Oriental motor

AZ Series

Battery-less Absolute Sensor Equipped

NEW

DC power-supply input

PS Geared Type Frame size 28 mm

Harmonic Geared Type Frame size 30 mm

New Generation & High-Precision Positioning Motors

αSTEP

Absolute × Battery-less
Advanced “positioning” is in your hand.

ADVANCED PERFORMANCE

New Generation & High-Precision Positioning Motors

αSTEP AZ Series

Battery-less Absolute Sensor Equipped

Equipped with a newly developed compact, battery-less, and absolute sensor (ABZO sensor)

Oriental Motor has developed a compact, battery-less, and low-cost mechanical driven type absolute sensor (ABZO sensor) which is patented. The sensor contributes to better productivity and cost reduction.

A battery-less mechanical driven sensor is used

A mechanical driven sensor consisting of multiple gears is employed. Recognizing the angle of each gear leads to the detection of positional information.

Multi-rotation absolute sensor

From the reference home position, absolute positions for ±900 rotations (for 1800 rotations) of the motor shaft can be detected.

Easily settable home position

Pressing the switch at the front of the driver allows easy setting of a home position.
You can also use data setting software (**MEXE02**) or external input signals to set a home position.

- Battery-less absolute sensor.
- With the use of the absolute system, no external sensors (home position sensors and limit sensors) and less wiring is required.
- With battery-less configuration, the maintenance frequency reduced and no battery replacement space is needed.
- With αSTEP excellent characteristics, high reliability, and energy saving is implemented.
- With a simplified sequence function*, capable of simplifying the sequence control program is possible.
  * Only for built-in controller type
- Monitoring of test operation conditions and motor operation conditions (alarms and statuses)*
  * Data setting software MEXE02 is required

AZ Series Lineup

We offer series of lineup that are compatible with various equipment, controls, and systems.

Motors

Standard Type

Frame size 20 mm～85 mm

TS Geared Type

(Spur gear mechanism)

Low backlash

High-speed operation

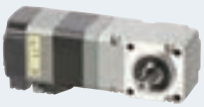
Frame size 42 mm～90 mm

Right-angle Shaft FC Geared Type

(Face gear mechanism)

Low backlash

Space saving



Frame size 42 mm, 60 mm

PS Geared Type

(Planetary gear mechanism)

Low backlash

High torque

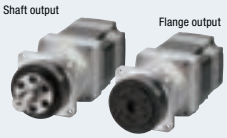
Frame size 28 mm～90 mm

HPG Geared Type

(HarmonicPlanetary®)

Non-backlash

High torque and high precision



Frame size 40 mm～90 mm

Harmonic Ceared Type

(HarmonicDrive®)

Non-backlash

High torque and high precision

Frame size 30 mm～90 mm

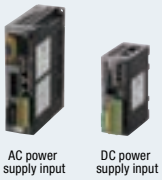
Drivers

Built-in Controller Type

I/O control
or
Modbus control

Positioning data is set in the driver (256 points).
The use of a network converter (sold separately) allows the control of an FA network.

Network converter (sold separately)



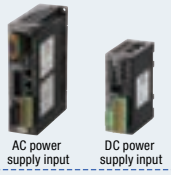
AC power supply input　DC power supply input

FLEX is a general term of the products that support I/O control, Modbus (RTU) control, and FA network control via a network converter.

Pulse Input Type with RS-485 Communication NEW

Pulse input signal control

RS-485 communication allows the monitoring of the position, speed, torque, alarm, and temperature of the motor.

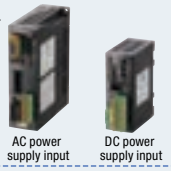


AC power supply input　DC power supply input

Pulse Input Type

Pulse input signal control

The motor is controlled from a positioning unit (pulse oscillator).

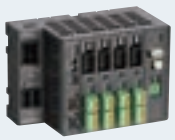


AC power supply input　DC power supply input

Network-Compatible Multi Axis Driver

Controlling via an FA network

Multi axis driver that supports MECHATROLINK-Ⅲ and EtherCAT Drive Profile.
2, 3, or 4 axes can be connected.



DC power supply input

Motorized Actuators Equipped with AZ Series

We provide motorized actuators equipped with **AZ** Series.
Since the actuators are equipped with the same motors and drivers, common wires, controls, and service parts can be used, and time as well as labor for startup can be reduced.

Motorized Linear Slides EAS Series

Motorized Linear Slides EZS Series

- Equipped with a simple dustproof function, compatible with a clean room

Motorized Linear Slides KRF AZ Series

- Fusing advanced motors
- High rigidity slides

Motorized Cylinders EAC Series

Compact Linear Actuators DRS2 Series

- Small-sized actuators the motor of which is integrated with a ball screw
- Most suitable for minute feeding and highly precise positioning during straight-line motion

Hollow Rotary Actuators DGII Series

- The motor is integrated with a large-bore hollow rotary table.
- High output power and high rigidity

Newly developed ABZO sensor comes with advanced technology is now at affordable price

Newly Developed **ABZO** Sensor

Oriental Motor has developed a compact, low-cost, and mechanical driven type equipped with absolute sensor that does not require a battery (Patented).

The products offered at affordable prices which can achieve productivity improvement and cost reduction.

Mechanical driven sensor

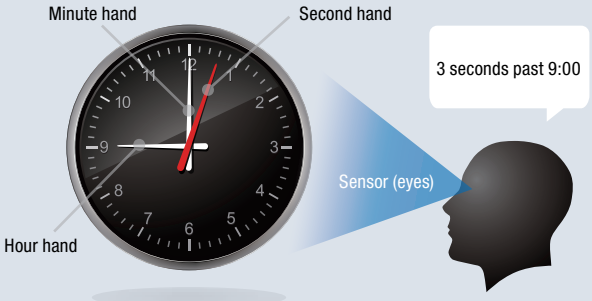
On an analog clock, the current time is shown by the positions of the second hand, minute hand, and hour hand. The ABZO sensor is a mechanical driven sensor equipped with multiple gears that correspond to the hands of a clock. The sensor recognizes the angle of each gear to detect positional information. Therefore, no batteries are required.

Multi-rotation absolute sensor

From the reference of home position, the absolute position for ±900 rotations (for 1800 rotations)* of the motor shaft can be detected.

*A frame size of 20 mm or 28 mm (30 mm) is for ±450 rotations (900 rotations).

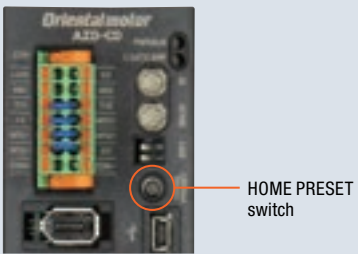
・The basic principle is derived from an analogue clock



How to set home position

A home position can easily be set by pressing the switch on the front of the driver, and the ABZO sensor saves the home position. You can also use the data setting software (**MEXE02**) or external input signals to set a home position.

・Set a home position



The absolute system is achieved with battery-less.

No External Sensor Required

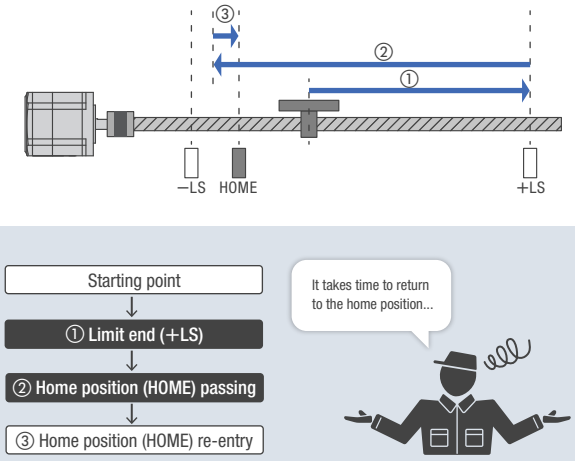
This series uses the absolute system that does not require external sensors such as a home position sensor and limit sensor.

● High-speed return to home + Improvement of accuracy in the return to home position

Since return-to-home operation is enabled without an external sensor, the operation can be performed at a high speed regardless of sensor sensitivity specifications. This reduces the machine cycle time. Returning to the home position is made possible regardless of variations in home sensors, improving the accuracy of the home position.

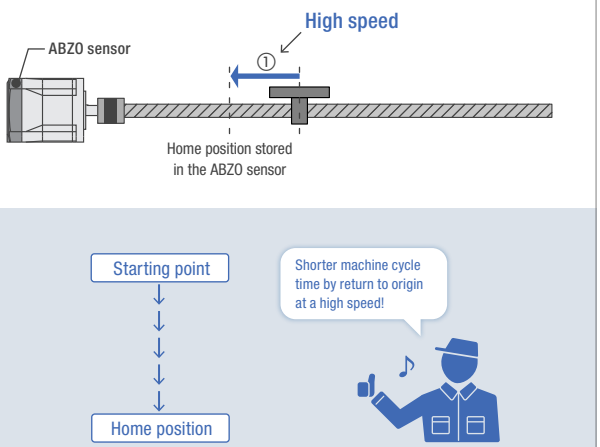
Conventional way of detecting the home position of the control motor

While the limit sensor (±LS) or the home sensor (HOME) is sensed, the home position is detected.



Return to home operation of the AZ Series

There is no need to sense the limit sensor, allowing the device to move directly at a high speed to the home position stored in the ABZO sensor.



● Cost reduction

The sensor and wiring cost can be reduced, lowering the total system cost.

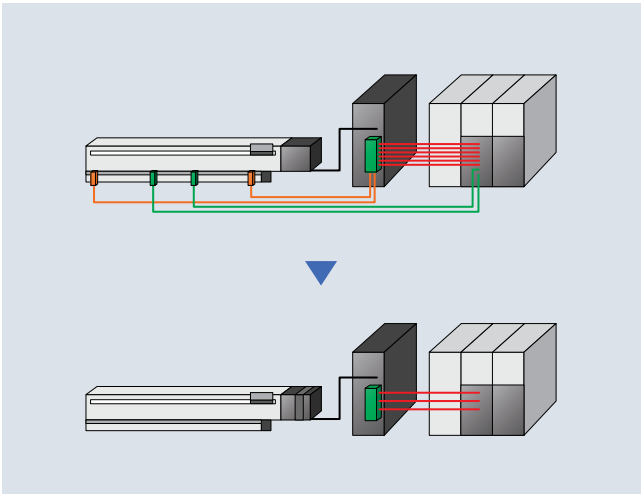
● Wire saving

Wire saving allows the equipment to design easily.

● The equipment is not affected by malfunction of an external sensor.

You do not have to worry about malfunction, failure, or disconnection of an external sensor (for example, in an environment where metal pieces scatter or oil mist occurs).

- If there is no limit sensor attached, you can use the software limit of the driver to prevent the threshold from being exceeded.



The absolute system is achieved with battery-less.

Battery-less

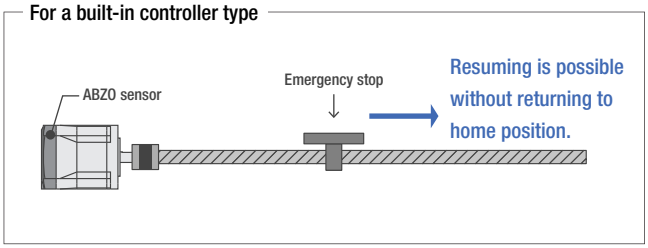
A mechanical driven sensor is used and requires no battery.

The positional information is mechanically managed by the ABZO sensor.

Keep positional information

The positional information is kept even if power is shut down during positioning operation or the cable between the motor and the driver is removed. When a built-in controller type recovers from an emergency stop of the production line or from a power failure, it can resume positioning operation without returning to the home position.

- Since positional information is kept in the ABZO sensor, the home position must be set again if the motor is replaced.

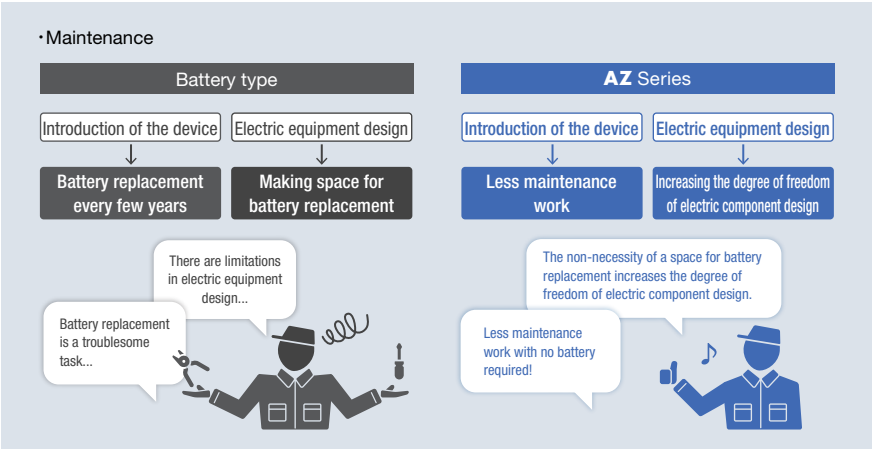


Less maintenance work

Battery replacement is not required, reducing maintenance work and costs.

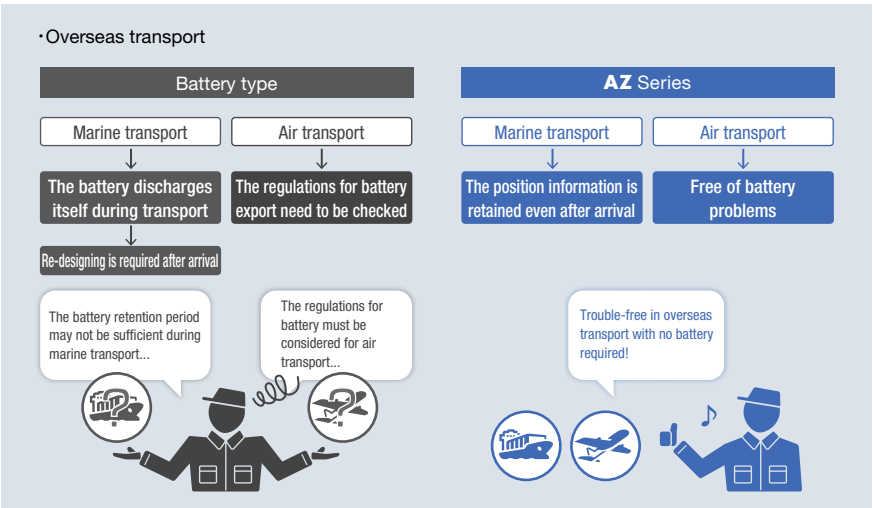
Desired installation of the driver

Not require to ensure space for battery replacement, as the driver can be installed in any location, and a more flexible layout design is available for the control panel and other devices.



Trouble-free for overseas transportation

Since batteries discharge by themselves, care must be taken when transported over a long period of time for international or long-distance shipment. The ABZO sensor does not require a battery, and there is no time limitation for positional information retainment. In addition, there is no need to consider the regulations applied to battery export.



Energy saving achieved by excellent characteristics, high reliability, and energy saving derived from αSTEP

Excellent Characteristics and High Reliability

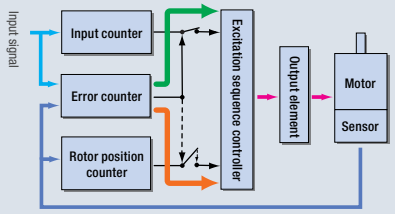
This unit employs the unique control method, achieve high reliability with advantages for both the open loop control and closed loop control.

Operation continues even at sudden load change or sudden acceleration

At normal times, this compact unit synchronizes with pulse commands and operates with open loop control. When overloaded, the current control immediately changed to the closed loop control and corrects the position.

In an abnormal condition, an alarm signal is output

If overloaded continuously applied, the unit outputs an alarm signal, and when positioning is completed, the unit outputs a signal. These features provide high reliability.



At normal times (position error: less than ±1.8°)
As in the case of a stepping motor, control is performed in the open mode.

Under overload (position error: at least ±1.8°)
The closed mode is selected to continue operation.

High response

Utilizing the high response of the stepping motor, the unit can move the device in a short distance for a short time. The unit can move the device by following the command and without delay.

The stop position is retained without hunting

During positioning, stoppage is done by the retaining force of the motor, without hunting. Therefore, the unit is most suitable for the applications which low-rigidity positioning mechanism is used and vibration should not occur during stoppage.

No tuning is required

Under normal conditions, this unit operates by open loop control. This enables positioning without gain adjustment even when there is a change in the load of the belt mechanism, chain drive, or other mechanical drives.

Smooth movement even at a low speed

The micro-step drive and smooth driving functions* are equipped with standard functions suppress vibration at a low speed and smooth movement.

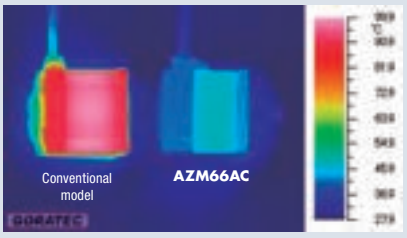
*These functions do not require any change of the pulse input setting but allow the micro-step drive which travel distance and speed are of the same as those of full-step drive.

Energy Saving and Low Heat Emission

The adoption of the high efficiency motor leads to the reduction of heat emission and power consumption.

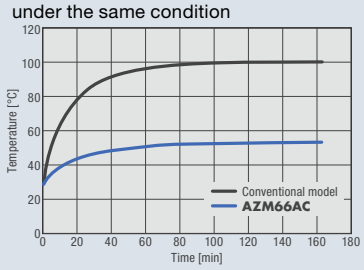
Heat emission drastically reduced

・Thermographic temperature distribution



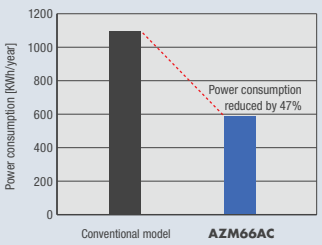
These are the images of operation under the same condition.

・Motor housing temperature at operation under the same condition



Power consumption Reduced by 47% compared to the conventional level

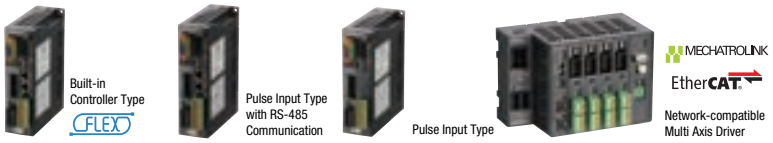
・Power consumption



Amount of CO2 emission Reduced by 47% compared to the conventional level

Operating conditions
Speed: 1000 r/min, Load factor: 50%
Operating time: 24-hour operation (Operation: 70%, Stand-by: 25%, Stop: 5%); 365 days/year
Power supply voltage: Single-Phase/Three-Phase 200-240 VAC

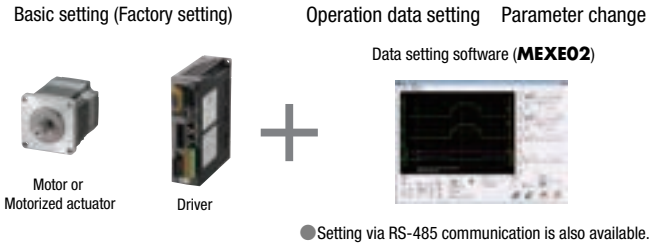
Drivers selectable according to the host system



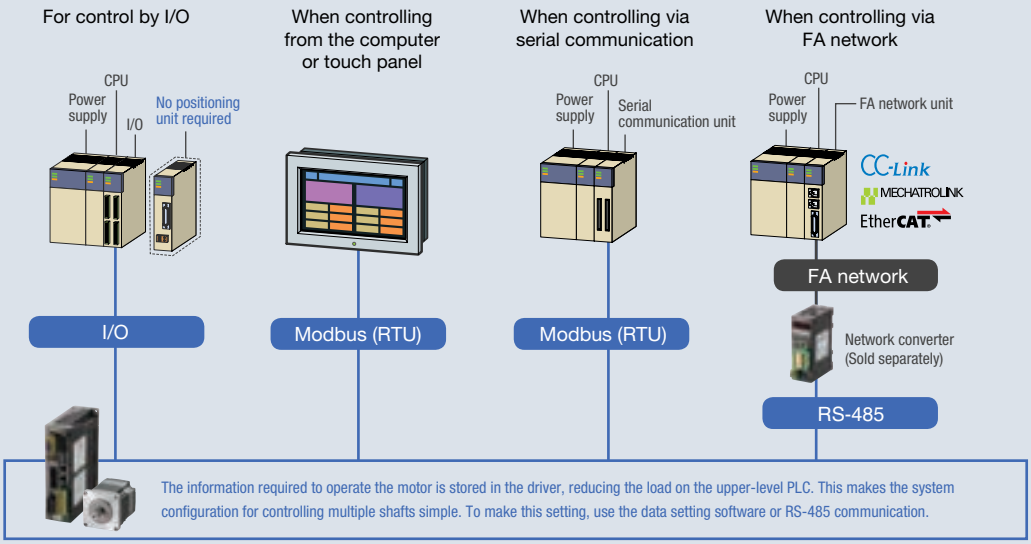
Built-in Controller Type FLEX AC DC

Sets of data operation in the driver, and selects and executes the operation data from the upper-level system. Connection with and control of the upper-level system are performed by I/O, Modbus (RTU), RS-485 communication, or FA network. By using a network converter (sold separately), the CC-Link communication, MECHATROLINK communication, and EtherCAT communication can be supported.

FLEX is a general term of the products that support I/O control, Modbus (RTU) control, and FA network control via a network converter.

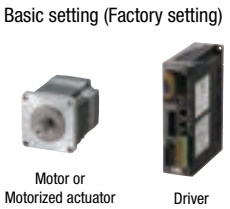


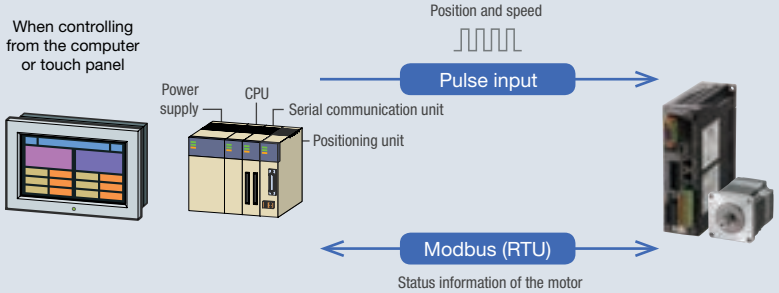
●Setting via RS-485 communication is also available.

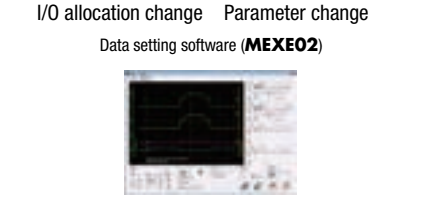


NEW Pulse Input Type with RS-485 Communication AC DC

It executes operation by inputting pulses to the driver. The motor is controlled from the positioning unit (pulse oscillator) provided by the customer. The use of RS-485 communication allows the monitoring of status information (position, speed, torque, alarms, temperature, etc.) of the motor.





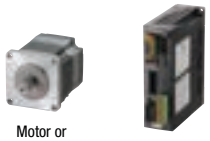


The use of the data setting software (**MEXE02**) allows the checking of alarm history and the monitoring of various conditions.

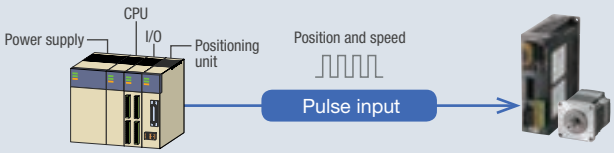
Pulse Input Type AC DC

It executes operation by inputting pulses to the driver. The motor is controlled by the positioning unit (pulse oscillator) provided by the customer. The use of the data setting software (**MEXE02**) allows the checking of alarm history and the monitoring of various conditions.

Basic setting (Factory setting)

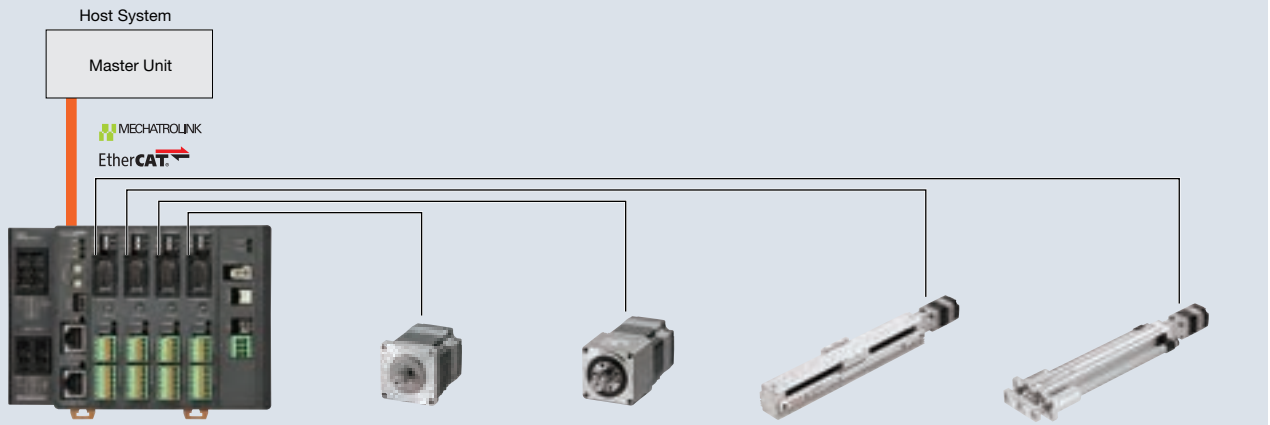


Motor or Motorized actuator　Driver



Network-compatible Multi Axis Driver DC

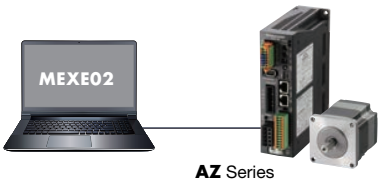
Multi axis driver that supports MECHATROLINKIII and EtherCAT Drive Profile. The driver can be connected to a DC power supply motor of the **AZ** Series and to a motorized actuator equipped with motor. We provide the drivers to which 2, 3, or 4 axial connectors can be connected.



✻The above motors and motorized actuators connected to the stepping motor are representative examples.

- CC-Link and MECHATROLINK are the registered trademarks of the CC-Link Partner Association and the MECHATROLINK Members Association, respectively.
- EtherCAT is the registered trademark licensed by Beckhoff Automation in Germany.
- The data setting software (**MEXE02**) can be downloaded from the Oriental Motor website. The media is also available (for free).

Easy settings and useful functions that are unique to the **AZ** Series.



Data setting software **MEXE02**

The data setting software can be downloaded from the Oriental Motor website. The media is also available (for free).

Easy Settings and Easy Operation

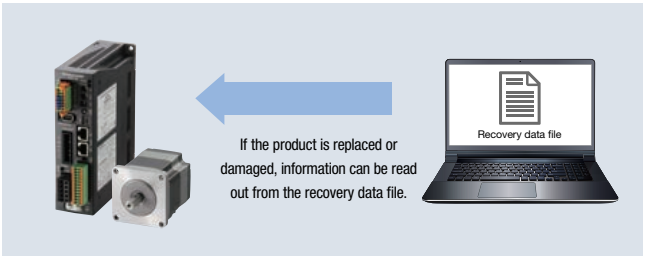
The data setting software (**MEXE02**) allows you to perform basic settings such as the editing of operation data and the setting of parameters. Furthermore, since the built-in controller type enables sequence control, it can configure a simple system without using a host sequence.

Unit setting wizard

This function allows you to display/enter the travel distance, speed, or other details in your desired unit. Since data can be input or displayed according to the mechanism used, the function saves labor for unit conversion and allows you to easily input operation data.

Creating a recovery data file

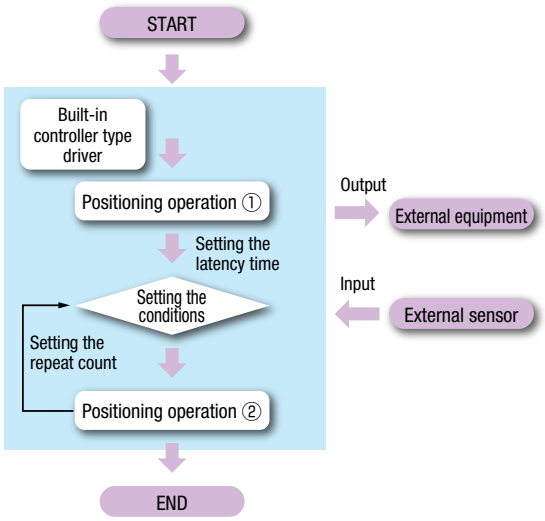
At first, create a file in which factory settings of the product will be saved in preparation for product replacement due to maintenance or for damage to the product. Be sure to create a recovery data file if you are using a motorized actuator.



The simplified sequence function simplifies programs (Only for a built-in controller type)

By importing output signals for controlling other equipment or external input signals such as those from sensors, the built-in controller type can simplify sequence control programs.

- No. of positioning operation data items that can be set (up to 256 points)
- No. of general-purpose I/O points (9 points for input and 6 points for output)
- No, of communication I/O points (16 points for input and 16 points for output)



Tip for the Usage Navigation

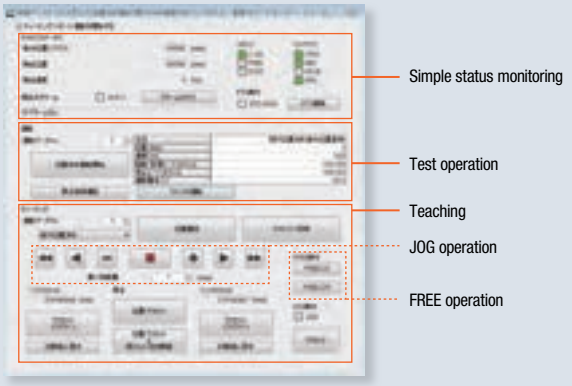
Our website contains video which shows useful functions and usage of the α_{STEP} **AZ** Series. We hope you will use the Usage Navigation.

Test Functions

The test functions allows the motor to operate by itself and enables you to check the connection with the host system.
The use of these functions during equipment startup can save time.

Teaching/Remote operation During startup

From the data setting software, you can easily set an original point or drive the motor. Before performing connection with the host system, you can perform teaching, test operation, etc. This contributes to the reduction of the equipment startup time.



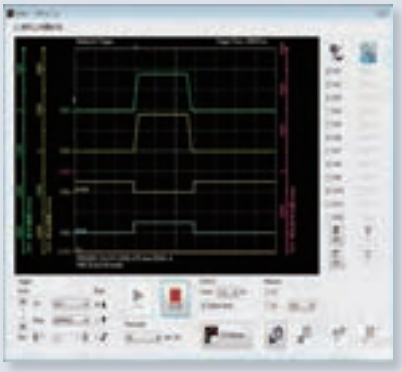
I/O test During startup During operation

You can monitor input signals and forcibly output output signals. This is a useful function for checking connection with the host system or the operation of a network I/O.

Various Monitor Functions

Waveform monitor During startup

Similar to using an oscilloscope, the motor drive condition and output signal status can be checked. Use this function when starting up the device or making adjustments.

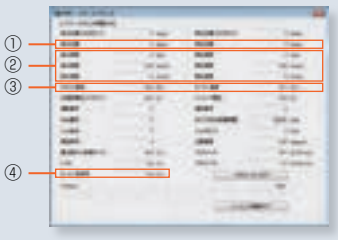


Alarm monitor During startup

If an error occurs, you can check the error details, operation conditions at the time of error occurrence, and measures to be taken.

Status monitoring During startup

In addition to the speed, motor, driver temperature, and load factor, you can monitor other conditions including rotation amount accumulated from the start of use. Signals can be output for each item as needed, achieving efficient maintenance.



①The actual position is detected for the command position.
②The actual speed is detected for the command speed.
③The temperatures of the encoder of the motor and the inside of the driver are detected.
④This shows the current load factor which is based on the output torque at the speed during rotation. The output torque is assumed to be 100%.

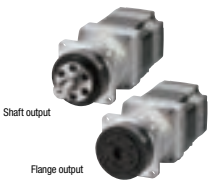
Compatible with multi monitoring

This function allows you to simultaneously open and use multiple setting screens such as those for data setting, test operation, and monitoring. This function facilitates equipment startup, adjustment, etc.

AZ Series Lineup

AC : Single-Phase 100-120 VAC, Single-Phase/Three-Phase 200-240 VAC input
DC : 24/48 VDC input

Motors

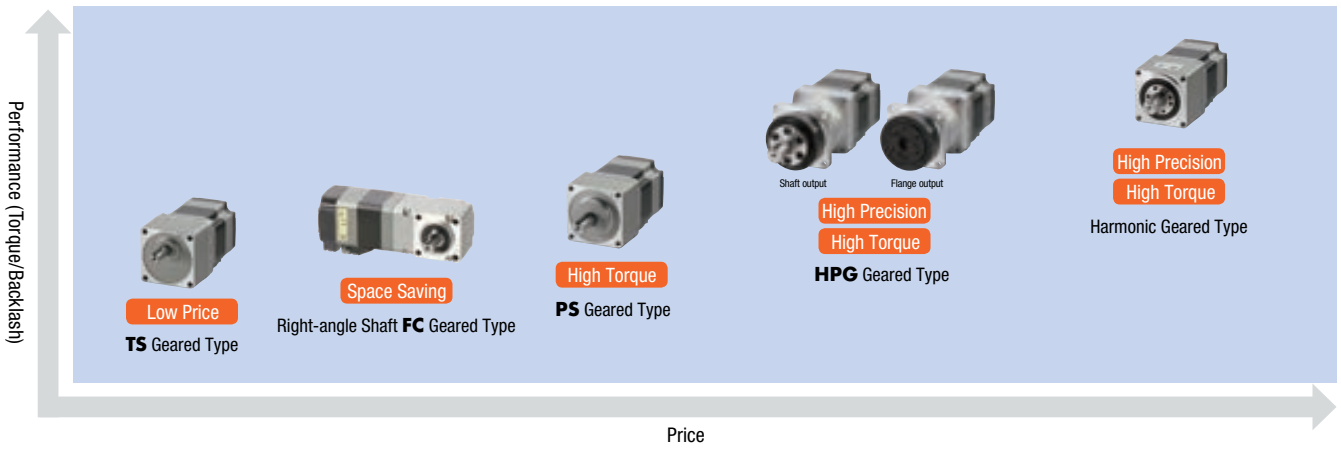
Type	Electromagnetic Brake	Frame Size				
		20 mm	28 mm*6	42 mm*2	60 mm	85 mm 90 mm*4
Standard  Motor shaft shape Single sided milling/straight/with key	Not equipped	DC *1	DC *1	AC DC	AC DC	AC
	Equipped	—	—	AC *3 DC *3	AC DC	AC *5
Low Backlash **TS** Geared (Spur gear mechanism)  Selection of the cable drawing direction Downward/upward/right/left Low gear ratio, high-speed operation enabled Gear ratio: 3.6, 7.2, 10, 20, 30	Not equipped	—	—	AC DC	AC DC	AC
	Equipped	—	—	AC DC	AC DC	AC
Low Backlash Right-angle Shaft **FC** Geared (Face gear mechanism)  Right-angle shaft gear for positioning Gear ratio: 7.2, 10, 20, 30	Not equipped	—	—	AC DC	AC DC	—
	Equipped	—	—	AC DC	AC DC	—
Low Backlash **PS** Geared (Planetary gear mechanism)  Gear ratio useful for angle indexing Gear ratio: 5, 7.2, 10, 25, 36, 50	Not equipped	—	NEW DC *1	AC DC	AC DC	AC
	Equipped	—	—	AC DC	AC DC	AC
Non-backlash **HPG** Geared (HarmonicPlanetary ®) HarmonicDrive Systems  Shaft output Flange output High-precision positioning Gear ratio: 5, 9, 15	Not equipped	—	—	AC DC	AC DC	AC
	Equipped	—	—	AC DC	AC DC	AC
Non-backlash Harmonic Geared (HarmonicDrive ®) HarmonicDrive Systems  High-precision positioning Gear ratio: 50, 100	Not equipped	—	NEW DC *1	AC DC	AC DC	AC
	Equipped	—	—	AC DC	AC DC	AC

*1 24 VDC only *2 40 mm for the **HPG** geared type *3 **AZM46** only *4 Geared type only *5 **AZM98** only *6 30 mm for the harmonic geared type

Note

- The values shown above must be used as reference. These values vary depending on the motor frame size and gear ratio.
- HarmonicPlanetary, HarmonicDrive and HarmonicDrive Systems are registered trademarks or trademarks of Harmonic Drive Systems Inc.

We offer motors pre-assembled with gears, as variations of stepping motors.
Select an appropriate type from the various geared motors according to the torque, accuracy (backlash) and price.



Permissible Torque/ Maximum Instantaneous Torque [N·m]	Backlash [arcmin]	Basic Resolution [°/Pulse]	Output Shaft Rotation Speed [r/min]
Maximum Holding Torque 4	—	0.36	6000
Permissible Torque / Maximum Instantaneous Torque 25 45	10	0.012	833
Permissible Torque 10.5	10	0.012	416
Permissible Torque \ Maximum Instantaneous Torque 37 60	7	0.0072	600
Permissible Torque \ Maximum Instantaneous Torque 24 33	3	0.024	900
Permissible Torque \ Maximum Instantaneous Torque 52 107	0	0.0036	70

Drivers

Type
Built-in Controller FLEX  AC DC
Pulse Input with RS-485 Communication NEW  AC DC
Pulse Input  AC DC
Network-compatible Multi Axis Driver  DC MECHATROLINK EtherCAT.

● FLEX is a general term of the products that support I/O control, Modbus (RTU) control, and FA network control via a network converter.

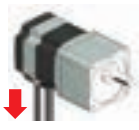
● MECHATROLINK is a registered trademark of the MECHATROLINK Members Association. ● EtherCAT. is a registered trademark licensed by Beckhoff Automation in Germany.

You can select the shaft shape and cable drawing direction depending on the application.

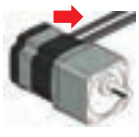

Single Sided Milling


Straight


With Key


Downward


Upward


Right


Left

● Standard Type

Frame Size \ Shaft Shape	Single Sided Milling	NEW Straight	NEW With Key
20 mm	●	—	—
28 mm	●	—	—
42 mm	●	●	● *
60 mm	●	●	●
85 mm	●	●	●

*AZM48 only

You can select a cable drawing direction from the output shaft from among the 4 directions.

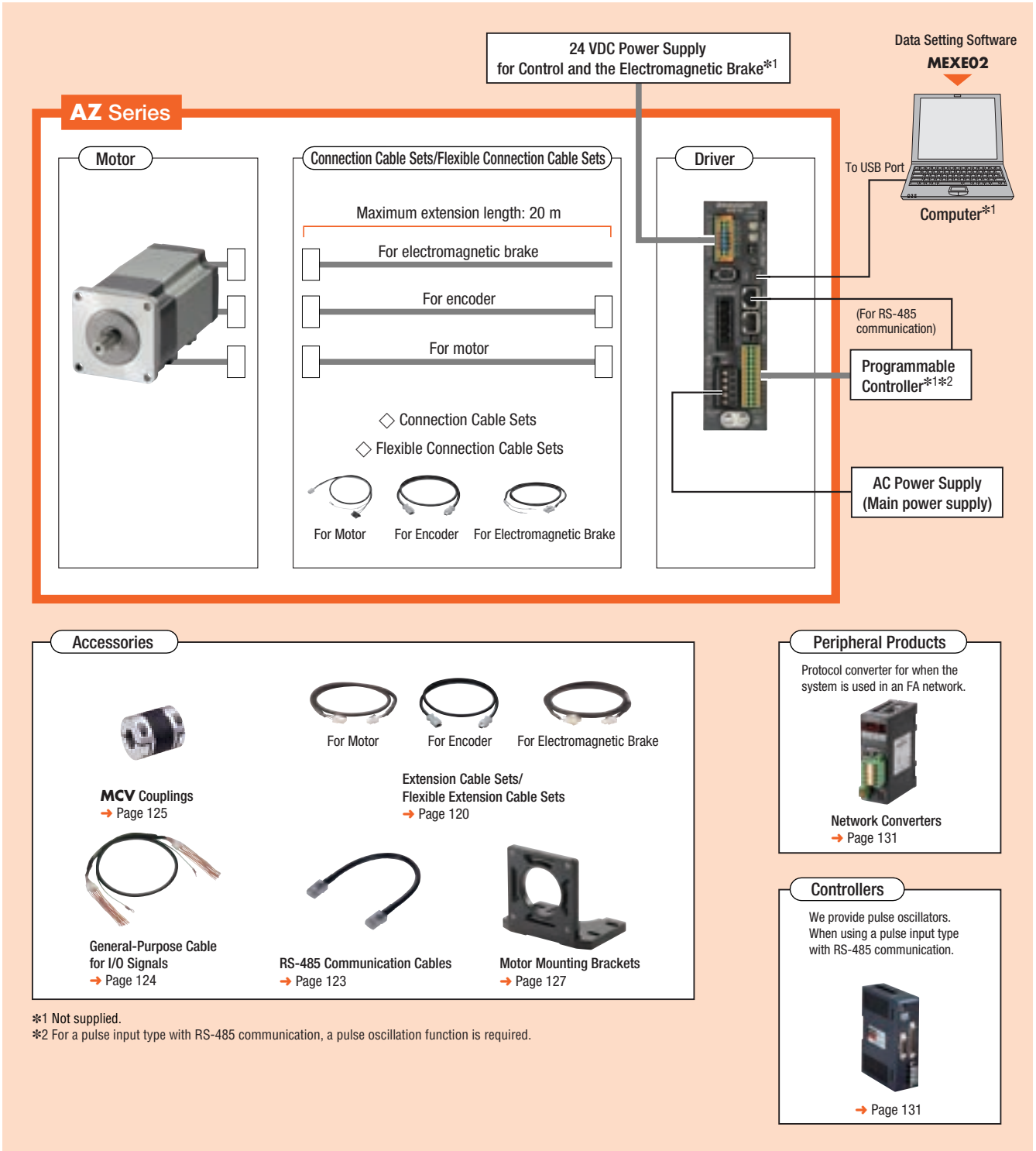
● TS Geared Type

Frame Size	Cable Drawing Direction			
	Downward	Upward NEW	Right NEW	Left NEW
42 mm	●	●	●	●
60 mm	●	●	●	●
90 mm	●	●	●	●

System Configuration

When a standard type motor with electromagnetic brake is combined with a built-in controller type driver or a pulse input type driver with RS-485 communication

The figure below shows a sample configuration which includes a built-in controller type driver and which uses I/O control or RS-485 communication.
The motor, driver, and connection cable set/flexible connection cable set need to be separately provided.



*1 Not supplied.
*2 For a pulse input type with RS-485 communication, a pulse oscillation function is required.

System Configuration Example

AZ Series				Accessories		
Motor	Driver	Connection Cable Sets	+	Motor Mounting Brackets	Flexible Couplings	General-Purpose Cable for I/O Signals (1 m)
AZM66MC	AZD-CD	CC030VZFB		PAL2P-5	MCV251010	CC16D010B-1

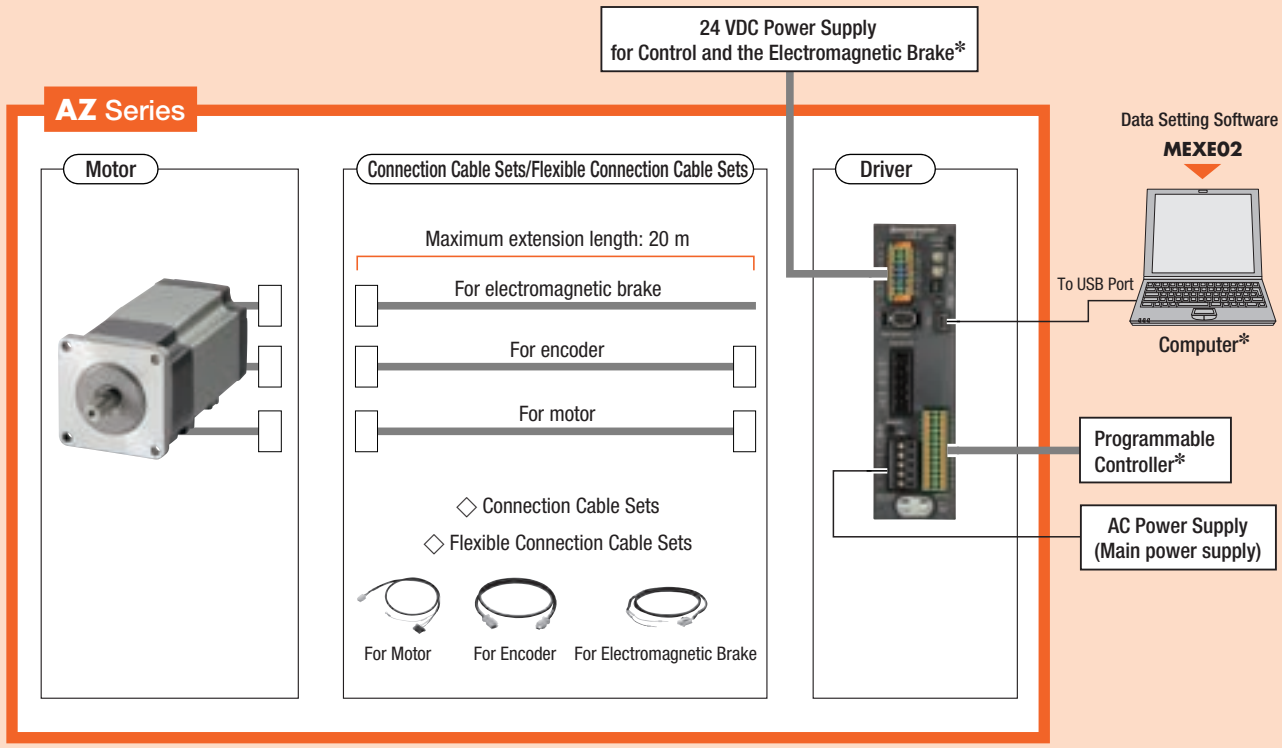
The system configuration shown above is an example. Other combinations are available.

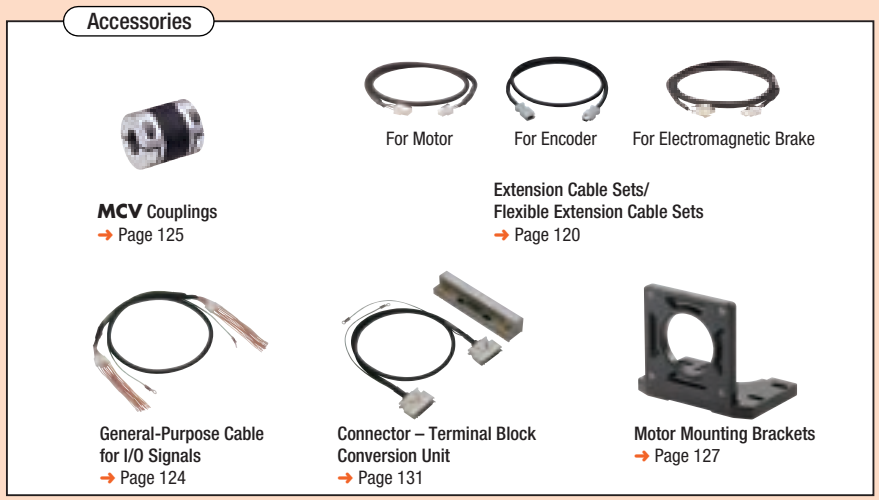
Note

The motor cable and electromagnetic brake cable from the motor cannot be directly connected to a driver. To connect the motor to the driver, use a connection cable.

When a standard type motor with electromagnetic brake is combined with a built-in controller type driver

The figure below shows a sample configuration of a single axis system which uses a programmable controller (equipped with a pulse oscillator).
The motor, driver, and connection cable set/flexible connection cable set need to be separately provided.





* Not supplied.

System Configuration Example

AZ Series				Controllers	Accessories			
Motor	Driver	Connection Cable Sets	+		Motor Mounting Brackets	Flexible Couplings	General-Purpose Cable for I/O Signals (1 m)	Connector – Terminal Block Conversion Unit (1 m)
AZM66MC	AZD-C	CC030VZFB		EMP401-1	PAL2P-5	MCV251010	CC16D010B-1	CC50T10E

The system configuration shown above is an example. Other combinations are available.

Note

The motor cable and electromagnetic brake cable from the motor cannot be directly connected to a driver. To connect the motor to the driver, use a connection cable.

Product Number Code

Motors

◇Standard Type

AZM 6 6 A 0 C

① ② ③ ④ ⑤ ⑥

①	Motor Type	**AZM**: **AZ** Series Motor
②	Motor Frame Size	**4**: 42 mm (40 mm for the **HPG** Geared Type) **6**: 60 mm **9**: 85 mm (90 mm for the Geared Type)
③	Motor Case Length	
④	Output Shaft Shape	**A**: Single Shaft **M**: With Electromagnetic Brake
⑤	Additional Function*	**0**: Straight **1**: With Key
⑥	Motor Specifications	**C**: AC Power Supply Input Specifications

◇**PS**, **HPG**, Harmonic Geared Type

AZM 6 6 A C - HP 15 F

① ② ③ ④ ⑥ ⑦ ⑧ ⑨

①	Motor Type	**AZM**: **AZ** Series Motor
②	Motor Frame Size	**4**: 42 mm (40 mm for the **HPG** Geared Type) **6**: 60 mm **9**: 85 mm (90 mm for the Geared Type)
③	Motor Case Length	
④	Output Shaft Shape	**A**: Single Shaft **M**: With Electromagnetic Brake
⑤	Additional Function*	**0**: Straight **1**: With Key
⑥	Motor Specifications	**C**: AC Power Supply Input Specifications
⑦	Gear Type	**PS**: **PS** Geared Type **HP**: **HPG** Geared Type **HS**: Harmonic Geared Type
⑧	Gear Ratio	
⑨	Output Shaft Type	**HPG** Geared Type Blank: Shaft Output **F**: Flange Output

*When the name of a standard type does not contain a number representing an additional function, it is a single-sided milled type.

◇**TS** Geared Type

AZM 6 6 A C - TS 7.2 U

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Motor Type	**AZM**: **AZ** Series Motor
②	Motor Frame Size	**4**: 42 mm **6**: 60 mm **9**: 90 mm
③	Motor Case Length	
④	Output Shaft Shape	**A**: Single Shaft **M**: With Electromagnetic Brake
⑤	Motor Specifications	**C**: AC Power Supply Input Specifications
⑥	Gear Type	**TS**: **TS** Geared Type
⑦	Gear Ratio	
⑧	Cable Drawing Direction	**U**: Upward **L**: Left **R**: Right

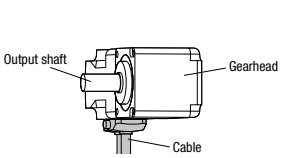
◇**FC** Geared Type

AZM 6 6 A C - FC 7.2 U A

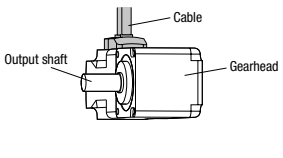
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①	Motor Type	**AZM**: **AZ** Series Motor
②	Motor Frame Size	**4**: 42 mm **6**: 60 mm
③	Motor Case Length	
④	Output Shaft Shape	**A**: Single Shaft **M**: With Electromagnetic Brake
⑤	Motor Specifications	**C**: AC Power Supply Input Specifications
⑥	Gear Type	**FC**: **FC** Geared Type
⑦	Gear Ratio	
⑧	Cable Drawing Direction*	**D**: Downward **U**: Upward
⑨	Identification	**A**: Solid Shaft

*The cable drawing direction is based on the assumption that the output shaft is at left and the gearhead is at right.



Cable direction downward



Cable direction upward

Driver

AZD - C D

① ② ③

①	Driver Type	**AZD**: **AZ** Series Driver
②	Power Supply Input	**A**: Single-Phase 100-120 VAC **C**: Single-Phase/Three-Phase 200-240 VAC
③	Type	**D**: Built-in Controller Type **X**: Pulse Input Type with RS-485 Communication Blank: Pulse Input Type

Connection Cable Set/Flexible Connection Cable Set

CC 050 V Z F B

① ② ③ ④ ⑤ ⑥

①		**CC**: Cable
②	Length	**005**: 0.5 m **010**: 1 m **015**: 1.5 m **020**: 2 m **025**: 2.5 m **030**: 3 m **040**: 4 m **050**: 5 m **070**: 7 m **100**: 10 m **150**: 15 m **200**: 20 m
③	Reference Number	
④	Applied Model	**Z**: For **AZ** Series
⑤	Cable Type	**F**: Connection Cable Set **R**: Flexible Connection Cable Set
⑥	Description	Blank: For the product with no Electromagnetic Brakes **B**: For the product with Electromagnetic Brake

Product Line

The motor, driver, and connection cables need to purchase separately.

Motors

◇Standard Type

Frame Size	Product Name
42 mm	**AZM46AC** **AZM46A0C** **AZM48AC** NEW **AZM48A0C** NEW **AZM48A1C** NEW
60 mm	**AZM66AC** **AZM66A0C** **AZM66A1C** **AZM69AC** **AZM69A0C** **AZM69A1C**
85 mm	**AZM98AC** **AZM98A0C** **AZM98A1C** **AZM911AC** **AZM911A0C** **AZM911A1C**

◇Standard Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**AZM46MC** **AZM46M0C**
60 mm	**AZM66MC** **AZM66M0C** **AZM66M1C** **AZM69MC** **AZM69M0C** **AZM69M1C**
85 mm	**AZM98MC** **AZM98M0C** **AZM98M1C**

◇**TS** Geared Type

Frame Size	Product Name
42 mm	**AZM46AC-TS3.6** **AZM46AC-TS3.6R** **AZM46AC-TS3.6U** **AZM46AC-TS3.6L** **AZM46AC-TS7.2** **AZM46AC-TS7.2R** **AZM46AC-TS7.2U** **AZM46AC-TS7.2L** **AZM46AC-TS10** **AZM46AC-TS10R** **AZM46AC-TS10U** **AZM46AC-TS10L** **AZM46AC-TS20** **AZM46AC-TS20R** **AZM46AC-TS20U** **AZM46AC-TS20L** **AZM46AC-TS30** **AZM46AC-TS30R** **AZM46AC-TS30U** **AZM46AC-TS30L**
60 mm	**AZM66AC-TS3.6** **AZM66AC-TS3.6R** **AZM66AC-TS3.6U** **AZM66AC-TS3.6L** **AZM66AC-TS7.2** **AZM66AC-TS7.2R** **AZM66AC-TS7.2U** **AZM66AC-TS7.2L** **AZM66AC-TS10** **AZM66AC-TS10R** **AZM66AC-TS10U** **AZM66AC-TS10L** **AZM66AC-TS20** **AZM66AC-TS20R** **AZM66AC-TS20U** **AZM66AC-TS20L** **AZM66AC-TS30** **AZM66AC-TS30R** **AZM66AC-TS30U** **AZM66AC-TS30L**

◇**TS** Geared Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**AZM46MC-TS3.6** **AZM46MC-TS3.6R** **AZM46MC-TS3.6U** **AZM46MC-TS3.6L** **AZM46MC-TS7.2** **AZM46MC-TS7.2R** **AZM46MC-TS7.2U** **AZM46MC-TS7.2L** **AZM46MC-TS10** **AZM46MC-TS10R** **AZM46MC-TS10U** **AZM46MC-TS10L** **AZM46MC-TS20** **AZM46MC-TS20R** **AZM46MC-TS20U** **AZM46MC-TS20L** **AZM46MC-TS30** **AZM46MC-TS30R** **AZM46MC-TS30U** **AZM46MC-TS30L**
60 mm	**AZM66MC-TS3.6** **AZM66MC-TS3.6R** **AZM66MC-TS3.6U** **AZM66MC-TS3.6L** **AZM66MC-TS7.2** **AZM66MC-TS7.2R** **AZM66MC-TS7.2U** **AZM66MC-TS7.2L** **AZM66MC-TS10** **AZM66MC-TS10R** **AZM66MC-TS10U** **AZM66MC-TS10L** **AZM66MC-TS20** **AZM66MC-TS20R** **AZM66MC-TS20U** **AZM66MC-TS20L** **AZM66MC-TS30** **AZM66MC-TS30R** **AZM66MC-TS30U** **AZM66MC-TS30L**

◇**TS** Geared Type

Frame Size	Product Name
90 mm	**AZM98AC-TS3.6**
	AZM98AC-TS3.6R
	AZM98AC-TS3.6U
	AZM98AC-TS3.6L
	AZM98AC-TS7.2
	AZM98AC-TS7.2R
	AZM98AC-TS7.2U
	AZM98AC-TS7.2L
	AZM98AC-TS10
	AZM98AC-TS10R
	AZM98AC-TS10U
	AZM98AC-TS10L
	AZM98AC-TS20
	AZM98AC-TS20R
	AZM98AC-TS20U
	AZM98AC-TS20L
	AZM98AC-TS30
	AZM98AC-TS30R
	AZM98AC-TS30U
	AZM98AC-TS30L

◇**TS** Geared Type with Electromagnetic Brake

Frame Size	Product Name
90 mm	**AZM98MC-TS3.6**
	AZM98MC-TS3.6R
	AZM98MC-TS3.6U
	AZM98MC-TS3.6L
	AZM98MC-TS7.2
	AZM98MC-TS7.2R
	AZM98MC-TS7.2U
	AZM98MC-TS7.2L
	AZM98MC-TS10
	AZM98MC-TS10R
	AZM98MC-TS10U
	AZM98MC-TS10L
	AZM98MC-TS20
	AZM98MC-TS20R
	AZM98MC-TS20U
	AZM98MC-TS20L
	AZM98MC-TS30
	AZM98MC-TS30R
	AZM98MC-TS30U
	AZM98MC-TS30L

◇**FC** Geared Type

Frame Size	Product Name
42 mm	**AZM46AC-FC7.2UA**
	AZM46AC-FC7.2DA
	AZM46AC-FC10UA
	AZM46AC-FC10DA
	AZM46AC-FC20UA
	AZM46AC-FC20DA
	AZM46AC-FC30UA
	AZM46AC-FC30DA
60 mm	**AZM66AC-FC7.2UA**
	AZM66AC-FC7.2DA
	AZM66AC-FC10UA
	AZM66AC-FC10DA
	AZM66AC-FC20UA
	AZM66AC-FC20DA
	AZM66AC-FC30UA
	AZM66AC-FC30DA

◇**FC** Geared Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**AZM46MC-FC7.2UA**
	AZM46MC-FC7.2DA
	AZM46MC-FC10UA
	AZM46MC-FC10DA
	AZM46MC-FC20UA
	AZM46MC-FC20DA
	AZM46MC-FC30UA
	AZM46MC-FC30DA
60 mm	**AZM66MC-FC7.2UA**
	AZM66MC-FC7.2DA
	AZM66MC-FC10UA
	AZM66MC-FC10DA
	AZM66MC-FC20UA
	AZM66MC-FC20DA
	AZM66MC-FC30UA
	AZM66MC-FC30DA

◇**PS** Geared Type

Frame Size	Product Name
42 mm	**AZM46AC-PS5**
	AZM46AC-PS7.2
	AZM46AC-PS10
	AZM46AC-PS25
	AZM46AC-PS36
	AZM46AC-PS50
60 mm	**AZM66AC-PS5**
	AZM66AC-PS7.2
	AZM66AC-PS10
	AZM66AC-PS25
	AZM66AC-PS36
	AZM66AC-PS50
90 mm	**AZM98AC-PS5**
	AZM98AC-PS7.2
	AZM98AC-PS10
	AZM98AC-PS25
	AZM98AC-PS36
	AZM98AC-PS50

◇**PS** Geared Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**AZM46MC-PS5**
	AZM46MC-PS7.2
	AZM46MC-PS10
	AZM46MC-PS25
	AZM46MC-PS36
	AZM46MC-PS50
60 mm	**AZM66MC-PS5**
	AZM66MC-PS7.2
	AZM66MC-PS10
	AZM66MC-PS25
	AZM66MC-PS36
	AZM66MC-PS50
90 mm	**AZM98MC-PS5**
	AZM98MC-PS7.2
	AZM98MC-PS10
	AZM98MC-PS25
	AZM98MC-PS36
	AZM98MC-PS50

◇**HPG** Geared Type

Frame Size	Product Name
40 mm	**AZM46AC-HP5** **AZM46AC-HP5F** **AZM46AC-HP9** **AZM46AC-HP9F**
60 mm	**AZM66AC-HP5** **AZM66AC-HP5F** **AZM66AC-HP15** **AZM66AC-HP15F**
90 mm	**AZM98AC-HP5** **AZM98AC-HP5F** **AZM98AC-HP15** **AZM98AC-HP15F**

◇**HPG** Geared Type with Electromagnetic Brake

Frame Size	Product Name
40 mm	**AZM46MC-HP5** **AZM46MC-HP5F** **AZM46MC-HP9** **AZM46MC-HP9F**
60 mm	**AZM66MC-HP5** **AZM66MC-HP5F** **AZM66MC-HP15** **AZM66MC-HP15F**
90 mm	**AZM98MC-HP5** **AZM98MC-HP5F** **AZM98MC-HP15** **AZM98MC-HP15F**

◇Harmonic Geared Type

Frame Size	Product Name
42 mm	**AZM46AC-HS50** **AZM46AC-HS100**
60 mm	**AZM66AC-HS50** **AZM66AC-HS100**
90 mm	**AZM98AC-HS50** **AZM98AC-HS100**

◇Harmonic Geared Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**AZM46MC-HS50** **AZM46MC-HS100**
60 mm	**AZM66MC-HS50** **AZM66MC-HS100**
90 mm	**AZM98MC-HS50** **AZM98MC-HS100**

●Drivers

◇Built-in Controller Type

Power Supply Input	Product Name
Single-Phase 100-120 VAC	**AZD-AD**
Single-Phase/Three-Phase 200-240 VAC	**AZD-CD**

◇Pulse Input Type

Power Supply Input	Product Name
Single-Phase 100-120 VAC	**AZD-A**
Single-Phase/Three-Phase 200-240 VAC	**AZD-C**

◇Pulse Input Type with RS-485 Communication NEW

Power Supply Input	Product Name
Single-Phase 100-120 VAC	**AZD-AX**
Single-Phase/Three-Phase 200-240 VAC	**AZD-CX**

Connection Cable Sets/Flexible Connection Cable Sets

Use a flexible connection cable set if the cable will be bent repeatedly. We provide connection cables and flexible extension cables that can be connected to connection cables for extension. See page 120.

The motor cable and electromagnetic brake cable from the motor cannot be directly connected to a driver. To connect the motor to the driver, use a connection cable.

