | D-frame | |
| | | 3SUP-HU50-ER-6 | E-frame | |

[DV0PM20042, DV0P4220]

[DV0PM20043]

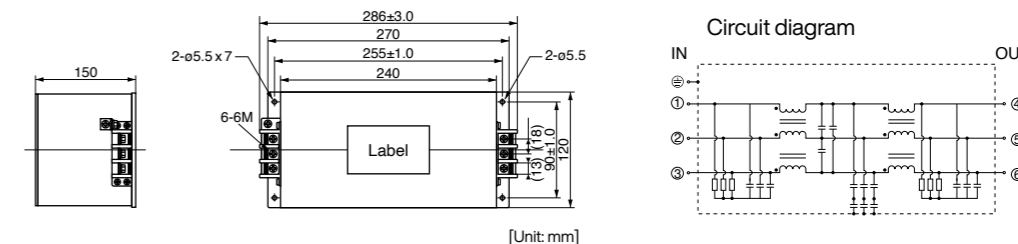


[Size] [Unit: mm]

| | A | B | C | D | E | F | G | H |
|------------|-----|-----|-----|----|----|----|----|-----|
| DV0PM20042 | 115 | 105 | 95 | 70 | 43 | 10 | 52 | 5.5 |
| DV0P4220 | 145 | 135 | 125 | 70 | 50 | 10 | 52 | 5.5 |
| DV0PM20043 | 165 | 136 | 165 | 90 | 80 | 40 | 54 | 5.5 |

For single phase application, use 2 terminals among 3 terminals, leaving the remaining terminal unconnected.

| Option part No. | Voltage specifications for driver | Manufacturer's part No. | Applicable driver (frame) | Manufacturer |
|-----------------|-----------------------------------|-------------------------|---------------------------|---------------------|
| DV0P3410 | 3-phase 200 V | 3SUP-HL50-ER-6B | F-frame | Okaya Electric Ind. |



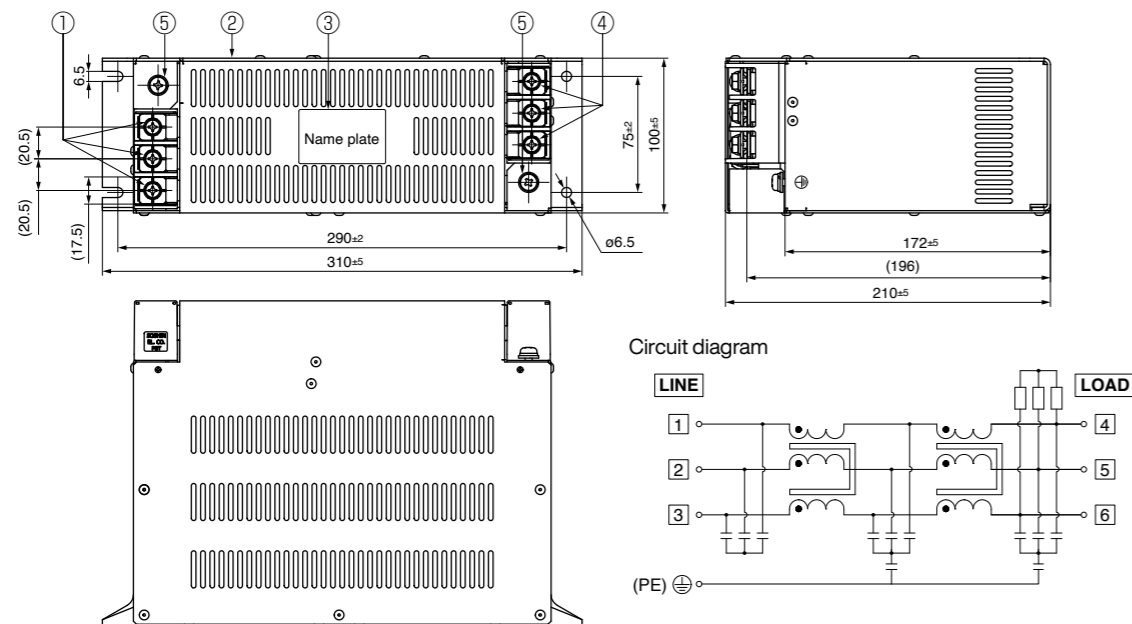
<Remarks>

- Select a noise filter of capacity that exceeds the capacity of the power source (also check for load condition).
- For detailed specification of the filter, contact the manufacturer.

Noise Filter

Recommended components

| Part No. | Voltage specifications for driver | Rated current (A) | Applicable driver (frame) | Manufacturer |
|-------------|-----------------------------------|-------------------|---------------------------|--------------------------|
| HF3080C-SZA | 3-phase 200 V | 80 | G | SOSHIN ELECTRIC CO.,LTD. |
| HF3100C-SZA | | 100 | H | |

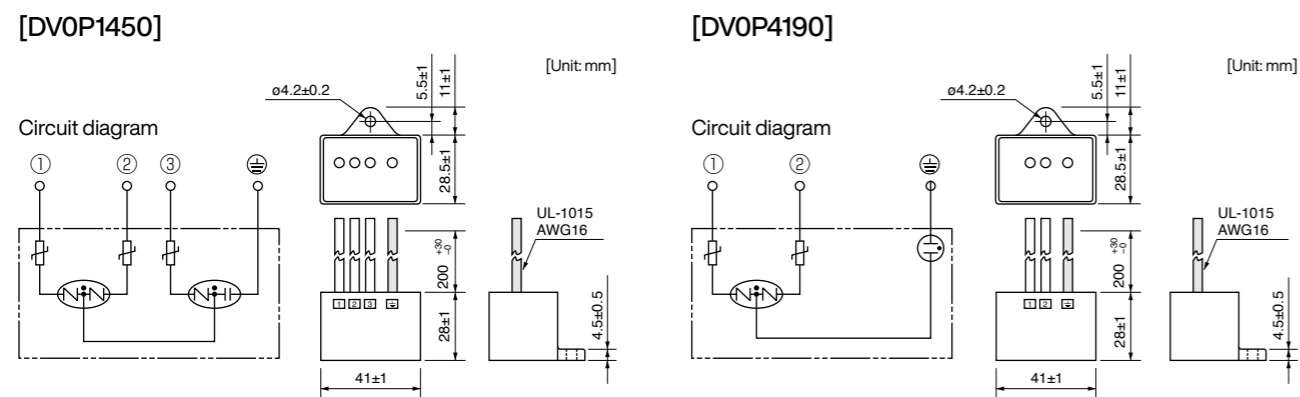


- <Remarks>**
- Select a noise filter of capacity that exceeds the capacity of the power source (also check for load condition).
 - For detailed specification of the filter, contact the manufacturer.
 - When you install one noise filter at the power supply for multi-axes application, contact the manufacturer of the noise filter.

Surge Absorber

Provide a surge absorber for the primary side of noise filter.

| Option part No. | Voltage specifications for driver | Manufacturer's part No. | Manufacturer |
|-----------------|-----------------------------------|-------------------------|---------------------|
| DV0P1450 | 3-phase 200 V | R · A · V-781BXZ-4 | Okaya Electric Ind. |
| DV0P4190 | Single phase 100 V, 200 V | R · A · V-781BWZ-4 | |



- <Remarks>**
- Remove this surge absorber when you perform dielectric test on the machine, or surge absorber might be damaged.

Ferrite core

Install ferrite core to power cable and motor cable

| Symbol ¹ | Cable Name | Applicable driver (frame) | Option part No. | Manufacturer's part No. | Manufacturer | Required number |
|---------------------|-------------|---------------------------|-----------------|-------------------------|-----------------------|-----------------|
| NF1 | Power cable | A, B, E | DV0P1460 | ZCAT3035-1330 | TDK Corp. | 1 |
| | | G, H | — | RJ8095 | Konno Kogyosho Co.Ltd | 3 |
| NF2 | Motor cable | A, B, C, D, E | DV0P1460 | ZCAT3035-1330 | TDK Corp. | 1 |
| | | F | | | | 2 |
| | | G, H | — | T400-61D | MICROMETALS | 3 |

- *1 For symbols, refer to the Block Diagram "Installation Environment" (P.411).
- The number of turns is all 1.
 - NF1 is not required for C frame, D frame, F frame.

<Remarks>
To connect the ferrite core to the connector XB connection cable, adjust the sheath length at the tip of the cable, as required.

<Caution>
Fix the ferrite core in order to prevent excessive stress to the cables.

Fig.1: DV0P1460 (Option) 4 pieces

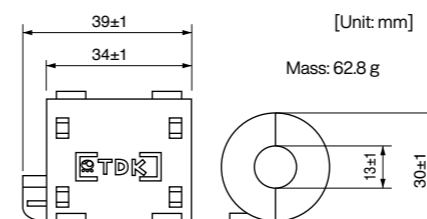


Fig.3: T400-61D (Recommended components) 1 pieces

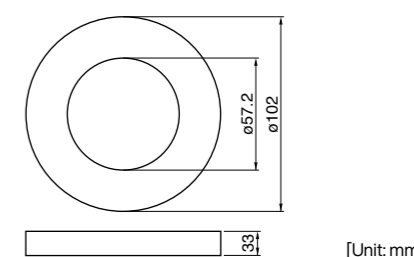
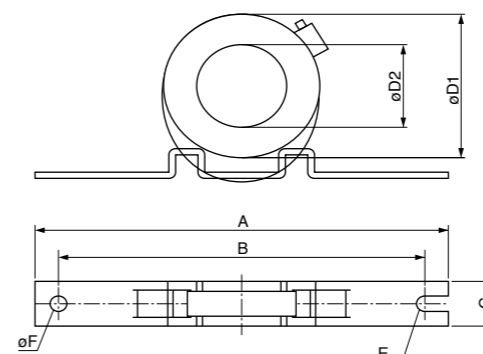


Fig.2: RJ8095 (Recommended components) 1 pieces



| Manufacturer's part No. | Current value | 100 kHz (μH) | Size [Unit: mm] | | | | | | | |
|-------------------------|---------------|--------------|-----------------|-----|----|-----|-----|----------------|------|---|
| | | | A | B | C | D1 | D2 | Core thickness | E | F |
| RJ8095 | 95 A | 7.9±3 | 200 | 180 | 34 | 130 | 107 | 35 | R3.5 | 7 |

Residual Current Device

Install a type B Residual current device (RCD) at primary side of the power supply.
Type B: Residual current device which detects a direct-current ingredient.

Grounding

- Connect the protective earth terminal (⊕) of the driver and the protective earth terminal (PE) of the control box without fail to prevent electrical shocks.
- Do not make a joint connection to the protective earth terminals (⊕). 2 terminals are provided for protective earth.

<Note>
For driver and applicable peripheral devices, refer to P.27 "Driver and List of Applicable Peripheral Devices".

Compliance to EU/ UK Regulation and EMC Directives

EU Directives/ UK Regulation

The EU Directives/ UK Regulation apply to all such electronic products as those having specific functions and have been exported to EU and directly sold to general consumers. Those products are required to conform to the EU unified standards and to furnish the CE marking on the products. MINAS AC Servos conforms to the EU Directives for EU Low Voltage Directives/ UK Low Voltage Regulation Equipment so that the machine incorporating our servos has an easy access to the conformity to relevant EU Directives for the machine.

EU EMC Directives/UK EMC Regulation

MINAS Servo System conform to relevant standard under EU EMC Directives/UK EMC Regulation setting up certain model (condition) with certain locating distance and wiring of the servo motor and the driver. And actual working condition often differs from this model condition especially in wiring and grounding. Therefore, in order for the machine to conform to the EU EMC Directives/UK EMC Regulation, especially for noise emission and noise terminal voltage, it is necessary to examine the machine incorporating our servos.

Conformed Standards

| Subject | Conformed Standard | | |
|------------------|------------------------------------|---|-----------------------|
| Motor | IEC60034-1 | IEC60034-5 | UL1004 CSA22.2 No.100 |
| Motor and driver | UL61800-5-1 | | CSA22.2 No.14 |
| | EN55011 | Radio Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment | |
| | EN61000-6-2 | Immunity for Industrial Environments | |
| | IEC61000-4-2 | Electrostatic Discharge Immunity Test | |
| | IEC61000-4-3 | Radio Frequency Electromagnetic Field Immunity Test | |
| | IEC61000-4-4 | Electric High-Speed Transition Phenomenon/Burst Immunity Test | |
| | IEC61000-4-5 | Lightening Surge Immunity Test | |
| | IEC61000-4-6 | High Frequency Conduction Immunity Test | |
| IEC61000-4-11 | Instantaneous Outage Immunity Test | | |

Conforms to EU Low Voltage Directives/UK Low Voltage Regulation
Conforms to references by EU EMC Directives/UK EMC Regulation

IEC : International Electrotechnical Commission
EN : Europäischen Normen
EMC : Electromagnetic Compatibility
UL : Underwriters Laboratories
CSA : Canadian Standards Association

Pursuant to at the directive 2004/108/EC, article 9(2)

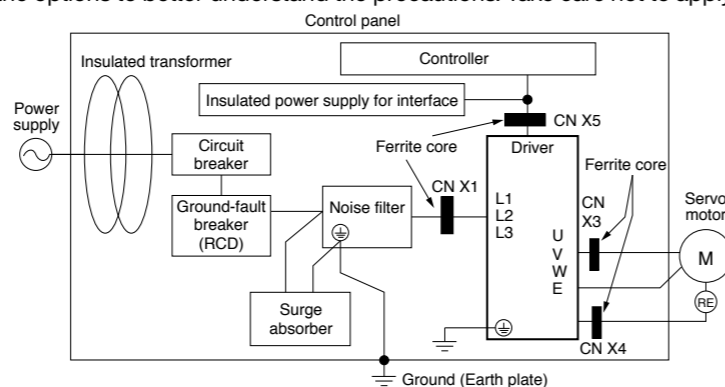
Composition of Peripheral Components

<Precautions in using options>

Use options correctly after reading operation manuals of the options to better understand the precautions. Take care not to apply excessive stress to each optional part.

Installation Environment

Use Minas driver in environment of Pollution Degree 1 or 2 prescribed in IEC-60664-1 (e.g. Install the driver in control panel with IP54 protection structure.)



Power Supply

| | | | | | | |
|--------------|---------------------|----------------|----|-------|----------------|-------------|
| 100 V system | Single phase, 100 V | +10 % -15 % | to | 115 V | +10 % -15 % | 50 Hz/60 Hz |
| 200 V system | Single phase, 200 V | +10 % -15 % | to | 240 V | +10 % -15 % | 50 Hz/60 Hz |
| 200 V system | 3-phase, 200 V | +10 % -15 % | to | 240 V | +10 % -15 % | 50 Hz/60 Hz |

- Use the power supply under an environment of Overvoltage Category II specified in IEC60664-1.
- For a interface power supply, use the insulated one with 12 VDC to 24 VDC which conforms to CE Marking or EN Standards (EN60950).

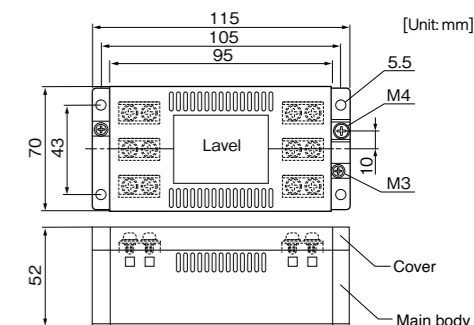
Circuit Breaker

Connect a circuit breaker which conforms to IEC standards and is UL recognized (UL Listed, marked), between the power supply and the noise filter.

Noise Filter

When you install one noise filter in the power supply for multi axis application, consult with the manufacture of the filter.

| Option part No. | Part No. | Manufacturer |
|-----------------|----------------|-------------------------------|
| DV0P4160 | 3SUP-HU10-ER-6 | Okaya Electric Industries Co. |

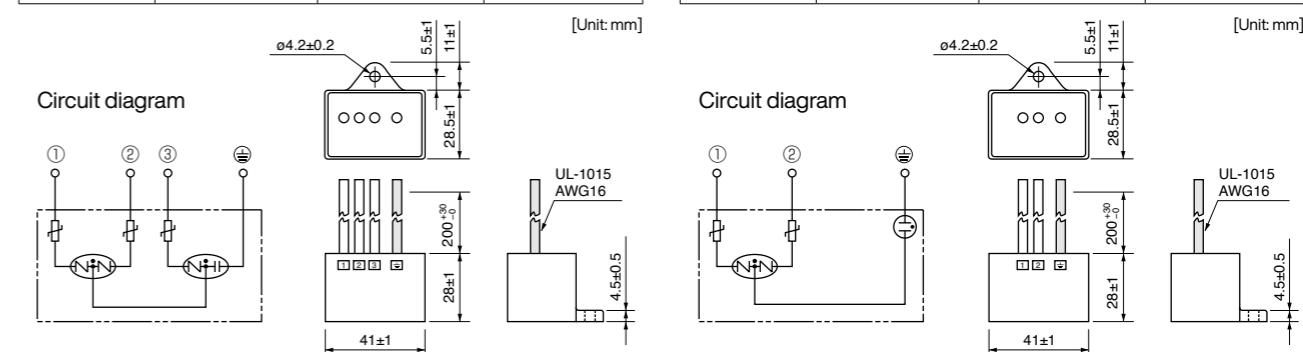


Surge Absorber

Install a surge absorber at primary side of the noise filter.

| Option part No. | Driver voltage spec | Part No. | Manufacturer |
|-----------------|---------------------|----------------|----------------|
| DV0P1450 | 3-phase, 200 V | R·A·V-781BXZ-4 | Okaya Electric |

| Option part No. | Driver voltage spec | Part No. | Manufacturer |
|-----------------|----------------------------|----------------|----------------|
| DV0P4190 | Single phase, 100 V, 200 V | R·A·V-781BWZ-4 | Okaya Electric |



<Remarks>

Remove this surge absorber when you perform dielectric test on the machine, or surge absorber might be damaged.

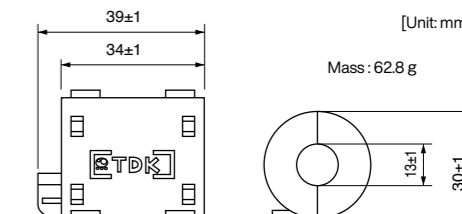
Ferrite core

Install ferrite core to all cables (Power line, motor cable, encoder cable, interface cable)

<Caution>

- Please fix a ferrite core to avoid excessive stress to the cable.
- When using multiple axes, noise generated from each driver might influence driver and peripheral equipment and result to malfunction. Please insert a ferrite core between driver and motor wires (U, V, W but grounding). (Please refer to P.415 "Composition of Peripheral Components".)

| Option part No. | Part No. | Qty. | Manufacturer |
|-----------------|---------------|------|--------------|
| DV0P1460 | ZCAT3035-1330 | 4 | TDK Corp. |



Grounding

- Connect the protective earth terminal of the driver () and protective earth terminal of the control panel (PE) without fail to prevent electrical shocks.
- Do not co-clamp to the ground terminals (). Two ground terminals are provided.

Ground-Fault Breaker

Install a ground fault circuit breaker (RCD) to the primary side of the power supply. Please use B-type (DC sensitive) ground fault circuit breakers defined in IEC60947-2, JISC8201-2-2.

AC Servo Motor Capacity Selection Software

We have prepared PC software "M-SELECT" for AC servo motor capacity selection. Consult our sales representative or authorized distributor.

Three-step selection

1. Select components and specified values

Select appropriate mechanical parameter items and fill them with parameter values derived from the real machine. To simulate the target machine as practical as possible, use maximum number of parameters available.



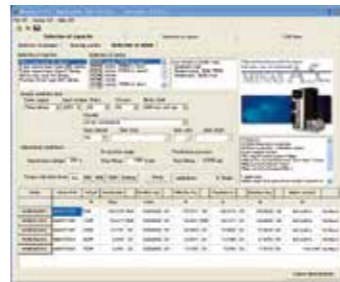
2. Enter operation pattern

Input the planned operation pattern that will contain [speed and rotation standard] or [absolute position standard] with optional settings such as S-acceleration/deceleration.



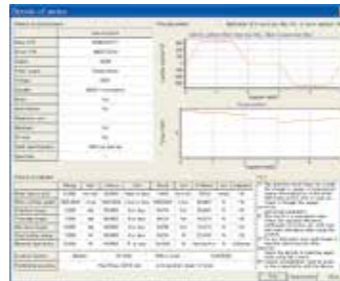
3. Select the motor

When the data required in step 1 and 2 above have been input, the software lists the motors, which will be appropriate to use with your machine. Select the motor that is best suitable for your machine application.



Details of motor

Once the motor is selected, specifications of the motor and driver, and details of reason for determination are displayed and may be printed out.



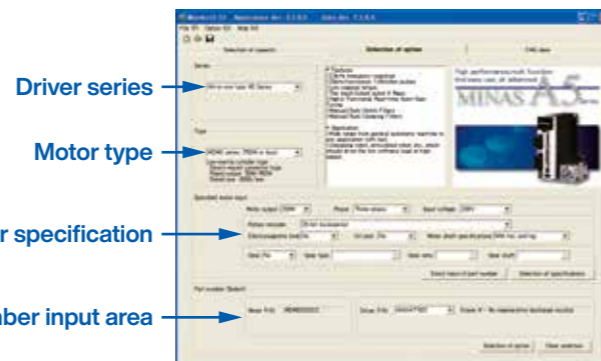
Option Selection Software for AC Servo Motor

We have prepared PC software to enable fast, easy, and correct option selection, a complicated job without the software.

Two procedures for option selection

1. Selection according to driver series and motor type

Suitable option can be selected by selecting driver series, motor type and motor specification through pulldown menu.

