Oriental motor

NEW PRODUCTS

## Stepping Motor and Driver Package αSTEP

# High-Efficiency AR Series DC Power-Supply Input

FLEX Built-in Controller Type

Pulse Input Type

The extensive **AR** Series DC Power-Supply Input lineup that utilizes high-efficiency technology. Two types are available: the built-in controller type equipped with interfaces that connect to a wide variety of host systems and the pulse input type that enables the motor to be controlled from a pulse generator provided by the customer.

# Built-in Controller Drivers Support FLEX, a Feature That Enables You to Select the Control Method in Accordance with Your Operation System.

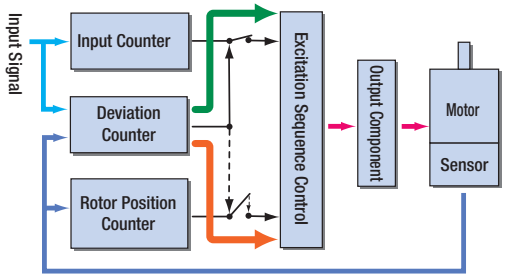
What is FLEX?

FLEX is a general name for products that support FA network control via I/O control, Modbus (RTU) control, and network converters.
It makes connections and controls easy and reduces the total lead time for building systems.

## Our Unique Closed Loop Control Providing High Reliability

### Continues Operation Even During Abrupt Load Changes and Accelerations

During normal operation, the motor operates synchronously with command pulses in open loop mode. When an overload condition is detected, the motor instantly switches to closed loop mode to correct the rotor position.

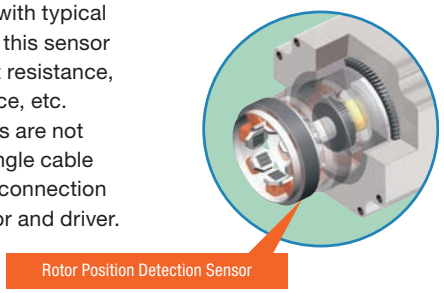



**Normal (Positioning deviation is less than ±1.8°)**
Motor runs in open loop mode like a stepping motor.

**Overload Condition (Positioning deviation is ±1.8° or more)**
The closed loop mode is engaged to maintain the positioning operation.

### Rotor Position Detection Sensor (Resolver)

- The sensor is compact and slim, making the overall length of the motor shorter.
- When compared with typical optical encoders, this sensor is superior in heat resistance, vibration resistance, etc.
- As encoder cables are not needed, only a single cable is needed for the connection between the motor and driver.




### Alarm Signal Output in Case of Abnormality

If an overload is applied continuously, an alarm signal is output. When the positioning is complete, an END signal is output. This ensures the same level of reliability achieved by a servo motor.

### Also Supports Absolute Systems

You can build an absolute system that detects absolute positions by connecting the accessory battery (sold separately). (available only on the built-in controller type)

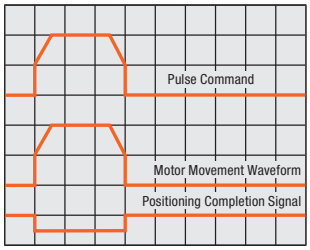
Battery Set (Sold separately)

## Stepping Motor Advantages

### Excellent Synchronicity and High Response Operation

◇Frequent Starting and Stopping

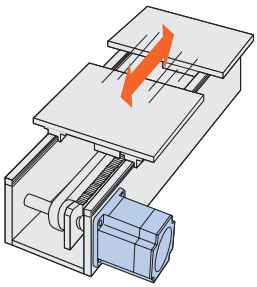
Since they operate synchronously with pulse commands and generate high torque with a compact body, stepping motors offer excellent acceleration performance and response.
They are ideal for applications requiring frequent starting and stopping.




Measurement Condition: Feed 1/5 rotation
Inertial Load: $250\times10^{-7}$kg·m$^2$(J)

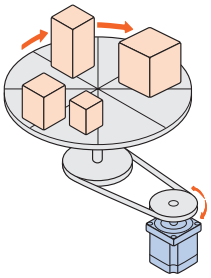
### No Tuning

Positioning is still possible without gain tuning even when the load fluctuates due to use of a belt mechanism, cam or chain drive, etc.



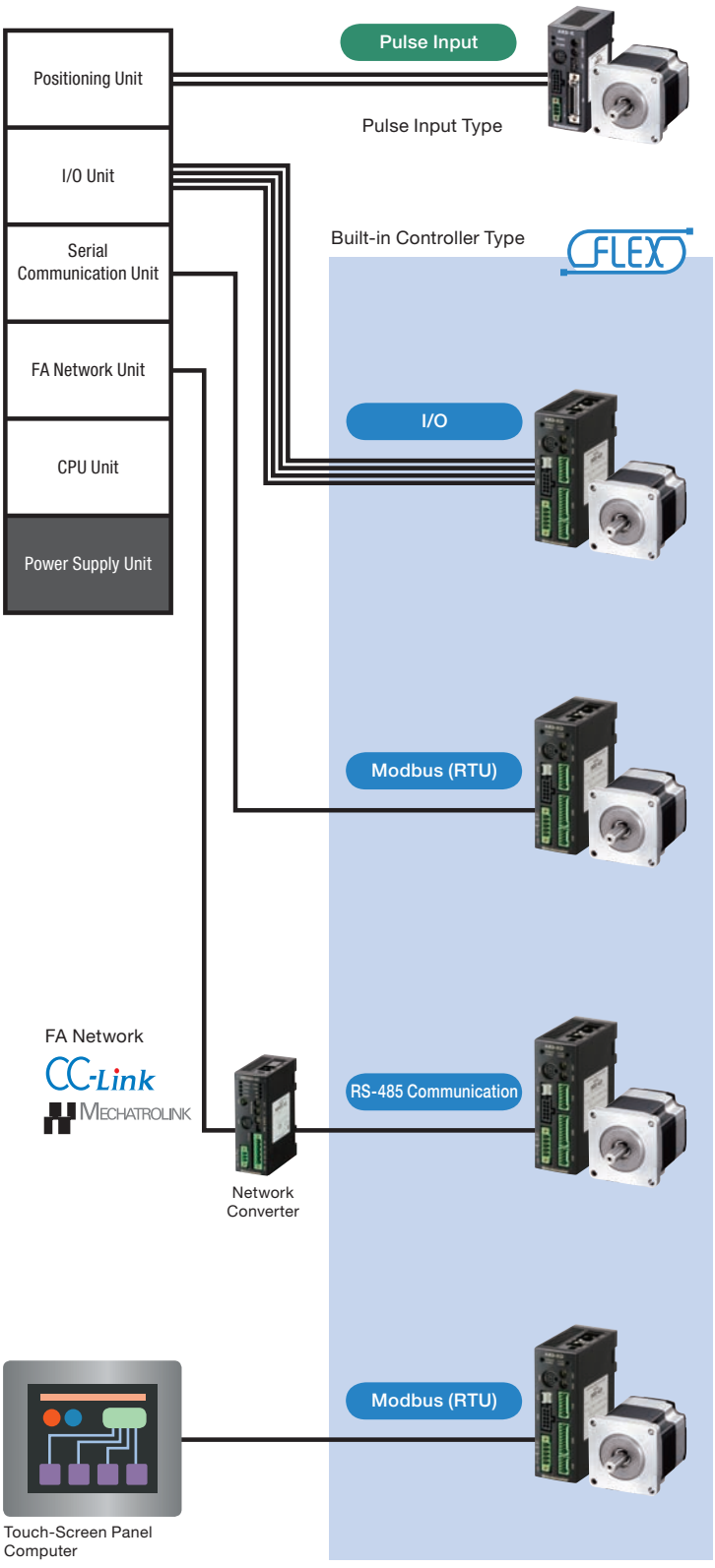
### Holding the Stop Position

During positioning, the motor stops with its own holding torque without hunting. Accordingly, stepping motors are ideal for applications where the low rigidity of the mechanism requires absence of vibration upon stop.

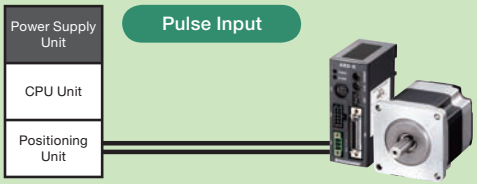


# Connects to a Wide Variety of Host Systems

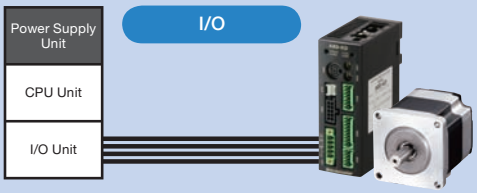
## Select the Control Method in Accordance with Your Operation System



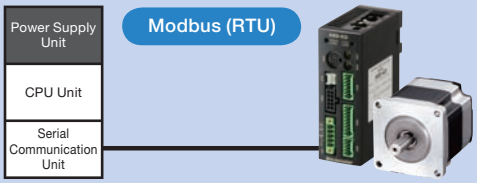

## ◇Representative Systems




The motor can be controlled using a pulse generator provided by the customer. Operating data registered in the pulse generator is selected from the PLC to operate the motor.




The function of a built-in pulse generator lets you build an operation system by connecting directly to a PLC. Since no separate pulse generator is required, the drivers of this type save space and simplify systems.




Through RS-485 communication, you can set operating data and parameters and input operation commands. Up to 31 drivers can be connected to a single serial unit. The unit also has a feature for starting multiple axes simultaneously. The unit supports the Modbus (RTU) protocol, which makes it easy to connect a PLC or similar device to the driver.

By using a Network Converter (sold separately), you can use CC-Link communication and MECHATROLINK communication. Over these links, operating data and parameters can be set, and operation commands can be sent to the driver.

The following products are available for setting data on built-in controller drivers.

**Control Module**
**OPX-2A**
(sold separately)
(➜ Page 53)

or

**Data Setting Software**
**MEXE02**
(➜ Page 54)

**Computer**

You can use these to set drivers' internal parameters and set and change data. You can also use these to set speeds, monitor the I/O, and perform teaching.

# Highly Functional, Compact Driver

## Compact DC Power-Supply Input Driver

The compact DC power input driver makes it possible to reduce the space needed for installing control boxes and devices. The driver can be mounted directly to a DIN rail, so no screws are necessary.

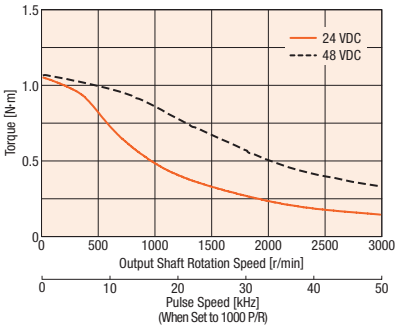
Built-in Controller Type

Pulse Input Type

## 48 VDC Compatible

The motor runs on a 24 VDC or 48 VDC power supply. Choose the power supply that you have available. The torque is higher when 48 VDC is used rather than 24 VDC. (□28 only accepts 24 VDC input.)

**AR66SAK-◇**

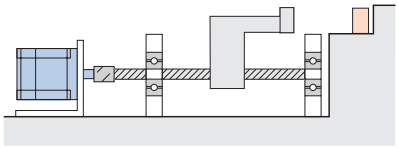



## Push-Motion Operation

A force is continuously applied to the load. When contact is made with the load, the motor switches to push-motion operation and applies constant torque to the load.

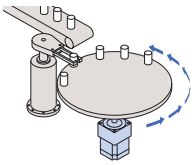
Note

- Push-motion operation requires a data module **OPX-2A** (sold separately) or data setting software **MEXE02**.
- Do not perform push-motion operation using geared motors. Doing so may damage the motor or gearhead.



## Position Control in the Same Direction

The round feature enables you to control positioning even in an application where positioning is repeated in the same direction (available only on the built-in controller type).



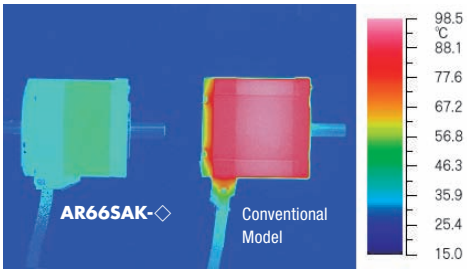
✻Building an absolute system requires an accessory battery (sold separately).

# Continuous Operation is Achieved Due to the Reduction of Motor Heat Generation by Utilizing High-Efficiency Technology.

## Lower Heat Generation

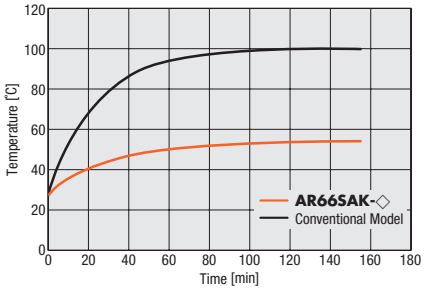
Significant reduction in heat generation has been achieved through high-efficiency technology.

Temperature Distribution by Thermography




Comparison under the Same Conditions.

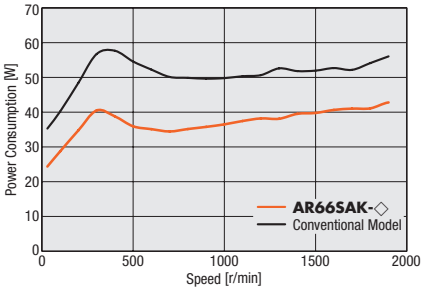
Motor Case Temperature under Same Operating Conditions




## Energy Savings

The power consumption is 30% less than a conventional model (also by Oriental Motor).

Power Consumption

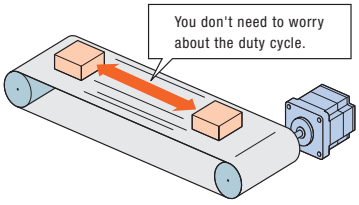



$CO_2$ emission: 30% less✻ than a conventional model (also by Oriental Motor)

✻Assuming operation at a duty of 40%

## Continuous Operation (Operation at high frequency)

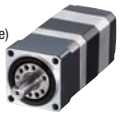
The AR Series can be operated at high frequency.
You can drive the motor continuously.




Note

When the motor is operated continuously, a heat sink of a capacity at least equivalent to an aluminum plate with a size of 100×100 mm, 6 mm thick is required.

## Types and Features of Standard and Geared Motors

| | Type | Feature | Gear Ratio | Permissible Torque and Maximum Torque[N·m] | Backlash [min] | Basic Resolution [°/Pulse] | Output Shaft Rotation Speed[r/min] |
|---|---|---|---|---|---|---|---|
| | Standard Type | ● **AR** Series standard model | —— | Max. Holding Torque 2 | —— | 0.36 | 4000 |
| Low Backlash | **TH** Geared Type (Spur gear mechanism) | ● High speed (Low gear ratio) | 1:3.6, 1:7.2, 1:10, 1:20, 1:30 (A wide variety of gear ratios for selecting the desired step angle (Resolution)) | 12 | 45 | 0.012 | 500 |
| Low Backlash | **PS** Geared Type (Planetary gear mechanism) | ● High speed (Low gear ratio)<br>● High permissible torque<br>● High maximum torque<br>● Center shaft | 1:5, 1:7.2, 1:10, 1:25, 1:36, 1:50 (A wide variety of gear ratios for selecting the desired step angle (Resolution)) | Permissible Torque 37 Maximum Torque 60 | 35 | 0.0072 | 600 |
| Non-Backlash | **PN** Geared Type (Planetary gear mechanism) | ● High speed (Low gear ratio)<br>● High positioning accuracy<br>● High permissible torque<br>● High maximum torque<br>● Center shaft | 1:5, 1:7.2, 1:10, 1:25, 1:36, 1:50 (A wide variety of gear ratios for selecting the desired step angle (Resolution)) | Permissible Torque 37 Maximum Torque 60 | 3 | 0.0072 | 600 |
| Non-Backlash | Harmonic Geared Type (Harmonic drive)  | ● High resolution (High gear ratio)<br>● High positioning accuracy<br>● High permissible torque<br>● High maximum torque<br>● Center shaft | 1:50, 1:100 | Permissible Torque 37 Maximum Torque 55 | 0 | 0.0036 | 70 |

Note

● The values shown above must be used as reference. These values vary depending on the motor frame size and gear ratio.