For Motor For Encoder

For Motor For Encoder For Electromagnetic Brake

◇For the product with no Electromagnetic Brakes

Type	Length L (m)	Product Name
Connection Cable Set	0.5	**CC005VZF**
	1	**CC010VZF**
	1.5	**CC015VZF**
	2	**CC020VZF**
	2.5	**CC025VZF**
	3	**CC030VZF**
	4	**CC040VZF**
	5	**CC050VZF**
	7	**CC070VZF**
	10	**CC100VZF**
	15	**CC150VZF**
	20	**CC200VZF**
Flexible Connection Cable Set	0.5	**CC005VZR**
	1	**CC010VZR**
	1.5	**CC015VZR**
	2	**CC020VZR**
	2.5	**CC025VZR**
	3	**CC030VZR**
	4	**CC040VZR**
	5	**CC050VZR**
	7	**CC070VZR**
	10	**CC100VZR**
	15	**CC150VZR**
	20	**CC200VZR**

◇For the product with Electromagnetic Brakes

Type	Length L (m)	Product Name
Connection Cable Set	0.5	**CC005VZFB**
	1	**CC010VZFB**
	1.5	**CC015VZFB**
	2	**CC020VZFB**
	2.5	**CC025VZFB**
	3	**CC030VZFB**
	4	**CC040VZFB**
	5	**CC050VZFB**
	7	**CC070VZFB**
	10	**CC100VZFB**
	15	**CC150VZFB**
	20	**CC200VZFB**
Flexible Connection Cable Set	0.5	**CC005VZRB**
	1	**CC010VZRB**
	1.5	**CC015VZRB**
	2	**CC020VZRB**
	2.5	**CC025VZRB**
	3	**CC030VZRB**
	4	**CC040VZRB**
	5	**CC050VZRB**
	7	**CC070VZRB**
	10	**CC100VZRB**
	15	**CC150VZRB**
	20	**CC200VZRB**

Accessories

Motors

Type \ Accessories		Parallel Key	Motor Installation Screws	Operating Manual
Standard Type		—	—	1 set
TS Geared Type	Frame Size 42 mm	—	—	
	Frame Size 60 mm	1 pc.	M4×60 P0.7 (4 pieces)	
	Frame Size 90 mm	1 pc.	M8×90 P1.25 (4 pieces)	
FC Geared Type		1 pc.	—	
PS Geared Type		1 pc.	—	
HPG Geared Type	Shaft Output	1 pc.	—	
	Flange Output	—	—	
Harmonic Geared Type		1 pc.	—	

● For the details of the functions and operation methods of the product, refer to the Operating Manual (Functions). The Operating Manual for Functions does not come with the product. Contact the nearest Oriental Motor sales office, or download the Operating Manual from the Oriental Motor website.

Drivers

Type \ Accessories	Connector	Operating Manual
For All Types	・Connector for CN4 (1 pc.) ・Connector for CN1 (1 pc.) ・Connector for CN5 (1 pc.) ・Connector Wiring Lever (1 pc.)	1 set

Connection Cable Sets/Flexible Connection Cable Sets

Type \ Accessories	Operating Manual
Connection Cable Sets	—
Flexible Connection Cable Sets	1 set

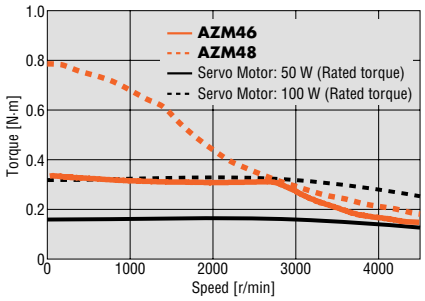
Estimate of Output from Stepping Motors

As for output (W) from an AC servo motor, the output (W) generated during rotation at the "Rated Speed" is expressed as the "Rated Output".
On the other hand, stepping motors which feature high-precision positioning and high torque in medium and low-speed areas do not have any rated speed. Therefore, there is no expression of "Rated Output". The table below shows the correspondence between the torque of each **AZ** Series standard type motor and the corresponding rated torque W of an applicable servo motor.

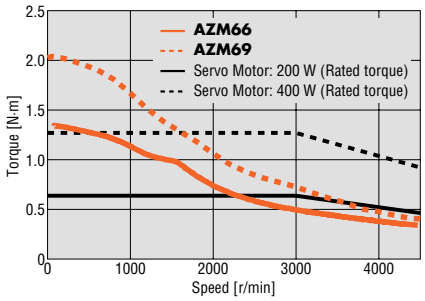
AZ Series (Standard type)		Servo motor with Corresponding Rated Torque (Estimate)
Frame Size	Product Name	
42 mm	**AZM46**	Corresponds to a rated torque of 50～100 W
	AZM48	
60 mm	**AZM66**	Corresponds to a rated torque of 100～200 W
	AZM69	Corresponds to a rated torque of 200～400 W
85 mm	**AZM98**	Corresponds to a rated torque of 400～750 W
	AZM911	

✻These are samples of total prices of a motor, driver, and 1 m connection cable.

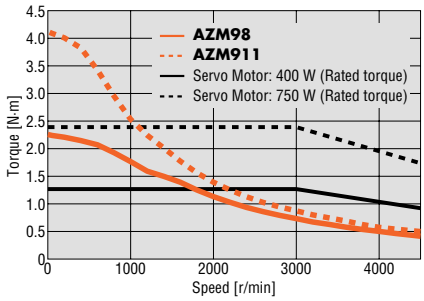
● Frame Size 42 mm



● Frame Size 60 mm



● Frame Size 85 mm



● The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

Standard Type Frame Size 42 mm, 60 mm, 85 mm

Specifications

Motor Product Name	Single Shaft		**AZM46A□C**	**AZM48A□C**	**AZM66A□C**	**AZM69A□C**	**AZM98A□C**	**AZM911A□C**
	With Electromagnetic Brake		**AZM46M□C**	—	**AZM66M□C**	**AZM69M□C**	**AZM98M□C**	—
Driver Product Name	Built-in Controller		**AZD-AD** (Single-Phase 100-120 VAC), **AZD-CD** (Single-Phase/Three-Phase 200-240 VAC)					
	Pulse Input with RS-485 Communication		**AZD-AX** (Single-Phase 100-120 VAC), **AZD-CX** (Single-Phase/Three-Phase 200-240 VAC)					
	Pulse Input		**AZD-A** (Single-Phase 100-120 VAC), **AZD-C** (Single-Phase/Three-Phase 200-240 VAC)					
Maximum Holding Torque		N·m	0.3	0.77	1.2	2	2	4
Holding Torque at Motor Standstill	Power ON	N·m	0.15	0.38	0.6	1	1	2
	Electromagnetic Brake	N·m	0.15	—	0.6	1	1	—
Rotor Inertial		J: kg·m^2	55×10^{-7} (71×10^{-7})*1	115×10^{-7}	370×10^{-7} (530×10^{-7})*1	740×10^{-7} (900×10^{-7})*1	1090×10^{-7} (1250×10^{-7})*1	2200×10^{-7}
Resolution	Resolution Setting: 1000 P/R		0.36°/Pulse					
Power Supply Input	Voltage and Frequency		Single-Phase 100-120 VAC, Single-Phase/Three-Phase 200-240 VAC −15～+6% 50/60 Hz					
	Input Current A	Single-Phase 100-120 VAC	2.7	2.7	3.8	5.4	5.5	6.4
		Single-Phase 200-240 VAC	1.7	1.6	2.3	3.3	3.3	3.9
		Three-Phase 200-240 VAC	1.0	1.0	1.4	2.0	2.0	2.3
Control Power Source			24 VDC ±5%*2 0.25 A (0.33 A)*1	24 VDC ±5% 0.25 A	24 VDC ±5%*2 0.25 A (0.5 A)*1			

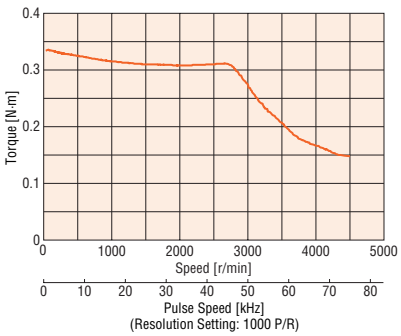
- Either **0** (Straight) or **1** (With a key) indicating the configuration is entered where the box □ is located within the product name. (For **AZM46**, straight only)
  For single-sided milling, no character is entered into the □ mark.
- For details of the standards, check the Oriental Motor website.

*1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

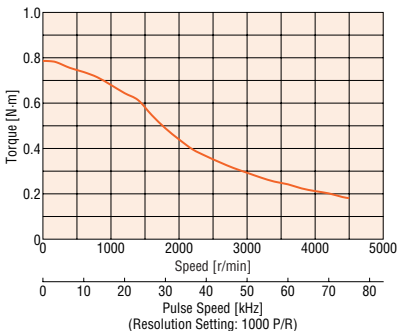
*2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

Speed – Torque Characteristics (Reference values)

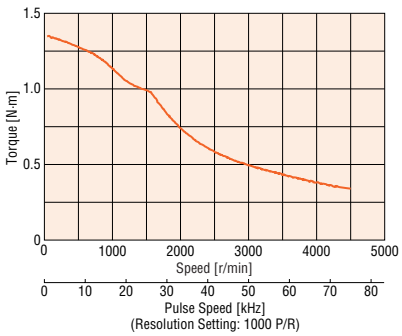
AZM46



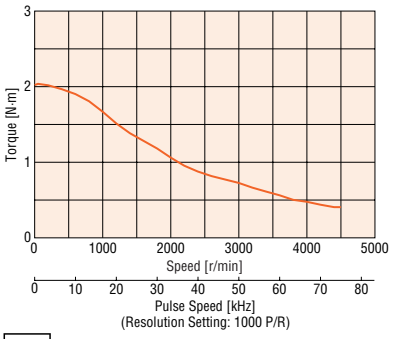
AZM48



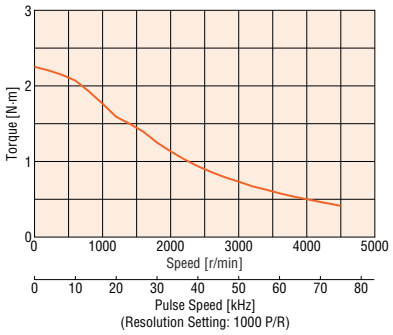
AZM66



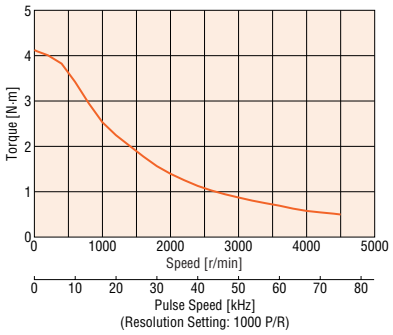
AZM69



AZM98



AZM911



Note

- The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less.
  (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

Descriptions of the Terms on the Specification Table

Maximum Holding Torque	: The maximum holding torque (holding force) of the motor when power (rated current) is being supplied but the motor shaft is at standstill. (With geared types, the permissible strength of the gear is given consideration for this value.)	
Permissible Torque	: The maximum value of the torque that can be continuously applied on the output gear shaft.	
Maximum Instantaneous Torque	: This is the maximum torque value that can be applied to the output gear shaft during acceleration/deceleration like when an inertial load is started and stopped.	
Holding Torque at Motor Standstill	Power ON	: Holding torque when the automatic current cutback function is active.
	Electromagnetic Brake	: Static friction torque when the electromagnetic brake is activated at standstill. (Electromagnetic brake is power off activated type.)

TS Geared Type Frame Size 42 mm

Specifications

Motor Product Name	Single Shaft	**AZM46AC-TS3.6□**	**AZM46AC-TS7.2□**	**AZM46AC-TS10□**	**AZM46AC-TS20□**	**AZM46AC-TS30□**
	With Electromagnetic Brake	**AZM46MC-TS3.6□**	**AZM46MC-TS7.2□**	**AZM46MC-TS10□**	**AZM46MC-TS20□**	**AZM46MC-TS30□**
Driver Product Name	Built-in Controller	**AZD-AD** (Single-Phase 100-120 VAC), **AZD-CD** (Single-Phase/Three-Phase 200-240 VAC)				
	Pulse Input with RS-485 Communication	**AZD-AX** (Single-Phase 100-120 VAC), **AZD-CX** (Single-Phase/Three-Phase 200-240 VAC)				
	Pulse Input	**AZD-A** (Single-Phase 100-120 VAC), **AZD-C** (Single-Phase/Three-Phase 200-240 VAC)				
Maximum Holding Torque	N·m	0.65	1.2	1.7	2	2.3
Rotor Inertial	J: kg·m^2	55×10^{-7} (71×10^{-7})*1				
Gear Ratio		3.6	7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	0.65	1.2	1.7	2	2.3
Maximum Instantaneous Torque	N·m	0.85	1.6	2	3	
Holding Torque at Motor Standstill	Power ON N·m	0.54	1	1.5	1.9	2.2
	Electromagnetic Brake N·m	0.54	1	1.5	1.9	2.2
Speed Range	r/min	0~833	0~416	0~300	0~150	0~100
Backlash	arcmin	45 (0.75°)	25 (0.42°)		15 (0.25°)	
Power Supply Input	Voltage and Frequency	Single-Phase 100-120 VAC, Single-Phase/Three-Phase 200-240 VAC −15~+6% 50/60 Hz				
	Input Current A: Single-Phase 100-120 VAC	2.7				
	Input Current A: Single-Phase 200-240 VAC	1.7				
	Input Current A: Three-Phase 200-240 VAC	1.0				
Control Power Source		24 VDC ±5%*2 0.25 A (0.33 A)*1				

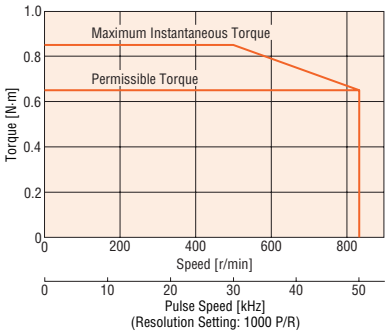
- The □ mark in the product name is replaced by **R** (Right), **U** (Upward), or **L** (Left) which shows the cable drawing direction. For the downward direction, no character is entered into the □ mark.
- For details of the standards, check the Oriental Motor website.

*1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

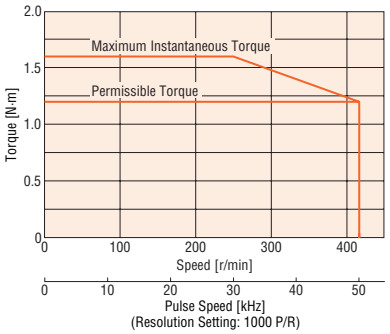
*2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

Speed – Torque Characteristics (Reference values)

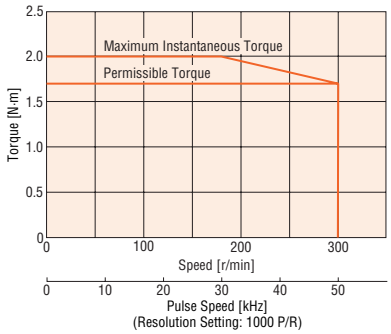
AZM46 Gear Ratio **3.6**



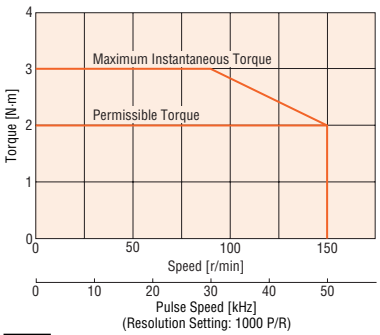
AZM46 Gear Ratio **7.2**



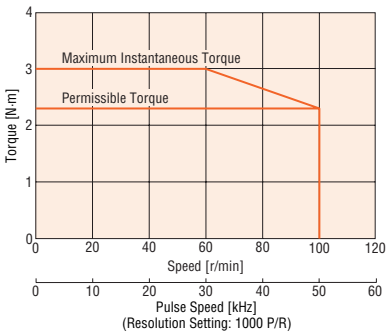
AZM46 Gear Ratio **10**



AZM46 Gear Ratio **20**



AZM46 Gear Ratio **30**



Note

- The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

TS Geared Type Frame Size 60 mm

Specifications

Motor Product Name	Single Shaft		**AZM66AC-TS3.6**□	**AZM66AC-TS7.2**□	**AZM66AC-TS10**□	**AZM66AC-TS20**□	**AZM66AC-TS30**□
	With Electromagnetic Brake		**AZM66MC-TS3.6**□	**AZM66MC-TS7.2**□	**AZM66MC-TS10**□	**AZM66MC-TS20**□	**AZM66MC-TS30**□
Driver Product Name	Built-in Controller		**AZD-AD** (Single-Phase 100-120 VAC), **AZD-CD** (Single-Phase/Three-Phase 200-240 VAC)				
	Pulse Input with RS-485 Communication		**AZD-AX** (Single-Phase 100-120 VAC), **AZD-CX** (Single-Phase/Three-Phase 200-240 VAC)				
	Pulse Input		**AZD-A** (Single-Phase 100-120 VAC), **AZD-C** (Single-Phase/Three-Phase 200-240 VAC)				
Maximum Holding Torque		N·m	1.8	3	4	5	6
Rotor Inertial		J: kg·m^2	370×10^{-7} (530×10^{-7})✻1				
Gear Ratio			3.6	7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R		0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque		N·m	1.8	3	4	5	6
Maximum Instantaneous Torque✻		N·m	✻	4.5	6	8	10
Holding Torque at Motor Standstill	Power ON	N·m	1.3	2.6	3.7	5	6
	Electromagnetic Brake	N·m	1.3	2.6	3.7	5	6
Speed Range		r/min	0～833	0～416	0～300	0～150	0～100
Backlash		arcmin	35 (0.59°)	15 (0.25°)		10 (0.17°)	
Power Supply Input	Voltage and Frequency		Single-Phase 100-120 VAC, Single-Phase/Three-Phase 200-240 VAC −15～+6% 50/60 Hz				
	Input Current A: Single-Phase 100-120 VAC		3.8				
	Input Current A: Single-Phase 200-240 VAC		2.3				
	Input Current A: Three-Phase 200-240 VAC		1.4				
Control Power Source			24 VDC ±5%✻2 0.25 A (0.5 A)✻1				

✻ For the geared motor output torque, refer to the Speed – Torque Characteristics.

● The □ mark in the product name is replaced by **R** (Right), **U** (Upward), or **L** (Left) which shows the cable drawing direction. For the downward direction, no character is entered into the □ mark.

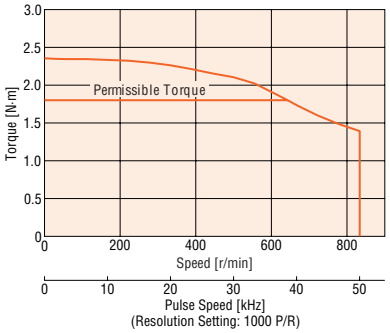
● For details of the standards, check the Oriental Motor website.

✻1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

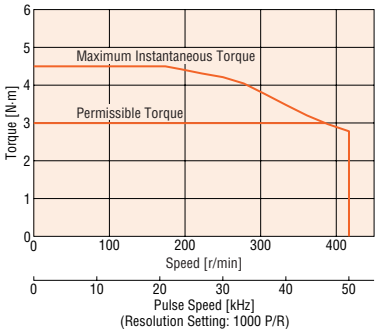
✻2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

Speed – Torque Characteristics (Reference values)

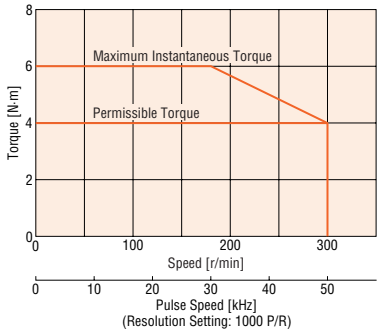
AZM66 Gear Ratio **3.6**



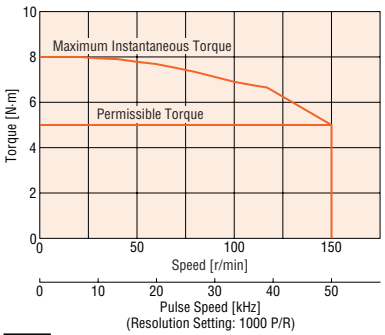
AZM66 Gear Ratio **7.2**



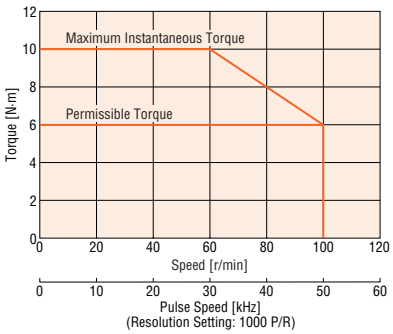
AZM66 Gear Ratio **10**



AZM66 Gear Ratio **20**



AZM66 Gear Ratio **30**



Note

● The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

TS Geared Type Frame Size 90 mm

Specifications

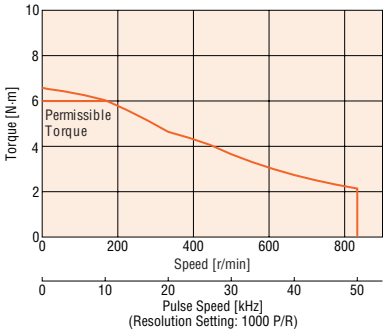
Motor Product Name	Single Shaft	**AZM98AC-TS3.6□**	**AZM98AC-TS7.2□**	**AZM98AC-TS10□**	**AZM98AC-TS20□**	**AZM98AC-TS30□**
	With Electromagnetic Brake	**AZM98MC-TS3.6□**	**AZM98MC-TS7.2□**	**AZM98MC-TS10□**	**AZM98MC-TS20□**	**AZM98MC-TS30□**
Driver Product Name	Built-in Controller	**AZD-AD** (Single-Phase 100-120 VAC), **AZD-CD** (Single-Phase/Three-Phase 200-240 VAC)				
	Pulse Input with RS-485 Communication	**AZD-AX** (Single-Phase 100-120 VAC), **AZD-CX** (Single-Phase/Three-Phase 200-240 VAC)				
	Pulse Input	**AZD-A** (Single-Phase 100-120 VAC), **AZD-C** (Single-Phase/Three-Phase 200-240 VAC)				
Maximum Holding Torque	N·m	6	10	14	20	25
Rotor Inertial	J: kg·m^2	1090×10^{-7} (1250×10^{-7})*1				
Gear Ratio		3.6	7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	6	10	14	20	25
Maximum Instantaneous Torque*	N·m	*	*	20	*	45
Holding Torque at Motor Standstill	Power ON N·m	3.6	7.2	10	20	25
	Electromagnetic Brake N·m	3.6	7.2	10	20	25
Speed Range	r/min	0～833	0～416	0～300	0～150	0～100
Backlash	arcmin	25 (0.42°)	15 (0.25°)		10 (0.17°)	
Power Supply Input	Voltage and Frequency	Single-Phase 100-120 VAC, Single-Phase/Three-Phase 200-240 VAC −15～+6% 50/60 Hz				
	Input Current A: Single-Phase 100-120 VAC	5.5				
	Input Current A: Single-Phase 200-240 VAC	3.3				
	Input Current A: Three-Phase 200-240 VAC	2.0				
Control Power Source		24 VDC ±5%*2 0.25 A (0.5 A)*1				

* For the geared motor output torque, refer to the Speed – Torque Characteristics.
- The □ mark in the product name is replaced by **R** (Right), **U** (Upward), or **L** (Left) which shows the cable drawing direction. For the downward direction, no character is entered into the □ mark.
- For details of the standards, check the Oriental Motor website.

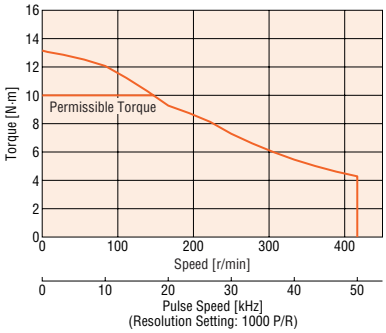
*1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.
*2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

Speed – Torque Characteristics (Reference values)

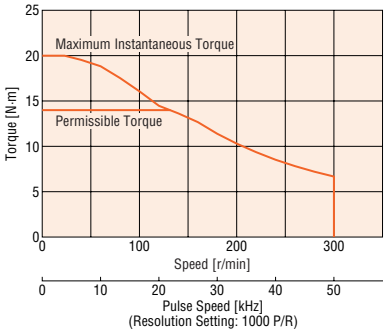
AZM98 Gear Ratio **3.6**



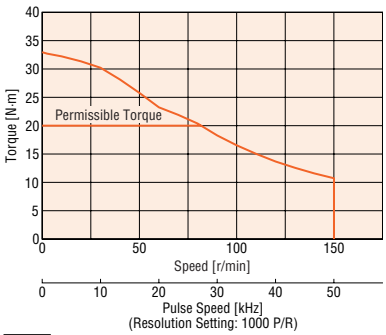
AZM98 Gear Ratio **7.2**



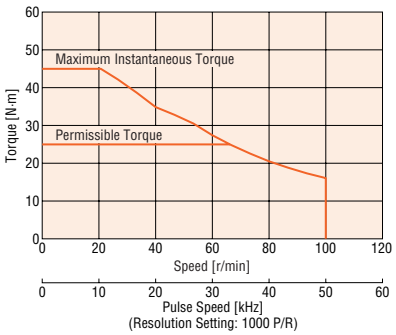
AZM98 Gear Ratio **10**



AZM98 Gear Ratio **20**



AZM98 Gear Ratio **30**



Note

- The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

FC Geared Type Frame Size 42 mm

Specifications

Motor Product Name	Single Shaft		**AZM46AC-FC7.2□A**	**AZM46AC-FC10□A**	**AZM46AC-FC20□A**	**AZM46AC-FC30□A**
	With Electromagnetic Brake		**AZM46MC-FC7.2□A**	**AZM46MC-FC10□A**	**AZM46MC-FC20□A**	**AZM46MC-FC30□A**
Driver Product Name	Built-in Controller		**AZD-AD** (Single-Phase 100-120 VAC), **AZD-CD** (Single-Phase/Three-Phase 200-240 VAC)			
	Pulse Input with RS-485 Communication		**AZD-AX** (Single-Phase 100-120 VAC), **AZD-CX** (Single-Phase/Three-Phase 200-240 VAC)			
	Pulse Input		**AZD-A** (Single-Phase 100-120 VAC), **AZD-C** (Single-Phase/Three-Phase 200-240 VAC)			
Maximum Holding Torque		N·m	0.7	1	2	3
Rotor Inertial		J: kg·m^2	55×10^{-7} (71×10^{-7})*1			
Gear Ratio			7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R		0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque		N·m	0.7	1	2	3
Holding Torque at Motor Standstill	Power ON	N·m	0.7	1	2	3
	Electromagnetic Brake	N·m	0.7	1	2	3
Speed Range		r/min	0～416	0～300	0～150	0～100
Backlash		arcmin	25 (0.42°)		15 (0.25°)	
Power Supply Input	Voltage and Frequency		Single-Phase 100-120 VAC, Single-Phase/Three-Phase 200-240 VAC −15～+6% 50/60 Hz			
	Input Current A	Single-Phase 100-120 VAC	2.7			
		Single-Phase 200-240 VAC	1.7			
		Three-Phase 200-240 VAC	1.0			
Control Power Source			24 VDC ±5%*2 0.25 A (0.33 A)*1			

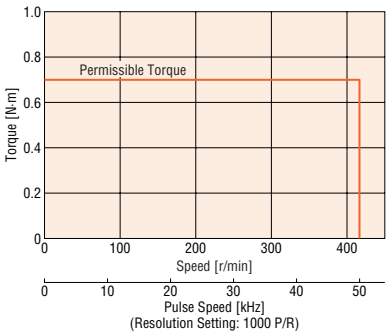
- Either **U** (Upward) or **D** (Downward) indicating the cable drawing direction is entered where the box □ is located within the product name.
- For details of the standards, check the Oriental Motor website.

*1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

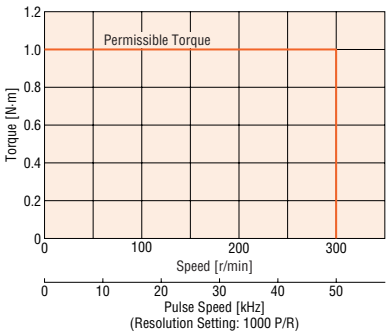
*2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

Speed – Torque Characteristics (Reference values)

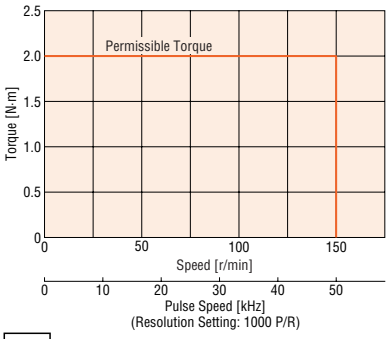
AZM46 Gear Ratio **7.2**



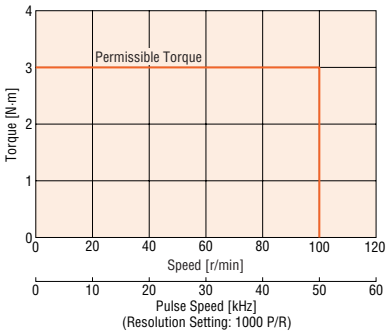
AZM46 Gear Ratio **10**



AZM46 Gear Ratio **20**



AZM46 Gear Ratio **30**



Note

- The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

FC Geared Type Frame Size 60 mm

Specifications

Motor Product Name	Single Shaft	**AZM66AC-FC7.2□A**	**AZM66AC-FC10□A**	**AZM66AC-FC20□A**	**AZM66AC-FC30□A**
	With Electromagnetic Brake	**AZM66MC-FC7.2□A**	**AZM66MC-FC10□A**	**AZM66MC-FC20□A**	**AZM66MC-FC30□A**
Driver Product Name	Built-in Controller	**AZD-AD** (Single-Phase 100-120 VAC), **AZD-CD** (Single-Phase/Three-Phase 200-240 VAC)			
	Pulse Input with RS-485 Communication	**AZD-AX** (Single-Phase 100-120 VAC), **AZD-CX** (Single-Phase/Three-Phase 200-240 VAC)			
	Pulse Input	**AZD-A** (Single-Phase 100-120 VAC), **AZD-C** (Single-Phase/Three-Phase 200-240 VAC)			
Maximum Holding Torque	N·m	2.5	3.5	7	10.5
Rotor Inertial	J: kg·m^2	370×10^{-7} (530×10^{-7})*1			
Gear Ratio		7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	2.5	3.5	7	10.5
Holding Torque at Motor Standstill	Power ON N·m	2.5	3.5	7	10.5
	Electromagnetic Brake N·m	2.5	3.5	7	10.5
Speed Range	r/min	0～416	0～300	0～150	0～100
Backlash	arcmin	15 (0.25°)		10 (0.17°)	
Power Supply Input	Voltage and Frequency	Single-Phase 100-120 VAC, Single-Phase/Three-Phase 200-240 VAC −15～+6% 50/60 Hz			
	Input Current A Single-Phase 100-120 VAC	3.8			
	Input Current A Single-Phase 200-240 VAC	2.3			
	Input Current A Three-Phase 200-240 VAC	1.4			
Control Power Source		24 VDC ±5%*2 0.25 A (0.5 A)*1			

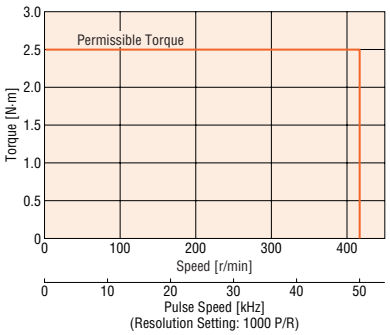
- Either **U** (Upward) or **D** (Downward) indicating the cable drawing direction is entered where the box □ is located within the product name.
- For details of the standards, check the Oriental Motor website.

*1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

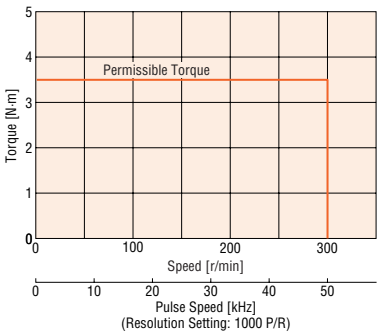
*2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

Speed – Torque Characteristics (Reference values)

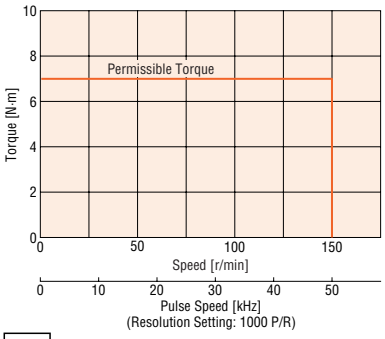
AZM66 Gear Ratio **7.2**



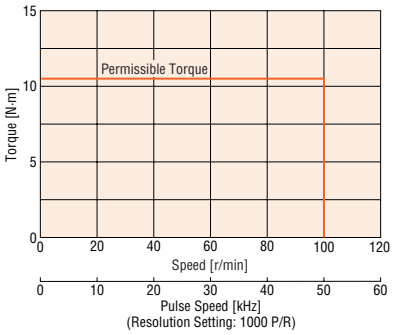
AZM66 Gear Ratio **10**



AZM66 Gear Ratio **20**



AZM66 Gear Ratio **30**



Note

- The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

PS Geared Type Frame Size 42 mm

Specifications

Motor Product Name	Single Shaft	AZM46AC-PS5	AZM46AC-PS7.2	AZM46AC-PS10	AZM46AC-PS25	AZM46AC-PS36	AZM46AC-PS50
	With Electromagnetic Brake	AZM46MC-PS5	AZM46MC-PS7.2	AZM46MC-PS10	AZM46MC-PS25	AZM46MC-PS36	AZM46MC-PS50
Driver Product Name	Built-in Controller	**AZD-AD** (Single-Phase 100-120 VAC), **AZD-CD** (Single-Phase/Three-Phase 200-240 VAC)					
	Pulse Input with RS-485 Communication	**AZD-AX** (Single-Phase 100-120 VAC), **AZD-CX** (Single-Phase/Three-Phase 200-240 VAC)					
	Pulse Input	**AZD-A** (Single-Phase 100-120 VAC), **AZD-C** (Single-Phase/Three-Phase 200-240 VAC)					
Maximum Holding Torque	N·m	1	1.5		2.5	3	
Rotor Inertial	J: kg·m^2	55×10^{-7} (71×10^{-7})*1					
Gear Ratio		5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque	N·m	1	1.5		2.5	3	
Maximum Instantaneous Torque	N·m	1.5	2		6		
Holding Torque at Motor Standstill	Power ON N·m	0.75	1	1.5	2.5	3	
	Electromagnetic Brake N·m	0.75	1	1.5	2.5	3	
Speed Range	r/min	0~600	0~416	0~300	0~120	0~83	0~60
Backlash	arcmin	15 (0.25°)					
Power Supply Input	Voltage and Frequency	Single-Phase 100-120 VAC, Single-Phase/Three-Phase 200-240 VAC −15~+6% 50/60 Hz					
	Input Current A: Single-Phase 100-120 VAC	2.7					
	Input Current A: Single-Phase 200-240 VAC	1.7					
	Input Current A: Three-Phase 200-240 VAC	1.0					
Control Power Source		24 VDC ±5%*2 0.25 A (0.33 A)*1					

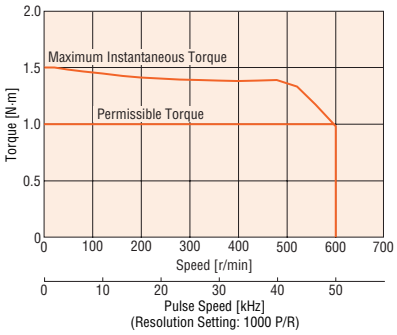
● For details of the standards, check the Oriental Motor website.

*1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

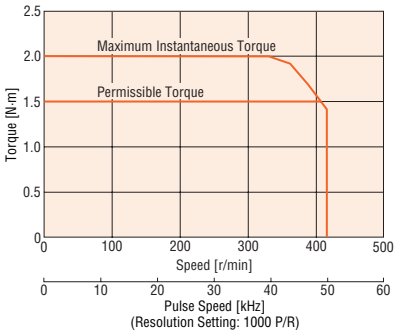
*2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

Speed – Torque Characteristics (Reference values)

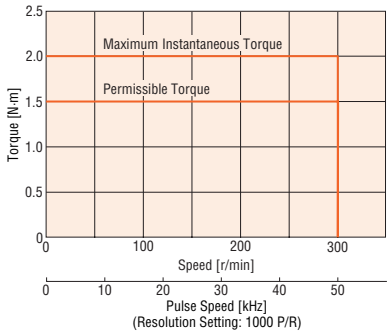
AZM46 Gear Ratio **5**



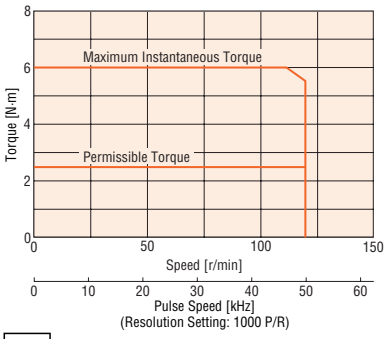
AZM46 Gear Ratio **7.2**



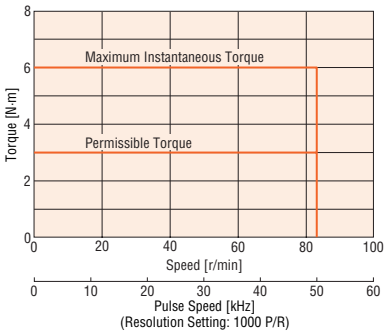
AZM46 Gear Ratio **10**



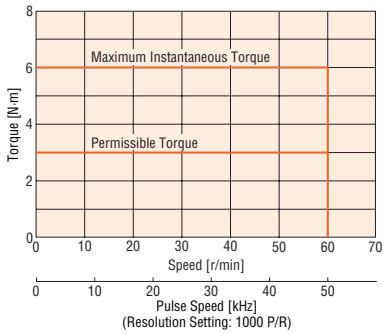
AZM46 Gear Ratio **25**



AZM46 Gear Ratio **36**



AZM46 Gear Ratio **50**



Note

● The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

PS Geared Type Frame Size 60 mm

Specifications

Motor Product Name	Single Shaft	**AZM66AC-PS5**	**AZM66AC-PS7.2**	**AZM66AC-PS10**	**AZM66AC-PS25**	**AZM66AC-PS36**	**AZM66AC-PS50**
	With Electromagnetic Brake	**AZM66MC-PS5**	**AZM66MC-PS7.2**	**AZM66MC-PS10**	**AZM66MC-PS25**	**AZM66MC-PS36**	**AZM66MC-PS50**
Driver Product Name	Built-in Controller	**AZD-AD** (Single-Phase 100-120 VAC), **AZD-CD** (Single-Phase/Three-Phase 200-240 VAC)					
	Pulse Input with RS-485 Communication	**AZD-AX** (Single-Phase 100-120 VAC), **AZD-CX** (Single-Phase/Three-Phase 200-240 VAC)					
	Pulse Input	**AZD-A** (Single-Phase 100-120 VAC), **AZD-C** (Single-Phase/Three-Phase 200-240 VAC)					
Maximum Holding Torque	N·m	3.5	4	5	8		
Rotor Inertial	J: kg·m^2	370×10^{-7} (530×10^{-7})✻1					
Gear Ratio		5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque	N·m	3.5	4	5	8		
Maximum Instantaneous Torque✻	N·m	✻	✻	11	16	20	
Holding Torque at Motor Standstill	Power ON N·m	3	4	5	8		
	Electromagnetic Brake N·m	3	4	5	8		
Speed Range	r/min	0～600	0～416	0～300	0～120	0～83	0～60
Backlash	arcmin	7 (0.12°)			9 (0.15°)		
Power Supply Input	Voltage and Frequency	Single-Phase 100-120 VAC, Single-Phase/Three-Phase 200-240 VAC −15～+6% 50/60 Hz					
	Input Current A Single-Phase 100-120 VAC	3.8					
	Input Current A Single-Phase 200-240 VAC	2.3					
	Input Current A Three-Phase 200-240 VAC	1.4					
Control Power Source		24 VDC ±5%✻2 0.25 A (0.5 A)✻1					

✻ For the geared motor output torque, refer to the Speed – Torque Characteristics.

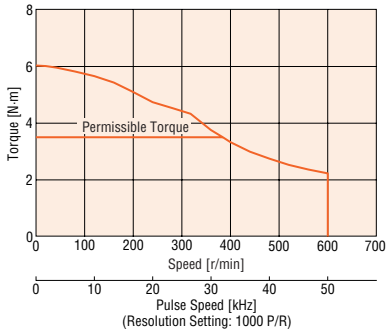
● For details of the standards, check the Oriental Motor website.

✻1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

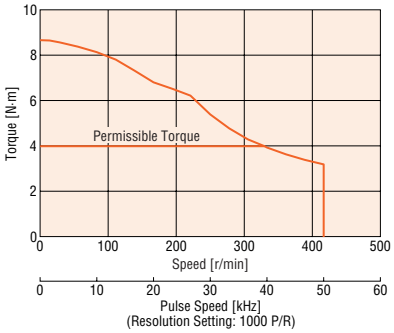
✻2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

Speed – Torque Characteristics (Reference values)

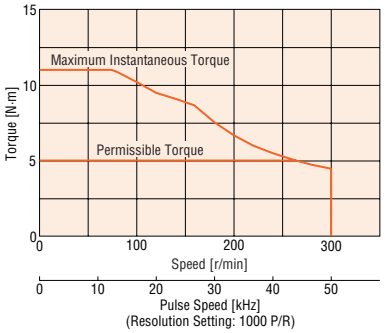
AZM66 Gear Ratio **5**



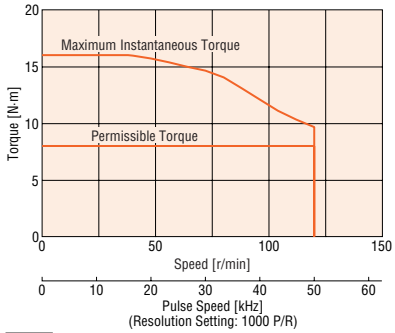
AZM66 Gear Ratio **7.2**



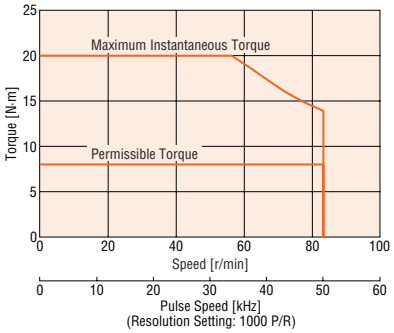
AZM66 Gear Ratio **10**



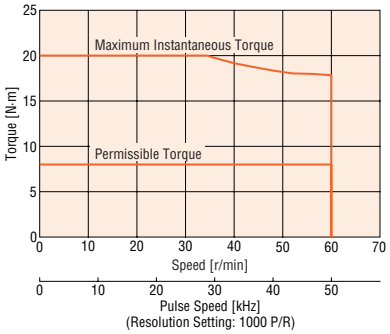
AZM66 Gear Ratio **25**



AZM66 Gear Ratio **36**



AZM66 Gear Ratio **50**



Note

● The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

PS Geared Type Frame Size 90 mm

Specifications

Motor Product Name	Single Shaft		AZM98AC-PS5	AZM98AC-PS7.2	AZM98AC-PS10	AZM98AC-PS25	AZM98AC-PS36	AZM98AC-PS50
	With Electromagnetic Brake		AZM98MC-PS5	AZM98MC-PS7.2	AZM98MC-PS10	AZM98MC-PS25	AZM98MC-PS36	AZM98MC-PS50
Driver Product Name	Built-in Controller		**AZD-AD** (Single-Phase 100-120 VAC), **AZD-CD** (Single-Phase/Three-Phase 200-240 VAC)					
	Pulse Input with RS-485 Communication		**AZD-AX** (Single-Phase 100-120 VAC), **AZD-CX** (Single-Phase/Three-Phase 200-240 VAC)					
	Pulse Input		**AZD-A** (Single-Phase 100-120 VAC), **AZD-C** (Single-Phase/Three-Phase 200-240 VAC)					
Maximum Holding Torque		N·m	10	14	20	37		
Rotor Inertial		J: kg·m^2	1090×10^{-7} (1250×10^{-7})✻1					
Gear Ratio			5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R		0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque✻		N·m	✻	✻	20	37		
Maximum Instantaneous Torque✻		N·m	✻	✻	✻	✻	60	
Holding Torque at Motor Standstill	Power ON	N·m	5	7.2	10	25	36	37
	Electromagnetic Brake	N·m	5	7.2	10	25	36	37
Speed Range		r/min	0～600	0～416	0～300	0～120	0～83	0～60
Backlash		arcmin	7 (0.12°)			9 (0.15°)		
Power Supply Input	Voltage and Frequency		Single-Phase 100-120 VAC, Single-Phase/Three-Phase 200-240 VAC −15～+6% 50/60 Hz					
	Input Current A: Single-Phase 100-120 VAC		5.5					
	Input Current A: Single-Phase 200-240 VAC		3.3					
	Input Current A: Three-Phase 200-240 VAC		2.0					
Control Power Source			24 VDC ±5%✻2 0.25 A (0.5 A)✻1					

✻ For the geared motor output torque, refer to the Speed – Torque Characteristics.

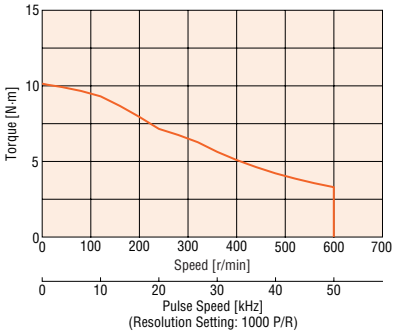
● For details of the standards, check the Oriental Motor website.

✻1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

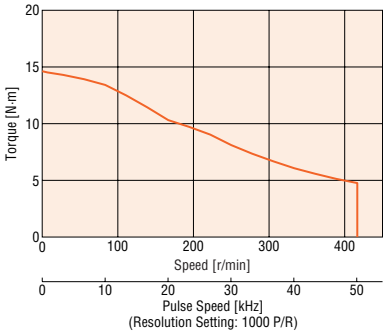
✻2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

Speed – Torque Characteristics (Reference values)

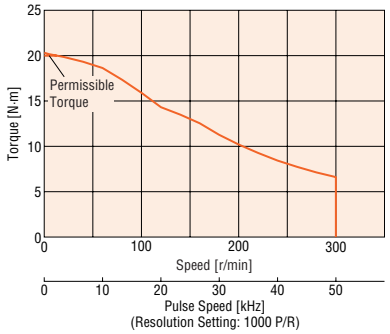
AZM98 Gear Ratio **5**



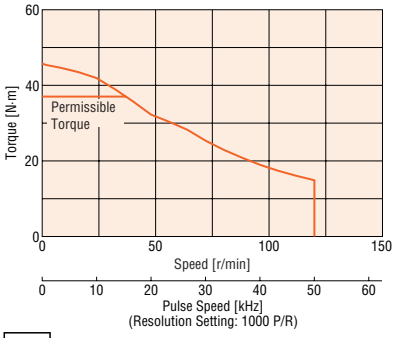
AZM98 Gear Ratio **7.2**



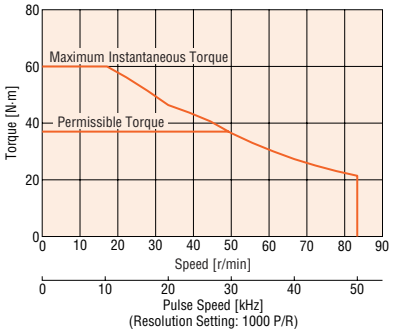
AZM98 Gear Ratio **10**



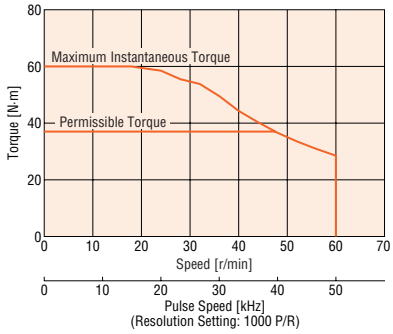
AZM98 Gear Ratio **25**



AZM98 Gear Ratio **36**



AZM98 Gear Ratio **50**



Note

● The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

HPG Geared Type Frame Size 40 mm, 60 mm, 90 mm

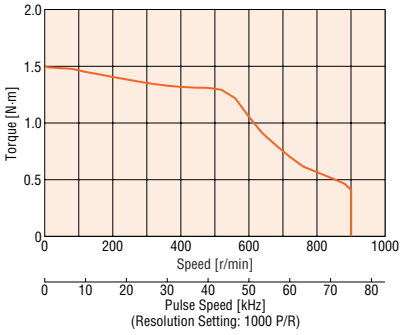
Specifications

Motor Product Name	Single Shaft	**AZM46AC-HP5□**	**AZM46AC-HP9□**	**AZM66AC-HP5□**	**AZM66AC-HP15□**	**AZM98AC-HP5□**	**AZM98AC-HP15□**
	With Electromagnetic Brake	**AZM46MC-HP5□**	**AZM46MC-HP9□**	**AZM66MC-HP5□**	**AZM66MC-HP15□**	**AZM98MC-HP5□**	**AZM98MC-HP15□**
Driver Product Name	Built-in Controller	**AZD-AD** (Single-Phase 100-120 VAC), **AZD-CD** (Single-Phase/Three-Phase 200-240 VAC)					
	Pulse Input with RS-485 Communication	**AZD-AX** (Single-Phase 100-120 VAC), **AZD-CX** (Single-Phase/Three-Phase 200-240 VAC)					
	Pulse Input	**AZD-A** (Single-Phase 100-120 VAC), **AZD-C** (Single-Phase/Three-Phase 200-240 VAC)					
Maximum Holding Torque	N·m	1.5	2.5	5.9	9	10	24
Rotor Inertial	J: kg·m^2	55×10^{-7} (71×10^{-7})*1		370×10^{-7} (530×10^{-7})*1		1090×10^{-7} (1250×10^{-7})*1	
Inertial*2	J: kg·m^2	5.8×10^{-7} (4.2×10^{-7})	3.4×10^{-7} (2.9×10^{-7})	92×10^{-7} (86×10^{-7})	78×10^{-7} (77×10^{-7})	629×10^{-7} (589×10^{-7})	488×10^{-7} (488×10^{-7})
Gear Ratio		5	9	5	15	5	15
Resolution	Resolution Setting: 1000 P/R	0.072°/Pulse	0.04°/Pulse	0.072°/Pulse	0.024°/Pulse	0.072°/Pulse	0.024°/Pulse
Permissible Torque*	N·m	*	2.5	5.9	9	*	24
Maximum Instantaneous Torque*	N·m	*	*	*	*	*	*
Holding Torque at Motor Standstill	Power ON N·m	0.75	1.35	3	9	5	15
	Electromagnetic Brake N·m	0.75	1.35	3	9	5	15
Speed Range	r/min	0～900	0～500	0～900	0～300	0～900	0～300
Backlash	arcmin	3 (0.05°)					
Power Supply Input	Voltage and Frequency	Single-Phase 100-120 VAC, Single-Phase/Three-Phase 200-240 VAC −15～+6% 50/60 Hz					
	Input Current A: Single-Phase 100-120 VAC	2.7		3.8		5.5	
	Input Current A: Single-Phase 200-240 VAC	1.7		2.3		3.3	
	Input Current A: Three-Phase 200-240 VAC	1.0		1.4		2.0	
Control Power Source		24 VDC ±5%*4 0.25 A (0.33 A)*1		24 VDC ±5%*4 0.25 A (0.5 A)*1			
Runout of Output Flange Surface*3	mm	0.02					
Runout of Output Flange Inner Diameter*3	mm	0.03		0.04			

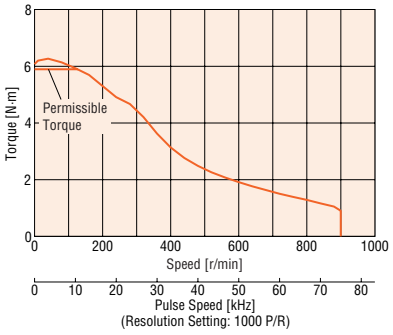
* For the geared motor output torque, refer to the Speed – Torque Characteristics.
● For the flange output type, **F** is entered where the box □ is located within the product name.
● For details of the standards, check the Oriental Motor website.
*1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.
*2 The values for the moments of inertia within the gear that has been converted to motor shaft values. The ( ) indicate the values for the flange output type.
*3 Specifications for the flange output type.
*4 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

Speed – Torque Characteristics (Reference values)

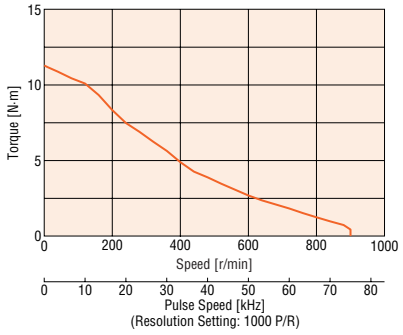
AZM46 Gear Ratio **5**



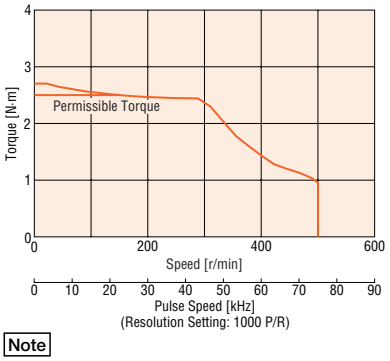
AZM66 Gear Ratio **5**



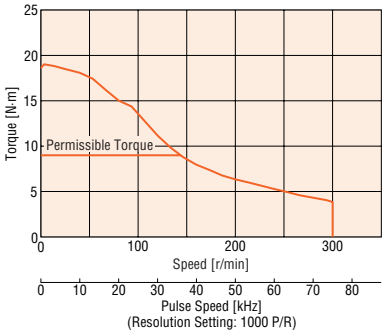
AZM98 Gear Ratio **5**



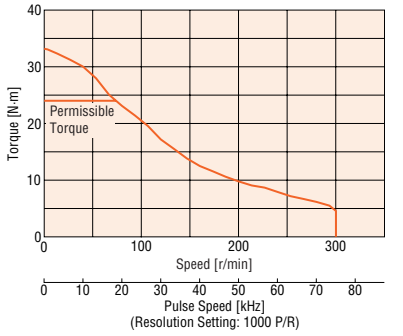
AZM46 Gear Ratio **9**



AZM66 Gear Ratio **15**



AZM98 Gear Ratio **15**



Note

● The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.
● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

Harmonic Geared Type Frame Size 42 mm, 60 mm, 90 mm

Specifications

Motor Product Name	Single Shaft	**AZM46AC-HS50**	**AZM46AC-HS100**	**AZM66AC-HS50**	**AZM66AC-HS100**	**AZM98AC-HS50**	**AZM98AC-HS100**
	With Electromagnetic Brake	**AZM46MC-HS50**	**AZM46MC-HS100**	**AZM66MC-HS50**	**AZM66MC-HS100**	**AZM98MC-HS50**	**AZM98MC-HS100**
Driver Product Name	Built-in Controller	**AZD-AD** (Single-Phase 100-120 VAC), **AZD-CD** (Single-Phase/Three-Phase 200-240 VAC)					
	Pulse Input with RS-485 Communication	**AZD-AX** (Single-Phase 100-120 VAC), **AZD-CX** (Single-Phase/Three-Phase 200-240 VAC)					
	Pulse Input	**AZD-A** (Single-Phase 100-120 VAC), **AZD-C** (Single-Phase/Three-Phase 200-240 VAC)					
Maximum Holding Torque	N·m	3.5	5	7	10	33	52
Rotor Inertial	J: kg·m^2	72×10^{-7} (88×10^{-7})✻1		405×10^{-7} (565×10^{-7})✻1		1290×10^{-7} (1450×10^{-7})✻1	
Gear Ratio		50	100	50	100	50	100
Resolution	Resolution Setting: 1000 P/R	0.0072°/Pulse	0.0036°/Pulse	0.0072°/Pulse	0.0036°/Pulse	0.0072°/Pulse	0.0036°/Pulse
Permissible Torque	N·m	3.5	5	7	10	33	52
Maximum Instantaneous Torque✻	N·m	8.3	11	23	36	✻	107
Holding Torque at Motor Standstill	Power ON N·m	3.5	5	7	10	33	52
	Electromagnetic Brake N·m	3.5	5	7	10	33	52
Speed Range	r/min	0~70	0~35	0~70	0~35	0~70	0~35
Lost Motion (Load torque)	arcmin	1.5 or less (±0.16 N·m)	1.5 or less (±0.20 N·m)	0.7 or less (±0.28 N·m)	0.7 or less (±0.39 N·m)	0.7 or less (±1.2 N·m)	
Power Supply Input	Voltage and Frequency	Single-Phase 100-120 VAC, Single-Phase/Three-Phase 200-240 VAC −15~+6% 50/60 Hz					
	Input Current A: Single-Phase 100-120 VAC	2.7		3.8		5.5	
	Input Current A: Single-Phase 200-240 VAC	1.7		2.3		3.3	
	Input Current A: Three-Phase 200-240 VAC	1.0		1.4		2.0	
Control Power Source		24 VDC ±5%✻2 0.25 A (0.33 A)✻1		24 VDC ±5%✻2 0.25 A (0.5 A)✻1			

✻ For the geared motor output torque, refer to the Speed – Torque Characteristics.

● For details of the standards, check the Oriental Motor website.

✻1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

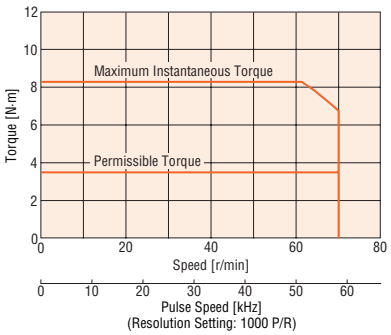
✻2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

Note

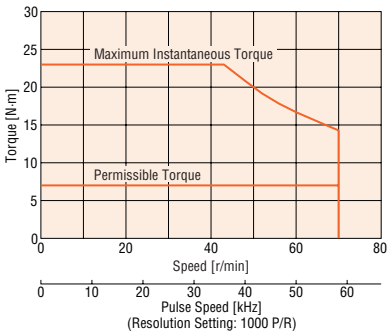
● The rotor inertia represents a sum of the inertia of the harmonic gear converted to motor shaft values.

Speed – Torque Characteristics (Reference values)

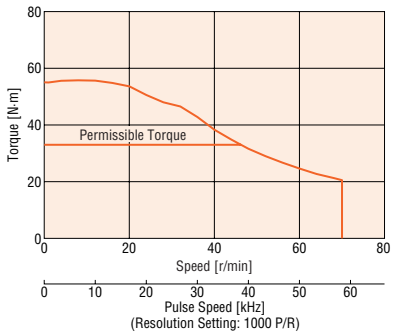
AZM46 Gear Ratio **50**



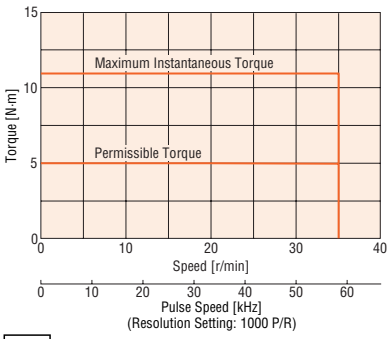
AZM66 Gear Ratio **50**



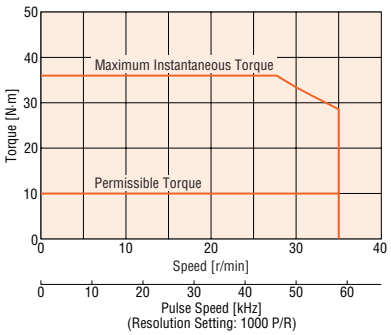
AZM98 Gear Ratio **50**



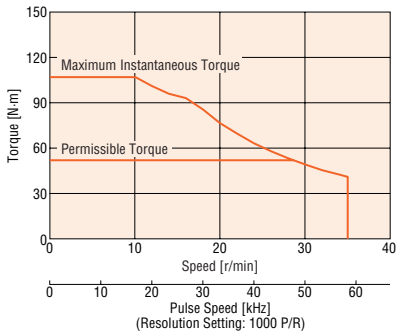
AZM46 Gear Ratio **100**



AZM66 Gear Ratio **100**



AZM98 Gear Ratio **100**



Note

● The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

Driver Specifications

Driver Type				Built-in Controller Type	Pulse Input Type with RS-485 Communication	Pulse Input Type
Driver Product Name				**AZD-AD AZD-CD**	**AZD-AX AZD-CX**	**AZD-A AZD-C**
I/O Function		Max. Input Pulse Frequency		–	Line driver output by programmable controller: 1 MHz (When the pulse duty is 50%) Open-collector output by programmable controller: 250 kHz (When the pulse duty is 50%)) Negative logic pulse input	
		Number of Positioning Data Sets		256 points	256 points*1	
		Direct Input		10 points	6 points	
		Direct Output		6 points		
		RS-485 Communication Remote Input		16 points		–
		RS-485 Communication Remote Output		16 points		–
Setting Tool		Data Setting Software **MEXE02**		○		
Coordinate Management Method				Battery-less absolute system		
Operation	Positioning Operation	Type	Positioning Operation	○	○	○*1
			Push-motion Positioning Operation*2	○	○	○*1
		Connecting Method	Independent Operation	○	○	○*1
			Forward Feed Operation	○	○	○*1
			Multistep Speed-change (Shape connection)	○	○	○*1
		Sequence Control	Loop Operation (Repetition)	○	○	○*1
			Event Jump Operation	○	○	○*1
	Linked Operation	Position Control		○	○	○*1
		Speed Control		○	○	○*1
		Torque Control		○	○	○*1
		Push-motion*2		○	○	○*1
	Return-to-home Operation		Return-to-home Operation	○	○	○
			High-speed Return-to-home Operation	○	○	○
	JOG Operation			○	○	○
Monitor/Information			Waveform Monitoring	○	○	○
			Overload Detection	○	○	○
			Overheat Detection (Motor and driver)	○	○	○
			Position and Speed Information	○	○	○
			Temperature Detection (Motor and driver)	○	○	○
			Motor Load Factor	○	○	○
			Mileage/Accumulated Mileage	○	○	○
Alarm				○	○	○

*1 Available after setting with data setting software **MEXE02**.

*2 Push-motion operation is not available to geared motors and **DG II** Series motorized actuators.

RS-485 Communication Specifications

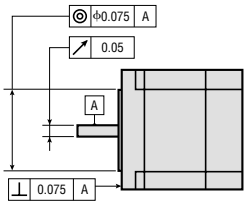
Protocol	Modbus RTU Mode
Electrical Characteristics	EIA-485 based, Straight cable Use twisted-pair cables (TIA/EIA-568B CAT5e or better recommended). The maximum total extension length is 50 m.*
Communication Mode	Half duplex and start-stop synchronization (Data: 8 bits, Stop bit: 1 bit or 2 bits, Parity: none, even, or odd)
Baud Rate	Select from 9600 bps/19200 bps/38400 bps/57600 bps/115200 bps/230400 bps.
Connection Type	Up to 31 units can be connected to a single programmable controller (Master unit).