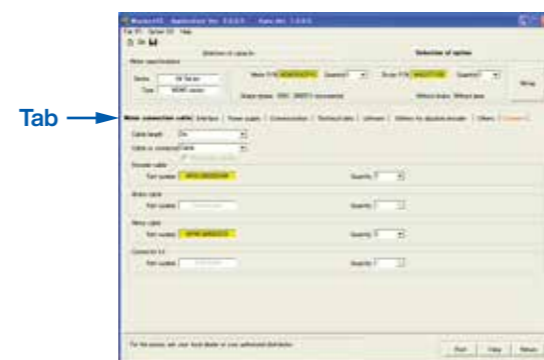


2. Entry of model number

If you know the model number based on the servo motor and driver currently used, enter the model number.

Result of selection

Tab sheet specific to each of option model numbers is used for easier identification of the desired option.



* When you are using the motor capacity selection software, simply press [Option Selection] tab and the screen as shown right will appear.

Please download from our web site and use after install to the PC.
<https://industrial.panasonic.com/ww/products/motors-compressors/fa-motors/ac-servo-motors/minas-a5-panatarm>

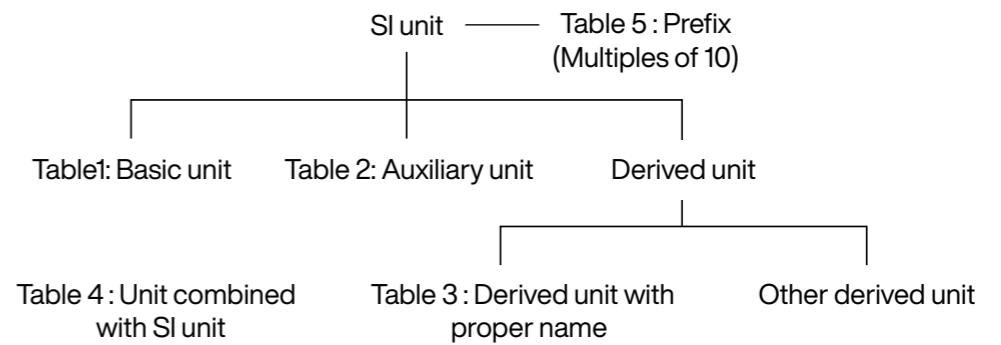


Table 1: Basic unit

| Quantity | Name of unit | Symbol of unit |
|---------------------------|--------------|----------------|
| Length | meter | m |
| Weight | kilogram | kg |
| Time | second | s |
| Current | ampere | A |
| Thermodynamic temperature | kelvin | K |
| Amount of substance | mol | mol |
| Luminous intensity | candela | cd |

Table 2: Auxiliary unit

| Quantity | Name of unit | Symbol of unit |
|-------------|--------------|----------------|
| Plane angle | radian | rad |
| Solid angle | steradian | sr |

Table 3: Major derived unit with proper name

| Quantity | Name | Symbol of unit | Derivation from basic unit, auxiliary unit or other derived unit |
|--|-------------------------------------|----------------|--|
| Frequency | hertz | Hz | 1 Hz = 1 s ⁻¹ |
| Force | newton | N | 1 N = 1 kg·m/s ² |
| Pressure, Stress | pascal | Pa | 1 Pa = 1 N/m ² |
| Energy, Work, Amount of heat | joule | J | 1 J = 1 N·m |
| Amount of work, Work efficiency, Power, Electric power | watt | W | 1 W = 1 J/s |
| Electric charge, Amount of electricity | coulomb | C | 1 C = 1 A·s |
| Electric potential, Potential difference, Voltage, Electromotive force | volt | V | 1 V = 1 J/C |
| Electrostatic capacity, Capacitance | farad | F | 1 F = 1 C/V |
| Electric resistance | ohm | Ω | 1 Ω = 1 V/A |
| Electric conductance | siemens | S | 1 S = 1 Ω ⁻¹ |
| Magnetic flux | weber | Wb | 1 Wb = 1 V·s |
| Magnetic flux density, Magnetic induction | tesla | T | 1 T = 1 Wb/m ² |
| Inductance | henry | H | 1 H = 1 Wb/A |
| Degree centigrade (Celsius) | degree centigrade (Celsius)/ degree | °C | t °C = (t+273.15) K |
| Luminous flux | lumen | lm | 1 lm = 1 cd·sr |
| Illuminance | lux | lx | 1 lx = 1 lm/m ² |

Table 4: Unit combined with SI unit

| Quantity | Name | Symbol of unit |
|-------------|--------|----------------|
| Time | minute | min |
| | hour | h |
| | day | d |
| Plane angle | degree | ° |
| | minute | ' |
| | second | " |
| Volume | liter | l, L |
| Weight | ton | t |

Table 5: Prefix

| Multiples powered to unit | Prefix | |
|---------------------------|--------|--------|
| | Name | Symbol |
| 10 ¹⁸ | exa | E |
| 10 ¹⁵ | peta | P |
| 10 ¹² | tera | T |
| 10 ⁹ | giga | G |
| 10 ⁶ | mega | M |
| 10 ³ | kilo | k |
| 10 ² | hecto | h |
| 10 | deca | da |
| 10 ⁻¹ | deci | d |
| 10 ⁻² | centi | c |
| 10 ⁻³ | milli | m |
| 10 ⁻⁶ | micro | μ |
| 10 ⁻⁹ | nano | n |
| 10 ⁻¹² | pico | p |
| 10 ⁻¹⁵ | femto | f |
| 10 ⁻¹⁸ | atto | a |

| Quantity | Symbol of conventional unit | Symbol of SI unit and compatible unit | Conversion value |
|--|---------------------------------------|---|--|
| Length | μ (micron) | μm | 1 μ = 1 μm (micrometer) |
| Acceleration | Gal | m/s ² | 1 Gal = 10 ⁻² m/s ² |
| | G | m/s ² | 1 G = 9.80665 m/s ² |
| Frequency | c/s, c | Hz | 1 c/s = Hz |
| Revolving speed, Number of revolutions | rpm | s ⁻¹ or min ⁻¹ , r/min | 1 rpm = 1 min ⁻¹ |
| Weight | kgf | - | Same value |
| Mass | - | kg | |
| Weight flow rate | kgf/s | - | Same value |
| Mass flow rate | - | kg/s | |
| Specific weight | kgf/m ³ | - | Same value |
| Density | - | kg/m ³ | |
| Specific volume | m ³ /kgf | m ³ /kg | Same value |
| Load | kgf | N | 1 kgf = 9.80665 N |
| Force | kgf | N | 1 kgf = 9.80665 N |
| | dyn | N | 1 dyn = 10 ⁻⁵ N |
| Moment of force | kgf·m | N·m | 1 kgf·m = 9.806 N·m |
| Pressure | kgf/cm ² | Pa, bar ⁽¹⁾ or kgf/cm ² | 1 kgf/cm ² = 9.80665 × 10 ⁴ Pa = 0.980665 bar |
| | at (Engineering atmospheric pressure) | Pa | 1 at = 9.80665 × 10 ⁴ Pa |
| | atm (Atmospheric pressure) | Pa | 1 atm = 1.01325 × 10 ⁵ Pa |
| | mH ₂ O, mAq | Pa | 1 mH ₂ O = 9.80665 × 10 ³ Pa |
| | mmHg | Pa or mmHg ⁽²⁾ | 1 mmHg = 133.322 Pa |
| | Torr | Pa | |
| Stress | kgf/mm ² | Pa or N/m ² | 1 kgf/mm ² = 9.80665 × 10 ⁶ Pa = 9.80665 × 10 ⁶ N/m ² |
| | kgf/cm ² | Pa or N/m ² | 1 kgf/cm ² = 9.80665 × 10 ⁴ Pa = 9.80665 × 10 ⁴ N/m ² |
| Elastic modulus | kgf/m ² | Pa or N/m ² | 1 kgf/m ² = 9.80665 Pa = 9.80665 N/m ² |
| | | | 1 kgf/cm ² = 9.80665 × 10 ⁴ N/m ² |
| Energy, Work | kgf·m | J (joule) | 1 kgf·m = 9.80665 J |
| | erg | J | 1 erg = 10 ⁻⁷ J |
| Work efficiency, Power | kgf·m/s | W (watt) | 1 kgf·m/s = 9.80665 W |
| | PS | W | 1 PS = 0.7355 kW |
| Viscosity | PP | Pa·s | 1 P = 0.1 Pa·s |
| Kinetic viscosity | St | mm ² /s | 10 ⁻² St = 1 mm ² /s |
| Thermodynamic temperature | K | K (kelvin) | 1 K = 1 K |
| Temperature interval | deg | K ⁽³⁾ | 1 deg = 1 K |
| Amount of heat | cal | J | 1 cal = 4.18605 J |
| Heat capacity | cal/°C | J/K ⁽³⁾ | 1 cal/°C = 4.18605 J/K |
| Specific heat, Specific heat capacity | cal/(kgf·°C) | cal/(kgf·K) ⁽³⁾ | 1 cal/(kgf·°C) = 4.18605 J/(kg·K) |
| Entropy | cal/K | J/K | 1 cal/K = 4.18605 J/K |
| Specific entropy | cal/(kgf·K) | J/(kg·K) | 1 cal/(kgf·K) = 4.18605 J/(kg·K) |
| Internal energy (Enthalpy) | cal | J | 1 cal = 4.18605 J |
| Specific internal energy (Specific enthalpy) | cal/kgf | J/kg | 1 cal/kgf = 4.18605 J/kg |
| Heat flux | cal/h | W | 1 kcal/h = 1.16279 W |
| Heat flux density | cal/(h·m ²) | W/m ² | 1 kcal/(h·m ²) = 1.16279 W/m ² |
| Thermal conductivity | cal/(h·m·°C) | W/(m·K) ⁽³⁾ | 1 kcal/(h·m·°C) = 1.16279 W/(m·K) |
| Coefficient of thermal conductivity | cal/(h·m ² ·°C) | W/(m ² ·K) ⁽³⁾ | 1 kcal/(h·m ² ·°C) = 1.16279 W/(m ² ·K) |
| Intensity of magnetic field | Oe | A/m | 1 Oe = 10 ³ / (4π) A/m |
| Magnetic flux | Mx | Wb (weber) | 1 Mx = 10 ⁻⁸ Wb |
| Magnetic flux density | Gs, G | T (tesla) | 1 Gs = 10 ⁻⁴ T |

Note

- (1) Applicable to liquid pressure. Also applicable to atmospheric pressure of meteorological data, when "bar" is used in international standard.
- (2) Applicable to scale or indication of blood pressure manometers.
- (3) "C" can be substituted for "K".

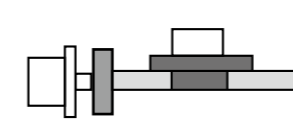
Flow of Motor Selection

1. Definition of mechanism to be driven by motor.

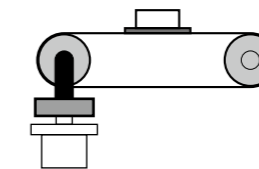
Define details of individual mechanical components (ball screw length, lead and pulley diameters, etc.)

<Typical mechanism>

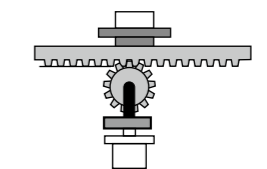
Ball screw mechanism



Belt mechanism

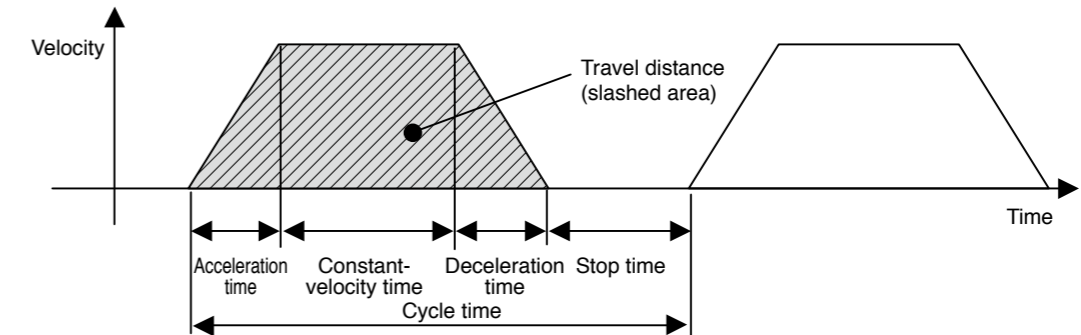


Rack & pinion, etc.



2. Definition of operating pattern.

Acceleration/deceleration time, Constant-velocity time, Stop time, Cycle time, Travel distance



Note) Selection of motor capacity significantly varies depending on the operating pattern. The motor capacity can be reduced if the acceleration/deceleration time and stop time are set as long as possible.

3. Calculation of load inertia and inertia ratio.

Calculate load inertia for each mechanical component. (Refer to "General inertia calculation method" described later.)

Divide the calculated load inertia by the inertia of the selected motor to check the inertia ratio.

For calculation of the inertia ratio, note that the catalog value of the motor inertia is expressed as "× 10⁻⁴ kg·m²".

4. Calculation of motor velocity

Calculate the motor velocity from the moving distance, acceleration / deceleration time and constant-velocity time.

5. Calculation of torque

Calculate the required motor torque from the load inertia, acceleration/deceleration time and constant-velocity time.

6. Calculation of motor

Select a motor that meets the above 3 to 5 requirements.

Description on the Items Related to Motor Selection

1. Torque

(1) Peak torque

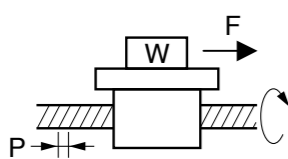
Indicate the maximum torque that the motor requires during operation (mainly in acceleration and deceleration steps). The reference value is 80% or less of the maximum motor torque. If the torque is a negative value, a regenerative discharge resistor may be required.

(2) Traveling torque, Stop holding torque

Indicates the torque that the motor requires for a long time. The reference value is 80% or less of the rated motor torque. If the torque is a negative value, a regenerative discharge resistor may be required.

Traveling torque calculation formula for each mechanism

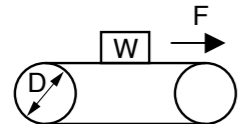
Ball screw mechanism



Traveling torque $T_f = \frac{P}{2\pi\eta} (\mu gW + F)$

W : Weight [kg] η : Mechanical efficiency
 P : Lead [m] μ : Coefficient of friction
 F : External force [N] g : Acceleration of gravity 9.8[m/s²]

Belt mechanism



Traveling torque $T_f = \frac{D}{2\pi\eta} (\mu gW + F)$

W : Weight [kg] η : Mechanical efficiency
 P : Pulley diameter [m] μ : Coefficient of friction
 F : External force [N] g : Acceleration of gravity 9.8[m/s²]

(3) Effective torque

Indicates a root-mean-square value of the total torque required for running and stopping the motor per unit time. The reference value is approx. 80% or less of the rated motor torque.

$$T_{rms} = \sqrt{\frac{T_a^2 \times t_a + T_f^2 \times t_b + T_d^2 \times t_d}{t_c}}$$

T_a : Acceleration torque [N·m] t_a : Acceleration time [s] t_c : Cycle time [s]
 T_f : Traveling torque [N·m] t_b : Constant-velocity time [s] (Run time + Stop time)
 T_d : Deceleration torque [N·m] t_d : Deceleration time [s]

2. Motor velocity

Maximum velocity

Maximum velocity of motor in operation: The reference value is the rated velocity or lower value. When the motor runs at the maximum velocity, you must pay attention to the motor torque and temperature rise. For actual calculation of motor velocity, see "Example of motor selection" described later.

3. Inertia and inertia ratio

Inertia is like the force to retain the current moving condition.

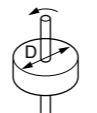
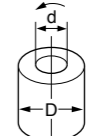
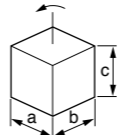
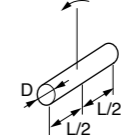
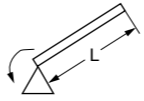
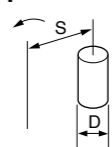
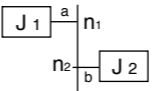
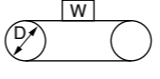
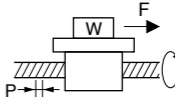
Inertia ratio is calculated by dividing load inertia by rotor inertia.

Generally, for motors with 750 W or lower capacity, the inertia ratio should be "20" or less. For motors with 1000 W or higher capacity, the inertia ratio should be "10" or less.

If you need quicker response, a lower inertia ratio is required.

(For example, when the motor takes several seconds in acceleration step, the inertia ratio can be further increased.)

General inertia calculation method

| Shape | J calculation formula | Shape | J calculation formula |
|--|---|---|--|
| Disk  | $J = \frac{1}{8} WD^2$ [kg·m ²] W : Weight [kg] D : Outer diameter [m] | Hollow cylinder  | $J = \frac{1}{8} W(D^2 + d^2)$ [kg·m ²] W : Weight [kg] D : Outer diameter [m] d : Inner diameter [m] |
| Prism  | $J = \frac{1}{12} W(a^2 + b^2)$ [kg·m ²] W : Weight [kg] a, b, c : Side length [m] | Uniform rod  | $J = \frac{1}{48} W(3D^2 + 4L^2)$ [kg·m ²] W : Weight [kg] D : Outer diameter [m] L : Length [m] |
| Straight rod  | $J = \frac{1}{3} WL^2$ [kg·m ²] W : Weight [kg] L : Length [m] | Separated rod  | $J = \frac{1}{8} WD^2 + WS^2$ [kg·m ²] W : Weight [kg] D : Outer diameter [m] S : Distance [m] |
| Reduction gear  | Inertia on shaft "a" $J = J_1 + \left(\frac{n_2}{n_1}\right)^2 J_2$ [kg·m ²] n ₁ : A rotational speed of a shaft [r/min] n ₂ : A rotational speed of b shaft [r/min] | | |
| Conveyor  | $J = \frac{1}{4} WD^2$ [kg·m ²] W : Workpiece weight on conveyor [kg] D : Drum diameter [m] * Excluding drum J | Ball screw  | $J = J_B + \frac{W \cdot P^2}{4\pi^2}$ [kg·m ²] W : Weight [kg] P : Lead J _B : J of ball screw |

If weight (W [kg]) is unknown, calculate it with the following formula:

Weight W[kg]=Density ρ [kg/m³] x Volume V[m³]

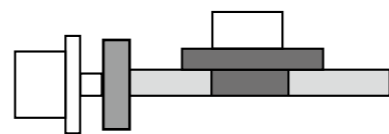
Density of each material

Iron ρ =7.9 x 10³ [kg/m³] Aluminum ρ =2.8 x 10³ [kg/m³]
 Brass ρ =8.5 x 10³ [kg/m³]

To Drive Ball Screw Mechanism

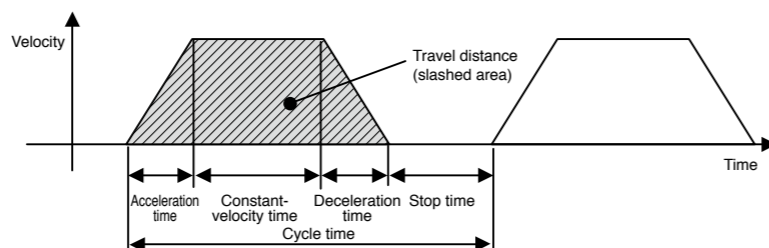
1. Example of motor selection for driving ball screw mechanism

- Workpiece weight WA = 10 [kg]
- Ball screw length BL = 0.5 [m]
- Ball screw diameter BD = 0.02 [m]
- Ball screw lead BP = 0.02 [m]
- Ball screw efficiency Bη = 0.9
- Travel distance 0.3[m]
- Coupling inertia Jc = 10 × 10⁻⁶ [kg·m²] (Use manufacturer-specified catalog value, or calculation value.)



2. Running pattern :

- Acceleration time ta = 0.1 [s]
- Constant-velocity time tb = 0.8 [s]
- Deceleration time td = 0.1 [s]
- Cycle time tc = 2 [s]
- Travel distance 0.3[m]



3. Ball screw weight

$$BW = \rho \times \pi \times \left(\frac{BD}{2}\right)^2 \times BL = 7.9 \times 10^3 \times \pi \times \left(\frac{0.02}{2}\right)^2 \times 0.5 = 1.24 \text{ [kg]}$$

4. Load inertia

$$JL = Jc + JB = Jc + \frac{1}{8}BW \times BD^2 + \frac{WA \cdot BP^2}{4\pi^2} = 0.00001 + (1.24 \times 0.02^2) / 8 + 10 \times 0.02^2 / 4\pi^2 = 1.73 \times 10^{-4} \text{ [kg}\cdot\text{m}^2\text{]}$$

5. Provisional motor selection

In case of MSMF 200 W motor : JM = 0.14 × 10⁻⁴ [kg·m²]

6. Calculation of inertia ratio

JL / JM = 1.73 × 10⁻⁴ / 0.14 × 10⁻⁴ Therefore, the inertia ratio is "12.3" (less than "30")
(In case of MSMF 100 W motor: JM = 0.048 × 10⁻⁴ Therefore, the inertia ratio is "36.0".)