## Frame Sizes

Four motor frame sizes are available for the built-in controller type and for the pulse input type.

(□42 : indicates a motor frame size of 42 mm)

| Motor Type | | □28 (□30*1) | □42 | □60 | □85 (□90*2) |
|---|---|---|---|---|---|
| Standard Type | Without Electromagnetic Brake | ● | ● | ● | ● |
| | Electromagnetic Brake Type | | ● | ● | ● |
| **TH**, **PS**, **PN**, Harmonic Geared Type | Without Electromagnetic Brake | ● | ● | ● | ● |
| | Electromagnetic Brake Type | | ● | ● | ● |

*1 Harmonic geared type

*2 Geared type

## Conformance to Various Directives

### ◇CE Marking

This product has CE Marking affixed under the EMC Directive and Low Voltage Directive.

| Product | CE Marking |
|---|---|
| Motor | Low Voltage Directive EMC Directive |
| Driver | |

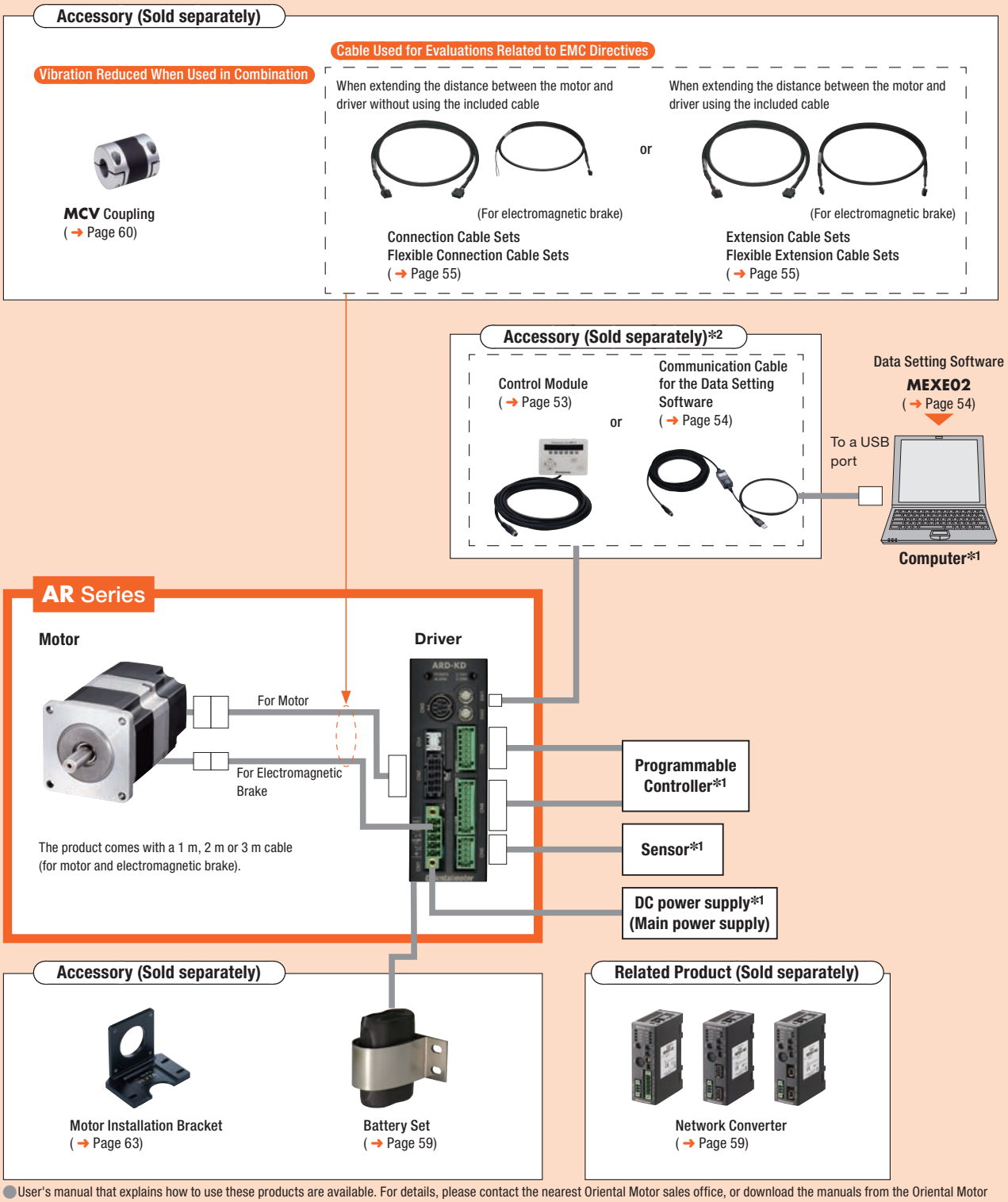
● The EMC value changes according to the wiring and layout. Therefore, the final level must be checked with the product incorporated in the user's equipment.

# System Configuration

## Built-in Controller Type - Standard Type with Electromagnetic Brake

An example of system configuration with I/O control or RS-485 communication is shown below.

*1 Not supplied.
*2 Required for I/O control drive.




User's manual that explains how to use these products are available. For details, please contact the nearest Oriental Motor sales office, or download the manuals from the Oriental Motor website. http://www.orientalmotor.com.sg/

### System Configuration Example

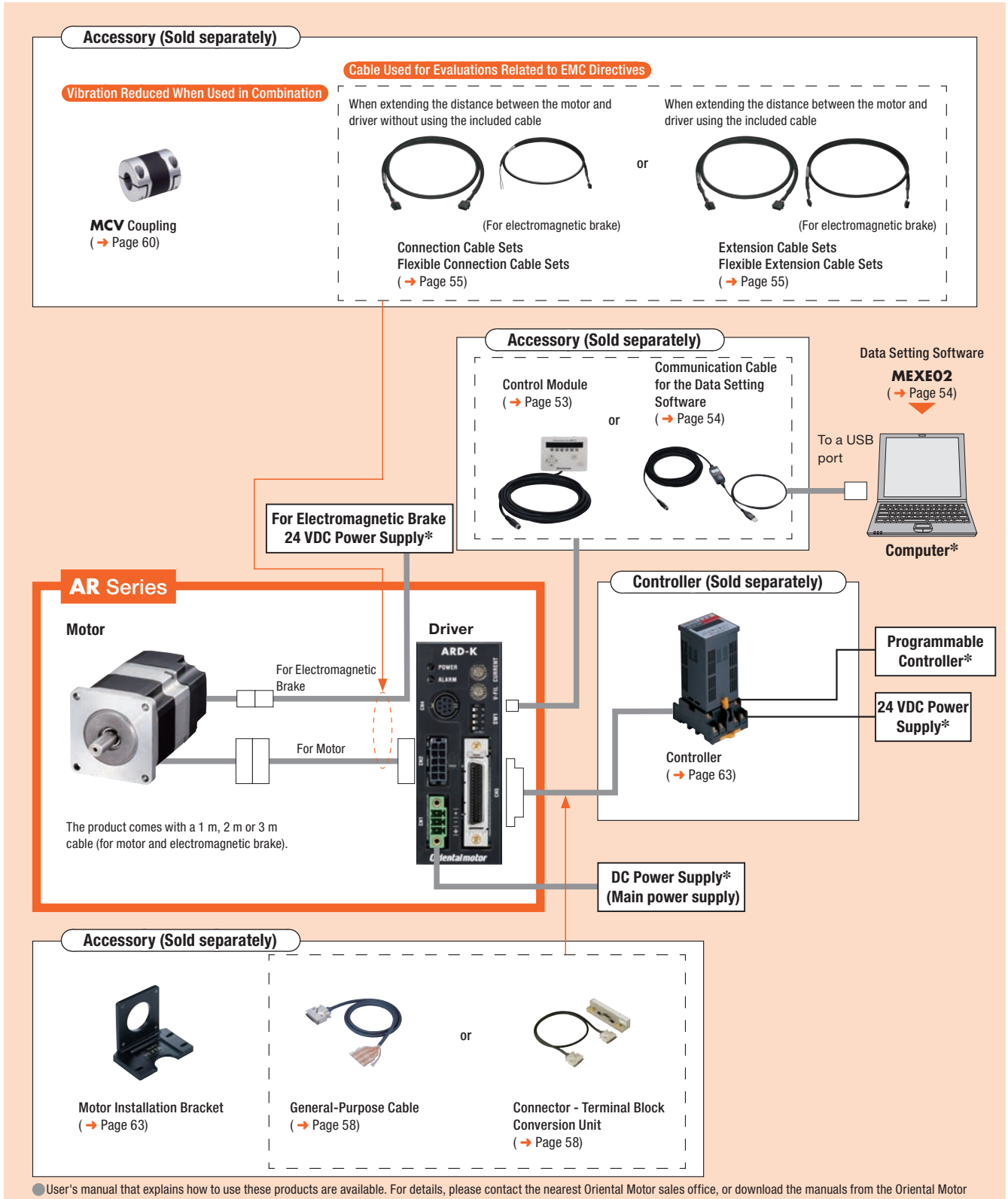
| AR Series | | Sold Separately | |
|---|---|---|---|
| | | Motor Installation Bracket | Flexible Coupling |
| AR66SMKD-3 | + | PAL2P-5 | MCV251010 |

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

## Pulse Input Type - Standard Type with Electromagnetic Brake

An example of a single-axis system configuration with the **PG1200** controller is shown below.

*Not supplied.




User's manual that explains how to use these products are available. For details, please contact the nearest Oriental Motor sales office, or download the manuals from the Oriental Motor website. http://www.orientalmotor.com.sg/

### System Configuration Example

| AR Series | + | Sold Separately | | | |
|---|---|---|---|---|---|
| | | Controller | Motor Installation Bracket | Flexible Coupling | Connector – Terminal Block Conversion Unit (1 m) |
| AR66SMK-3 | | PG1200 | PAL2P-5 | MCV251010 | CC36T1 |

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

## Product Number Code

**AR 6 6 S A K D - PS 10 - 1**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

| | | |
|---|---|---|
| ① | Series Name | **AR**: **AR** Series |
| ② | Motor Frame Size | **2**: 28 mm (30 mm) **4**: 42 mm<br>**6**: 60 mm **9**: 85 mm (90 mm) |
| ③ | Motor Case Length | |
| ④ | Motor Classification | |
| ⑤ | Configuration | **A**: Standard (Single shaft)<br>**B**: Standard (Double shaft)<br>**M**: Electromagnetic Brake Type |
| ⑥ | Power Supply Input | **K**: DC Power Supply |
| ⑦ | Driver Type | **D**: Built-in Controller Type<br>Blank: Pulse Input Type |
| ⑧ | Gear Type | Blank: Standard Type<br>**T**: **TH** Geared Type<br>**PS**: **PS** Geared Type<br>**N**: **PN** Geared Type<br>**H**: Harmonic Geared Type |
| ⑨ | Gear Ratio | |
| ⑩ | Cable Length (Included) | **1**: 1 m **2**: 2 m **3**: 3 m |

## Product Line

### Built-in Controller Type

#### ◇Standard Type

| Product Name (Single shaft) | Product Name (Double shaft) |
|---|---|
| **AR24SAKD-◇** | **AR24SBKD-◇** |
| **AR26SAKD-◇** | **AR26SBKD-◇** |
| **AR46SAKD-◇** | **AR46SBKD-◇** |
| **AR66SAKD-◇** | **AR66SBKD-◇** |
| **AR69SAKD-◇** | **AR69SBKD-◇** |
| **AR98SAKD-◇** | **AR98SBKD-◇** |

#### ◇Standard Type with Electromagnetic Brake

| Product Name |
|---|
| **AR46SMKD-◇** |
| **AR66SMKD-◇** |
| **AR69SMKD-◇** |
| **AR98SMKD-◇** |

#### ◇**TH** Geared Type / ◇**TH** Geared Type with Electromagnetic Brake

| Product Name | Product Name |
|---|---|
| **AR24SAKD-T7.2-◇**<br>**AR24SAKD-T10-◇**<br>**AR24SAKD-T20-◇**<br>**AR24SAKD-T30-◇** | – |
| **AR46SAKD-T3.6-◇** | **AR46SMKD-T3.6-◇** |
| **AR46SAKD-T7.2-◇** | **AR46SMKD-T7.2-◇** |
| **AR46SAKD-T10-◇** | **AR46SMKD-T10-◇** |
| **AR46SAKD-T20-◇** | **AR46SMKD-T20-◇** |
| **AR46SAKD-T30-◇** | **AR46SMKD-T30-◇** |
| **AR66SAKD-T3.6-◇** | **AR66SMKD-T3.6-◇** |
| **AR66SAKD-T7.2-◇** | **AR66SMKD-T7.2-◇** |
| **AR66SAKD-T10-◇** | **AR66SMKD-T10-◇** |
| **AR66SAKD-T20-◇** | **AR66SMKD-T20-◇** |
| **AR66SAKD-T30-◇** | **AR66SMKD-T30-◇** |
| **AR98SAKD-T3.6-◇** | **AR98SMKD-T3.6-◇** |
| **AR98SAKD-T7.2-◇** | **AR98SMKD-T7.2-◇** |
| **AR98SAKD-T10-◇** | **AR98SMKD-T10-◇** |
| **AR98SAKD-T20-◇** | **AR98SMKD-T20-◇** |
| **AR98SAKD-T30-◇** | **AR98SMKD-T30-◇** |

#### ◇**PS** Geared Type / ◇**PS** Geared Type with Electromagnetic Brake

| Product Name | Product Name |
|---|---|
| **AR24SAKD-PS5-◇**<br>**AR24SAKD-PS7-◇**<br>**AR24SAKD-PS10-◇** | – |
| **AR46SAKD-PS5-◇** | **AR46SMKD-PS5-◇** |
| **AR46SAKD-PS7-◇** | **AR46SMKD-PS7-◇** |
| **AR46SAKD-PS10-◇** | **AR46SMKD-PS10-◇** |
| **AR46SAKD-PS25-◇** | **AR46SMKD-PS25-◇** |
| **AR46SAKD-PS36-◇** | **AR46SMKD-PS36-◇** |
| **AR46SAKD-PS50-◇** | **AR46SMKD-PS50-◇** |
| **AR66SAKD-PS5-◇** | **AR66SMKD-PS5-◇** |
| **AR66SAKD-PS7-◇** | **AR66SMKD-PS7-◇** |
| **AR66SAKD-PS10-◇** | **AR66SMKD-PS10-◇** |
| **AR66SAKD-PS25-◇** | **AR66SMKD-PS25-◇** |
| **AR66SAKD-PS36-◇** | **AR66SMKD-PS36-◇** |
| **AR66SAKD-PS50-◇** | **AR66SMKD-PS50-◇** |
| **AR98SAKD-PS5-◇** | **AR98SMKD-PS5-◇** |
| **AR98SAKD-PS7-◇** | **AR98SMKD-PS7-◇** |
| **AR98SAKD-PS10-◇** | **AR98SMKD-PS10-◇** |
| **AR98SAKD-PS25-◇** | **AR98SMKD-PS25-◇** |
| **AR98SAKD-PS36-◇** | **AR98SMKD-PS36-◇** |
| **AR98SAKD-PS50-◇** | **AR98SMKD-PS50-◇** |

#### ◇**PN** Geared Type / ◇**PN** Geared Type with Electromagnetic Brake

| Product Name | Product Name |
|---|---|
| **AR24SAKD-N5-◇**<br>**AR24SAKD-N7.2-◇**<br>**AR24SAKD-N10-◇** | – |
| **AR46SAKD-N5-◇** | **AR46SMKD-N5-◇** |
| **AR46SAKD-N7.2-◇** | **AR46SMKD-N7.2-◇** |
| **AR46SAKD-N10-◇** | **AR46SMKD-N10-◇** |
| **AR66SAKD-N5-◇** | **AR66SMKD-N5-◇** |
| **AR66SAKD-N7.2-◇** | **AR66SMKD-N7.2-◇** |
| **AR66SAKD-N10-◇** | **AR66SMKD-N10-◇** |
| **AR66SAKD-N25-◇** | **AR66SMKD-N25-◇** |
| **AR66SAKD-N36-◇** | **AR66SMKD-N36-◇** |
| **AR66SAKD-N50-◇** | **AR66SMKD-N50-◇** |
| **AR98SAKD-N5-◇** | **AR98SMKD-N5-◇** |
| **AR98SAKD-N7.2-◇** | **AR98SMKD-N7.2-◇** |
| **AR98SAKD-N10-◇** | **AR98SMKD-N10-◇** |
| **AR98SAKD-N25-◇** | **AR98SMKD-N25-◇** |
| **AR98SAKD-N36-◇** | **AR98SMKD-N36-◇** |
| **AR98SAKD-N50-◇** | **AR98SMKD-N50-◇** |

◇Harmonic Geared Type

| Product Name |
|---|
| **AR24SAKD-H50-◇** |
| **AR24SAKD-H100-◇** |
| **AR46SAKD-H50-◇** |
| **AR46SAKD-H100-◇** |
| **AR66SAKD-H50-◇** |
| **AR66SAKD-H100-◇** |
| **AR98SAKD-H50-◇** |
| **AR98SAKD-H100-◇** |

◇Harmonic Geared Type with Electromagnetic Brake

| Product Name |
|---|
| – |
| **AR46SMKD-H50-◇** |
| **AR46SMKD-H100-◇** |
| **AR66SMKD-H50-◇** |
| **AR66SMKD-H100-◇** |
| **AR98SMKD-H50-◇** |
| **AR98SMKD-H100-◇** |

●A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
Select a desired cable length from 1 m, 2 m and 3 m.