*If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

General Specifications

		Motor	Driver	
			Built-in Controller Type Pulse Input Type with RS-485 Communication	Pulse Input Type
Heat-resistant Class		130 (B) [Recognized as 105 (A) by UL.]	–	
Insulation Resistance		The measured value is 100 MΩ or more when a 500 VDC megger is applied between the following locations: ・Case – Motor windings ・Case – Electromagnetic brake windings*1	The measured value is 100 MΩ or more when a 500 VDC megger is applied between the following locations: ・Protective earth terminal – Power supply terminal ・Encoder connector – Power supply terminal ・Power input terminal – Power supply terminal	
Dielectric Strength Voltage		No abnormality is found with the following application for 1 minute: ・Case – Motor windings 1.5 kVAC 50 Hz or 60 Hz ・Case – Electromagnetic brake windings*1 1.5 kVAC 50 Hz or 60 Hz	No abnormality is found with the following application for 1 minute: ・Protective earth terminal – Power supply terminal 1.5 kVAC 50 Hz or 60 Hz ・Encoder connector – Power supply terminal 1.8 kVAC 50 Hz or 60 Hz ・Power input terminal – Power supply terminal 1.8 kVAC 50 Hz or 60 Hz	
Operating Environment (In operation)	Ambient Temperature	0～+40˚C (Non-freezing)*2	0～+55˚C (Non-freezing)*3	
	Ambient Humidity	85% or less (Non-condensing)		
	Atmosphere	Use in an area without corrosive gases and dust. The product should not be exposed to water, oil or other liquids.		
Degree of Protection		IP66 (excluding installation surfaces and connector locations)	IP10	IP20
Stop Position Accuracy		**AZM46**, **AZM48**: ±4 min (±0.067˚)	**AZM66**, **AZM69**, **AZM98**, **AZM911**: ±3 min (±0.05˚)	
Shaft Runout		0.05 T.I.R. (mm)*4	–	
Concentricity of Installation Pilot to the Shaft		0.075 T.I.R. (mm)*4	–	
Perpendicularity of Installation Surface to the Shaft		0.075 T.I.R. (mm)*4	–	
Range of Multiple Rotation Inspection at Power OFF		±900 rotations (1800 rotations)		

*1 Electromagnetic brake type only
*2 Under the Oriental Motor's measurement conditions
*3 When a heat sink equivalent to an aluminum plate size of at least 200×200 mm and 2 mm thickness is installed
*4 T.I.R. (Total Indicator Reading): The total dial gauge reading when the measurement section is rotated one revolution, centered on the reference axis center.



Note

● When measuring insulation resistance or performing a dielectric strength voltage test, be sure to disconnect the motor from the driver beforehand. Also, do not conduct these tests on the ABZO sensor section of the motor.

Electromagnetic Brake Specifications

Product Name		AZM46	AZM66	AZM69	AZM98
Type		Power off activated type			
Power Supply Voltage		24 VDC ±5%*			
Power Supply Current	A	0.08	0.25	0.25	0.25
Brake Activate Time	ms	20			
Brake Release Time	ms	30			
Time Rating		Continuous			

*For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

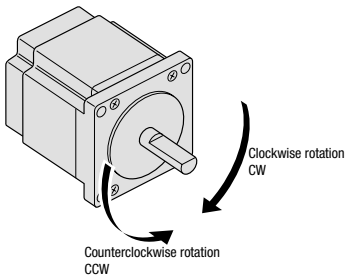
● The product names are described with text by which the product name can be identified.

Rotation Direction

The figure below shows the rotation directions seen from the output shaft.
The rotation direction of the gear output shaft, which is seen from the output shaft of a standard type motor, differs depending on the gear type or gear ratio.
Refer to the table below.

Type	Gear Ratio	Rotation Direction seen from the Output Shaft
TS Geared Type	**3.6**, **7.2**, **10**	Same direction
	20, **30**	Reverse direction
FC Geared Type **PS** Geared Type **HPG** Geared Type	Total reduction gear ratio	Same direction
Harmonic Geared Type	Total reduction gear ratio	Reverse direction

● Standard type motor



Permissible Radial Load/Permissible Axial Load

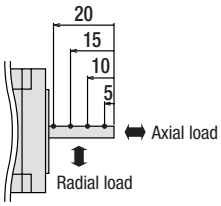
Unit: N

Type	Motor Frame Size	Product Name	Gear Ratio	Permissible Radial Load Distance from Shaft End mm					Permissible Axial Load
				0	5	10	15	20	
Standard Type	42 mm	**AZM46**	–	35	44	58	85	–	15
		AZM48		30	35	44	58	85	
	60 mm	**AZM66**, **AZM69**		90	100	130	180	270	30
	85 mm	**AZM98**, **AZM911**		260	290	340	390	480	60
TS Geared Type	42 mm	**AZM46**	**3.6**, **7.2**, **10**	20	30	40	50	–	15
			20, **30**	40	50	60	70	–	
	60 mm	**AZM66**	**3.6**, **7.2**, **10**	120	135	150	165	180	40
			20, **30**	170	185	200	215	230	
	90 mm	**AZM98**	**3.6**, **7.2**, **10**	300	325	350	375	400	150
			20, **30**	400	450	500	550	600	
FC Geared Type	42 mm	**AZM46**	**7.2**, **10**, **20**, **30**	180	200	220	250	–	100
	60 mm	**AZM66**		270	290	310	330	350	200
PS Geared Type	42 mm	**AZM46**	**5**	70	80	95	120	–	100
			7.2	80	90	110	140	–	
			10	85	100	120	150	–	
			25	120	140	170	210	–	
			36	130	160	190	240	–	
			50	150	170	210	260	–	
	60 mm	**AZM66**	**5**	170	200	230	270	320	200
			7.2	200	220	260	310	370	
			10	220	250	290	350	410	
			25	300	340	400	470	560	
			36	340	380	450	530	630	
			50	380	430	500	600	700	
	90 mm	**AZM98**	**5**	380	420	470	540	630	600
			7.2	430	470	530	610	710	
			10	480	530	590	680	790	
			25	650	720	810	920	1070	
			36	730	810	910	1040	1210	
			50	820	910	1020	1160	1350	
HPG Geared Type	40 mm	**AZM46**	**5**	150	170	190	230	270	430
			9	180	200	230	270	320	510
	60 mm	**AZM66**	**5**	250	270	300	330	360	700
			15	360	380	420	460	510	980
	90 mm	**AZM98**	**5**	600	630	670	710	750	1460
			15	830	880	930	980	1050	2030
Harmonic Geared Type	42 mm	**AZM46**	**50**, **100**	180	220	270	360	510	220
	60 mm	**AZM66**		320	370	440	550	720	450
	90 mm	**AZM98**		1090	1150	1230	1310	1410	1300

- The product names are described with text by which the product name can be identified.
- **PS** geared type and **HPG** geared type: The values shown in the table are those that enable a product life of 20,000 hours when either permissible radial load or permissible axial load is applied. For the product life of the gearhead, contact the nearest Oriental Motor sales office, or check the Oriental Motor website.

Radial Load and Axial Load

Distance from Shaft End [mm]



Permissible Moment Load

When eccentric load is applied to the installation surface of the output flange, load moment acts on the bearing.
Before using the motor, apply the formulas below to check that the axial load and load moment are within the specifications.

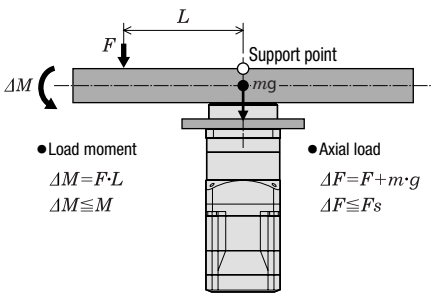
HPG Geared Type　Flange Output Type

Product Name	Gear Ratio	Permissible Axial Load (N)	Permissible Moment Load (N·m)	Constant α(m)
AZM46	**5**	430	4.9	0.006
	9	510	5.9	
AZM66	**5**	700	12.0	0.011
	15	980	17.2	
AZM98	**5**	1460	38.7	0.0115
	15	2030	53.5	

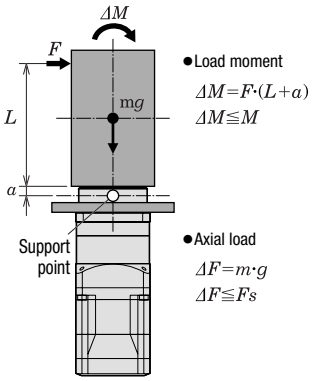
m : Load mass (kg)
g : Gravitational acceleration (m/s^2)
F : External force (N)
L : Overhung distance (m)
α : Constant (m)
ΔF : Load applied to the output flange surface (N)
Fs : Permissible axial load (N)
ΔM : Load moment (N·m)
M : Permissible moment load (N·m)

Apply the formulas below to calculate the load moment.

Example 1: External force F (N) is applied to the protrusion L (m). It is applied horizontally to the center of the output flange.



Example 2: External force F (N) is applied to the protrusion L (m). It is applied vertically to the center of the output flange.

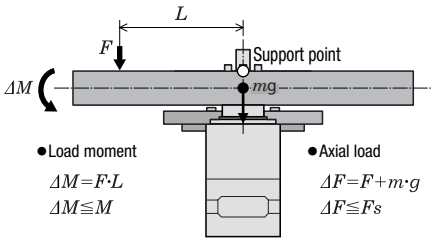


Harmonic Geared Type

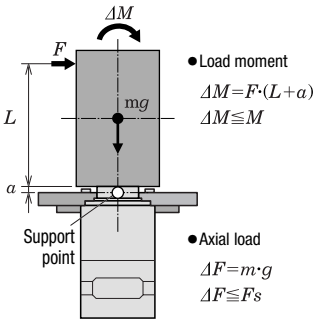
Motor Frame Size	Permissible Axial Load (N)	Permissible Moment Load (N·m)	Constant α(m)
42 mm	220	5.6	0.009
60 mm	450	11.6	0.0114

Apply the formulas below to calculate the load moment.

Example 1: External force F (N) is applied to the protrusion L (m). It is applied horizontally to the center of the output flange.

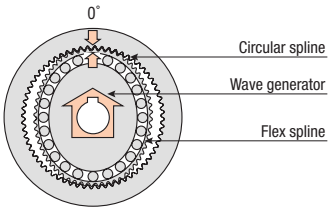


Example 2: External force F (N) is applied to the protrusion L (m). It is applied vertically to the center of the output flange.



Accuracy of the Harmonic Geared Type

Basic Structure



Accuracy

Unlike common reduction gears which employ spur gears, the harmonic geared type has no backlash (play between the meshing gears) between the harmonic gears. With this mechanism, the harmonic gears have the following features: The number of teeth that simultaneously mesh is large; the influence of teeth pitch errors or accumulated pitch errors on rotational accuracy are averaged; and with these, high positioning accuracy is achieved. In addition, the harmonic gears have a high gear ratio. Therefore, the distortion of the output shaft which is caused by the load torque applied to the output shaft is by far smaller than the distortion that occurs on the output shafts of standalone motors or other geared motors. This means that harmonic gears have high rigidity. With high rigidity, harmonic gears are resistant to load change, enabling stable positioning. When high positioning accuracy or rigidity is required, refer to the characteristics described below.

◇Angular Transmission Accuracy

Error between the actual rotation angle of an output shaft and the theoretical rotation angle of the output shaft which is calculated based on the input pulse count. The accuracy is represented by the difference between the minimum error and the maximum error that are measured when the output shaft is rotated once from an arbitrary position.

Product Name	Angular Transmission Accuracy [arcmin]
AZM24-HS□	2 (0.034°)
AZM46-HS□	1.5 (0.025°)
AZM66-HS□	
AZM98-HS□	1 (0.017°)

●Values measured under no load (reference values measured at the gears)

◇Torque – Distortion Characteristics

In actual applications, frictional load is inevitably generated, causing displacement depending on the frictional load. If the frictional load is constant, the displacement is also constant during one direction operation. However, when the motor is operated in both directions (the forward and reverse directions), the displacement doubles during the back and forth motion. The displacement can be assumed from the torque - distortion characteristics described below.

The displacement occurs when external force is applied during stop or when the motor is operated under frictional load. The slope in the graph below is close to the spring constant of each of the three classifications given below and can be estimated by the corresponding calculation.

1. When the load torque T_L is up to T_1

$$\theta = \frac{T_L}{K_1} \text{ [min]}$$

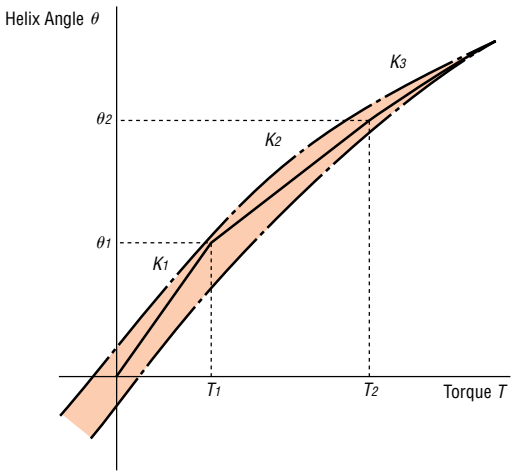
2. When the load torque T_L is above T_1 but up to T_2

$$\theta = \theta_1 + \frac{T_L - T_1}{K_2} \text{ [min]}$$

3. When the load torque T_L exceeds T_2

$$\theta = \theta_2 + \frac{T_L - T_2}{K_3} \text{ [min]}$$

The helix angle determined by the calculation is the helix angle of a stand-alone harmonic gear.



Helix Angle – Torque Characteristics

Values used for the calculation

Product Name	Gear Ratio	T1 N·m	K1 N·m/min	θ1 min	T2 N·m	K2 N·m/min	θ2 min	K3 N·m/min
AZM24-HS50	50	0.29	0.08	3.7	–	0.12	–	–
AZM24-HS100	100	0.29	0.1	2.9	1.5	0.15	11	0.21
AZM46-HS50	50	0.8	0.64	1.25	2	0.87	2.6	0.93
AZM46-HS100	100	0.8	0.79	1.02	2	0.99	2.2	1.28
AZM66-HS50	50	2	0.99	2	6.9	1.37	5.6	1.66
AZM66-HS100	100	2	1.37	1.46	6.9	1.77	4.2	2.1
AZM98-HS50	50	7	3.8	1.85	25	5.2	5.3	6.7
AZM98-HS100	100	7	4.7	1.5	25	7.3	4	8.4

Load Torque – Driver Input Current Characteristics

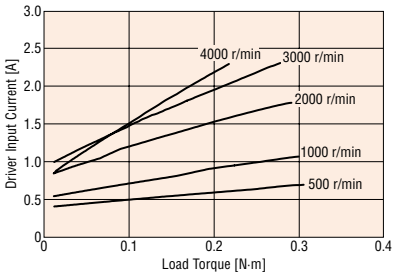
This is the relationship between the load torque and driver input current at each speed when the motor is actually operated. From these characteristics, the power supply capacity required for use in multi-axis operation can be estimated. For the geared type, convert to torque and speed by the motor shaft.

Motor shaft speed = Gear output shaft speed × Gear ratio [r/min]

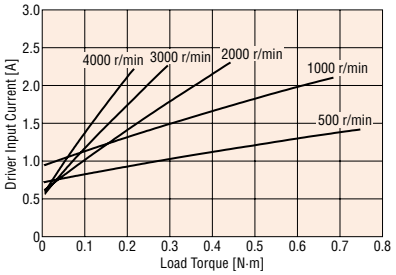
$$\text{Motor shaft torque} = \frac{\text{Gear output shaft torque}}{\text{Gear ratio}} \text{ [N·m]}$$

Single-Phase 100-120 VAC

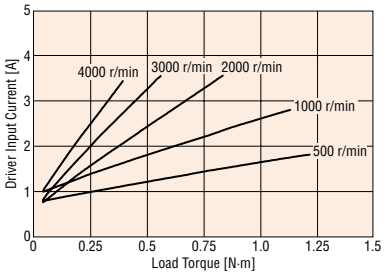
AZM46□C



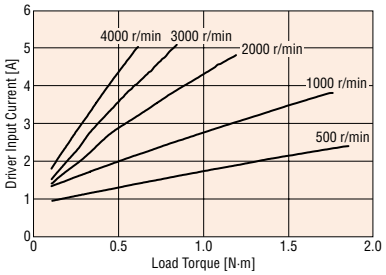
AZM48□C



AZM66□C

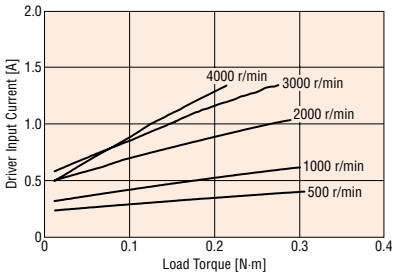


AZM69□C

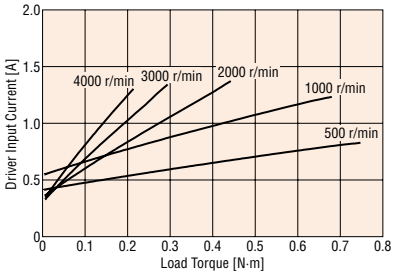


Single-Phase 200-240 VAC

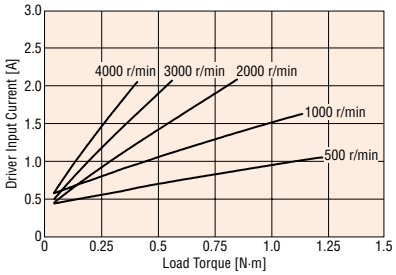
AZM46□C



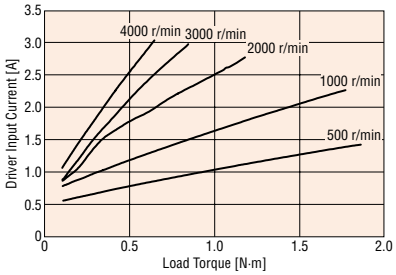
AZM48□C



AZM66□C

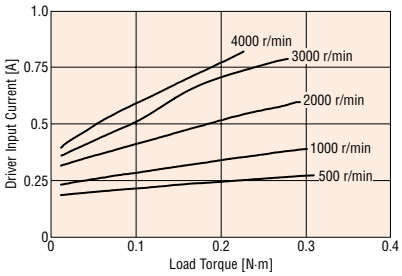


AZM69□C

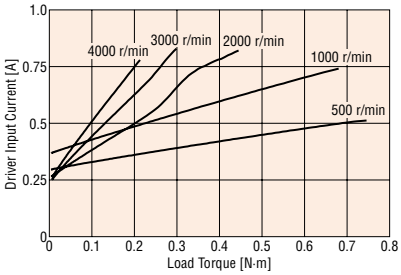


Three-Phase 200-240 VAC

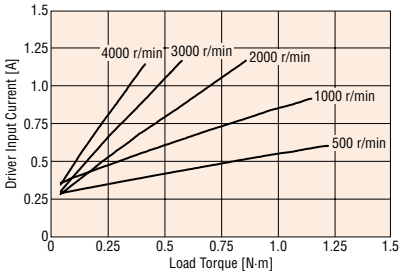
AZM46□C



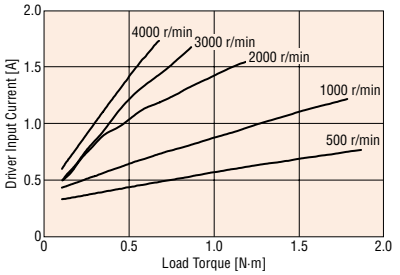
AZM48□C



AZM66□C

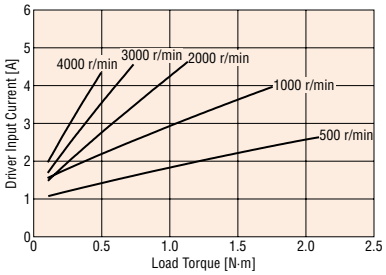


AZM69□C

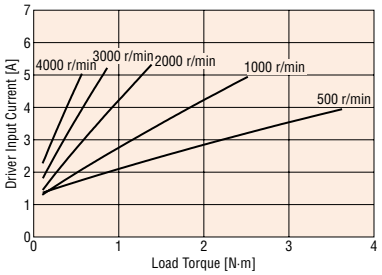


Single-Phase 100-120 VAC

AZM98□C

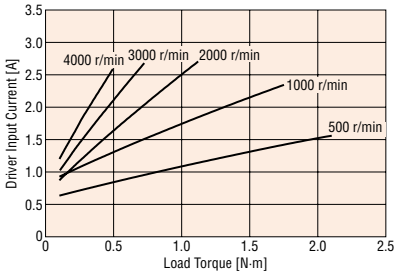


AZM911□C

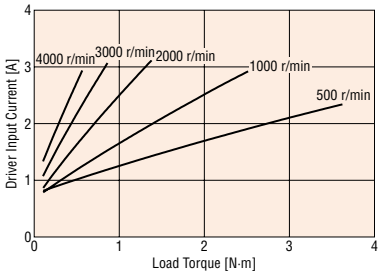


Single-Phase 200-240 VAC

AZM98□C

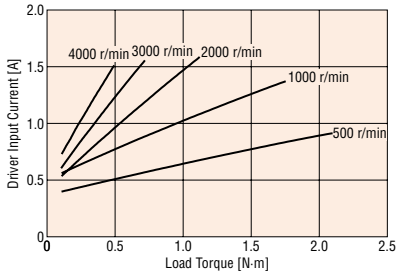


AZM911□C

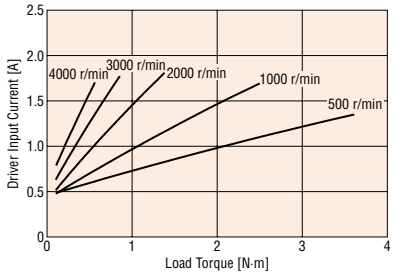


Three-Phase 200-240 VAC

AZM98□C



AZM911□C



Dimensions (Unit=mm)

Motors

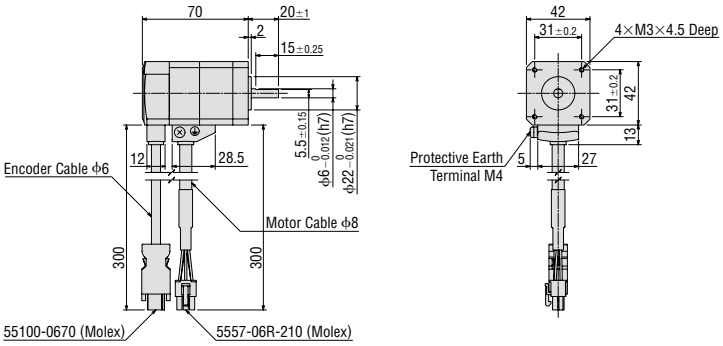
◇Standard Type

Frame Size 42 mm

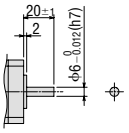
2D & 3D CAD

Shaft Shape	Product Name	Mass kg	2D CAD
Single Sided Milling	**AZM46AC**	0.44	B1092
Straight	**AZM46A0C**		B1288

Single Sided Milling



Straight

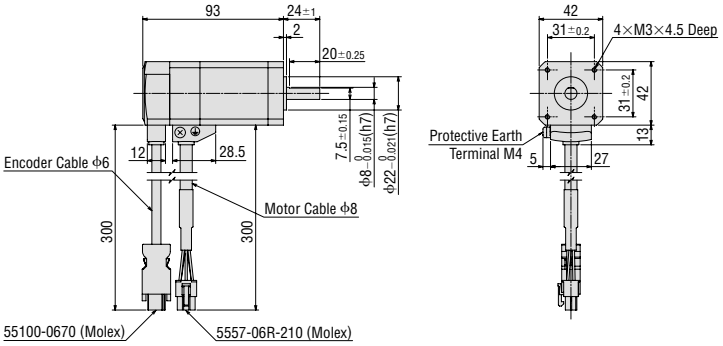


Frame Size 42 mm

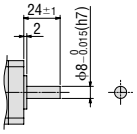
2D & 3D CAD

Shaft Shape	Product Name	Mass kg	2D CAD
Single Sided Milling	**AZM48AC**	0.68	B1312
Straight	**AZM48A0C**		B1289
With Key	**AZM48A1C**		B1299

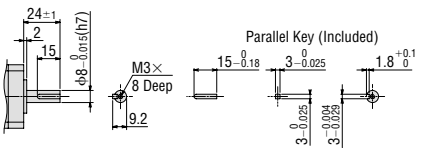
Single Sided Milling



Straight



With Key

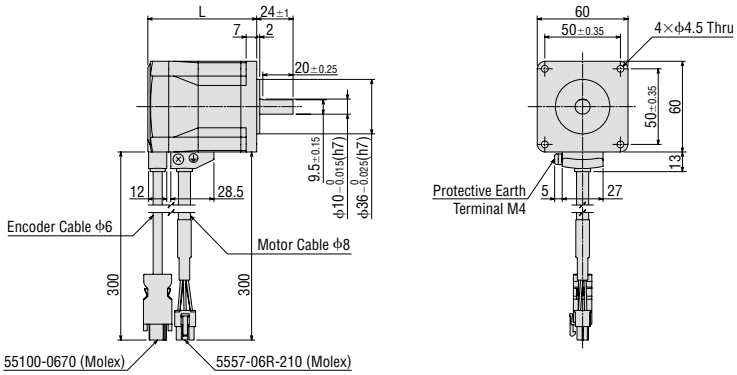


Frame Size 60 mm

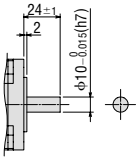
2D & 3D CAD

Shaft Shape	Product Name	L	Mass kg	2D CAD
Single Sided Milling	**AZM66AC**	72	0.91	B1093
Straight	**AZM66A0C**			B1290
With Key	**AZM66A1C**			B1300
Single Sided Milling	**AZM69AC**	97.5	1.4	B1129
Straight	**AZM69A0C**			B1291
With Key	**AZM69A1C**			B1301

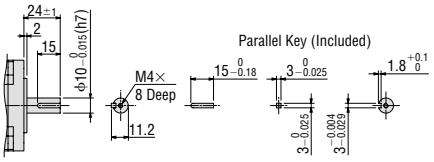
Single Sided Milling



Straight



With Key

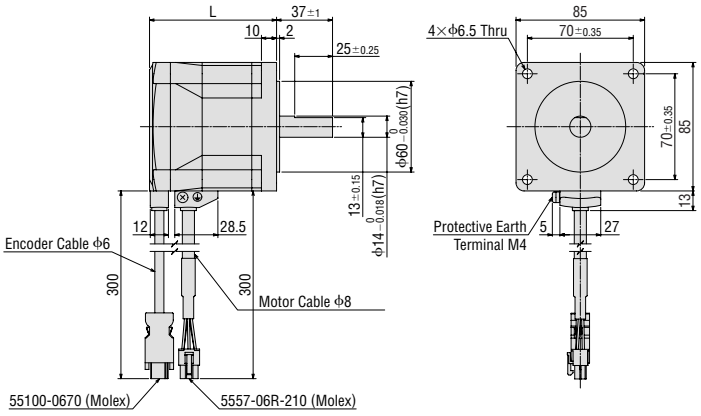


Frame Size 85 mm

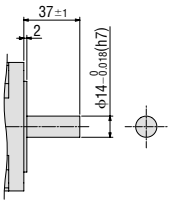
2D & 3D CAD

Shaft Shape	Product Name	L	Mass kg	2D CAD
Single Sided Milling	**AZM98AC**	84	1.9	B1181
Straight	**AZM98A0C**			B1292
With Key	**AZM98A1C**			B1302
Single Sided Milling	**AZM911AC**	114	3	B1183
Straight	**AZM911A0C**			B1293
With Key	**AZM911A1C**			B1303

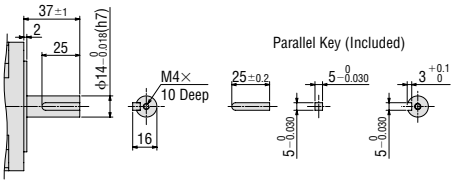
Single Sided Milling



Straight



With Key



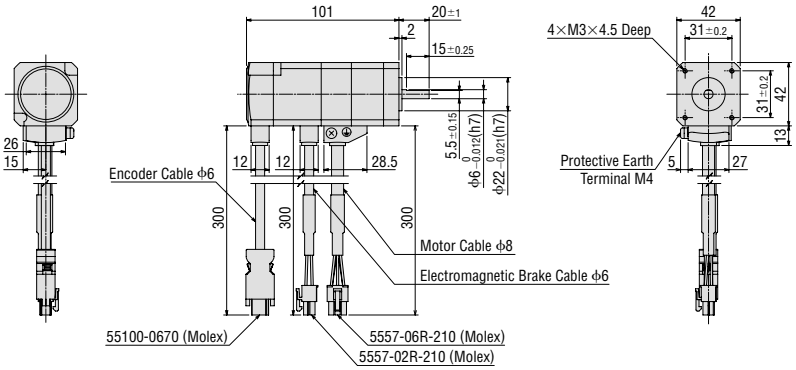
◇Standard Type with Electromagnetic Brake

Frame Size 42 mm

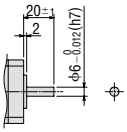
2D & 3D CAD

Shaft Shape	Product Name	Mass kg	2D CAD
Single Sided Milling	**AZM46MC**	0.61	B1154
Straight	**AZM46M0C**		B1294

Single Sided Milling



Straight

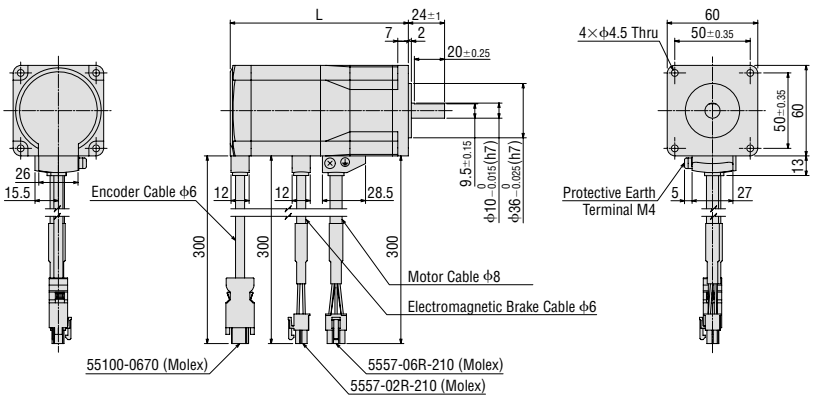


Frame Size 60 mm

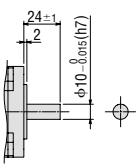
2D & 3D CAD

Shaft Shape	Product Name	L	Mass kg	2D CAD
Single Sided Milling	**AZM66MC**	118	1.3	B1155
Straight	**AZM66M0C**			B1295
With Key	**AZM66M1C**			B1305
Single Sided Milling	**AZM69MC**	143.5	1.8	B1156
Straight	**AZM69M0C**			B1296
With Key	**AZM69M1C**			B1306

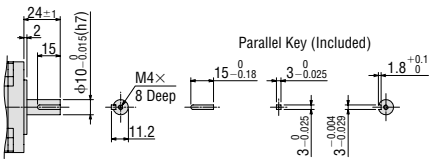
Single Sided Milling



Straight



With Key

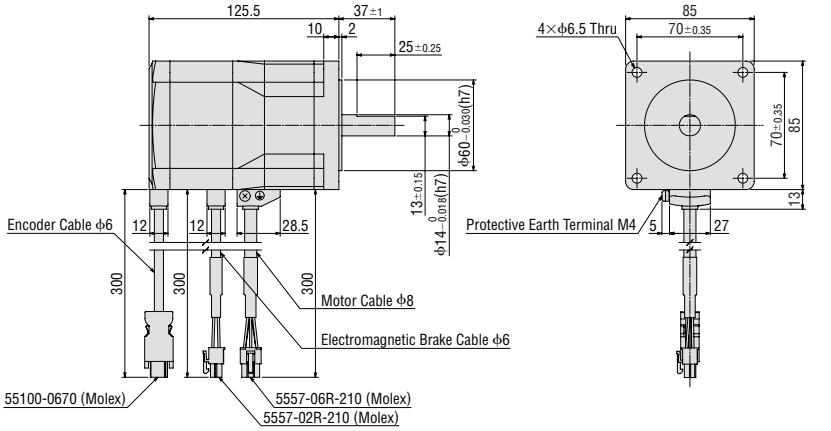


Frame Size 85 mm

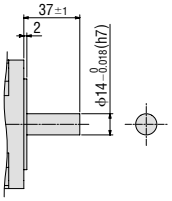
2D & 3D CAD

Shaft Shape	Product Name	Mass kg	2D CAD
Single Sided Milling	**AZM98MC**	2.5	B1182
Straight	**AZM98M0C**		B1297
With Key	**AZM98M1C**		B1307

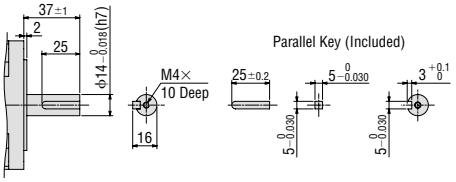
Single Sided Milling



Straight



With Key



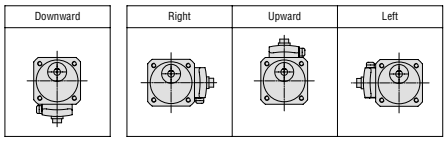
◇**TS** Geared Type

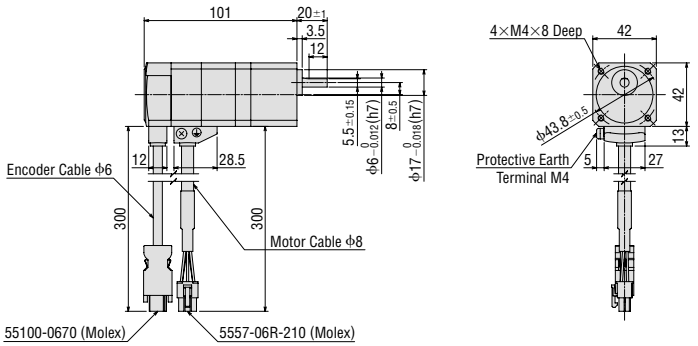
Frame Size 42 mm

2D & 3D CAD

Cable Drawing Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward	**AZM46AC-TS□**	**3.6**, **7.2**, **10**, **20**, **30**	0.59	B1157
Right	**AZM46AC-TS□R**			B1272
Upward	**AZM46AC-TS□U**			B1270
Left	**AZM46AC-TS□L**			B1271

●Cable Drawing Direction



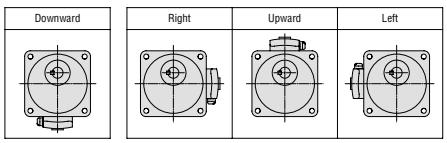


Frame Size 60 mm

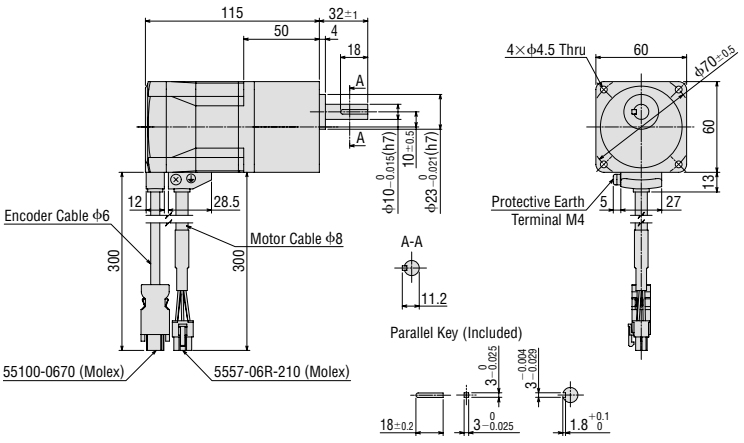
2D & 3D CAD

Cable Drawing Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward	**AZM66AC-TS□**	**3.6**, **7.2**, **10**, **20**, **30**	1.3	B1158
Right	**AZM66AC-TS□R**			B1275
Upward	**AZM66AC-TS□U**			B1273
Left	**AZM66AC-TS□L**			B1274

●Cable Drawing Direction



●Installation Screws: M4×60 P0.7 (4 pieces included)



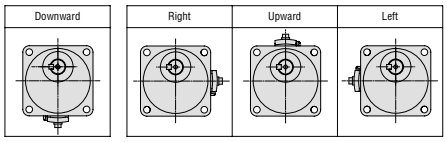
●A number indicating the gear ratio is entered where the box ■ is located within the product name.

Frame Size 90 mm

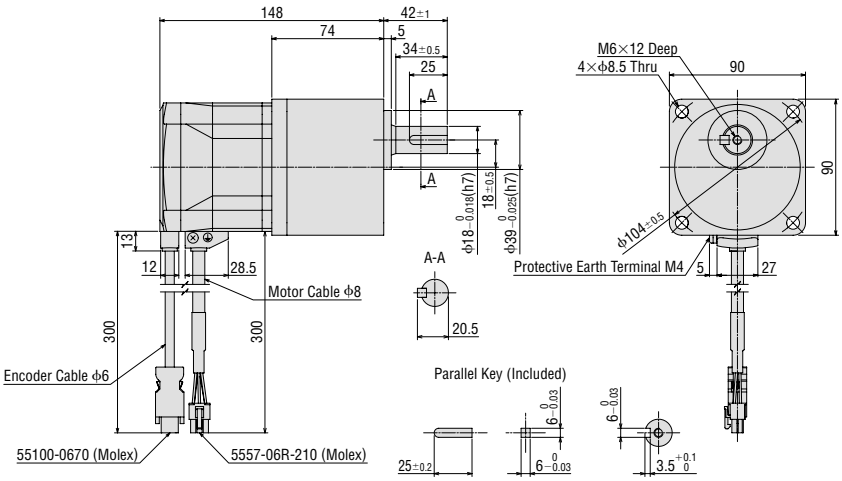
2D & 3D CAD

Cable Drawing Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward	**AZM98AC-TS□**	**3.6, 7.2, 10, 20, 30**	3.1	B1184
Right	**AZM98AC-TS□R**			B1278
Upward	**AZM98AC-TS□U**			B1276
Left	**AZM98AC-TS□L**			B1277

● Cable Drawing Direction



● Installation Screws: M8×90 P1.25 (4 pieces included)



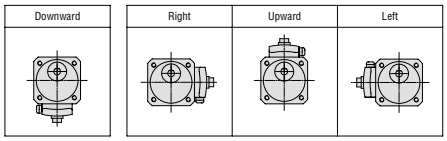
◇TS Geared Type with Electromagnetic Brake

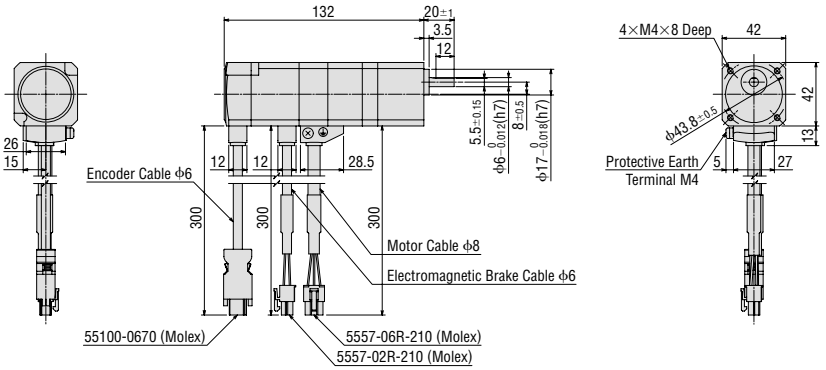
Frame Size 42 mm

2D & 3D CAD

Cable Drawing Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward	**AZM46MC-TS□**	**3.6, 7.2, 10, 20, 30**	0.76	B1216
Right	**AZM46MC-TS□R**			B1284
Upward	**AZM46MC-TS□U**			B1282
Left	**AZM46MC-TS□L**			B1283

● Cable Drawing Direction



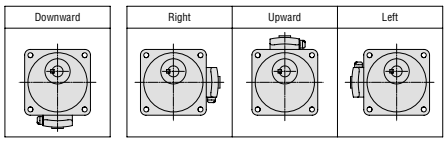


Frame Size 60 mm

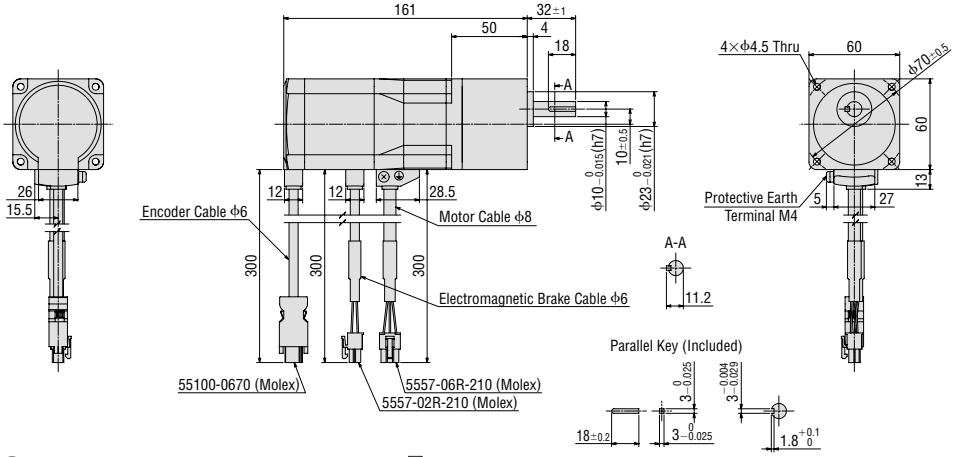
2D & 3D CAD

Cable Drawing Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward	**AZM66MC-TS□**	**3.6, 7.2, 10, 20, 30**	1.7	B1217
Right	**AZM66MC-TS□R**			B1287
Upward	**AZM66MC-TS□U**			B1285
Left	**AZM66MC-TS□L**			B1286

● Cable Drawing Direction



● Installation Screws: M4×60 P0.7 (4 pieces included)



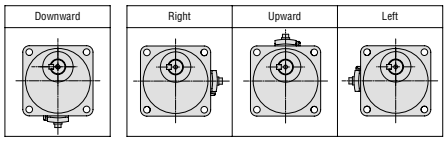
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

Frame Size 90 mm

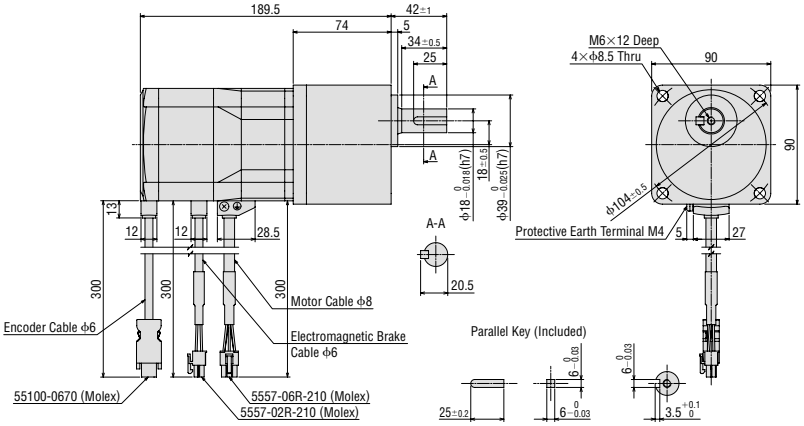
2D & 3D CAD

Cable Drawing Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward	**AZM98MC-TS□**	**3.6**, **7.2**, **10**, **20**, **30**	3.7	B1190
Right	**AZM98MC-TS□R**			B1281
Upward	**AZM98MC-TS□U**			B1279
Left	**AZM98MC-TS□L**			B1280

● Cable Drawing Direction



● Installation Screws: M8×90 P1.25 (4 pieces included)

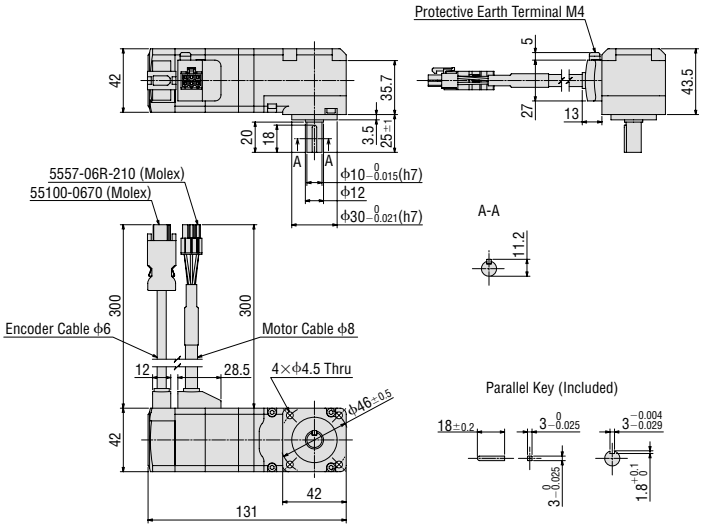


◇**FC** Geared Type

Frame Size 42 mm Cable Drawing Direction Upward

2D & 3D CAD

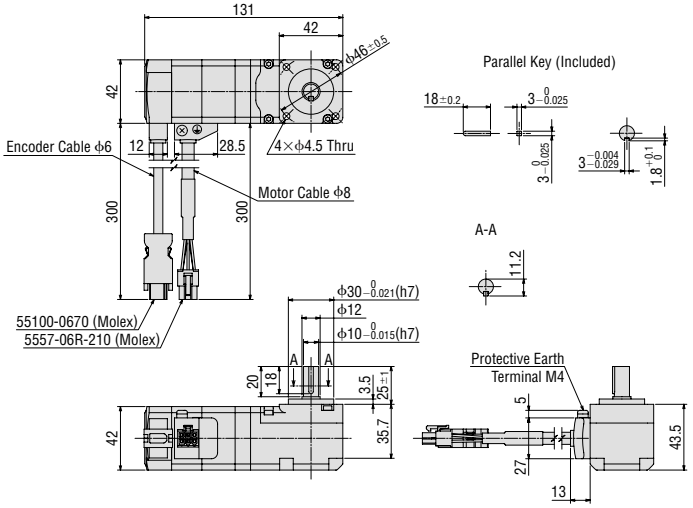
Product Name	Gear Ratio	Mass kg	2D CAD
AZM46AC-FC□UA	**7.2**, **10**, **20**, **30**	0.79	B1314



Frame Size 42 mm Cable Drawing Direction Downward

2D & 3D CAD

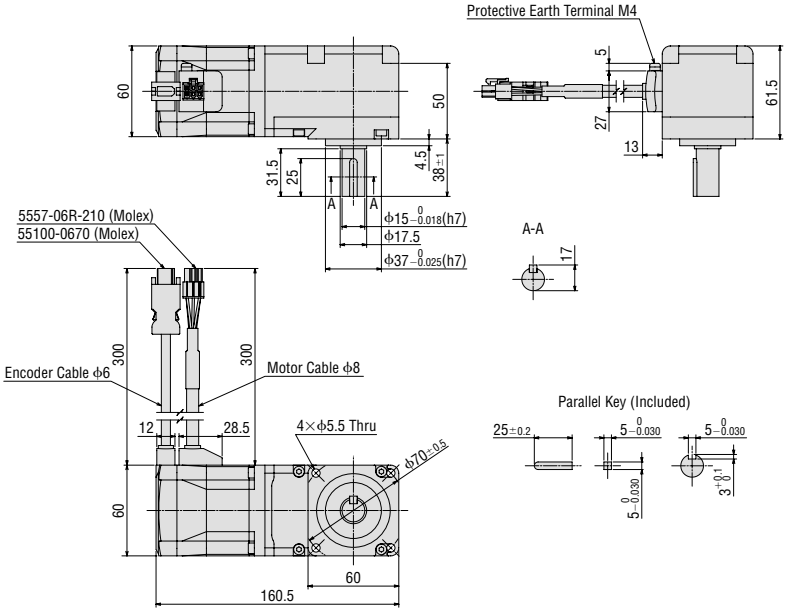
Product Name	Gear Ratio	Mass kg	2D CAD
AZM46AC-FC□DA	**7.2**, **10**, **20**, **30**	0.79	B1313



● A number indicating the gear ratio is entered where the box ■ is located within the product name.

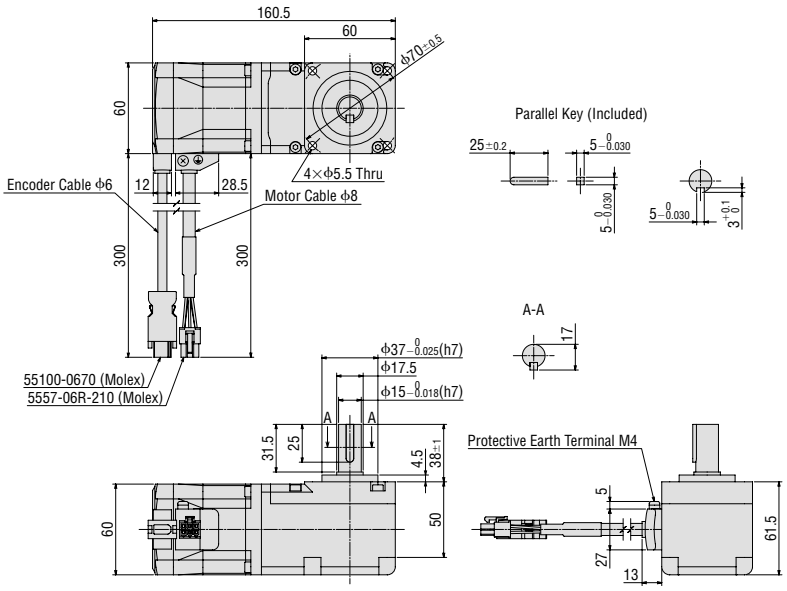
Frame Size 60 mm Cable Drawing Direction Upward 2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66AC-FC■UA	**7.2**, **10**, **20**, **30**	1.8	B1318



Frame Size 60 mm Cable Drawing Direction Downward 2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66AC-FC■DA	**7.2**, **10**, **20**, **30**	1.8	B1317



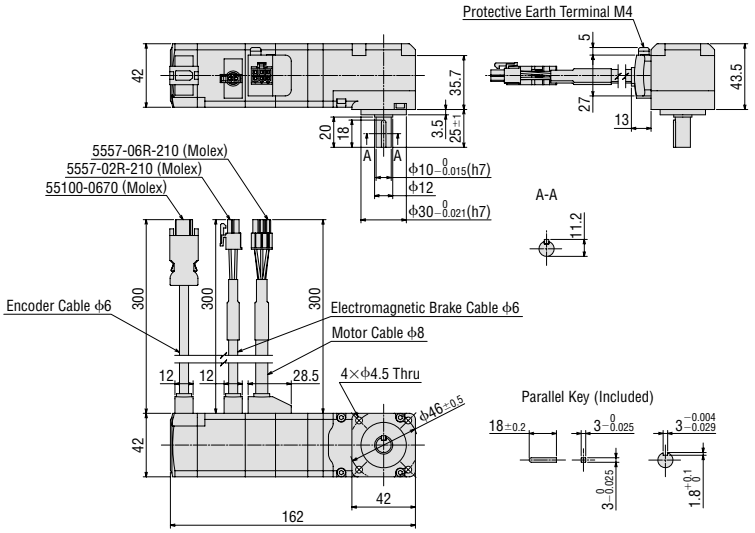
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

◇**FC** Geared Type with Electromagnetic Brake

Frame Size 42 mm Cable Drawing Direction Upward

2D & 3D CAD

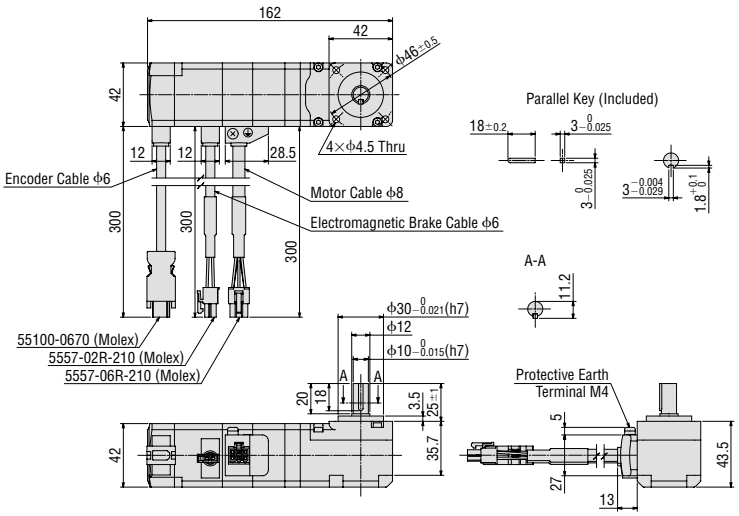
Product Name	Gear Ratio	Mass kg	2D CAD
AZM46MC-FC□UA	**7.2**, **10**, **20**, **30**	0.96	B1316



Frame Size 42 mm Cable Drawing Direction Downward

2D & 3D CAD

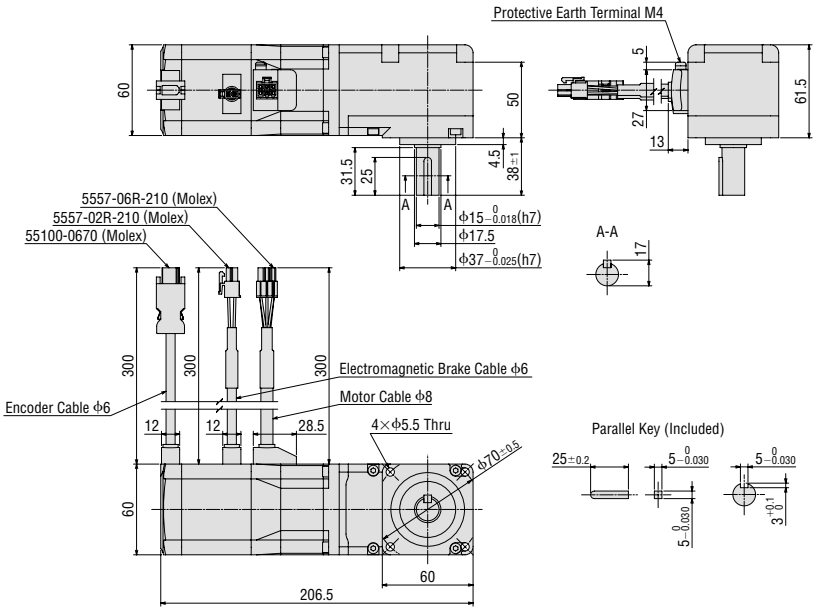
Product Name	Gear Ratio	Mass kg	2D CAD
AZM46MC-FC□DA	**7.2**, **10**, **20**, **30**	0.96	B1315



● A number indicating the gear ratio is entered where the box □ is located within the product name.

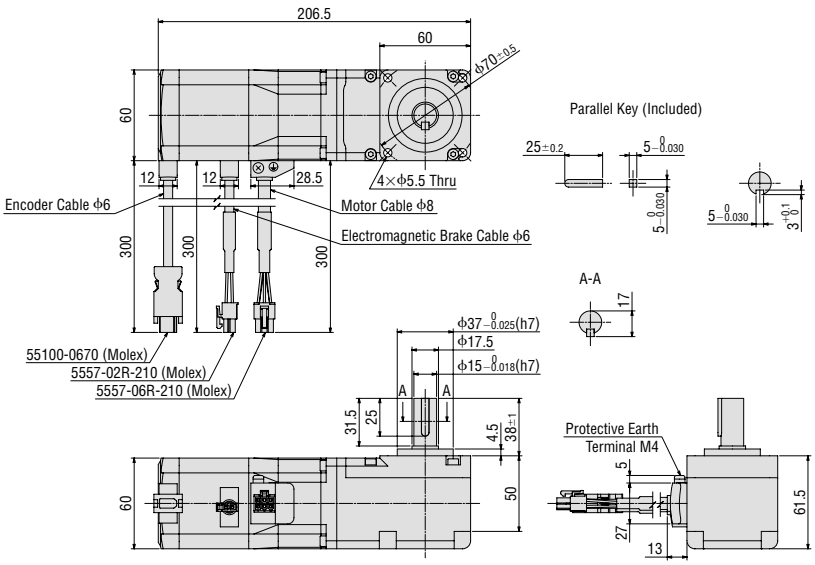
Frame Size 60 mm Cable Drawing Direction Upward 2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66MC-FC■UA	**7.2**, **10**, **20**, **30**	2.2	B1320



Frame Size 60 mm Cable Drawing Direction Downward 2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66MC-FC■DA	**7.2**, **10**, **20**, **30**	2.2	B1319



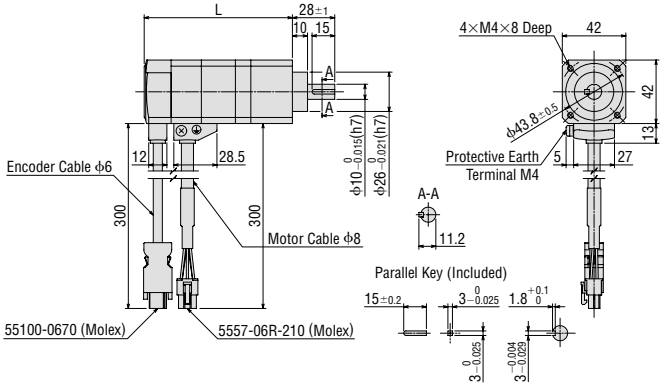
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

◇**PS** Geared Type

Frame Size 42 mm

2D & 3D CAD

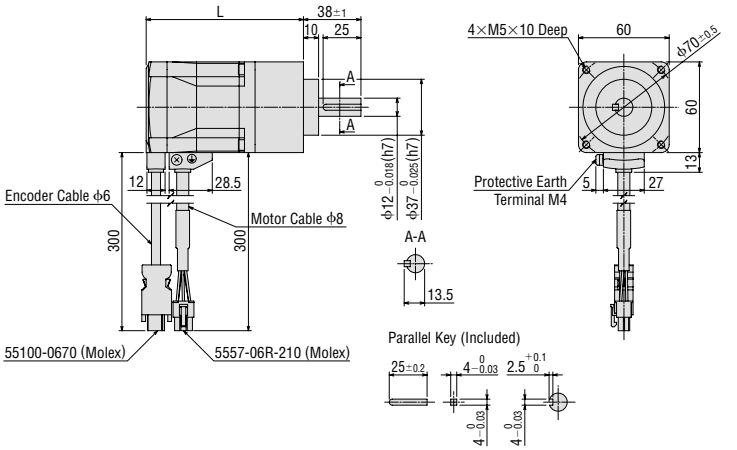
Product Name	Gear Ratio	L	Mass kg	2D CAD
AZM46AC-PS■	**5**, **7.2**, **10**	98	0.64	B1159
	25, **36**, **50**	121.5	0.79	B1160



Frame Size 60 mm

2D & 3D CAD

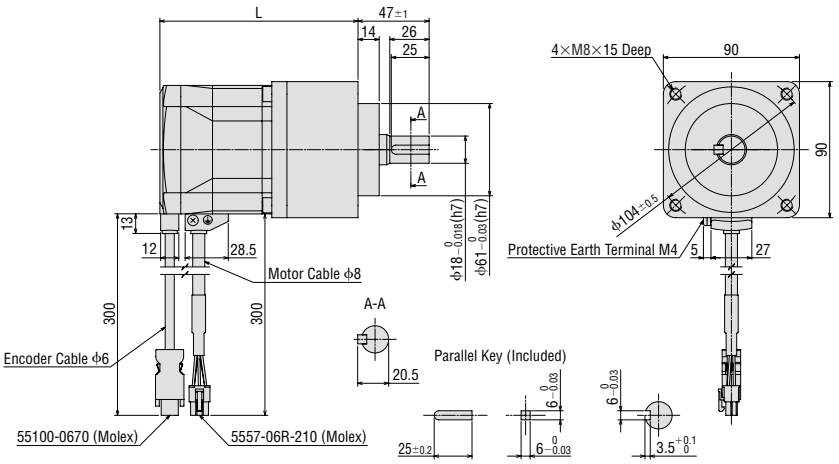
Product Name	Gear Ratio	L	Mass kg	2D CAD
AZM66AC-PS■	**5**, **7.2**, **10**	104	1.3	B1161
	25, **36**, **50**	124	1.6	B1162



Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
AZM98AC-PS■	**5**, **7.2**, **10**	131	3.3	B1185
	25, **36**, **50**	158.5	4.1	B1186



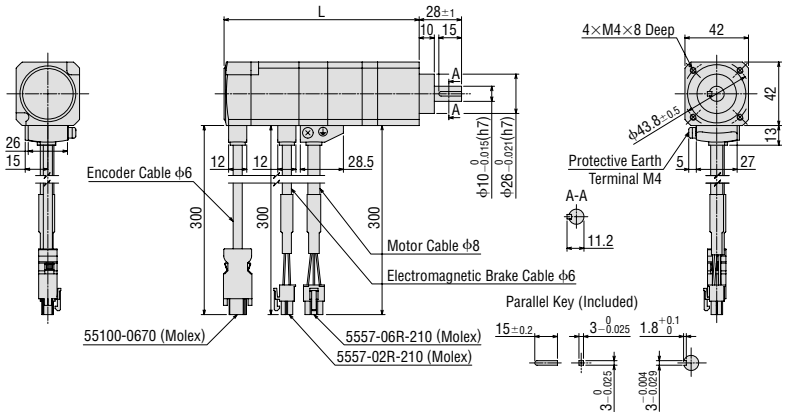
●A number indicating the gear ratio is entered where the box ■ is located within the product name.