7. Calculation of maximum velocity (Vmax)

$$\frac{1}{2} \times \text{Acceleration time} \times V_{\max} + \text{Constant-velocity time} \times V_{\max} + \frac{1}{2} \times \text{Deceleration time} \times V_{\max} = \text{Travel distance}$$

$$\frac{1}{2} \times 0.1 \times V_{\max} + 0.8 \times V_{\max} + \frac{1}{2} \times 0.1 \times V_{\max} = 0.3$$

$$0.9 \times V_{\max} = 0.3$$

$$V_{\max} = 0.3 / 0.9 = 0.334 \text{ [m/s]}$$

8. Calculation of motor velocity (N [r/min]) Ball screw lead per resolution: BP = 0.02 [m]

$$N = 0.334 / 0.02 = 16.7 \text{ [r/s]}$$

$$= 16.7 \times 60 = 1002 \text{ [r/min]} < 3000 \text{ [r/min]} \text{ (Rated velocity of MSMF 200 W motor)}$$

9. Calculation of torque

$$\text{Traveling torque } T_f = \frac{BP}{2\pi B\eta} (\mu g WA + F) = \frac{0.02}{2\pi \times 0.9} (0.1 \times 9.8 \times 10 + 0) = 0.035 \text{ [N}\cdot\text{m]}$$

$$\text{Acceleration torque } T_a = \frac{(JL + JM) \times 2\pi N \text{ [r/s]}}{\text{Acceleration time [s]}} + \text{Traveling torque}$$

$$= \frac{(1.73 \times 10^{-4} + 0.14 \times 10^{-4}) \times 2\pi \times 16.7}{0.1} + 0.035$$

$$= 0.196 + 0.035 = 0.231 \text{ [N}\cdot\text{m]}$$

$$\text{Deceleration torque } T_d = \frac{(JL + JM) \times 2\pi N \text{ [r/s]}}{\text{Deceleration time [s]}} - \text{Traveling torque}$$

$$= \frac{(1.73 \times 10^{-4} + 0.14 \times 10^{-4}) \times 2\pi \times 16.7}{0.1} - 0.035$$

$$= 0.196 - 0.035 = 0.161 \text{ [N}\cdot\text{m]}$$

10. Verification of maximum torque

Acceleration torque = Ta = 0.231 [N·m] < 1.91 [N·m] (Maximum torque of MSMF 200 W motor)

11. Verification of effective torque

$$T_{\text{rms}} = \sqrt{\frac{T_a^2 \times t_a + T_f^2 \times t_b + T_d^2 \times t_d}{t_c}}$$

$$= \sqrt{\frac{0.231^2 \times 0.1 + 0.035^2 \times 0.8 + 0.161^2 \times 0.1}{2}}$$

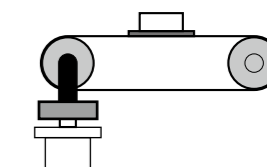
$$= 0.067 \text{ [N}\cdot\text{m]} < 0.64 \text{ [N}\cdot\text{m]} \text{ (Rated torque of MSMF 200 W motor)}$$

12. Judging from the inertia ratio calculated above, selection of 200 W motor is preferable, although the torque margin is significantly large.

Example of Motor Selection

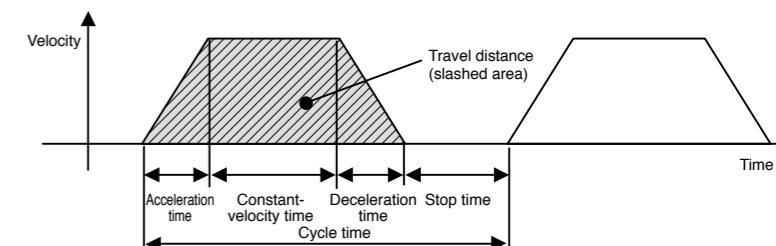
Example of motor selection for timing belt mechanism

1. Mechanism
- Workpiece weight WA = 2[kg] (including belt)
 - Pulley diameter PD = 0.05[m]
 - Pulley weight WP = 0.5[kg] (Use manufacturer-specified catalog value, or calculation value.)
 - Mechanical efficiency Bη = 0.8
 - Coupling inertia Jc = 0 (Direct connection to motor shaft)
 - Belt mechanism inertia JB
 - Pulley inertia JP



2. Running pattern

- Acceleration time ta = 0.1[s]
- Constant-velocity time tb = 0.8[s]
- Deceleration time td = 0.1[s]
- Cycle time tc = 2[s]
- Travel distance 1[m]



3. Load inertia JL = Jc + JB + JP

$$= Jc + \frac{1}{4}WA \times PD^2 + \frac{1}{8}WP \times PD^2 \times 2$$

$$= 0 + \frac{1}{4} \times 2 \times 0.05^2 + \frac{1}{8} \times 0.5 \times 0.05^2 \times 2$$

$$= 0.00156 = 15.6 \times 10^{-4} \text{ [kg}\cdot\text{m}^2\text{]}$$

4. Provisional motor selection

In case of MSMF 750 W motor : JM = 0.96 × 10⁻⁴ [kg·m²]

5. Calculation of inertia ratio

JL / JM = 15.6 × 10⁻⁴ / 0.96 × 10⁻⁴ Therefore, the inertia ratio is "16.3" (less than "20")

6. Calculation of maximum velocity (Vmax)

$$\frac{1}{2} \times \text{Acceleration time} \times V_{\max} + \text{Constant-velocity time} \times V_{\max} + \frac{1}{2} \times \text{Deceleration time} \times V_{\max} = \text{Travel distance}$$

$$\frac{1}{2} \times 0.1 \times V_{\max} + 0.8 \times V_{\max} + \frac{1}{2} \times 0.1 \times V_{\max} = 1$$

$$0.9 \times V_{\max} = 1$$

$$V_{\max} = 1 / 0.9 = 1.111 [\text{m/s}]$$

7. Calculation of motor velocity (N [r/min])

A single rotation of pulley : $\pi \times PD = 0.157 [\text{m}]$

$$N = 1.111 / 0.157 = 7.08 [\text{r/s}]$$

$$= 7.08 \times 60 = 424.8 [\text{r/min}] < 3000 [\text{r/min}] \text{ (Rated velocity of MSMF 750 W motor)}$$

8. Calculation of torque

Traveling torque

$$T_f = \frac{PD}{2\gamma} (\mu g W_A + F) = \frac{0.05}{2 \times 0.8} (0.1 \times 9.8 \times 3 + 0)$$

$$= 0.061 [\text{N}\cdot\text{m}]$$

Acceleration torque

$$T_a = \frac{(J_L + J_M) \times 2\pi N [\text{r/s}]}{\text{Acceleration time} [\text{s}]} + \text{Traveling torque}$$

$$= \frac{(15.6 \times 10^{-4} + 0.96 \times 10^{-4}) \times 2\pi \times 7.08}{0.1} + 0.061$$

$$= 0.736 + 0.061 = 0.797 [\text{N}\cdot\text{m}]$$

Deceleration torque

$$T_d = \frac{(J_L + J_M) \times 2\pi N [\text{r/s}]}{\text{Deceleration time} [\text{s}]} - \text{Traveling torque}$$

$$= \frac{(15.6 \times 10^{-4} + 0.96 \times 10^{-4}) \times 2\pi \times 7.08}{0.1} - 0.061$$

$$= 0.736 - 0.061 = 0.675 [\text{N}\cdot\text{m}]$$

9. Verification of maximum torque

Acceleration torque $T_a = 0.797 [\text{N}\cdot\text{m}] < 7.1 [\text{N}\cdot\text{m}]$ (Maximum torque of MSMF 750 W motor)

10. Verification of effective torque

$$T_{\text{rms}} = \sqrt{\frac{T_a^2 \times t_a + T_f^2 \times t_b + T_d^2 \times t_d}{t_c}}$$

$$= \sqrt{\frac{0.797^2 \times 0.1 + 0.061^2 \times 0.8 + 0.675^2 \times 0.1}{2}}$$

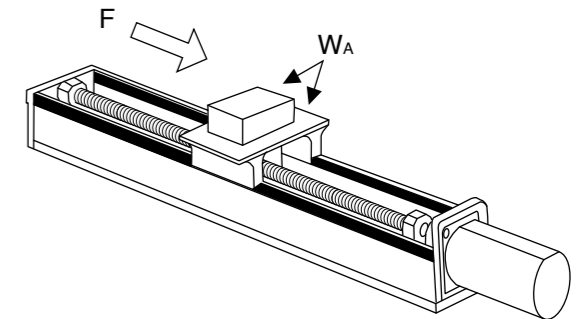
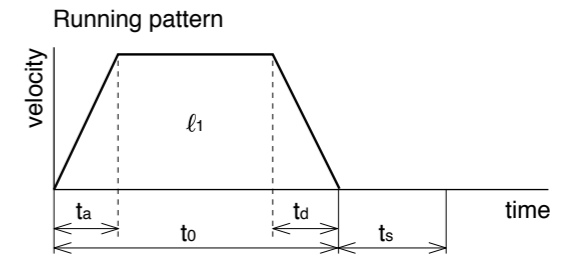
$$= 0.237 [\text{N}\cdot\text{m}] < 2.4 [\text{N}\cdot\text{m}] \text{ (Rated torque of MSMF 750 W motor)}$$

11. Judging from the above calculation result, selection of MSMF 750W motor is acceptable.

Request for motor selection I : Ball screw drive

1. Driven mechanism and running data

- 1) Travel distance of the work load per one cycle mm
- 2) Cycle time s
(Fill in items 3) and 4) if required.)
- 3) Acceleration time s
- 4) Deceleration time s
- 5) Stopping time s
- 6) Max. velocity mm/s
- 7) External force N
- 8) Positioning accuracy of the work load mm
- 9) Total weight of the work load and the table kg
- 10) Power supply voltage
- 11) Diameter of the ball screw
- 12) Total length of the ball
- 13) Lead of the ball screw



14) Traveling direction (horizontal, vertical etc.)

2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

Company name : _____

Department/Section : _____

Name : _____

Address : _____

Tel : _____

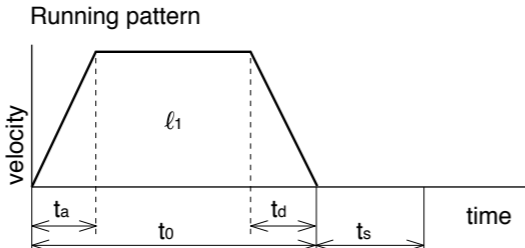
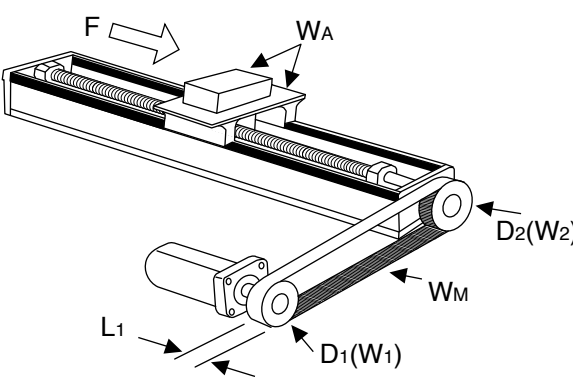
Fax : _____

E-mail address: _____

Request Sheet for Motor Selection

Request for motor selection II : Timing pulley + Ball screw drive

1. Driven mechanism and running data

| | | Motor side | Ball screw side |
|---|------------|---|-----------------|
| 1) Travel distance of the work load per one cycle | l_1 : mm | 15) Diameter of the pulley D_1 : mm | D_2 : mm |
| 2) Cycle time | t_0 : s | 16) Weight of the pulley W_1 : kg | W_2 : kg |
| (Fill in items 3) and 4) if required.) | | (or item 17) and 18)) | |
| 3) Acceleration time | t_a : s | 17) Width of the pulley L_1 : mm | |
| 4) Deceleration time | t_d : s | 18) Material of the pulley | |
| 5) Stopping time | t_s : s | 19) Weight of the belt W_M : kg | |
| 6) Max. velocity | V : mm/s |  | |
| 7) External force | F : N | | |
| 8) Positioning accuracy of the work load | \pm mm | | |
| 9) Total weight of the work load and the table | W_A : kg | | |
| 10) Power supply voltage | V |  | |
| 11) Diameter of the ball screw | mm | | |
| 12) Total length of the ball screw | mm | | |
| 13) Lead of the ball screw | mm | | |
| 14) Traveling direction (horizontal, vertical etc.) | | | |

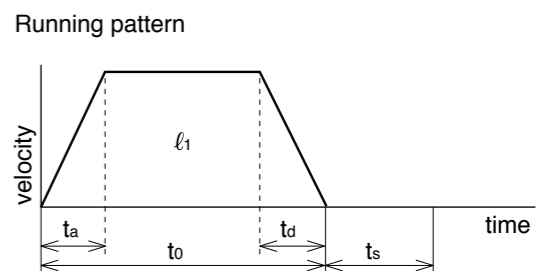
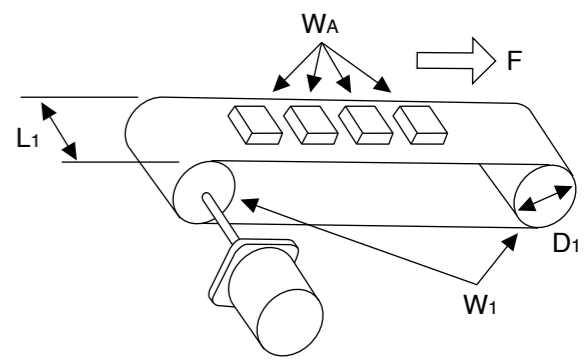
2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

| | |
|--|----------------------|
| | Company name : |
| | Department/Section : |
| | Name : |
| | Address : |
| | Tel : |
| | Fax : |
| | E-mail address: |

Request Sheet for Motor Selection

Request for motor selection III : Belt drive

1. Driven mechanism and running data

| | | |
|---|------------|---|
| 1) Travel distance of the work load per one cycle | l_1 : mm |  |
| 2) Cycle time | t_0 : s | |
| (Fill in items 3) and 4) if required.) | | |
| 3) Acceleration time | t_a : s | |
| 4) Deceleration time | t_d : s |  |
| 5) Stopping time | t_s : s | |
| 6) Max. velocity | V : mm/s | |
| 7) External force | F : N | |
| 8) Positioning accuracy of the work load | \pm mm | (or item 14) and 15)) |
| 9) Total weight of the work load | W_A : kg | 14) Width of the pulley L_1 : mm |
| 10) Power supply voltage | V | 15) Material of the pulley |
| 11) Weight of the belt | W_M : kg | 16) Traveling direction (horizontal, vertical etc.) |
| 12) Diameter of the driving pulley | D_1 : mm | |
| 13) Total weight of the pulley | W_1 : kg | |

2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

| | |
|--|----------------------|
| | Company name : |
| | Department/Section : |
| | Name : |
| | Address : |
| | Tel : |
| | Fax : |
| | E-mail address: |

Request Sheet for Motor Selection

Request for motor selection IV : Timing pulley + Belt drive

1. Driven mechanism and running data

1) Travel distance of the work load per one cycle mm

2) Cycle time s

(Fill in items 3) and 4) if required.)

3) Acceleration time s

4) Deceleration time s

5) Stopping time s

6) Max. velocity mm/s

7) External force N

8) Positioning accuracy of the work load mm

9) Total weight of the work load kg

10) Power supply voltage

11) Weight of motor side belt kg

| | Motor side | Belt side |
|----------------------------|---|---|
| 12) Diameter of the pulley | <input type="text" value="D<sub>1</sub>"/> mm | <input type="text" value="D<sub>2</sub>"/> mm |
| 13) Weight of the pulley | <input type="text" value="W<sub>1</sub>"/> kg | <input type="text" value="W<sub>2</sub>"/> kg |

(or item 14) and 15))

14) Width of the belt mm

15) Material of the pulley

| | Motor side | Belt side |
|----------------------------|---|---|
| 16) Diameter of the pulley | <input type="text" value="D<sub>3</sub>"/> mm | <input type="text" value="D<sub>4</sub>"/> mm |
| 17) Weight of the pulley | <input type="text" value="W<sub>3</sub>"/> kg | <input type="text" value="W<sub>4</sub>"/> kg |

(or item 18) and 19))

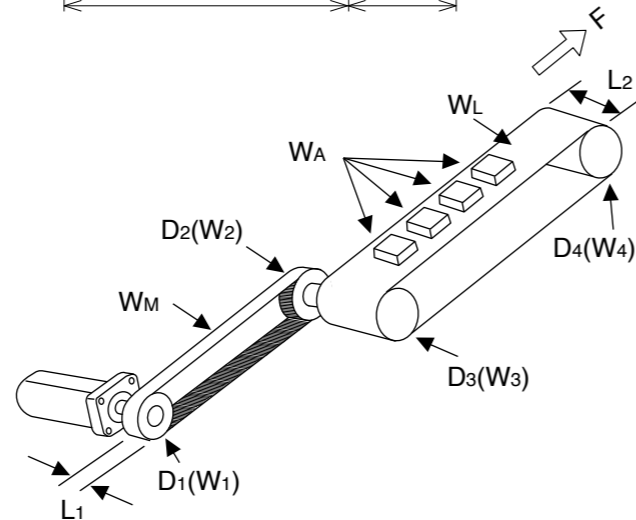
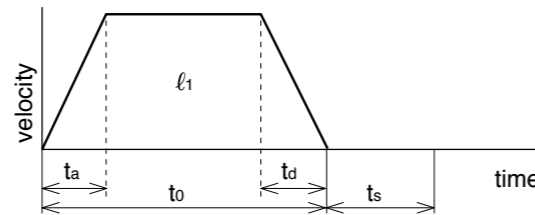
18) Width of the pulley mm

19) Material of the pulley

20) Weight of the belt kg

21) Traveling direction (horizontal, vertical etc.)

Running pattern



2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

| | |
|--|--|
| | Company name : _____ Department/Section : _____ Name : _____ Address : _____ Tel : _____ Fax : _____ E-mail address: _____ |
|--|--|

Request Sheet for Motor Selection

Request for motor selection V : Turntable drive

1. Driven mechanism and running data

1) Travel distance of the work load per one cycle deg

2) Cycle time s

(Fill in items 3) and 4) if required.)

3) Acceleration time s

4) Deceleration time s

5) Stopping time s

6) Max. rotational speed of the table deg/s

(or) r/s

7) Positioning accuracy of the work load deg

8) Weight of one work load kg

9) Driving radius of the center of gravity of the work mm

10) Diameter of the table mm

11) Mass of the table kg

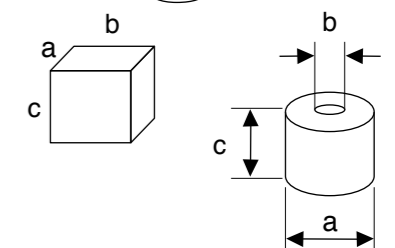
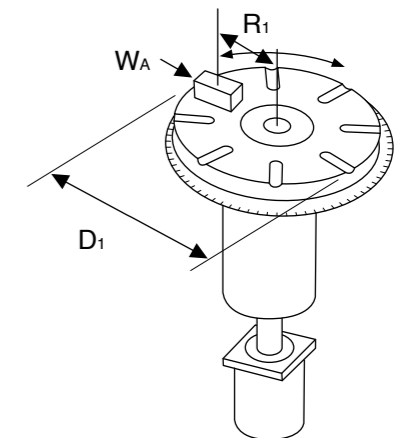
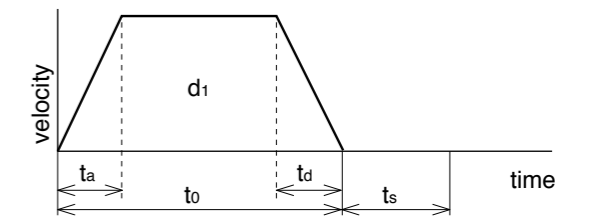
12) Diameter of the table support mm

13) Power supply voltage

| | Prism | Cylinder |
|---------------------------------|-----------------------------------|-----------------------------------|
| 14) Dimensions of the work load | <input type="text" value="a"/> mm | <input type="text" value="a"/> mm |
| | <input type="text" value="b"/> mm | <input type="text" value="b"/> mm |
| | <input type="text" value="c"/> mm | <input type="text" value="c"/> mm |

15) Number of work loads pcs

Running pattern



2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

| | |
|--|--|
| | Company name : _____ Department/Section : _____ Name : _____ Address : _____ Tel : _____ Fax : _____ E-mail address: _____ |
|--|--|

Request Sheet for Motor Selection

Request for motor selection VI : Timing pulley + Turntable drive

1. Driven mechanism and running data

| | | | | | |
|--|---------------|----------------------------|-----------------------|---------------------------|------------------|
| 1) Travel distance of the work load per one cycle | d_1 : deg | 16) Diameter of the pulley | Motor side D_2 : mm | Turntable side D_3 : mm | |
| 2) Cycle time | t_o : s | 17) Weight of the pulley | W_2 : kg | W_3 : kg | |
| (Fill in items 3) and 4) if required.) | | (or item 18) and 19)) | | | |
| 3) Acceleration time | t_a : s | 18) Width of the pulley | L_1 : mm | | |
| 4) Deceleration time | t_d : s | 19) Material of the pulley | | | |
| 5) Stopping time | t_s : s | 20) Weight of the belt | W_M : kg | | |
| 6) Max. rotational speed of the table | v : deg/s | | | | |
| (or) | V : r/s | | | | |
| 7) Positioning accuracy of the work load | \pm deg | | | | |
| 8) Weight of one work load | W_A : kg | | | | |
| 9) Driving radius of the center of gravity of the work | R_1 : mm | | | | |
| 10) Diameter of the table | D_1 : mm | | | | |
| 11) Mass of the table | W_1 : kg | | | | |
| 12) Diameter of the table support | T_1 : mm | | | | |
| 13) Power supply voltage | V | | | | |
| 14) Dimension of the work load | (Prism) a: mm | | | | (Cylinder) a: mm |
| | b: mm | | | | b: mm |
| | c: mm | | | | c: mm |
| 15) Number of work loads | pcs | | | | |

2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

| | |
|--|----------------------------|
| | Company name : _____ |
| | Department/Section : _____ |
| | Name : _____ |
| | Address : _____ |
| | Tel : _____ |
| | Fax : _____ |
| | E-mail address: _____ |