## ●Pulse Input Type

### ◇Standard Type

| Product Name (Single shaft) | Product Name (Double shaft) |
|---|---|
| **AR24SAK-◇** | **AR24SBK-◇** |
| **AR26SAK-◇** | **AR26SBK-◇** |
| **AR46SAK-◇** | **AR46SBK-◇** |
| **AR66SAK-◇** | **AR66SBK-◇** |
| **AR69SAK-◇** | **AR69SBK-◇** |
| **AR98SAK-◇** | **AR98SBK-◇** |

### ◇Standard Type with Electromagnetic Brake

| Product Name |
|---|
| **AR46SMK-◇** |
| **AR66SMK-◇** |
| **AR69SMK-◇** |
| **AR98SMK-◇** |

◇**TH** Geared Type

| Product Name |
|---|
| **AR24SAK-T7.2-◇** |
| **AR24SAK-T10-◇** |
| **AR24SAK-T20-◇** |
| **AR24SAK-T30-◇** |
| **AR46SAK-T3.6-◇** |
| **AR46SAK-T7.2-◇** |
| **AR46SAK-T10-◇** |
| **AR46SAK-T20-◇** |
| **AR46SAK-T30-◇** |
| **AR66SAK-T3.6-◇** |
| **AR66SAK-T7.2-◇** |
| **AR66SAK-T10-◇** |
| **AR66SAK-T20-◇** |
| **AR66SAK-T30-◇** |
| **AR98SAK-T3.6-◇** |
| **AR98SAK-T7.2-◇** |
| **AR98SAK-T10-◇** |
| **AR98SAK-T20-◇** |
| **AR98SAK-T30-◇** |

◇**TH** Geared Type with Electromagnetic Brake

| Product Name |
|---|
| – |
| **AR46SMK-T3.6-◇** |
| **AR46SMK-T7.2-◇** |
| **AR46SMK-T10-◇** |
| **AR46SMK-T20-◇** |
| **AR46SMK-T30-◇** |
| **AR66SMK-T3.6-◇** |
| **AR66SMK-T7.2-◇** |
| **AR66SMK-T10-◇** |
| **AR66SMK-T20-◇** |
| **AR66SMK-T30-◇** |
| **AR98SMK-T3.6-◇** |
| **AR98SMK-T7.2-◇** |
| **AR98SMK-T10-◇** |
| **AR98SMK-T20-◇** |
| **AR98SMK-T30-◇** |

◇Harmonic Geared Type

| Product Name |
|---|
| **AR24SAK-H50-◇** |
| **AR24SAK-H100-◇** |
| **AR46SAK-H50-◇** |
| **AR46SAK-H100-◇** |
| **AR66SAK-H50-◇** |
| **AR66SAK-H100-◇** |
| **AR98SAK-H50-◇** |
| **AR98SAK-H100-◇** |

◇Harmonic Geared Type with Electromagnetic Brake

| Product Name |
|---|
| – |
| **AR46SMK-H50-◇** |
| **AR46SMK-H100-◇** |
| **AR66SMK-H50-◇** |
| **AR66SMK-H100-◇** |
| **AR98SMK-H50-◇** |
| **AR98SMK-H100-◇** |

●A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
Select a desired cable length from 1 m, 2 m and 3 m.

The following items are included in each product.

Motor, Driver, Cable for Motor, Cable for Electromagnetic Brake*, Connector for Input Signal, Connector for Output Signal, Sensor Signal Connector, Power Input Terminal Connector, Operating Manual

●The product comes with a 1 m, 2 m or 3 m cable for motor and cable for electromagnetic brake*.
If you need cables longer than 3 m or cables offering excellent flexibility, select appropriate cables from the accessories (sold separately).
For details, refer to Page 55.

*Only for electromagnetic brake type.

◇**PS** Geared Type

| Product Name |
|---|
| **AR24SAK-PS5-◇** |
| **AR24SAK-PS7-◇** |
| **AR24SAK-PS10-◇** |
| **AR46SAK-PS5-◇** |
| **AR46SAK-PS7-◇** |
| **AR46SAK-PS10-◇** |
| **AR46SAK-PS25-◇** |
| **AR46SAK-PS36-◇** |
| **AR46SAK-PS50-◇** |
| **AR66SAK-PS5-◇** |
| **AR66SAK-PS7-◇** |
| **AR66SAK-PS10-◇** |
| **AR66SAK-PS25-◇** |
| **AR66SAK-PS36-◇** |
| **AR66SAK-PS50-◇** |
| **AR98SAK-PS5-◇** |
| **AR98SAK-PS7-◇** |
| **AR98SAK-PS10-◇** |
| **AR98SAK-PS25-◇** |
| **AR98SAK-PS36-◇** |
| **AR98SAK-PS50-◇** |

◇**PS** Geared Type with Electromagnetic Brake

| Product Name |
|---|
| – |
| **AR46SMK-PS5-◇** |
| **AR46SMK-PS7-◇** |
| **AR46SMK-PS10-◇** |
| **AR46SMK-PS25-◇** |
| **AR46SMK-PS36-◇** |
| **AR46SMK-PS50-◇** |
| **AR66SMK-PS5-◇** |
| **AR66SMK-PS7-◇** |
| **AR66SMK-PS10-◇** |
| **AR66SMK-PS25-◇** |
| **AR66SMK-PS36-◇** |
| **AR66SMK-PS50-◇** |
| **AR98SMK-PS5-◇** |
| **AR98SMK-PS7-◇** |
| **AR98SMK-PS10-◇** |
| **AR98SMK-PS25-◇** |
| **AR98SMK-PS36-◇** |
| **AR98SMK-PS50-◇** |

◇**PN** Geared Type

| Product Name |
|---|
| **AR24SAK-N5-◇** |
| **AR24SAK-N7.2-◇** |
| **AR24SAK-N10-◇** |
| **AR46SAK-N5-◇** |
| **AR46SAK-N7.2-◇** |
| **AR46SAK-N10-◇** |
| **AR66SAK-N5-◇** |
| **AR66SAK-N7.2-◇** |
| **AR66SAK-N10-◇** |
| **AR66SAK-N25-◇** |
| **AR66SAK-N36-◇** |
| **AR66SAK-N50-◇** |
| **AR98SAK-N5-◇** |
| **AR98SAK-N7.2-◇** |
| **AR98SAK-N10-◇** |
| **AR98SAK-N25-◇** |
| **AR98SAK-N36-◇** |
| **AR98SAK-N50-◇** |

◇**PN** Geared Type with Electromagnetic Brake

| Product Name |
|---|
| – |
| **AR46SMK-N5-◇** |
| **AR46SMK-N7.2-◇** |
| **AR46SMK-N10-◇** |
| **AR66SMK-N5-◇** |
| **AR66SMK-N7.2-◇** |
| **AR66SMK-N10-◇** |
| **AR66SMK-N25-◇** |
| **AR66SMK-N36-◇** |
| **AR66SMK-N50-◇** |
| **AR98SMK-N5-◇** |
| **AR98SMK-N7.2-◇** |
| **AR98SMK-N10-◇** |
| **AR98SMK-N25-◇** |
| **AR98SMK-N36-◇** |
| **AR98SMK-N50-◇** |

The following items are included in each product.

Motor, Driver, Cable for Motor, Cable for Electromagnetic Brake*, I/O signal Connector, Main Power Supply Input and Frame Ground Terminal Connectors, Surge Suppressor*, Operating Manual

●The product comes with a 1 m, 2 m or 3 m cable for motor and cable for electromagnetic brake*.
If you need cables longer than 3 m or cables offering excellent flexibility, select appropriate cables from the accessories (sold separately).
For details, refer to Page 55.

*Only for electromagnetic brake type.

# Standard Type Frame Size 28 mm, 42 mm, 60 mm, 85 mm

## Specifications RoHS

CE

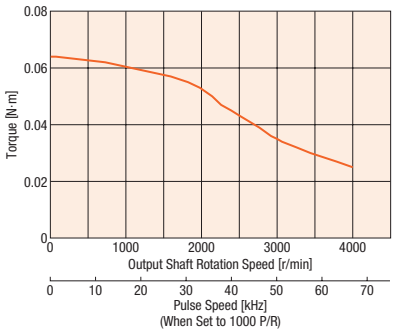
| Product Name | Built-in Controller | AR24S□KD-◇ | AR26S□KD-◇ | AR46S□KD-◇ | AR66S□KD-◇ | AR69S□KD-◇ | AR98S□KD-◇ |
|---|---|---|---|---|---|---|---|
| | Pulse Input | AR24S□K-◇ | AR26S□K-◇ | AR46S□K-◇ | AR66S□K-◇ | AR69S□K-◇ | AR98S□K-◇ |
| Max. Holding Torque | N·m | 0.055 | 0.12 | 0.3 | 1 | 2 | |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 0.027 | 0.06 | 0.15 | 0.5 | 1 | |
| | Electromagnetic Brake N·m | – | – | 0.15 | 0.5 | 1 | |
| Rotor Inertial Moment | J: kg·m$^2$ | $11\times10^{-7}$ | $20\times10^{-7}$ | $58\times10^{-7}$ [$73\times10^{-7}$]*1 | $380\times10^{-7}$ [$500\times10^{-7}$]*1 | $750\times10^{-7}$ [$870\times10^{-7}$]*1 | $1100\times10^{-7}$ [$1220\times10^{-7}$]*1 |
| Resolution | When Set to 1000P/R | 0.36°/Pulse | | | | | |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%)*2 | | 24 VDC±10% (24 VDC±5%)*2/ 48 VDC±5% | 24 VDC±10% (24 VDC±5%)*2/48 VDC±5%*3 | | |
| | Input Current A | 0.9 (1.3)*2 | | 1.4 (1.8)*2 | 3.1 (3.8)*2 | 3.0 (3.7)*2 | 2.5 (3.1)*2 |
| Electromagnetic Brake*4 | Power Supply Input | – | | 24 VDC±5%*5 0.08A | 24 VDC±5%*5 0.25A | | |

● Either **A** (single shaft), **B** (double shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
Either **A** (Single shaft) or **B** (Double shaft) indicating the configuration is entered in the box where □ is located within the **AR24** and **AR26** product names.
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

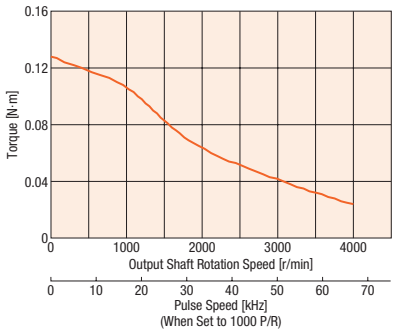
*1 The brackets [ ] indicate the specifications for the electromagnetic brake type.
*2 The parentheses () indicate the specifications for the built-in controller type.
*3 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.
*4 For the pulse input type, a separate power supply for the electromagnetic brake is also required.
*5 If the wiring distance between the motor and driver is extended to 20 m or longer using an accessory cable (sold separately), the 24 VDC±4% specification applies.

## Speed – Torque Characteristics

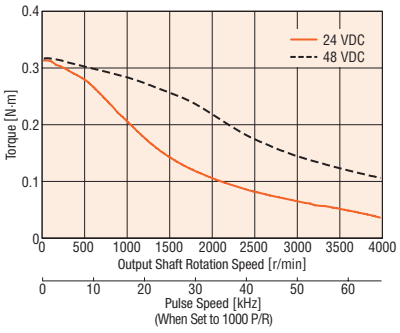
**AR24**



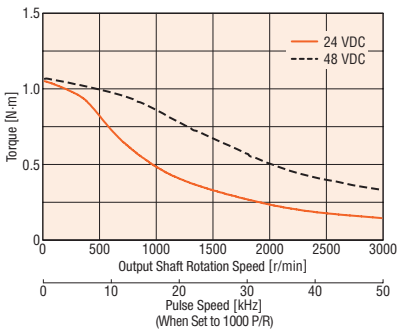

**AR26**



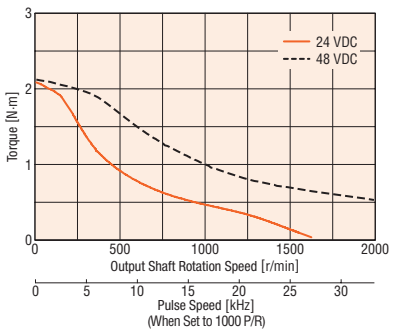

**AR46**



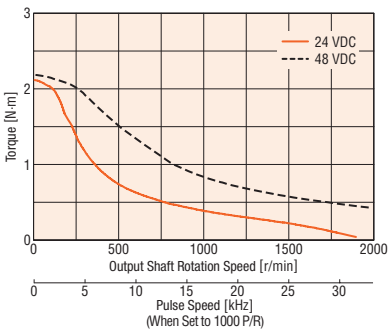

**AR66**




**AR69**




**AR98**




Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.

# TH Geared Type Frame Size 28 mm

## Specifications RoHS

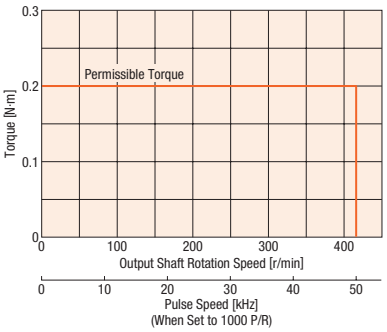
| Product Name | Built-in Controller | AR24SAKD-T7.2-◇ | AR24SAKD-T10-◇ | AR24SAKD-T20-◇ | AR24SAKD-T30-◇ |
|---|---|---|---|---|---|
| | Pulse Input | AR24SAK-T7.2-◇ | AR24SAK-T10-◇ | AR24SAK-T20-◇ | AR24SAK-T30-◇ |
| Max. Holding Torque | N·m | 0.2 | 0.3 | 0.4 | 0.5 |
| Rotor Inertial Moment | J: kg·m$^2$ | $11\times10^{-7}$ | | | |
| Gear Ratio | | 7.2 | 10 | 20 | 30 |
| Resolution | When Set to 1000P/R | 0.05°/Pulse | 0.036°/Pulse | 0.018°/Pulse | 0.012°/Pulse |
| Permissible Torque | N·m | 0.2 | 0.3 | 0.4 | 0.5 |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 0.13 | 0.19 | 0.38 | 0.5 |
| Permissible Speed Range | r/min | 0～416 | 0～300 | 0～150 | 0～100 |
| Backlash | arc minute (degrees) | 60(1°) | | | |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%)* | | | |
| | Input Current A | 0.9(1.3)* | | | |

●A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

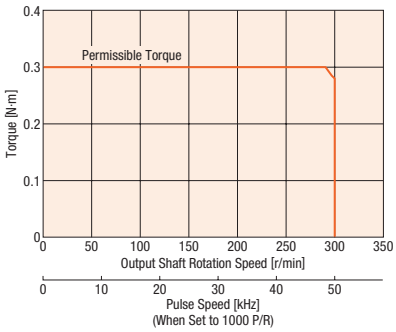
*The parentheses () indicate the specifications for the built-in controller type.