◇**PS** Geared Type with Electromagnetic Brake

Frame Size 42 mm

2D & 3D CAD

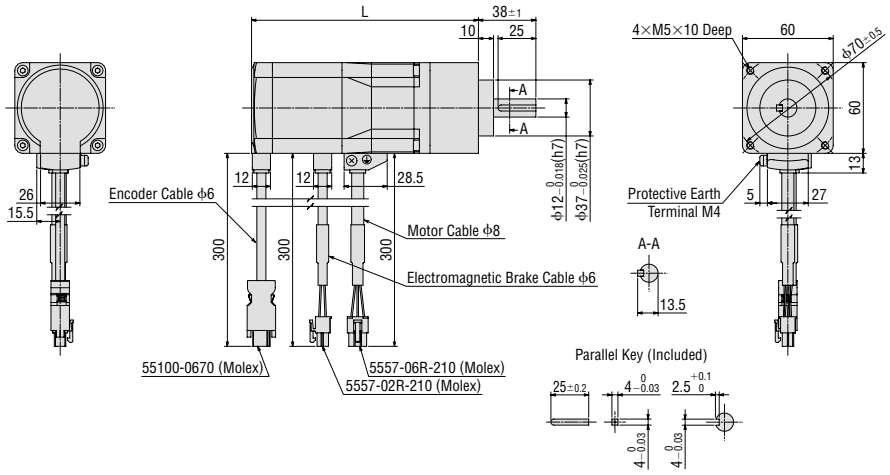
Product Name	Gear Ratio	L	Mass kg	2D CAD
AZM46MC-PS■	**5**, **7.2**, **10**	129	0.81	B1218
	25, **36**, **50**	152	0.96	B1219



Frame Size 60 mm

2D & 3D CAD

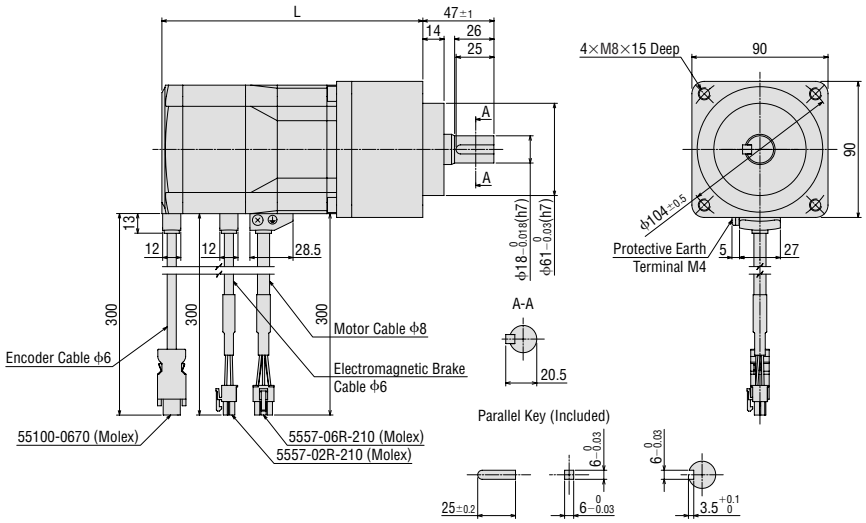
Product Name	Gear Ratio	L	Mass kg	2D CAD
AZM66MC-PS■	**5**, **7.2**, **10**	150	1.7	B1220
	25, **36**, **50**	170	2.0	B1221



Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
AZM98MC-PS■	**5**, **7.2**, **10**	172.5	3.9	B1191
	25, **36**, **50**	200	4.7	B1192



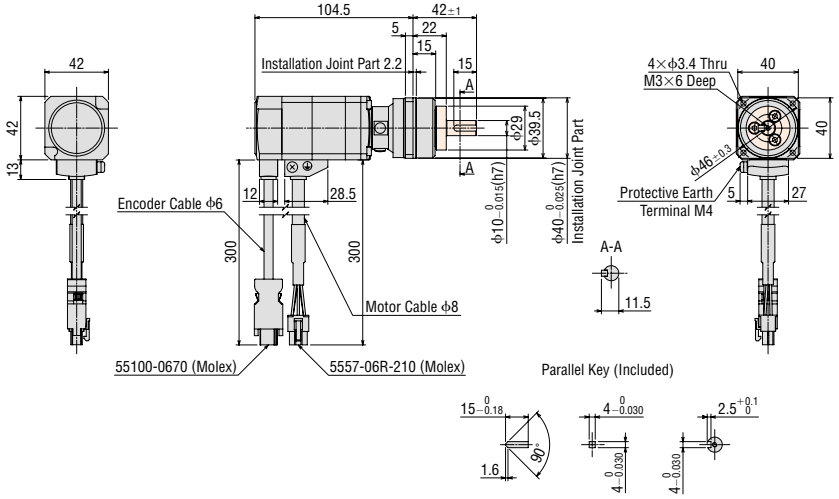
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

◇**HPG** Geared Type Shaft Output Type

Frame Size 40 mm

2D & 3D CAD

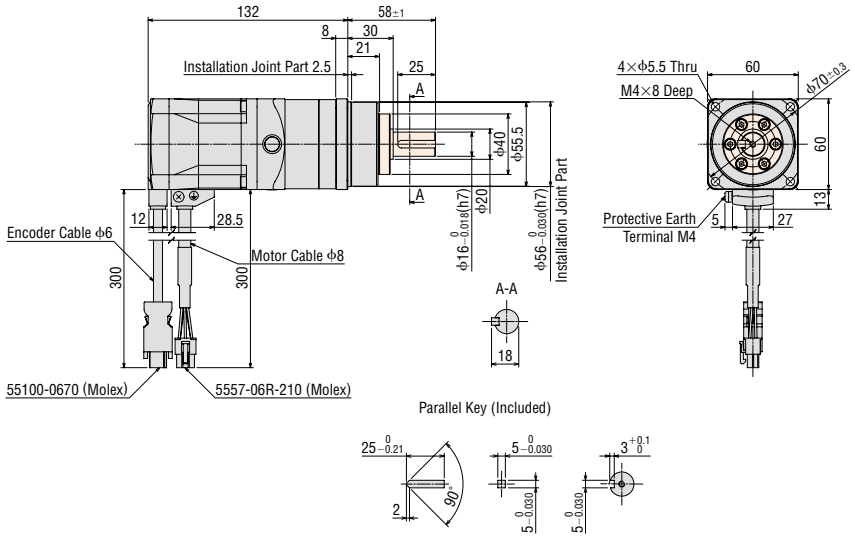
Product Name	Gear Ratio	Mass kg	2D CAD
AZM46AC-HP■	**5**, **9**	0.71	B1163



Frame Size 60 mm

2D & 3D CAD

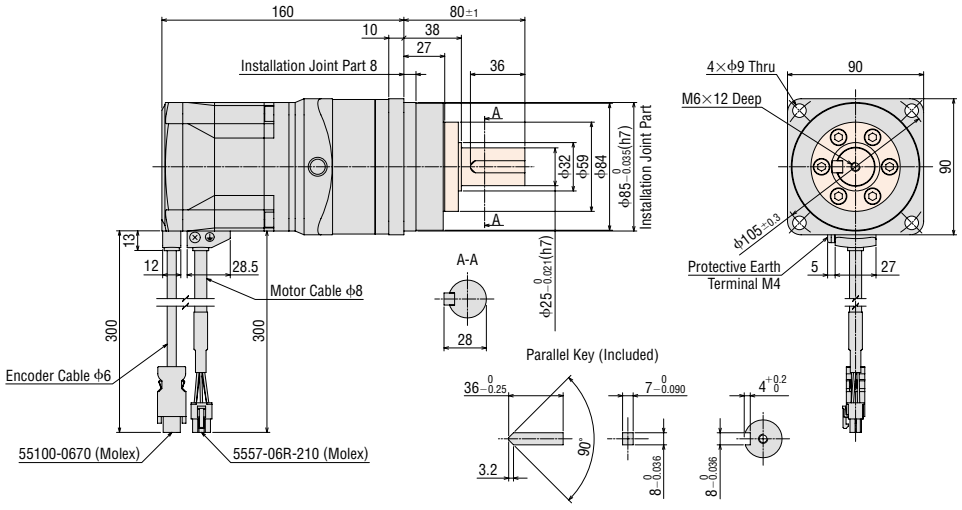
Product Name	Gear Ratio	Mass kg	2D CAD
AZM66AC-HP■	**5**, **15**	1.9	B1165



Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM98AC-HP■	**5**, **15**	4.8	B1187



● The ▭ colored section for the dimensions indicates the rotating part.

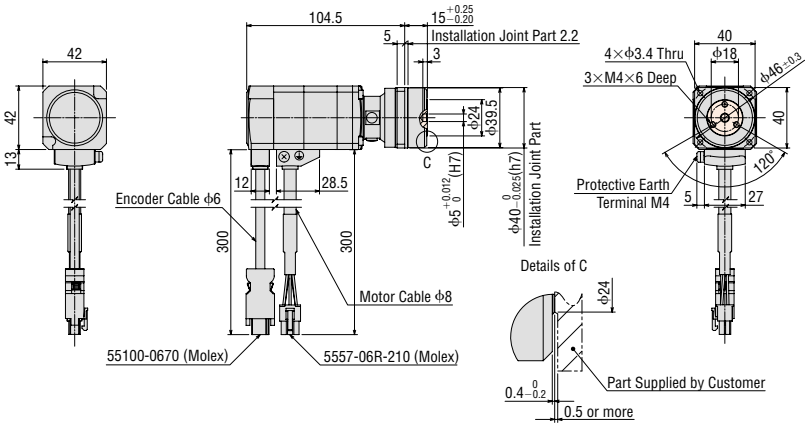
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

◇**HPG** Geared Type　Flange Output Type

Frame Size 40 mm

2D & 3D CAD

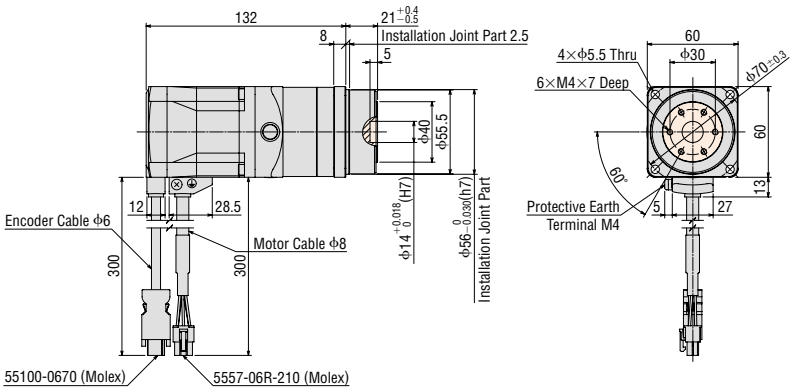
Product Name	Gear Ratio	Mass kg	2D CAD
AZM46AC-HP■F	**5**, **9**	0.66	B1164



Frame Size 60 mm

2D & 3D CAD

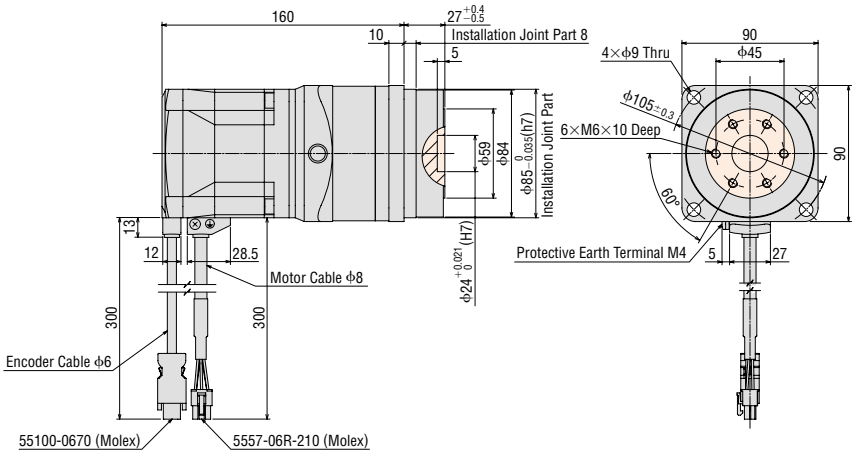
Product Name	Gear Ratio	Mass kg	2D CAD
AZM66AC-HP■F	**5**, **15**	1.8	B1166



Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM98AC-HP■F	**5**	4.5	B1188
	15	4.4	



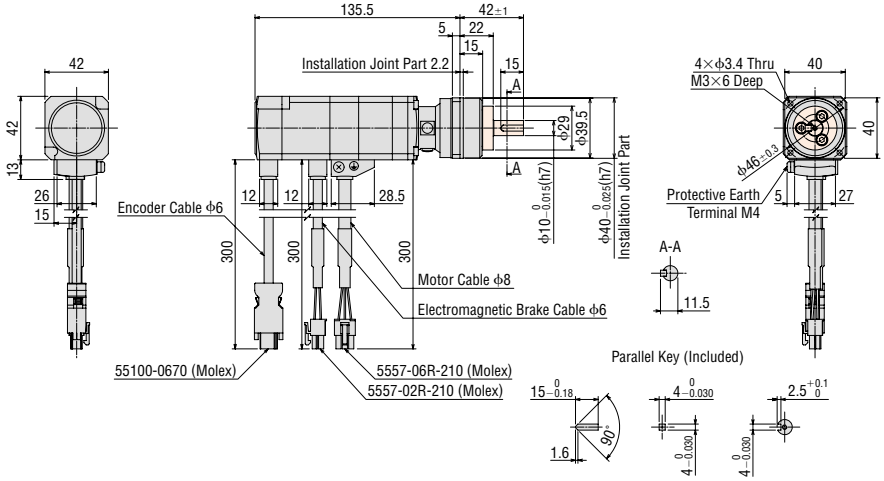
● The ▭ colored section for the dimensions indicates the rotating part.
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

◇**HPG** Geared Type with Electromagnetic Brake Shaft Output Type

Frame Size 40 mm

2D & 3D CAD

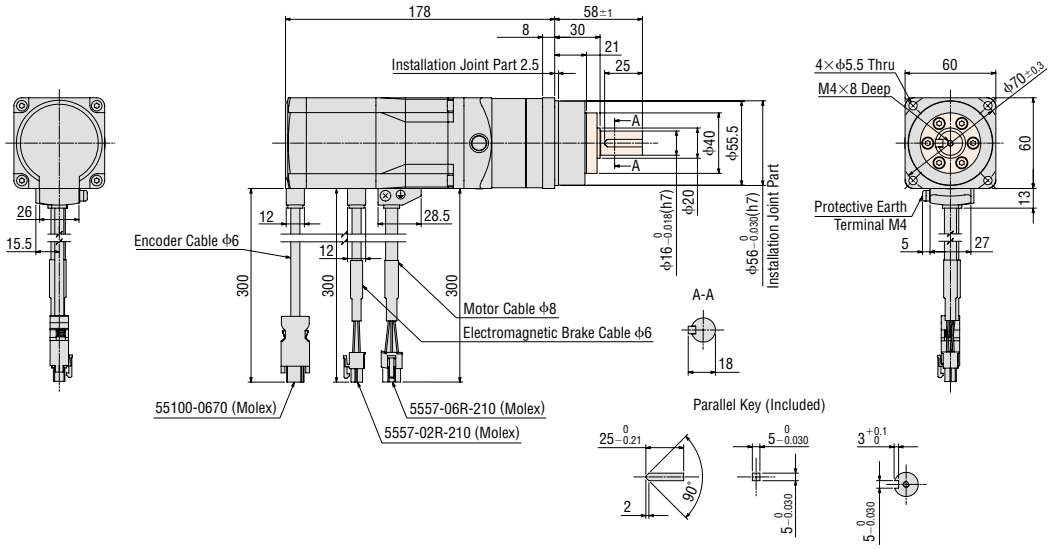
Product Name	Gear Ratio	Mass kg	2D CAD
AZM46MC-HP■	**5**, **9**	0.88	B1222



Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66MC-HP■	**5**, **15**	2.3	B1224



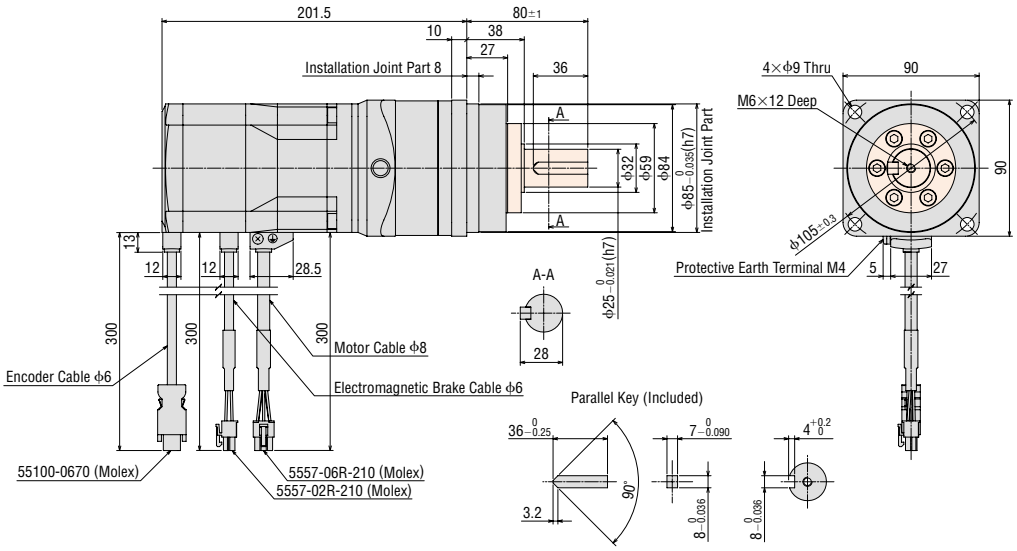
● The ▭ colored section for the dimensions indicates the rotating part.

● A number indicating the gear ratio is entered where the box ■ is located within the product name.

Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM98MC-HP■	**5, 15**	5.4	B1193

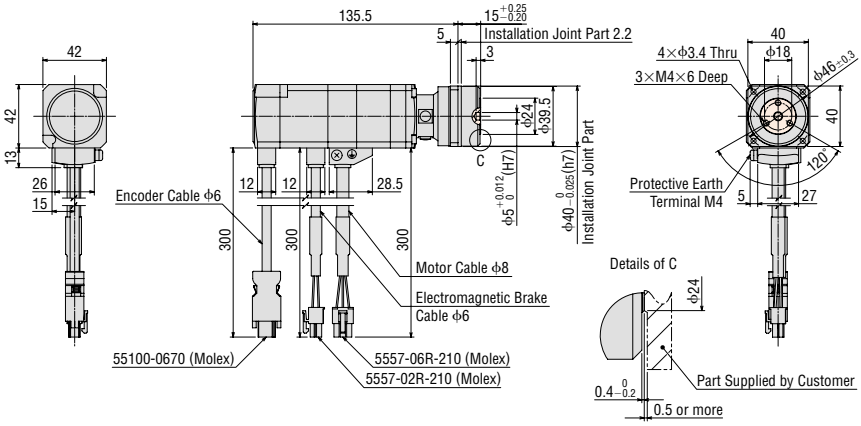


◇HPG Geared Type with Electromagnetic Brake　Flange Output Type

Frame Size 40 mm

2D & 3D CAD

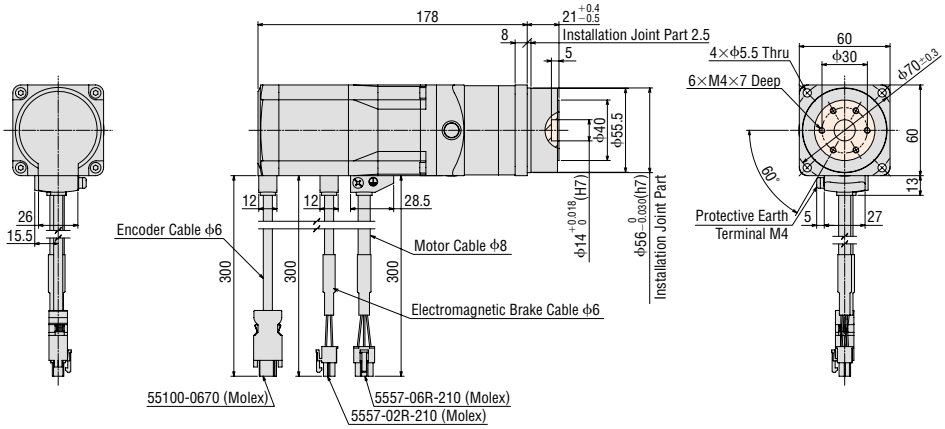
Product Name	Gear Ratio	Mass kg	2D CAD
AZM46MC-HP■F	**5, 9**	0.83	B1223



Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66MC-HP■F	**5, 15**	2.2	B1225

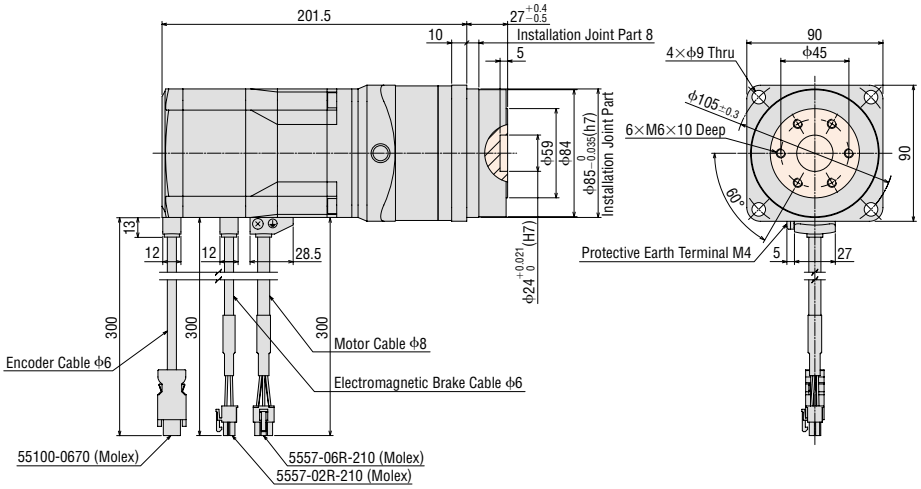


● The ▭ colored section for the dimensions indicates the rotating part.
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM98MC-HP■F	**5**	5.1	B1194
	15	5	

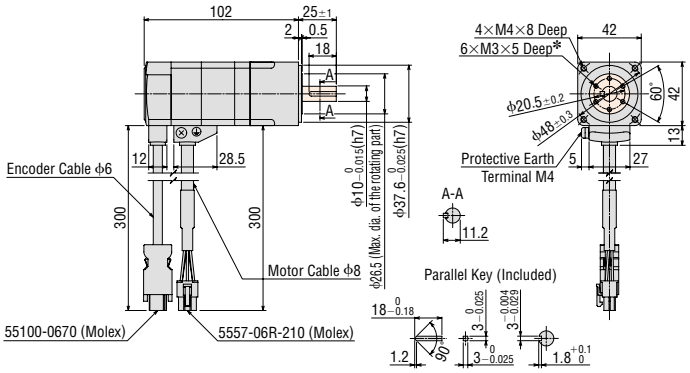


◇Harmonic Geared Type

Frame Size 42 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM46AC-HS■	**50**, **100**	0.65	B1167

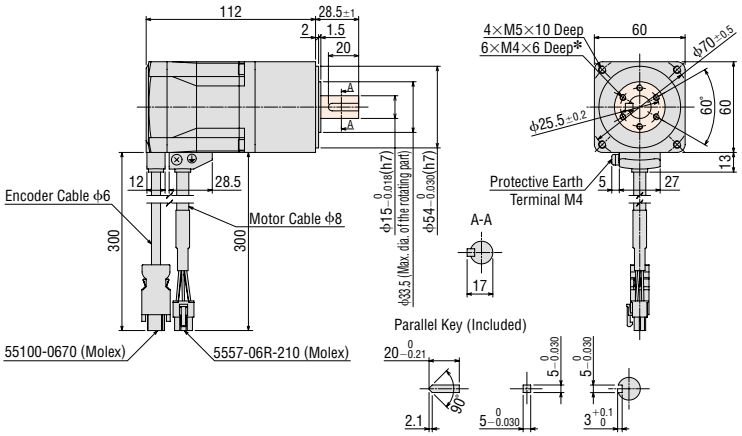


*On the dimensions, you cannot designate the positions of the output shaft and screw holes. Therefore, develop a design by using the size of the screw holes on the surface to which load is applied.

Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66AC-HS■	**50**, **100**	1.4	B1168



*On the dimensions, you cannot designate the positions of the output shaft and screw holes. Therefore, develop a design by using the size of the screw holes on the surface to which load is applied.

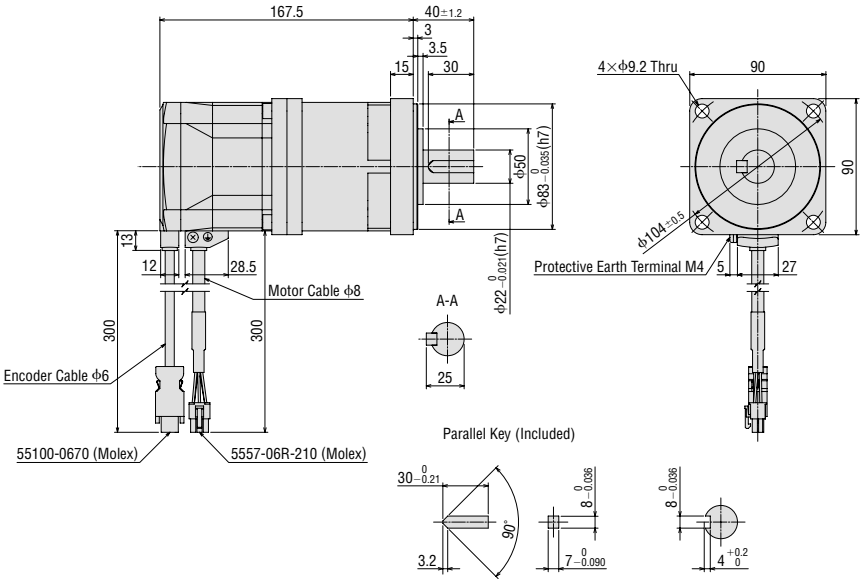
● The ▭ colored section for the dimensions indicates the rotating part.

● A number indicating the gear ratio is entered where the box ■ is located within the product name.

Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM98AC-HS■	**50, 100**	3.9	B1189

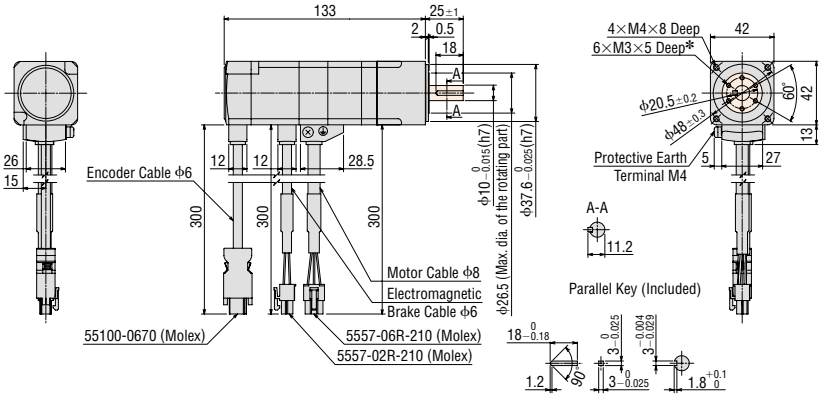


◇Harmonic Geared Type with Electromagnetic Brake

Frame Size 42 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM46MC-HS■	**50, 100**	0.82	B1226

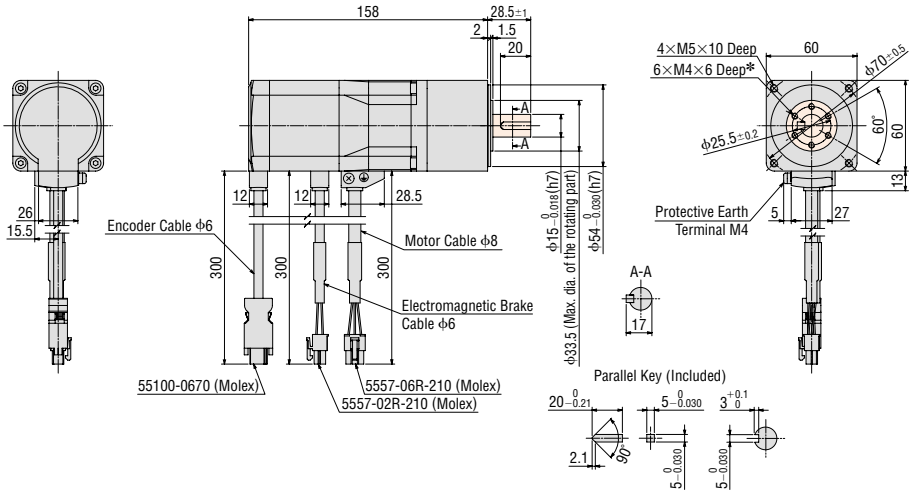


✻On the dimensions, you cannot designate the positions of the output shaft and screw holes. Therefore, develop a design by using the size of the screw holes on the surface to which load is applied.

Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66MC-HS■	**50, 100**	1.8	B1227



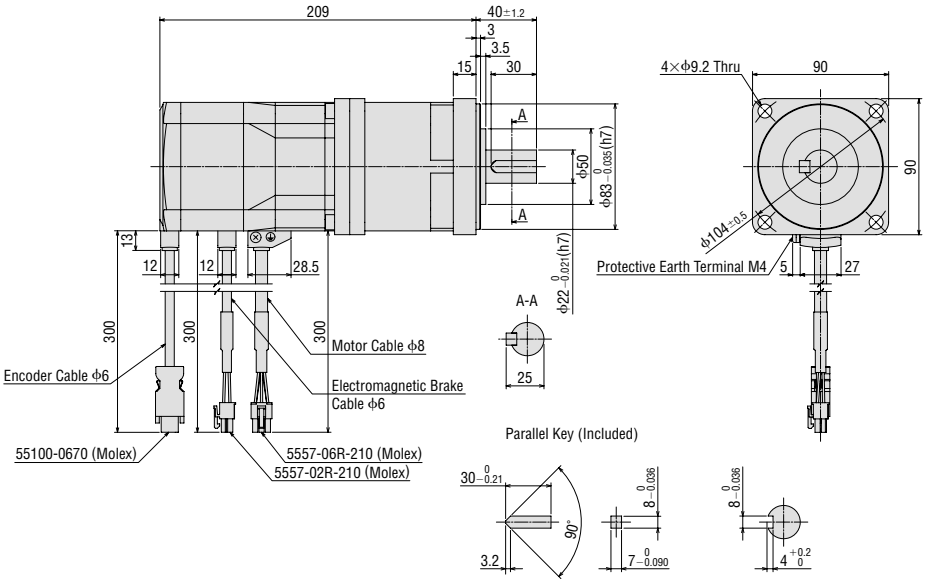
✻On the dimensions, you cannot designate the positions of the output shaft and screw holes. Therefore, develop a design by using the size of the screw holes on the surface to which load is applied.

- The ▭ colored section for the dimensions indicates the rotating part.
- A number indicating the gear ratio is entered where the box ■ is located within the product name.

Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM98MC-HS□	**50, 100**	4.5	B1195



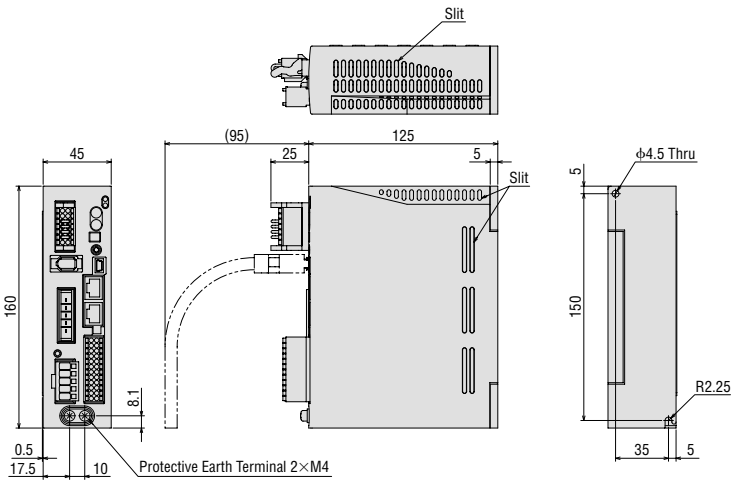
●A number indicating the gear ratio is entered where the box □ is located within the product name.

●Drivers

2D & 3D CAD

Type	Product Name	Mass kg	2D CAD
Built-in Controller Type	**AZD-AD, AZD-CD**	0.65	B1095
Pulse Input Type with RS-485 Communication	**AZD-AX, AZD-CX**		
Pulse Input Type	**AZD-A, AZD-C**		B1097

●The dimensions below is the drawing of a built-in controller type. The external dimensions and accessories are common to all driver types.



●Accessories

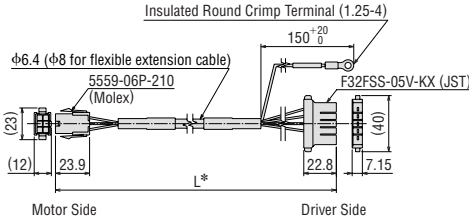
Connector for the Main Power Supply and Regeneration Unit (CN4)
Connector: 05JFAT-SAXGDK-H5.0
(J.S.T.MFG.CO.,LTD.)
Connector wiring lever

I/O Signals Connector (CN5)
Connector: DFMC1,5/12-ST-3,5
(PHOENIX CONTACT)

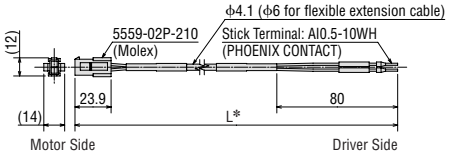
Connector for 24 VDC Power-Supply Input/Electromagnetic Brake Connection/Regeneration Unit Thermal Input/Power Cutoff Signal I/O (CN1)
Connector: DFMC1,5/7-ST-3,5-LR
(PHOENIX CONTACT)

Connection Cable Sets/Flexible Connection Cable Sets

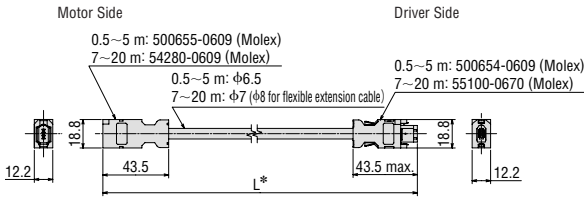
◇Cable for Motor



◇Cable for Electromagnetic Brake



◇Cable for Encoder



✻"L" in the above dimensions is replaced by any Length L (m) in "■ Product Line" on Page 20.

Note

●The motor cable and electromagnetic brake cable from the motor cannot be directly connected to a driver. To connect the motor to the driver, use a connection cable.

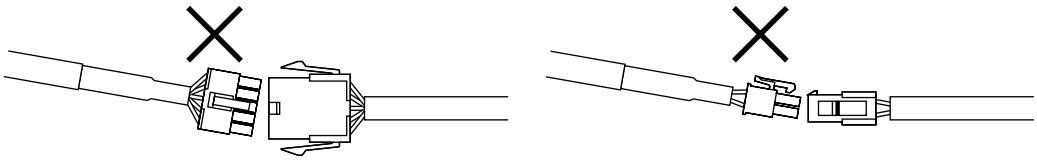
■Cautions for Using Connection Cables

When using connection cables, make sure you follow the instructions below.

●When inserting the connector

Be sure to hold the connector and firmly insert it straight into the socket.

Inserting the connector at an angle may damage the terminal or result in a bad connection.



●When Disconnecting the Connector

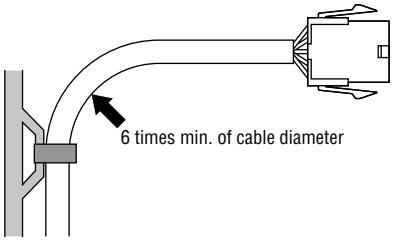
While releasing the lock of the connector, pull it out straight.

Pulling the cable (lead wire) may damage the connector.

●Bending Radius of Cables

The bending radius of the cable, use at least 6 times min. of the cable diameter.

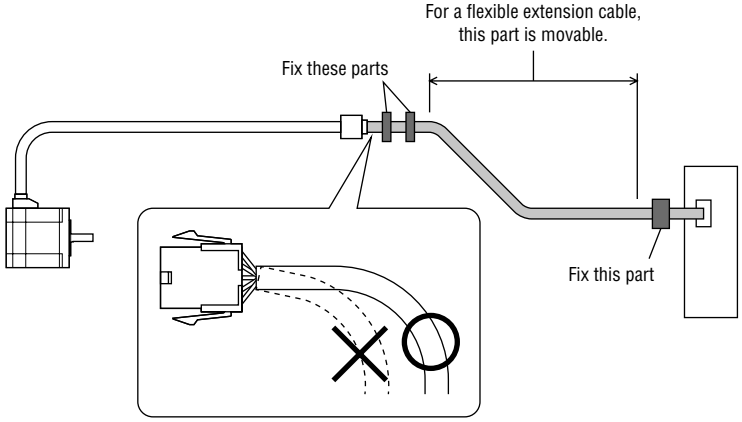
For lead wire types, make sure that the bending radius of the lead wire that you use is at least 4 times larger than the lead wire diameter.



●Method for Fixing the Cable

When fixing the cable, fix a part near the connector to avoid stress on the connector.

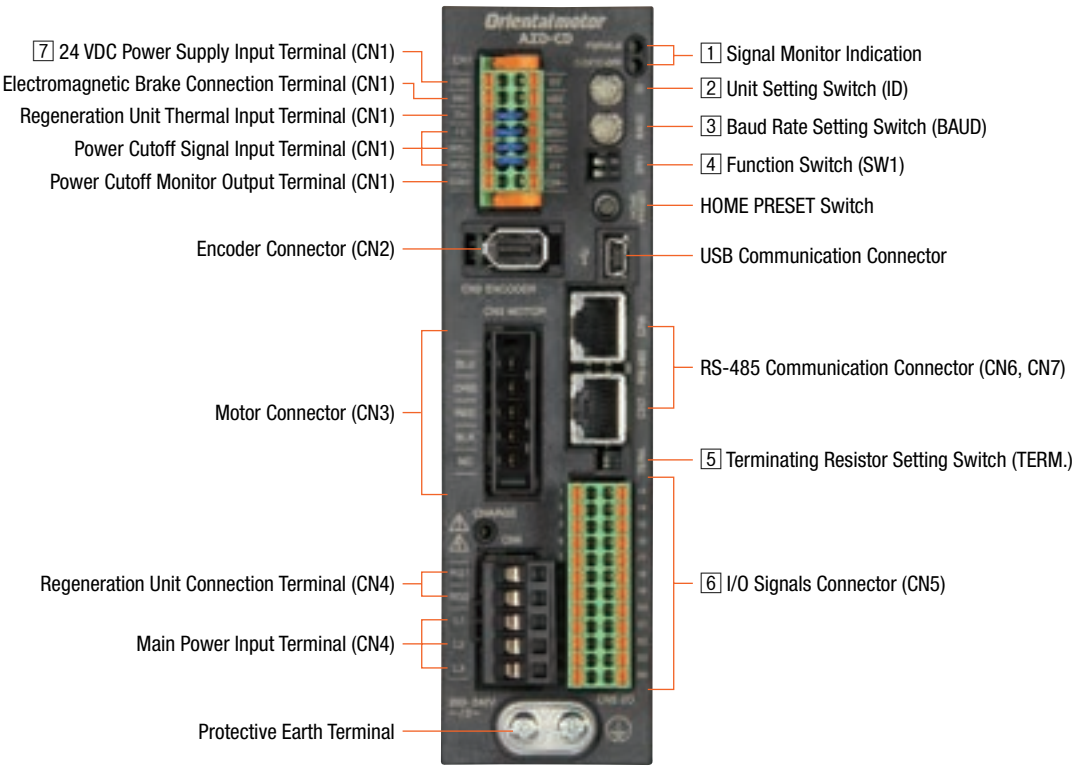
Take measures such as using wide clamps and fixing two parts of the cable to avoid stress on the connector.



Connection and Operation (Built-in controller type/Pulse input type with RS-485 communication)

Names and Functions of Driver Parts

Below is a photo of the built-in controller type.



1 Signal Monitor Indication

◇LED Indicators

Indication	Color	Function	Lighting Condition
PWR	Green	Power supply indication	When 24 VDC power supply is input
ALM	Red	Alarm indication	When a protective function is activated (blinking)
C-DAT	Green	Communication indication	When communication data is being sent or received
C-ERR	Red	Communication error indication	When communication data is in error

2 Unit Setting Switch

Indication	Function
ID	Set this when you use RS-485 communication. Set the unit number. (Factory setting) Built-in controller type: 0 Pulse input type with RS-485 communication: 1

3 Baud Rate Setting Switch

Indication	Function
BAUD	Set this when you use RS-485 communication. Set the baud rate. (Factory setting) Built-in controller type: 7 Pulse input type with RS-485 communication: 4

◇RS-485 Baud Rate Setting

No.	Baud Rate (bps)
0	9600
1	19200
2	38400
3	57600
4	115200
5	230400
6	Not used
7	Network converter
8~F	Not used

4 Function Switch

Indication	No.	Function
SW1	1	Use in combination with the unit setting switch (ID) to set the axis number. (Factory setting) OFF
	2	Set the RS-485 communication protocol. (Factory setting) Built-in controller type: OFF Pulse input type with RS-485 communication: ON

5 Terminating Resistor Setting Switch

Indication	No.	Function
TERM.	1	Set the terminating resistor (120 Ω) for RS-485 communication (Factory setting: OFF).
	2	OFF: Terminating resistor not used ON: Terminating resistor used

● Configure both No. 1 and No. 2 to the same setting.

6 I/O Signals Connector (CN5)

For the pulse input type with RS-485 communication, No. 1, 2, 13, and 14 pins are dedicated to pulse input. For wire connection with programmable controller, refer to "Pulse Input Type" on Page 65.

Indication	Pin No.	Driver Type	Signal Name	Description	
CN5	1	Built-in Controller Type	IN0	START	This signal is used to start positioning operation.
		Pulse Input Type with RS-485 Communication	CW+* [PLS+]	CW Pulse Input + [Pulse Input +]	This is the pulse signal that is input to operate the motor in the CW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	2	Built-in Controller Type	IN2	M1	Uses the 3 bits, between M0, M1 and M2, to select the operating data number.
		Pulse Input Type with RS-485 Communication	CCW+* [DIR+]	CCW Pulse Input + [Rotation Direction Input +]	This is the pulse signal that is input to operate the motor in the CCW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	3	Common	IN4	ZHOME	Moves to home that has been set with the HOME/PRESET switch.
	4	Common	IN6	STOP	Stops the motor.
	5	Common	IN-COM [0-7]*	IN0~IN7 Input Common	
	6	Common	IN8	FW-JOG	Starts the JOG operation.
	7	Common	OUT0	HOME-END	When home position has been established, it will be output when the high-speed return-to-home operation is completed.
	8	Common	OUT2	PLS-RDY	Not used.
	9	Common	OUT4	MOVE	Output during motor operation.
	10	Common	OUT-COM*	Output Common	
	11	Common	ASG+	A-Phase Pulse Output +	
	12	Common	BSG+	B-Phase Pulse Output +	
	13	Built-in controller type	IN1	M0	Uses the 3 bits, between M0, M1 and M2, to select the operating data number.
		Pulse input type with RS-485 communication	CW−* [PLS−]	CW Pulse Input − [Pulse Input −]	This is the pulse signal that is input to operate the motor in the CW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	14	Built-in controller type	IN3	M2	Uses the 3 bits, between M0, M1 and M2, to select the operating data number.
		Pulse input type with RS-485 communication	CCW−* [DIR−]	CCW Pulse Input − [Rotation Direction Input −]	This is the pulse signal that is input to operate the motor in the CCW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	15	Common	IN5	FREE	Stops motor excitation.
	16	Common	IN7	ALM-RST	Resets the alarms.
	17	Common	IN-COM [8-9]*	IN8, IN9 Input Common	
	18	Common	IN9	RV-JOG	Starts the JOG operation.
	19	Common	OUT1	IN-POS	Outputs when the motor operation is finished.
	20	Common	OUT3	READY	Outputs when the driver is ready for operation.
	21	Common	OUT5	ALM-B	Outputs the alarm status of the driver (Normal close).
	22	Common	GND*	Ground	
	23	Common	ASG−	A-Phase Pulse Output −	
	24	Common	BSG−	B-Phase Pulse Output −	

● You can set functions to assign by using parameters. Initial values are shown above. For details, refer to “Functions” in the Operating Manual of the **AZ** Series.

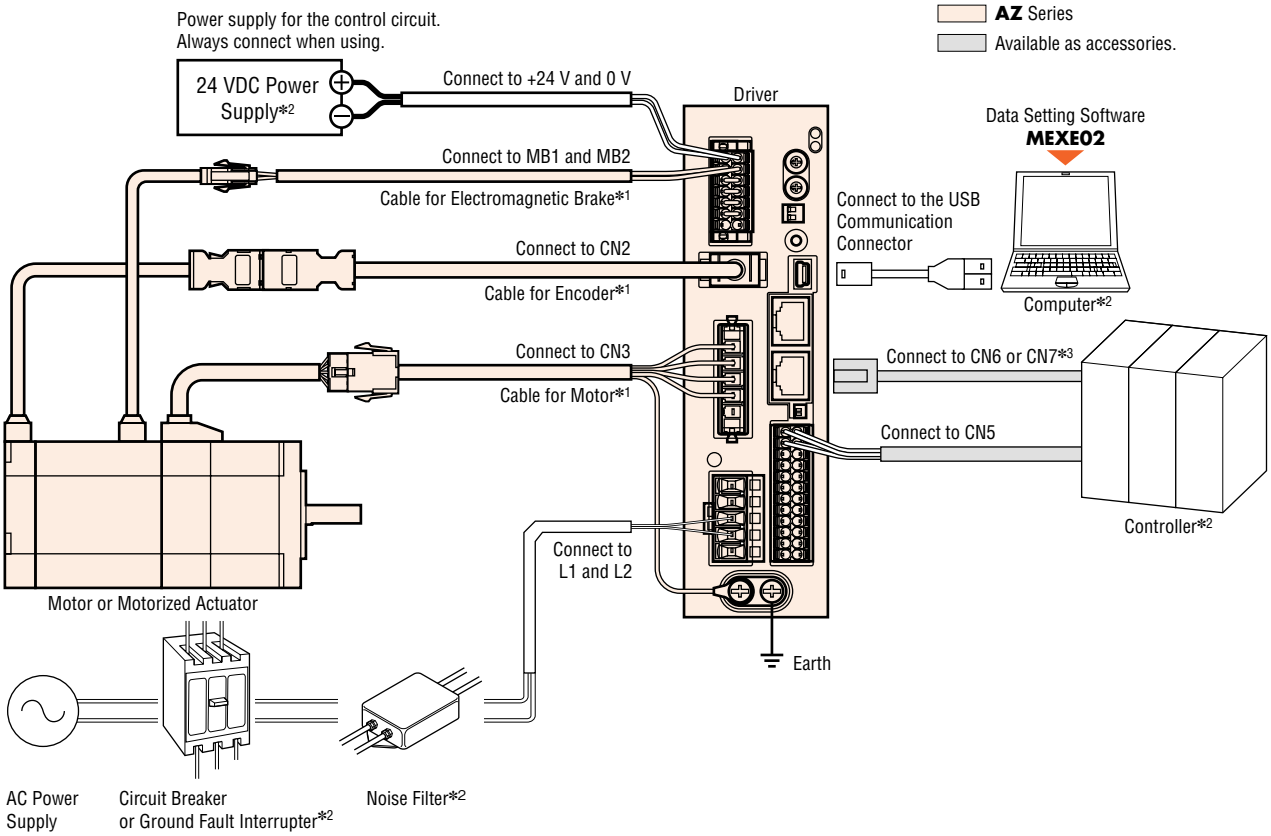
*Initial settings cannot be changed.

7 24 VDC Power Supply Input Terminal/Electromagnetic Brake Connection Terminal/Regeneration Unit Thermal Input Terminal/Power Cutoff Signal Input Terminal/Power Cutoff Monitor Output Terminal (CN1)

Indication	I/O	Terminal Name	Description
+24V	Input	24 VDC Power Supply Input Terminal +	The power supply for the driver control circuit. Always connect when using.
0V		24 VDC Power Supply Input Terminal −	
MB1	Output	Electromagnetic Brake Connection Terminal −	For an electromagnetic brake type motor, connect the electromagnetic brake cable line here.
MB2		Electromagnetic Brake Connection Terminal +	
TH1	Input	Regeneration Unit Thermal Input Terminal	Connect the accessory regeneration unit (**RGB100**). When not connecting a regeneration unit, short these 2 terminals to each other.
TH2		Regeneration Unit Thermal Input Terminal	
HWTO1+	Input	Power Cutoff Signal Input Terminal 1 +	Connect the switches and the programmable controller. If either the HWT01 input or HWT02 input is OFF, power supply to the motor will be cut off directly with hardware, without passing through the CPU.
HWTO1−		Power Cutoff Signal Input Terminal 1 −	
HWTO2+		Power Cutoff Signal Input Terminal 2 +	
HWTO2−		Power Cutoff Signal Input Terminal 2 −	
EDM+	Output	Power Cutoff Monitor Output Terminal +	Connects the programmable controller. If both the HWT01 input and HWT02 input are OFF, EDM output will be turned to ON.
EDM−		Power Cutoff Monitor Output Terminal −	

Connection Diagram

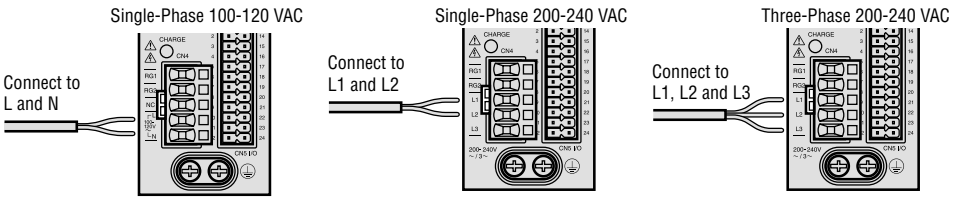
◇Connections with Peripheral Equipment



*1 Keep the wiring distance between the motor and driver to 20 m or less.
*2 Not supplied.
*3 Connect to the controller when controlling by RS-485 communication.

◇Connecting the Main Power Supply

The connection method varies depending on power supply specifications.



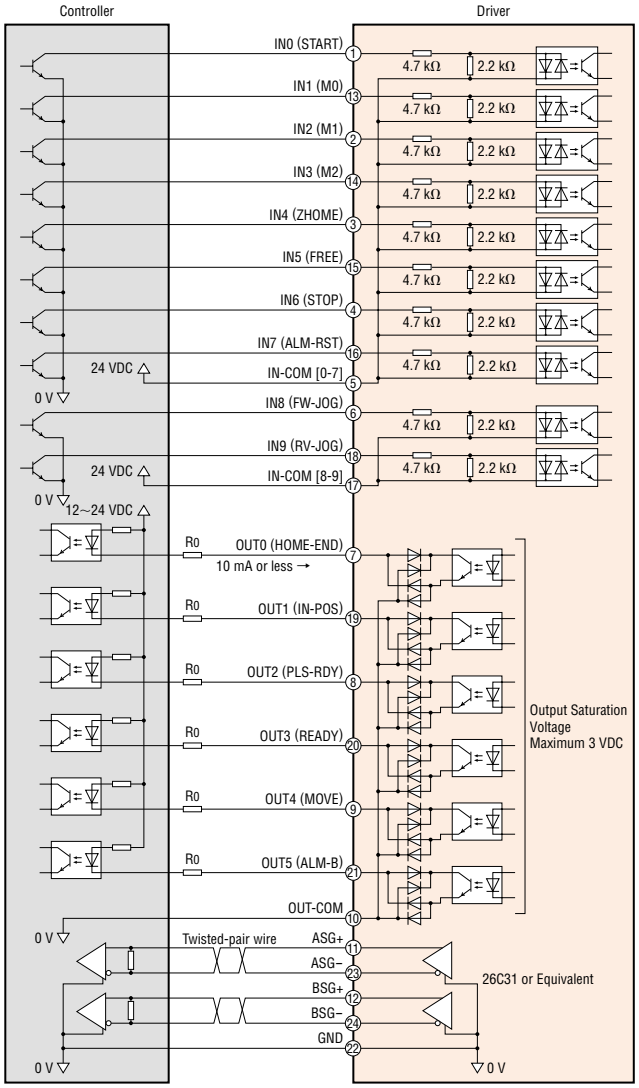
◇Connection of the USB Cable

Use this USB cable to connect the driver to the computer on which the data setting software **MEXE02** is installed.
Use a USB cable with the following specifications.

Specifications	USB2.0 (Full speed)
Cable	Length: 3 m or less
	Configuration: A to mini B

◇Connecting to Programmable Controller (Built-in controller type)

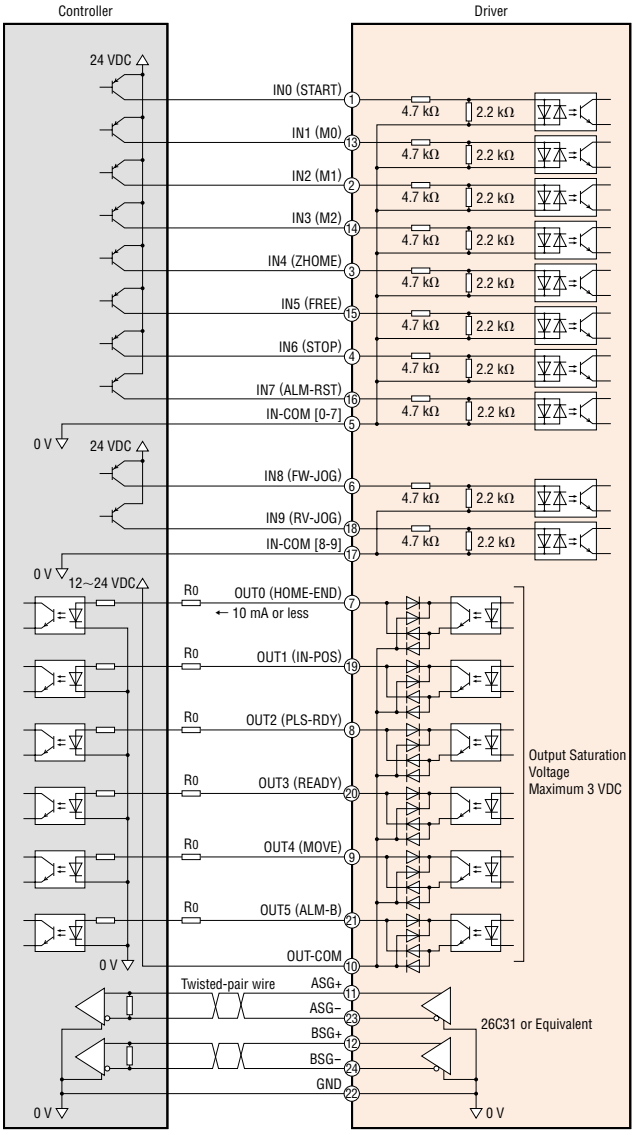
•Connection Diagram for Connection with Current Sink Output Circuit



Note

- Use 24 VDC for the input signals.
- Use 12~24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor R_0 to reduce the current to 10 mA or below.
- Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).
  Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

•Connection Diagram for Connection with Current Source Output Circuit



Note

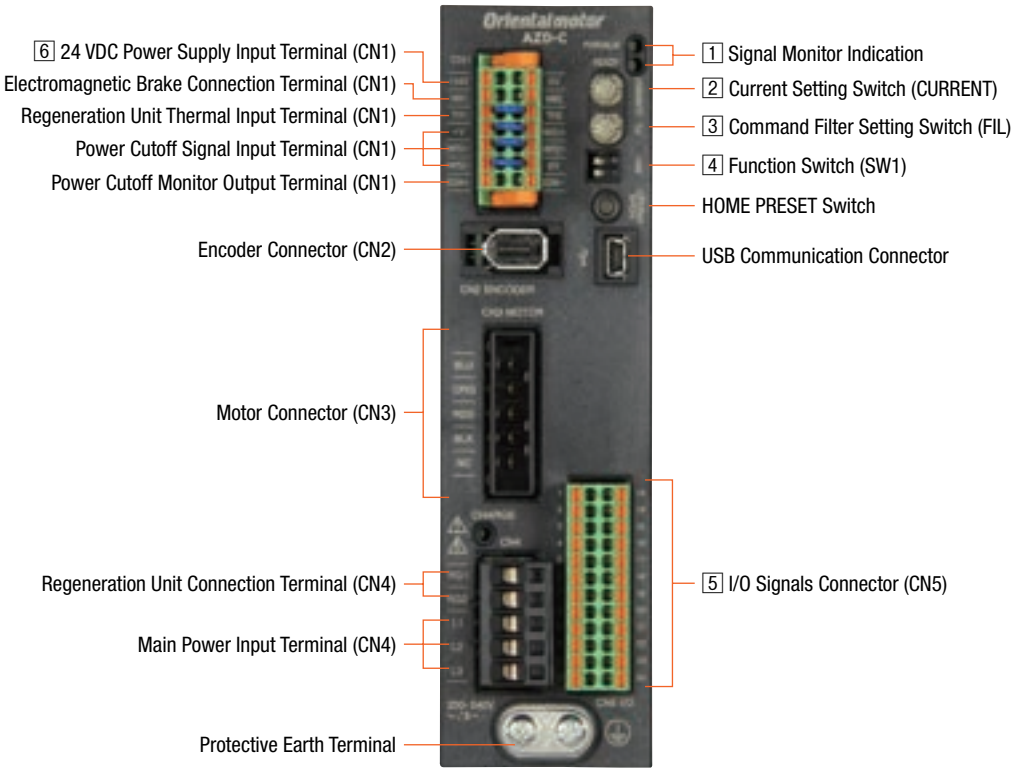
- Use 24 VDC for the input signals.
- Use 12~24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor R_0 to reduce the current to 10 mA or below.
- Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).
  Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

◇Connecting to the Programmable Controller (Pulse input type with RS-485 communication)

The connection diagram is similar to that of the pulse input type. Refer to Page 65.

Connection and Operation (Pulse input type)

Names and Functions of Driver Parts



1 Signal Monitor Indication

◇LED Indicators

Indication	Color	Function	Lighting Condition
PWR	Green	Power supply indication	When 24 VDC power supply is input
ALM	Red	Alarm indication	When a protective function is activated (blinking)
READY	Green	READY output	When READY output is ON

2 Current Setting Switch

Indication	Function
CURRENT	Set the base current, which is the basis of the running current and the standstill current (Factory setting: F).

3 Command Filter Setting Switch

Indication	Function
FIL	Adjust the responsiveness of the motor (Factory setting: 1).

4 Function Switch

Indication	No.	Function
SW1	1	Sets the resolution per one rotation of the motor output shaft (Factory setting: OFF [1000 p/r])
	2	Sets the pulse input mode as either 1-pulse input mode or 2-pulse input mode. (Factory setting: OFF [2-pulse input mode])

5 I/O Signals Connector (CN5)

Indication	Pin No.	Signal Name	Description	
CN5	1	CW+ [PLS+]*	CW Pulse Input + [Pulse Input +]	This is the pulse signal that is input to operate the motor in the CW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	2	CCW+ [DIR+]*	CCW Pulse Input + [Rotation Direction Input +]	This is the pulse signal that is input to operate the motor in the CCW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	3	IN4	ZHOME	Moves to home that has been set with the HOME/PRESET switch.
	4	IN6	STOP	Stops the motor.
	5	IN-COM [4-7]*	IN4~IN7 Input Common	
	6	IN8	FW-JOG	Starts the JOG operation.
	7	OUT0	HOME-END	When home position has been established, it will be output when the high-speed return-to-home operation is completed.
	8	OUT2	PLS-RDY	Output when the pulse input preparation is completed.
	9	OUT4	MOVE	Output during motor operation.
	10	OUT-COM*	Output Common	
	11	ASG+	A-Phase Pulse Output +	
	12	BSG+	B-Phase Pulse Output +	
	13	CW− [PLS-]*	CW Pulse Input − [Pulse Input −]	This is the pulse signal that is input to operate the motor in the CW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	14	CCW− [DIR-]*	CCW Pulse Input − [Rotation Direction Input −]	This is the pulse signal that is input to operate the motor in the CCW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	15	IN5	FREE	Stops motor excitation.
	16	IN7	ALM-RST	Resets the alarms.
	17	IN-COM [8-9]*	IN8, IN9 Input Common	
	18	IN9	RV-JOG	Starts the JOG operation.
	19	OUT1	IN-POS	Outputs when the motor operation is finished.
	20	OUT3	READY	Outputs when the driver is ready for operation.
	21	OUT5	ALM-B	Outputs the alarm status of the driver (Normal close).
	22	GND*	Ground	
	23	ASG−	A-Phase Pulse Output −	
	24	BSG−	B-Phase Pulse Output −	

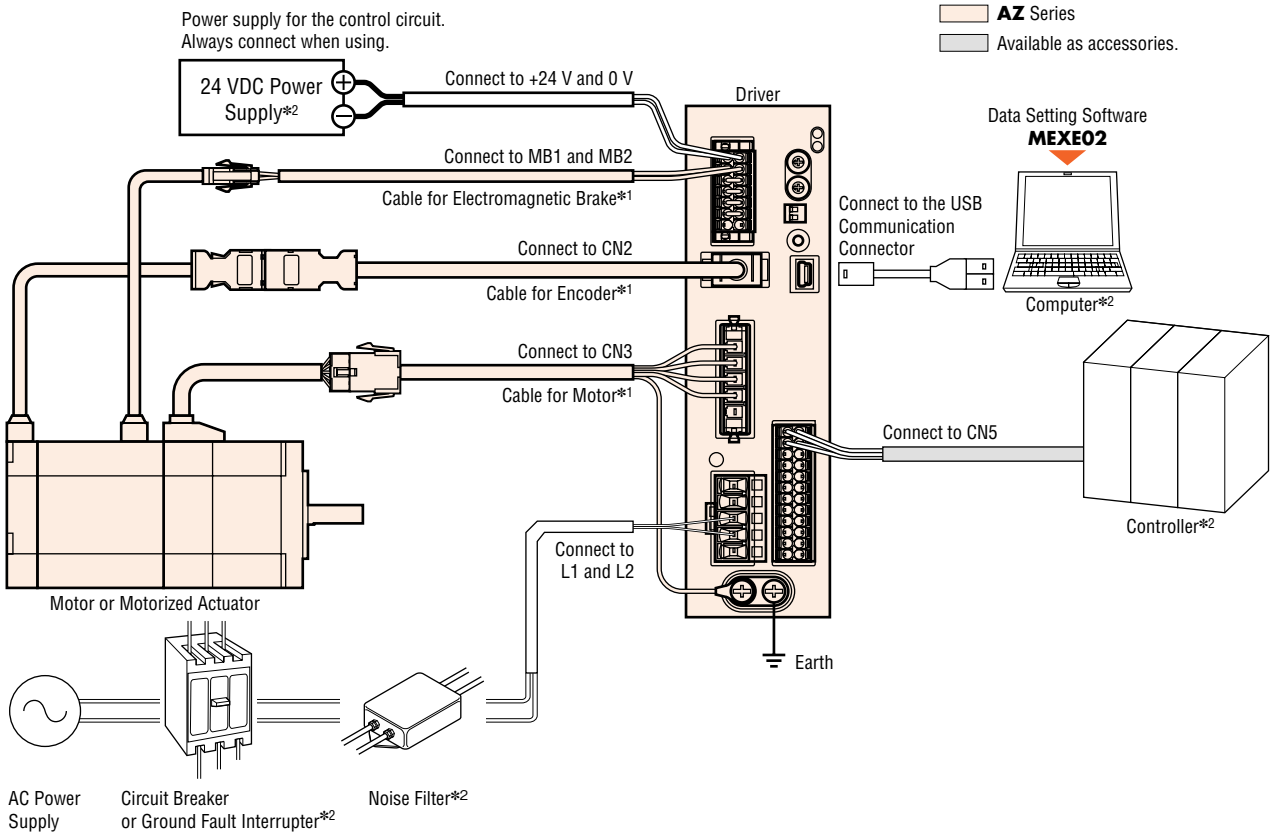
● You can set functions to assign by using parameters. Initial values are shown above. For details, refer to "Functions" in the Operating Manual of the **AZ** Series.
*Initial settings cannot be changed.