Request Sheet for Motor Selection

Request for motor selection VII : Roller feed drive

1. Driven mechanism and running data

| | | |
|---|------------|----------------------------------|
| 1) Travel distance of the work load per one cycle | l_1 : mm | |
| 2) Cycle time | t_o : s | |
| (Fill in items 3) and 4) if required.) | | |
| 3) Acceleration time | t_a : s | |
| 4) Deceleration time | t_d : s | |
| 5) Stopping time | t_s : s | |
| 6) Max. velocity | v : mm/s | |
| 7) External pulling force | F : N | |
| 8) Positioning accuracy of the work load | \pm mm | |
| 9) Number of rollers | pcs | |
| 10) Power supply voltage | V | |
| 11) Diameter of the roller | D_1 : mm | |
| 12) Mass of the roller | W_1 : kg | 14) Material of the roller _____ |

2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

| | |
|--|----------------------------|
| | Company name : _____ |
| | Department/Section : _____ |
| | Name : _____ |
| | Address : _____ |
| | Tel : _____ |
| | Fax : _____ |
| | E-mail address: _____ |

Request for motor selection VIII : Driving with Rack & Pinion

1. Driven mechanism and running data

- 1) Travel distance of the work load per one cycle

| | |
|---------|----|
| l_1 : | mm |
|---------|----|
- 2) Cycle time

| | |
|---------|---|
| t_0 : | s |
|---------|---|

(Fill in items 3) and 4) if required.)
- 3) Acceleration time

| | |
|---------|---|
| t_a : | s |
|---------|---|
- 4) Deceleration time

| | |
|---------|---|
| t_d : | s |
|---------|---|
- 5) Stopping time

| | |
|---------|---|
| t_s : | s |
|---------|---|
- 6) Max. velocity

| | |
|-------|------|
| V : | mm/s |
|-------|------|
- 7) External force

| | |
|-------|---|
| F : | N |
|-------|---|
- 8) Positioning accuracy of the work load

| | |
|-------|----|
| \pm | mm |
|-------|----|
- 9) Total weight of the work load

| | |
|---------|----|
| W_A : | kg |
|---------|----|
- 10) Power supply voltage

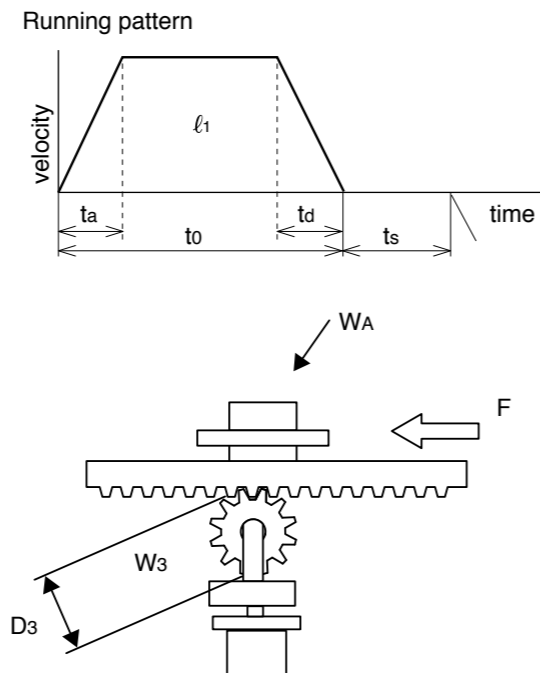
| | |
|--|---|
| | V |
|--|---|
- 11) Diameter of the pinion