## Speed – Torque Characteristics

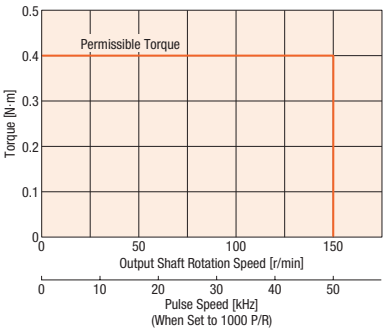
**AR24** Gear Ratio **7.2**



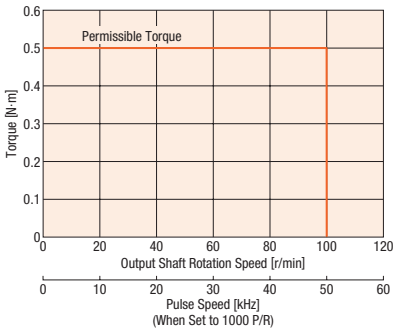

**AR24** Gear Ratio **10**




**AR24** Gear Ratio **20**




**AR24** Gear Ratio **30**




Note

●Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.

# TH Geared Type Frame Size 42 mm

## Specifications RoHS

CE

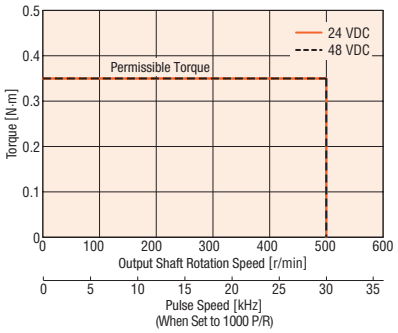
| Product Name | Built-in Controller | AR46S□KD-T3.6-◇ | AR46S□KD-T7.2-◇ | AR46S□KD-T10-◇ | AR46S□KD-T20-◇ | AR46S□KD-T30-◇ |
|---|---|---|---|---|---|---|
| | Pulse Input | AR46S□K-T3.6-◇ | AR46S□K-T7.2-◇ | AR46S□K-T10-◇ | AR46S□K-T20-◇ | AR46S□K-T30-◇ |
| Max. Holding Torque | N·m | 0.35 | 0.7 | 1 | 1.5 | |
| Rotor Inertial Moment | J: kg·m$^2$ | $58\times10^{-7}$ [$73\times10^{-7}$]*1 | | | | |
| Gear Ratio | | 3.6 | 7.2 | 10 | 20 | 30 |
| Resolution | When Set to 1000P/R | 0.1°/Pulse | 0.05°/Pulse | 0.036°/Pulse | 0.018°/Pulse | 0.012°/Pulse |
| Permissible Torque | N·m | 0.35 | 0.7 | 1 | 1.5 | |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 0.33 | 0.67 | 0.93 | 1.5 | |
| | Electromagnetic Brake N·m | 0.33 | 0.67 | 0.93 | 1.5 | |
| Permissible Speed Range | r/min | 0～500 | 0～250 | 0～180 | 0～90 | 0～60 |
| Backlash | arc minute (degrees) | 45(0.75°) | 25 (0.42°) | | 15 (0.25°) | |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%)*2/48 VDC±5% | | | | |
| | Input Current A | 1.4 (1.8)*2 | | | | |
| Electromagnetic Brake*3 | Power Supply Input | 24 VDC±5%*4 0.08 A | | | | |

● Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

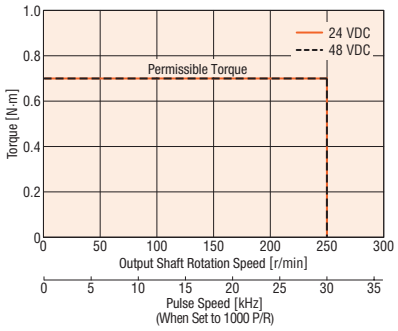
*1 The brackets [ ] indicate the specifications for the electromagnetic brake type.
*2 The parentheses () indicate the specifications for the built-in controller type.
*3 For the pulse input type, a separate power supply for the electromagnetic brake is also required.
*4 If the wiring distance between the motor and driver is extended to 20 m or longer using an accessory cable (sold separately), the 24 VDC±4% specification applies.

## Speed – Torque Characteristics

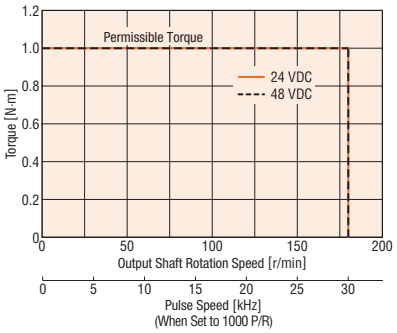
**AR46** Gear Ratio **3.6**



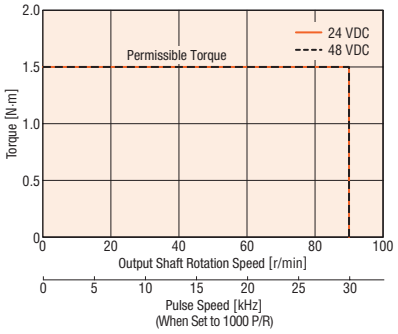

**AR46** Gear Ratio **7.2**



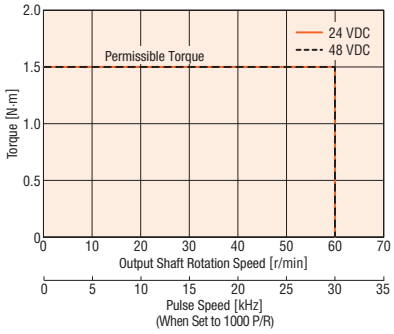

**AR46** Gear Ratio **10**




**AR46** Gear Ratio **20**




**AR46** Gear Ratio **30**




Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.

# TH Geared Type Frame Size 60 mm

## Specifications RoHS

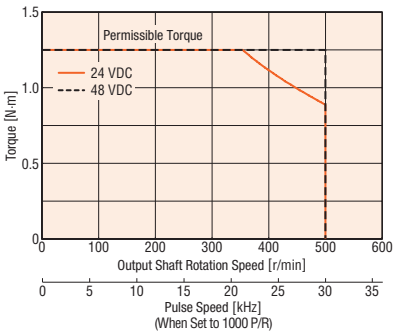
| Product Name | Built-in Controller | AR66S□KD-T3.6-◇ | AR66S□KD-T7.2-◇ | AR66S□KD-T10-◇ | AR66S□KD-T20-◇ | AR66S□KD-T30-◇ |
|---|---|---|---|---|---|---|
| | Pulse Input | AR66S□K-T3.6-◇ | AR66S□K-T7.2-◇ | AR66S□K-T10-◇ | AR66S□K-T20-◇ | AR66S□K-T30-◇ |
| Max. Holding Torque | N·m | 1.25 | 2.5 | 3 | 3.5 | 4 |
| Rotor Inertial Moment | J: kg·m$^2$ | $380\times10^{-7}$[$500\times10^{-7}$]*1 | | | | |
| Gear Ratio | | 3.6 | 7.2 | 10 | 20 | 30 |
| Resolution | When Set to 1000P/R | 0.1°/Pulse | 0.05°/Pulse | 0.036°/Pulse | 0.018°/Pulse | 0.012°/Pulse |
| Permissible Torque | N·m | 1.25 | 2.5 | 3 | 3.5 | 4 |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 1.1 | 2.2 | 3 | 3.5 | 4 |
| | Electromagnetic Brake N·m | 1.1 | 2.2 | 3 | 3.5 | 4 |
| Permissible Speed Range | r/min | 0～500 | 0～250 | 0～180 | 0～90 | 0～60 |
| Backlash | arc minute (degrees) | 35 (0.59°) | 15 (0.25°) | | 10 (0.17°) | |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%)*2/48 VDC±5%*3 | | | | |
| | Input Current A | 3.1(3.8)*2 | | | | |
| Electromagnetic Brake*4 | Power Supply Input | 24 VDC±5%*5 0.25 A | | | | |

● Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

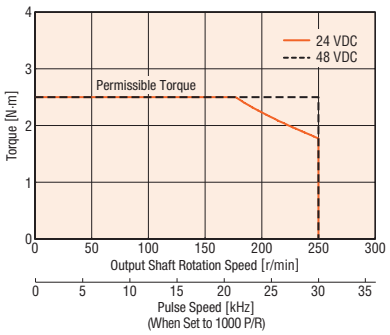
*1 The brackets [ ] indicate the specifications for the electromagnetic brake type.
*2 The parentheses () indicate the specifications for the built-in controller type.
*3 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.
*4 For the pulse input type, a separate power supply for the electromagnetic brake is also required.
*5 If the wiring distance between the motor and driver is extended to 20 m or longer using an accessory cable (sold separately), the 24 VDC±4% specification applies.

## Speed – Torque Characteristics

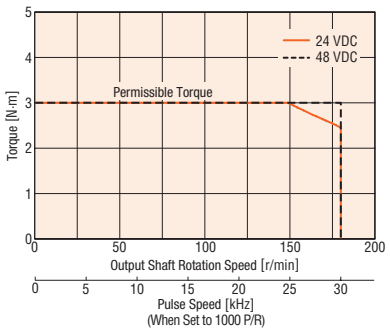
**AR66** Gear Ratio **3.6**



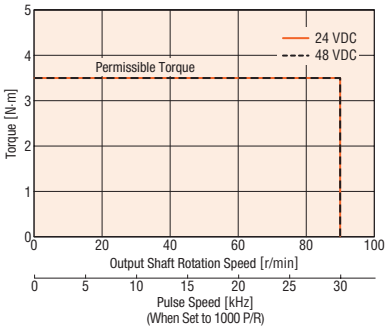

**AR66** Gear Ratio **7.2**



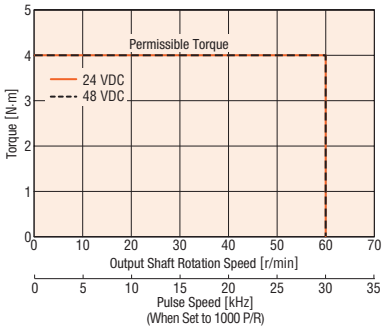

**AR66** Gear Ratio **10**




**AR66** Gear Ratio **20**




**AR66** Gear Ratio **30**




Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.

# TH Geared Type Frame Size 90 mm

## Specifications RoHS

CE

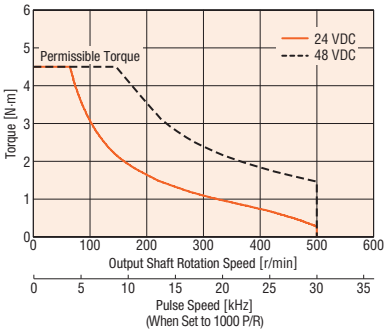
| Product Name | Built-in Controller | AR98S□KD-T3.6-◇ | AR98S□KD-T7.2-◇ | AR98S□KD-T10-◇ | AR98S□KD-T20-◇ | AR98S□KD-T30-◇ |
|---|---|---|---|---|---|---|
| | Pulse Input | AR98S□K-T3.6-◇ | AR98S□K-T7.2-◇ | AR98S□K-T10-◇ | AR98S□K-T20-◇ | AR98S□K-T30-◇ |
| Max. Holding Torque | N·m | 4.5 | 9 | | 12 | |
| Rotor Inertial Moment | J: kg·m$^2$ | $1100\times10^{-7}$[$1220\times10^{-7}$]*1 | | | | |
| Gear Ratio | | 3.6 | 7.2 | 10 | 20 | 30 |
| Resolution | When Set to 1000P/R | 0.1°/Pulse | 0.05°/Pulse | 0.036°/Pulse | 0.018°/Pulse | 0.012°/Pulse |
| Permissible Torque | N·m | 4.5 | 9 | | 12 | |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 3.6 | 7.2 | 9 | 12 | |
| | Electromagnetic Brake N·m | 3.6 | 7.2 | 9 | 12 | |
| Permissible Speed Range | r/min | 0～500 | 0～250 | 0～180 | 0～90 | 0～60 |
| Backlash | arc minute (degrees) | 25 (0.42°) | 15 (0.25°) | | 10 (0.17°) | |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%)*2/48 VDC±5%*3 | | | | |
| | Input Current A | 2.5(3.1)*2 | | | | |
| Electromagnetic Brake*4 | Power Supply Input | 24 VDC±5%*5 0.25 A | | | | |

● Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

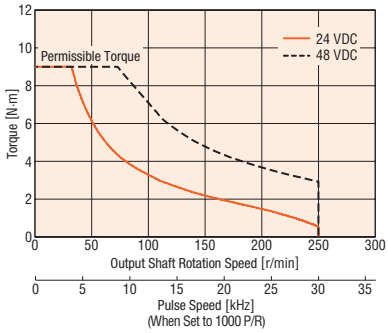
*1 The brackets [ ] indicate the specifications for the electromagnetic brake type.
*2 The parentheses () indicate the specifications for the built-in controller type.
*3 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.
*4 For the pulse input type, a separate power supply for the electromagnetic brake is also required.
*5 If the wiring distance between the motor and driver is extended to 20 m or longer using an accessory cable (sold separately), the 24 VDC±4% specification applies.

## Speed – Torque Characteristics

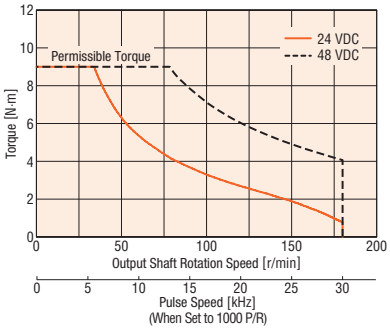
**AR98** Gear Ratio **3.6**



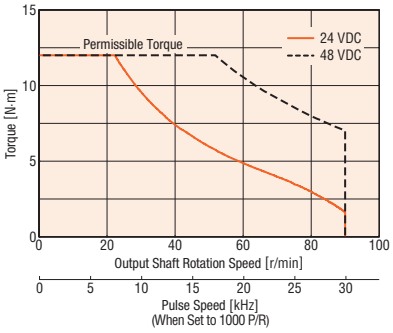

**AR98** Gear Ratio **7.2**



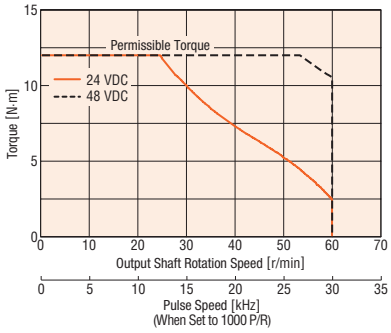

**AR98** Gear Ratio **10**




**AR98** Gear Ratio **20**




**AR98** Gear Ratio **30**




Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.

# PS Geared Type Frame Size 28 mm

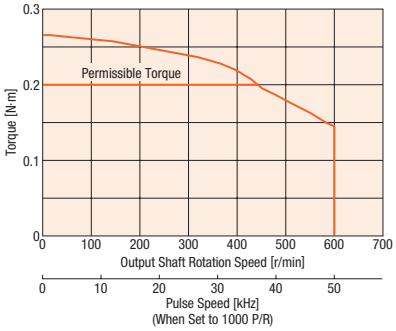
## Specifications RoHS

| Product Name | Built-in Controller / Pulse Input | AR24SAKD-PS5-◇ / AR24SAK-PS5-◇ | AR24SAKD-PS7-◇ / AR24SAK-PS7-◇ | AR24SAKD-PS10-◇ / AR24SAK-PS10-◇ |
|---|---|---|---|---|
| Max. Holding Torque | N·m | 0.2 | 0.3 | 0.5 |
| Rotor Inertial Moment | J: kg·m$^2$ | $11\times10^{-7}$ | | |
| Gear Ratio | | 5 | 7.2 | 10 |
| Resolution | When Set to 1000P/R | 0.072°/Pulse | 0.05°/Pulse | 0.036°/Pulse |
| Permissible Torque | N·m | 0.2 | 0.3 | 0.5 |
| Maximum Torque | N·m | 0.5 | | |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 0.13 | 0.19 | 0.27 |
| Permissible Speed Range | r/min | 0～600 | 0～416 | 0～300 |
| Backlash | arc minute (degrees) | 35 (0.59°) | | |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%)* | | |
| | Input Current A | 0.9(1.3)* | | |

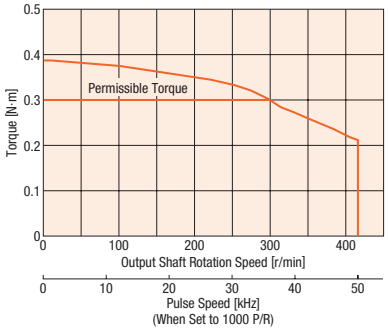
●A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
*The parentheses () indicate the specifications for the built-in controller type.