6 24 VDC Power Supply Input Terminal/Electromagnetic Brake Connection Terminal/Regeneration Unit Thermal Input Terminal/Power Cutoff Signal Input Terminal/Power Cutoff Monitor Output Terminal (CN1)

Indication	I/O	Terminal Name	Description
+24V	Input	24 VDC Power Supply Input Terminal +	The power supply for the driver control circuit. Always connect when using.
0V		24 VDC Power Supply Input Terminal −	
MB1	Output	Electromagnetic Brake Connection Terminal −	For an electromagnetic brake type motor, connect the electromagnetic brake cable line here.
MB2		Electromagnetic Brake Connection Terminal +	
TH1	Input	Regeneration Unit Thermal Input Terminal	Connect the accessory regeneration unit (**RGB100**). When not connecting a regeneration unit, short these 2 terminals to each other.
TH2		Regeneration Unit Thermal Input Terminal	
HWT01+	Input	Power Cutoff Signal Input Terminal 1 +	Connect the switches and the programmable controller. If either the HWT01 input or HWT02 input is OFF, power supply to the motor will be cut off directly with hardware, without passing through the CPU.
HWT01−		Power Cutoff Signal Input Terminal 1 −	
HWT02+		Power Cutoff Signal Input Terminal 2 +	
HWT02−		Power Cutoff Signal Input Terminal 2 −	
EDM+	Output	Power Cutoff Monitor Output Terminal +	Connects the programmable controller. If both the HWT01 input and HWT02 input are OFF, EDM output will be turned to ON.
EDM−		Power Cutoff Monitor Output Terminal −	

Connection Diagram

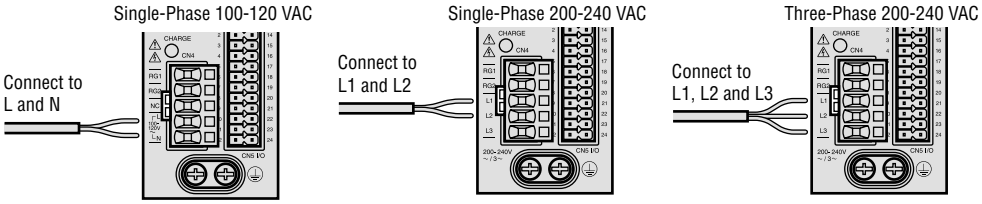
◇Connections with Peripheral Equipment



*1 Keep the wiring distance between the motor and driver to 20 m or less.
*2 Not supplied.

◇Connecting the Main Power Supply

The connection method varies depending on power supply specifications.



◇Connection of the USB Cable

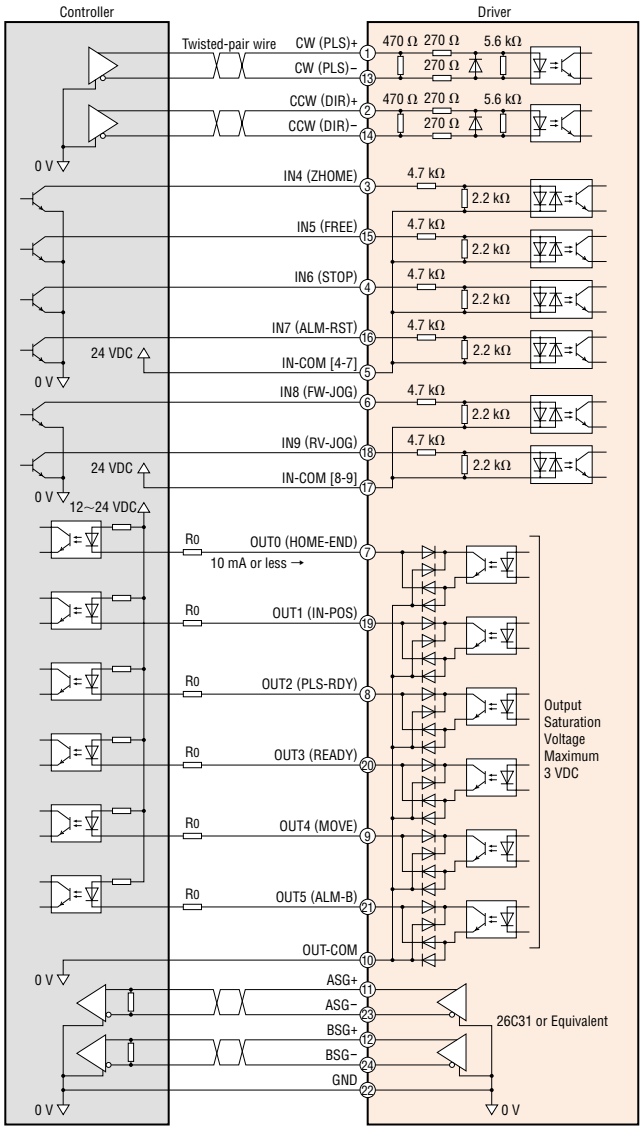
Use this USB cable to connect the driver to the computer on which the data setting software **MEXE02** is installed.
Use a USB cable with the following specifications.

Specifications	USB2.0 (Full speed)
Cable	Length: 3 m or less
	Configuration: A to mini B

◇Connecting to the Programmable Controller (Pulse input type)

•Connection Diagram for Connection with Current Sink Output Circuit

When the pulse input is the line driver

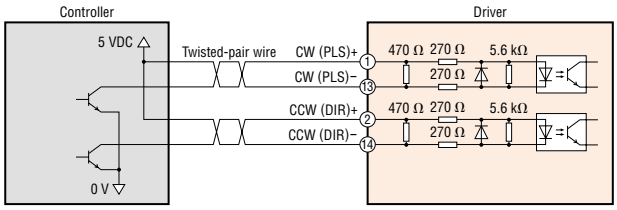


Note

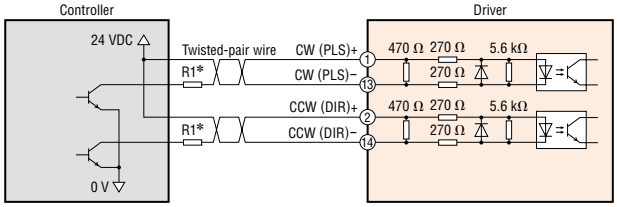
- Use 24 VDC for the input signals.
- Use 12~24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor R_0 to reduce the current to 10 mA or below.
- Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).
  Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

When the pulse input is the open collector

•When the pulse input signal is 5 VDC



•When the pulse input signal is 24 VDC



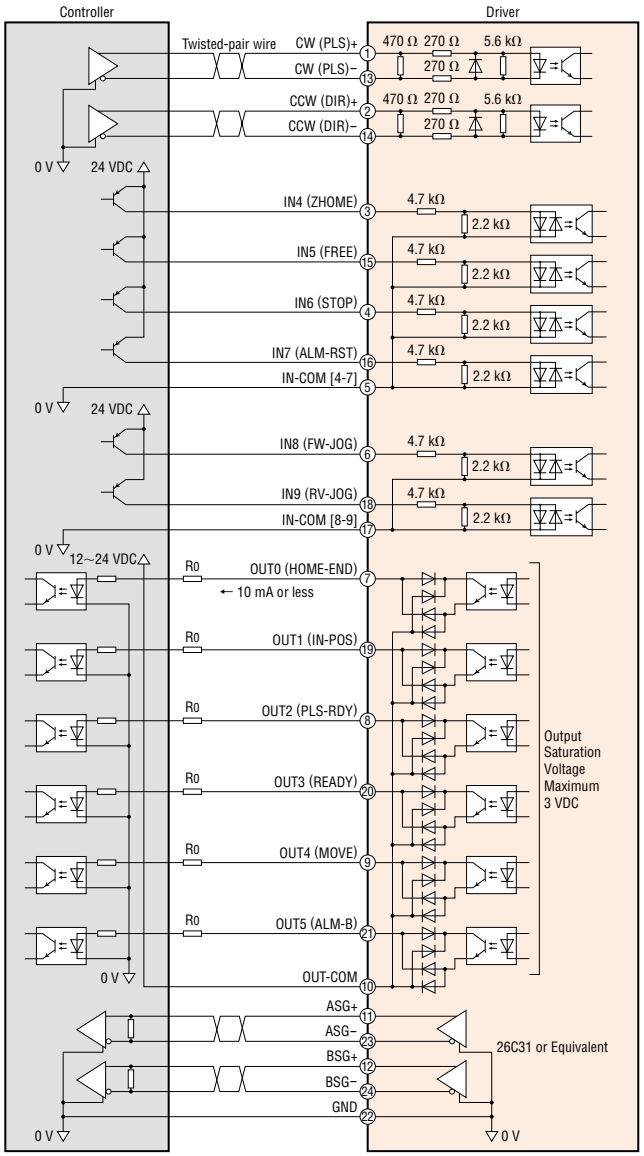
*R_1: 1.2 kΩ~2.2 kΩ, 0.5 W or more

Note

- Use 5~24 VDC for the CW (PLS) and CCW (DIR) inputs.
  When using at 24 VDC, connect external resistor R_1 (1.2 kΩ~2.2 kΩ, 0.5 W or more).
- When using at 5 VDC, do not connect any external resistors, but directly connect a pulse input signal.

•Connection Diagram for Connection with Current Source Output Circuit

When the pulse input is the line driver

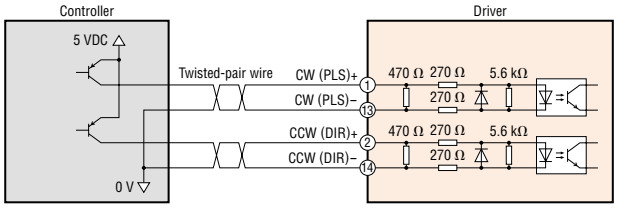


Note

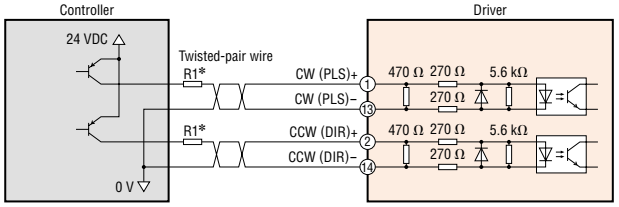
- Use 24 VDC for the input signals.
- Use 12~24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor R_0 to reduce the current to 10 mA or below.
- Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).
  Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

When the pulse input is the open collector

•When the pulse input signal is 5 VDC



•When the pulse input signal is 24 VDC



✻R_1: 1.2 kΩ~2.2 kΩ, 0.5 W or more

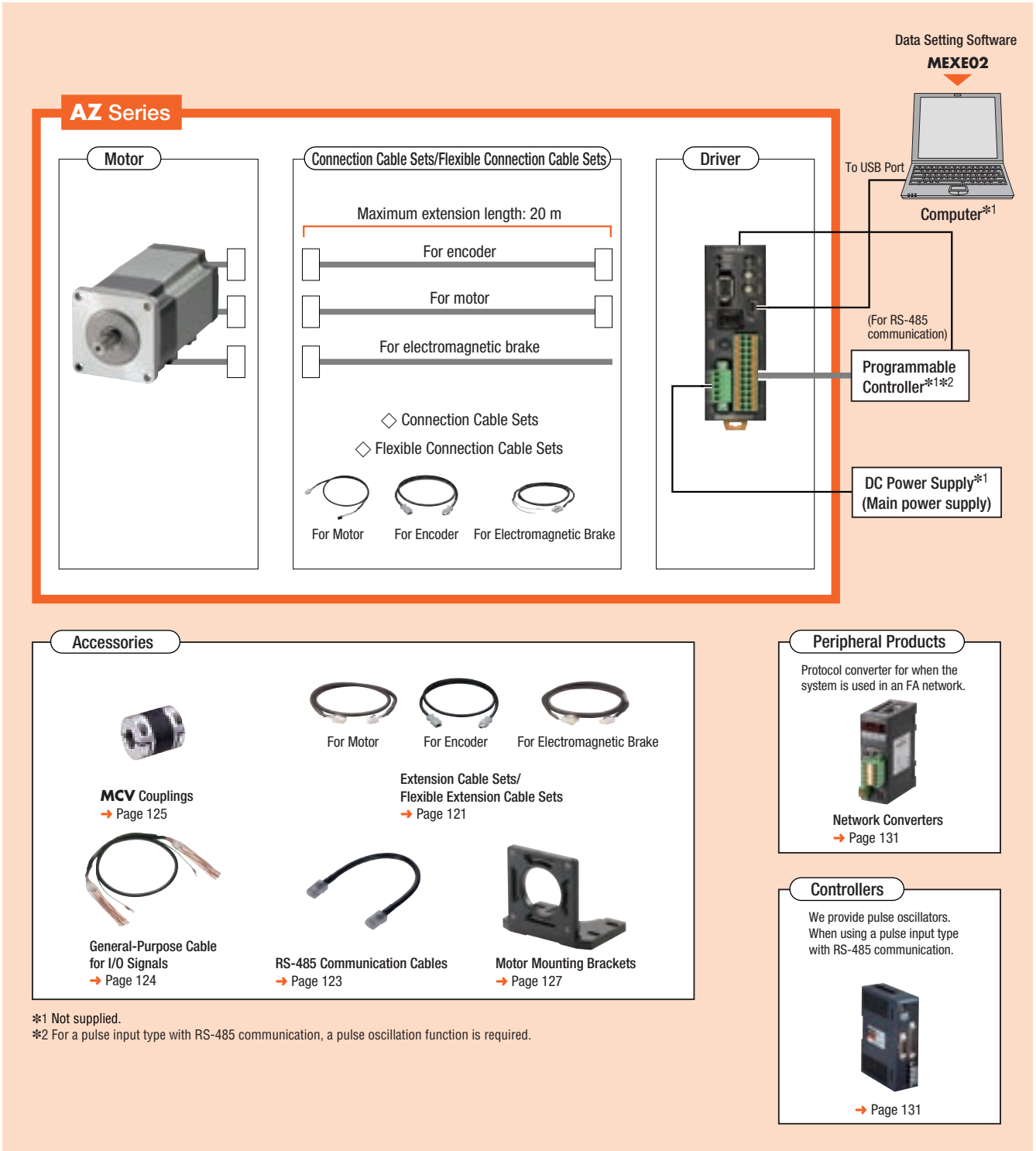
Note

- Use 5~24 VDC for the CW (PLS) and CCW (DIR) inputs.
  When using at 24 VDC, connect external resistor R_1 (1.2 kΩ~2.2 kΩ, 0.5 W or more).
- When using at 5 VDC, do not connect any external resistors, but directly connect a pulse input signal.

System Configuration

When a standard type motor with electromagnetic brake is combined with a built-in controller type driver or a pulse input type driver with RS-485 communication

The figure below shows a sample configuration which includes a built-in controller type driver and which uses I/O control or RS-485 communication.
The motor, driver, and connection cable set/flexible connection cable set need to be separately provided.



*1 Not supplied.
*2 For a pulse input type with RS-485 communication, a pulse oscillation function is required.

● System Configuration Example

AZ Series				Accessories		
Motor	Driver	Connection Cable Sets	+	Motor Mounting Brackets	Flexible Couplings	General-Purpose Cable for I/O Signals (1 m)
AZM66MK	AZD-KD	CC030VZFB2		PAL2P-5	MCV251010	CC16D010B-1

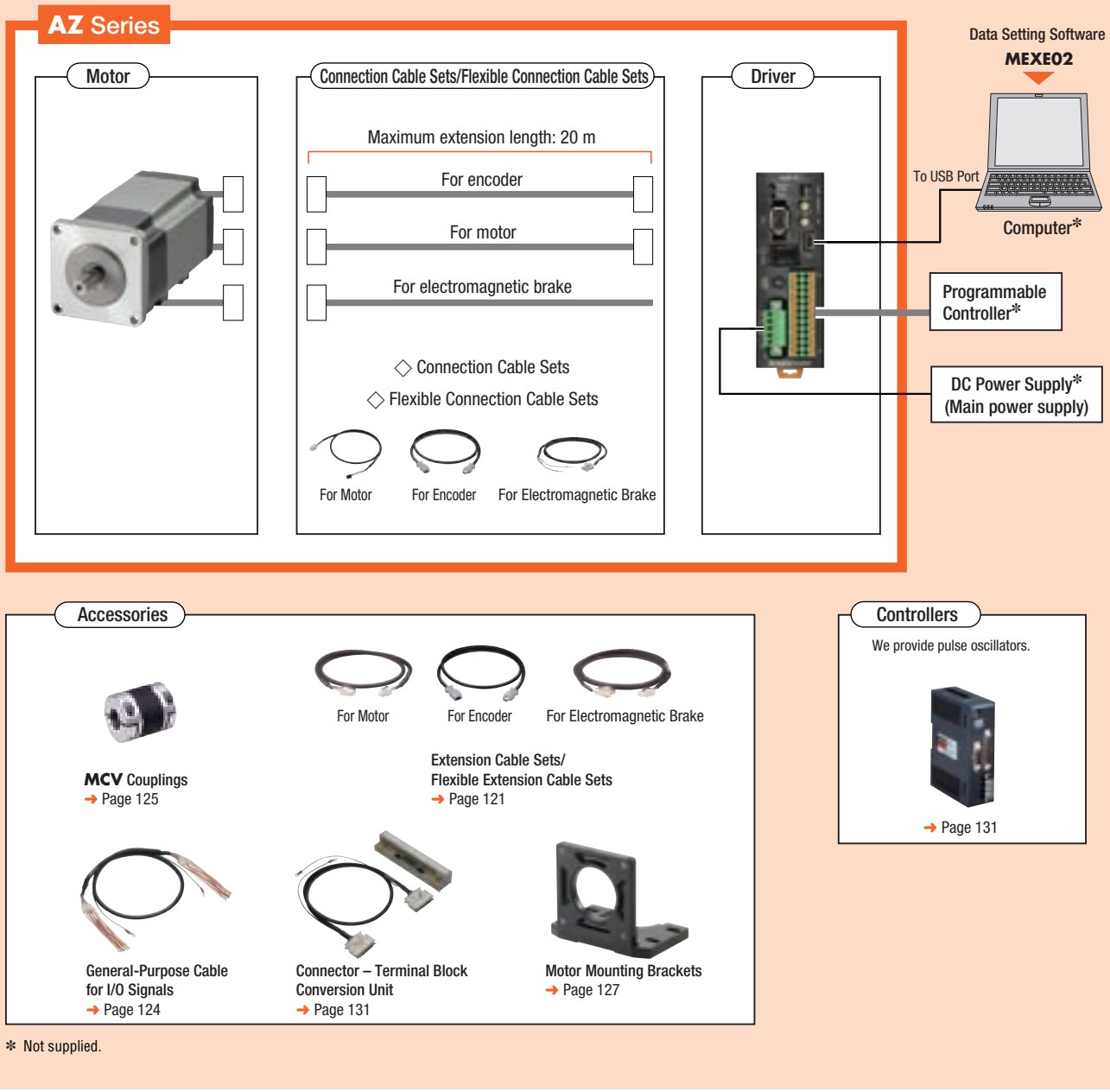
● The system configuration shown above is an example. Other combinations are available.

Note

● The motor cable and electromagnetic brake cable from the motor cannot be directly connected to a driver. To connect the motor to the driver, use a connection cable.

When a standard type motor with electromagnetic brake is combined with a built-in controller type driver

The figure below shows a sample configuration of a single axis system which uses a programmable controller (equipped with a pulse oscillator).
The motor, driver, and connection cable set/flexible connection cable set need to be separately provided.



* Not supplied.

System Configuration Example

AZ Series				Controllers	Accessories			
Motor	Driver	Connection Cable Sets			Motor Mounting Brackets	Flexible Couplings	General-Purpose Cable for I/O Signals (1 m)	Connector – Terminal Block Conversion Unit (1 m)
AZM66MK	AZD-K	CC030VZFB2	+	EMP401-1	PAL2P-5	MCV251010	CC16D010B-1	CC50T10E

The system configuration shown above is an example. Other combinations are available.

Note

The motor cable and electromagnetic brake cable from the motor cannot be directly connected to a driver. To connect the motor to the driver, use a connection cable.

Product Number Code

Motors

◇Standard Type

AZM 6 6 A 0 K

① ② ③ ④ ⑤ ⑥

◇**PS**, **HPG**, Harmonic Geared Type

AZM 6 6 A K - HP 15 F

① ② ③ ④ ⑥ ⑦ ⑧ ⑨

①	Motor Type	**AZM**: **AZ** Series Motor
②	Motor Frame Size	**1**: 20 mm **2**: 28 mm (30 mm for the Harmonic Geared Type) **4**: 42 mm (40 mm for the **HPG** Geared Type) **6**: 60 mm
③	Motor Case Length	
④	Output Shaft Shape	**A**: Single Shaft **M**: With Electromagnetic Brake
⑤	Additional Function*	**0**: Straight **1**: With Key
⑥	Motor Specifications	**K**: DC Power Supply Input Specifications
⑦	Gear Type	**PS**: **PS** Geared Type **HP**: **HPG** Geared Type **HS**: Harmonic Geared Type
⑧	Gear Ratio	
⑨	Output Shaft Type	**HPG** Geared Type Blank: Shaft Output **F**: Flange Output

*When the name of a standard type does not contain a number representing an additional function, it is a single-sided milled type.

◇**TS** Geared Type

AZM 6 6 A K - TS 7.2 U

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Motor Type	**AZM**: **AZ** Series Motor
②	Motor Frame Size	**4**: 42 mm **6**: 60 mm
③	Motor Case Length	
④	Output Shaft Shape	**A**: Single Shaft **M**: With Electromagnetic Brake
⑤	Motor Specifications	**K**: DC Power Supply Input Specifications
⑥	Gear Type	**TS**: **TS** Geared Type
⑦	Gear Ratio	
⑧	Cable Drawing Direction	**U**: Upward **L**: Left **R**: Right

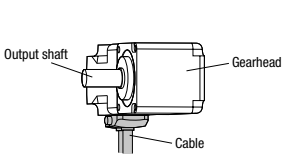
◇**FC** Geared Type

AZM 6 6 A K - FC 7.2 U A

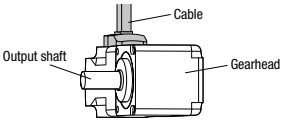
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①	Motor Type	**AZM**: **AZ** Series Motor
②	Motor Frame Size	**4**: 42 mm **6**: 60 mm
③	Motor Case Length	
④	Output Shaft Shape	**A**: Single Shaft **M**: With Electromagnetic Brake
⑤	Motor Specifications	**K**: DC Power Supply Input Specifications
⑥	Gear Type	**FC**: **FC** Geared Type
⑦	Gear Ratio	
⑧	Cable Drawing Direction*	**D**: Downward **U**: Upward
⑨	Identification	**A**: Solid Shaft

*The cable drawing direction is based on the assumption that the output shaft is at left and the gearhead is at right.



Cable direction downward



Cable direction upward

Driver

AZD - K D

① ② ③

①	Driver Type	**AZD**: **AZ** Series Driver
②	Power Supply Input	**K**: 24 VDC/48 VDC
③	Type	**D**: Built-in Controller Type **X**: Pulse Input Type with RS-485 Communication Blank: Pulse Input Type

Connection Cable Set/Flexible Connection Cable Set

CC 050 V Z □ F B 2

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①		**CC**: Cable
②	Length	**005**: 0.5 m **010**: 1 m **015**: 1.5 m **020**: 2 m **025**: 2.5 m **030**: 3 m **040**: 4 m **050**: 5 m **070**: 7 m **100**: 10 m **150**: 15 m **200**: 20 m
③	Reference Number	
④	Applied Model	**Z**: For **AZ** Series
⑤	Reference Number	Blank: For frame size 42 mm (40 mm for the **HPG** Geared Type), 60 mm **2**: For frame size 20 mm, 28 mm (30 mm for the Harmonic Geared Type)
⑥	Cable Type	**F**: Connection Cable Set **R**: Flexible Connection Cable Set
⑦	Description	Blank: For the product with no Electromagnetic Brakes **B**: For the product with Electromagnetic Brakes
⑧	Cable Specifications	**2**: DC Power Supply Input

Product Line

The motor, driver, and connection cables need to purchase separately.

Motors

◇Standard Type

Frame Size	Product Name
20 mm	**AZM14AK** **AZM15AK**
28 mm	**AZM24AK** **AZM26AK**
42 mm	**AZM46AK** **AZM46A0K** **AZM48AK** NEW **AZM48A0K** NEW **AZM48A1K** NEW
60 mm	**AZM66AK** **AZM66A0K** **AZM66A1K** **AZM69AK** **AZM69A0K** **AZM69A1K**

◇Standard Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**AZM46MK** **AZM46M0K**
60 mm	**AZM66MK** **AZM66M0K** **AZM66M1K** **AZM69MK** **AZM69M0K** **AZM69M1K**

◇**TS** Geared Type

Frame Size	Product Name
42 mm	**AZM46AK-TS3.6** **AZM46AK-TS3.6R** **AZM46AK-TS3.6U** **AZM46AK-TS3.6L** **AZM46AK-TS7.2** **AZM46AK-TS7.2R** **AZM46AK-TS7.2U** **AZM46AK-TS7.2L** **AZM46AK-TS10** **AZM46AK-TS10R** **AZM46AK-TS10U** **AZM46AK-TS10L** **AZM46AK-TS20** **AZM46AK-TS20R** **AZM46AK-TS20U** **AZM46AK-TS20L** **AZM46AK-TS30** **AZM46AK-TS30R** **AZM46AK-TS30U** **AZM46AK-TS30L**
60 mm	**AZM66AK-TS3.6** **AZM66AK-TS3.6R** **AZM66AK-TS3.6U** **AZM66AK-TS3.6L** **AZM66AK-TS7.2** **AZM66AK-TS7.2R** **AZM66AK-TS7.2U** **AZM66AK-TS7.2L** **AZM66AK-TS10** **AZM66AK-TS10R** **AZM66AK-TS10U** **AZM66AK-TS10L** **AZM66AK-TS20** **AZM66AK-TS20R** **AZM66AK-TS20U** **AZM66AK-TS20L** **AZM66AK-TS30** **AZM66AK-TS30R** **AZM66AK-TS30U** **AZM66AK-TS30L**

◇**TS** Geared Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**AZM46MK-TS3.6** **AZM46MK-TS3.6R** **AZM46MK-TS3.6U** **AZM46MK-TS3.6L** **AZM46MK-TS7.2** **AZM46MK-TS7.2R** **AZM46MK-TS7.2U** **AZM46MK-TS7.2L** **AZM46MK-TS10** **AZM46MK-TS10R** **AZM46MK-TS10U** **AZM46MK-TS10L** **AZM46MK-TS20** **AZM46MK-TS20R** **AZM46MK-TS20U** **AZM46MK-TS20L** **AZM46MK-TS30** **AZM46MK-TS30R** **AZM46MK-TS30U** **AZM46MK-TS30L**
60 mm	**AZM66MK-TS3.6** **AZM66MK-TS3.6R** **AZM66MK-TS3.6U** **AZM66MK-TS3.6L** **AZM66MK-TS7.2** **AZM66MK-TS7.2R** **AZM66MK-TS7.2U** **AZM66MK-TS7.2L** **AZM66MK-TS10** **AZM66MK-TS10R** **AZM66MK-TS10U** **AZM66MK-TS10L** **AZM66MK-TS20** **AZM66MK-TS20R** **AZM66MK-TS20U** **AZM66MK-TS20L** **AZM66MK-TS30** **AZM66MK-TS30R** **AZM66MK-TS30U** **AZM66MK-TS30L**

◇**FC** Geared Type

Frame Size	Product Name
42 mm	**AZM46AK-FC7.2UA** **AZM46AK-FC7.2DA** **AZM46AK-FC10UA** **AZM46AK-FC10DA** **AZM46AK-FC20UA** **AZM46AK-FC20DA** **AZM46AK-FC30UA** **AZM46AK-FC30DA**
60 mm	**AZM66AK-FC7.2UA** **AZM66AK-FC7.2DA** **AZM66AK-FC10UA** **AZM66AK-FC10DA** **AZM66AK-FC20UA** **AZM66AK-FC20DA** **AZM66AK-FC30UA** **AZM66AK-FC30DA**

◇**FC** Geared Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**AZM46MK-FC7.2UA** **AZM46MK-FC7.2DA** **AZM46MK-FC10UA** **AZM46MK-FC10DA** **AZM46MK-FC20UA** **AZM46MK-FC20DA** **AZM46MK-FC30UA** **AZM46MK-FC30DA**
60 mm	**AZM66MK-FC7.2UA** **AZM66MK-FC7.2DA** **AZM66MK-FC10UA** **AZM66MK-FC10DA** **AZM66MK-FC20UA** **AZM66MK-FC20DA** **AZM66MK-FC30UA** **AZM66MK-FC30DA**

◇**PS** Geared Type

Frame Size	Product Name
28 mm	**AZM24AK-PS7.2** NEW **AZM24AK-PS10** NEW
42 mm	**AZM46AK-PS5** **AZM46AK-PS7.2** **AZM46AK-PS10** **AZM46AK-PS25** **AZM46AK-PS36** **AZM46AK-PS50**
60 mm	**AZM66AK-PS5** **AZM66AK-PS7.2** **AZM66AK-PS10** **AZM66AK-PS25** **AZM66AK-PS36** **AZM66AK-PS50**

◇**PS** Geared Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**AZM46MK-PS5** **AZM46MK-PS7.2** **AZM46MK-PS10** **AZM46MK-PS25** **AZM46MK-PS36** **AZM46MK-PS50**
60 mm	**AZM66MK-PS5** **AZM66MK-PS7.2** **AZM66MK-PS10** **AZM66MK-PS25** **AZM66MK-PS36** **AZM66MK-PS50**

◇**HPG** Geared Type

Frame Size	Product Name
40 mm	**AZM46AK-HP5** **AZM46AK-HP5F** **AZM46AK-HP9** **AZM46AK-HP9F**
60 mm	**AZM66AK-HP5** **AZM66AK-HP5F** **AZM66AK-HP15** **AZM66AK-HP15F**

◇**HPG** Geared Type with Electromagnetic Brake

Frame Size	Product Name
40 mm	**AZM46MK-HP5** **AZM46MK-HP5F** **AZM46MK-HP9** **AZM46MK-HP9F**
60 mm	**AZM66MK-HP5** **AZM66MK-HP5F** **AZM66MK-HP15** **AZM66MK-HP15F**

◇Harmonic Geared Type

Frame Size	Product Name
30 mm	**AZM24AK-HS50** NEW **AZM24AK-HS100** NEW
42 mm	**AZM46AK-HS50** **AZM46AK-HS100**
60 mm	**AZM66AK-HS50** **AZM66AK-HS100**

◇Harmonic Geared Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**AZM46MK-HS50** **AZM46MK-HS100**
60 mm	**AZM66MK-HS50** **AZM66MK-HS100**

Drivers

◇Built-in Controller Type

Power Supply Input	Product Name
24/48 VDC	**AZD-KD**

◇Pulse Input Type with RS-485 Communication NEW

Power Supply Input	Product Name
24/48 VDC	**AZD-KX**

◇Pulse Input Type

Power Supply Input	Product Name
24/48 VDC	**AZD-K**

Connection Cable Sets/Flexible Connection Cable Sets

Use a flexible connection cable set if the cable will be bent repeatedly. We provide connection cables and flexible extension cables that can be connected to connection cables for extension. See page 121.

The motor cable and electromagnetic brake cable from the motor cannot be directly connected to a driver. To connect the motor to the driver, use a connection cable.

[For **AZM14**, **AZM15**, **AZM24**, **AZM26**]

◇For the product with no Electromagnetic Brakes

Type	Length L (m)	Product Name
Connection Cable Set	0.5	**CC005VZ2F2**
	1	**CC010VZ2F2**
	1.5	**CC015VZ2F2**
	2	**CC020VZ2F2**
	2.5	**CC025VZ2F2**
	3	**CC030VZ2F2**
	4	**CC040VZ2F2**
	5	**CC050VZ2F2**
	7	**CC070VZ2F2**
	10	**CC100VZ2F2**
	15	**CC150VZ2F2**
	20	**CC200VZ2F2**

Type	Length L (m)	Product Name
Flexible Connection Cable Set	0.5	**CC005VZ2R2**
	1	**CC010VZ2R2**
	1.5	**CC015VZ2R2**
	2	**CC020VZ2R2**
	2.5	**CC025VZ2R2**
	3	**CC030VZ2R2**
	4	**CC040VZ2R2**
	5	**CC050VZ2R2**
	7	**CC070VZ2R2**
	10	**CC100VZ2R2**
	15	**CC150VZ2R2**
	20	**CC200VZ2R2**

[For **AZM46**, **AZM48**, **AZM66**, **AZM69**]

For Motor For Encoder

For Motor For Encoder For Electromagnetic Brake

◇For the product with no Electromagnetic Brakes

Type	Length L (m)	Product Name
Connection Cable Set	0.5	**CC005VZF2**
	1	**CC010VZF2**
	1.5	**CC015VZF2**
	2	**CC020VZF2**
	2.5	**CC025VZF2**
	3	**CC030VZF2**
	4	**CC040VZF2**
	5	**CC050VZF2**
	7	**CC070VZF2**
	10	**CC100VZF2**
	15	**CC150VZF2**
	20	**CC200VZF2**
Flexible Connection Cable Set	0.5	**CC005VZR2**
	1	**CC010VZR2**
	1.5	**CC015VZR2**
	2	**CC020VZR2**
	2.5	**CC025VZR2**
	3	**CC030VZR2**
	4	**CC040VZR2**
	5	**CC050VZR2**
	7	**CC070VZR2**
	10	**CC100VZR2**
	15	**CC150VZR2**
	20	**CC200VZR2**

◇For the product with Electromagnetic Brakes

Type	Length L (m)	Product Name
Connection Cable Set	0.5	**CC005VZFB2**
	1	**CC010VZFB2**
	1.5	**CC015VZFB2**
	2	**CC020VZFB2**
	2.5	**CC025VZFB2**
	3	**CC030VZFB2**
	4	**CC040VZFB2**
	5	**CC050VZFB2**
	7	**CC070VZFB2**
	10	**CC100VZFB2**
	15	**CC150VZFB2**
	20	**CC200VZFB2**
Flexible Connection Cable Set	0.5	**CC005VZRB2**
	1	**CC010VZRB2**
	1.5	**CC015VZRB2**
	2	**CC020VZRB2**
	2.5	**CC025VZRB2**
	3	**CC030VZRB2**
	4	**CC040VZRB2**
	5	**CC050VZRB2**
	7	**CC070VZRB2**
	10	**CC100VZRB2**
	15	**CC150VZRB2**
	20	**CC200VZRB2**

Accessories

Motors

Type \ Accessories		Parallel Key	Motor Installation Screws	Operating Manual
Standard Type		—	—	1 set
TS Geared Type	Frame Size 42 mm	—	—	
	Frame Size 60 mm	1 pc.	M4×60 P0.7 (4 pieces)	
FC Geared Type		1 pc.	—	
PS Geared Type	Frame Size 28 mm	—	—	
	Frame Size 42 mm, 60 mm	1 pc.	—	
HPG Geared Type	Shaft Output	1 pc.	—	
	Flange Output	—	—	
Harmonic Geared Type	Frame Size 30 mm	—	—	
	Frame Size 42 mm, 60 mm	1 pc.	—	

● For the details of the functions and operation methods of the product, refer to the Operating Manual (Functions). The Operating Manual for Functions does not come with the product. Contact the nearest Oriental Motor sales office, or download the Operating Manual from the Oriental Motor website.

Drivers

Type \ Accessories	Connector	Operating Manual
For All Types	・Connector for CN4 (1 pc.) ・Connector for CN1 (1 pc.)	1 set

Connection Cable Sets/Flexible Connection Cable Sets

Type \ Accessories	Operating Manual
Connection Cable Sets	—
Flexible Connection Cable Sets	1 set

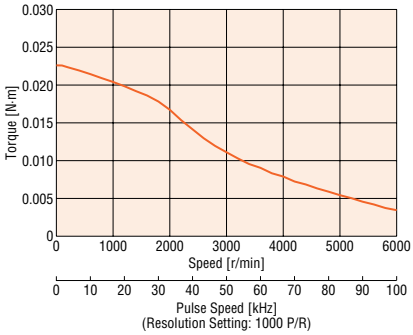
Standard Type Frame Size 20 mm, 28 mm

Specifications

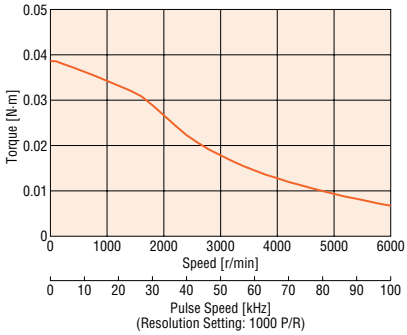
Motor Product Name	Single Shaft	AZM14AK	AZM15AK	AZM24AK	AZM26AK
Driver Product Name	Built-in Controller	AZD-KD			
	Pulse Input with RS-485 Communication	AZD-KX			
	Pulse Input	AZD-K			
Maximum Holding Torque	N·m	0.02	0.036	0.095	0.19
Holding Torque at Motor Standstill	N·m	0.01	0.018	0.047	0.095
Rotor Inertial	J: kg·m^2	2.7×10^{-7}	3.9×10^{-7}	9.2×10^{-7}	17×10^{-7}
Resolution	Resolution Setting: 1000 P/R	0.36°/Pulse			
Power Supply Input	Voltage	24 VDC ±5%			
	Input Current A	0.5	0.6	1.6	1.6

Speed – Torque Characteristics (Reference values)

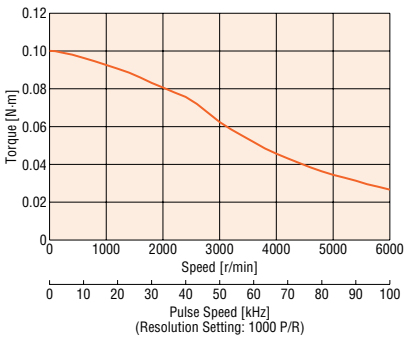
AZM14



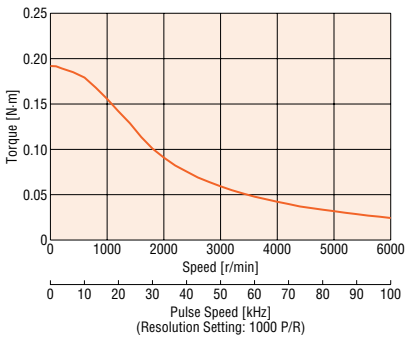
AZM15



AZM24



AZM26



Note

- The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less.

Descriptions of the Terms on the Specification Table

Maximum Holding Torque	: The maximum holding torque (holding force) of the motor when power (rated current) is being supplied but the motor shaft is at standstill. (With geared types, the permissible strength of the gear is given consideration for this value.)	
Permissible Torque	: The maximum value of the torque that can be continuously applied on the output gear shaft.	
Maximum Instantaneous Torque	: This is the maximum torque value that can be applied to the output gear shaft during acceleration/deceleration like when an inertial load is started and stopped.	
Holding Torque at Motor Standstill	Power ON	: Holding torque when the automatic current cutback function is active.
	Electromagnetic Brake	: Static friction torque when the electromagnetic brake is activated at standstill. (Electromagnetic brake is power off activated type.)

Standard Type Frame Size 42 mm, 60 mm

Specifications

Motor Product Name	Single Shaft		AZM46A□K	AZM48A□K	AZM66A□K	AZM69A□K
	With Electromagnetic Brake		AZM46M□K	—	AZM66M□K	AZM69M□K
Driver Product Name	Built-in Controller		AZD-KD			
	Pulse Input with RS-485 Communication		AZD-KX			
	Pulse Input		AZD-K			
Maximum Holding Torque		N·m	0.3	0.72	1	2
Holding Torque at Motor Standstill	Power ON	N·m	0.15	0.36	0.5	1
	Electromagnetic Brake	N·m	0.15	—	0.5	1
Rotor Inertial		J: kg·m^2	55×10^{-7} (71×10^{-7})*1	115×10^{-7}	370×10^{-7} (530×10^{-7})*1	740×10^{-7} (900×10^{-7})*1
Resolution	Resolution Setting: 1000 P/R		0.36°/Pulse			
Power Supply Input	Voltage		24 VDC ±5%*2 /48 VDC ±5%*3	24 VDC ±5% /48 VDC ±5%*3	24 VDC ±5%*2 /48 VDC ±5%*3	
	Input Current	A	1.72 (1.8)*1	2.2	3.55 (3.8)*1	3.45 (3.7)*1

● Either **0** (Straight) or **1** (With a key) indicating the configuration is entered where the box □ is located within the product name. (For **AZM46**, straight only)
For single-sided milling, no character is entered into the □ mark.

*1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

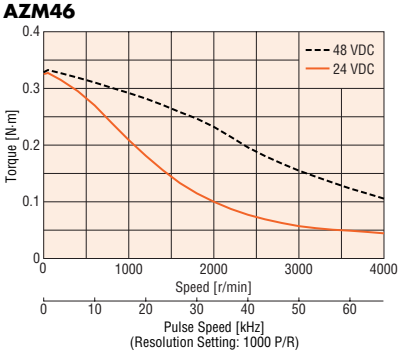
*2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

*3 When the motor is operated from 48 VDC input, use an inertial load 10 times of the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque. (Excluding **AZM46**).

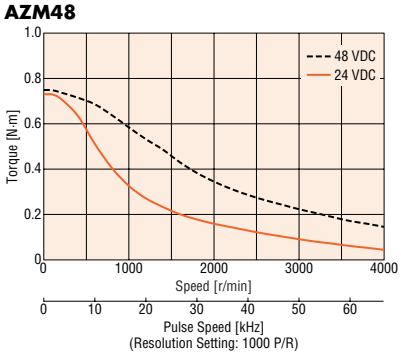
*4 Motor only

Speed – Torque Characteristics (Reference values)

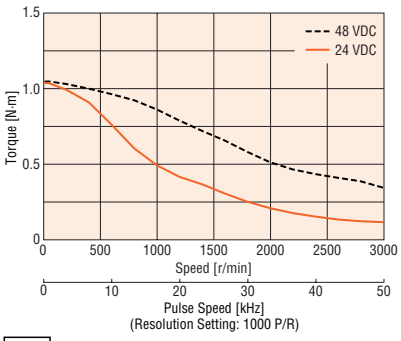
AZM46



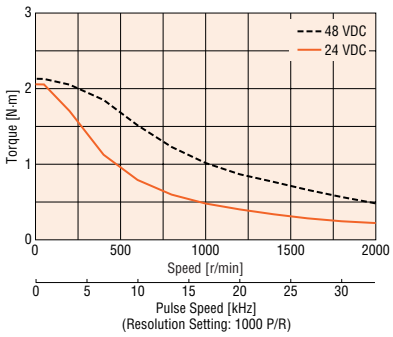
AZM48



AZM66



AZM69



Note

● The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less.
(When conforming to the UL/CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

TS Geared Type Frame Size 42 mm

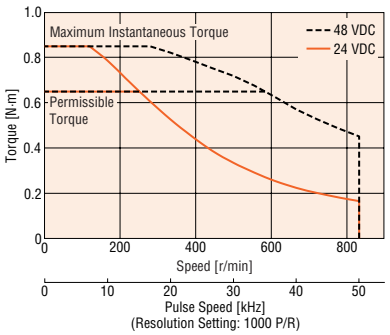
Specifications

Motor Product Name		AZM46AK-TS3.6□	AZM46AK-TS7.2□	AZM46AK-TS10□	AZM46AK-TS20□	AZM46AK-TS30□
	With Electromagnetic Brake	AZM46MK-TS3.6□	AZM46MK-TS7.2□	AZM46MK-TS10□	AZM46MK-TS20□	AZM46MK-TS30□
Driver Product Name	Built-in Controller	AZD-KD				
	Pulse Input with RS-485 Communication	AZD-KX				
	Pulse Input	AZD-K				
Maximum Holding Torque	N·m	0.65	1.2	1.7	2	2.3
Rotor Inertial	J: kg·m^2	55×10^{-7} (71×10^{-7})*1				
Gear Ratio		3.6	7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	0.65	1.2	1.7	2	2.3
Maximum Instantaneous Torque*	N·m	0.85	1.6	2	*	3
Holding Torque at Motor Standstill	Power ON N·m	0.54	1	1.5	1.8	2.3
	Electromagnetic Brake N·m	0.54	1	1.5	1.8	2.3
Speed Range	r/min	0～833	0～416	0～300	0～150	0～100
Backlash	arcmin	45 (0.75°)	25 (0.42°)		15 (0.25°)	
Power Supply Input	Voltage	24 VDC ±5%*2/48 VDC ±5%				
	Input Current A	1.72 (1.8)*1				

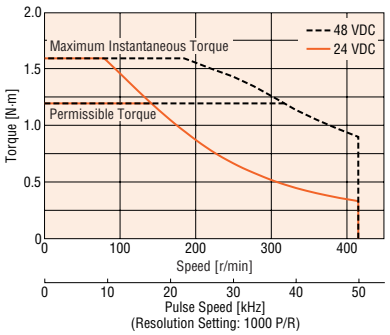
- The □ mark in the product name is replaced by **R** (Right), **U** (Upward), or **L** (Left) which shows the cable drawing direction. For the downward direction, no character is entered into the □ mark.
- * For the geared motor output torque, refer to the Speed – Torque Characteristics.
- *1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.
- *2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.
- *3 Motor only

Speed – Torque Characteristics (Reference values)

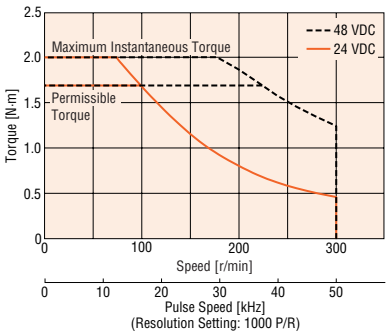
AZM46 Gear Ratio **3.6**



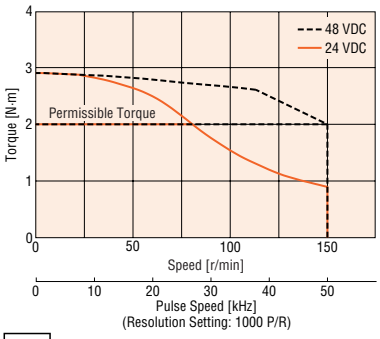
AZM46 Gear Ratio **7.2**



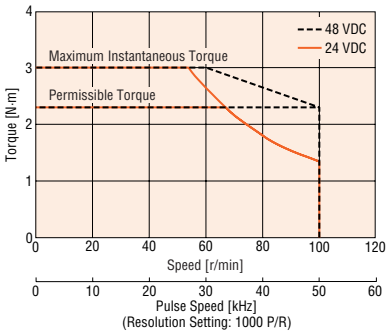
AZM46 Gear Ratio **10**



AZM46 Gear Ratio **20**



AZM46 Gear Ratio **30**



Note

- The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL/CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

TS Geared Type Frame Size 60 mm

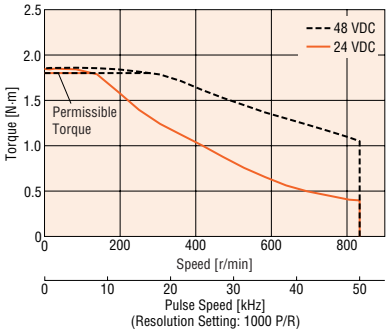
Specifications

Motor Product Name	Single Shaft		AZM66AK-TS3.6□	AZM66AK-TS7.2□	AZM66AK-TS10□	AZM66AK-TS20□	AZM66AK-TS30□
	With Electromagnetic Brake		AZM66MK-TS3.6□	AZM66MK-TS7.2□	AZM66MK-TS10□	AZM66MK-TS20□	AZM66MK-TS30□
Driver Product Name	Built-in Controller		AZD-KD				
	Pulse Input with RS-485 Communication		AZD-KX				
	Pulse Input		AZD-K				
Maximum Holding Torque		N·m	1.8	3	4	5	6
Rotor Inertial		J: kg·m^2	370×10^{-7} (530×10^{-7})✻1				
Gear Ratio			3.6	7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R		0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque		N·m	1.8	3	4	5	6
Maximum Instantaneous Torque✻		N·m	✻	✻	✻	8	10
Holding Torque at Motor Standstill	Power ON	N·m	1.1	2.2	3	5	6
	Electromagnetic Brake	N·m	1.1	2.2	3	5	6
Speed Range		r/min	0～833	0～416	0～300	0～150	0～100
Backlash		arcmin	35 (0.59°)	15 (0.25°)		10 (0.17°)	
Power Supply Input	Voltage		24 VDC ±5%✻2/48 VDC ±5%✻3				
	Input Current	A	3.55 (3.8)✻1				

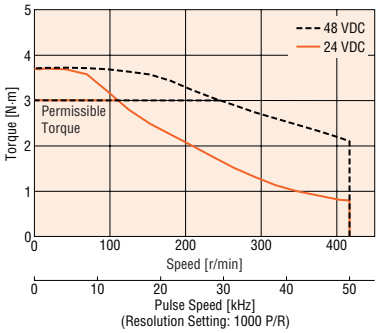
- The □ mark in the product name is replaced by **R** (Right), **U** (Upward), or **L** (Left) which shows the cable drawing direction. For the downward direction, no character is entered into the □ mark.
- ✻ For the geared motor output torque, refer to the Speed – Torque Characteristics.
- ✻1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.
- ✻2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.
- ✻3 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.
- ✻4 Motor only

Speed – Torque Characteristics (Reference values)

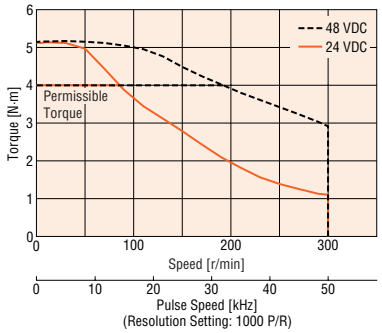
AZM66 Gear Ratio **3.6**



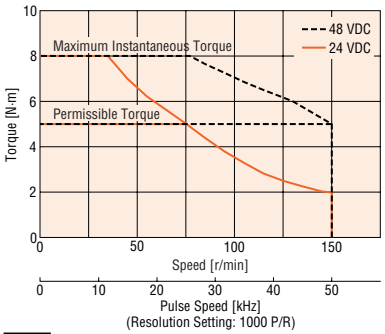
AZM66 Gear Ratio **7.2**



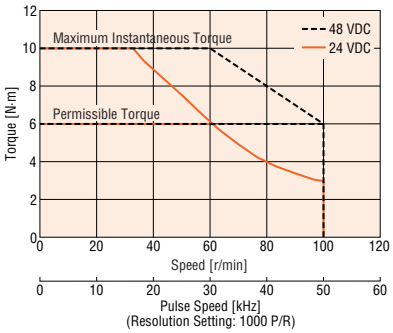
AZM66 Gear Ratio **10**



AZM66 Gear Ratio **20**



AZM66 Gear Ratio **30**



Note

- The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL/CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

FC Geared Type Frame Size 42 mm

Specifications

Motor Product Name		AZM46AK-FC7.2□A	AZM46AK-FC10□A	AZM46AK-FC20□A	AZM46AK-FC30□A
	With Electromagnetic Brake	AZM46MK-FC7.2□A	AZM46MK-FC10□A	AZM46MK-FC20□A	AZM46MK-FC30□A
Driver Product Name	Built-in Controller	AZD-KD			
	Pulse Input with RS-485 Communication	AZD-KX			
	Pulse Input	AZD-K			
Maximum Holding Torque	N·m	0.7	1	2	3
Rotor Inertial	J: kg·m^2	55×10^{-7} (71×10^{-7})*1			
Gear Ratio		7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	0.7	1	2	3
Holding Torque at Motor Standstill	Power ON N·m	0.7	1	2	3
	Electromagnetic Brake N·m	0.7	1	2	3
Speed Range	r/min	0～416	0～300	0～150	0～100
Backlash	arcmin	25 (0.42°)		15 (0.25°)	
Power Supply Input	Voltage	24 VDC ±5%*2/48 VDC ±5%			
	Input Current A	1.72 (1.8)*1			

●Either **U** (Upward) or **D** (Downward) indicating the cable drawing direction is entered where the box □ is located within the product name.

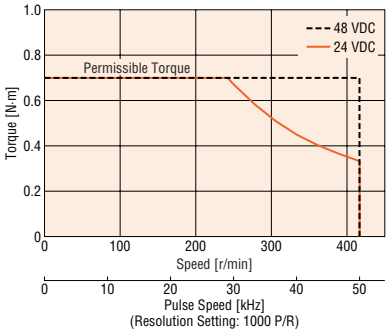
*1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

*2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

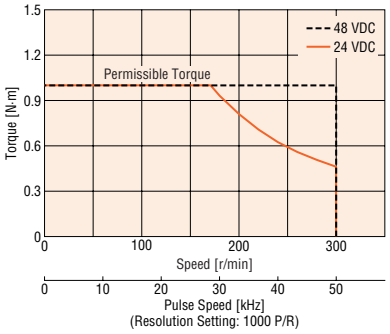
*3 Motor only

Speed – Torque Characteristics (Reference values)

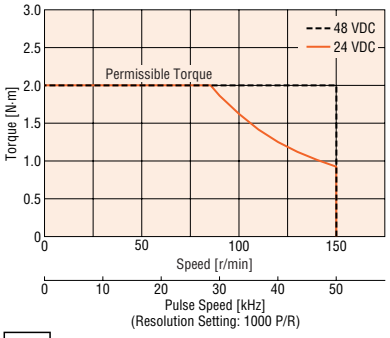
AZM46 Gear Ratio **7.2**



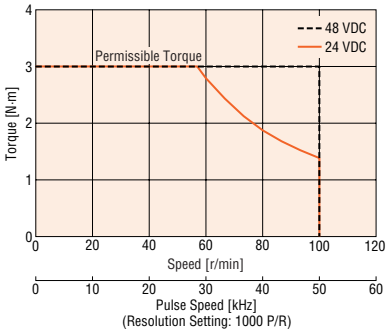
AZM46 Gear Ratio **10**



AZM46 Gear Ratio **20**



AZM46 Gear Ratio **30**



Note

●The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

●Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL/CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

FC Geared Type Frame Size 60 mm

Specifications

Motor Product Name	Single Shaft		AZM66AK-FC7.2□A	AZM66AK-FC10□A	AZM66AK-FC20□A	AZM66AK-FC30□A
	With Electromagnetic Brake		AZM66MK-FC7.2□A	AZM66MK-FC10□A	AZM66MK-FC20□A	AZM66MK-FC30□A
Driver Product Name	Built-in Controller		AZD-KD			
	Pulse Input with RS-485 Communication		AZD-KX			
	Pulse Input		AZD-K			
Maximum Holding Torque		N·m	2.5	3.5	7	10.5
Rotor Inertial		J: kg·m^2	370×10^{-7} (530×10^{-7})*1			
Gear Ratio			7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R		0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque		N·m	2.5	3.5	7	10.5
Holding Torque at Motor Standstill	Power ON	N·m	2.5	3.5	7	10.5
	Electromagnetic Brake	N·m	2.5	3.5	7	10.5
Speed Range		r/min	0～416	0～300	0～150	0～100
Backlash		arcmin	15 (0.25°)		10 (0.17°)	
Power Supply Input	Voltage		24 VDC ±5%*2/48 VDC ±5%*3			
	Input Current	A	3.35 (3.8)*1			

● Either **U** (Upward) or **D** (Downward) indicating the cable drawing direction is entered where the box □ is located within the product name.

*1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

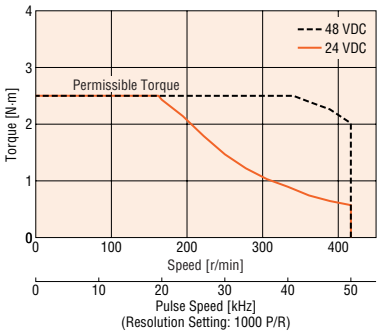
*2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

*3 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.

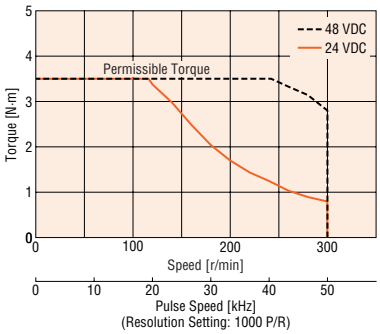
*4 Motor only

Speed – Torque Characteristics (Reference values)

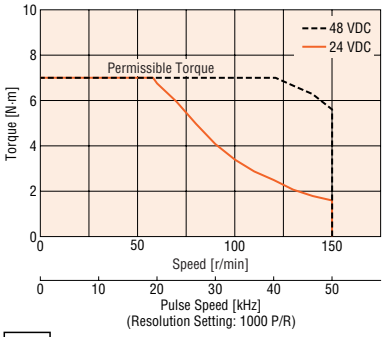
AZM66 Gear Ratio **7.2**



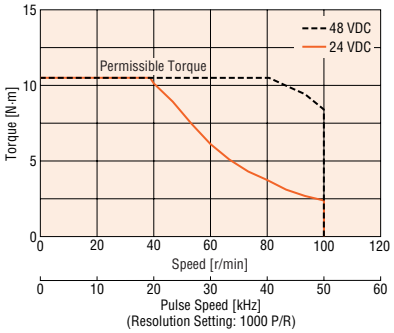
AZM66 Gear Ratio **10**



AZM66 Gear Ratio **20**



AZM66 Gear Ratio **30**



Note

● The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL/CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

PS Geared Type Frame Size 28 mm NEW

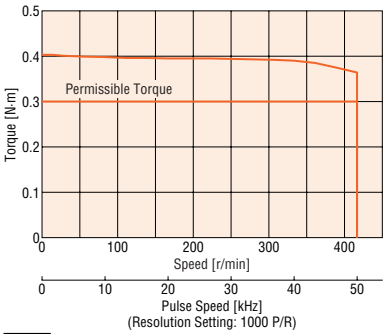
Specifications

Motor Product Name	Single Shaft		AZM24AK-PS7.2	AZM24AK-PS10
Driver Product Name	Built-in Controller		AZD-KD	
	Pulse Input with RS-485 Communication		AZD-KX	
	Pulse Input		AZD-K	
Maximum Holding Torque		N·m	0.3	0.5
Rotor Inertial		J: kg·m^2	9.2×10^{-7}	
Gear Ratio			7.2	10
Resolution		Resolution Setting: 1000 P/R	0.05°/Pulse	0.036°/Pulse
Permissible Torque		N·m	0.3	0.5
Maximum Instantaneous Torque*		N·m	*	–
Holding Torque at Motor Standstill		N·m	0.2	0.27
Speed Range		r/min	0~416	0~300
Backlash		arcmin	35 (0.59°)	
Power Supply Input	Voltage		24 VDC ±5%	
	Input Current	A	1.6	

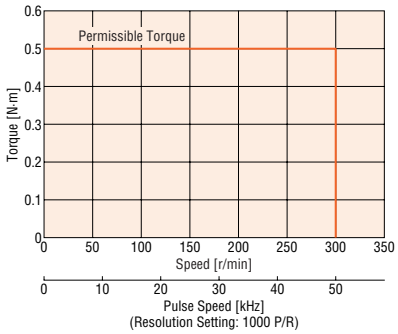
* For the geared motor output torque, refer to the Speed – Torque Characteristics.

Speed – Torque Characteristics (Reference values)

AZM24 Gear Ratio **7.2**



AZM24 Gear Ratio **10**



Note

- The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less.

PS Geared Type Frame Size 42 mm

Specifications

Motor Product Name	Single Shaft	AZM46AK-PS5	AZM46AK-PS7.2	AZM46AK-PS10	AZM46AK-PS25	AZM46AK-PS36	AZM46AK-PS50
	With Electromagnetic Brake	AZM46MK-PS5	AZM46MK-PS7.2	AZM46MK-PS10	AZM46MK-PS25	AZM46MK-PS36	AZM46MK-PS50
Driver Product Name	Built-in Controller	AZD-KD					
	Pulse Input with RS-485 Communication	AZD-KX					
	Pulse Input	AZD-K					
Maximum Holding Torque		N·m	1	1.5		2.5	3	
Rotor Inertial		J: kg·m^2	55×10^{-7} (71×10^{-7})*1					
Gear Ratio			5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R		0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque		N·m	1	1.5		2.5	3	
Maximum Instantaneous Torque*		N·m	*	2		6	*	6
Holding Torque at Motor Standstill	Power ON	N·m	0.75	1	1.5	2.5	3	
	Electromagnetic Brake	N·m	0.75	1	1.5	2.5	3	
Speed Range		r/min	0~600	0~416	0~300	0~120	0~83	0~60
Backlash		arcmin	15 (0.25°)					
Power Supply Input	Voltage		24 VDC ±5%*2/48 VDC ±5%					
	Input Current	A	1.72 (1.8)*1					

* For the geared motor output torque, refer to the Speed – Torque Characteristics.