| | |
|---------|----|
| D_3 : | mm |
|---------|----|
- 12) Mass of the pinion

| | |
|---------|----|
| W_3 : | kg |
|---------|----|
- 13) Traveling direction

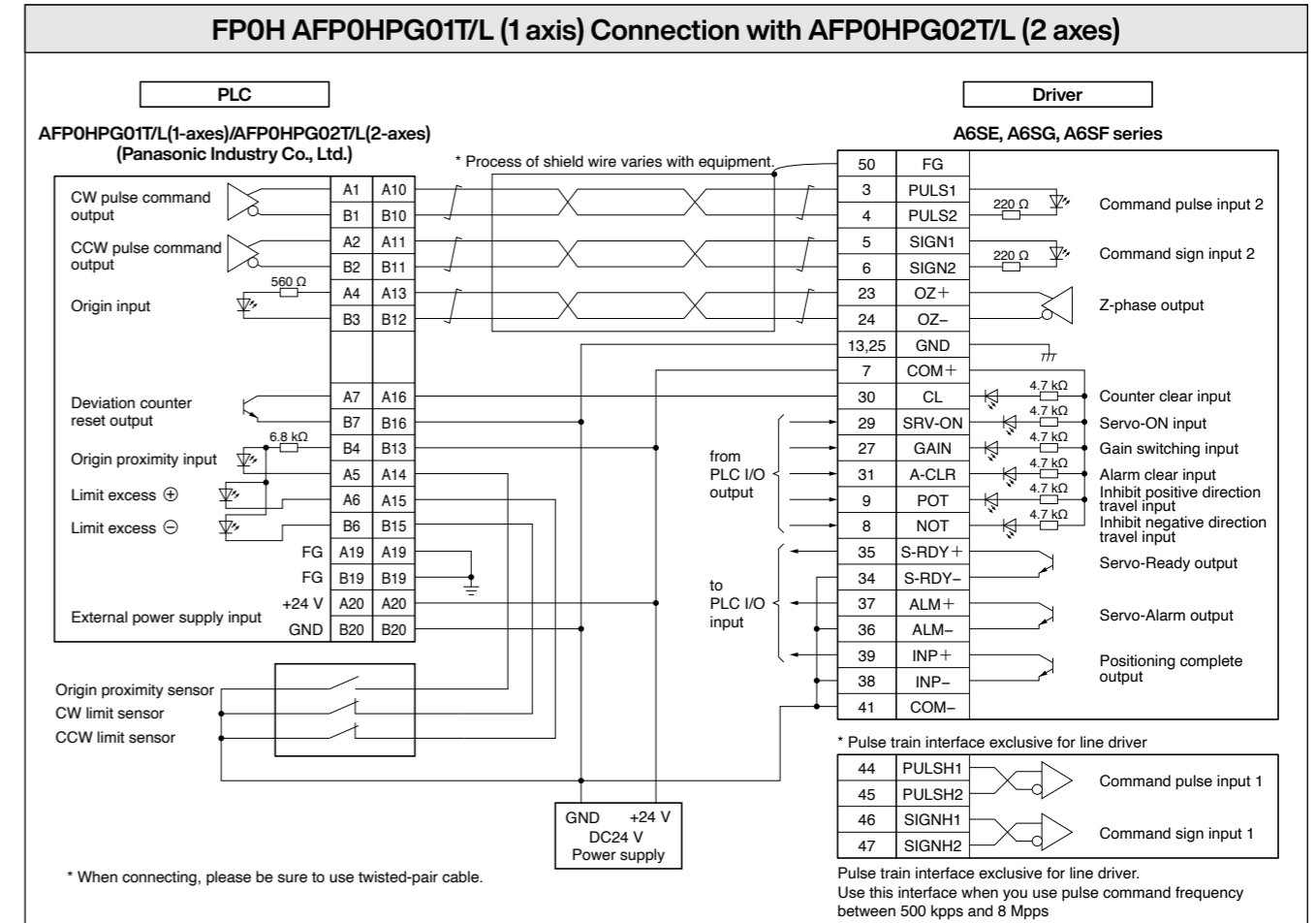
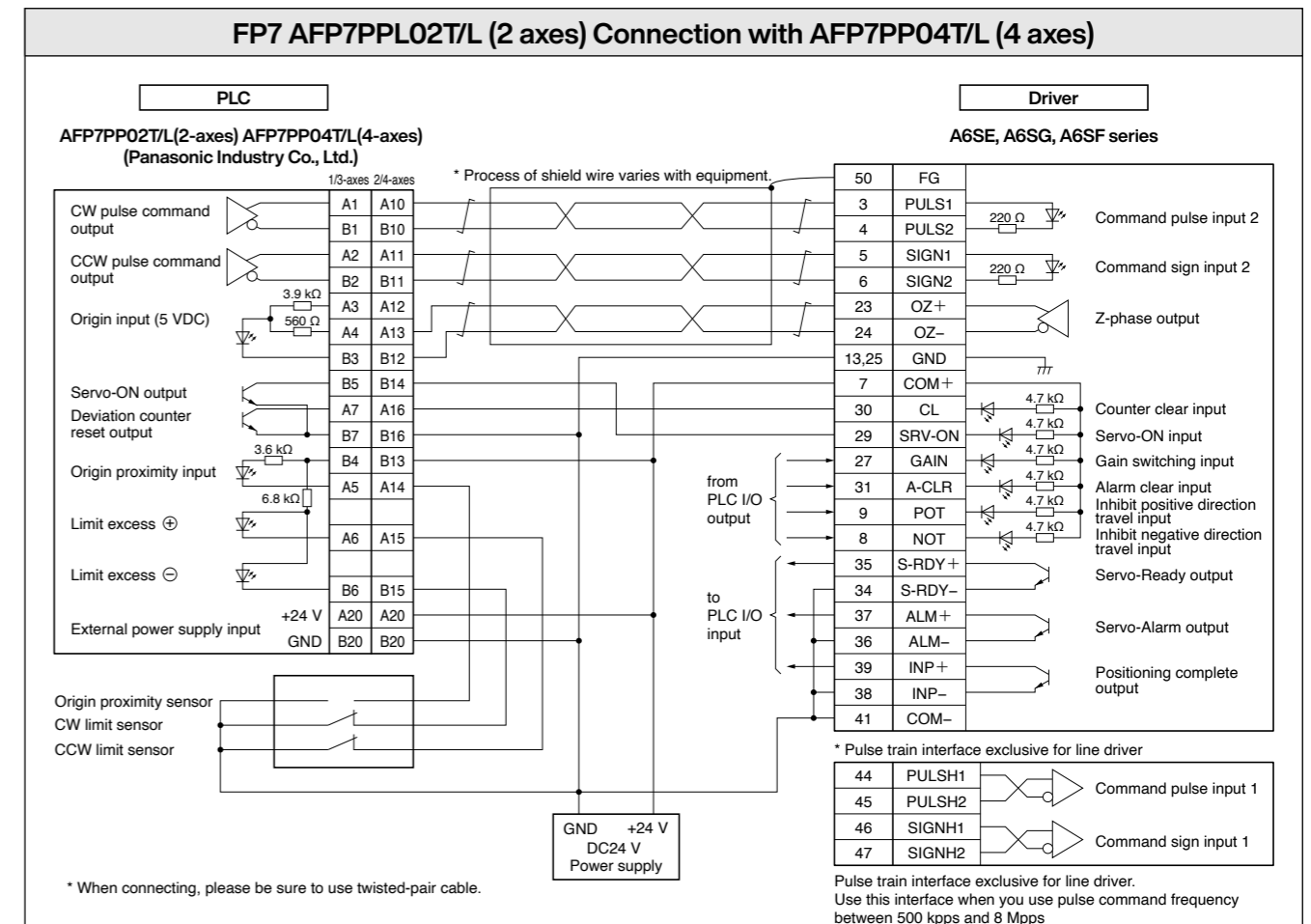
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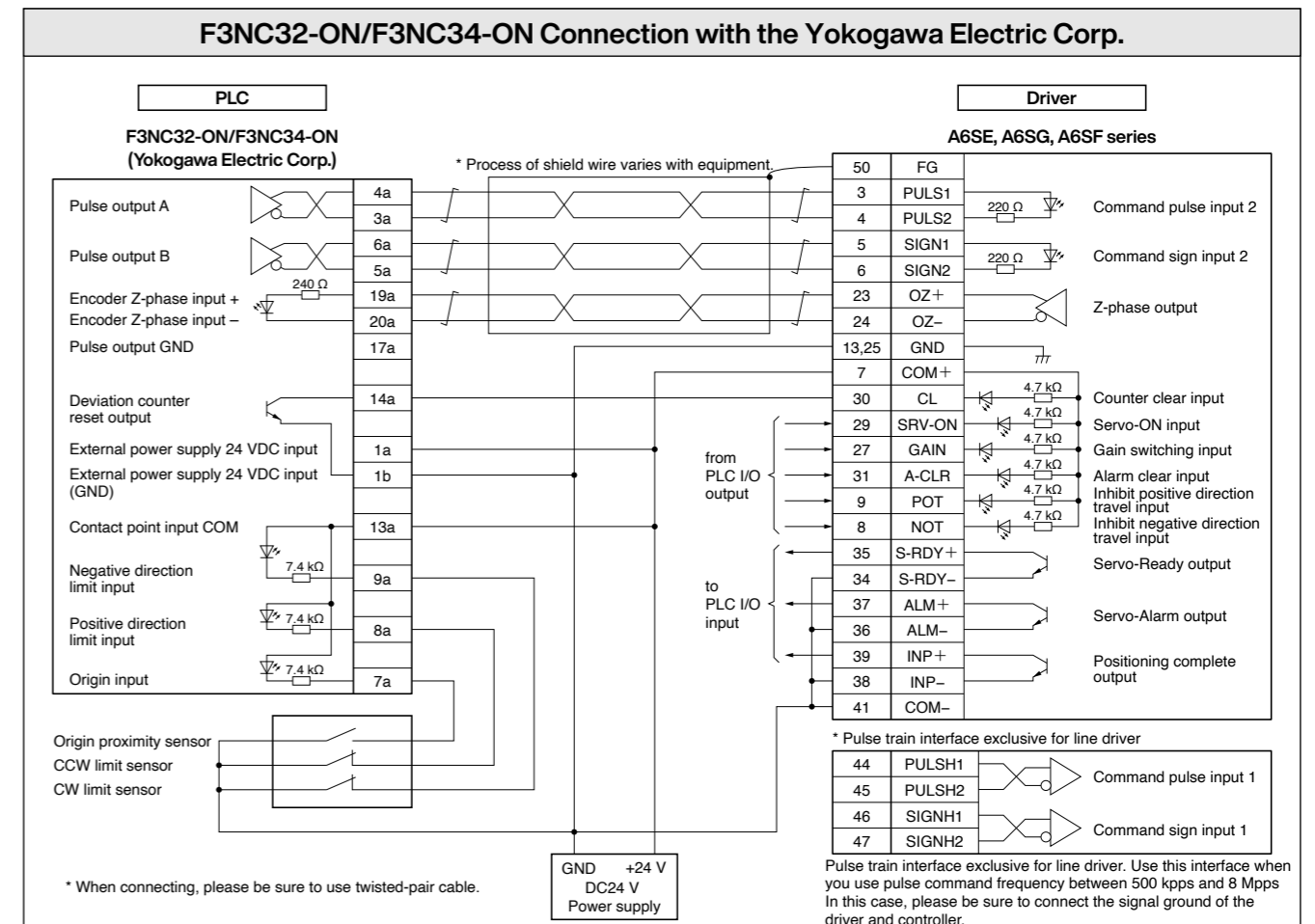
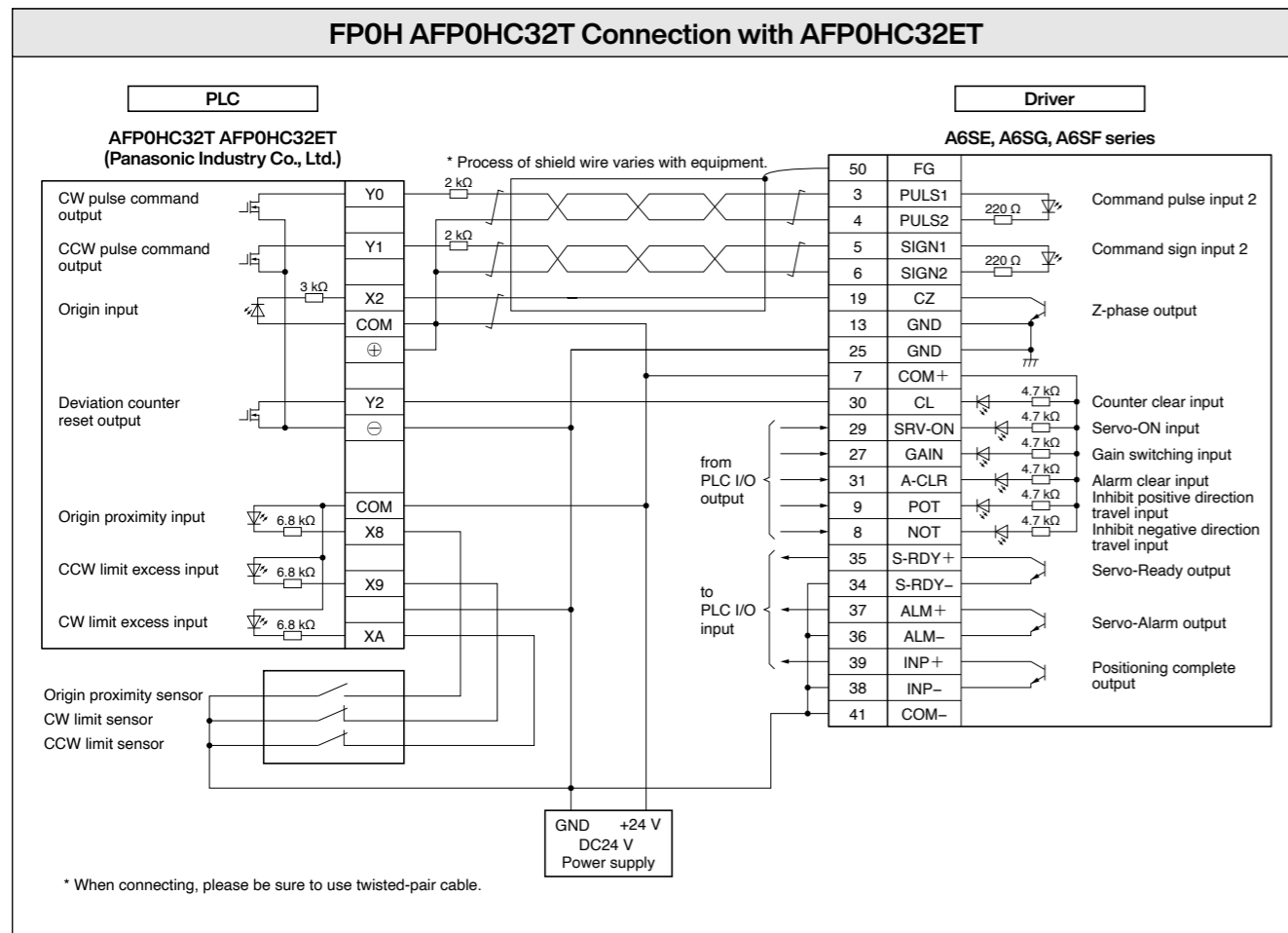
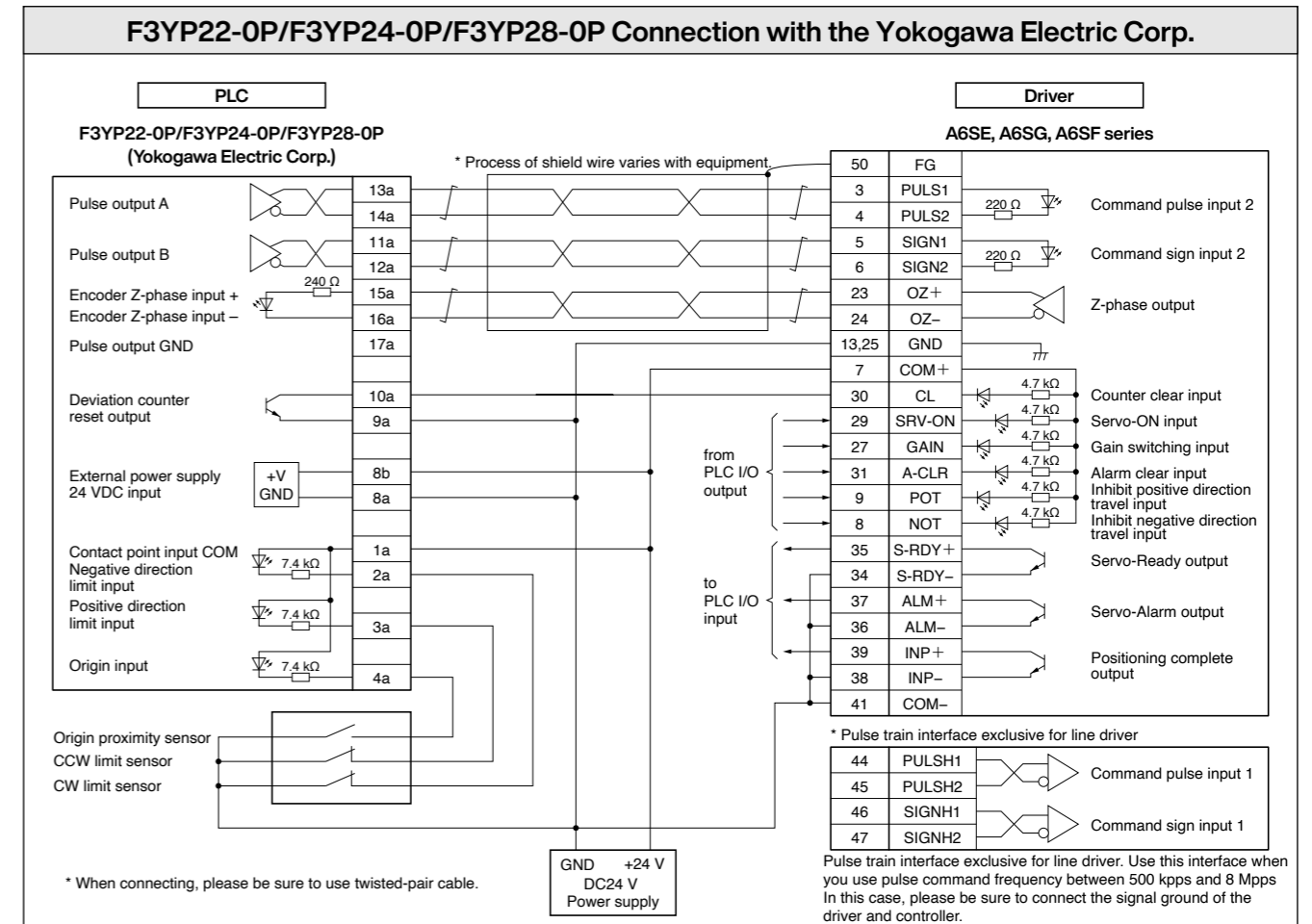
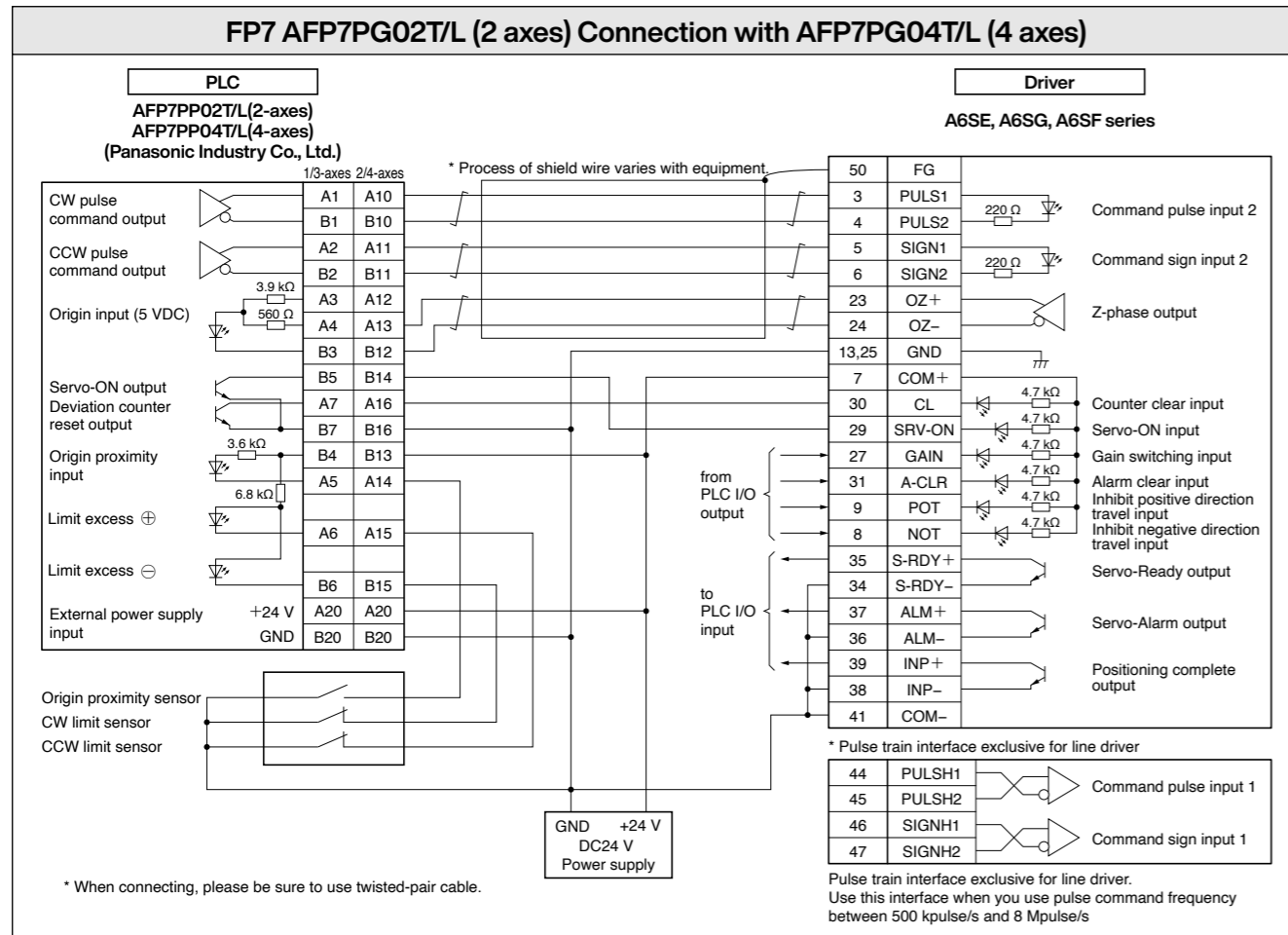
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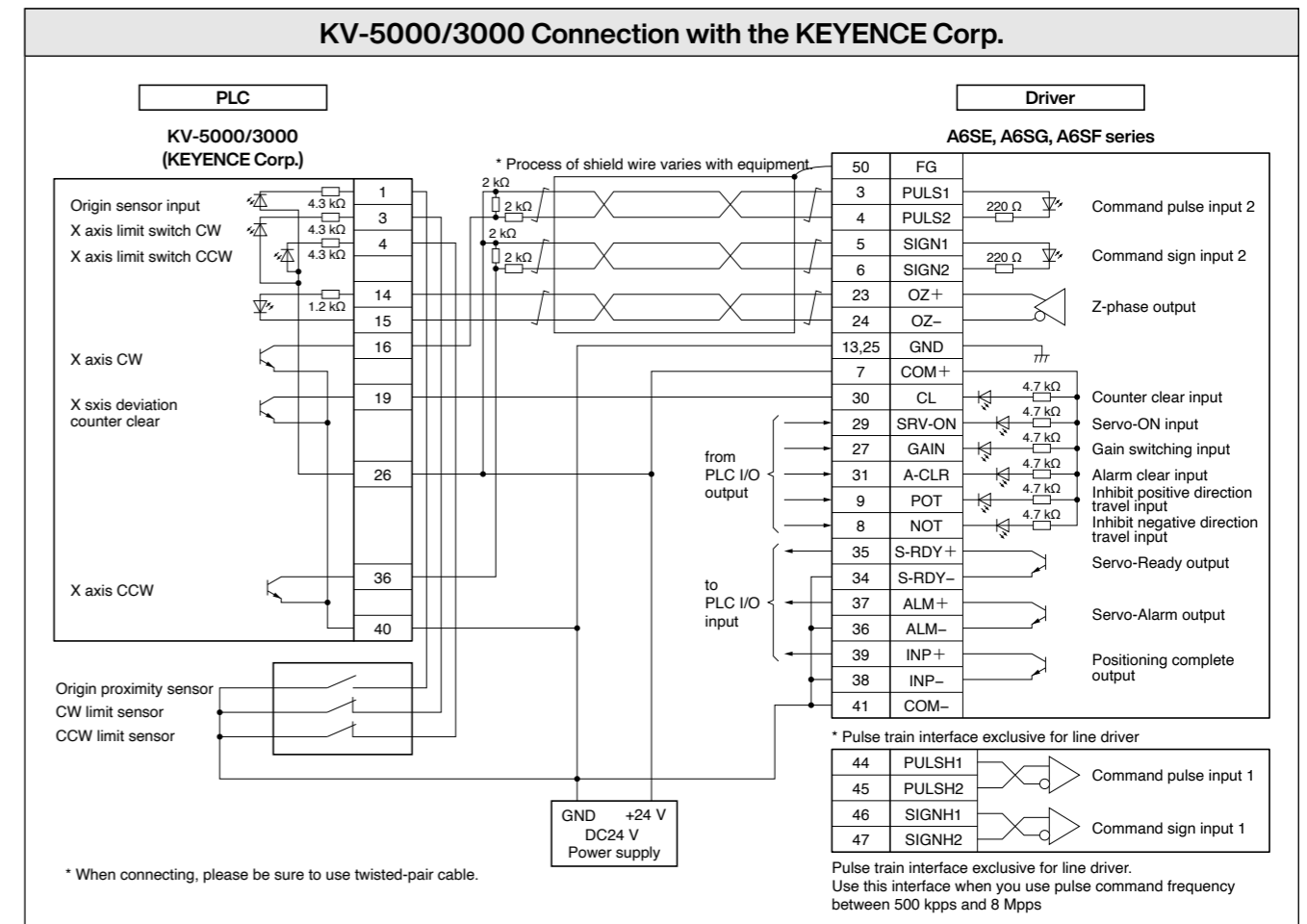
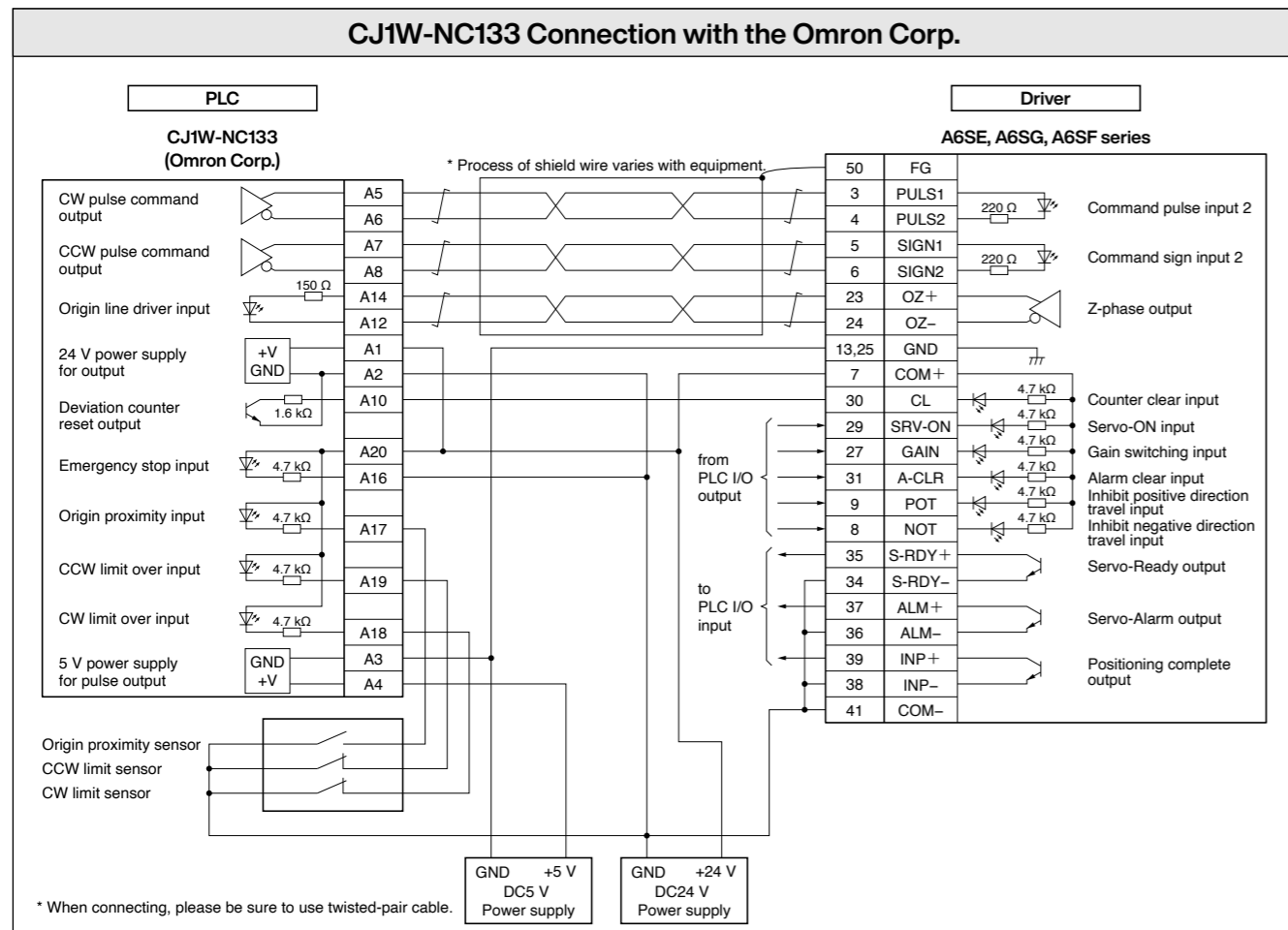
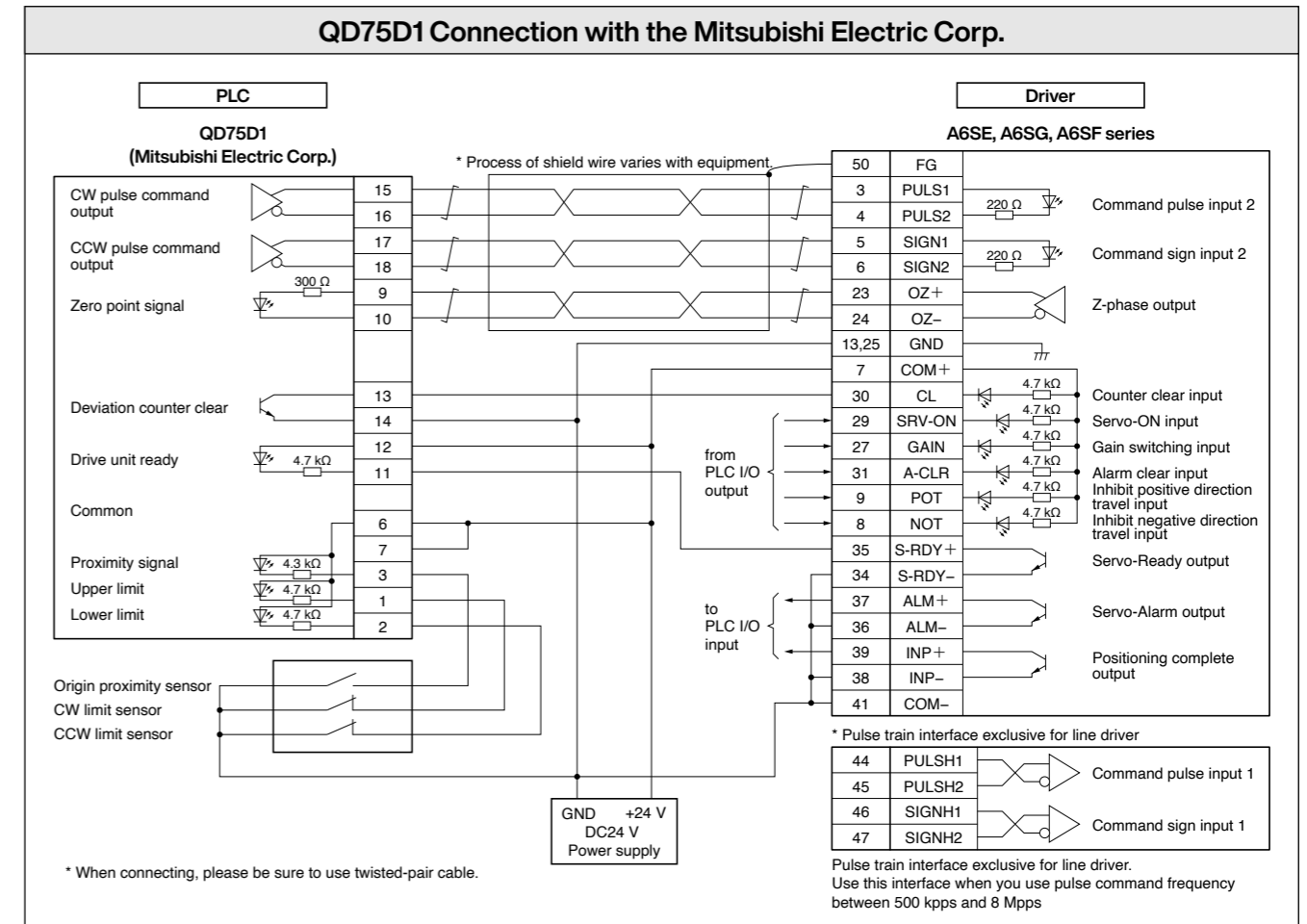
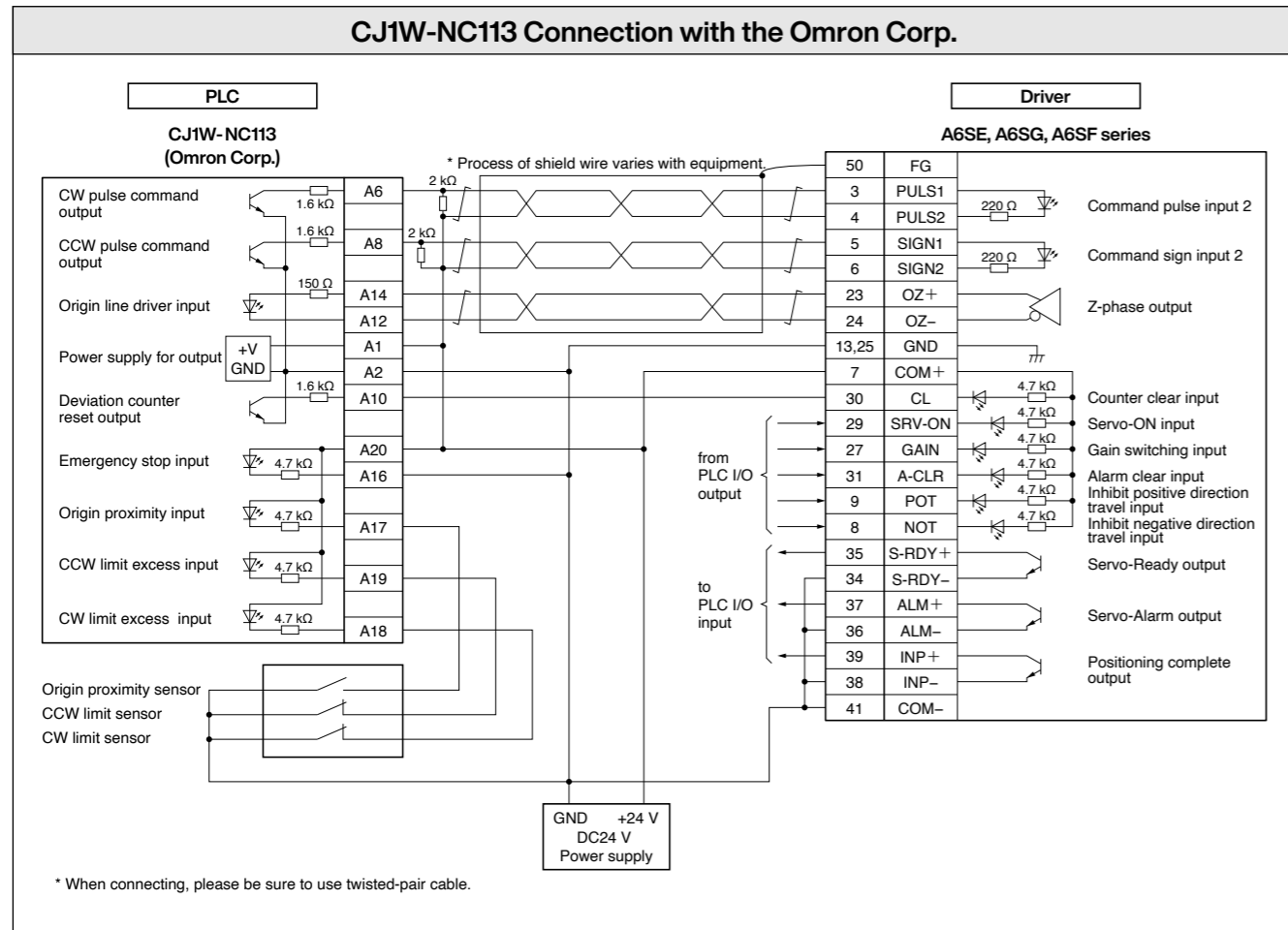


2. Other data (Fill the details on specific mechanism and its configurations in the following blank.)

| | |
|----------------------|--|
| Company name : | |
| Department/Section : | |
| Name : | |
| Address : | |
| Tel : | |
| Fax : | |
| E-mail address: | |

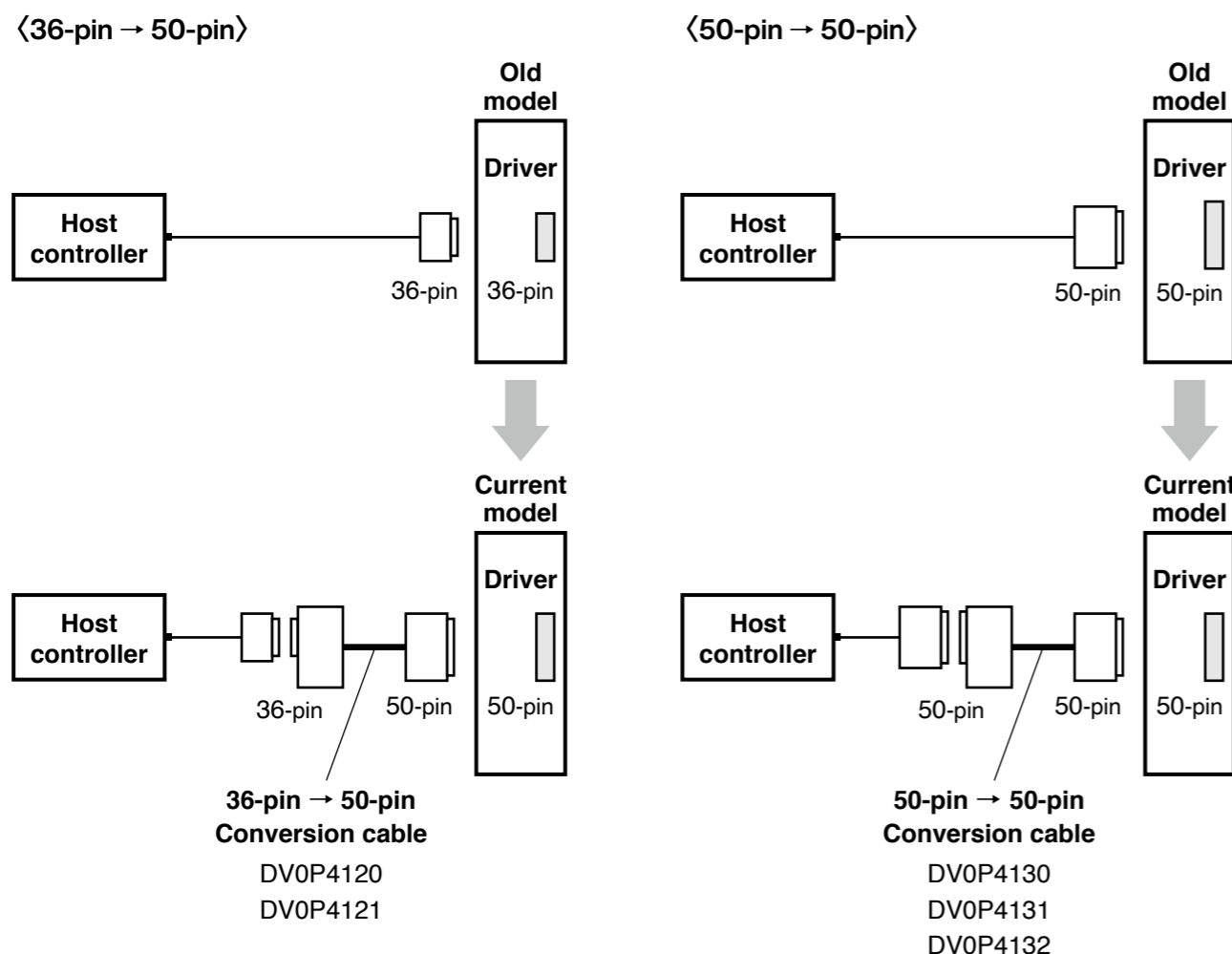






A6 Series
A6N Series
A6B Series
E Series
Information

For easier replacement of old driver (MINAS X/XX/V series) with A6 series, use the interface conversion connector.