## Speed – Torque Characteristics

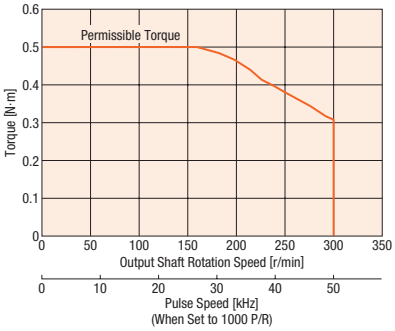
**AR24** Gear Ratio **5**




**AR24** Gear Ratio **7.2**




**AR24** Gear Ratio **10**




Note
●Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.

# PS Geared Type Frame Size 42 mm

## Specifications RoHS

CE

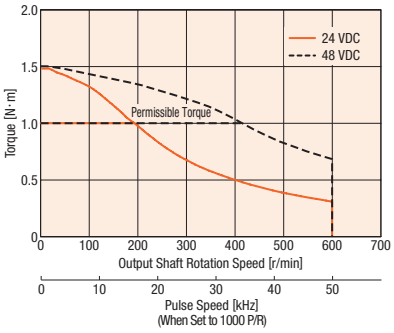
| Product Name | Built-in Controller | AR46S□KD-PS5-◇ | AR46S□KD-PS7-◇ | AR46S□KD-PS10-◇ | AR46S□KD-PS25-◇ | AR46S□KD-PS36-◇ | AR46S□KD-PS50-◇ |
|---|---|---|---|---|---|---|---|
| | Pulse Input | AR46S□K-PS5-◇ | AR46S□K-PS7-◇ | AR46S□K-PS10-◇ | AR46S□K-PS25-◇ | AR46S□K-PS36-◇ | AR46S□K-PS50-◇ |
| Max. Holding Torque | N·m | 1 | 1.5 | | 2.5 | 3 | |
| Rotor Inertial Moment | J: kg·m$^2$ | $58\times10^{-7}$ [$73\times10^{-7}$]*1 | | | | | |
| Gear Ratio | | 5 | 7.2 | 10 | 25 | 36 | 50 |
| Resolution | When Set to 1000P/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 Torque | N·m | 1.5 | 2 | | 6 | | |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 0.75 | 1 | 1.5 | 2.5 | 3 | |
| | Electromagnetic Brake N·m | 0.75 | 1 | 1.5 | 2.5 | 3 | |
| Permissible Speed Range | r/min | 0～600 | 0～416 | 0～300 | 0～120 | 0～83 | 0～60 |
| Backlash | arc minute (degrees) | 25 (0.42°) | | | | | |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%)*2/48 VDC±5% | | | | | |
| | Input Current A | 1.4(1.8)*2 | | | | | |
| Electromagnetic Brake*3 | Power Supply Input | 24 VDC±5%*4 0.08 A | | | | | |

● Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

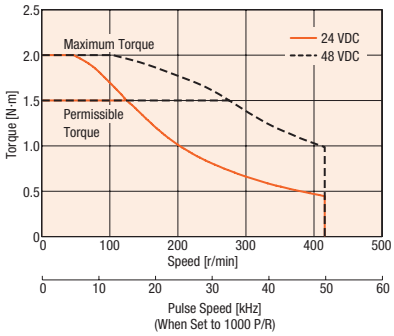
*1 The brackets [ ] indicate the specifications for the electromagnetic brake type.
*2 The parentheses () indicate the specifications for the built-in controller type.
*3 For the pulse input type, a separate power supply for the electromagnetic brake is also required.
*4 If the wiring distance between the motor and driver is extended to 20 m or longer using an accessory cable (sold separately), the 24 VDC±4% specification applies.

## Speed – Torque Characteristics

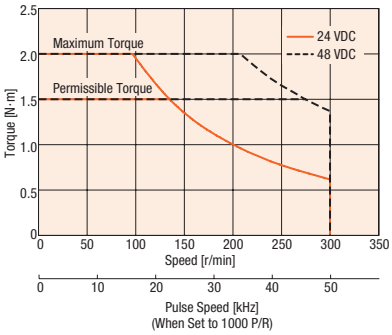
**AR46** Gear Ratio **5**



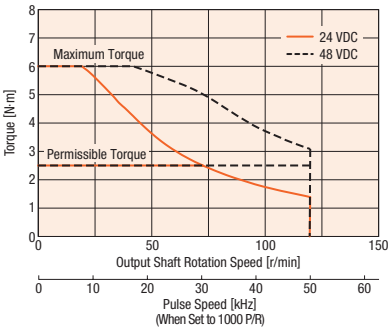

**AR46** Gear Ratio **7.2**



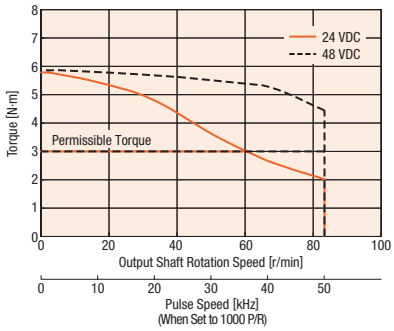

**AR46** Gear Ratio **10**



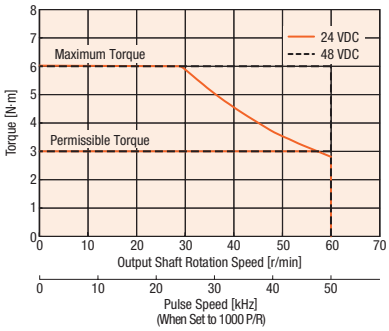

**AR46** Gear Ratio **25**




**AR46** Gear Ratio **36**




**AR46** Gear Ratio **50**




Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.

# PS Geared Type Frame Size 60 mm

## Specifications RoHS

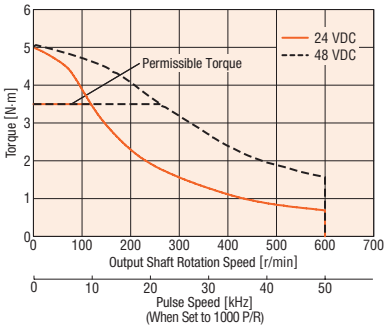
| Product Name | Built-in Controller | AR66S□KD-PS5-◇ | AR66S□KD-PS7-◇ | AR66S□KD-PS10-◇ | AR66S□KD-PS25-◇ | AR66S□KD-PS36-◇ | AR66S□KD-PS50-◇ |
|---|---|---|---|---|---|---|---|
| | Pulse Input | AR66S□K-PS5-◇ | AR66S□K-PS7-◇ | AR66S□K-PS10-◇ | AR66S□K-PS25-◇ | AR66S□K-PS36-◇ | AR66S□K-PS50-◇ |
| Max. Holding Torque | N·m | 3.5 | 4 | 5 | 8 | | |
| Rotor Inertial Moment | J: kg·m$^2$ | $380\times10^{-7}$[$500\times10^{-7}$]✻1 | | | | | |
| Gear Ratio | | 5 | 7.2 | 10 | 25 | 36 | 50 |
| Resolution | When Set to 1000P/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 Torque | N·m | 7 | 9 | 11 | 16 | 20 | |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 2.5 | 3.6 | 5 | 7.6 | 8 | |
| | Electromagnetic Brake N·m | 2.5 | 3.6 | 5 | 7.6 | 8 | |
| Permissible Speed Range | r/min | 0～600 | 0～416 | 0～300 | 0～120 | 0～83 | 0～60 |
| Backlash | arc minute (degrees) | 15 (0.25°) | | | | | |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%)✻2/48 VDC±5%✻3 | | | | | |
| | Input Current A | 3.1(3.8)✻2 | | | | | |
| Electromagnetic Brake✻4 | Power Supply Input | 24 VDC±5%✻5 0.25 A | | | | | |

● Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

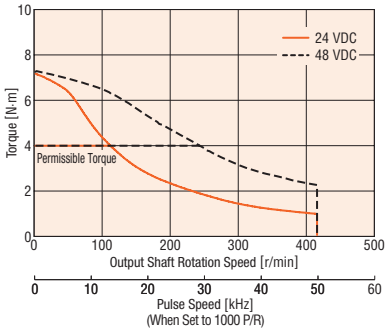
✻1 The brackets [ ] indicate the specifications for the electromagnetic brake type.
✻2 The parentheses () indicate the specifications for the built-in controller type.
✻3 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.
✻4 For the pulse input type, a separate power supply for the electromagnetic brake is also required.
✻5 If the wiring distance between the motor and driver is extended to 20 m or longer using an accessory cable (sold separately), the 24 VDC±4% specification applies.

## Speed – Torque Characteristics

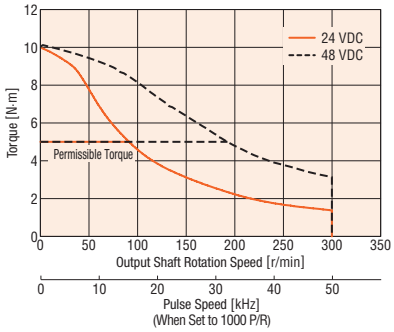
**AR66** Gear Ratio **5**



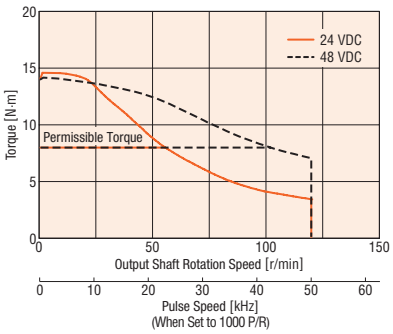

**AR66** Gear Ratio **7.2**



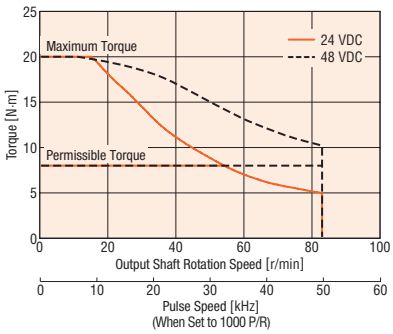

**AR66** Gear Ratio **10**



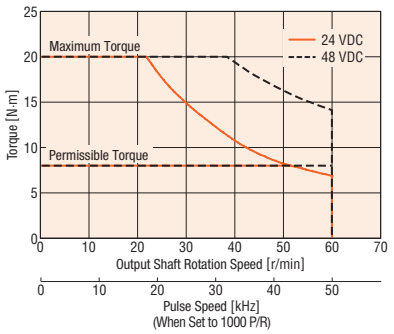

**AR66** Gear Ratio **25**




**AR66** Gear Ratio **36**




**AR66** Gear Ratio **50**




Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.

# PS Geared Type Frame Size 90 mm

## Specifications RoHS

CE

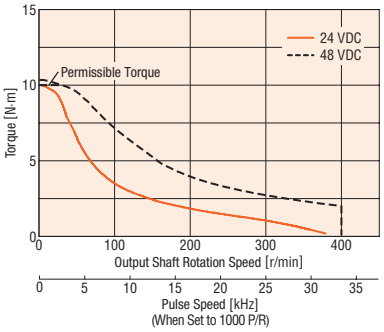
| Product Name | Built-in Controller | AR98S□KD-PS5-◇ | AR98S□KD-PS7-◇ | AR98S□KD-PS10-◇ | AR98S□KD-PS25-◇ | AR98S□KD-PS36-◇ | AR98S□KD-PS50-◇ |
|---|---|---|---|---|---|---|---|
| | Pulse Input | AR98S□K-PS5-◇ | AR98S□K-PS7-◇ | AR98S□K-PS10-◇ | AR98S□K-PS25-◇ | AR98S□K-PS36-◇ | AR98S□K-PS50-◇ |
| Max. Holding Torque | N·m | 10 | 14 | 20 | 37 | | |
| Rotor Inertial Moment | J: kg·m$^2$ | $1100\times10^{-7}$[$1220\times10^{-7}$]✻1 | | | | | |
| Gear Ratio | | 5 | 7.2 | 10 | 25 | 36 | 50 |
| Resolution | When Set to 1000P/R | 0.072°/Pulse | 0.05°/Pulse | 0.036°/Pulse | 0.0144°/Pulse | 0.01°/Pulse | 0.0072°/Pulse |
| Permissible Torque | N·m | 10 | 14 | 20 | 37 | | |
| Maximum Torque | N·m | 28 | 35 | | 56 | 60 | |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 5 | 7.2 | 10 | 25 | 36 | 37 |
| | Electromagnetic Brake N·m | 5 | 7.2 | 10 | 25 | 36 | 37 |
| Permissible Speed Range | r/min | 0～400 | 0～277 | 0～200 | 0～80 | 0～55 | 0～40 |
| Backlash | arc minute (degrees) | 15 (0.25°) | | | | | |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%)✻2/48 VDC±5%✻3 | | | | | |
| | Input Current A | 2.5(3.1)✻2 | | | | | |
| Electromagnetic Brake✻4 | Power Supply Input | 24 VDC±5%✻5 0.25 A | | | | | |

● Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

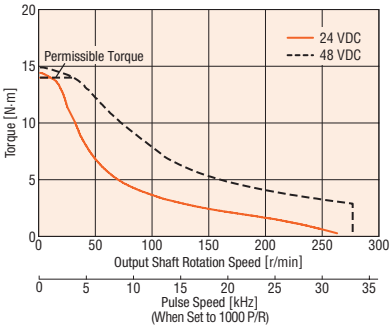
✻1 The brackets [ ] indicate the specifications for the electromagnetic brake type.
✻2 The parentheses () indicate the specifications for the built-in controller type.
✻3 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.
✻4 For the pulse input type, a separate power supply for the electromagnetic brake is also required.
✻5 If the wiring distance between the motor and driver is extended to 20 m or longer using an accessory cable (sold separately), the 24 VDC±4% specification applies.

## Speed – Torque Characteristics

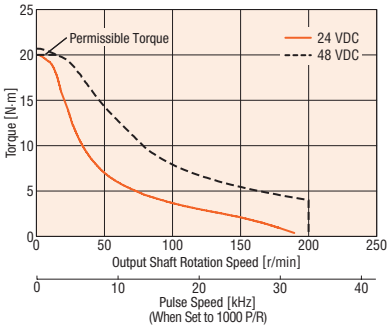
**AR98** Gear Ratio **5**



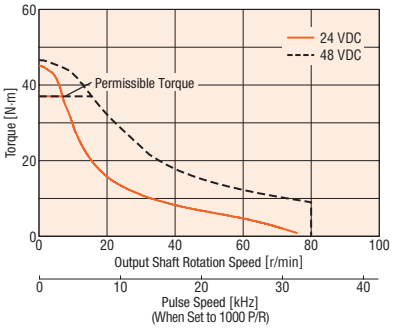

**AR98** Gear Ratio **7.2**



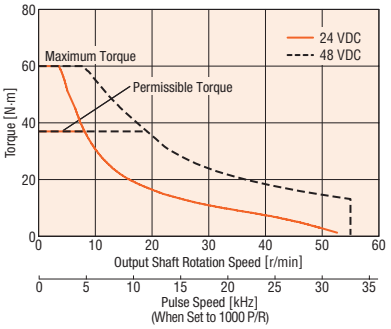

**AR98** Gear Ratio **10**



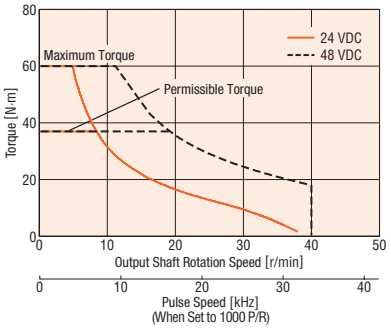

**AR98** Gear Ratio **25**




**AR98** Gear Ratio **36**




**AR98** Gear Ratio **50**




Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.