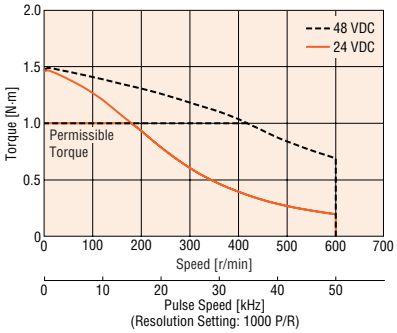
*1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

*2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

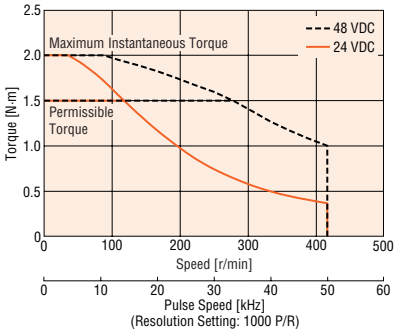
*3 Motor only

Speed – Torque Characteristics (Reference values)

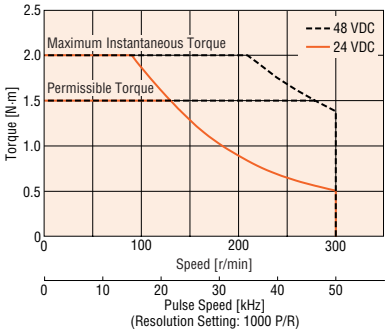
AZM46 Gear Ratio **5**



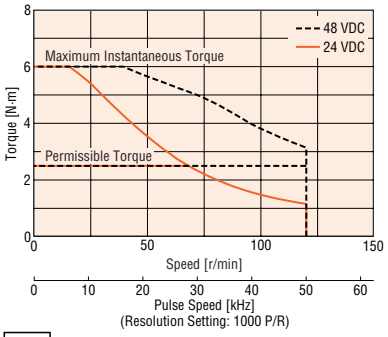
AZM46 Gear Ratio **7.2**



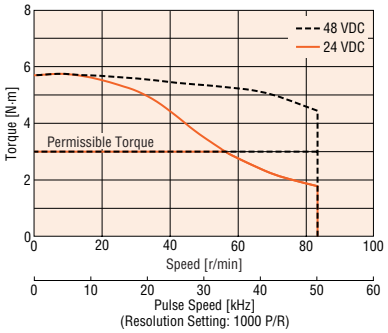
AZM46 Gear Ratio **10**



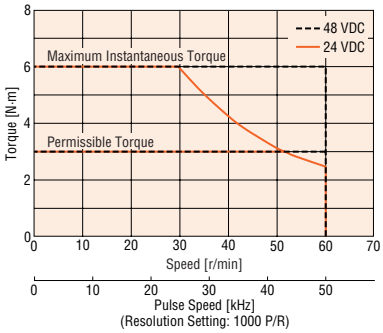
AZM46 Gear Ratio **25**



AZM46 Gear Ratio **36**



AZM46 Gear Ratio **50**



Note

- The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL/CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

PS Geared Type Frame Size 60 mm

Specifications

Motor Product Name	Single Shaft	AZM66AK-PS5	AZM66AK-PS7.2	AZM66AK-PS10	AZM66AK-PS25	AZM66AK-PS36	AZM66AK-PS50
	With Electromagnetic Brake	AZM66MK-PS5	AZM66MK-PS7.2	AZM66MK-PS10	AZM66MK-PS25	AZM66MK-PS36	AZM66MK-PS50
Driver Product Name	Built-in Controller	AZD-KD					
	Pulse Input with RS-485 Communication	AZD-KX					
	Pulse Input	AZD-K					
Maximum Holding Torque		N·m	3.5	4	5	8	
Rotor Inertial		J: kg·m^2	370×10^{-7} (530×10^{-7})*1				
Gear Ratio			5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R		0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque		N·m	3.5	4	5	8		
Maximum Instantaneous Torque*		N·m	*	*	*	*	*	20
Holding Torque at Motor Standstill	Power ON	N·m	2.5	3.6	5	7.6	8	
	Electromagnetic Brake	N·m	2.5	3.6	5	7.6	8	
Speed Range		r/min	0~600	0~416	0~300	0~120	0~83	0~60
Backlash		arcmin	7 (0.12°)			9 (0.15°)		
Power Supply Input	Voltage		24 VDC ±5%*2/48 VDC ±5%*3					
	Input Current	A	3.55 (3.8)*1					

* For the geared motor output torque, refer to the Speed – Torque Characteristics.

*1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

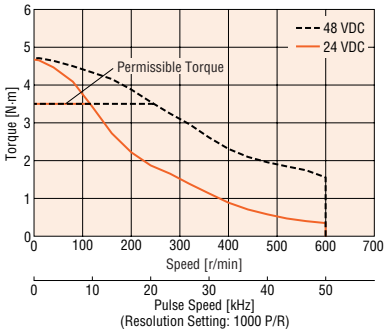
*2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

*3 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.

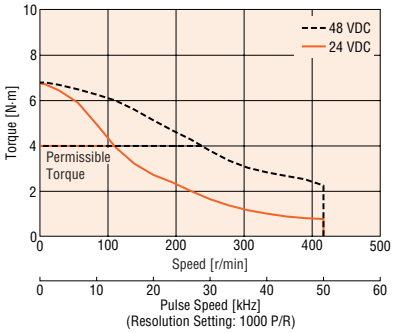
*4 Motor only

Speed – Torque Characteristics (Reference values)

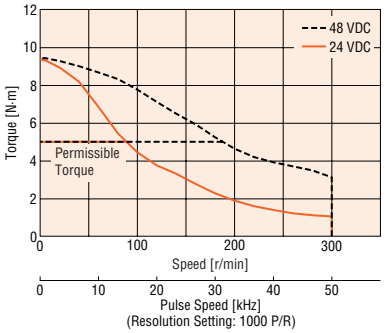
AZM66 Gear Ratio **5**



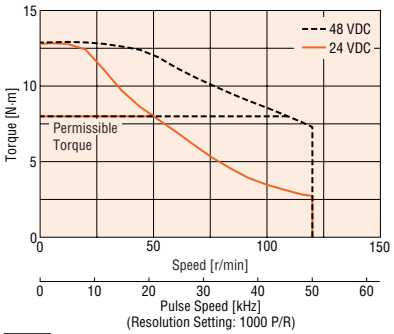
AZM66 Gear Ratio **7.2**



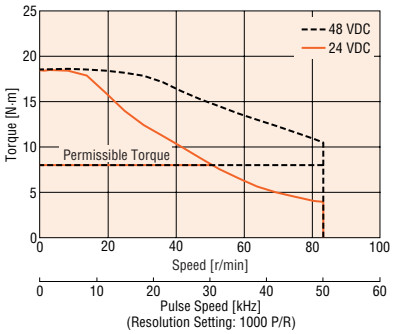
AZM66 Gear Ratio **10**



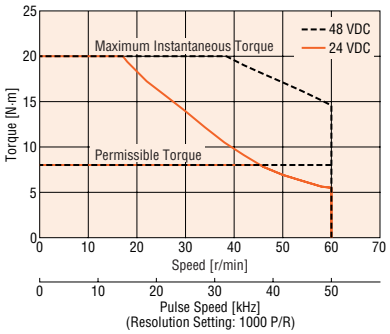
AZM66 Gear Ratio **25**



AZM66 Gear Ratio **36**



AZM66 Gear Ratio **50**



Note

- The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL/CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

HPG Geared Type Frame Size 40 mm, 60 mm

Specifications

Motor Product Name	Single Shaft		AZM46AK-HP5□	AZM46AK-HP9□	AZM66AK-HP5□	AZM66AK-HP15□
	With Electromagnetic Brake		AZM46MK-HP5□	AZM46MK-HP9□	AZM66MK-HP5□	AZM66MK-HP15□
Driver Product Name	Built-in Controller		AZD-KD			
	Pulse Input with RS-485 Communication		AZD-KX			
	Pulse Input		AZD-K			
Maximum Holding Torque		N·m	1.5	2.5	5	9
Rotor Inertial		J: kg·m^2	55×10^{-7} (71×10^{-7})*1		370×10^{-7} (530×10^{-7})*1	
Inertial*2		J: kg·m^2	5.8×10^{-7} (4.2×10^{-7})	3.4×10^{-7} (2.9×10^{-7})	92×10^{-7} (86×10^{-7})	78×10^{-7} (77×10^{-7})
Gear Ratio			5	9	5	15
Resolution	Resolution Setting: 1000 P/R		0.072°/Pulse	0.04°/Pulse	0.072°/Pulse	0.024°/Pulse
Permissible Torque*		N·m	*	2.5	*	9
Maximum Instantaneous Torque*		N·m	*	*	*	*
Holding Torque at Motor Standstill	Power ON	N·m	0.75	1.35	2.5	7.5
	Electromagnetic Brake	N·m	0.75	1.35	2.5	7.5
Speed Range		r/min	0~800	0~444	0~600	0~200
Backlash		arcmin	3 (0.05°)			
Power Supply Input	Voltage		24 VDC ±5%*4/48 VDC ±5%*5			
	Input Current	A	1.72 (1.8)*1		3.55 (3.8)*1	
Runout of Output Flange Surface*3		mm	0.02			
Runout of Output Flange Inner Diameter*3		mm	0.03		0.04	

* For the geared motor output torque, refer to the Speed – Torque Characteristics.

● For the flange output type, **F** is entered where the box □ is located within the product name.

*1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

*2 The values for the moments of inertia within the gear that has been converted to motor shaft values. The parentheses ( ) indicate the values for the flange output type.

*3 Specifications for the flange output type.

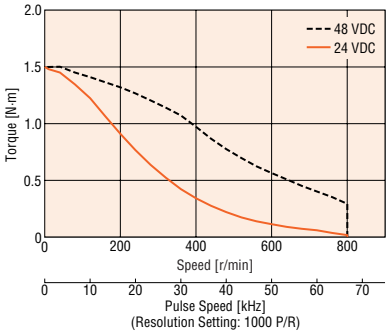
*4 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

*5 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque. (Excluding **AZM46**)

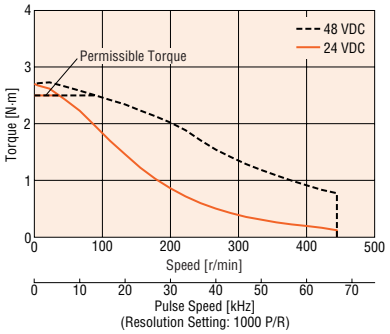
*6 Motor only

Speed – Torque Characteristics (Reference values)

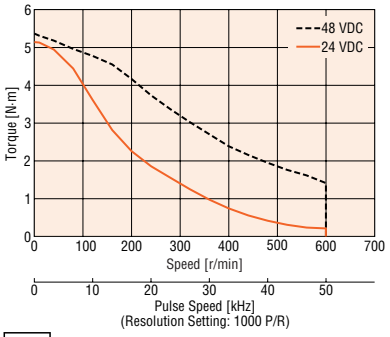
AZM46 Gear Ratio **5**



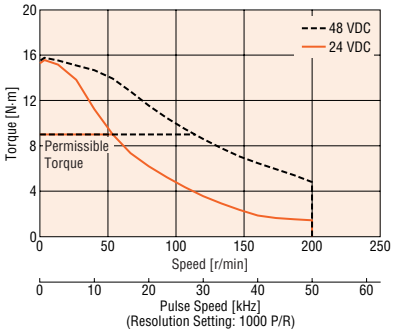
AZM46 Gear Ratio **9**



AZM66 Gear Ratio **5**



AZM66 Gear Ratio **15**



Note

● The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL/CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

Harmonic Geared Type Frame Size 30 mm, 42 mm, 60 mm

Lineup Added

Specifications

Motor Product Name	Single Shaft		AZM24AK-HS50	AZM24AK-HS100	AZM46AK-HS50	AZM46AK-HS100	AZM66AK-HS50	AZM66AK-HS100
	With Electromagnetic Brake		–	–	AZM46MK-HS50	AZM46MK-HS100	AZM66MK-HS50	AZM66MK-HS100
Driver Product Name	Built-in Controller		AZD-KD					
	Pulse Input with RS-485 Communication		AZD-KX					
	Pulse Input		AZD-K					
Maximum Holding Torque		N·m	1.8	2.4	3.5	5	7	10
Rotor Inertial		J: kg·m^2	12×10^{-7}		72×10^{-7} (88×10^{-7})*1		405×10^{-7} (565×10^{-7})*1	
Gear Ratio			50	100	50	100	50	100
Resolution	Resolution Setting: 1000 P/R		0.0072°/Pulse	0.0036°/Pulse	0.0072°/Pulse	0.0036°/Pulse	0.0072°/Pulse	0.0036°/Pulse
Permissible Torque		N·m	1.8	2.4	3.5	5	7	10
Maximum Instantaneous Torque*		N·m	3.3	4.8	8.3	11	*	36
Holding Torque at Motor Standstill	Power ON	N·m	1.8	2.4	3.5	5	7	10
	Electromagnetic Brake	N·m	–	–	3.5	5	7	10
Speed Range		r/min	0~70	0~35	0~70	0~35	0~60	0~30
Lost Motion (Load torque)		arcmin	1.5 or less (±0.09 N·m)	1.5 or less (±0.12 N·m)	1.5 or less (±0.16 N·m)	1.5 or less (±0.20 N·m)	0.7 or less (±0.28 N·m)	0.7 or less (±0.39 N·m)
Power Supply Input	Voltage		24 VDC ±5%		24 VDC ±5%*2/48 VDC ±5%*3			
	Input Current	A	1.6		1.72 (1.8)*1		3.55 (3.8)*1	

* For the geared motor output torque, refer to the Speed – Torque Characteristics.

*1 The values in the ( ) are those measured when a motor with electromagnetic brake is connected.

*2 For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

*3 When the motor is operated from 48 VDC input, use an inertial load 10 times of the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque. (Excluding **AZM46**).

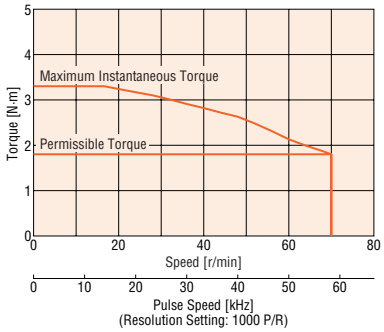
*4 Motor only (Excluding frame size 30 mm)

Note

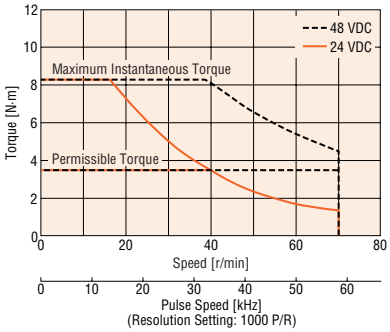
- The rotor inertia represents a sum of the inertia of the harmonic gear converted to motor shaft values.

Speed – Torque Characteristics (Reference values)

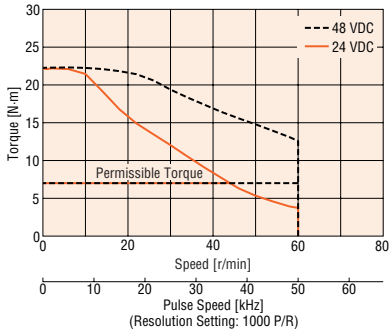
AZM24 Gear Ratio **50**



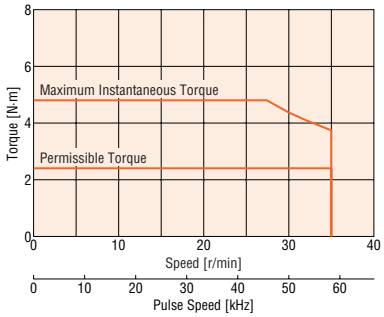
AZM46 Gear Ratio **50**



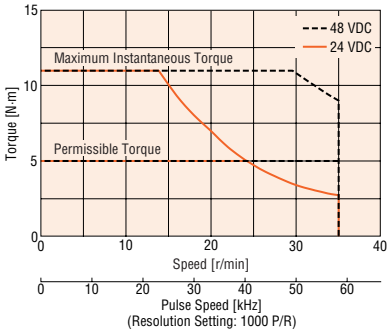
AZM66 Gear Ratio **50**



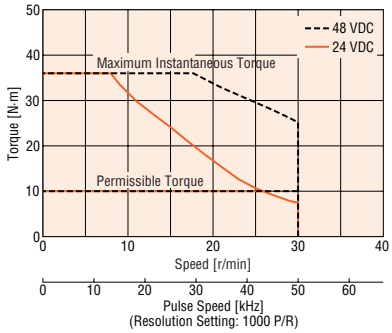
AZM24 Gear Ratio **100**



AZM46 Gear Ratio **100**



AZM66 Gear Ratio **100**



Note

- The speed–torque characteristics shows the data based on the company's measurement conditions. If conditions change, the characteristics may change.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the ABZO sensor, ensure that the motor case temperature is 80°C or less. (When conforming to the UL/CSA Standards, it is required to keep the temperature of the motor case at 75°C or less, since the motor is recognized as insulation class A.)

Driver Specifications

Driver Type				Built-in Controller Type	Pulse Input Type with RS-485 Communication	Pulse Input Type
Driver Product Name				**AZD-KD**	**AZD-KX**	**AZD-K**
I/O Function	Max. Input Pulse Frequency			–	Line driver output by programmable controller: 1 MHz (When the pulse duty is 50%) Open-collector output by programmable controller: 250 kHz (When the pulse duty is 50%) Negative logic pulse input	
	Number of Positioning Data Sets			256 points	256 points*1	
	Direct Input			10 points	6 points	
	Direct Output			6 points		
	RS-485 Communication Remote Input			16 points		–
	RS-485 Communication Remote Output			16 points		–
Setting Tool	Data Setting Software **MEXE02**			○		
Coordinate Management Method				Battery-less absolute system		
Operation	Positioning Operation	Type	Positioning Operation	○	○	○*1
			Push-motion Positioning Operation*2	○	○	○*1
		Connecting Method	Independent Operation	○	○	○*1
			Forward Feed Operation	○	○	○*1
			Multistep Speed-change (Shape connection)	○	○	○*1
		Sequence Control	Loop Operation (Repetition)	○	○	○*1
			Event Jump Operation	○	○	○*1
	Linked Operation	Position Control		○	○	○*1
		Speed Control		○	○	○*1
		Torque Control		○	○	○*1
		Push-motion*2		○	○	○*1
	Return-to-home Operation		Return-to-home Operation	○	○	○
			High-speed Return-to-home Operation	○	○	○
	JOG Operation			○	○	○
Monitor/Information			Waveform Monitoring	○	○	○
			Overload Detection	○	○	○
			Overheat Detection (Motor and driver)	○	○	○
			Position and Speed Information	○	○	○
			Temperature Detection (Motor and driver)	○	○	○
			Motor Load Factor	○	○	○
			Mileage/Accumulated Mileage	○	○	○
Alarm				○	○	○

*1 Available after setting with the data setting software **MEXE02**.

*2 Push-motion operation is not available to geared motors and **DG**Ⅱ Series motorized actuators.

RS-485 Communication Specifications

Protocol	Modbus RTU Mode
Electrical Characteristics	EIA-485 based, Straight cable Use twisted-pair cables (TIA/EIA-568B CAT5e or better recommended). The maximum total extension length is 50 m.*
Communication Mode	Half duplex and start-stop synchronization (Data: 8 bits, Stop bit: 1 bit or 2 bits, Parity: none, even, or odd)
Baud Rate	Select from 9600bps/19200bps/38400bps/57600bps/115200bps/230400bps.
Connection Type	Up to 31 units can be connected to a single programmable controller (Master unit).

*If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

Electromagnetic Brake Specifications

Product Name		AZM46	AZM66	AZM69
Type		Power off activated type		
Power Supply Voltage		24 VDC ±5%*		
Power Supply Current	A	0.08	0.25	0.25
Brake Activate Time	ms	20		
Brake Release Time	ms	30		
Time Rating		Continuous		

*For the electromagnetic brake type, the 24 VDC±4% specification applies if the wiring distance between the motor and driver is extended by 20 m using a cable.

●The product names are described with text by which the product name can be identified.

General Specifications

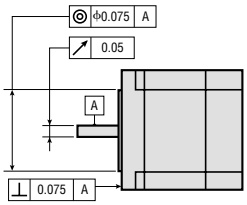
		Motor	Driver
Heat-resistant Class		130 (B) [Recognized as 105 (A) by UL.]	–
Insulation Resistance		The measured value is 100 MΩ or more when a 500 VDC megger is applied between the following locations: ・Case – Motor windings ・Case – Electromagnetic brake windings*1	The measured value is 100 MΩ or more when a 500 VDC megger is applied between the following locations: ・Protective earth terminal – Power supply terminal
Dielectric Strength Voltage		No abnormality is found with the following application for 1 minute: **AZM14**, **AZM15**, **AZM24**, **AZM26** ・Case – Motor windings 0.5 kVAC 50 Hz or 60 Hz **AZM46**, **AZM48**, **AZM66**, **AZM69** ・Case – Motor windings 1.0 kVAC 50 Hz or 60 Hz ・Case – Electromagnetic brake windings*1 1.0 kVAC 50 Hz or 60 Hz	–
Operating Environment (In operation)	Ambient Temperature	0～+40°C (Non-freezing)	0～+50°C (Non-freezing)
	Ambient Humidity	85% or less (Non-condensing)	
	Atmosphere	Use in an area without corrosive gases and dust. The product should not be exposed to water, oil or other liquids.	
Degree of Protection		**AZM14**, **AZM15**, **AZM24**, **AZM26**: IP40 (excluding installation surfaces and connector locations) **AZM46**, **AZM48**, **AZM66**, **AZM69**: IP66 (excluding installation surfaces and connector locations)	IP10
Stop Position Accuracy		**AZM14**, **AZM15**, **AZM24**, **AZM26**: ±5 min (±0.083°) **AZM46**, **AZM48**: ±4 min (±0.067°) **AZM66**, **AZM69**: ±3 min (±0.05°)	
Shaft Runout		0.05 T.I.R. (mm)*2	–
Concentricity of Installation Pilot to the Shaft		0.075 T.I.R. (mm)*2	–
Perpendicularity of Installation Surface to the Shaft		0.075 T.I.R. (mm)*2	–
Range of Multiple Rotation Inspection at Power OFF		**AZM14**, **AZM15**, **AZM24**, **AZM26**: ±450 rotations (900 rotations) **AZM46**, **AZM48**, **AZM66**, **AZM69**: ±900 rotations (1800 rotations)	

*1 Electromagnetic brake type only

*2 T.I.R. (Total Indicator Reading): The total dial gauge reading when the measurement section is rotated one revolution, centered on the reference axis center.

Note

● When measuring insulation resistance or performing a dielectric strength voltage test, be sure to disconnect the motor from the driver beforehand. Also, do not conduct these tests on the ABZO sensor section of the motor.

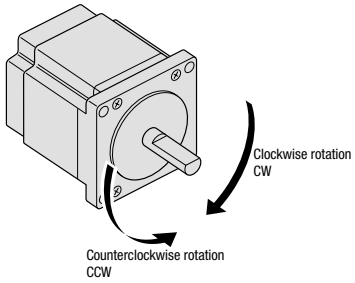


Rotation Direction

The figure shows the rotation directions seen from the output shaft. The rotation direction of the gear output shaft, which is seen from the output shaft of a standard type motor, differs depending on the gear type or gear ratio.
Refer to the table below.

Type	Gear Ratio	Rotation Direction seen from the Output Shaft
TS Geared Type	**3.6**, **7.2**, **10**	Same direction
	20, **30**	Reverse direction
FC Geared Type **PS** Geared Type **HPG** Geared Type	Total reduction gear ratio	Same direction
Harmonic Geared Type	Total reduction gear ratio	Reverse direction

● Standard type motor



Motor Installation

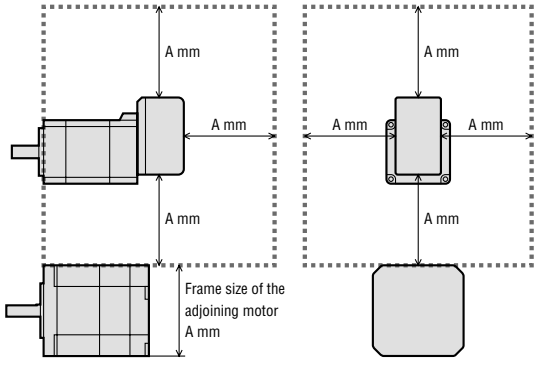
Since the ABZO sensor is easily affected by magnetism, exercise caution when determining the location to install the motor.

●Installing the motor the frame size 28 mm or less

When installing multiple motors next to each other, make sure that the distance between two motors in the horizontal and vertical directions is at least the frame size of the adjoining motor.

● Reference

Adjoining Motor	A
Frame size 20 mm	20
Frame size 28 mm	28
Frame size 42 mm	42
Frame size 60 mm	60



● Make sure that the distance between the two motors is at least the frame size of the adjoining motor (A mm).

●When installing motors in an environment in which a magnetic field is generated

Ensure that the magnetic flux density on the ABZO sensor surface does not exceed the values listed below.

Motor Frame Size	Magnetic Flux Density
28 mm or less	2 mT*
42 mm or more	10 mT

*If the magnetic flux density is between more than 1 mT and 2 mT, the ambient temperature must be between more than 20°C and 40°C.

Permissible Radial Load/Permissible Axial Load

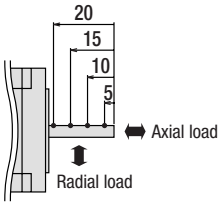
Unit: N

Type	Motor Frame Size	Product Name	Gear Ratio	Permissible Radial Load					Permissible Axial Load
				Distance from Shaft End mm					
				0	5	10	15	20	
Standard Type	20 mm	**AZM14**, **AZM15**	—	12	15	—	—	—	3
	28 mm	**AZM24**, **AZM26**		25	34	52	—	—	5
	42 mm	**AZM46**		35	44	58	85	—	15
		AZM48		30	35	44	58	85	
	60 mm	**AZM66**, **AZM69**		90	100	130	180	270	30
TS Geared Type	42 mm	**AZM46**	**3.6**, **7.2**, **10**	20	30	40	50	—	15
			20, **30**	40	50	60	70	—	
	60 mm	**AZM66**	**3.6**, **7.2**, **10**	120	135	150	165	180	40
			20, **30**	170	185	200	215	230	
FC Geared Type	42 mm	**AZM46**	**7.2**, **10**, **20**, **30**	180	200	220	250	—	100
	60 mm	**AZM66**		270	290	310	330	350	200
PS Geared Type	28 mm	**AZM24**	**7.2**, **10**	45	60	80	100	—	40
	42 mm	**AZM46**	**5**	70	80	95	120	—	100
			7.2	80	90	110	140	—	
			10	85	100	120	150	—	
			25	120	140	170	210	—	
			36	130	160	190	240	—	
			50	150	170	210	260	—	
	60 mm	**AZM66**	**5**	170	200	230	270	320	200
			7.2	200	220	260	310	370	
			10	220	250	290	350	410	
			25	300	340	400	470	560	
			36	340	380	450	530	630	
			50	380	430	500	600	700	
HPG Geared Type	40 mm	**AZM46**	**5**	150	170	190	230	270	430
			9	180	200	230	270	320	510
	60 mm	**AZM66**	**5**	250	270	300	330	360	700
			15	360	380	420	460	510	980
Harmonic Geared Type	30 mm	**AZM24**	**50**, **100**	100	135	175	250	—	140
	42 mm	**AZM46**		180	220	270	360	510	220
	60 mm	**AZM66**		320	370	440	550	720	450

- The product names are described with text by which the product name can be identified.
- **PS** geared type and **HPG** geared type: The values shown in the table are those that enable a product life of 20,000 hours when either permissible radial load or permissible axial load is applied. For the product life of the gearhead, contact the nearest Oriental Motor sales office, or check the Oriental Motor website.

Radial Load and Axial Load

Distance from Shaft End [mm]



Permissible Moment Load

When eccentric load is applied to the installation surface of the output flange, load moment acts on the bearing.
Before using the motor, apply the formulas below to check that the axial load and load moment are within the specifications.

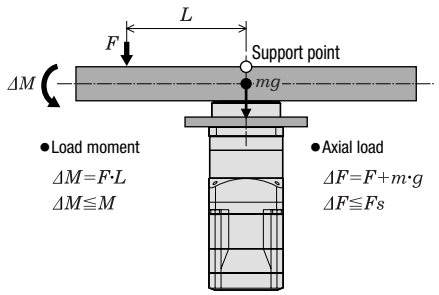
HPG Geared Type　Flange Output Type

Product Name	Gear Ratio	Permissible Axial Load (N)	Permissible Moment Load (N·m)	Constant α(m)
AZM46	5	430	4.9	0.006
	9	510	5.9	
AZM66	5	700	12.0	0.011
	15	980	17.2	

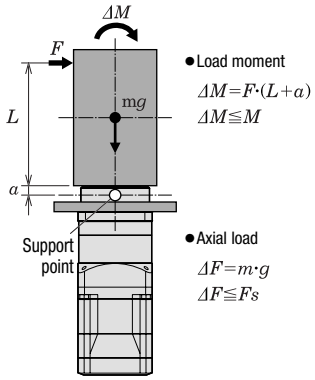
m : Load mass (kg)
g : Gravitational acceleration (m/s^2)
F : External force (N)
L : Overhung distance (m)
α : Constant (m)
ΔF : Load applied to the output flange surface (N)
Fs : Permissible axial load (N)
ΔM : Load moment (N·m)
M : Permissible moment load (N·m)

Apply the formulas below to calculate the load moment.

Example 1: External force F (N) is applied to the protrusion L (m). It is applied horizontally to the center of the output flange.



Example 2: External force F (N) is applied to the protrusion L (m). It is applied vertically to the center of the output flange.

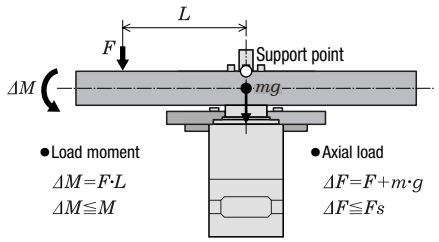


Harmonic Geared Type

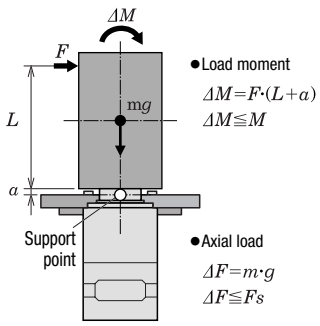
Motor Frame Size	Permissible Axial Load (N)	Permissible Moment Load (N·m)	Constant α(m)
30 mm	140	2.9	0.0073
42 mm	220	5.6	0.009
60 mm	450	11.6	0.0114

Apply the formulas below to calculate the load moment.

Example 1: External force F (N) is applied to the protrusion L (m). It is applied horizontally to the center of the output flange.



Example 2: External force F (N) is applied to the protrusion L (m). It is applied vertically to the center of the output flange.



Accuracy of the Harmonic Geared Type

➔ Page 37

Load Torque – Driver Input Current Characteristics

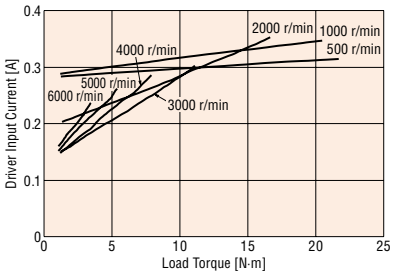
This is the relationship between the load torque and driver input current at each speed when the motor is actually operated. From these characteristics, the power supply capacity required for use in multi-axis operation can be estimated. For the geared type, convert to torque and speed by the motor shaft.

Motor shaft speed = Gear output shaft speed × Gear ratio [r/min]

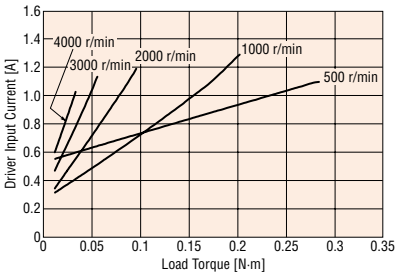
$$\text{Motor shaft torque} = \frac{\text{Gear output shaft torque}}{\text{Gear ratio}} \text{ [N·m]}$$

24 VDC

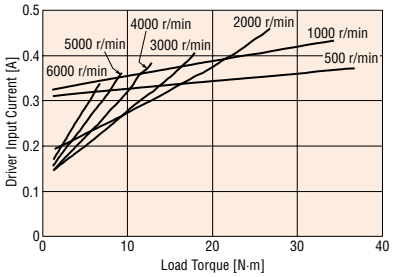
AZM14



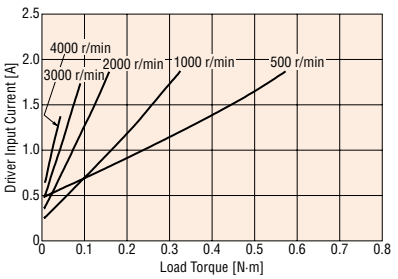
AZM46



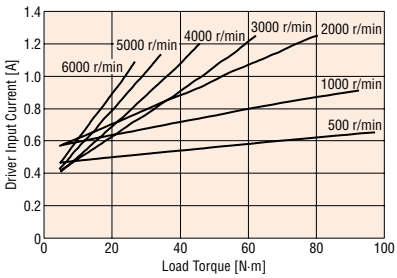
AZM15



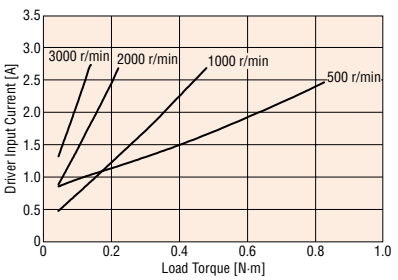
AZM48



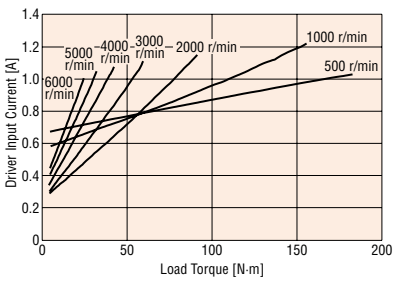
AZM24



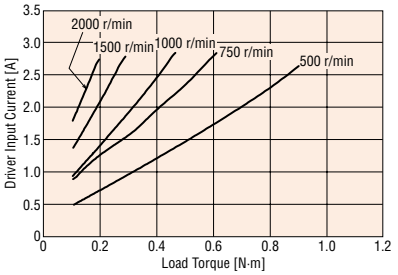
AZM66



AZM26

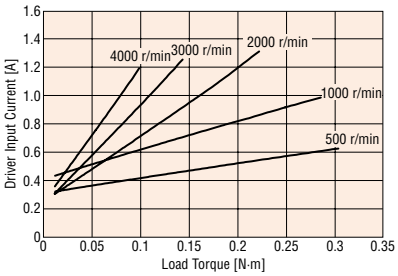


AZM69

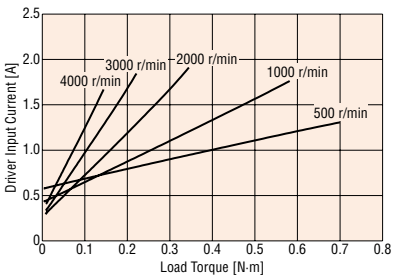


48 VDC

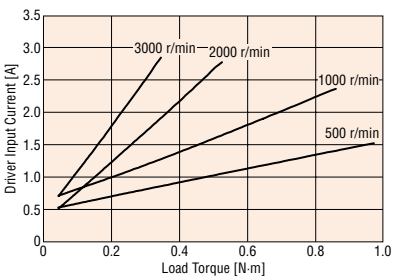
AZM46



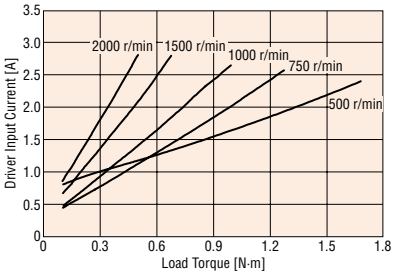
AZM48



AZM66



AZM69



Dimensions (Unit=mm)

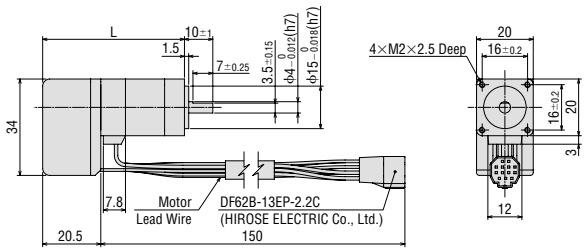
Motors

◇Standard Type

Frame Size 20 mm

2D & 3D CAD

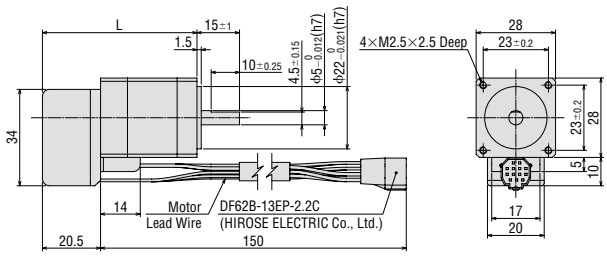
Product Name	L	Mass kg	2D CAD
AZM14AK	50	0.08	B1212
AZM15AK	60	0.1	B1213



Frame Size 28 mm

2D & 3D CAD

Product Name	L	Mass kg	2D CAD
AZM24AK	54.5	0.15	B1214
AZM26AK	74	0.24	B1215

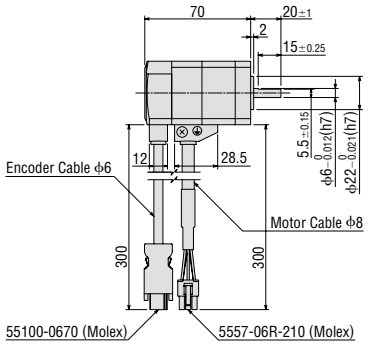


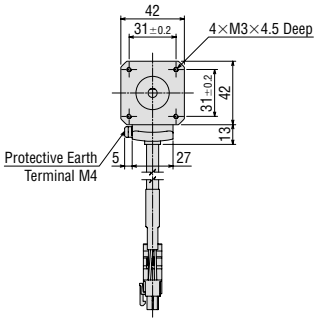
Frame Size 42 mm

2D & 3D CAD

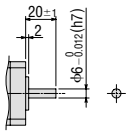
Shaft Shape	Product Name	Mass kg	2D CAD
Single Sided Milling	**AZM46AK**	0.44	B1092
Straight	**AZM46A0K**		B1288

Single Sided Milling





Straight

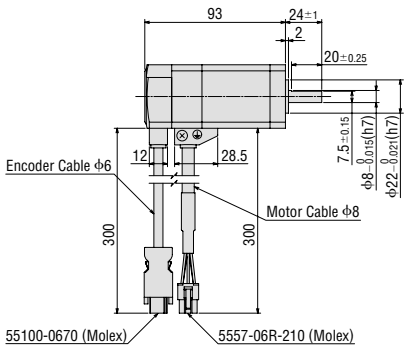


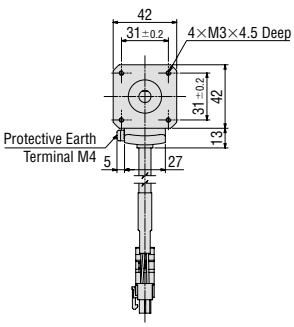
Frame Size 42 mm

2D & 3D CAD

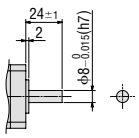
Shaft Shape	Product Name	Mass kg	2D CAD
Single Sided Milling	**AZM48AK**	0.68	B1312
Straight	**AZM48A0K**		B1289
With Key	**AZM48A1K**		B1299

Single Sided Milling

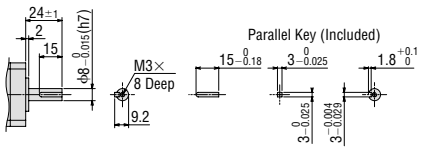




Straight



With Key

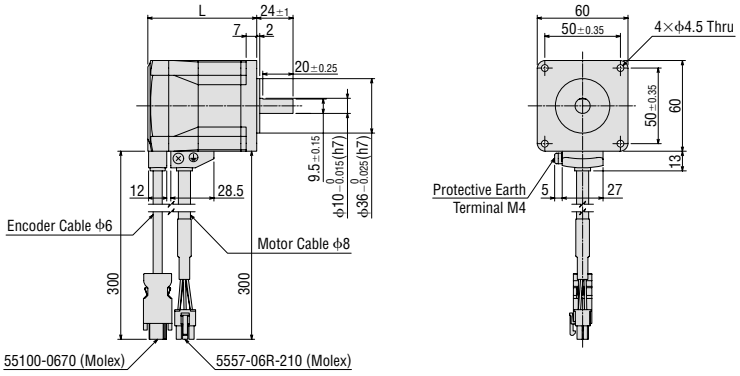


Frame Size 60 mm

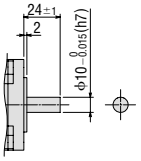
2D & 3D CAD

Shaft Shape	Product Name	L	Mass kg	2D CAD
Single Sided Milling	**AZM66AK**	72	0.91	B1093
Straight	**AZM66A0K**			B1290
With Key	**AZM66A1K**			B1300
Single Sided Milling	**AZM69AK**	97.5	1.4	B1129
Straight	**AZM69A0K**			B1291
With Key	**AZM69A1K**			B1301

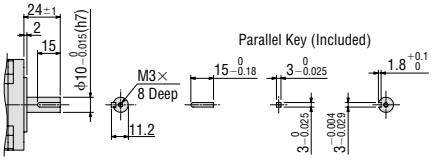
Single Sided Milling



Straight



With Key



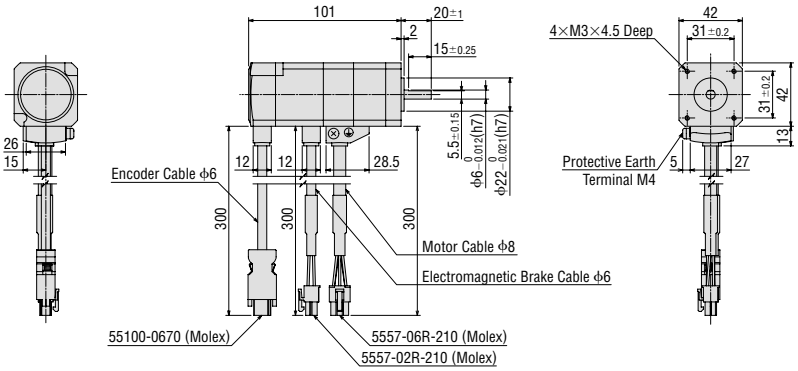
◇Standard Type with Electromagnetic Brake

Frame Size 42 mm

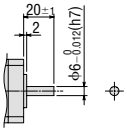
2D & 3D CAD

Shaft Shape	Product Name	Mass kg	2D CAD
Single Sided Milling	**AZM46MK**	0.61	B1154
Straight	**AZM46M0K**		B1294

Single Sided Milling



Straight

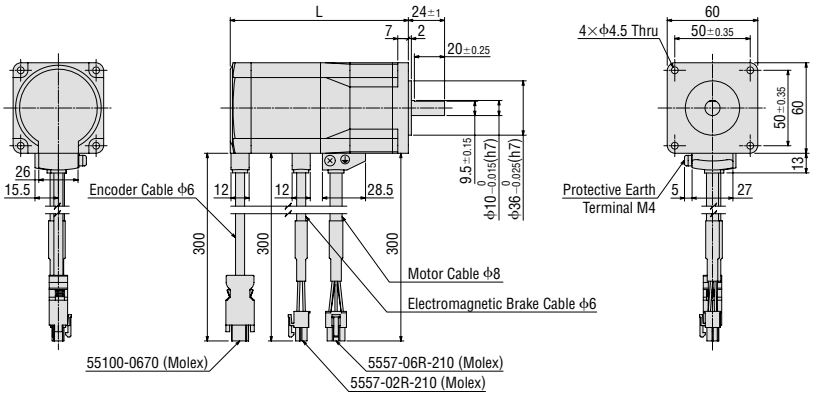


Frame Size 60 mm

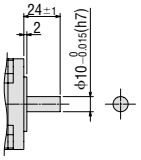
2D & 3D CAD

Shaft Shape	Product Name	L	Mass kg	2D CAD
Single Sided Milling	**AZM66MK**	118	1.3	B1155
Straight	**AZM66M0K**			B1295
With Key	**AZM66M1K**			B1305
Single Sided Milling	**AZM69MK**	143.5	1.8	B1156
Straight	**AZM69M0K**			B1296
With Key	**AZM69M1K**			B1306

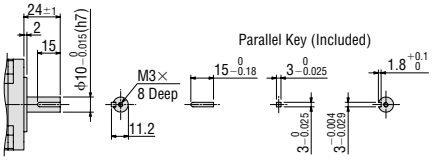
Single Sided Milling



Straight



With Key



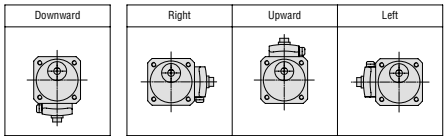
◇TS Geared Type

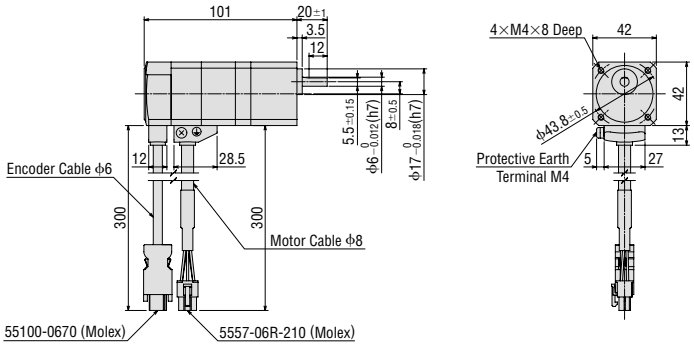
Frame Size 42 mm

2D & 3D CAD

Cable Drawing Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward	**AZM46AK-TS□**	**3.6**, **7.2**, **10**, **20**, **30**	0.59	B1157
Right	**AZM46AK-TS□R**			B1272
Upward	**AZM46AK-TS□U**			B1270
Left	**AZM46AK-TS□L**			B1271

● Cable Drawing Direction



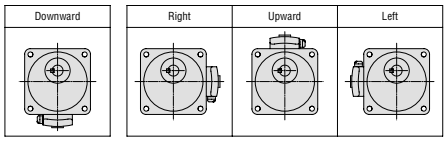


Frame Size 60 mm

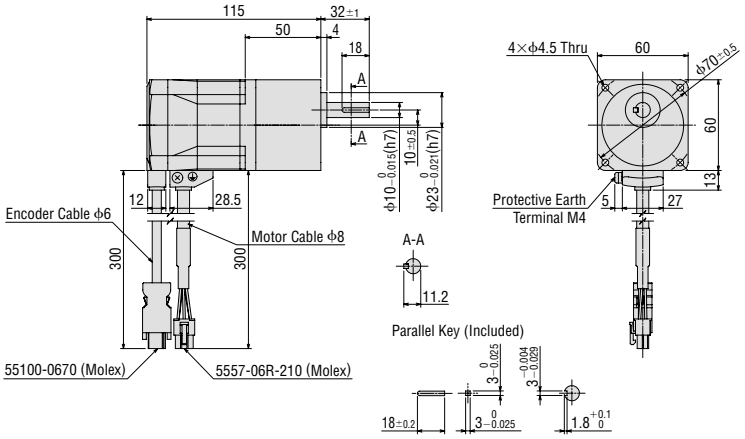
2D & 3D CAD

Cable Drawing Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward	**AZM66AK-TS□**	**3.6**, **7.2**, **10**, **20**, **30**	1.3	B1158
Right	**AZM66AK-TS□R**			B1275
Upward	**AZM66AK-TS□U**			B1273
Left	**AZM66AK-TS□L**			B1274

● Cable Drawing Direction



● Installation Screws: M4×60 P0.7 (4 pieces included)



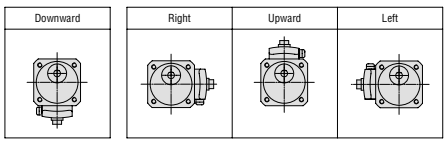
◇TS Geared Type with Electromagnetic Brake

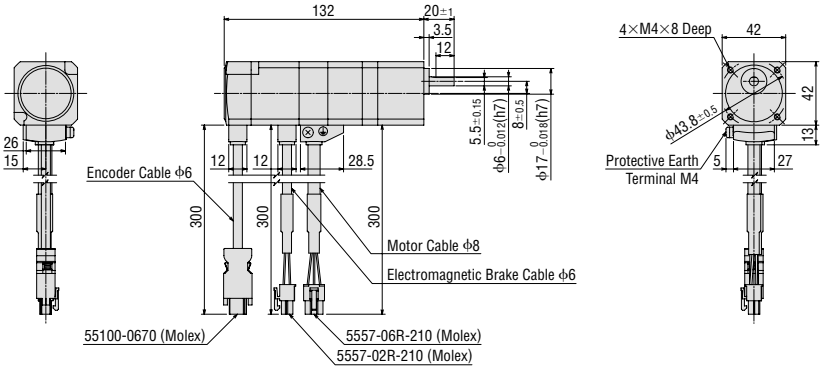
Frame Size 42 mm

2D & 3D CAD

Cable Drawing Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward	**AZM46MK-TS□**	**3.6**, **7.2**, **10**, **20**, **30**	0.76	B1216
Right	**AZM46MK-TS□R**			B1284
Upward	**AZM46MK-TS□U**			B1282
Left	**AZM46MK-TS□L**			B1283

● Cable Drawing Direction





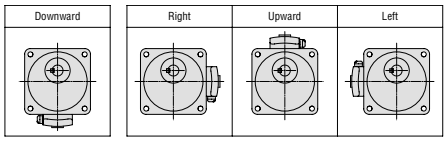
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

Frame Size 60 mm

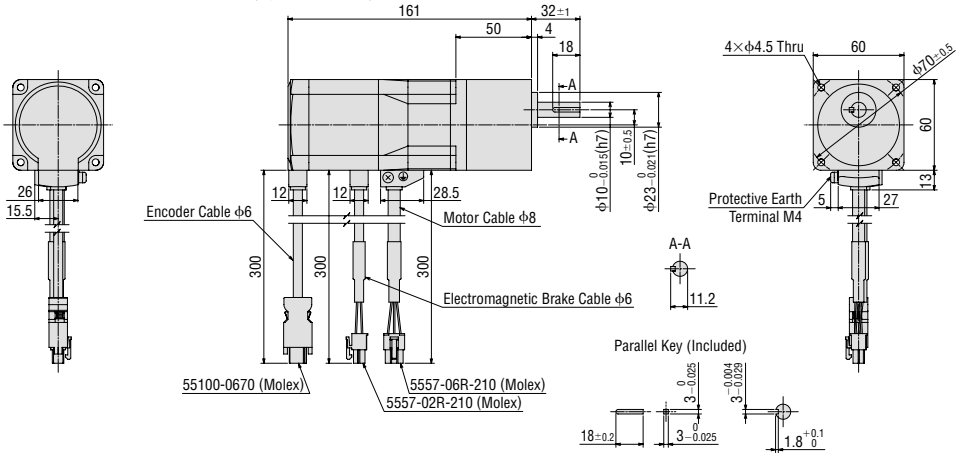
2D & 3D CAD

Cable Drawing Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward	**AZM66MK-TS■**	**3.6**, **7.2**, **10**, **20**, **30**	1.7	B1217
Right	**AZM66MK-TS■R**			B1287
Upward	**AZM66MK-TS■U**			B1285
Left	**AZM66MK-TS■L**			B1286

● Cable Drawing Direction



● Installation Screws: M4×60 P0.7 (4 pieces included)

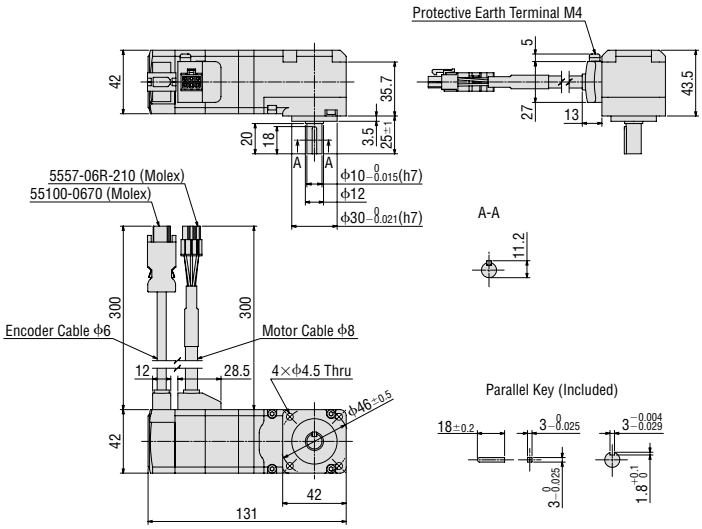


◇**FC** Geared Type

Frame Size 42 mm Cable Drawing Direction Upward

2D & 3D CAD

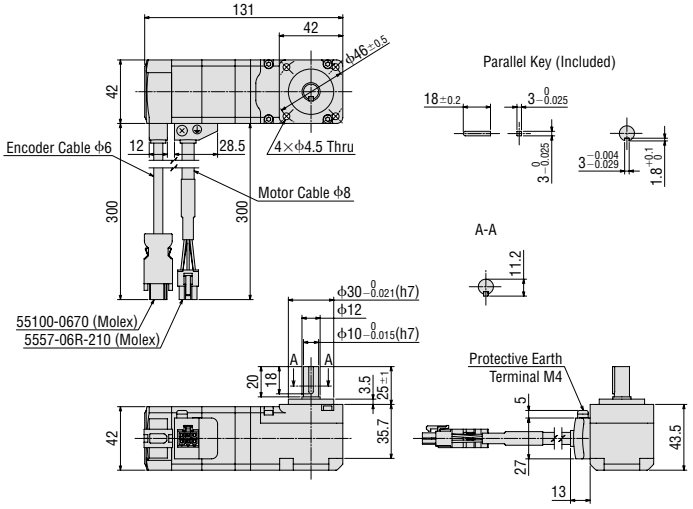
Product Name	Gear Ratio	Mass kg	2D CAD
AZM46AK-FC■UA	**7.2**, **10**, **20**, **30**	0.79	B1314



Frame Size 42 mm Cable Drawing Direction Downward

2D & 3D CAD

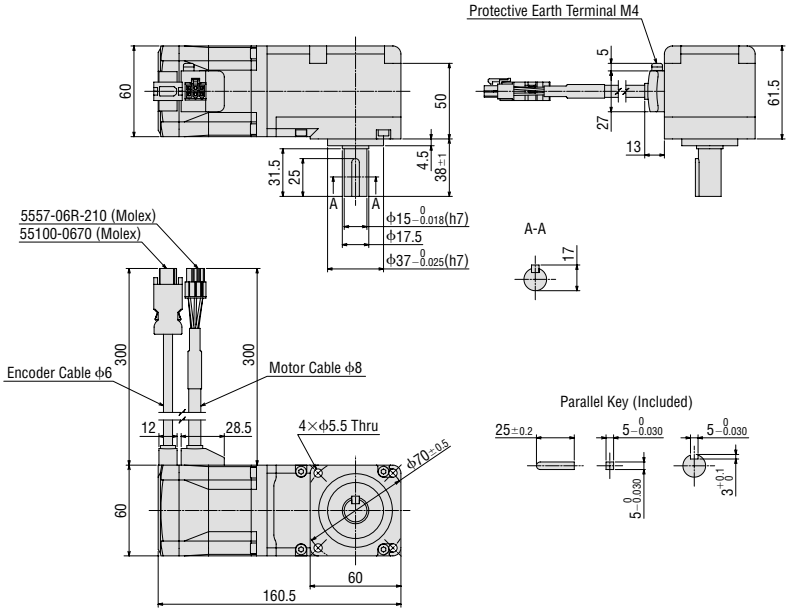
Product Name	Gear Ratio	Mass kg	2D CAD
AZM46AK-FC■DA	**7.2**, **10**, **20**, **30**	0.79	B1313



● A number indicating the gear ratio is entered where the box ■ is located within the product name.

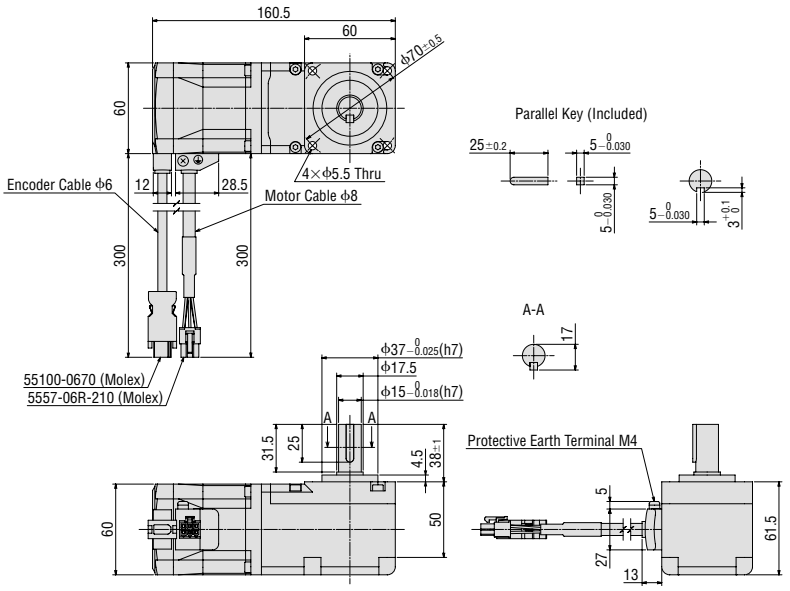
Frame Size 60 mm Cable Drawing Direction Upward 2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66AK-FC□UA	**7.2**, **10**, **20**, **30**	1.8	B1318



Frame Size 60 mm Cable Drawing Direction Downward 2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66AK-FC□DA	**7.2**, **10**, **20**, **30**	1.8	B1317



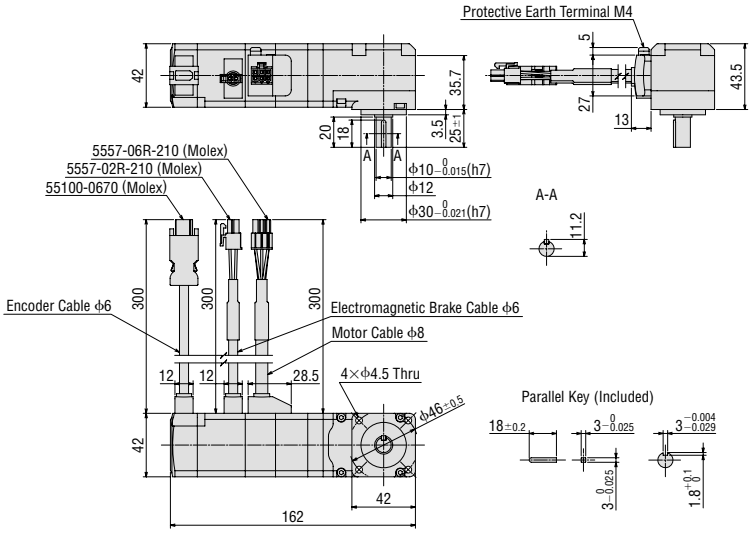
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

◇**FC** Geared Type with Electromagnetic Brake

Frame Size 42 mm Cable Drawing Direction Upward

2D & 3D CAD

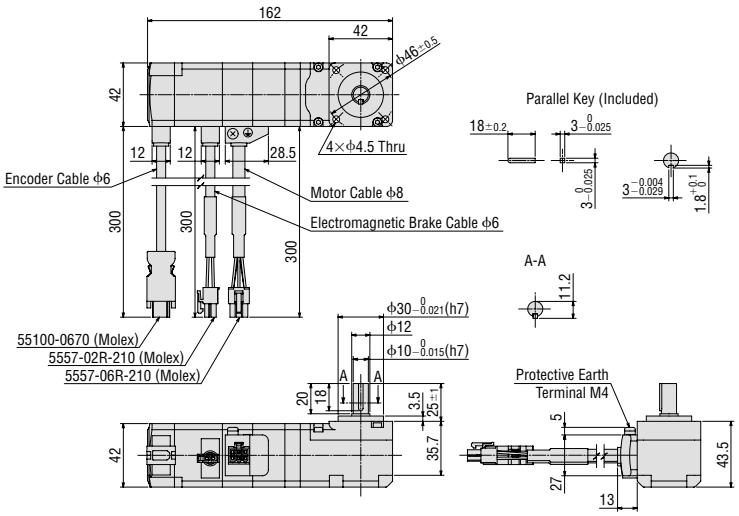
Product Name	Gear Ratio	Mass kg	2D CAD
AZM46MK-FC■UA	**7.2**, **10**, **20**, **30**	0.96	B1316



Frame Size 42 mm Cable Drawing Direction Downward

2D & 3D CAD

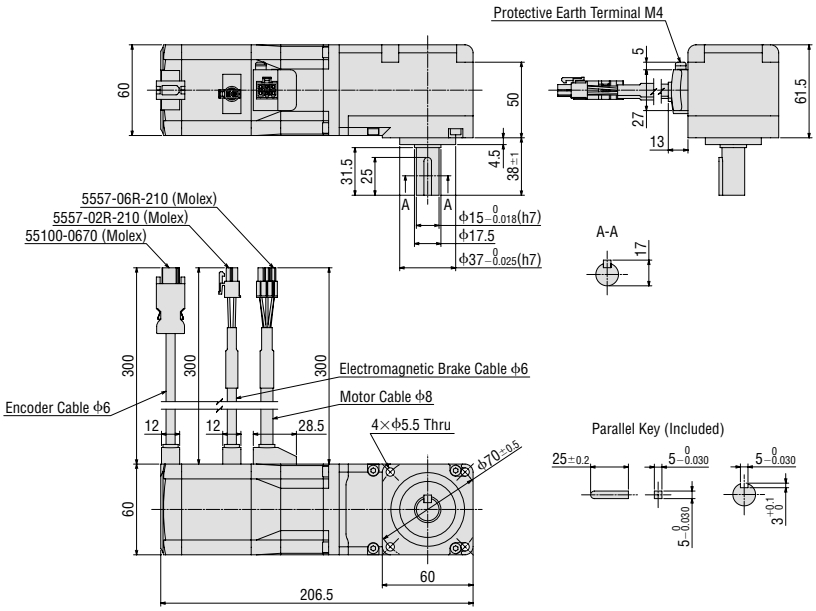
Product Name	Gear Ratio	Mass kg	2D CAD
AZM46MK-FC■DA	**7.2**, **10**, **20**, **30**	0.96	B1315



● A number indicating the gear ratio is entered where the box ■ is located within the product name.