When selecting the cable, refer to the table below because the part number of the cable is specific to the control mode of the old model.

| Old model | Control mode | Conversion cable part No. | Conversion wiring table |
|-----------------------------------|---------------------------|---------------------------|-------------------------|
| X series XX series (36-pin) | Position/velocity control | DV0P4120 | P.440 |
| | Torque control | DV0P4121 | |
| V series (50-pin) | Position control | DV0P4130 | P.441 |
| | Velocity control | DV0P4131 | |
| | Torque control | DV0P4132 | P.442 |

* For external dimensions, refer to P.322.

Conversion Wiring Table

| Pin No. on Old Model | DV0P4120 | | | DV0P4121 | | |
|----------------------|--------------------------|---|--------------------|--------------------------|---|--------------------|
| | Pin No. on Current Model | Signal Name | Symbol | Pin No. on Current Model | Signal Name | Symbol |
| 1 | 23 | Z-phase output | OZ+ | 23 | Z-phase output | OZ+ |
| 2 | 24 | Z-phase output | OZ- | 24 | Z-phase output | OZ- |
| 3 | 13 | Signal ground | GND | 13 | Signal ground | GND |
| 4 | 19 | Z-phase output | CZ | 19 | Z-phase output | CZ |
| 5 | 4 | Command pulse input 2 | PULS2 | 4 | Command pulse input 2 | PULS2 |
| 6 | 3 | Command pulse input 2 | PULS1 | 3 | Command pulse input 2 | PULS1 |
| 7 | 6 | Command pulse sign input 2 | SIGN2 | 6 | Command pulse sign input 2 | SIGN2 |
| 8 | 5 | Command pulse sign input 2 | SIGN1 | 5 | Command pulse sign input 2 | SIGN1 |
| 9 | 33 | Command pulse inhibition input | INH | 33 | Command pulse inhibition input | INH |
| 10 | 26 | Speed zero clamp input | ZEROSPD | 26 | Speed zero clamp input | ZEROSPD |
| 11 | 7 | Power supply for control signal (+) | COM+ | 7 | Power supply for control signal (+) | COM+ |
| 12 | 29 | Servo-ON input | SRV-ON | 29 | Servo-ON input | SRV-ON |
| 13 | 30 | Deviation counter clear input | CL | 30 | Deviation counter clear input | CL |
| 14 | 14 | Speed command input | SPR | NC | | |
| 15 | 15 | Signal ground | GND | 15 | Signal ground | GND |
| 16 | 43 | Speed monitor output | SP | 43 | Speed monitor output | SP |
| 17 | 25 | Signal ground | GND | 25 | Signal ground | GND |
| 18 | 50 | Frame ground | FG | 50 | Frame ground | FG |
| 19 | 21 | A-phase output | OA+ | 21 | A-phase output | OA+ |
| 20 | 22 | A-phase output | OA- | 22 | A-phase output | OA- |
| 21 | 48 | B-phase output | OB+ | 48 | B-phase output | OB+ |
| 22 | 49 | B-phase output | OB- | 49 | B-phase output | OB- |
| 23 | NC | | | NC | | |
| 24 | NC | | | NC | | |
| 25 | 39 | Positioning complete output Speed arrival output | COIN+ AT-SPEED+ | 39 | Positioning complete output Speed arrival output | COIN+ AT-SPEED+ |
| 26 | 37 | Servo-Alarm output | ALM+ | 37 | Servo-Alarm output | ALM+ |
| 27 | 35 | Servo-Ready output | S-RDY+ | 35 | Servo-Ready output | S-RDY+ |
| 28 | 34 | Positioning complete output (-) Speed arrival output (-) | COIN- AT-SPEED- | 34 | Positioning complete output (-) Speed arrival output (-) | COIN- AT-SPEED- |
| | 36 | Servo-Alarm output (-) | ALM- | 36 | Servo-Alarm output (-) | ALM- |
| | 38 | Servo-Ready output (-) | S-RDY- | 38 | Servo-Ready output (-) | S-RDY- |
| | 41 | Power supply for control signal (-) | COM- | 41 | Power supply for control signal (-) | COM- |
| 29 | 8 | CW over-travel inhibit input | CWL | 8 | CW over-travel inhibit input | CWL |
| 30 | 9 | CCW over-travel inhibit input | CCWL | 9 | CCW over-travel inhibit input | CCWL |
| 31 | 31 | Alarm clear input | A-CLR | 31 | Alarm clear input | A-CLR |
| 32 | 32 | Control mode switching input | C-MODE | 32 | Control mode switching input | C-MODE |
| 33 | 18 | CW direction torque limit input | CWTL | 18 | CW direction torque limit input | CWTL |
| 34 | 16 | CCW direction torque limit input | CCWTL | 14 | Torque command input | TRQR |
| 35 | 17 | Signal ground | GND | 17 | Signal ground | GND |
| 36 | 42 | Torque monitor output | IM | 42 | Torque monitor output | IM |

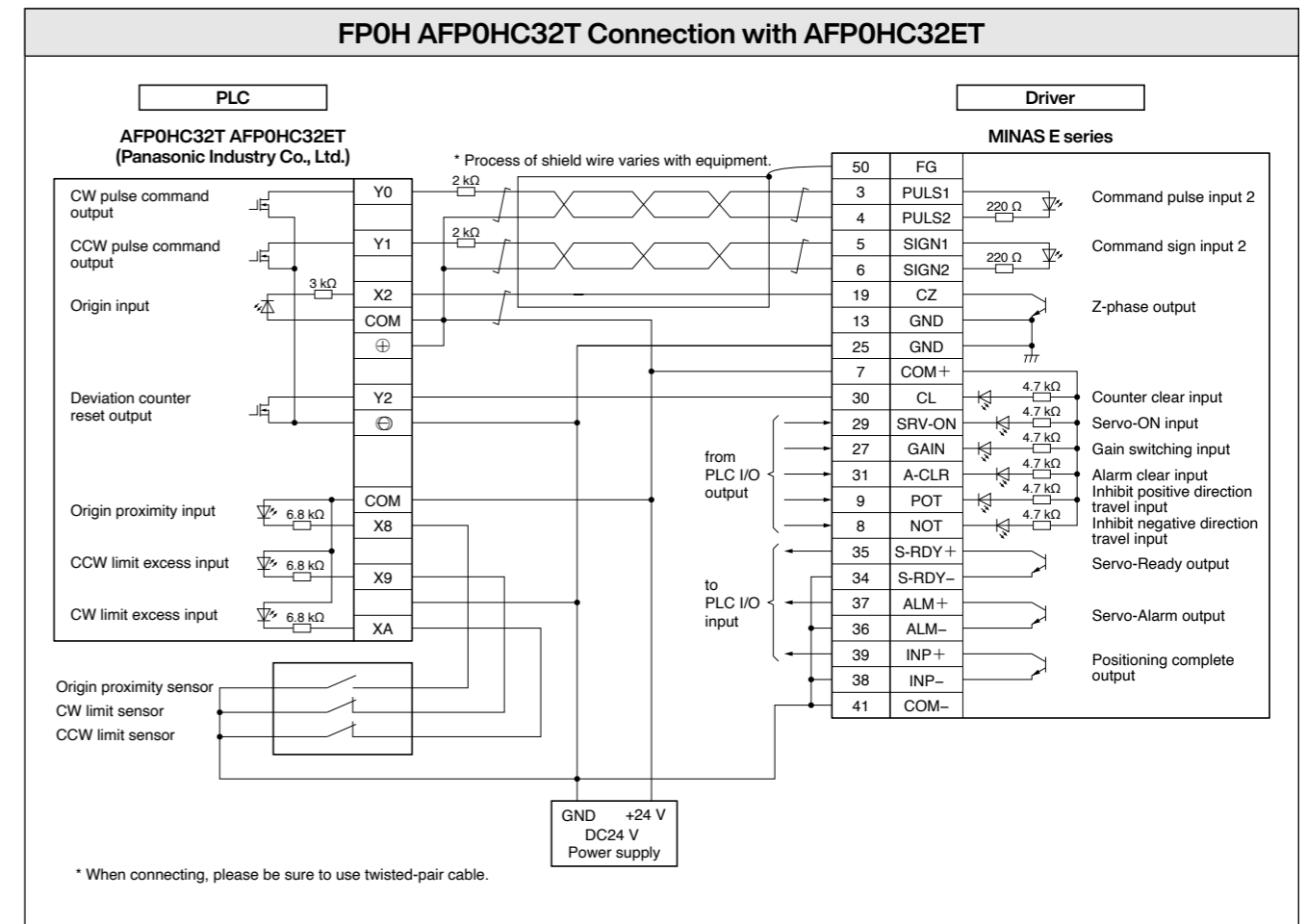
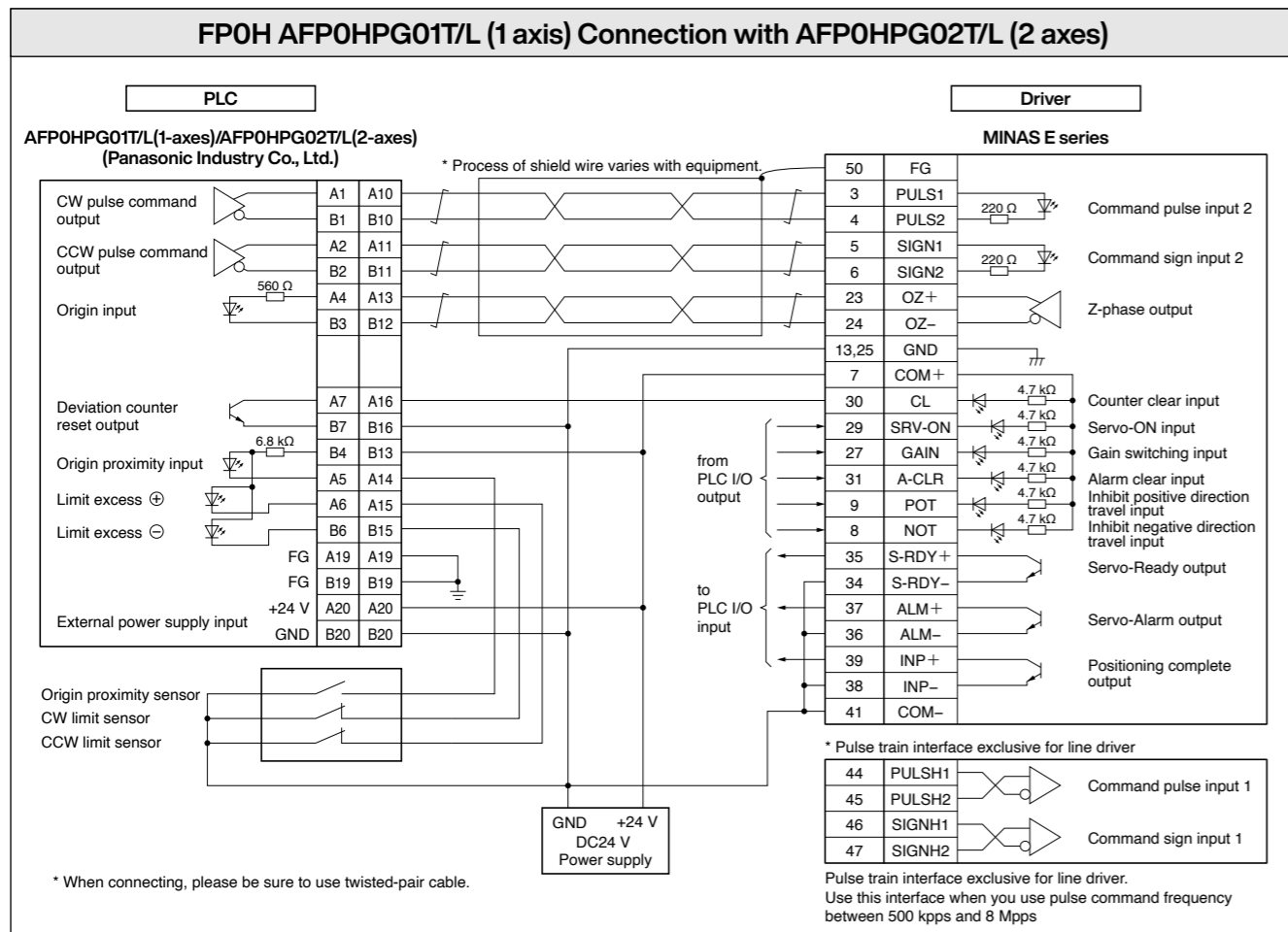
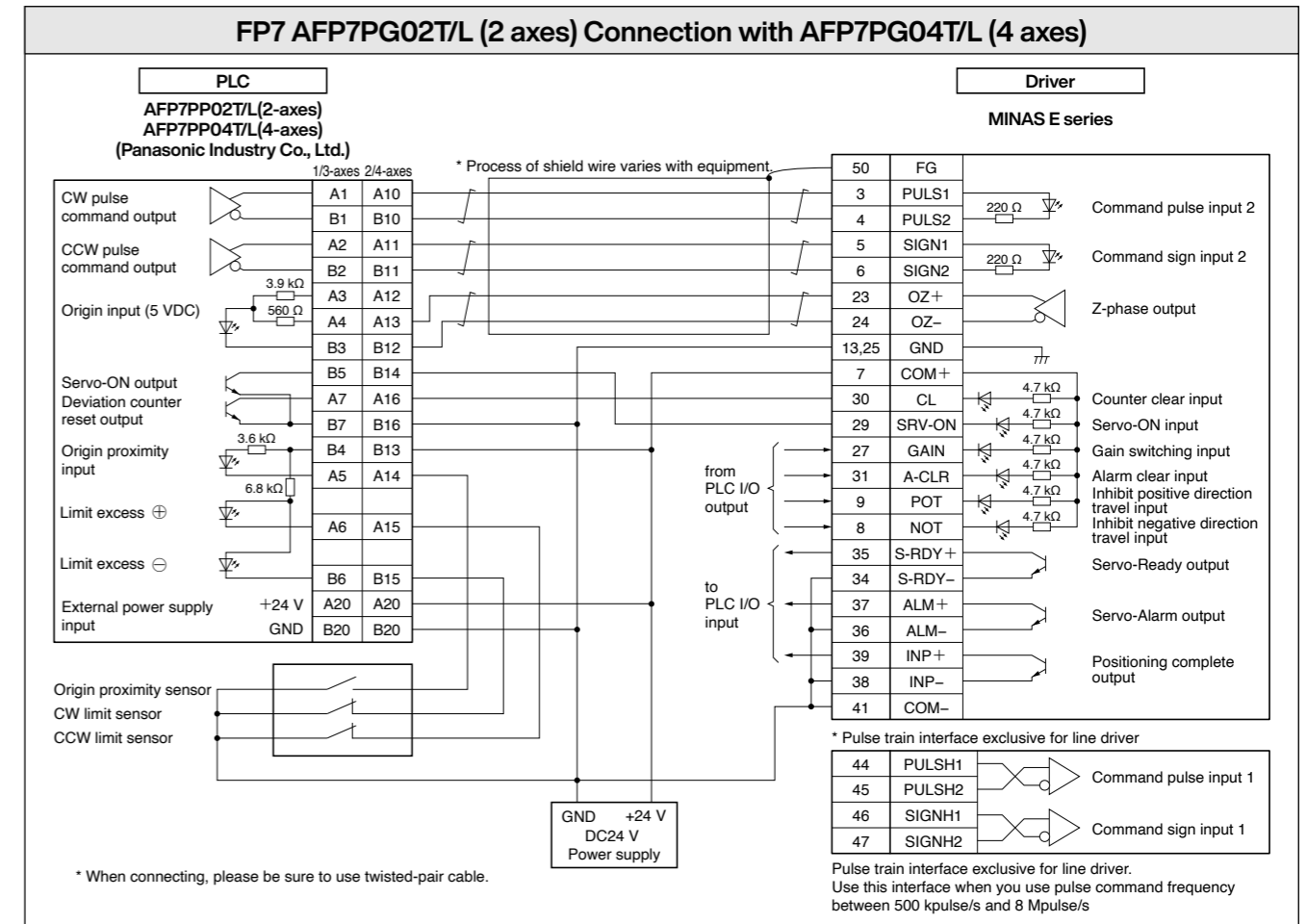
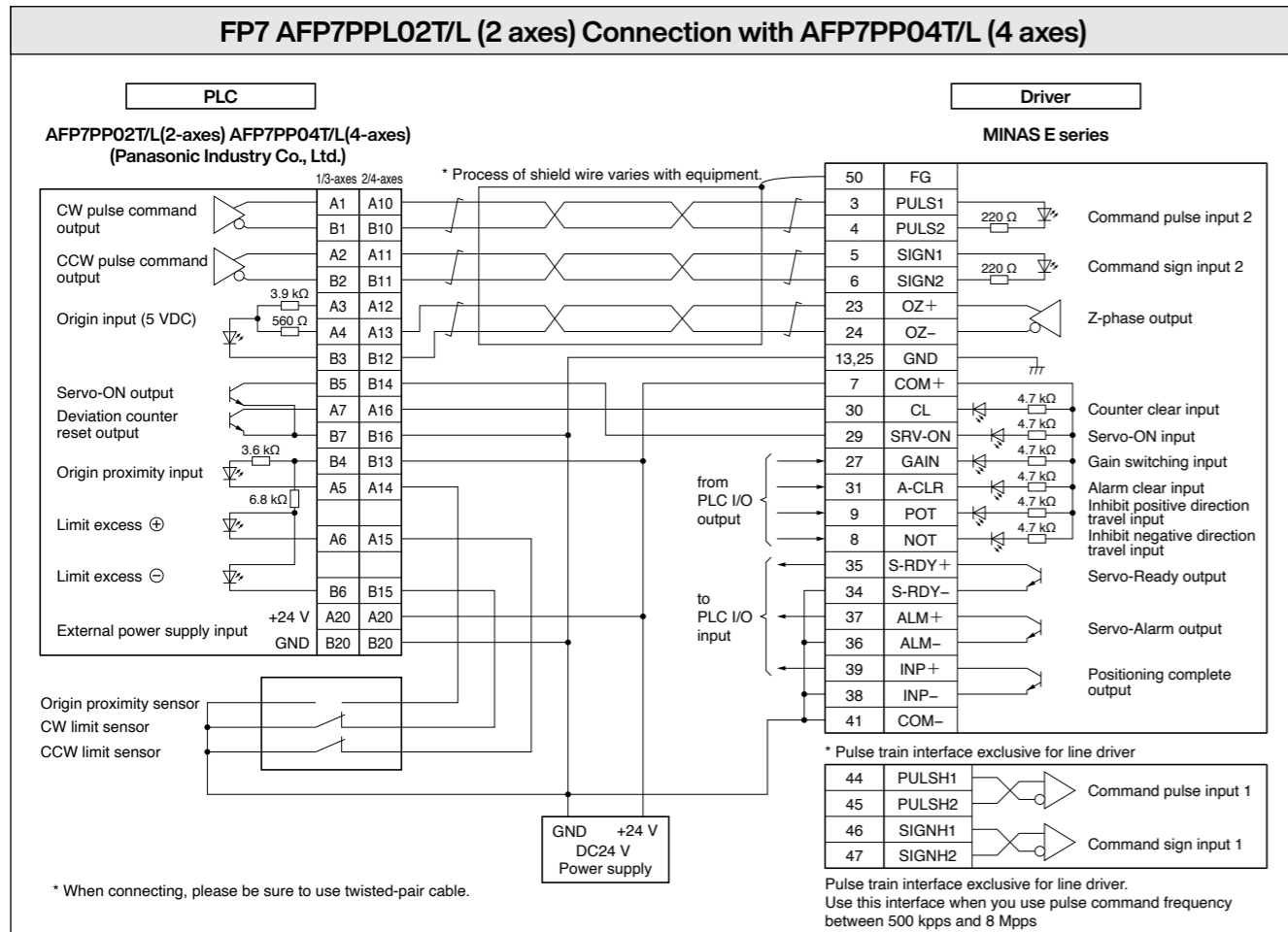
* "NC" is no connect.