# PN Geared Type Frame Size 28 mm

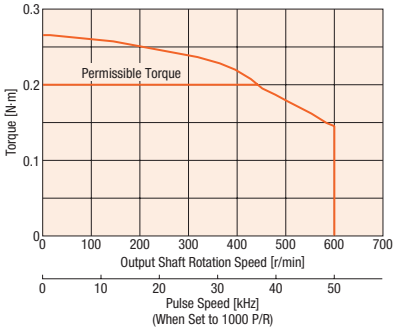
## Specifications RoHS

| Product Name | Built-in Controller / Pulse Input | AR24SAKD-N5-◇ / AR24SAK-N5-◇ | AR24SAKD-N7.2-◇ / AR24SAK-N7.2-◇ | AR24SAKD-N10-◇ / AR24SAK-N10-◇ |
|---|---|---|---|---|
| Max. Holding Torque | N·m | 0.2 | 0.3 | 0.5 |
| Rotor Inertial Moment | J: kg·m$^2$ | $11\times10^{-7}$ | | |
| Gear Ratio | | 5 | 7.2 | 10 |
| Resolution | When Set to 1000P/R | 0.072°/Pulse | 0.05°/Pulse | 0.036°/Pulse |
| Permissible Torque | N·m | 0.2 | 0.3 | 0.5 |
| Maximum Torque | N·m | 0.5 | | |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 0.13 | 0.19 | 0.27 |
| Permissible Speed Range | r/min | 0～600 | 0～416 | 0～300 |
| Backlash | arc minute (degrees) | 3(0.05°) | | |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%)* | | |
| | Input Current A | 0.9(1.3)* | | |

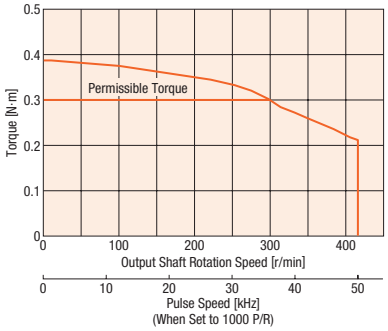
● A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
* The parentheses () indicate the specifications for the built-in controller type.

## Speed – Torque Characteristics

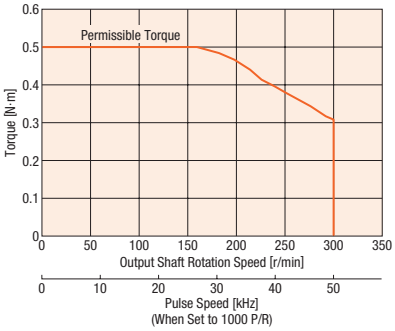
**AR24** Gear Ratio **5**




**AR24** Gear Ratio **7.2**




**AR24** Gear Ratio **10**




Note
● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.

# PN Geared Type Frame Size 42 mm

## Specifications RoHS

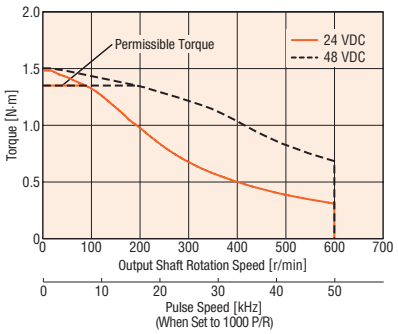
| Product Name | Built-in Controller | AR46S□KD-N5-◇ | AR46S□KD-N7.2-◇ | AR46S□KD-N10-◇ |
|---|---|---|---|---|
| | Pulse Input | AR46S□K-N5-◇ | AR46S□K-N7.2-◇ | AR46S□K-N10-◇ |
| Max. Holding Torque | N·m | 1.35 | 1.5 | |
| Rotor Inertial Moment | J: kg·m$^2$ | $58\times10^{-7}$[$73\times10^{-7}$]*1 | | |
| Gear Ratio | | 5 | 7.2 | 10 |
| Resolution | When Set to 1000P/R | 0.072°/Pulse | 0.05°/Pulse | 0.036°/Pulse |
| Permissible Torque | N·m | 1.35 | 1.5 | |
| Maximum Torque | N·m | 1.5 | 2 | |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 0.75 | 1 | 1.5 |
| | Electromagnetic Brake N·m | 0.75 | 1 | 1.5 |
| Permissible Speed Range | r/min | 0～600 | 0～416 | 0～300 |
| Backlash | arc minute (degrees) | 2(0.034°) | | |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%)*2/48 VDC±5% | | |
| | Input Current A | 1.4(1.8)*2 | | |
| Electromagnetic Brake*3 | Power Supply Input | 24 VDC±5%*4 0.08 A | | |

● Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

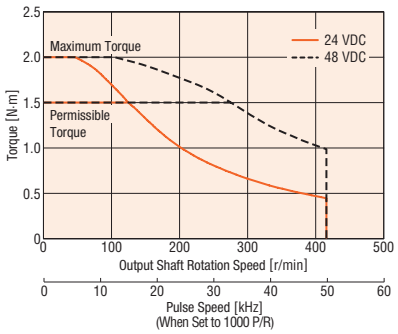
*1 The brackets [ ] indicate the specifications for the electromagnetic brake type.
*2 The parentheses () indicate the specifications for the built-in controller type.
*3 For the pulse input type, a separate power supply for the electromagnetic brake is also required.
*4 If the wiring distance between the motor and driver is extended to 20 m or longer using an accessory cable (sold separately), the 24 VDC±4% specification applies.

## Speed – Torque Characteristics

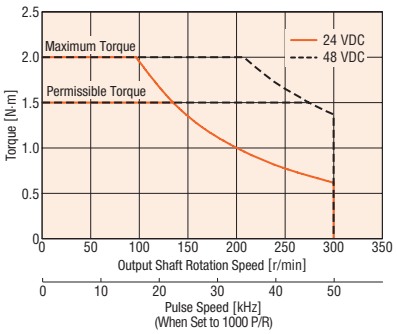
**AR46** Gear Ratio **5**




**AR46** Gear Ratio ***7.2***




**AR46** Gear Ratio **10**




Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.

# PN Geared Type Frame Size 60 mm

## Specifications RoHS

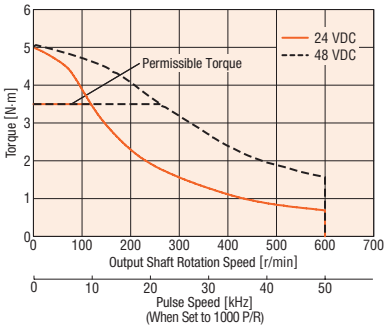
| Product Name | Built-in Controller | AR66S□KD-N5-◇ | AR66S□KD-N7.2-◇ | AR66S□KD-N10-◇ | AR66S□KD-N25-◇ | AR66S□KD-N36-◇ | AR66S□KD-N50-◇ |
|---|---|---|---|---|---|---|---|
| | Pulse Input | AR66S□K-N5-◇ | AR66S□K-N7.2-◇ | AR66S□K-N10-◇ | AR66S□K-N25-◇ | AR66S□K-N36-◇ | AR66S□K-N50-◇ |
| Max. Holding Torque | N·m | 3.5 | 4 | 5 | 8 | | |
| Rotor Inertial Moment | J: kg·m$^2$ | $380\times10^{-7}$[$500\times10^{-7}$]*1 | | | | | |
| Gear Ratio | | 5 | 7.2 | 10 | 25 | 36 | 50 |
| Resolution | When Set to 1000P/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 Torque | N·m | 7 | 9 | 11 | 16 | 20 | |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 2.5 | 3.6 | 5 | 7.6 | 8 | |
| | Electromagnetic Brake N·m | 2.5 | 3.6 | 5 | 7.6 | 8 | |
| Permissible Speed Range | r/min | 0～600 | 0～416 | 0～300 | 0～120 | 0～83 | 0～60 |
| Backlash | arc minute (degrees) | 2(0.034°) | | | 3(0.05°) | | |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%)*2/48 VDC±5%*3 | | | | | |
| | Input Current A | 3.1(3.8)*2 | | | | | |
| Electromagnetic Brake*4 | Power Supply Input | 24 VDC±5%*5 0.25 A | | | | | |

● Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

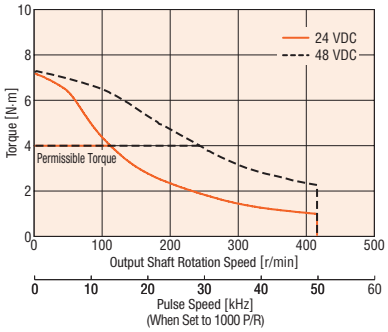
*1 The brackets [ ] indicate the specifications for the electromagnetic brake type.
*2 The parentheses () indicate the specifications for the built-in controller type.
*3 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.
*4 For the pulse input type, a separate power supply for the electromagnetic brake is also required.
*5 If the wiring distance between the motor and driver is extended to 20 m or longer using an accessory cable (sold separately), the 24 VDC±4% specification applies.

## Speed – Torque Characteristics

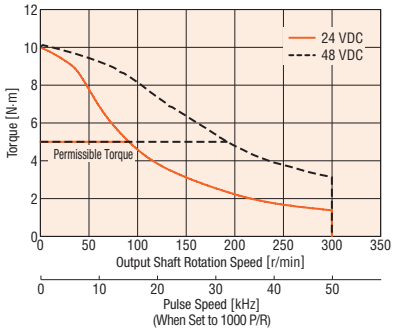
**AR66** Gear Ratio **5**



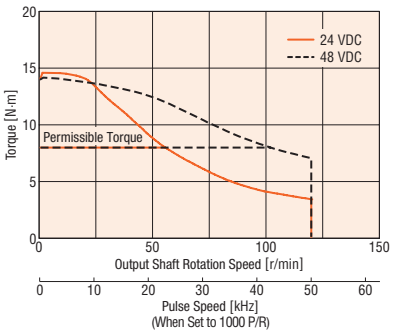

**AR66** Gear Ratio **7.2**



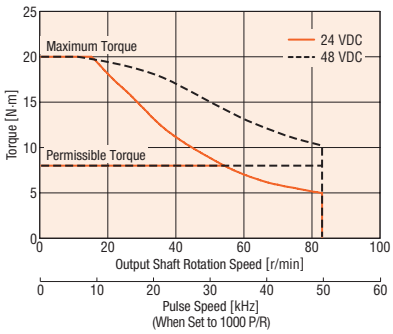

**AR66** Gear Ratio **10**



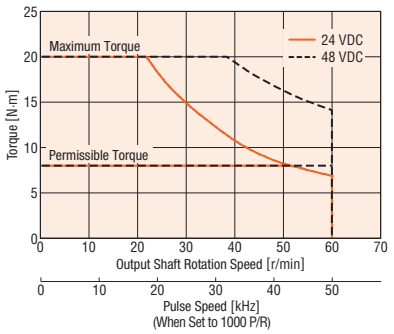

**AR66** Gear Ratio **25**




**AR66** Gear Ratio **36**




**AR66** Gear Ratio **50**




Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.

# PN Geared Type Frame Size 90 mm

## Specifications RoHS

CE

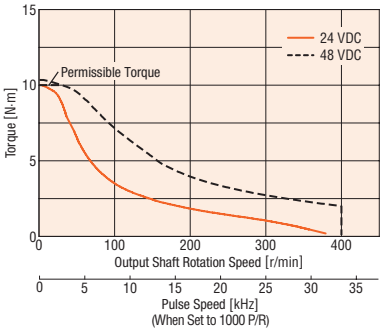
| Product Name | Built-in Controller | AR98S□KD-N5-◇ | AR98S□KD-N7.2-◇ | AR98S□KD-N10-◇ | AR98S□KD-N25-◇ | AR98S□KD-N36-◇ | AR98S□KD-N50-◇ |
|---|---|---|---|---|---|---|---|
| | Pulse Input | AR98S□K-N5-◇ | AR98S□K-N7.2-◇ | AR98S□K-N10-◇ | AR98S□K-N25-◇ | AR98S□K-N36-◇ | AR98S□K-N50-◇ |
| Max. Holding Torque | N·m | 10 | 14 | 20 | 37 | | |
| Rotor Inertial Moment | J: kg·m$^2$ | $1100\times10^{-7}$ [$1220\times10^{-7}$]*1 | | | | | |
| Gear Ratio | | 5 | 7.2 | 10 | 25 | 36 | 50 |
| Resolution | When Set to 1000P/R | 0.072°/Pulse | 0.05°/Pulse | 0.036°/Pulse | 0.0144°/Pulse | 0.01°/Pulse | 0.0072°/Pulse |
| Permissible Torque | N·m | 10 | 14 | 20 | 37 | | |
| Maximum Torque | N·m | 28 | 35 | | 56 | 60 | |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 5 | 7.2 | 10 | 25 | 36 | 37 |
| | Electromagnetic Brake N·m | 5 | 7.2 | 10 | 25 | 36 | 37 |
| Permissible Speed Range | r/min | 0～400 | 0～277 | 0～200 | 0～80 | 0～55 | 0～40 |
| Backlash | arc minute (degrees) | 2(0.034°) | | | 3(0.05°) | | |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%)*2/48 VDC±5%*3 | | | | | |
| | Input Current A | 2.5(3.1)*2 | | | | | |
| Electromagnetic Brake*4 | Power Supply Input | 24 VDC±5%*5 0.25 A | | | | | |

● Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

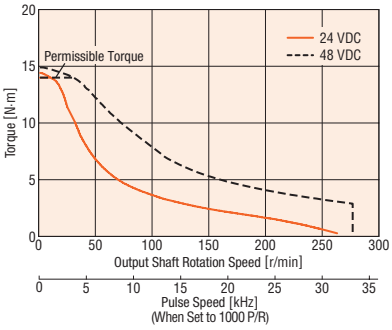
*1 The brackets [ ] indicate the specifications for the electromagnetic brake type.
*2 The parentheses () indicate the specifications for the built-in controller type.
*3 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.
*4 For the pulse input type, a separate power supply for the electromagnetic brake is also required.
*5 If the wiring distance between the motor and driver is extended to 20 m or longer using an accessory cable (sold separately), the 24 VDC±4% specification applies.

## Speed – Torque Characteristics

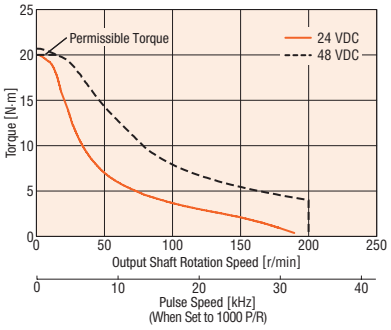
**AR98** Gear Ratio **5**



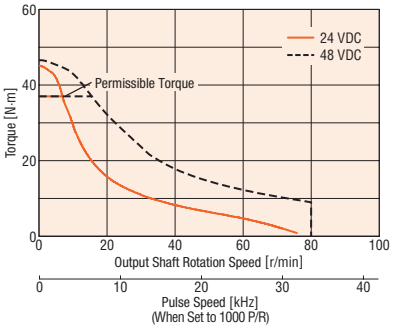

**AR98** Gear Ratio **7.2**



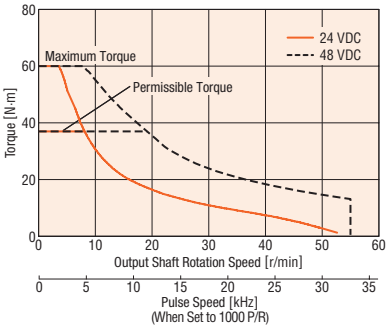

**AR98** Gear Ratio **10**



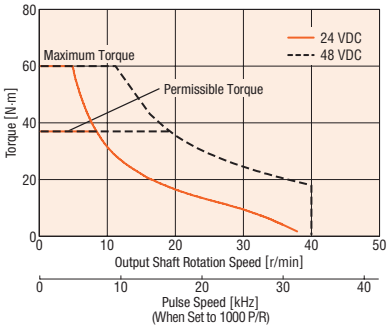

**AR98** Gear Ratio **25**




**AR98** Gear Ratio **36**




**AR98** Gear Ratio **50**




Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.