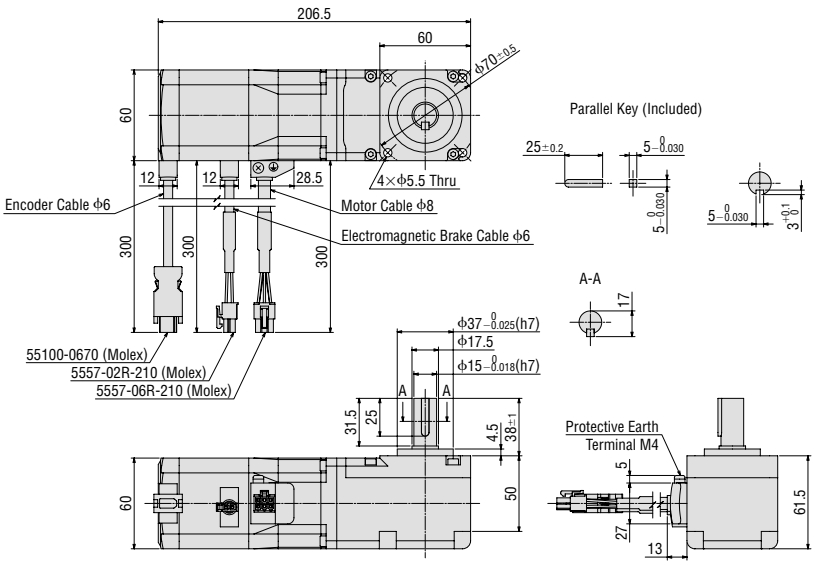
Frame Size 60 mm Cable Drawing Direction Upward 2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66MK-FC■UA	**7.2**, **10**, **20**, **30**	2.2	B1320



Frame Size 60 mm Cable Drawing Direction Downward 2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66MK-FC■DA	**7.2**, **10**, **20**, **30**	2.2	B1319



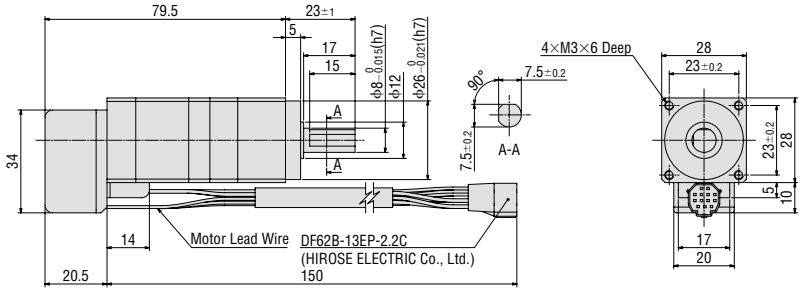
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

◇**PS** Geared Type

Frame Size 28 mm

2D & 3D CAD

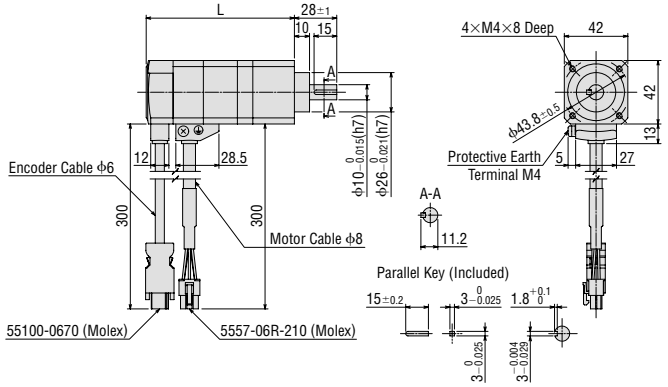
Product Name	Gear Ratio	Mass kg	2D CAD
AZM24AK-PS■	**7.2**, **10**	0.25	B1366



Frame Size 42 mm

2D & 3D CAD

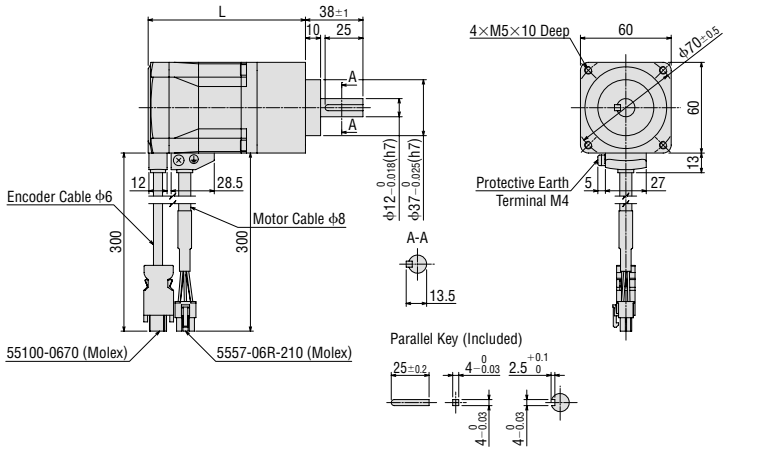
Product Name	Gear Ratio	L	Mass kg	2D CAD
AZM46AK-PS■	**5**, **7.2**, **10**	98	0.64	B1159
	25, **36**, **50**	121.5	0.79	B1160



Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
AZM66AK-PS■	**5**, **7.2**, **10**	104	1.3	B1161
	25, **36**, **50**	124	1.6	B1162



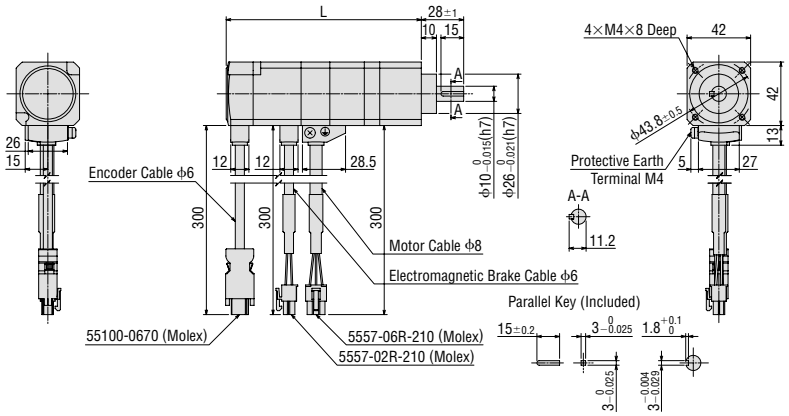
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

◇**PS** Geared Type with Electromagnetic Brake

Frame Size 42 mm

2D & 3D CAD

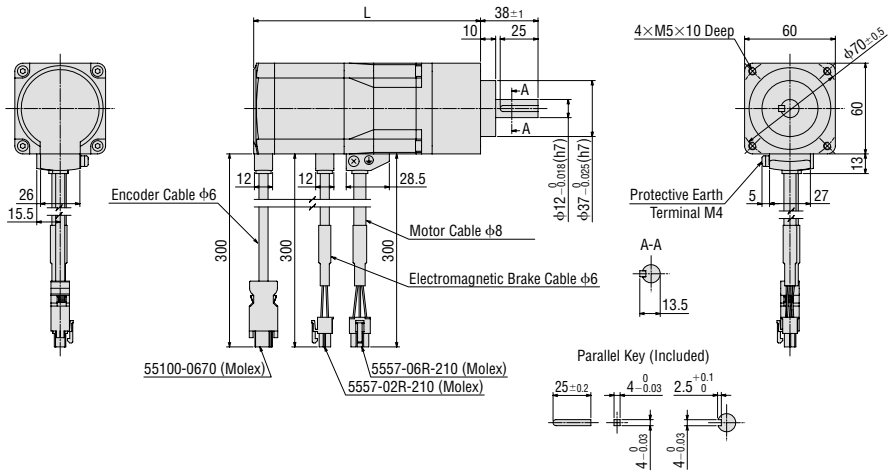
Product Name	Gear Ratio	L	Mass kg	2D CAD
AZM46MK-PS■	**5**, **7.2**, **10**	129	0.81	B1218
	25, **36**, **50**	152	0.96	B1219



Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
AZM66MK-PS■	**5**, **7.2**, **10**	150	1.7	B1220
	25, **36**, **50**	170	2.0	B1221

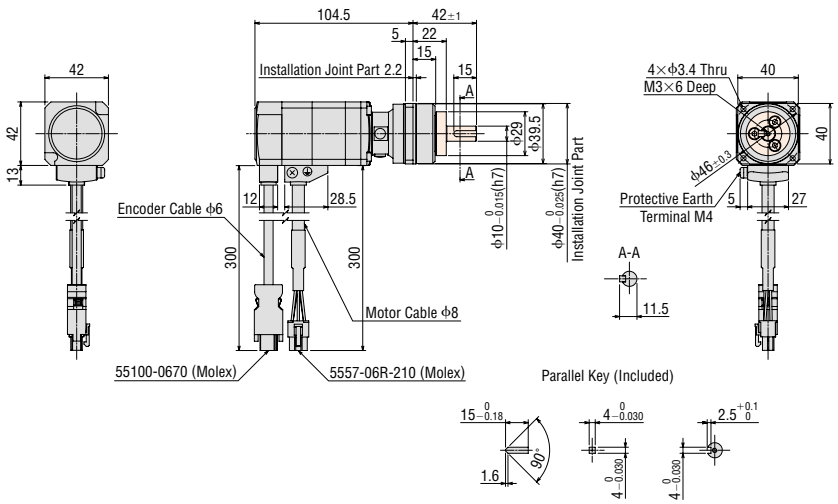


◇**HPG** Geared Type　Shaft Output Type

Frame Size 40 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM46AK-HP■	**5**, **9**	0.71	B1163

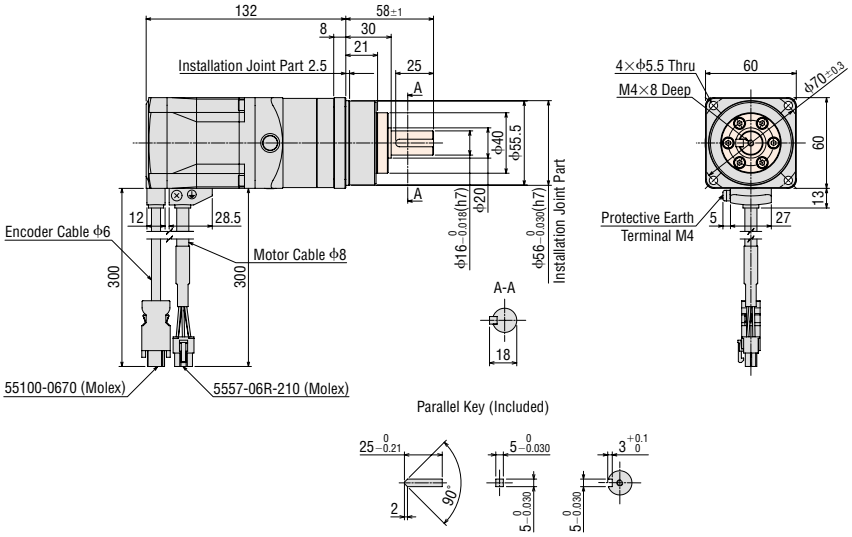


● The ▭ colored section for the dimensions indicates the rotating part.
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66AK-HP■	**5, 15**	1.9	B1165

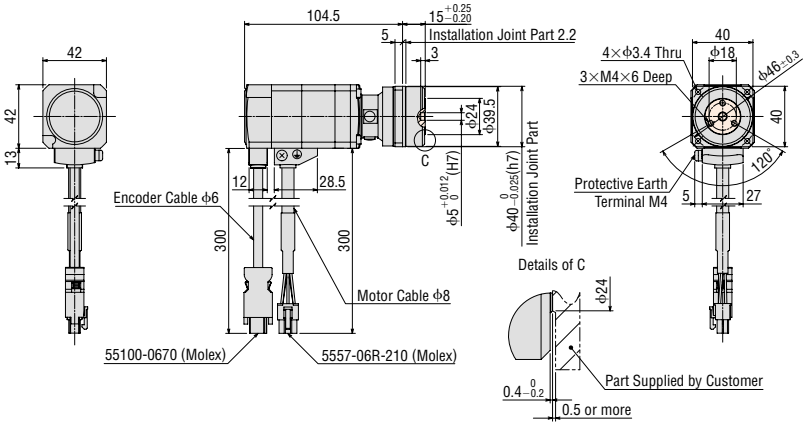


◇**HPG** Geared Type Flange Output Type

Frame Size 40 mm

2D & 3D CAD

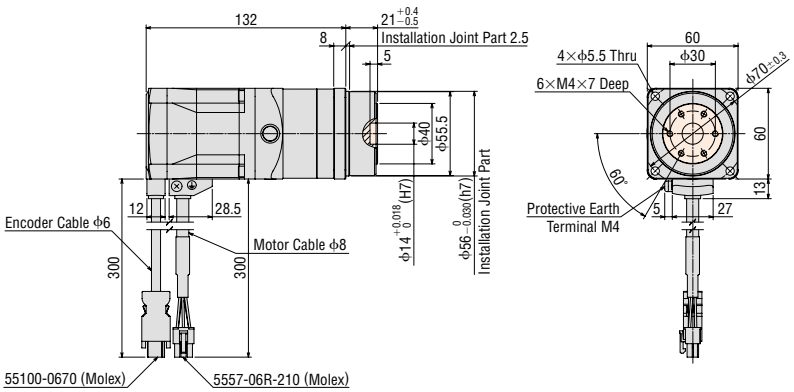
Product Name	Gear Ratio	Mass kg	2D CAD
AZM46AK-HP■F	**5, 9**	0.66	B1164



Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66AK-HP■F	**5, 15**	1.8	B1166



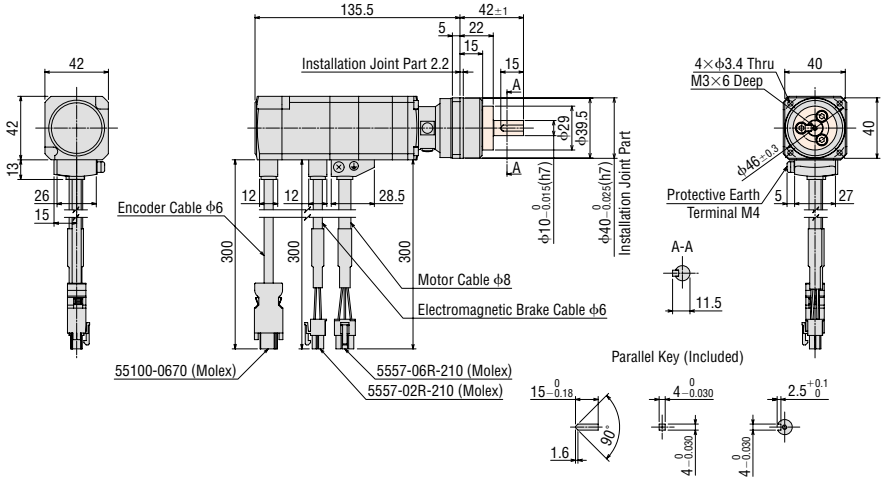
● The ▭ colored section for the dimensions indicates the rotating part.
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

◇**HPG** Geared Type with Electromagnetic Brake　Shaft Output Type

Frame Size 40 mm

2D & 3D CAD

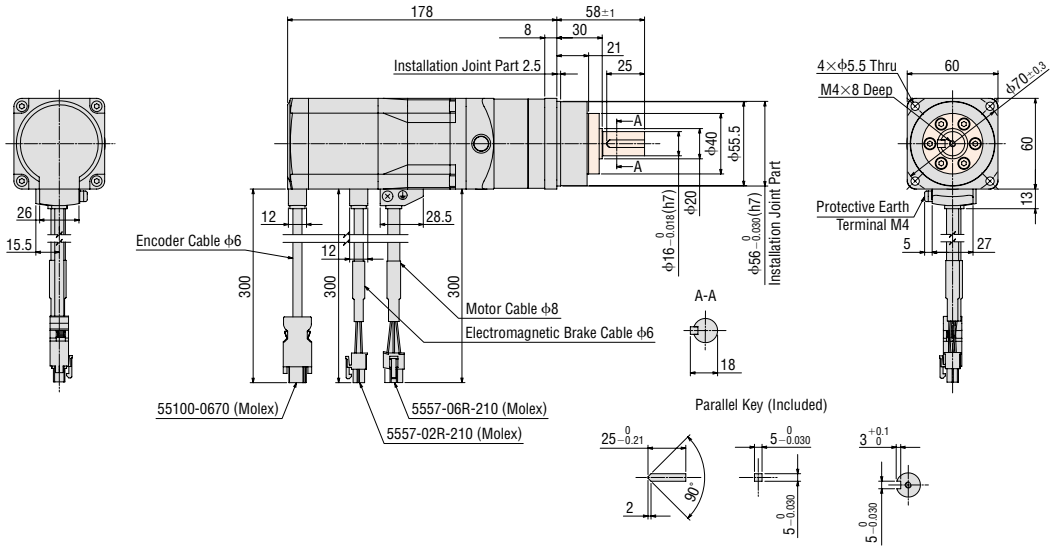
Product Name	Gear Ratio	Mass kg	2D CAD
AZM46MK-HP■	**5, 9**	0.88	B1222



Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66MK-HP■	**5, 15**	2.3	B1224

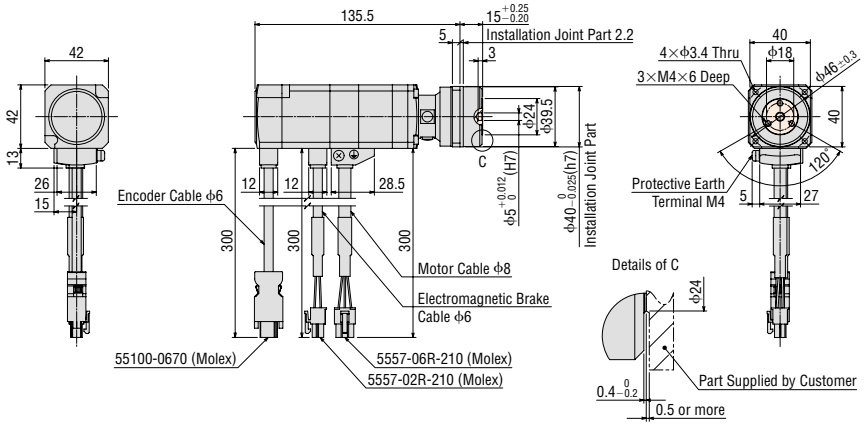


◇**HPG** Geared Type with Electromagnetic Brake　Flange Output Type

Frame Size 40 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM46MK-HP■F	**5, 9**	0.83	B1223

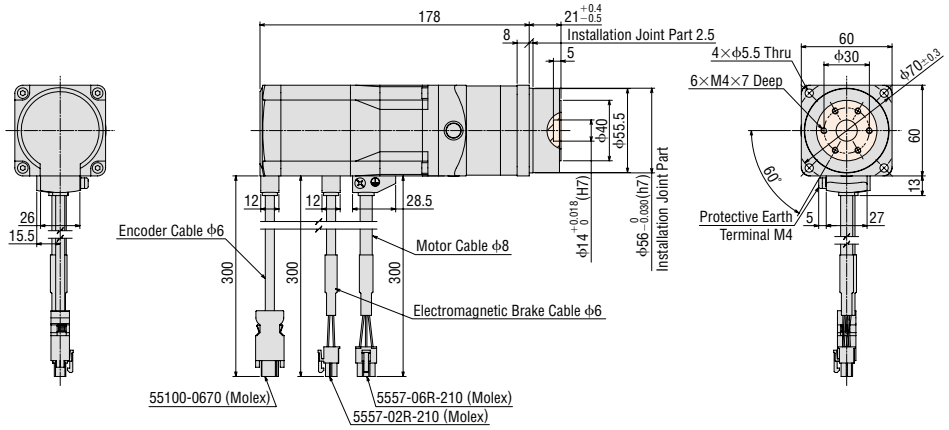


● The ▭ colored section for the dimensions indicates the rotating part.
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66MK-HP□F	**5, 15**	2.2	B1225

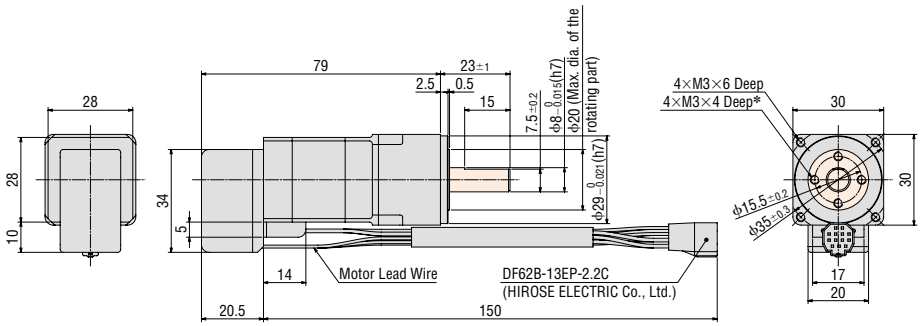


◇Harmonic Geared Type

Frame Size 30 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM24AK-HS□	**50, 100**	0.24	B1367

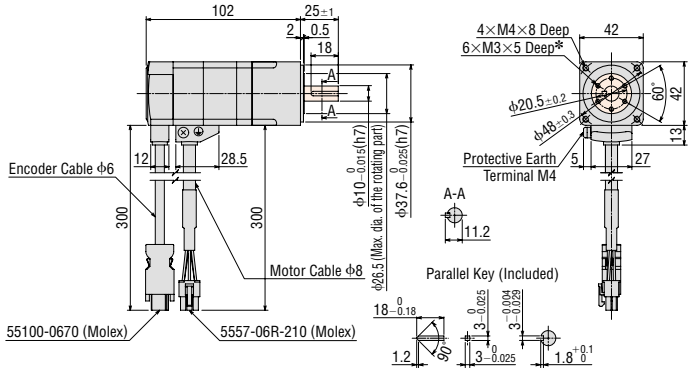


✻On the dimensions, you cannot designate the positions of the output shaft and screw holes. Therefore, develop a design by using the size of the screw holes on the surface to which load is applied.

Frame Size 42 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM46AK-HS□	**50, 100**	0.65	B1167



✻On the dimensions, you cannot designate the positions of the output shaft and screw holes. Therefore, develop a design by using the size of the screw holes on the surface to which load is applied.

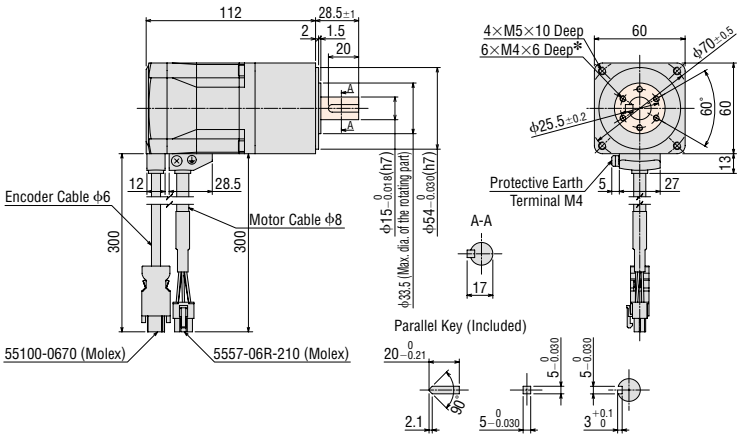
● The ▭ colored section for the dimensions indicates the rotating part.

● A number indicating the gear ratio is entered where the box ■ is located within the product name.

Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66AK-HS■	**50, 100**	1.4	B1168



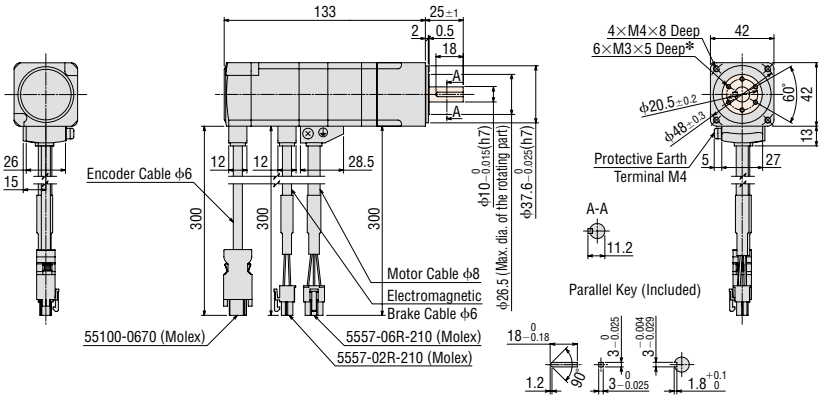
*On the dimensions, you cannot designate the positions of the output shaft and screw holes. Therefore, develop a design by using the size of the screw holes on the surface to which load is applied.

◇Harmonic Geared Type with Electromagnetic Brake

Frame Size 42 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM46MK-HS■	**50, 100**	0.82	B1226

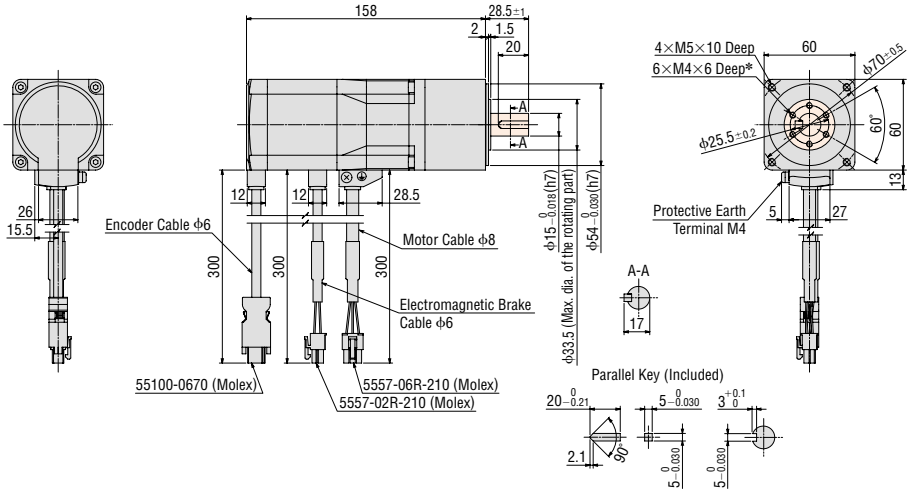


*On the dimensions, you cannot designate the positions of the output shaft and screw holes. Therefore, develop a design by using the size of the screw holes on the surface to which load is applied.

Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
AZM66MK-HS■	**50, 100**	1.8	B1227



*On the dimensions, you cannot designate the positions of the output shaft and screw holes. Therefore, develop a design by using the size of the screw holes on the surface to which load is applied.

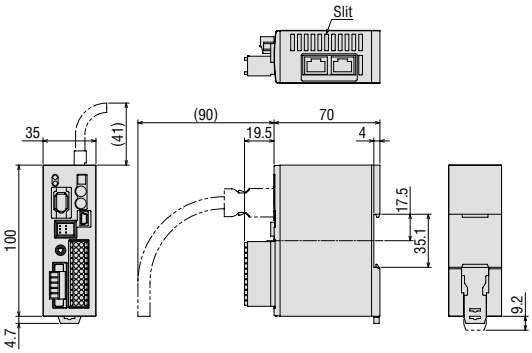
● The ▭ colored section for the dimensions indicates the rotating part.
● A number indicating the gear ratio is entered where the box ■ is located within the product name.

Drivers

2D & 3D CAD

Type	Product Name	Mass kg	2D CAD
Built-in Controller Type	**AZD-KD**	0.15	B1094
Pulse Input Type with RS-485 Communication	**AZD-KX**		
Pulse Input Type	**AZD-K**		B1096

● The dimensions below is the drawing of a built-in controller type. The external dimensions and accessories are common to all driver types.



● Accessories

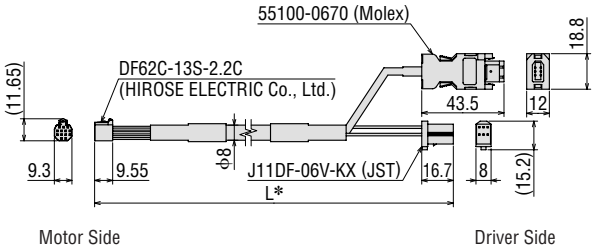
Main Power Supply/Electromagnetic Brake Connector (CN1)
Connector: MC1,5/5-STF-3,5
(PHOENIX CONTACT)

I/O Signals Connector (CN4)
Connector: DFMC1,5/12-ST-3,5
(PHOENIX CONTACT)

Connection Cable Sets/Flexible Connection Cable Sets

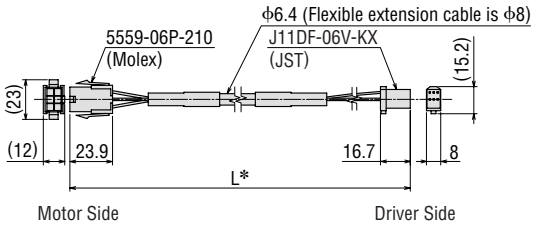
[For **AZM14**, **AZM15**, **AZM24**, **AZM26**]

◇Cable for Motor

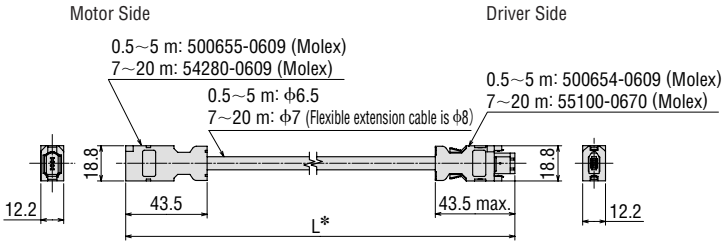


[For **AZM46**, **AZM48**, **AZM66**, **AZM69**]

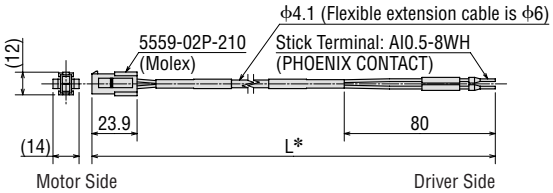
◇Cable for Motor



◇Cable for Encoder



◇Cable for Electromagnetic Brake



✻"L" is replaced by the length specified in Length L (m) in "■ Product Line" on Page 73.

Note

● The motor cable and electromagnetic brake cable from the motor cannot be directly connected to a driver. To connect the motor to the driver, use a connection cable.

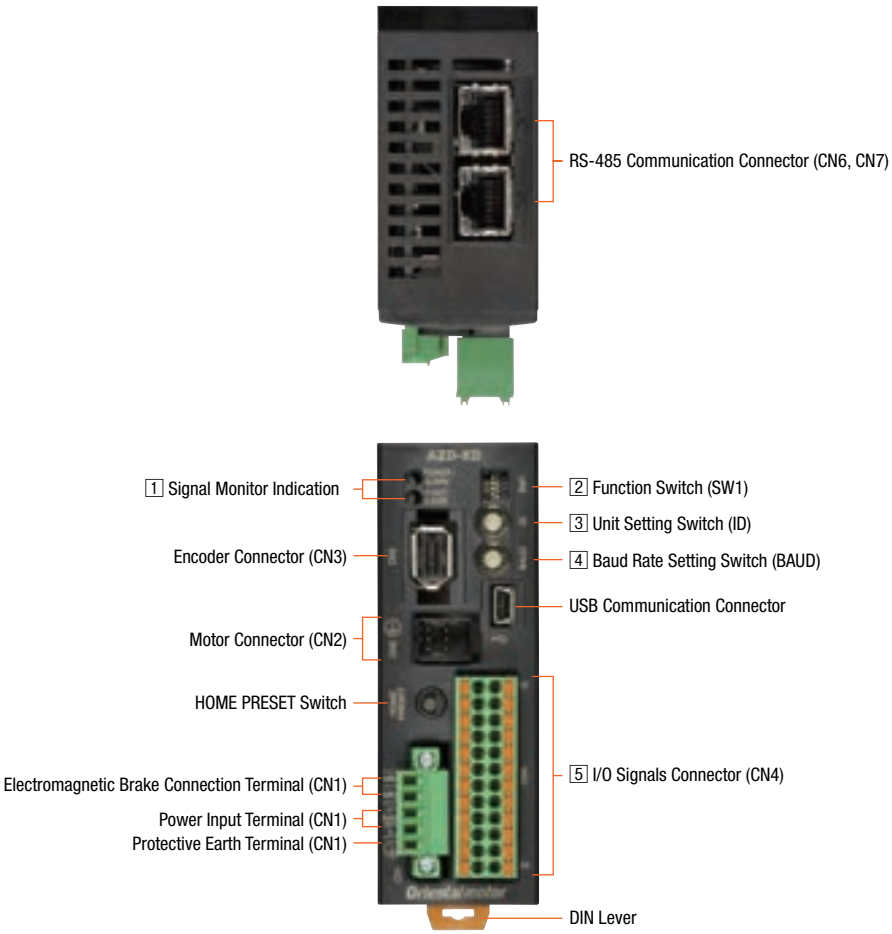
■Cautions for Using Connection Cables

➜ Page 57

Connection and Operation (Built-in controller type/Pulse input type with RS-485 communication)

Names and Functions of Driver Parts

Below is a photo of the built-in controller type.



1 Signal Monitor Indication

◇LED Indicators

Indication	Color	Function	Lighting Condition
POWER	Green	Power supply indication	When power is applied
ALARM	Red	Alarm indication	When a protective function is activated (blinking)
C-DAT	Green	Communication indication	When communication data is being sent or received
C-ERR	Red	Communication error indication	When communication data is in error

2 Function Switch

Indication	No.	Function
SW1	1	Use in combination with the unit setting switch (ID) to set the axis number. (Factory setting) OFF
	2	Set the RS-485 communication protocol. (Factory setting) Built-in controller type: OFF Pulse input type with RS-485 communication: ON
	3	Set the terminating resistor (120 Ω) for RS-485 communication. (Factory setting) OFF (OFF: Terminating resistor not used ON: Terminating resistor used)
	4	

✻Configure both No. 3 and No. 4 to the same setting.

3 Unit Setting Switch

Indication	Function
ID	Set this when you use RS-485 communication. Set the unit number. (Factory setting) Built-in controller type: 0 Pulse input type with RS-485 communication: 1

4 Baud Rate Setting Switch

Indication	Function
BAUD	Set this when you use RS-485 communication. Set the baud rate. (Factory setting) Built-in controller type: 7 Pulse input type with RS-485 communication: 4

◇RS-485 Baud Rate Setting

No.	Baud Rate (bps)
0	9600
1	19200
2	38400
3	57600
4	115200
5	230400
6	Not used
7	Network converter
8~F	Not used

5 I/O Signals Connector (CN4)

For the pulse input type with RS-485 communication, No. 1, 2, 13, and 14 pins are dedicated to pulse input. For wire connection with the programmable controller, refer to "Pulse Input Types" on Page 111.

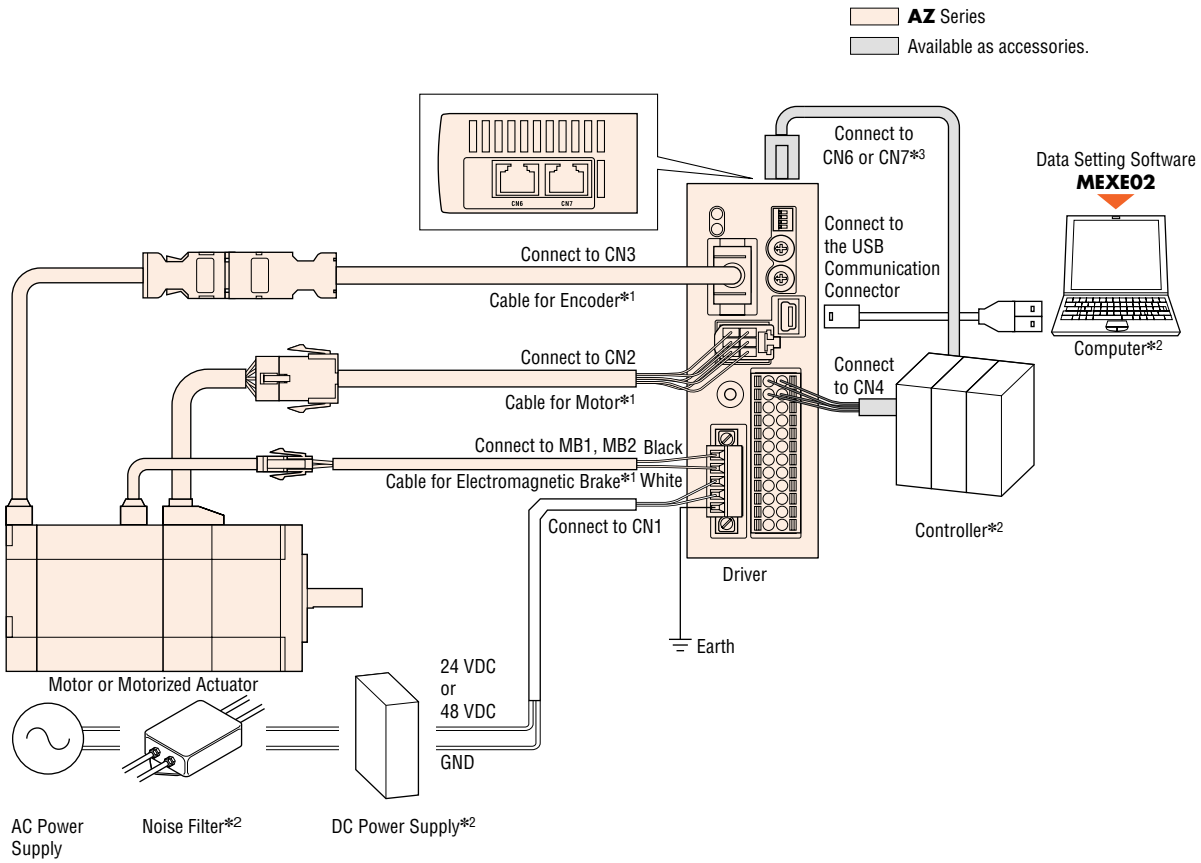
Indication	Pin No.	Driver Type	Signal Name	Description	
CN4	1	Built-in controller type	IN0	START	This signal is used to start positioning operation.
		Pulse input type with RS-485 communication	CW+* [PLS+]	CW Pulse Input + [Pulse Input +]	This is the pulse signal that is input to operate the motor in the CW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	2	Built-in controller type	IN2	M1	Uses the 3 bits, between M0, M1 and M2, to select the operating data number.
		Pulse input type with RS-485 communication	CCW+* [DIR+]	CCW Pulse Input + [Rotation Direction Input +]	This is the pulse signal that is input to operate the motor in the CCW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	3	Common	IN4	ZHOME	Moves to home that has been set with the HOME/PRESET switch.
	4	Common	IN6	STOP	Stops the motor.
	5	Common	IN-COM [0-7]*	IN0~IN7 Input Common	
	6	Common	IN8	FW-JOG	Starts the JOG operation.
	7	Common	OUT0	HOME-END	When home position has been established, it will be output when the high-speed return-to-home operation is completed.
	8	Common	OUT2	PLS-RDY	Not used.
	9	Common	OUT4	MOVE	Output during motor operation.
	10	Common	OUT-COM*	Output Common	
	11	Common	ASG+	A-Phase Pulse Output +	
	12	Common	BSG+	B-Phase Pulse Output +	
	13	Built-in controller type	IN1	M0	Uses the 3 bits, between M0, M1 and M2, to select the operating data number.
		Pulse input type with RS-485 communication	CW−* [PLS−]	CW Pulse Input − [Pulse Input −]	This is the pulse signal that is input to operate the motor in the CW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	14	Built-in controller type	IN3	M2	Uses the 3 bits, between M0, M1 and M2, to select the operating data number.
		Pulse input type with RS-485 communication	CCW−* [DIR−]	CCW Pulse Input − [Rotation Direction Input −]	This is the pulse signal that is input to operate the motor in the CCW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	15	Common	IN5	FREE	Stops motor excitation.
	16	Common	IN7	ALM-RST	Resets the alarms.
	17	Common	IN-COM [8-9]*	IN8, IN9 Input Common	
	18	Common	IN9	RV-JOG	Starts the JOG operation.
	19	Common	OUT1	IN-POS	Outputs when the motor operation is finished.
	20	Common	OUT3	READY	Outputs when the driver is ready for operation.
	21	Common	OUT5	ALM-B	Outputs the alarm status of the driver (Normal close).
	22	Common	GND*	Ground	
	23	Common	ASG−	A-Phase Pulse Output −	
	24	Common	BSG−	B-Phase Pulse Output −	

● You can set functions to assign by using parameters. Initial values are shown above. For details, refer to “Functions” in the Operating Manual of the **AZ** Series.

*Initial settings cannot be changed.

Connection Diagram

◇Connections with Peripheral Equipment



*1 Keep the wiring distance between the motor and driver to 20 m or less.
*2 Not supplied.
*3 Connect to the controller when controlling by RS-485 communication.

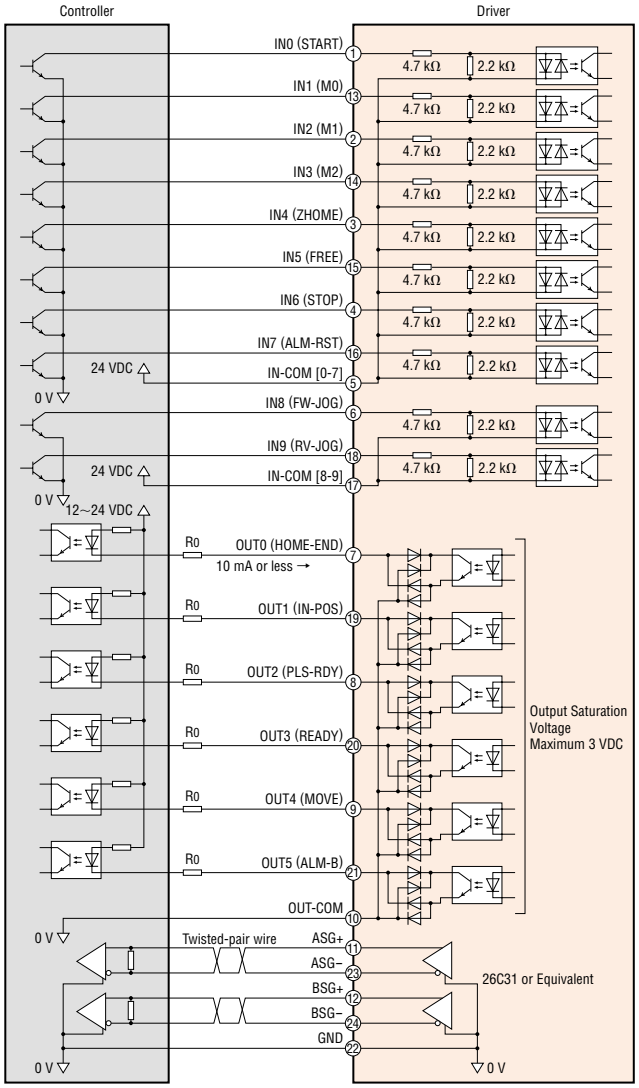
◇Connection of the USB Cable

Use this USB cable to connect the driver to the computer on which the data setting software **MEXE02** is installed.
Use a USB cable with the following specifications.

Specifications	USB2.0 (Full speed)
Cable	Length: 3 m or less
	Configuration: A to mini B

◇Connecting to the Programmable Controller (Built-in controller type)

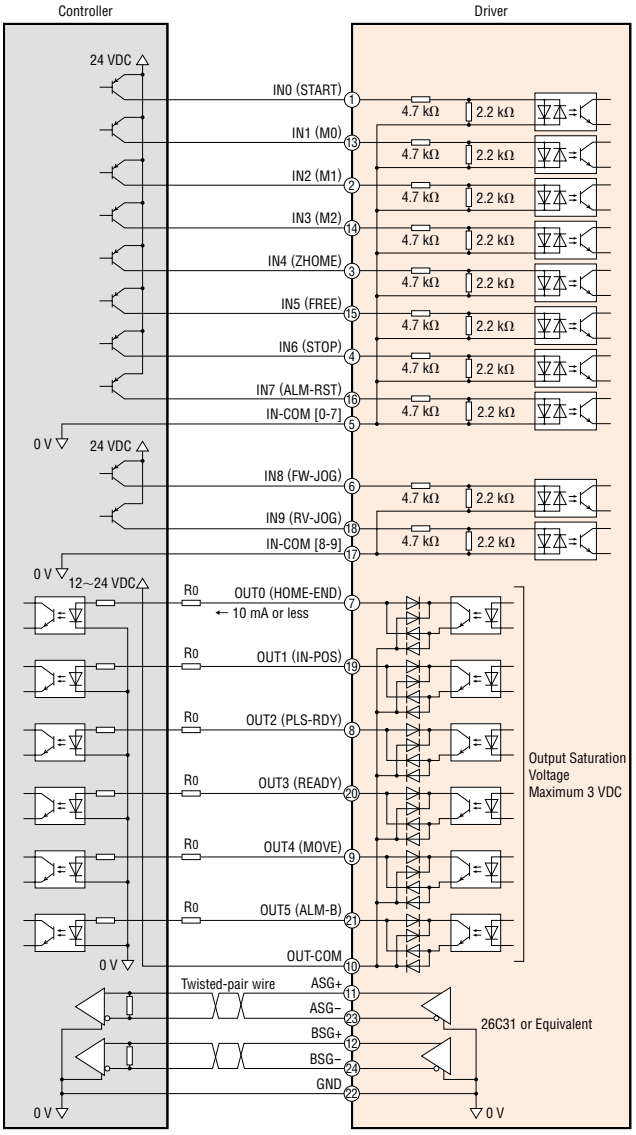
•Connection Diagram for Connection with Current Sink Output Circuit



Note

- Use 24 VDC for the input signals.
- Use 12~24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor R_0 to reduce the current to 10 mA or below.
- Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).
  Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

•Connection Diagram for Connection with Current Source Output Circuit



Note

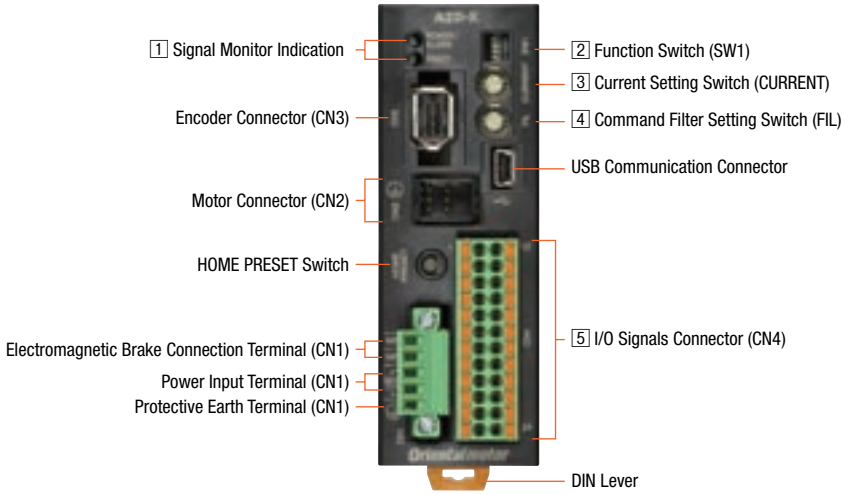
- Use 24 VDC for the input signals.
- Use 12~24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor R_0 to reduce the current to 10 mA or below.
- Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).
  Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

◇Connecting to the Programmable Controller (Pulse input type with RS-485 communication)

The connection diagram is similar to that of the pulse input type. Refer to Page 111.

Connection and Operation (Pulse input type)

Names and Functions of Driver Parts



1 Signal Monitor Indication

◇LED Indicators

Indication	Color	Function	Lighting Condition
POWER	Green	Power supply indication	When power is applied
ALARM	Red	Alarm indication	When a protective function is activated (blinking)
READY	Green	READY output	When READY output is ON

2 Function Switch

Indication	No.	Function
SW1	1	Sets the resolution per one rotation of the motor output shaft (Factory setting: OFF [1000 p/r])
	2	Sets the pulse input mode as either 1-pulse input mode or 2-pulse input mode. (Factory setting: OFF [2-pulse input mode])
	3, 4	Not used

3 Current Setting Switch

Indication	Function
CURRENT	Set the base current, which is the basis of the running current and the standstill current (Factory setting: F).

4 Command Filter Setting Switch

Indication	Function
FIL	Adjust the responsiveness of the motor (Factory setting: 1).

5 I/O Signals Connector (CN4)

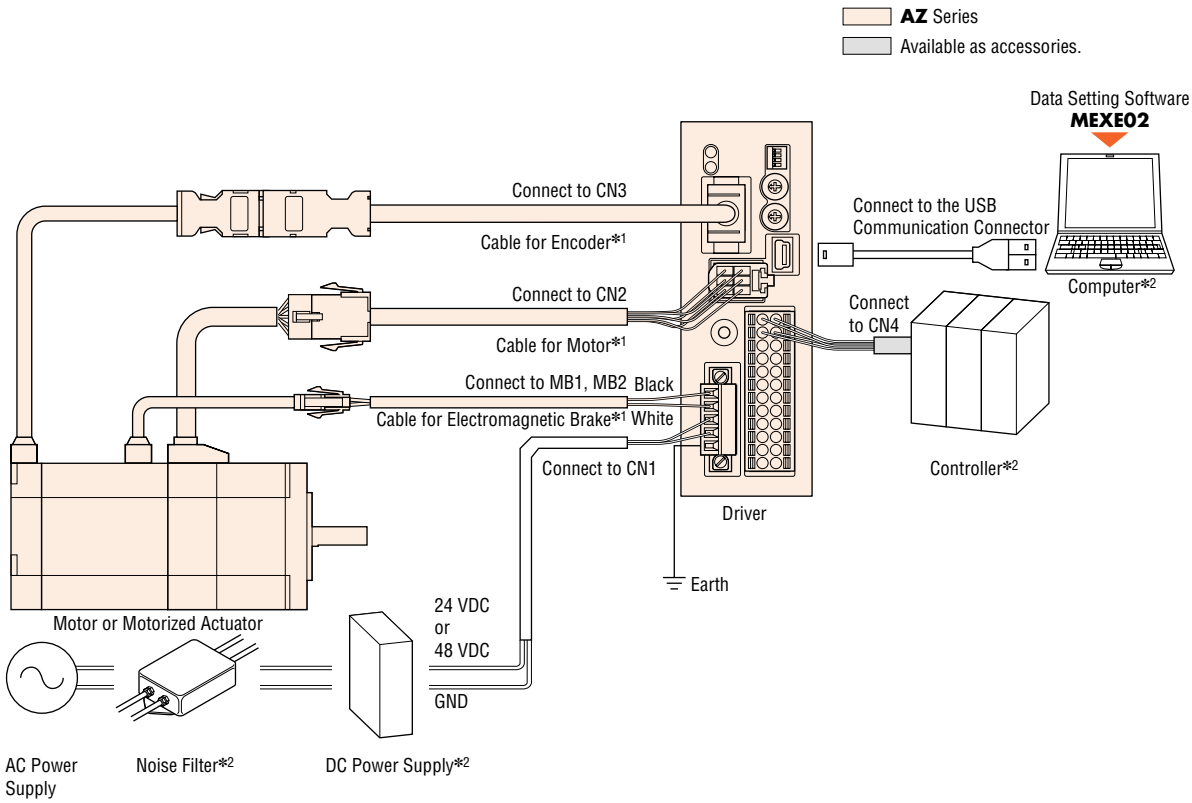
Indication	Pin No.	Signal Name	Description	
CN4	1	CW+ [PLS+]*	CW Pulse Input + [Pulse Input +]	This is the pulse signal that is input to operate the motor in the CW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	2	CCW+ [DIR+]*	CCW Pulse Input + [Rotation Direction Input +]	This is the pulse signal that is input to operate the motor in the CCW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	3	IN4	ZHOME	Moves to home that has been set with the HOME/PRESET switch.
	4	IN6	STOP	Stops the motor.
	5	IN-COM [4-7]*	IN4~IN7 Input Common	
	6	IN8	FW-JOG	Starts the JOG operation.
	7	OUT0	HOME-END	When home position has been established, it will be output when the high-speed return-to-home operation is completed.
	8	OUT2	PLS-RDY	Output when the pulse input preparation is completed.
	9	OUT4	MOVE	Output during motor operation.
	10	OUT-COM*	Output Common	
	11	ASG+	A-Phase Pulse Output +	
	12	BSG+	B-Phase Pulse Output +	
	13	CW− [PLS−]*	CW Pulse Input − [Pulse Input −]	This is the pulse signal that is input to operate the motor in the CW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	14	CCW− [DIR−]*	CCW Pulse Input − [Rotation Direction Input −]	This is the pulse signal that is input to operate the motor in the CCW direction in the 2-pulse input method. The input method in the [ ] applies to the 1-pulse input method.
	15	IN5	FREE	Stops motor excitation.
	16	IN7	ALM-RST	Resets the alarms.
	17	IN-COM [8-9]*	IN8, IN9 Input Common	
	18	IN9	RV-JOG	Starts the JOG operation.
	19	OUT1	IN-POS	Outputs when the motor operation is finished.
	20	OUT3	READY	Outputs when the driver is ready for operation.
	21	OUT5	ALM-B	Outputs the alarm status of the driver (Normal close).
	22	GND*	Ground	
	23	ASG−	A-Phase Pulse Output −	
	24	BSG−	B-Phase Pulse Output −	

● You can set functions to assign by using parameters. Initial values are shown above. For details, refer to "Functions" in the Operating Manual of the **AZ** Series.

*Initial settings cannot be changed.

Connection Diagram

◇Connections with Peripheral Equipment



*1 Keep the wiring distance between the motor and driver to 20 m or less.
*2 Not supplied.

◇Connection of the USB Cable

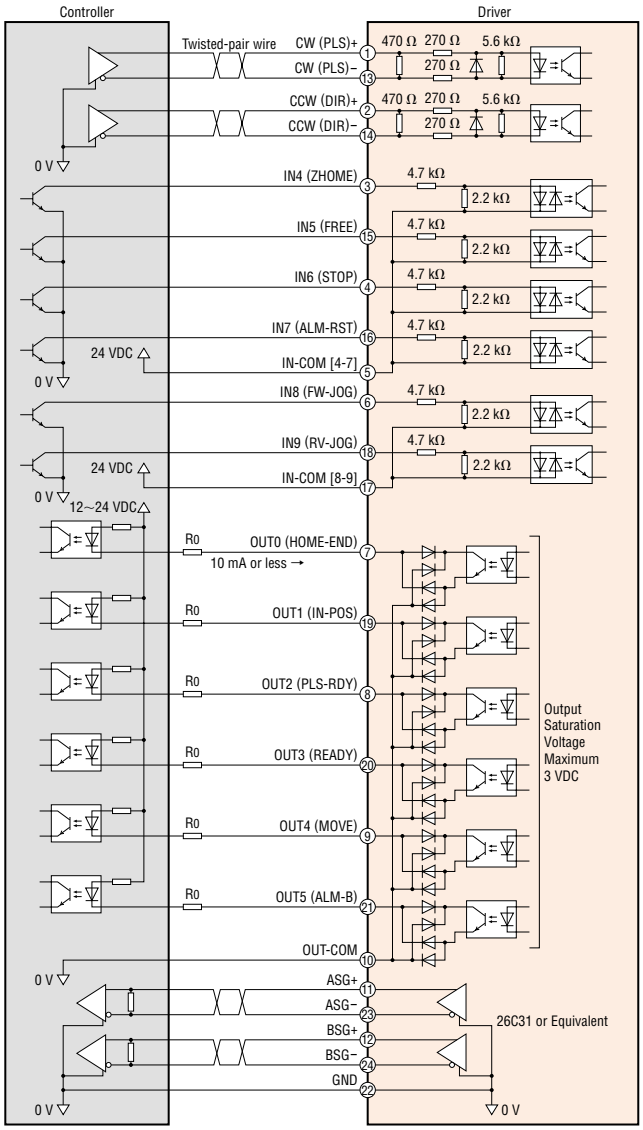
Use this USB cable to connect the driver to the computer on which the data setting software **MEXE02** is installed.
Use a USB cable with the following specifications.

Specifications	USB2.0 (Full speed)
Cable	Length: 3 m or less
	Configuration: A to mini B

◇Connecting to the Programmable Controller (Pulse input type)

•Connection Diagram for Connection with Current Sink Output Circuit

When the pulse input is the line driver

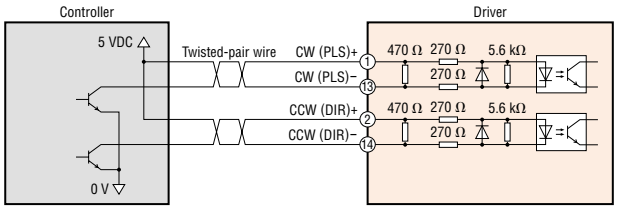


Note

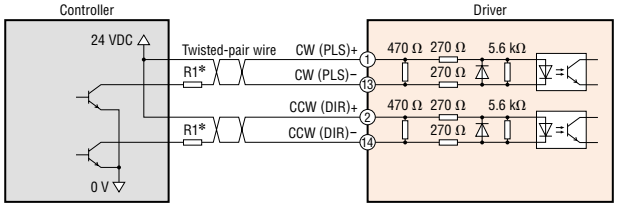
- Use 24 VDC for the input signals.
- Use 12～24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor R_0 to reduce the current to 10 mA or below.
- Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).
  Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

When the pulse input is the open collector

- When the pulse input signal is 5 VDC



- When the pulse input signal is 24 VDC



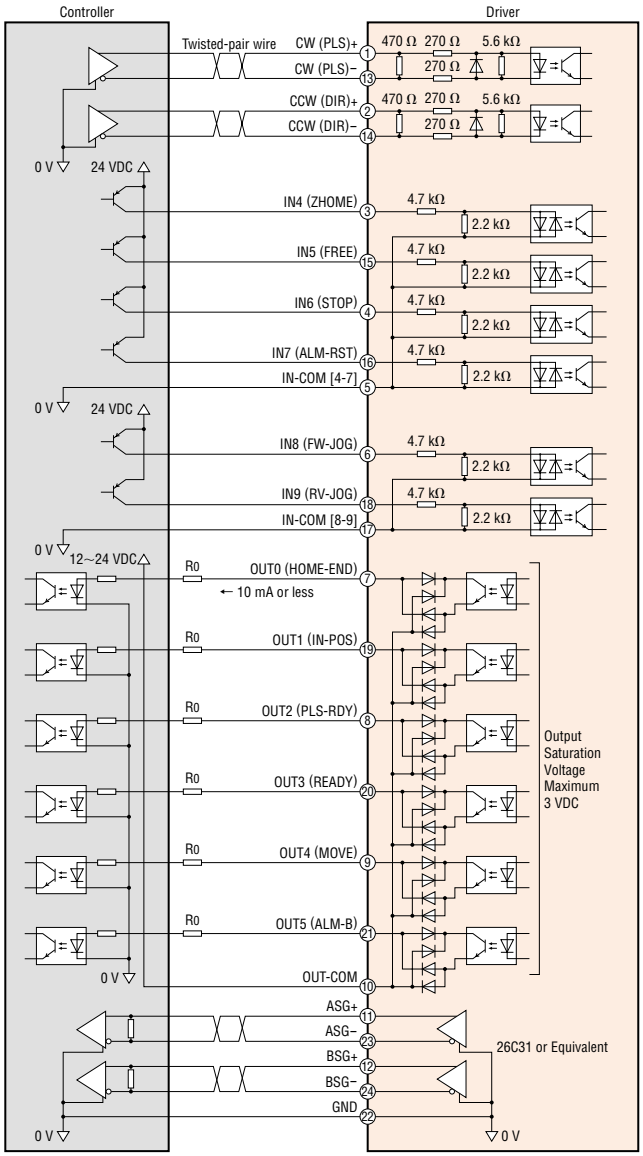
✻R_1: 1.2 kΩ～2.2 kΩ, 0.5 W or more

Note

- Use 5～24 VDC for the CW (PLS) and CCW (DIR) inputs.
  When using at 24 VDC, connect external resistor R_1 (1.2 kΩ～2.2 kΩ, 0.5 W or more).
- When using at 5 VDC, do not connect any external resistors, but directly connect a pulse input signal.

•Connection Diagram for Connection with Current Source Output Circuit

When the pulse input is the line driver

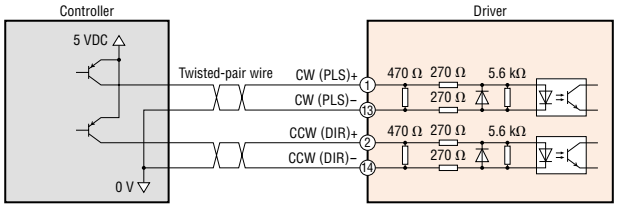


Note

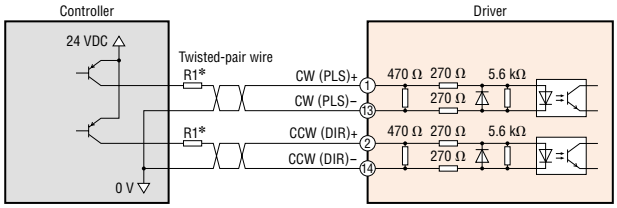
- Use 24 VDC for the input signals.
- Use 12~24 VDC, 10 mA or less for the output signals. When the current value exceeds 10 mA, connect the external resistor R_0 to reduce the current to 10 mA or below.
- Provide a distance of 200 mm or longer between the signal lines and power lines (power supply lines, motor lines).
  Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

When the pulse input is the open collector

•When the pulse input signal is 5 VDC



•When the pulse input signal is 24 VDC



✻R_1: 1.2 kΩ~2.2 kΩ, 0.5 W or more

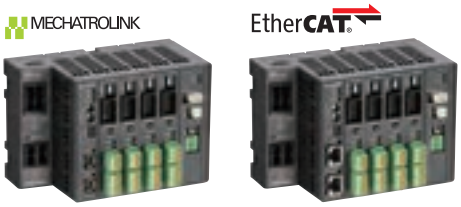
Note

- Use 5~24 VDC for the CW (PLS) and CCW (DIR) inputs.
  When using at 24 VDC, connect external resistor R_1 (1.2 kΩ~2.2 kΩ, 0.5 W or more).
- When using at 5 VDC, do not connect any external resistors, but directly connect a pulse input signal.

AZ Series Multi Axis Drivers
DC Power Supply Input

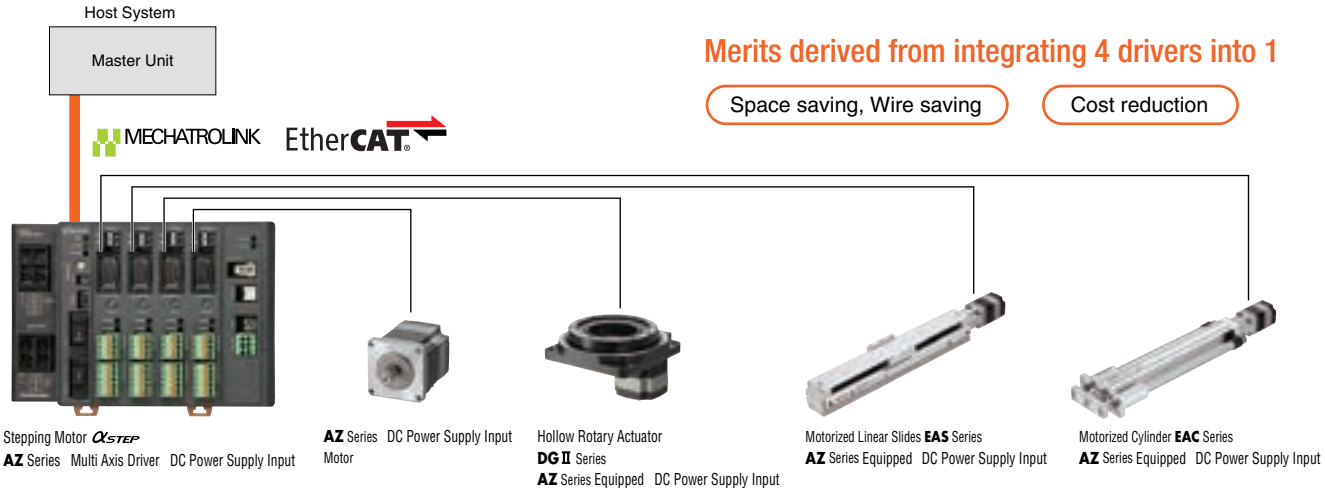
MECHATROLINK-Ⅲ-Compatible
Compatible with EtherCAT Drive Profile

The multi axis drivers can be connected to DC power supply motors of our **AZ** Series and to the motorized actuators equipped with motors.
We provide the multi axis drivers that can support MECHATROLINK-Ⅲ, or EtherCAT Drive Profile.
No. of axes: 2, 3, or 4



Features

Multi axis driver (up to 4 axes) that reduces space and cost



●The above motors and motorized actuators connected to the stepping motor are representative examples.

ESI File

We provide an ESI file to allow you to use EtherCAT-compatible products more easily.
The ESI file can be downloaded from the Oriental Motor website.
Contact OMRON Corporation for connection with the PLCs made by the company.
An EtherCAT connection guide is available.

Applicable Product Series

The **AZ** Series multi axis driver DC power supply input can be used in combination with the motorized actuators listed below.