| Pin No. on Old Model | DV0P4130 | | | DV0P4131 | | |
|----------------------|--------------------------|-------------------------------------|----------|--------------------------|---|-----------|
| | Pin No. on Current Model | Signal Name | Symbol | Pin No. on Current Model | Signal Name | Symbol |
| 1 | 8 | CW over-travel inhibit input | CWL | 8 | CW over-travel inhibit input | CWL |
| 2 | 9 | CCW over-travel inhibit input | CCWL | 9 | CCW over-travel inhibit input | CCWL |
| 3 | 3 | Command pulse input 2 | PULS1 | NC | | |
| 4 | 4 | Command pulse input 2 | PULS2 | NC | | |
| 5 | 5 | Command pulse sign input 2 | SIGN1 | NC | | |
| 6 | 6 | Command pulse sign input 2 | SIGN2 | NC | | |
| 7 | 7 | Power supply for control signal (+) | COM+ | 7 | Power supply for control signal (+) | COM+ |
| 8 | NC | | | NC | | |
| 9 | NC | | | NC | | |
| 10 | NC | | | NC | | |
| 11 | 11 | External brake release signal | BRK-OFF+ | 11 | External brake release signal | BRK-OFF+ |
| 12 | 12 | Zero-speed detection output signal | ZSP | 12 | Zero-speed detection output signal | ZSP |
| 13 | 13 | Torque in-limit signal output | TLC | 13 | Torque in-limit signal output | TLC |
| 14 | NC | | | 14 | Speed command input | SPR |
| 15 | 15 | Signal ground | GND | 15 | Signal ground | GND |
| 16 | 16 | CCW direction torque limit input | CCWTL | 16 | CCW direction torque limit input | CCWTL |
| 17 | 17 | Signal ground | GND | 17 | Signal ground | GND |
| 18 | 18 | CW direction torque limit input | CWTL | 18 | CW direction torque limit input | CWTL |
| 19 | 19 | Z-phase output | CZ | 19 | Z-phase output | CZ |
| 20 | NC | | | NC | | |
| 21 | 21 | A-phase output | OA+ | 21 | A-phase output | OA+ |
| 22 | 22 | A-phase output | OA- | 22 | A-phase output | OA- |
| 23 | 23 | Z-phase output | OZ+ | 23 | Z-phase output | OZ+ |
| 24 | 24 | Z-phase output | OZ- | 24 | Z-phase output | OZ- |
| 25 | 50 | Frame ground | FG | 50 | Frame ground | FG |
| 26 | 26 | Speed zero clamp input | ZEROSPD | 26 | Speed zero clamp input | ZEROSPD |
| 27 | 27 | Gain switching input | GAIN | 27 | Gain switching input | GAIN |
| 28 | NC | | | 33 | Selection 1 input of internal command speed | INTSPD1 |
| 29 | 29 | Servo-ON input | SRV-ON | 29 | Servo-ON input | SRV-ON |
| 30 | 30 | Deviation counter clear input | CL | NC | | |
| 31 | 31 | Alarm clear input | A-CLR | 31 | Alarm clear input | A-CLR |
| 32 | 32 | Control mode switching input | C-MODE | 32 | Control mode switching input | C-MODE |
| 33 | 33 | Command pulse inhibition input | INH | NC | | |
| 34 | NC | | | NC | | |
| 35 | 35 | Servo-Ready output | S-RDY+ | 35 | Servo-Ready output | S-RDY+ |
| 36 | NC | | | NC | | |
| 37 | 37 | Servo-Alarm output | ALM+ | 37 | Servo-Alarm output | ALM+ |
| 38 | NC | | | NC | | |
| 39 | 39 | Positioning complete output | COIN+ | 39 | Speed arrival output | AT-SPEED+ |
| 40 | 40 | Torque in-limit signal output | TLC | 40 | Torque in-limit signal output | TLC |
| 41 | 10 | External brake release signal (-) | BRK-OFF- | 10 | External brake release signal (-) | BRK-OFF- |
| | 34 | Positioning complete output (-) | COIN- | 34 | Speed arrival output (-) | AT-SPEED- |
| | 36 | Servo-Alarm output (-) | ALM- | 36 | Servo-Alarm output (-) | ALM- |
| | 38 | Servo-Ready output (-) | S-RDY- | 38 | Servo-Ready output (-) | S-RDY- |
| | 41 | Power supply for control signal (-) | COM- | 41 | Power supply for control signal (-) | COM- |
| 42 | 42 | Torque monitor output | IM | 42 | Torque monitor output | IM |
| 43 | 43 | Speed monitor output | SP | 43 | Speed monitor output | SP |
| 44 | 25 | Signal ground | GND | 25 | Signal ground | GND |
| 45 | 25 | Signal ground | GND | 25 | Signal ground | GND |
| 46 | 25 | Signal ground | GND | 25 | Signal ground | GND |
| 47 | NC | | | NC | | |
| 48 | 48 | B-phase output | OB+ | 48 | B-phase output | OB+ |
| 49 | 49 | B-phase output | OB- | 49 | B-phase output | OB- |
| 50 | 50 | Frame ground | FG | 50 | Frame ground | FG |

* "NC" is no connect.

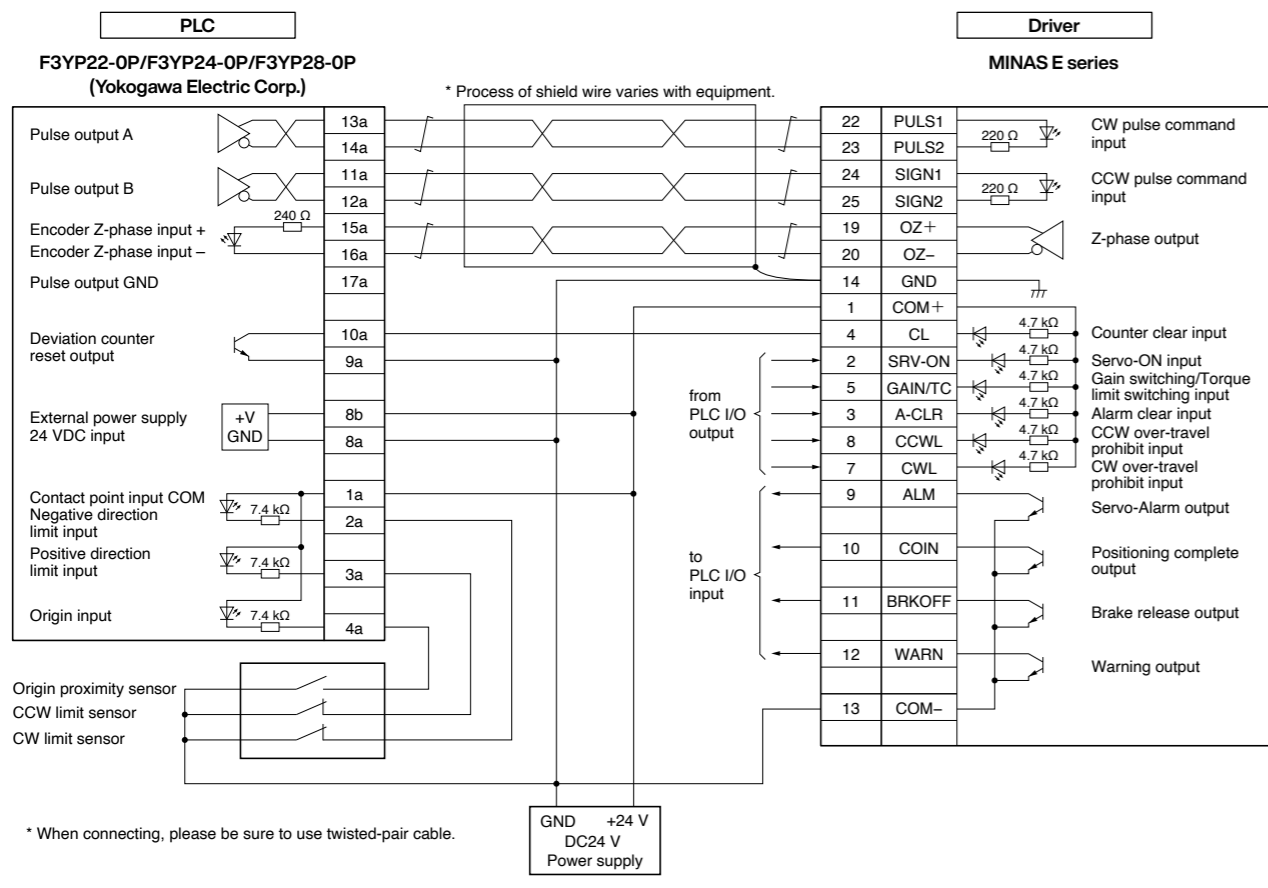
| Pin No. on Old Model | DV0P4132 | | |
|----------------------|--------------------------|-------------------------------------|-----------|
| | Pin No. on Current Model | Signal Name | Symbol |
| 1 | 8 | CW over-travel inhibit input | CWL |
| 2 | 9 | CCW over-travel inhibit input | CCWL |
| 3 | NC | | |
| 4 | NC | | |
| 5 | NC | | |
| 6 | NC | | |
| 7 | 7 | Power supply for control signal (+) | COM+ |
| 8 | NC | | |
| 9 | NC | | |
| 10 | NC | | |
| 11 | 11 | External brake release signal | BRK-OFF+ |
| 12 | 12 | Zero-speed detection output signal | ZSP |
| 13 | 13 | Torque in-limit signal output | TLC |
| 14 | NC | | |
| 15 | 15 | Signal ground | GND |
| 16 | 16 | Torque command input | TRQR |
| 17 | 17 | Signal ground | GND |
| 18 | 18 | CW direction torque limit input | CWTL |
| 19 | 19 | Z-phase output | CZ |
| 20 | NC | | |
| 21 | 21 | A-phase output | OA+ |
| 22 | 22 | A-phase output | OA- |
| 23 | 23 | Z-phase output | OZ+ |
| 24 | 24 | Z-phase output | OZ- |
| 25 | 50 | Frame ground | FG |
| 26 | 26 | Speed zero clamp input | ZEROSPD |
| 27 | 27 | Gain switching input | GAIN |
| 28 | NC | | |
| 29 | 29 | Servo-ON input | SRV-ON |
| 30 | NC | | |
| 31 | 31 | Alarm clear input | A-CLR |
| 32 | 32 | Control mode switching input | C-MODE |
| 33 | NC | | |
| 34 | NC | | |
| 35 | 35 | Servo-Ready output | S-RDY+ |
| 36 | NC | | |
| 37 | 37 | Servo-Alarm output | ALM+ |
| 38 | NC | | |
| 39 | 39 | Speed arrival output | AT-SPEED+ |
| 40 | 40 | Torque in-limit signal output | TLC |
| 41 | 10 | External brake release signal (-) | BRK-OFF- |
| | 34 | Speed arrival output (-) | AT-SPEED- |
| | 36 | Servo-Alarm output (-) | ALM- |
| | 38 | Servo-Ready output (-) | S-RDY- |
| | 41 | Power supply for control signal (-) | COM- |
| 42 | 42 | Torque monitor output | IM |
| 43 | 43 | Speed monitor output | SP |
| 44 | 25 | Signal ground | GND |
| 45 | 25 | Signal ground | GND |
| 46 | 25 | Signal ground | GND |
| 47 | NC | | |
| 48 | 48 | B-phase output | OB+ |
| 49 | 49 | B-phase output | OB- |
| 50 | 50 | Frame ground | FG |

* "NC" is no connect.

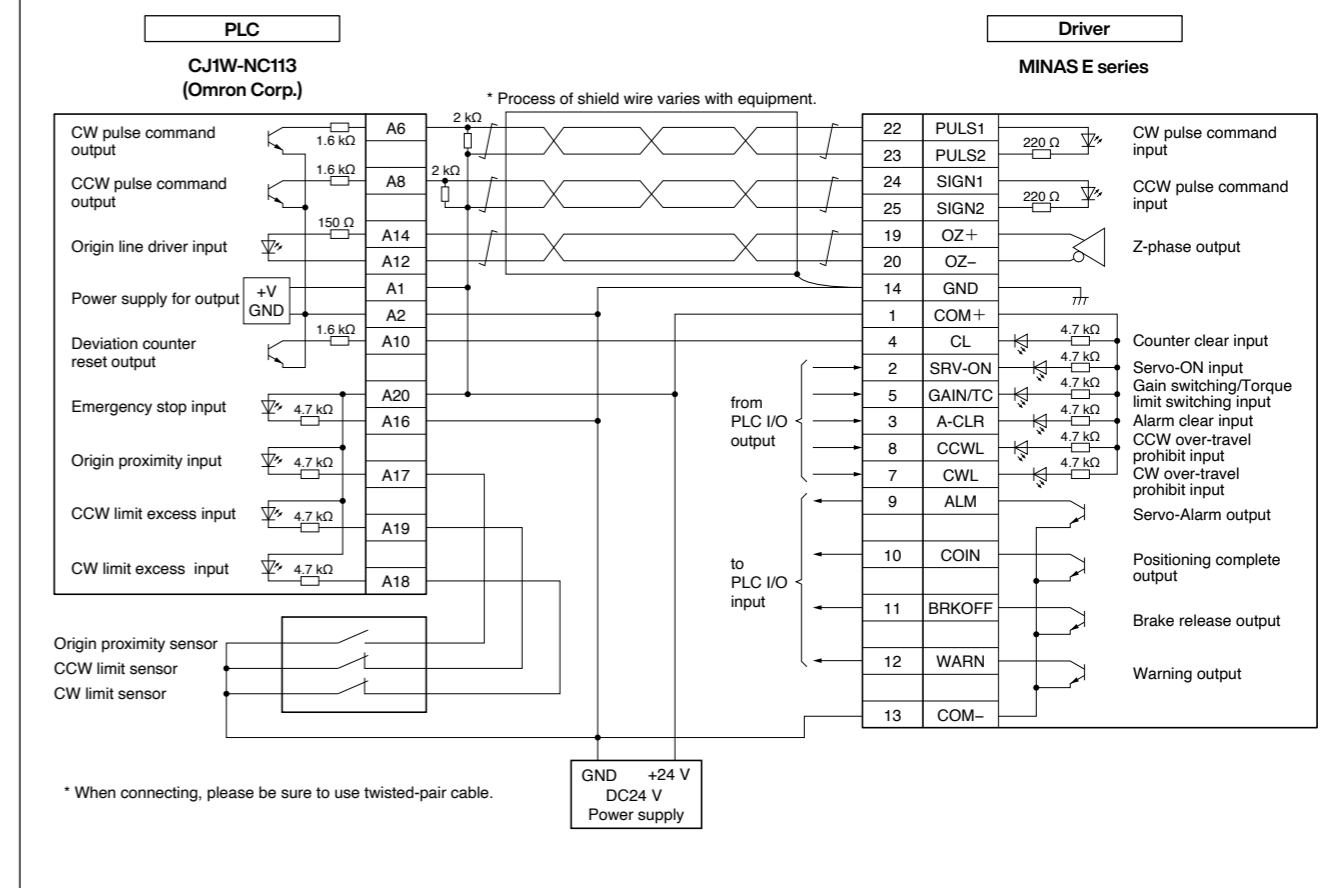


A6 Series
A6N Series
A6B Series
Special Order Product
E Series
Information

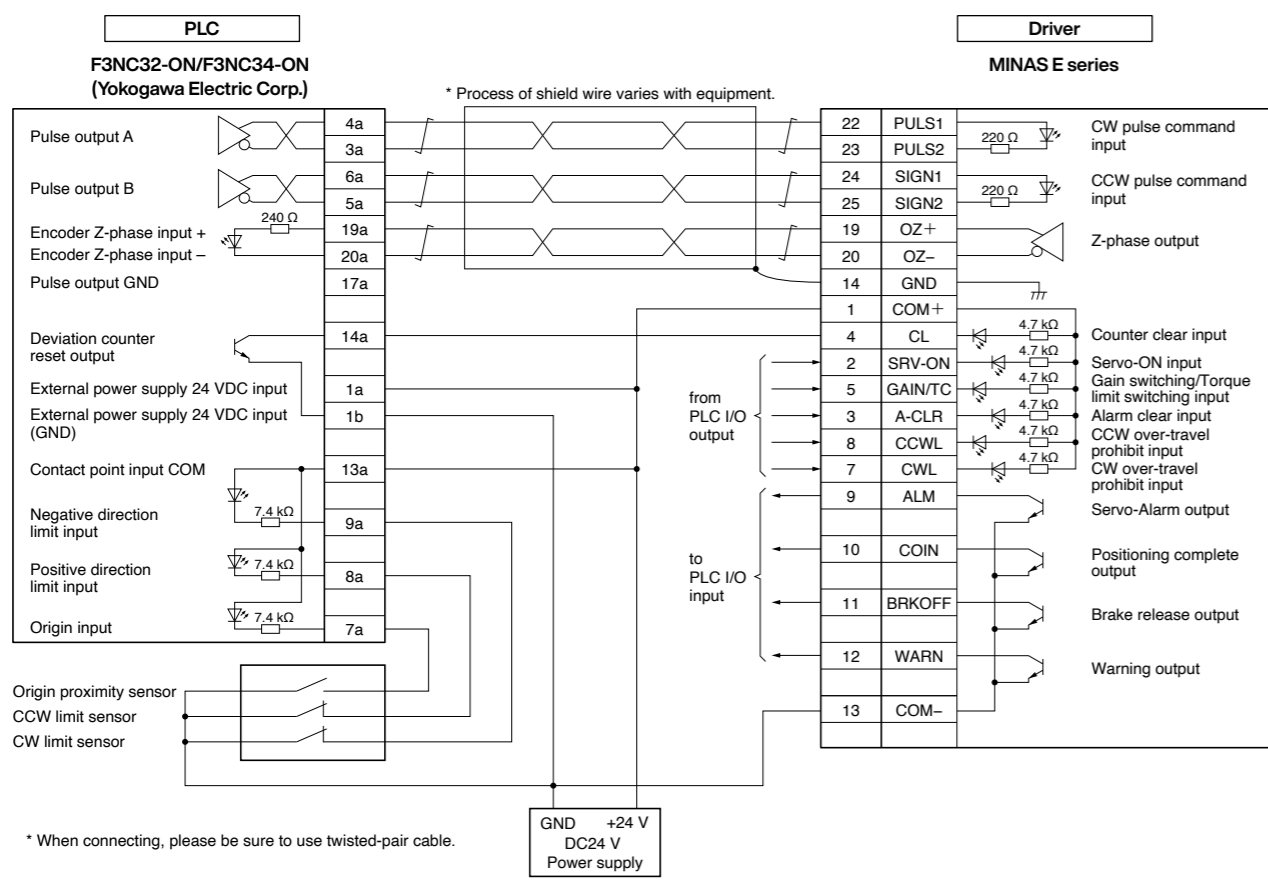
F3YP22-0P/F3YP24-0P/F3YP28-0P Connection with the Yokogawa Electric Corp.



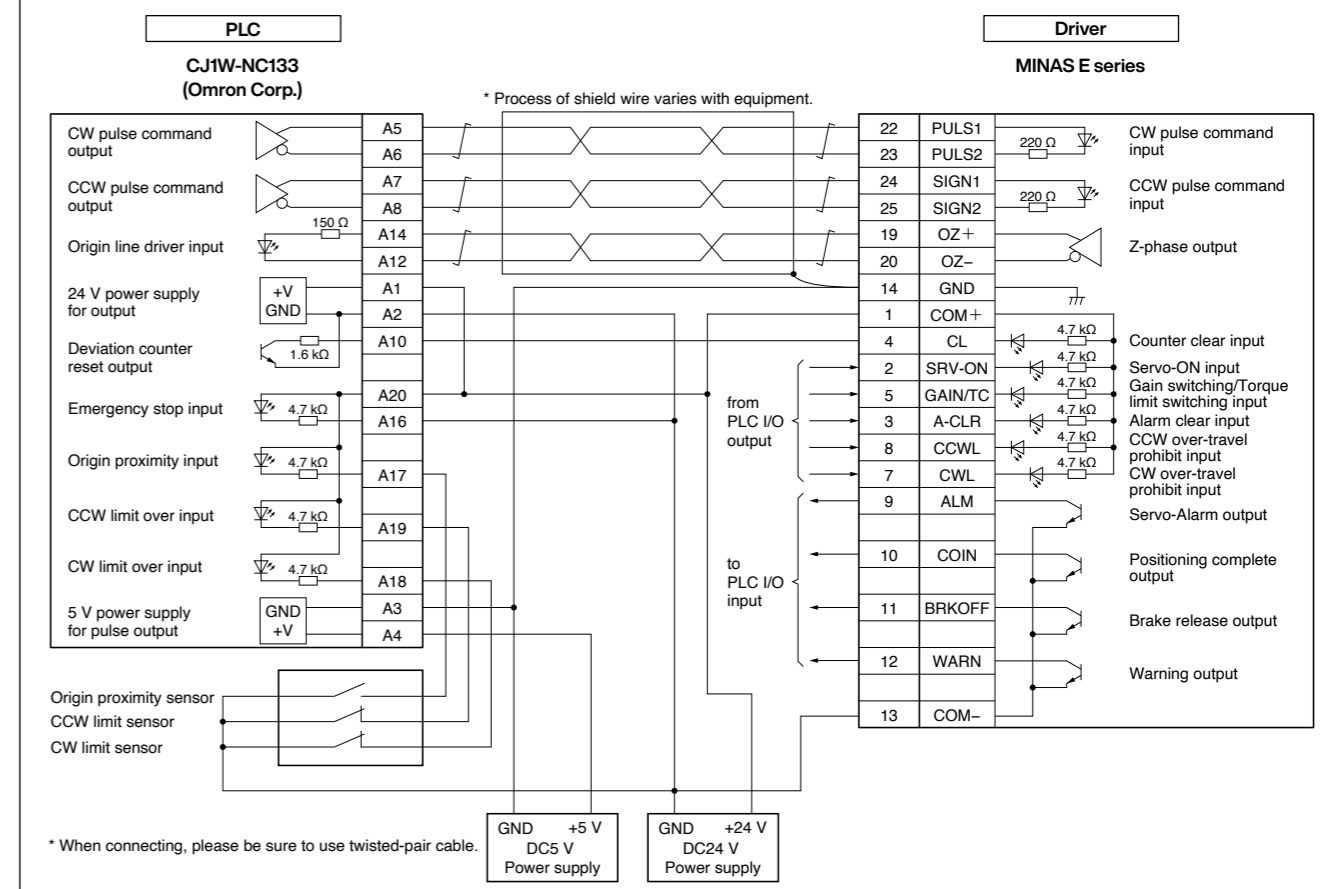
CJ1W-NC113 Connection with the Omron Corp.