# Harmonic Geared Type Frame Size 30 mm, 42 mm

## Specifications RoHS

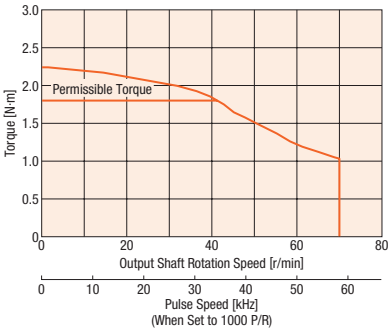
| Product Name | Built-in Controller | AR24SAKD-H50-◇ | AR24SAKD-H100-◇ | AR46S□KD-H50-◇ | AR46S□KD-H100-◇ |
|---|---|---|---|---|---|
| | Pulse Input | AR24SAK-H50-◇ | AR24SAK-H100-◇ | AR46S□K-H50-◇ | AR46S□K-H100-◇ |
| Max. Holding Torque | N·m | 1.8 | 2.4 | 3.5 | 5 |
| Rotor Inertial Moment | J: kg·m$^2$ | $14\times10^{-7}$ | | $75\times10^{-7}$ [$90\times10^{-7}$] ✻1 | |
| Gear Ratio | | 50 | 100 | 50 | 100 |
| Resolution | When Set to 1000P/R | 0.0072°/Pulse | 0.0036°/Pulse | 0.0072°/Pulse | 0.0036°/Pulse |
| Permissible Torque | N·m | 1.8 | 2.4 | 3.5 | 5 |
| Maximum Torque | N·m | 3.3 | 4.8 | 8.3 | 11 |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 1.3 | 2.4 | 3.5 | 5 |
| | Electromagnetic Brake N·m | – | – | 3.5 | 5 |
| Permissible Speed Range | r/min | 0～70 | 0～35 | 0～70 | 0～35 |
| Lost Motion (Load torque) | arc minute (degrees) | 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 (±0.2 N·m) |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%) ✻2 | | 24 VDC±10% (24 VDC±5%) ✻2/48 VDC±5% | |
| | Input Current A | 0.9(1.3) ✻2 | | 1.4(1.8) ✻2 | |
| Electromagnetic Brake ✻3 | Power Supply Input | – | – | 24 VDC±5% ✻4 0.08 A | |

● Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

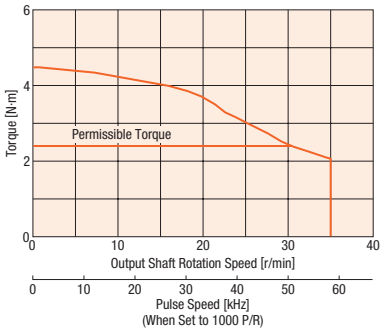
✻1 The brackets [ ] indicate the specifications for the electromagnetic brake type.
✻2 The parentheses () indicate the specifications for the built-in controller type.
✻3 For the pulse input type, a separate power supply for the electromagnetic brake is also required.
✻4 If the wiring distance between the motor and driver is extended to 20 m or longer using an accessory cable (sold separately), the 24 VDC±4% specification applies.

## Speed – Torque Characteristics

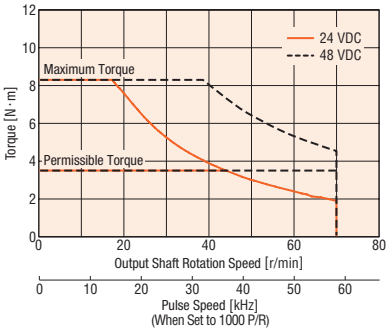
**AR24** Gear Ratio **50**



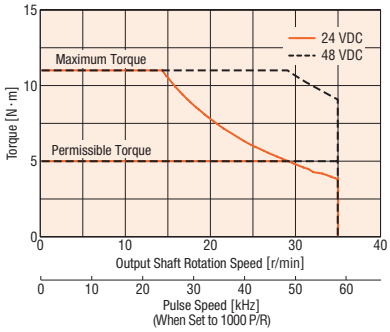

**AR24** Gear Ratio **100**




**AR46** Gear Ratio **50**




**AR46** Gear Ratio **100**




Note

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.
● In order to prevent deterioration of the gear grease in the harmonic geared type, keep the temperature of the gear case at 70°C max.

# Harmonic Geared Type Frame Size 60 mm, 90 mm

## Specifications RoHS

CE

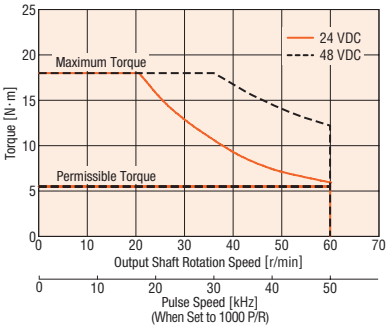
| Product Name | Built-in Controller | AR66S□KD-H50-◇ | AR66S□KD-H100-◇ | AR98S□KD-H50-◇ | AR98S□KD-H100-◇ |
|---|---|---|---|---|---|
| | Pulse Input | AR66S□K-H50-◇ | AR66S□K-H100-◇ | AR98S□K-H50-◇ | AR98S□K-H100-◇ |
| Max. Holding Torque | N·m | 5.5 | 8 | 25 | 37 |
| Rotor Inertial Moment | J: kg·m$^2$ | $415\times10^{-7}$[$535\times10^{-7}$]*1 | | $1300\times10^{-7}$[$1420\times10^{-7}$]*1 | |
| Gear Ratio | | 50 | 100 | 50 | 100 |
| Resolution | When Set to 1000P/R | 0.0072°/Pulse | 0.0036°/Pulse | 0.0072°/Pulse | 0.0036°/Pulse |
| Permissible Torque | N·m | 5.5 | 8 | 25 | 37 |
| Maximum Torque | N·m | 18 | 28 | 35 | 55 |
| Holding Torque at Motor Standstill | While Power is Supplied N·m | 5.5 | 8 | 25 | 37 |
| | Electromagnetic Brake N·m | 5.5 | 8 | 25 | 37 |
| Permissible Speed Range | r/min | 0～60 | 0～30 | 0～40 | 0～20 |
| Lost Motion (Load torque) | arc minute (degrees) | 0.7 or less (±0.28 N·m) | 0.7 or less (±0.39 N·m) | 1.5 or less (±1.2 N·m) | |
| Power Supply Input | Voltage | 24 VDC±10% (24 VDC±5%)*2/48 VDC±5%*3 | | | |
| | Input Current A | 3.1(3.8)*2 | | 2.5(3.1)*2 | |
| Electromagnetic Brake*4 | Power Supply Input | 24 VDC±5%*5 0.25 A | | | |

- Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
  A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

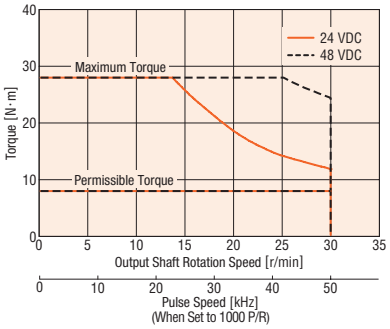
*1 The brackets [ ] indicate the specifications for the electromagnetic brake type.
*2 The parentheses () indicate the specifications for the built-in controller type.
*3 When the motor is operated from 48 VDC input, use an inertial load 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.
*4 For the pulse input type, a separate power supply for the electromagnetic brake is also required.
*5 If the wiring distance between the motor and driver is extended to 20 m or longer using an accessory cable (sold separately), the 24 VDC±4% specification applies.

## Speed – Torque Characteristics

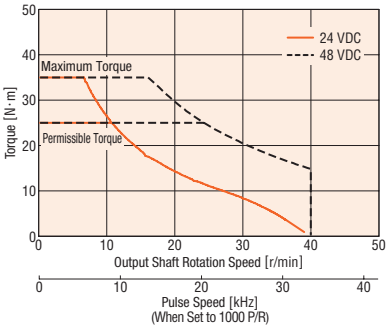
**AR66** Gear Ratio **50**



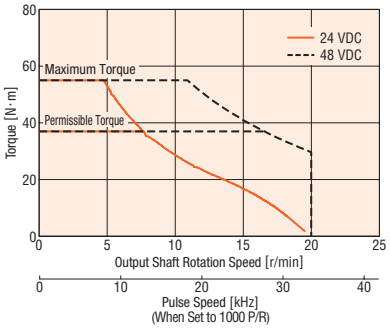

**AR66** Gear Ratio **100**




**AR98** Gear Ratio **50**




**AR98** Gear Ratio **100**




Note

- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C max.
- In order to prevent deterioration of the gear grease in the harmonic geared type, keep the temperature of the gear case at 70°C max.

## Driver Specifications

| | | Built-in Controller Type | Pulse Input Type |
|---|---|---|---|
| Max. Input Pulse Frequency | | – | When the programmable controller is generating line driver output: 500 kHz (Duty: 50%)<br>When the programmable controller is generating open-collector output: 250kHz (Duty: 50%)* |
| Positioning Data | | 64 Points | – |
| Positioning Operation | Independent | ○ | – |
| | Linked | ○ | – |
| | Linked 2 | ○ | – |
| | Sequential | ○ | – |
| | Direct | ○ | – |
| | Pushing | ○ | ○ |
| Continuous Operation | | ○ | – |
| JOG Operation | | ○ | – |
| Return-To-Home Operation | | ○ | – |
| Test Operation | | ○ | ○ |
| Absolute Backup System | | ○ | – |
| Control Module **OPX-2A** | | ○ | ○ |
| Data Setting Software **MEXE02** | | ○ | ○ |

* A value when the general-purpose cable (**CC36D1-1**) sold separately was used.General purpose cable ➜ Page 58

## Built-in Controller Type RS-485 Communication Specifications

| | |
|---|---|
| Protocol | Modbus protocol (Modbus RTU mode) |
| Electrical Characteristics | EIA-485 conformance<br>Use a twisted-pair cable (TIA/EIA-568B CAT5e or better recommended). The total extension length must be 50 m or less. |
| Transmission Method | Half duplex |
| Baud Rate | 9600 bps/19200 bps/38400 bps/57600 bps/115200 bps |
| Physical Layer | Start-stop synchronization (data length: 8 bits, stop bits: 1 or 2 bits, parity: none, even, or odd) |
| Connection Type | Up to 31 drivers can be connected to a single programmable controller (master equipment). |

## General Specifications

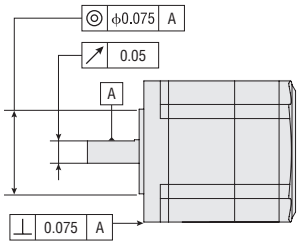
| | | Motor | Driver | |
|---|---|---|---|---|
| | | | Built-in Controller Type | Pulse Input Type |
| Heat Resistance Class | | 130 (B) | – | |
| Insulation Resistance | | 100 MΩ min. when measured with a 500 VDC megger between the following locations:<br>・Case - Motor and Sensor Windings<br>・Case – Electromagnetic Brake Windings | 100 MΩ min. when measured with a 500 VDC megger between the following locations:<br>・FG terminal - Power input terminal | – |
| Dielectric Strength | | No abnormality is judged with the following application for 1 minute:<br>・Case - Motor and Sensor Windings 1.0 kV at 50 Hz or 60 Hz<br>・Case - Electromagnetic Brake Windings 1.0 kV at 50 Hz or 60 Hz | No abnormality is judged with the following application for 1 minute:<br>・FG terminal - Power input terminal 500 VAC at 50 Hz or 60 Hz | – |
| Operating Environment (In operation) | Ambient Temperature | −10～+50°C (non-freezing)*1: Standard Type, **TH**, **PS** and **PN** Geared Types<br>0～+40°C (non-freezing)*1: Harmonic Geared Type | 0～+50°C (non-freezing) | |
| | Ambient Humidity | 85% max. (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 | | IP20 | IP10 | IP20 |
| Stop Position Accuracy | | **AR24**, **AR26**, **AR46**: ±4 minutes (±0.067°)<br>**AR66**, **AR69**, **AR98**: ±3 minutes (±0.05°) | | |
| Shaft Runout | | 0.05 T. I. R. (mm)*2 | – | |
| Concentricity of Installing 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 | – | |

*1 When a heat sink of a capacity at least equivalent to an aluminum plate with a size of 100×100 mm, 6 mm thick is installed

*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

● Do not perform the insulation resistance test or dielectric voltage withstand test while the motor and driver are connected.



# Load Torque – Driver Input Current Characteristics

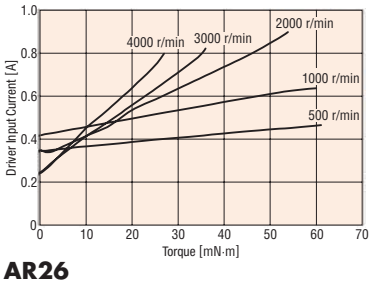
This is the relationship between the load torque and driver input current at each speed when the motor is actually operated. From these characteristics, the power supply capacity required for use in multi-axis operation can be estimated. For the geared type, convert to torque and speed at the motor shaft.

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

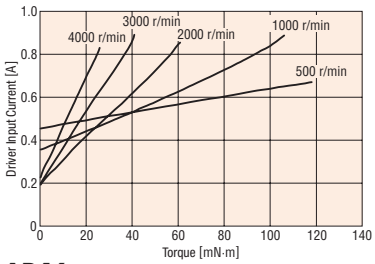
$$\text{Motor shaft torque} = \frac{\text{Gear output shaft torque}}{\text{Gear ratio}} \text{[N·m]}$$