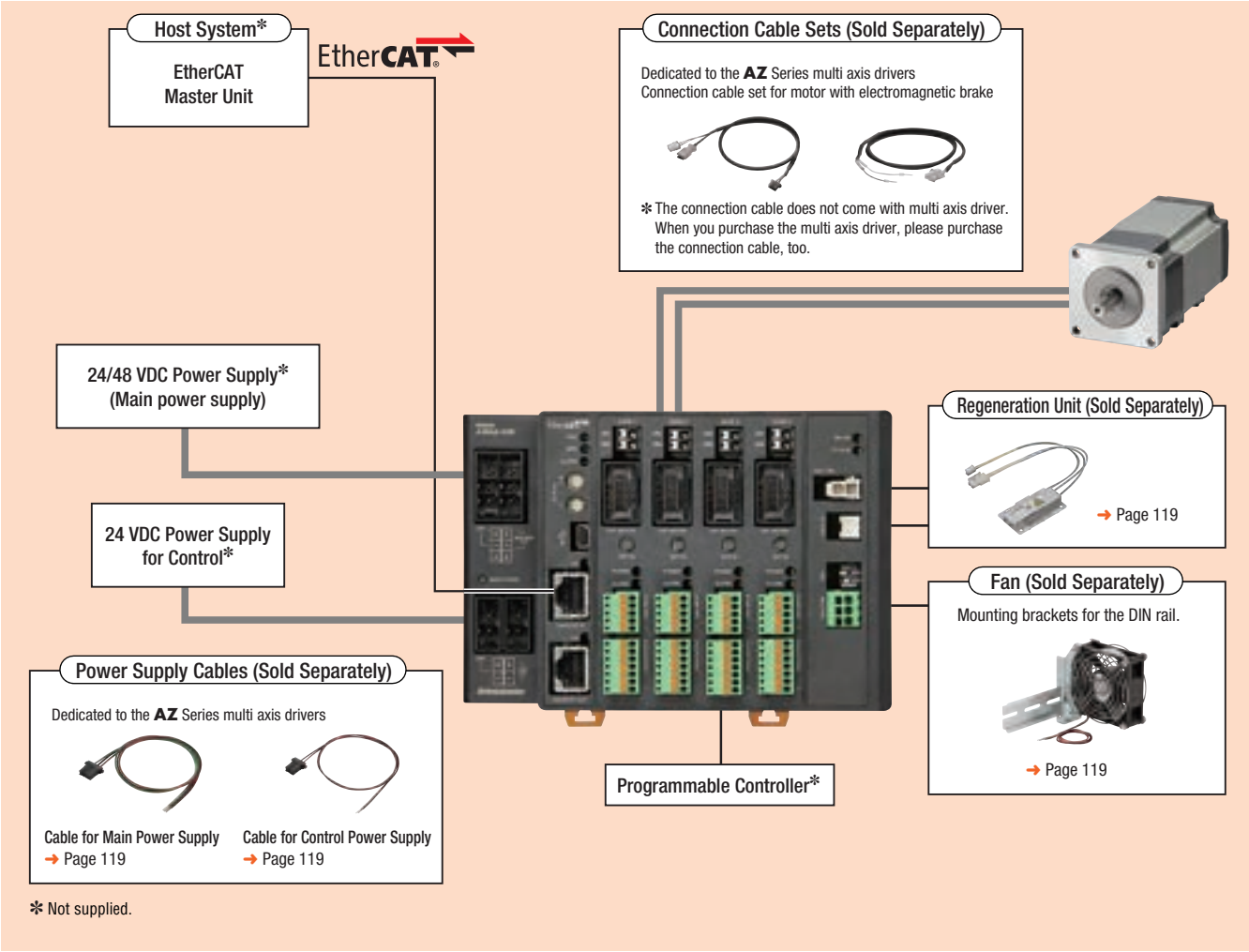
- Compact linear actuators **DRS2** Series **AZ** Series equipped
- Hollow rotary actuators **DG**Ⅱ Series **AZ** Series equipped DC power supply input
- Motorized linear slides **EAS** Series **AZ** Series equipped DC power supply input
- Motorized linear slides **EZS** Series **AZ** Series equipped DC power supply input
- Motorized cylinders **EAC** Series **AZ** Series equipped DC power supply input

●For the details of the motors and motorized actuators that can be combined, refer to the Oriental Motor website or the catalog of each Series.

System Configuration

When supporting EtherCAT Drive Profile

This is a sample system configuration showing a combination with standard type **AZ** Series DC power supply input with electromagnetic brake.



System Configuration Example

AZ Series				Accessories			
Motor	Driver	Connection Cable Sets	+	Cable for Main Power Supply	Cable for Control Power Supply	Regeneration Unit	Fan
AZM66MK	AZD4A-KED	CC030VZFBA		LC03D06A	LC02D06A	RGC40	V-MD825B24L

- The system configuration shown above is an example. Other combinations are available.

Note

- The motor cable and electromagnetic brake cable from the motor cannot be directly connected to a driver. To connect the motor to the driver, use a connection cable.

Product Number Code

Multi Axis Driver

AZD 4A - K S3

① ② ③ ④

①	Driver Type	**AZD**: **AZ** Series Driver
②	No. of Axes	**2A**: 2 Axes **3A**: 3 Axes **4A**: 4 Axes
③	Power Supply Input	**K**: 24 VDC/48 VDC
④	Network Type	**M3**: MECHATROLINK-Ⅲ **ED**: EtherCAT Drive Profile

Dedicated to the **AZ** Series Multi Axis Drivers Connection Cable Sets/Flexible Connection Cable Sets

◇Connection Cable for Motor

CC 050 V Z □ F A

① ② ③ ④ ⑤ ⑥ ⑧

◇Connection Cable Set for Motor with Electromagnetic Brake

CC 050 V Z F B A

① ② ③ ④ ⑥ ⑦ ⑧

①		**CC**: Cable
②	Length	**005**: 0.5 m **010**: 1 m **015**: 1.5 m **020**: 2 m **025**: 2.5 m **030**: 3 m **040**: 4 m **050**: 5 m **070**: 7 m **100**: 10 m **150**: 15 m **200**: 20 m
③	Reference Number	
④	Applied Model	**Z**: For **AZ** Series
⑤	Reference Number	Blank: For frame size 42 mm (40 mm for the **HPG** Geared Type), 60 mm **2**: For frame size 20 mm, 28 mm (30 mm for the harmonic Geared Type)
⑥	Cable Type	**F**: Connection Cable Set **R**: Flexible Connection Cable Set
⑦	Description	**B**: For the product with Electromagnetic Brakes
⑧	Driver Type	**A**: For Multi Axis Drivers

Product Line

Multi Axis Drivers

◇MECHATROLINK-Ⅲ-Compatible

Product Name	No. of Axes
AZD2A-KM3	2 axes
AZD3A-KM3	3 axes
AZD4A-KM3	4 axes

◇Compatible with EtherCAT Drive Profile

Product Name	No. of Axes
AZD2A-KED	2 axes
AZD3A-KED	3 axes
AZD4A-KED	4 axes

●Connection Cable Sets/Flexible Connection Cable Sets dedicated to the **AZ** Series Multi Axis Drivers


◇Connection Cable for Motor

Length L (m)	For Frame Size 20 mm, 28 mm		For Frame Size 42 mm, 60 mm	
	Connection Cable	Flexible Connection Cable	Connection Cable	Flexible Connection Cable
0.5	**CC005VZ2FA**	**CC005VZ2RA**	**CC005VZFA**	**CC005VZRA**
1	**CC010VZ2FA**	**CC010VZ2RA**	**CC010VZFA**	**CC010VZRA**
1.5	**CC015VZ2FA**	**CC015VZ2RA**	**CC015VZFA**	**CC015VZRA**
2	**CC020VZ2FA**	**CC020VZ2RA**	**CC020VZFA**	**CC020VZRA**
2.5	**CC025VZ2FA**	**CC025VZ2RA**	**CC025VZFA**	**CC025VZRA**
3	**CC030VZ2FA**	**CC030VZ2RA**	**CC030VZFA**	**CC030VZRA**
4	**CC040VZ2FA**	**CC040VZ2RA**	**CC040VZFA**	**CC040VZRA**
5	**CC050VZ2FA**	**CC050VZ2RA**	**CC050VZFA**	**CC050VZRA**
7	**CC070VZ2FA**	**CC070VZ2RA**	**CC070VZFA**	**CC070VZRA**
10	**CC100VZ2FA**	**CC100VZ2RA**	**CC100VZFA**	**CC100VZRA**
15	**CC150VZ2FA**	**CC150VZ2RA**	**CC150VZFA**	**CC150VZRA**
20	**CC200VZ2FA**	**CC200VZ2RA**	**CC200VZFA**	**CC200VZRA**

◇Connection Cable Set for Motor with Electromagnetic Brake

Length L (m)	For Frame Size 42 mm, 60 mm	
	Connection Cable Set	Flexible Connection Cable Set
0.5	**CC005VZFBA**	**CC005VZRBA**
1	**CC010VZFBA**	**CC010VZRBA**
1.5	**CC015VZFBA**	**CC015VZRBA**
2	**CC020VZFBA**	**CC020VZRBA**
2.5	**CC025VZFBA**	**CC025VZRBA**
3	**CC030VZFBA**	**CC030VZRBA**
4	**CC040VZFBA**	**CC040VZRBA**
5	**CC050VZFBA**	**CC050VZRBA**
7	**CC070VZFBA**	**CC070VZRBA**
10	**CC100VZFBA**	**CC100VZRBA**
15	**CC150VZFBA**	**CC150VZRBA**
20	**CC200VZFBA**	**CC200VZRBA**


Cable for Motor


Cable for Electromagnetic Brake

Note

●As for the cables dedicated to multi axis drivers, we provide only connection cables. You cannot use extension cables for the **AZ** Series for multi axis drivers.

■Accessories

●Multi Axis Drivers

Type and No. of Axes \ Accessories		Connector for CN1	Connector for CN3	Contact for CN1, CN2	Connector Cap for CN4A, CN4B	Connector for CN9	Connector for CN10	Operating Manual
MECHATROLINK-Ⅲ-Compatible Compatible with EtherCAT	2 axes	2 pcs	2 pcs	10 pcs	2 pcs	2 pcs	2 pcs	1 set
	3 axes	2 pcs	2 pcs	10 pcs	2 pcs	3 pcs	3 pcs	1 set
	4 axes	2 pcs	2 pcs	10 pcs	2 pcs	4 pcs	4 pcs	1 set

■Specifications CE cULus*

●Power Supply Input

For main power supply: 24 VDC/48 VDC ±10%　7.0 A　(Maximum 7.0 A　Average 4.0 A or less during use)
For control power supply: 24 VDC ±10%　1.5 A　(For motors with electromagnetic brake, use power supply, 24 VDC ±5%)
(For motors with electromagnetic brake (when using a 20 cm connection cable), use power supply, 24 VDC ±4%)

●Communication Specifications

◇MECHATROLINK-Ⅲ Specifications

Items	Description
Baud Rate	100 Mbps
Transmission Period	0.5 ms/1 ms/2 ms/4 ms
Station Address	03 h～EF h (Initial value: 03 h)
Transmission Bytes	32/48 bytes (Initial value: 48 bytes)
Profile	Standard stepping motor drive profile Standard servo profile

◇EtherCAT Specifications

Items	Description
Baud Rate	100 Mbps
Communication Period	0.5 ms/1 ms/2 ms/3 ms/4 ms/5 ms/6 ms/7 ms/8 ms
Node Address	0～255 (00 h～FF h, Initial value: 00 h)
Communication Protocol	Proprietary protocol for EtherCAT (CoE) CiA402 drive profile

*Compatible with EtherCAT drive profile only

General Specifications

Items	Description
Degree of Protection	IP10
Operating Environment	Ambient temperature: 0～+50˚C (Non-freezing) Humidity: 85% or less (Non-condensing) Altitude: Up to 1000 m above sea level Atmosphere: No corrosive gases or dust. The product should not be exposed to water or oil.
Storage Condition Transportation Environment	Ambient temperature: −25～+70˚C (Non-freezing) Humidity: 85% or less (Non-condensing) Altitude: Up to 3000 m above sea level Atmosphere: No corrosive gases or dust. The product should not be exposed to water or oil.
Insulation Resistance	When a 500 VDC megger is applied to the location below, the resistance to be measured is 100 MΩ or more. · FG terminal – Power supply terminal
Dielectric Strength Voltage	No abnormality is found with the following application for 1 minute: · MECHATROLINK-Ⅲ-Compatible: FG terminal – Power supply terminal 500 VAC 50/60 Hz Leakage current 15 mA or less · Compatible with EtherCAT: FG terminal – Power supply terminal 1 kVAC 50/60 Hz Leakage current 10 mA or less

Note

- When measuring insulation resistance or performing a dielectric strength voltage test, be sure to disconnect the motor from the driver beforehand. In addition, make sure that the ABZO sensor of the motor is exempt from the above measurement and test.

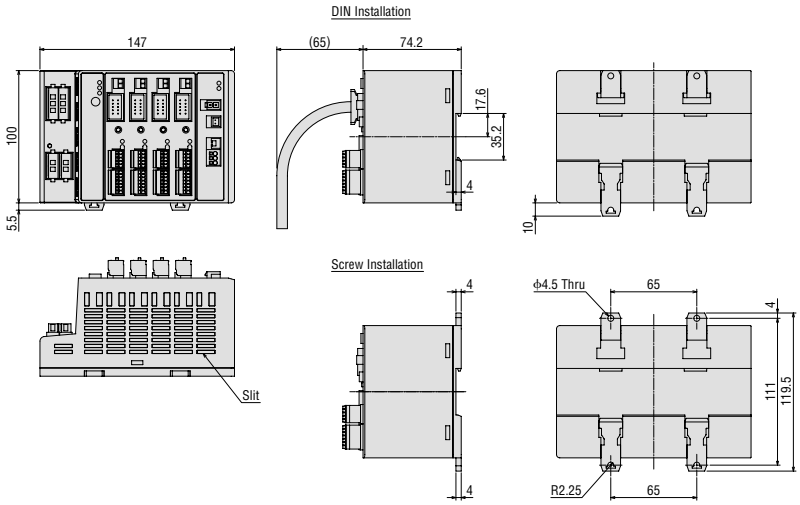
Dimensions (Unit=mm)

Multi Axis Drivers

2D & 3D CAD

Type / No. of Axes	MECHATROLINK-Ⅲ-Compatible		Compatible with EtherCAT		Mass
	Product Name	2D CAD	Product Name	2D CAD	kg
2 Axes	**AZD2A-KM3**	B1200	**AZD2A-KED**	B1206	0.39
3 Axes	**AZD3A-KM3**	B1201	**AZD3A-KED**	B1207	0.42
4 Axes	**AZD4A-KM3**	B1202	**AZD4A-KED**	B1208	0.45

- The size is commonly applied to 2, 3, and 4 axis drivers.



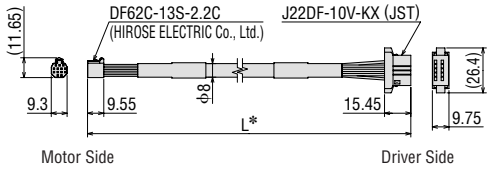
- Accessories

Connector for main power supply: F32FSS-03V-KX (JST)
Connector for control power supply: F32FSS-02V-KX (JST)
Contact for main power supply connectors and control power supply connectors: LF3F-41GF-P2.0 (JST)
Input signal connector: FK-MC 0,5/ 5-ST-2,5 (PHOENIX CONTACT)
Output signal connector: FK-MC 0,5/ 7-ST-2,5 (PHOENIX CONTACT)

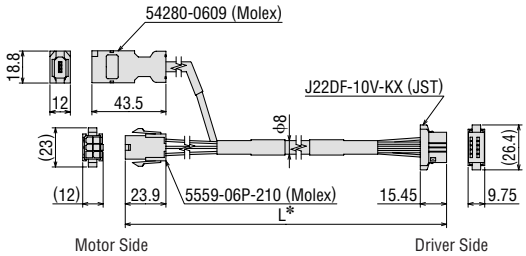
Connection Cable Sets, Flexible Connection Cable Sets

◇Cable for Motor

•For frame size 20 mm, 28 mm

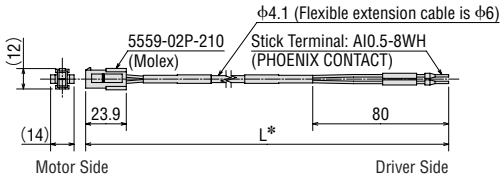


•For frame size 42 mm, 60 mm



◇Cable for Electromagnetic Brake

•For frame size 42 mm, 60 mm



✻"L" in the above dimensions is replaced by any Length L (m) in "■ Product Line" on Page 117.

Accessories Dedicated to Multi Axis Drivers

Power Supply Cables (Sold separately)

These lead wires, equipped with a connector, are dedicated to the **AZ** Series multi axis drivers. The wires easily allow connection with main power supply and control power supply.

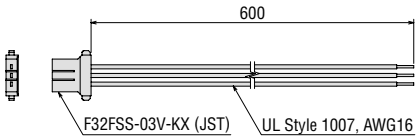
◇Product Line

Product Name	Type
LC03D06A	For main power supply
LC02D06A	For control power supply

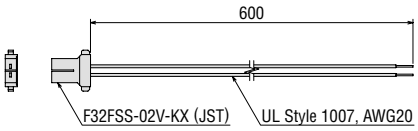
LC03D06A **LC02D06A**

◇Dimensions (Unit=mm)

Cable for main power supply
LC03D06A



Cable for control power supply
LC02D06A



Regeneration Unit

During vertical drive (gravitational operation) or sudden start/stop in high inertia, an external force causes the motor to rotate and function as a power generator. When the regenerative power exceeds the driver's regenerative power absorption capacity, it may cause damage to the motor. In such a case, the regeneration unit is connected to the driver to convert regenerative energy into thermal energy for dissipation.
When 24 VDC is used for a multi axis driver, alarms tend to be easily generated. Therefore, we recommend to use a regeneration unit.

◇Product Line

Product Name
RGC40

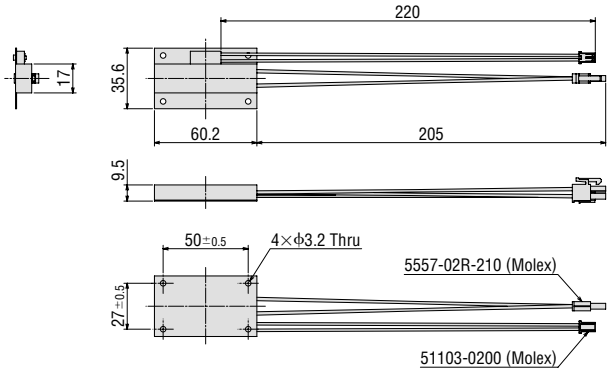
◇Specifications

Items	Description
Allowable Power Consumption	Continuous regenerative power: 40 W* Instantaneous regenerative power: 400 W
Resistance Value	15 Ω
Thermostat Operating Temperature	Operation: Opens at 95±5℃ Reset: Closes at 65±15℃ (Normally closed)
Thermostat Electrical Rating	250 VAC, 0.5 A (Min. current 1.5 VDC, 1 mA)

*Install the regeneration unit in the location that has the same heat radiation capability as the heat sink (Material: Aluminum 180×150 mm Thickness 2 mm).

◇Dimensions (Unit=mm)

Mass: 0.03 kg 2D CAD B1209 3D CAD



Fan

DC propeller fan for circulating air in the control panel or cooling a certain part.

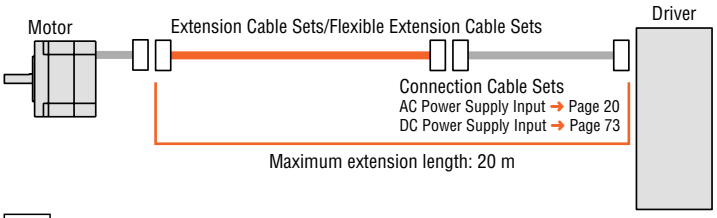
◇Product Line

Product Name	Type
V-MD825B24L	With DIN rail mounting bracket

Accessories

Extension Cable Sets, Flexible Extension Cable Sets

For the **AZ** Series, we provide sets of connection cables and flexible extension cables that can be connected to sets of connection cables for extension.
For standard motors, sets of motor cables and encoder cables are provided. For motors with an electromagnetic brake, sets of motor cables, encoder cables, and electromagnetic brake cables are provided.
Use a flexible connection cable set or flexible extension cable set if the cable will be bent repeatedly.



Note

- The motor cable and electromagnetic brake cable from the motor cannot be directly connected to a driver. To connect the motor to the driver, use a connection cable. The maximum length of the cable extension is 20 m.

AC Power Supply Input

Extension Cable Sets, Flexible Extension Cable Sets

Product Line

Extension Cable Sets

◇For Standard Motors

Cable for Motor　　Cable for Encoder

Product Name	Length L (m)
CC010VZFT	1
CC020VZFT	2
CC030VZFT	3
CC050VZFT	5
CC070VZFT	7
CC100VZFT	10
CC150VZFT	15

◇For Motors with Electromagnetic Brake

Cable for Motor　　Cable for Encoder　　Cable for Electromagnetic Brake

Product Name	Length L (m)
CC010VZFBT	1
CC020VZFBT	2
CC030VZFBT	3
CC050VZFBT	5
CC070VZFBT	7
CC100VZFBT	10
CC150VZFBT	15

Flexible Extension Cable Sets

◇For Standard Motors

Cable for Motor　　Cable for Encoder

Product Name	Length L (m)
CC010VZRT	1
CC020VZRT	2
CC030VZRT	3
CC050VZRT	5
CC070VZRT	7
CC100VZRT	10
CC150VZRT	15

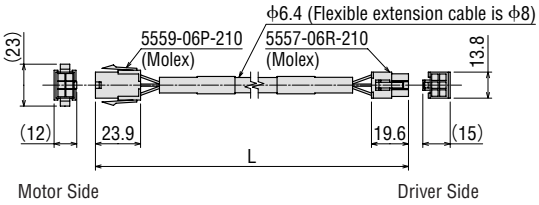
◇For Motors with Electromagnetic Brake

Cable for Motor　　Cable for Encoder　　Cable for Electromagnetic Brake

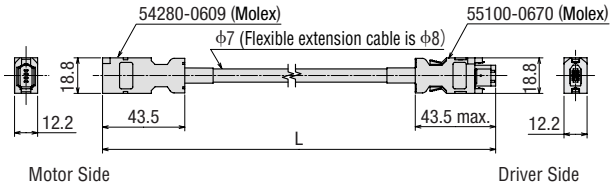
Product Name	Length L (m)
CC010VZRBT	1
CC020VZRBT	2
CC030VZRBT	3
CC050VZRBT	5
CC070VZRBT	7
CC100VZRBT	10
CC150VZRBT	15

Dimensions (Unit=mm)

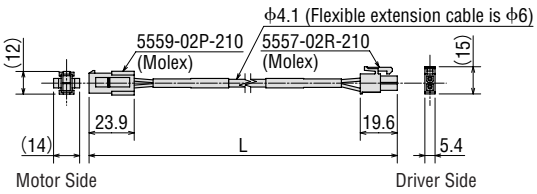
Cable for Motor



Cable for Encoder



Cable for Electromagnetic Brake



DC Power Supply Input

Extension Cable Sets, Flexible Extension Cable Sets

Product Line

[For **AZM14**, **AZM15**, **AZM24**, **AZM26**]

Extension Cables

◇For Standard Motors

Product Name	Length L (m)
CC010VZ2FT	1
CC020VZ2FT	2
CC030VZ2FT	3
CC050VZ2FT	5
CC070VZ2FT	7
CC100VZ2FT	10
CC150VZ2FT	15

Flexible Extension Cables

◇For Standard Motors

Product Name	Length L (m)
CC010VZ2RT	1
CC020VZ2RT	2
CC030VZ2RT	3
CC050VZ2RT	5
CC070VZ2RT	7
CC100VZ2RT	10
CC150VZ2RT	15

[For **AZM46**, **AZM48**, **AZM66**, **AZM69**]

Extension Cable Sets

◇For Standard Motors

Cable for Motor　　Cable for Encoder

Product Name	Length L (m)
CC010VZFT	1
CC020VZFT	2
CC030VZFT	3
CC050VZFT	5
CC070VZFT	7
CC100VZFT	10
CC150VZFT	15

◇For Motors with Electromagnetic Brake

Cable for Motor　　Cable for Encoder　　Cable for Electromagnetic Brake

Product Name	Length L (m)
CC010VZFBT	1
CC020VZFBT	2
CC030VZFBT	3
CC050VZFBT	5
CC070VZFBT	7
CC100VZFBT	10
CC150VZFBT	15

Flexible Extension Cable Sets

◇For Standard Motors

Cable for Motor　　Cable for Encoder

Product Name	Length L (m)
CC010VZRT	1
CC020VZRT	2
CC030VZRT	3
CC050VZRT	5
CC070VZRT	7
CC100VZRT	10
CC150VZRT	15

◇For Motors with Electromagnetic Brake

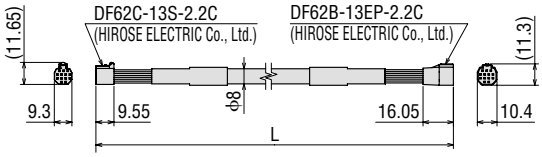
Cable for Motor　　Cable for Encoder　　Cable for Electromagnetic Brake

Product Name	Length L (m)
CC010VZRBT	1
CC020VZRBT	2
CC030VZRBT	3
CC050VZRBT	5
CC070VZRBT	7
CC100VZRBT	10
CC150VZRBT	15

Dimensions (Unit=mm)

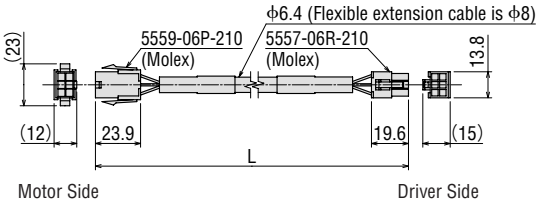
[For **AZM14**, **AZM15**, **AZM24**, **AZM26**]

Cable for Motor

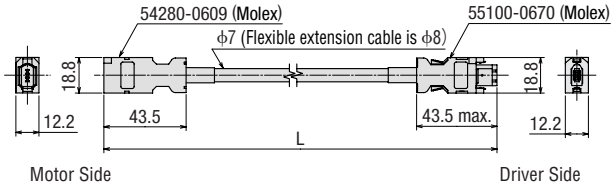


[For **AZM46**, **AZM48**, **AZM66**, **AZM69**]

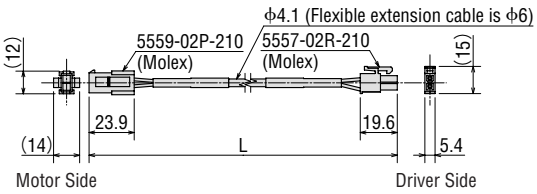
Cable for Motor



Cable for Encoder



Cable for Electromagnetic Brake



Notes on Use of Cables

➜Refer to Page 57.

Data Setting Software MEXE02

In addition to operating data and various parameter settings with a computer, you can perform teaching and monitor I/O and operating speed waveform with Data Setting Software.
Data Setting Software can be downloaded from the Oriental Motor website.
Oriental Motor also provides media.
Visit our website, or contact the nearest Oriental Motor sales office.

Operating Environment

Computer

Recommended CPU*1	Intel Core processor 2 GHz or faster (OS must be supported)
Display	Video adapter and monitor with a minimum resolution of XGA (1024 × 768)
Recommended Memory*1	32 bit (x86) edition: 1 GB or more 64 bit (x64) edition: 2 GB or more
Hard Disk*2	Free disk space of at least 60 MB
USB Port	USB2.0 1 port

*1 The system requirements for the OS must be met.
*2 **MEXE02** requires Microsoft.NET Framework 4 Client Profile. If it is not installed, it will be installed automatically. An additional 1.5 GB of free space may be required for 64-bit (x64) edition OS and 600 MB for 32-bit (x86) edition OS.

- Windows and Windows Vista are registered trademarks of Microsoft Corporation in the United States and other countries.
- Intel and Core are registered trademarks or trademarks of Intel Corporation in the United States and other countries.
- For the latest information of operating environment, refer to the Oriental Motor website.

Note

- Depending on your system environment, the required memory and hard disk may vary.
- When using media to install the data setting software, you need to prepare a drive for the media.

Operating System (OS)

The 32 bit (x86) editions and 64 bit (x64) editions are supported.

- Microsoft Windows XP Service Pack 3*
- Microsoft Windows Vista Service Pack 2
- Microsoft Windows 7 Service Pack 1
- Microsoft Windows 8
- Microsoft Windows 8.1
- Microsoft Windows 10

*For the 64-bit (x64) version, Service Pack 2 is used.

Computer and Driver Connection

Use a USB cable with the following specifications.

Specifications	USB2.0 (Full speed)
Cable	Length: 3 m or less Configuration: A-mini-B

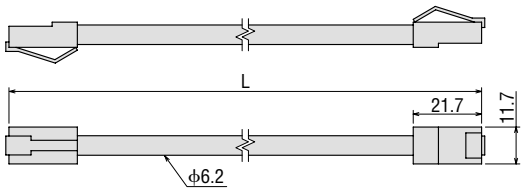
RS-485 Communication Cables

This cable is used to connect drivers when the multi-axis operation of built-in controller types or pulse input types with RS-485 communication is performed.
It also connects the network converter to the driver.

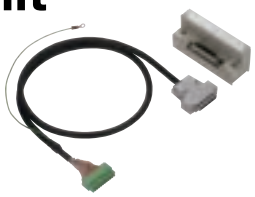
Product Line

Product Name	Applicable Drivers	Length L (m)
CC001-RS4	DC Power Supply Input Driver	0.1
CC002-RS4	AC Power Supply Input Driver DC Power Supply Input Driver	0.25

Dimensions (Unit=mm)



Connector – Terminal Block Conversion Unit

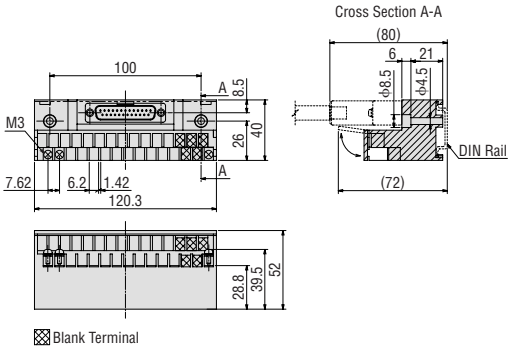


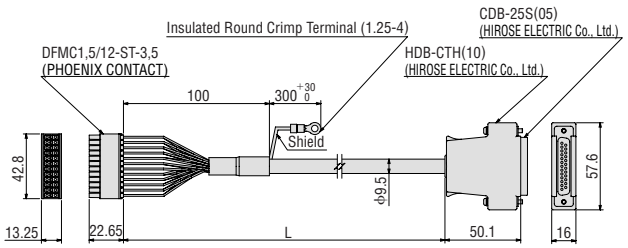
A conversion unit that connects a driver to a programmable controller using a terminal block.
- Includes a signal name plate for easy, one-glance identification of driver signal names
- Enables both DIN rail installation and screw installation
- Employs a double shield cable

Product Line

Product Name	Length L (m)
CC24T05E	0.5
CC24T10E	1

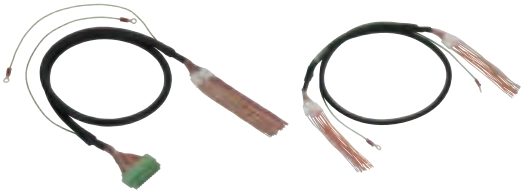
Dimensions (Unit=mm)





General-Purpose Cable for I/O Signals

General-purpose multi-core cables provide convenient connection between a driver and programmable controller.
- Employs a double shield cable
- Core wire AWG24



Cables with disorganized wires on one side

Cable with disorganized wires on both sides

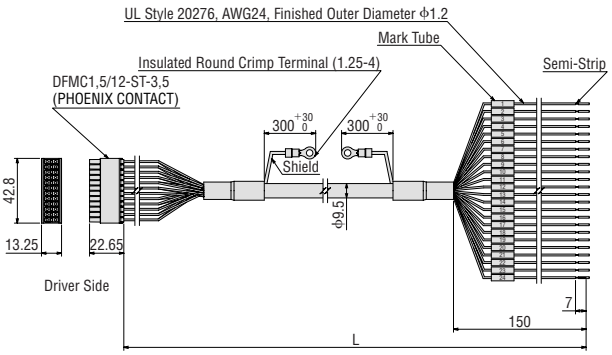
Cables with Disorganized Wires on One Side

Since cables on the driver side are connected to the connector, labor and time can be saved.

Product Line

Number of Lead Line Cores	Length L		
	0.5 m	1 m	2 m
24	**CC24D005C-1**	**CC24D010C-1**	**CC24D020C-1**

Dimensions (Unit=mm)



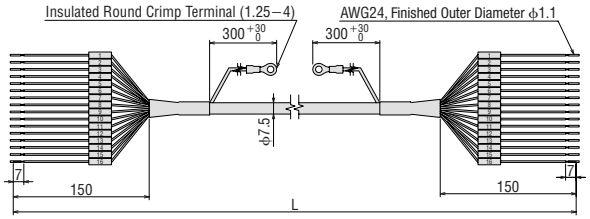
Cable with Disorganized Wires on Both Sides

In accordance with the number of I/O signals to be connected, select the optimum cable.

Product Line

Number of Lead Line Cores	Length L			
	0.5 m	1 m	1.5 m	2 m
6	**CC06D005B-1**	**CC06D010B-1**	**CC06D015B-1**	**CC06D020B-1**
10	**CC10D005B-1**	**CC10D010B-1**	**CC10D015B-1**	**CC10D020B-1**
12	**CC12D005B-1**	**CC12D010B-1**	**CC12D015B-1**	**CC12D020B-1**
16	**CC16D005B-1**	**CC16D010B-1**	**CC16D015B-1**	**CC16D020B-1**

Dimensions (Unit=mm)



The dimensions shows a 16-core cable.

MCV Couplings

This one-piece coupling is made with anti-vibration rubber molded between aluminum alloy hubs.

Product Line

Product Name
MCV15□
MCV19□
MCV25□
MCV30□

●A number indicating the coupling inner diameter is entered where the box □ is located within the product name.

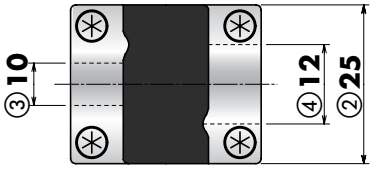
Product Number Code

MCV 25 10 12

① ② ③ ④

①	**MCV** Coupling
②	Outer Diameter of Coupling
③	Inner Diameter d1 (Smaller inner diameter) (**06A** represents ϕ6.35 mm)
④	Inner Diameter d2 (Larger inner diameter) (**06A** represents ϕ6.35 mm)

●For inner diameter d1, the smaller of the motor shaft diameter or the driven shaft diameter is entered.
For inner diameter d2, the larger of the motor shaft diameter or the driven shaft diameter is entered.



Coupling Selection Table

●Select the coupling based on the criteria below.

- The output torque of the motor is equal to or under the normal torque of the coupling.
- Motor shaft diameter.

Applicable Product			Coupling Type	Motor Shaft Diameter mm		Driven Shaft Diameter mm									
Type	Frame Size	Product Name				**03**	**04**	**05**	**06**	**06A**	**08**	**10**	**12**	**14**	**15**
						ϕ3	ϕ4	ϕ5	ϕ6	ϕ6.35	ϕ8	ϕ10	ϕ12	ϕ14	ϕ15
Standard Type	20 mm	**AZM14**, **AZM15**	**MCV15**	**04**	ϕ4		●	●	●						
	28 mm	**AZM24**, **AZM26**		**05**	ϕ5	●	●	●	●						
	42 mm	**AZM46**		**06**	ϕ6		●	●	●						
		AZM48	**MCV19**	**08**	ϕ8			●	●		●				
	60 mm	**AZM66**, **AZM69**	**MCV25**	**10**	ϕ10				●	●	●	●	●		
	85 mm	**AZM98**, **AZM911**	**MCV30**	**14**	ϕ14						●	●	●	●	●

●The product names of the applicable ones are described with text by which the product name can be identified.

MCS Couplings

This three-piece coupling adopts an aluminum alloy hub and a resin spider.

Product Line

Product Name
MCS20□
MCS30□
MCS40□
MCS55□
MCS65□

- A number indicating the coupling inner diameter is entered where the box □ is located within the product name.

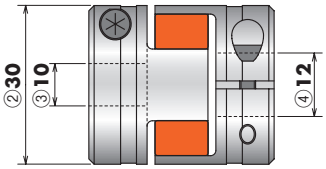
Product Number Code

MCS 30 10 12

① ② ③ ④

①	**MCS** Coupling
②	Outer Diameter of Coupling
③	Inner Diameter d1 (Smaller inner diameter) (**F04** represents ϕ6.35 mm)
④	Inner Diameter d2 (Larger inner diameter) (**F04** represents ϕ6.35 mm)

- For inner diameter d1, the smaller of the motor shaft diameter or the driven shaft diameter is entered.
  For inner diameter d2, the larger of the motor shaft diameter or the driven shaft diameter is entered.



Coupling Selection Table

- Select the coupling based on the criteria below.
  - The output torque of the motor is equal to or under the normal torque of the coupling.
  - Motor shaft diameter.
- When using a parallel key, select the coupling that matches the parallel key.

Applicable Product			Gear Ratio	Coupling Type	Motor Shaft Diameter mm		Driven Shaft Diameter mm													
Type	Frame Size	Product Name					**05**	**06**	**F04**	**08**	**10**	**12**	**14**	**15**	**16**	**18**	**20**	**22**	**24**	**25**
							ϕ5	ϕ6	ϕ6.35	ϕ8	ϕ10	ϕ12	ϕ14	ϕ15	ϕ16	ϕ18	ϕ20	ϕ22	ϕ24	ϕ25
TS Geared Type	42 mm	**AZM46-TS**□	**3.6, 7.2**	**MCS20**	**06**	ϕ6	●	●	●	●	●									
			10, 20, 30	**MCS30**				●	●	●	●	●	●	●	●					
	60 mm	**AZM66-TS**□	**3.6, 7.2**	**MCS30**	**10**	ϕ10		●	●	●	●	●	●	●	●					
			10, 20, 30	**MCS40**						●	●	●	●	●	●	●	●			
	90 mm	**AZM98-TS**□	**3.6, 7.2, 10**	**MCS55**	**18**	ϕ18						●	●	●	●	●	●	●	●	
			20, 30	**MCS65**											●	●	●	●	●	●
FC Geared Type	42 mm	**AZM46-FC**□	**7.2, 10, 20, 30**	**MCS20**	**10**	ϕ10	●	●	●	●	●									
				MCS30								●	●	●	●					
	60 mm	**AZM66-FC**□		**MCS40**	**15**	ϕ15				●	●	●								
				MCS55								●	●			●				
PS Geared Type	28 mm	**AZM24-PS**□	**7.2, 10**	**MCS20**	**08**	ϕ8	●	●	●	●	●									
	42 mm	**AZM46-PS**□	**5**	**MCS20**	**10**	ϕ10	●	●	●	●	●									
			7.2, 10, 25, 36, 50	**MCS30**				●	●	●	●	●	●	●	●					
	60 mm	**AZM66-PS**□	**5, 7.2**	**MCS40**	**12**	ϕ12				●	●	●	●	●	●	●	●			
			10, 25, 36, 50	**MCS55**								●	●	●	●	●	●	●	●	
	90 mm	**AZM98-PS**□	**5, 7.2**	**MCS55**	**18**	ϕ18						●	●	●	●	●	●	●	●	
			10, 25, 36, 50	**MCS65**											●	●	●	●	●	●
HPG Geared Type	40 mm	**AZM46-HP**□	**5, 9**	**MCS30**	**10**	ϕ10		●	●	●	●	●	●	●	●					
	60 mm	**AZM66-HP**□	**5, 15**	**MCS55**	**16**	ϕ16						●	●			●				
	90 mm	**AZM98-HP**□	**5, 15**	**MCS65**	**25**	ϕ25										●	●			
Harmonic Geared Type	30 mm	**AZM24-HS**□	**50, 100**	**MCS30**	**08**	ϕ8		●	●	●	●	●	●	●	●					
	42 mm	**AZM46-HS**□	**50, 100**	**MCS40**	**10**	ϕ10				●	●	●	●	●	●	●	●			
	60 mm	**AZM66-HS**□	**50, 100**	**MCS55**	**15**	ϕ15						●	●			●				

- The product names of the applicable ones are described with text by which the product name can be identified.
- A number in the box □ in the product name indicates the gear ratio.

Motor Mounting Brackets

Mounting brackets are convenient for installation and securing a stepping motor and geared type stepping motor.
The mounting bracket base is built with holes large enough to allow for adjustments of belt tension after a motor is installed.

Product Line

For Standard Type

Material: Aluminum alloy (SPCC)*
Surface treatment: Painting (Electroless nickel plating)*

Product Name	Motor Frame Size	Applicable Product
PFB28A	28 mm	**AZM24**, **AZM26**
PAF0P	42 mm	**AZM46**, **AZM48**
PAL0P		
PAL2P-5	60 mm	**AZM66**, **AZM69**
PAL4P-5	85 mm	**AZM98**, **AZM911**

*The specifications in the ( ) apply to **PFB28A**.
● These installation brackets can be perfectly fitted to the pilot of the stepping motors. (Excluding **PAL0P**)
● The motor installation screws are included.

For **TS** Geared Type

Material: Aluminum alloy
Surface treatment: Painting

Product Name	Motor Frame Size	Applicable Product
SOL0B	42 mm	**AZM46**
SOL2M4	60 mm	**AZM66**
SOL5M8	90 mm	**AZM98**

For **PS** Geared Type

Material: SS400
Surface treatment: Electroless nickel plating

Product Name	Motor Frame Size	Applicable Product
PFA28G	28 mm	**AZM24**
PFA42F	42 mm	**AZM46**
PLA60G	60 mm	**AZM66**
PLA90G	90 mm	**AZM98**

● The motor installation screws are included.

For Harmonic Geared Type

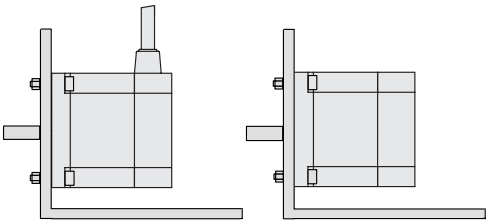
Material: SS400
Surface treatment: Electroless nickel plating

Product Name	Motor Frame Size	Applicable Product
PFA42H	42 mm	**AZM46**
PLA60H	60 mm	**AZM66**
PLA90H	90 mm	**AZM98**

● The motor installation screws are included.

Motor Installation Direction

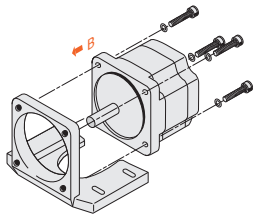
Since the cable comes out perpendicular with the motor, install the cable in a way that it faces upward or sideward.



Cable Facing Up　　Cable Facing Sideways

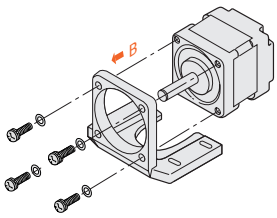
Installation Methods of the Motor

1 **PAL2P-5**, **SOL2M4** **PAL4P-5**, **SOL5M8**



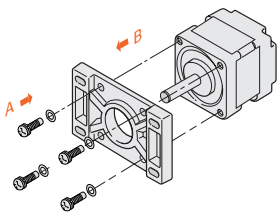
①Use the screws to secure the motor to the installation bracket.
②Install the motor from the direction shown by the arrow (B).

2 **PAL0P**, **SOL0B**



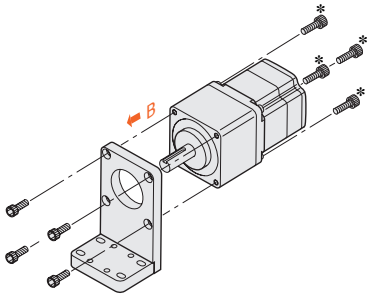
①Use the screws to secure the motor to the installation bracket.
②Install the motor from the direction shown by the arrow (B).

3 **PAF0P**, **PFB28A** **PFA28G**, **PFA42F** **PFA42H**



①Use the screws to secure the motor to the installation bracket.
②Install the motor from the direction shown by the arrow (A, B).

4 **PLA60G**, **PLA60H** **PLA90G**, **PLA90H**



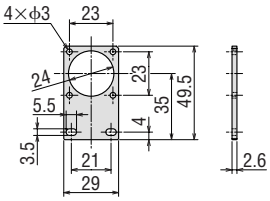
①Use the screws to secure the motor to the installation bracket.
②Install the motor from the direction shown by the arrow (B).
*For **PLA90H**, install the screws from (B) direction.

Dimensions (Unit=mm)

PFB28A

Mass: 25 g

2D CAD B645

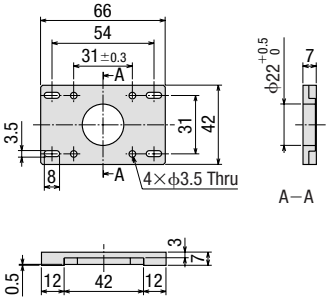


Installation screws: M2.5 Length 5 mm
4 pieces included

PAF0P

Mass: 30 g

2D CAD B140 3D CAD

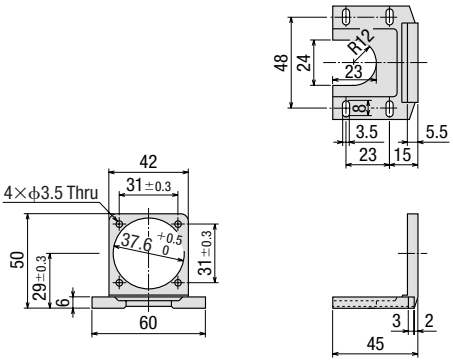


Installation screws: M3 Length 7 mm
4 pieces included

PAL0P

Mass: 35 g

2D CAD B139 3D CAD

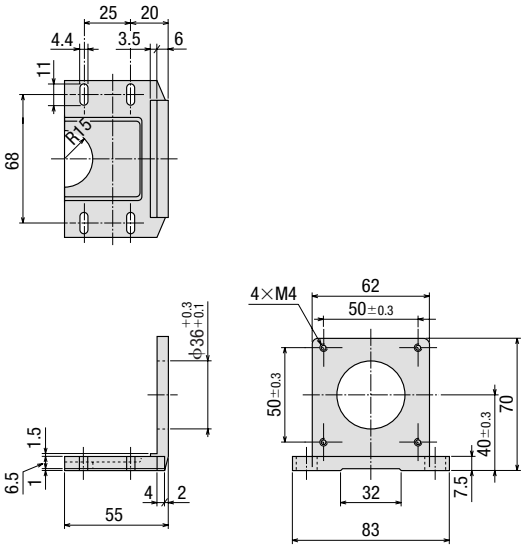


Installation screws: M3 Length 10 mm
4 pieces included

PAL2P-5

Mass: 110 g

2D CAD B143 3D CAD

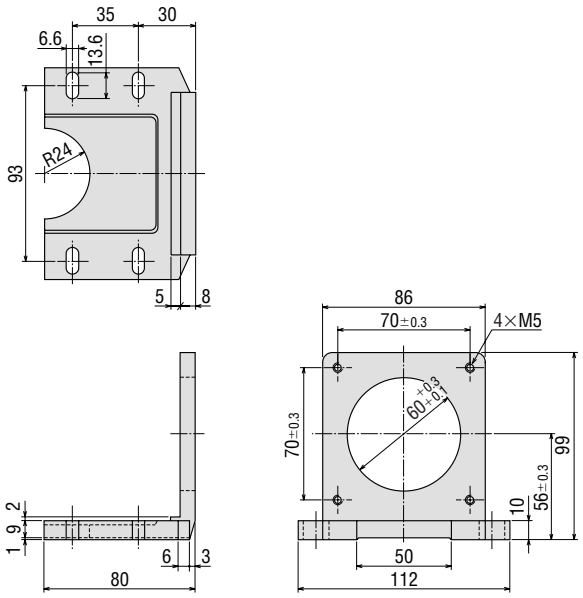


Installation screws: M4 Length 12 mm
4 pieces included

PAL4P-5

Mass: 250 g

2D CAD B145 3D CAD

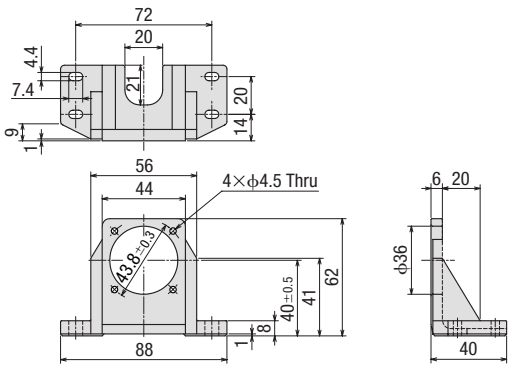


Installation screws: M5 Length 16 mm
4 pieces included

SOL0B

Mass: 85 g

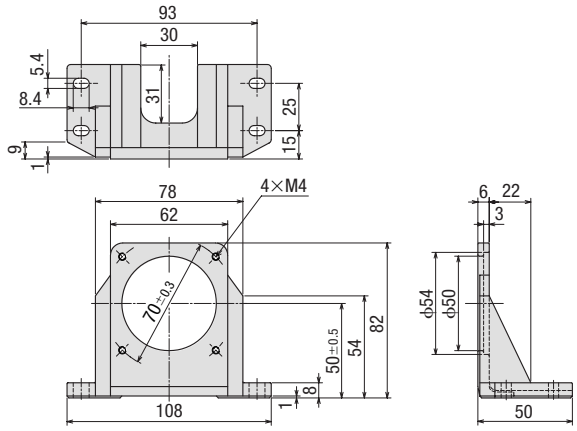
2D CAD B267 3D CAD



SOL2M4

Mass: 135 g

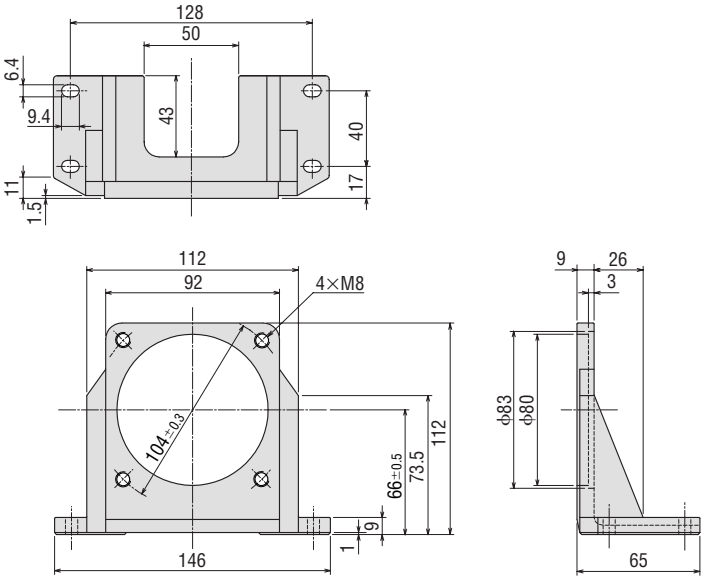
2D CAD A321 3D CAD



SOL5M8

Mass: 270 g

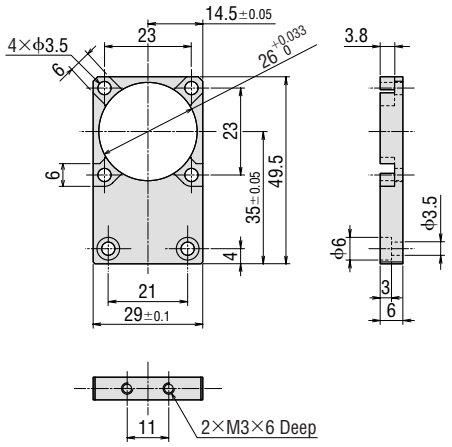
2D CAD A239 3D CAD



PFA28G

Mass: 40 g

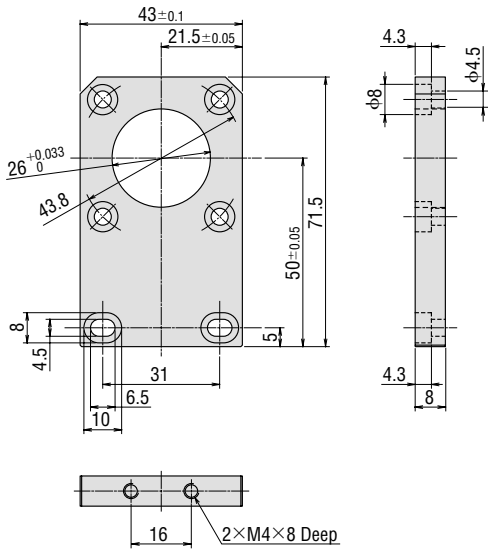
2D CAD B640



PFA42F

Mass: 150 g

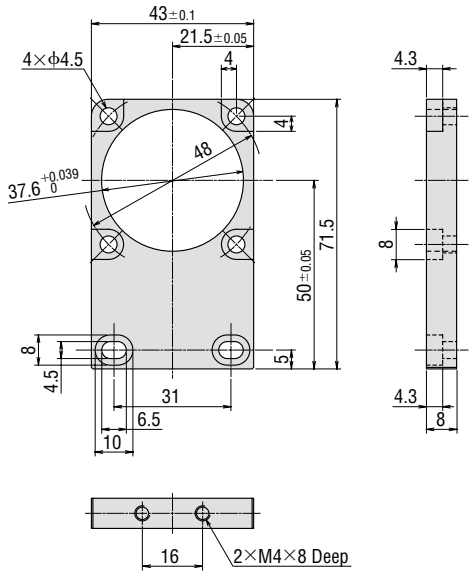
2D CAD B643



PFA42H

Mass: 120 g

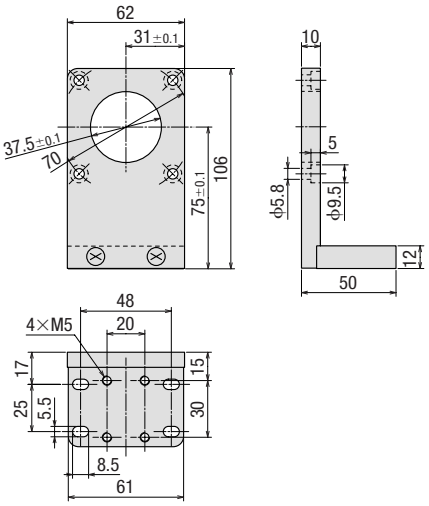
2D CAD B644



PLA60G

Mass: 0.7 kg

2D CAD B634

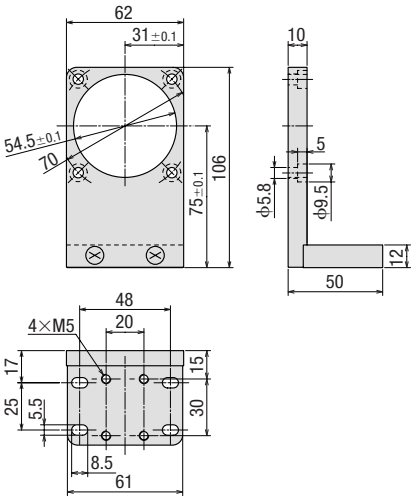


● Installation screws: M5 Length 15 mm
4 pieces included

PLA60H

Mass: 0.7 kg

2D CAD B635

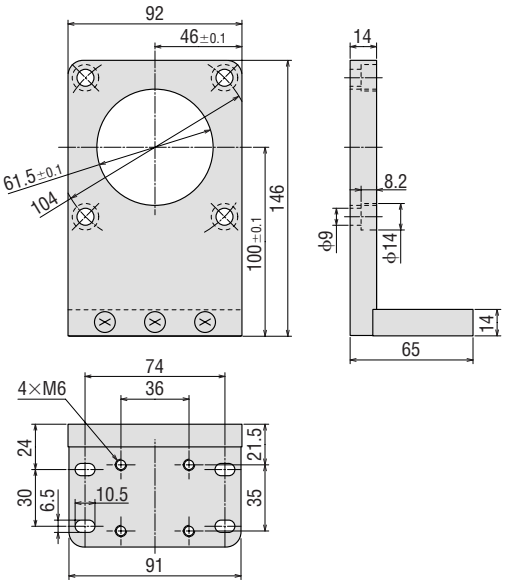


● Installation screws: M5 Length 15 mm
4 pieces included

PLA90G

Mass: 1.6 kg

2D CAD B637

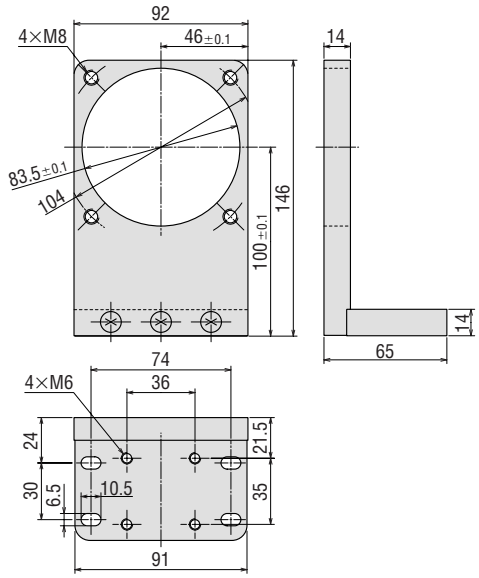


● Installation screws: M8 Length 20 mm
4 pieces included

PLA90H

Mass: 1.6 kg

2D CAD B638



● Installation screws: M8 Length 30 mm 4 pieces included
4 washers included

Regeneration Unit

During vertical drive (gravitational operation) or sudden start/stop in high inertia, an external force causes the motor to rotate and function as a power generator. When the regenerative power exceeds the driver's regenerative power absorption capacity, it may cause damage to the motor.
In such a case, the regeneration unit is connected to the driver to convert regenerative energy into thermal energy for dissipation.

Product Line

Product Name	Applicable Driver
RGB100	AC Power Supply Input Driver

Specifications

Items	Description
Continuous Regenerative Power	50 W
Resistance Value	150 Ω
Thermostat Operating Temperature	Operation: 150±7°C Reset: 145±12°C (Normally closed)
Thermostat Electrical Rating	120 VAC, 4 A 30 VDC, 4 A (Min. current 5 mA)

● Install the regeneration unit in the location that has the same heat radiation capability as the heat sink (Material: Aluminum 350×350 mm Thickness 3 mm).

Network Converters

The network converter converts host communication protocol to Oriental Motor's original RS-485 communication protocol. You can use a network converter to control Oriental Motor's RS-485-compatible products within the host communication environment.

NETC01-CC NETC02-CC NETC01-M2 NETC01-M3 NETC01-ECT

Product Line

Network Type	Product Name
CC-Link Ver.1.1-Compatible	**NETC01-CC**
CC-Link Ver.2-Compatible	**NETC02-CC**
MECHATROLINK-Ⅱ-Compatible	**NETC01-M2**
MECHATROLINK-Ⅲ-Compatible	**NETC01-M3**
Compatible with EtherCAT	**NETC01-ECT**

Controllers

Stored-Program Type Controllers
EMP400 Series

In addition to enhanced pulse oscillation functions that only a motor manufacturer can provide, this series adopts stored program type controllers that include I/O control functions and sequence functions that make programming sequential operations possible.

For Single Axis For Dual Axis Control Module (Sold separately)

Product Line

Product Name	Number of Axis	Connector
EMP401-1	Single Axis	–
EMP401-2		Included
EMP402-1	Dual Axis	–
EMP402-2		Included

● Control module **OP300**

Connector – Terminal Block Conversion Unit

The **EMP** Series half-pitch connector can be connected with the terminal block.
- Includes a signal name plate for easy, one-glance identification of signal names
- DIN-rail Installable

Product Line

Product Name	Number of Pins	Cable Length (m)
CC50T10E	50	1

Safety Precautions

- To ensure correct operation, carefully read the Operating Manual before using it.
- The products listed in this catalogue are for industrial use and for built-in component. Do not use for any other applications.

- The factories which manufacture the products listed in this catalogue have obtained Quality Management Systems ISO9001 and Environment Management Systems ISO14001.
- The content listed in this catalogue such as performance and specifications of the products are subject to change without notice for improvements.
- The price of all products listed in this catalogue does not include the consumption tax etc.
- For details of the products, please contact the nearest dealer, sales office or the following "Order Support Center" or "Customer Support Center".
- CC-Link is a registered trademark of CC-Link Partner Association.
- MECHATROLINK- Ⅱ is a registered trademark of YASUKAWA ELECTRIC CORPORATION.
- Modbus is a registered trademark of Schneider Automation Inc..
- Orientalmotor αSTEP and AFLEX are registered trademark or trademark of Oriental Motor in Japan and other countries.

Orientalmotor

ORIENTAL MOTOR ASIA PACIFIC PTE. LTD.

31 Kaki Bukit Road 3, #04-02/04
Techlink, Singapore 417818
TEL: +65-6745-7344 FAX: +65-6745-9405
http://www.orientalmotor.com.sg/

ORIENTAL MOTOR (THAILAND) CO., LTD.

Headquarters & Bangkok Office

900, 8th Floor Zone C, Tonson Tower, Ploenchit Road,
Lumpini, Pathumwan, Bangkok 10330 Thailand
TEL: +66-2-251-1871 FAX: +66-2-251-1872

Lamphun Office

238/4 Moo 4, Tambol Ban-Klang,
Amphur Muang, Lamphun 51000 Thailand
TEL: +66-(0)53-582-074 FAX: +66-(0)53-582-076
http://www.orientalmotor.co.th/

ORIENTAL MOTOR (INDIA) PVT. LTD.

No.810, 8th Floor, Prestige Meridian-1 No.29,
M.G.Road, Bangalore, 560001, India
TEL: +91-80-41125586 FAX: +91-80-41125588
http://www.orientalmotor.co.in/

ORIENTAL MOTOR (MALAYSIA) SDN. BHD.

Headquarters & Kuala Lumpur Office

A-13-1, North Point Offices, Mid Valley City,
No.1 Medan Syed Putra Utara 59200
Kuala Lumpur, Malaysia
TEL: +60-3-22875778 FAX: +60-3-22875528

Penang Office

1-4-14 Krystal Point II, Lebuh Bukit Kecil 6, Bayan Lepas,
11900 Penang, Malaysia
TEL: +60-4-6423788 FAX: +60-4-6425788

Customer Support Centre

TEL: For Singapore: 1800-8420280 (Toll Free)
For Malaysia: 1800-806161 (Toll Free)
For Thailand: 1800-888881 (Toll Free)
For India: 1800-1201995 (Toll Free)
For Other Countries: +65-6842-0280
Mail to: support@orientalmotor.com.sg

Japanese Customer Support Centre

TEL: +65-6745-3008
Mail to: j-support@orientalmotor.com.sg

For more information please contact:

Printed in Singapore 17S 5K 2300Y SVPD26B