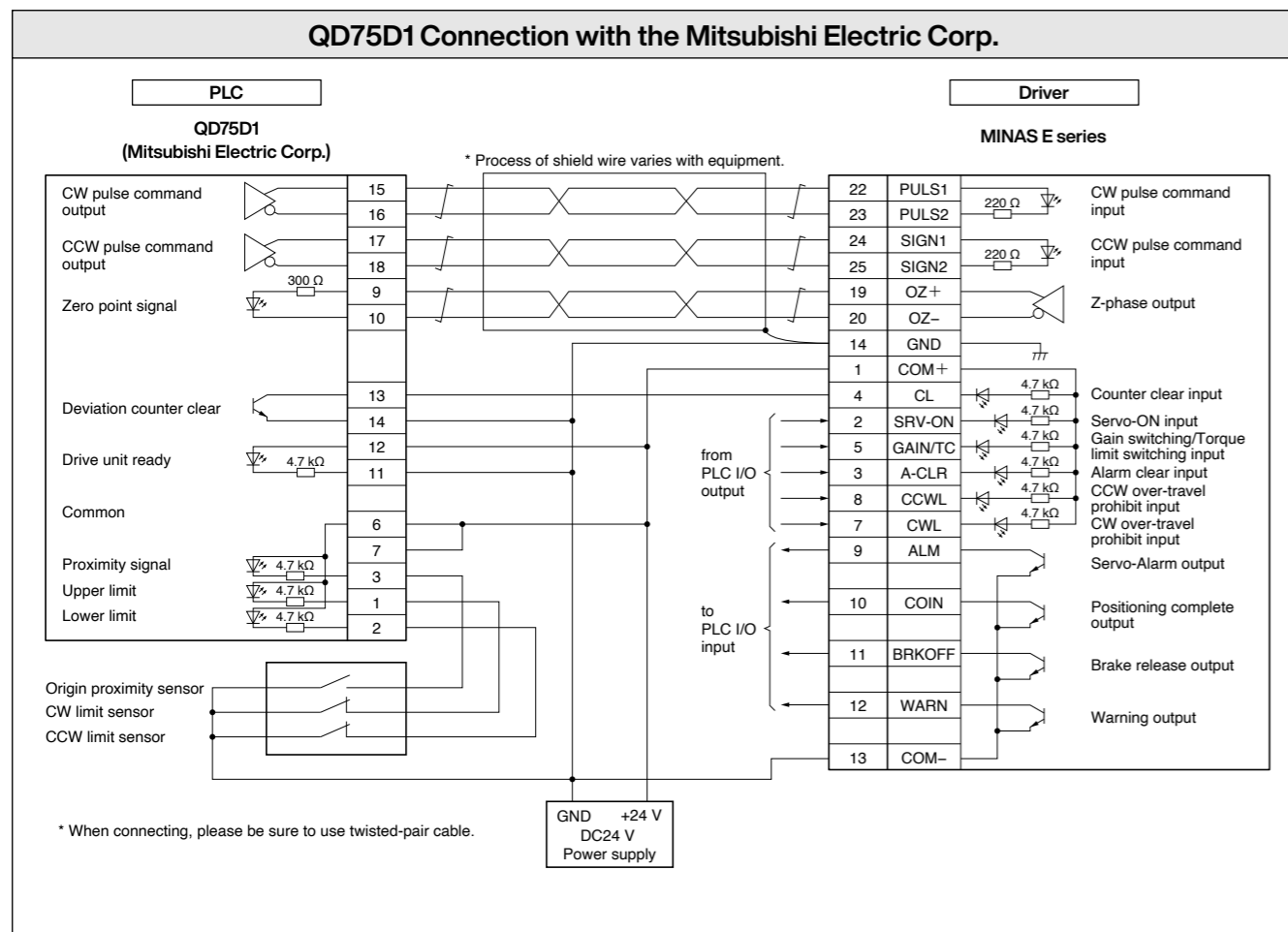


F3NC32-ON/F3NC34-ON Connection with the Yokogawa Electric Corp.



CJ1W-NC133 Connection with the Omron Corp.





| DVOP | Part No. | Title | Page |
|------------|--|---------|------|
| DVOP0770 | Connector kit for external peripheral equipment | 368-402 | |
| DVOP0800 | Interface cable | 368-403 | |
| DVOP1450 | Surge absorber (3-phase) | 413-416 | |
| DVOP1460 | Ferrite core | 416 | |
| DVOP1960 | Communication cable | 403 | |
| DVOP220 | Reactor | 342-405 | |
| DVOP221 | Reactor | 342 | |
| DVOP222 | Reactor | 342 | |
| DVOP223 | Reactor | 342 | |
| DVOP224 | Reactor | 342 | |
| DVOP225 | Reactor | 342 | |
| DVOP227 | Reactor | 342-405 | |
| DVOP228 | Reactor | 342-405 | |
| DVOP2870 | Connector kit for power supply connection | 401 | |
| DVOP2890 | External regenerative resistor | 404 | |
| DVOP2891 | External regenerative resistor | 404 | |
| DVOP2990 | Battery for absolute encoder | 338 | |
| DVOP3410 | Noise filter | 412 | |
| DVOP3670 | Connector kit for motor/encoder connection | 401 | |
| DVOP37300 | Cable set (3 m) | 400 | |
| DVOP3811 | DIN rail mounting unit | 404 | |
| DVOP39200 | Cable set (5 m) | 400 | |
| DVOP4120 | Interface conversion cable | 439 | |
| DVOP4121 | Interface conversion cable | 439 | |
| DVOP4130 | Interface conversion cable | 439 | |
| DVOP4131 | Interface conversion cable | 439 | |
| DVOP4132 | Interface conversion cable | 439 | |
| DVOP4160 | Noise filter | 416 | |
| DVOP4170 | Noise filter | 412 | |
| DVOP4190 | Surge absorber (Single phase) | 413-416 | |
| DVOP4220 | Noise Filter | 412 | |
| DVOP4280 | External regenerative resistor: 50 Ω 25 W | 343 | |
| DVOP4281 | External regenerative resistor: 100 Ω 25 W | 343 | |
| DVOP4282 | External regenerative resistor: 25 Ω 50 W | 343 | |
| DVOP4283 | External regenerative resistor: 50 Ω 50 W | 343 | |
| DVOP4284 | External regenerative resistor: 30 Ω 100 W | 343 | |
| DVOP4285 | External regenerative resistor: 20 Ω 130 W | 343 | |
| DVOP4290 | Connector kit for motor/encoder connection | 326 | |
| DVOP4310 | Connector kit for motor/encoder connection | 331 | |
| DVOP4320 | Connector kit for motor/encoder connection | 332 | |
| DVOP4330 | Connector kit for motor/encoder connection | 331 | |
| DVOP4340 | Connector kit for motor/encoder connection | 332 | |
| DVOP4350 | Interface connector | 324 | |
| DVOP4360 | Interface cable | 322 | |
| DVOP4420 | Console | 403 | |
| DVOP4430 | Battery box | 338 | |
| DVOP4460 | Setup support software "PANATERM" for MINAS series AC servo motor & driver | 398 | |
| DVOPM20010 | Connector Kit: Encoder | 324 | |
| DVOPM20026 | Connector kit: External scale | 324 | |
| DVOPM20032 | Connector for power supply input connection (A-frame to D-frame (Single row type)) | 325 | |
| DVOPM20033 | Connector for power supply input connection (A-frame to D-frame (Double row type)) | 325 | |
| DVOPM20034 | Connector for motor connection (A-frame to D-frame) | 326 | |
| DVOPM20035 | Connector kit for motor/encoder connection | 327 | |
| DVOPM20036 | Connector kit for motor/encoder connection | 331 | |
| DVOPM20037 | Connector kit for motor/encoder connection | 332 | |
| DVOPM20038 | Connector kit for motor/encoder connection | 331 | |
| DVOPM20039 | Connector kit for motor/encoder connection | 332 | |
| DVOPM20040 | Connector kit for motor/brake connection | 337 | |
| DVOPM20042 | Noise filter | 412 | |
| DVOPM20043 | Noise filter | 412 | |
| DVOPM20044 | Connector for power supply input connection (E-frame) | 325 | |
| DVOPM20045 | Connector for regenerative resistor (E-frame 200 V/400 V common) | 325 | |
| DVOPM20046 | Connector for motor connection (E-frame 200 V/400 V common) | 326 | |
| DVOPM20047 | Reactor | 342 | |
| DVOPM20056 | Connector kit for motor/encoder connection | 334 | |
| DVOPM20057 | Connector kit for motor/encoder connection | 334 | |
| DVOPM20094 | Safety by-pass plug | 323 | |

| DVOP | Part No. | Title | Page |
|------------|--|-------|------|
| DVOPM20100 | Mounting bracket for A-frame and B-frame | 340 | |
| DVOPM20101 | Mounting bracket for C-frame and D-frame | 341 | |
| DVOPM20102 | Connector kit: RS485, 232 | 323 | |
| DVOPM20103 | Connector kit: Safety | 323 | |
| DVOPM20107 | Connector kit for motor/encoder connection | 333 | |
| DVOPM20108 | Connector kit for motor/encoder connection | 333 | |
| DVOPM20109 | Connector kit for motor/encoder connection | 335 | |
| DVOPM20110 | Connector kit for motor/encoder connection | 335 | |
| DVOPM20111 | Connector kit for motor/encoder connection | 333 | |
| DVOPM20112 | Connector kit for motor/encoder connection | 334 | |
| DVOPM20113 | Connector kit for motor/encoder connection | 335 | |
| DVOPM20114 | Connector kit for motor/encoder connection | 336 | |
| DVOPM20115 | Connector kit for motor/encoder connection | 336 | |
| DVOPM20116 | Connector kit for motor/encoder connection | 336 | |
| DVOPM24581 | Connector kit for motor/encoder connection | 328 | |
| DVOPM24582 | Connector kit for motor/encoder connection | 328 | |
| DVOPM24583 | Connector kit for motor/encoder connection | 329 | |
| DVOPM24584 | Connector kit for motor/encoder connection | 330 | |
| DVOPM24585 | Connector kit for motor/encoder connection | 329 | |
| DVOPM24586 | Connector kit for motor/encoder connection | 330 | |
| DVOPM24587 | Connector kit for motor/encoder connection | 329 | |
| DVOPM24588 | Connector kit for motor/encoder connection | 330 | |
| DVOPM24589 | Connector kit for motor/encoder connection | 329 | |
| DVOPM24590 | Connector kit for motor/encoder connection | 330 | |
| DVOPM24610 | Daisy Chain | 345 | |

| MADL | Part No. | Title | Page |
|-----------|-----------------------------|---------|------|
| MADLN01NE | A6NE series driver: A-frame | 361-362 | |
| MADLN01SE | A6SE series driver: A-frame | 45-46 | |
| MADLN01SG | A6SG series driver: A-frame | 45-46 | |
| MADLN05NE | A6NE series driver: A-frame | 361-362 | |
| MADLN05SE | A6SE series driver: A-frame | 45-46 | |
| MADLN05SG | A6SG series driver: A-frame | 45-46 | |
| MADLN11NE | A6NE series driver: A-frame | 361-362 | |
| MADLN11SE | A6SE series driver: A-frame | 45-46 | |
| MADLN11SG | A6SG series driver: A-frame | 45-46 | |
| MADLN15NE | A6NE series driver: A-frame | 361-362 | |
| MADLN15SE | A6SE series driver: A-frame | 45-46 | |
| MADLN15SG | A6SG series driver: A-frame | 45-46 | |
| MADLT01NF | A6NF series driver: A-frame | 359-360 | |
| MADLT01SF | A6SF series driver: A-frame | 43-44 | |
| MADLT05NF | A6NF series driver: A-frame | 359-360 | |
| MADLT05SF | A6SF series driver: A-frame | 43-44 | |
| MADLT11NF | A6NF series driver: A-frame | 359-360 | |
| MADLT11SF | A6SF series driver: A-frame | 43-44 | |
| MADLT15NF | A6NF series driver: A-frame | 359-360 | |
| MADLT15SF | A6SF series driver: A-frame | 43-44 | |

| MBDL | Part No. | Title | Page |
|-----------|-----------------------------|---------|------|
| MBDLN21NE | A6NE series driver: B-frame | 361-362 | |
| MBDLN21SE | A6SE series driver: B-frame | 45-46 | |
| MBDLN21SG | A6SG series driver: B-frame | 45-46 | |
| MBDLN25NE | A6NE series driver: B-frame | 361-362 | |
| MBDLN25SE | A6SE series driver: B-frame | 45-46 | |
| MBDLN25SG | A6SG series driver: B-frame | 45-46 | |
| MBDLT21NF | A6NF series driver: B-frame | 359-360 | |
| MBDLT21SF | A6SF series driver: B-frame | 43-44 | |
| MBDLT25NF | A6NF series driver: B-frame | 359-360 | |
| MBDLT25SF | A6SF series driver: B-frame | 43-44 | |

| MCDL | Part No. | Title | Page |
|-----------|-----------------------------|---------|------|
| MCDLN31NE | A6NE series driver: C-frame | 361-362 | |
| MCDLN31SE | A6SE series driver: C-frame | 45-46 | |
| MCDLN31SG | A6SG series driver: C-frame | 45-46 | |
| MCDLN35NE | A6NE series driver: C-frame | 361-362 | |
| MCDLN35SE | A6SE series driver: C-frame | 45-46 | |
| MCDLN35SG | A6SG series driver: C-frame | 45-46 | |
| MCDLT31NF | A6NF series driver: C-frame | 359-360 | |
| MCDLT31SF | A6SF series driver: C-frame | 43-44 | |

Index
(Alphabetical Order)

| MSMF (Low inertia) | | |
|--------------------|------------------------------------|-------|
| Part No. | Title | Page |
| MSMF302L1H7 | MSMF 3.0 kW 200 V Motor | 76 |
| MSMF302L1H8 | MSMF 3.0 kW 200 V Motor | 76 |
| MSMF302L1H8M | MSMF 3.0 kW 200 V Motor | 220 |
| MSMF402L1C5 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1C6 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1C6M | MSMF 4.0 kW 200 V Motor | 221 |
| MSMF402L1C7 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1C8 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1C8M | MSMF 4.0 kW 200 V Motor | 221 |
| MSMF402L1D5 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1D6 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1D6M | MSMF 4.0 kW 200 V Motor | 221 |
| MSMF402L1D7 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1D8 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1D8M | MSMF 4.0 kW 200 V Motor | 221 |
| MSMF402L1G5 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1G6 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1G6M | MSMF 4.0 kW 200 V Motor | 221 |
| MSMF402L1G7 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1G8 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1G8M | MSMF 4.0 kW 200 V Motor | 221 |
| MSMF402L1H5 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1H6 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1H6M | MSMF 4.0 kW 200 V Motor | 221 |
| MSMF402L1H7 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1H8 | MSMF 4.0 kW 200 V Motor | 77 |
| MSMF402L1H8M | MSMF 4.0 kW 200 V Motor | 221 |
| MSMF502L1C5 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1C6 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1C6M | MSMF 5.0 kW 200 V Motor | 222 |
| MSMF502L1C7 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1C8 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1C8M | MSMF 5.0 kW 200 V Motor | 222 |
| MSMF502L1D5 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1D6 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1D6M | MSMF 5.0 kW 200 V Motor | 222 |
| MSMF502L1D7 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1D8 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1D8M | MSMF 5.0 kW 200 V Motor | 222 |
| MSMF502L1G5 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1G6 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1G6M | MSMF 5.0 kW 200 V Motor | 222 |
| MSMF502L1G7 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1G8 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1G8M | MSMF 5.0 kW 200 V Motor | 222 |
| MSMF502L1H5 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1H6 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1H6M | MSMF 5.0 kW 200 V Motor | 222 |
| MSMF502L1H7 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1H8 | MSMF 5.0 kW 200 V Motor | 78 |
| MSMF502L1H8M | MSMF 5.0 kW 200 V Motor | 222 |
| MSMF5AZL1A1 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1A2 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1A2M | MSMF 50 W 100 V/200 V common Motor | 211 |
| MSMF5AZL1B1 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1B2 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1B2M | MSMF 50 W 100 V/200 V common Motor | 211 |
| MSMF5AZL1C1 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1C2 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1C2M | MSMF 50 W 100 V/200 V common Motor | 211 |
| MSMF5AZL1D1 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1D2 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1D2M | MSMF 50 W 100 V/200 V common Motor | 211 |
| MSMF5AZL1S1 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1S2 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1S2M | MSMF 50 W 100 V/200 V common Motor | 211 |
| MSMF5AZL1T1 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1T2 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1T2M | MSMF 50 W 100 V/200 V common Motor | 211 |
| MSMF5AZL1U1 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1U2 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1U2M | MSMF 50 W 100 V/200 V common Motor | 211 |

| MSMF (Low inertia) | | |
|--------------------|------------------------------------|-------|
| Part No. | Title | Page |
| MSMF5AZL1V1 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1V2 | MSMF 50 W 100 V/200 V common Motor | 63-64 |
| MSMF5AZL1V2M | MSMF 50 W 100 V/200 V common Motor | 211 |

| MUMA (Low inertia MINAS E series Motor) | | |
|---|--|----------------|
| Part No. | Title | Page |
| MUMA011P1S | MUMA 100 W 100 V Incremental encoder | 389-393 |
| MUMA011P1T | MUMA 100 W 100 V Incremental encoder | 389-393 |
| MUMA012P1S | MUMA 100 W 200 V Incremental encoder | 391-393 |
| MUMA012P1T | MUMA 100 W 200 V Incremental encoder | 391-393 |
| MUMA021P1S | MUMA 200 W 100 V Incremental encoder | 389-393 |
| MUMA021P1T | MUMA 200 W 100 V Incremental encoder | 389-393 |
| MUMA022P1S | MUMA 200 W 200 V Incremental encoder | 391-393 |
| MUMA022P1T | MUMA 200 W 200 V Incremental encoder | 391-393 |
| MUMA042P1S | MUMA 400 W 200 V Incremental encoder | 391-393 |
| MUMA042P1T | MUMA 400 W 200 V Incremental encoder | 391-393 |
| MUMA5AZP1S | MUMA 50 W 100 V/200 V common Incremental encoder | 389-391 393 |
| MUMA5AZP1T | MUMA 50 W 100 V/200 V common Incremental encoder | 389-391 393 |

| MUMA (MINAS E series Motor with gear reducer) | | |
|---|--|---------|
| Part No. | Title | Page |
| MUMA011P31N | MUMA with reduction gear 100 W 100 V Incremental encoder | 394-397 |
| MUMA011P32N | | 394-397 |
| MUMA011P34N | | 394-397 |
| MUMA011P41N | | 394-397 |
| MUMA011P42N | | 394-397 |
| MUMA011P44N | 394-397 | |
| MUMA012P31N | MUMA with reduction gear 100 W 200 V Incremental encoder | 394-397 |
| MUMA012P32N | | 394-397 |
| MUMA012P34N | | 394-397 |
| MUMA012P41N | | 394-397 |
| MUMA012P42N | | 394-397 |
| MUMA012P44N | 394-397 | |
| MUMA021P31N | MUMA with reduction gear 200 W 100 V Incremental encoder | 394-397 |
| MUMA021P32N | | 394-397 |
| MUMA021P34N | | 394-397 |
| MUMA021P41N | | 394-397 |
| MUMA021P42N | | 394-397 |
| MUMA021P44N | 394-397 | |
| MUMA022P31N | MUMA with reduction gear 200 W 200 V Incremental encoder | 394-397 |
| MUMA022P32N | | 394-397 |
| MUMA022P34N | | 394-397 |
| MUMA022P41N | | 394-397 |
| MUMA022P42N | | 394-397 |
| MUMA022P44N | 394-397 | |
| MUMA042P31N | MUMA with reduction gear 400 W 200 V Incremental encoder | 394-397 |
| MUMA042P32N | | 394-397 |
| MUMA042P34N | | 394-397 |
| MUMA042P41N | | 394-397 |
| MUMA042P42N | | 394-397 |
| MUMA042P44N | 394-397 | |

Sales Office

[Panasonic Industry Co., Ltd. Sales Office of Motors]

(November 01, 2023)

| Region | Company Name [Category] | City | Address | TEL |
|--------------------------------|--|---|--|--|
| | | | | FAX |
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| | Component Sales Division | Two Riverfront Plaza, 10th Floor Newark, NJ 07102-5490 U.S.A | +1-800-344-2112 | |
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| Industrial Automation Division | Two Riverfront Plaza, 10th Floor Newark, NJ 07102-5490 U.S.A | — | | |
| | Food Chain & Building Products Division | Two Riverfront Plaza, 10th Floor Newark, NJ 07102-5490 U.S.A | — | |
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| Brazil | Panasonic Do Brasil Limitada | São Paulo | Rua Alexandre Dumas, 1711 - 8 Andar torre 11, Chácara Santo Antônio, São Paulo SP Brazil | — — |
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| | | | Web site http://www.panasonic-electric-works.fr/ | — |
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A6 Series

A6N Series

A6B Series
Special Order Product

E Series

Information

Sales Office

| Region | Company Name [Category] | City | Address | TEL | |
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