## 24 VDC

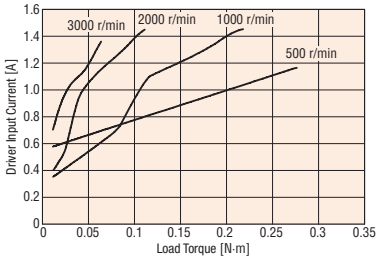
### AR24



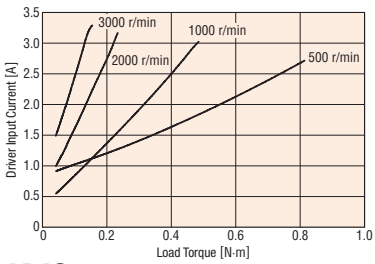

### AR26



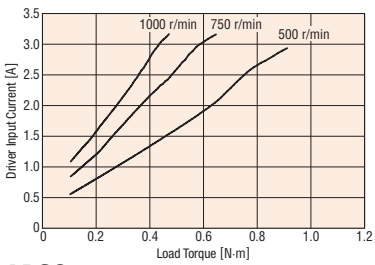

### AR46



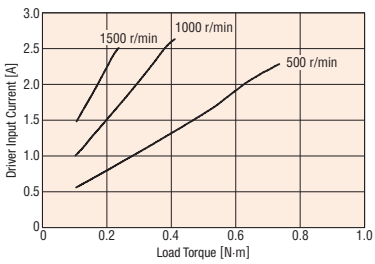

### AR66




### AR69

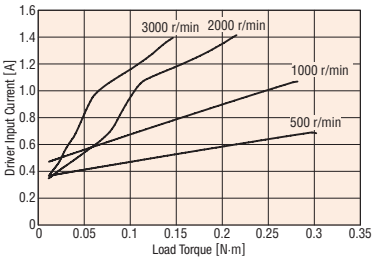



### AR98

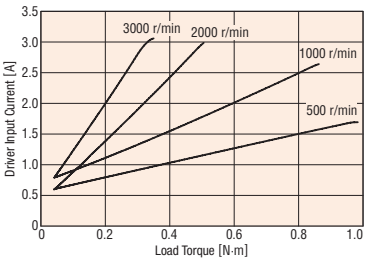



## 48 VDC

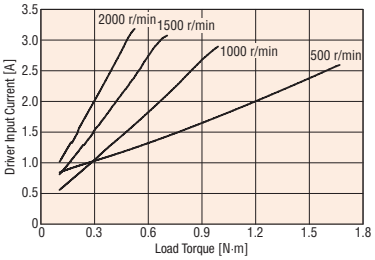
### AR46



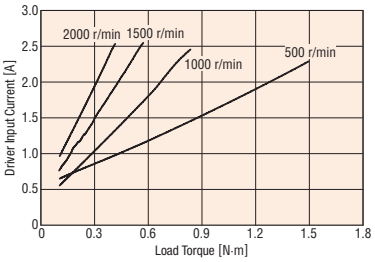

### AR66




### AR69




### AR98



## Permissible Overhung Load and Permissible Thrust Load

Unit = N

| Type | Motor Frame Size | Type | Gear Ratio | Permissible Overhung Load Distance from Shaft End mm | | | | | Permissible Thrust Load |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 0 | 5 | 10 | 15 | 20 | |
| Standard Type | 28 mm | **AR24** | – | 25 | 34 | 52 | – | – | 1.5 |
| | | **AR26** | – | | | | | | 2.2 |
| | 42 mm | **AR46** | – | 35 | 44 | 58 | 85 | – | 4.6[6.1]* |
| | 60 mm | **AR66** | – | 90 | 100 | 130 | 180 | 270 | 8.8[11.8]* |
| | | **AR69** | | | | | | | 13.7[16.7]* |
| | 85 mm | **AR98** | | 260 | 290 | 340 | 390 | 480 | 18[24]* |
| **TH** Geared Type | 28 mm | **AR24** | **7.2**, **10**, **20**, **30** | 15 | 17 | 20 | 23 | – | 10 |
| | 42 mm | **AR46** | **3.6**, **7.2**, **10**, **20**, **30** | 10 | 14 | 20 | 30 | – | 15 |
| | 60 mm | **AR66** | | 70 | 80 | 100 | 120 | 150 | 40 |
| | 90 mm | **AR98** | | 220 | 250 | 300 | 350 | 400 | 100 |
| **PS** Geared Type | 28 mm | **AR24** | **5**, **7.2**, **10** | 45 | 60 | 80 | 100 | – | 20 |
| | 42 mm | **AR46** | **5**, **7.2**, **10** | 73 | 84 | 100 | 123 | – | 50 |
| | | | **25**, **36**, **50** | 109 | 127 | 150 | 184 | – | |
| | 60 mm | **AR66** | **5** | 200 | 220 | 250 | 280 | 320 | 100 |
| | | | **7.2**, **10** | 250 | 270 | 300 | 340 | 390 | |
| | | | **25**, **36**, **50** | 330 | 360 | 400 | 450 | 520 | |
| | 90 mm | **AR98** | **5**, **7.2**, **10** | 480 | 540 | 600 | 680 | 790 | 300 |
| | | | **25** | 850 | 940 | 1050 | 1190 | 1380 | |
| | | | **36** | 930 | 1030 | 1150 | 1310 | 1520 | |
| | | | **50** | 1050 | 1160 | 1300 | 1480 | 1710 | |
| **PN** Geared Type | 28 mm | **AR24** | **5**, **7.2**, **10** | 45 | 60 | 80 | 100 | – | 20 |
| | 42 mm | **AR46** | | 100 | 120 | 150 | 190 | – | 100 |
| | 60 mm | **AR66** | **5** | 200 | 220 | 250 | 280 | 320 | |
| | | | **7.2**, **10** | 250 | 270 | 300 | 340 | 390 | |
| | | | **25**, **36**, **50** | 330 | 360 | 400 | 450 | 520 | |
| | 90 mm | **AR98** | **5** | 480 | 520 | 550 | 580 | 620 | 300 |
| | | | **7.2**, **10** | 480 | 540 | 600 | 680 | 790 | |
| | | | **25** | 850 | 940 | 1050 | 1110 | 1190 | |
| | | | **36** | 930 | 1030 | 1150 | 1220 | 1300 | |
| | | | **50** | 1050 | 1160 | 1300 | 1380 | 1490 | |
| Harmonic Geared Type | 30 mm | **AR24** | **50**, **100** | 100 | 135 | 175 | 250 | – | 140 |
| | 42 mm | **AR46** | | 180 | 220 | 270 | 360 | 510 | 220 |
| | 60 mm | **AR66** | | 320 | 370 | 440 | 550 | 720 | 450 |
| | 90 mm | **AR98** | | 1090 | 1150 | 1230 | 1310 | 1410 | 1300 |

*The brackets [ ] indicate the value for the electromagnetic brake type.

Note

● With a double shaft product, the output shaft located on the opposite side of the motor output shaft is used to install a slit disk or similar device. Do not apply any load torque, overhung load or thrust load on this output shaft.

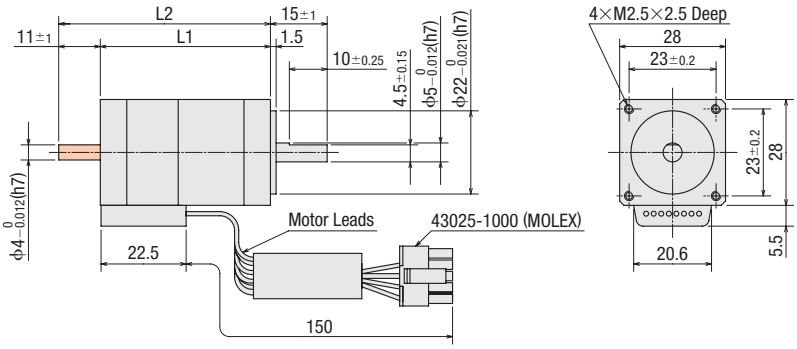
# Dimensions (Unit = mm)

## Motor

### ◇Standard Type

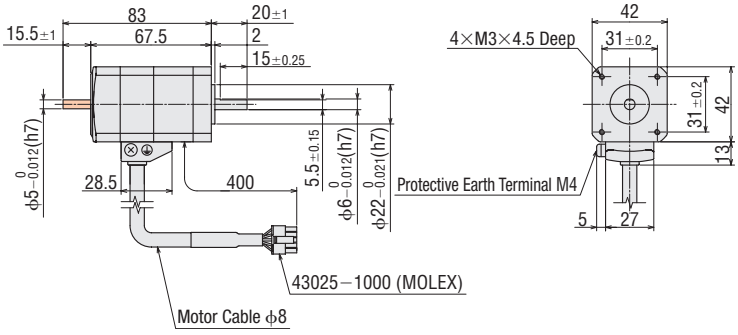
#### Frame Size 28 mm

| Product Name | | Motor Product Name | L1 | L2 | Mass kg | CAD |
|---|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | | |
| **AR24SAKD-◇** | **AR24SAK-◇** | ARM24SAK | 45 | – | 0.15 | B705 |
| **AR24SBKD-◇** | **AR24SBK-◇** | ARM24SBK | | 56 | | |
| **AR26SAKD-◇** | **AR26SAK-◇** | ARM26SAK | 65 | – | 0.22 | B706 |
| **AR26SBKD-◇** | **AR26SBK-◇** | ARM26SBK | | 76 | | |



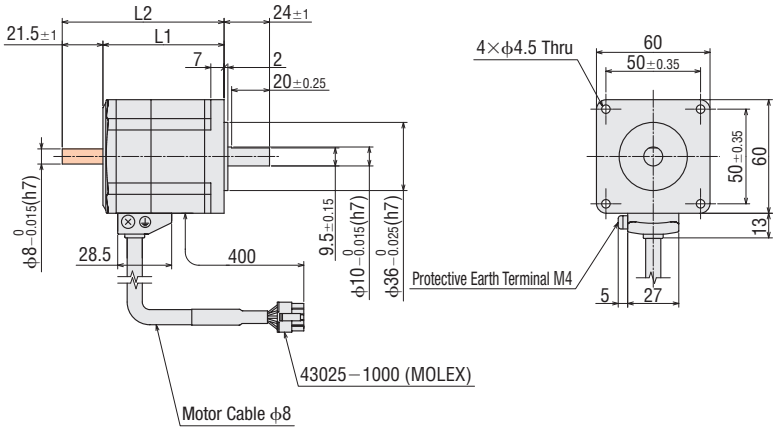

#### Frame Size 42 mm

| Product Name | | Motor Product Name | Mass kg | CAD |
|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | |
| **AR46SAKD-◇** | **AR46SAK-◇** | ARM46SAK | 0.44 | B718 |
| **AR46SBKD-◇** | **AR46SBK-◇** | ARM46SBK | | |




#### Frame Size 60 mm

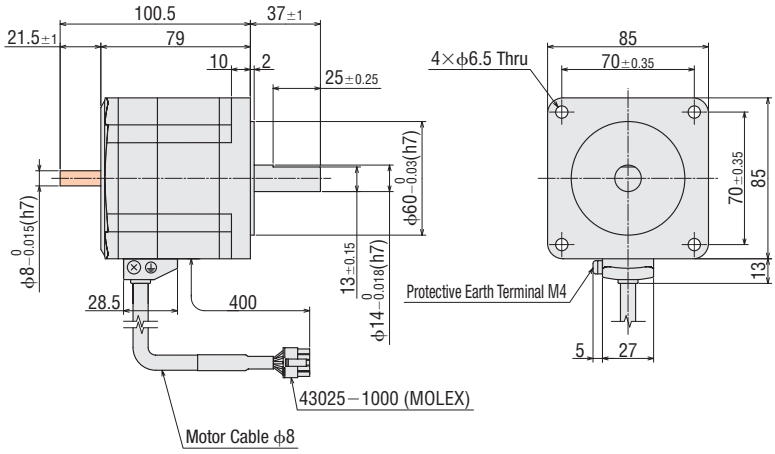
| Product Name | | Motor Product Name | L1 | L2 | Mass kg | CAD |
|---|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | | |
| **AR66SAKD-◇** | **AR66SAK-◇** | ARM66SAK | 64 | – | 0.87 | B719 |
| **AR66SBKD-◇** | **AR66SBK-◇** | ARM66SBK | | 85.5 | | |
| **AR69SAKD-◇** | **AR69SAK-◇** | ARM69SAK | 89.5 | – | 1.37 | B720 |
| **AR69SBKD-◇** | **AR69SBK-◇** | ARM69SBK | | 111 | | |




● A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
● These dimensions are for double shaft models. For single shaft models, ignore the shaded areas.

### Frame Size 85 mm

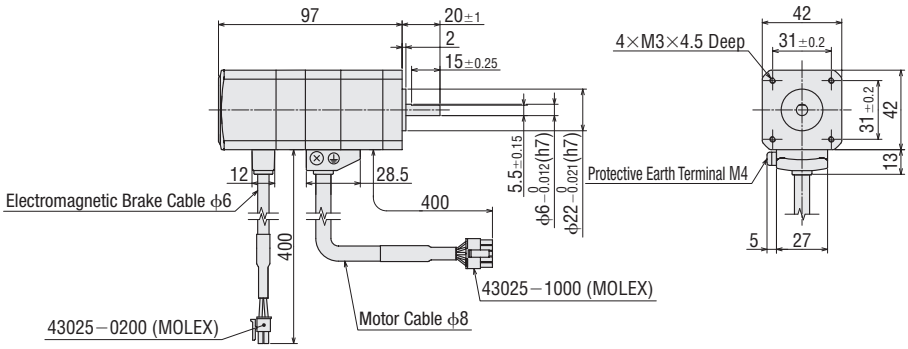
| Product Name | | Motor Product Name | Mass kg | CAD |
|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | |
| **AR98SAKD-◇** | **AR98SAK-◇** | ARM98SAK | 1.85 | B721 |
| **AR98SBKD-◇** | **AR98SBK-◇** | ARM98SBK | | |




### ◇Standard Type with Electromagnetic Brake

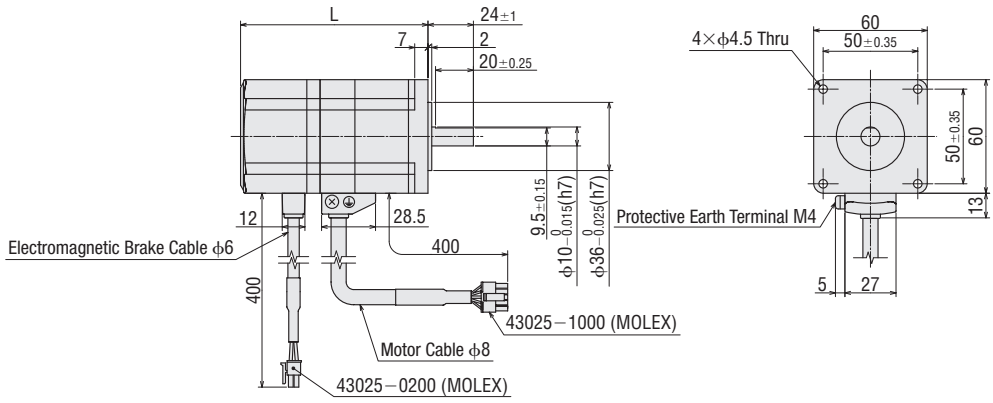
### Frame Size 42 mm

| Product Name | | Motor Product Name | Mass kg | CAD |
|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | |
| **AR46SMKD-◇** | **AR46SMK-◇** | ARM46SMK | 0.57 | B722 |




### Frame Size 60 mm

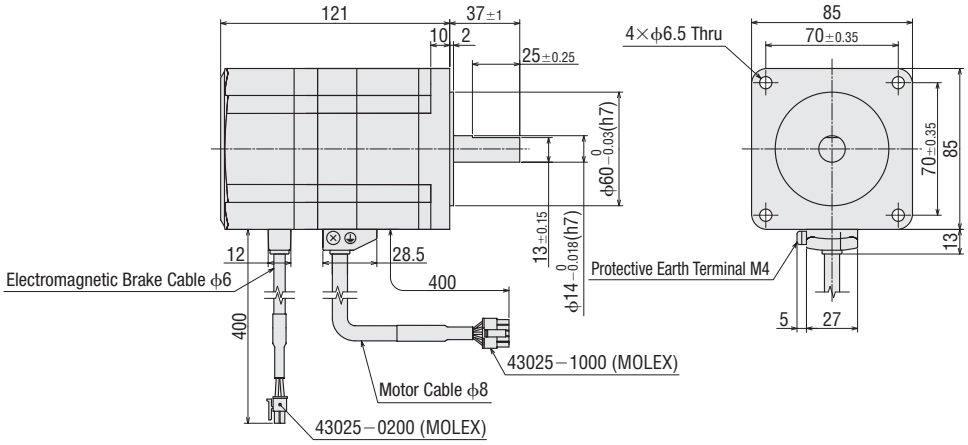
| Product Name | | Motor Product Name | L | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR66SMKD-◇** | **AR66SMK-◇** | ARM66SMK | 99 | 1.13 | B723 |
| **AR69SMKD-◇** | **AR69SMK-◇** | ARM69SMK | 124.5 | 1.63 | B724 |




● A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
● The dimensions of the standard type frame size 85 mm are for double shaft models. For single shaft models, ignore the shaded ▭ areas.

## Frame Size 85 mm

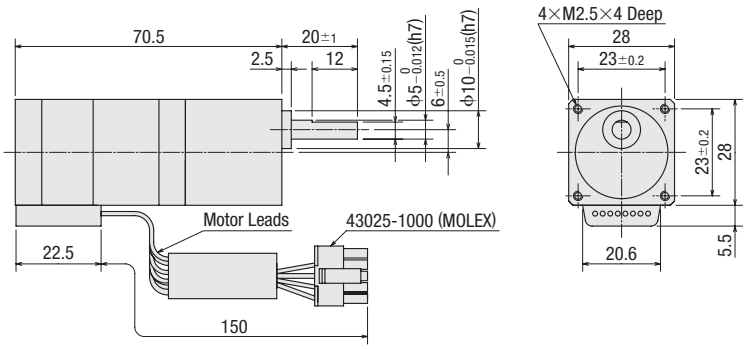
| Product Name | | Motor Product Name | Mass kg | CAD |
|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | |
| **AR98SMKD-◇** | **AR98SMK-◇** | ARM98SMK | 2.3 | B725 |




## ◇TH Geared Type

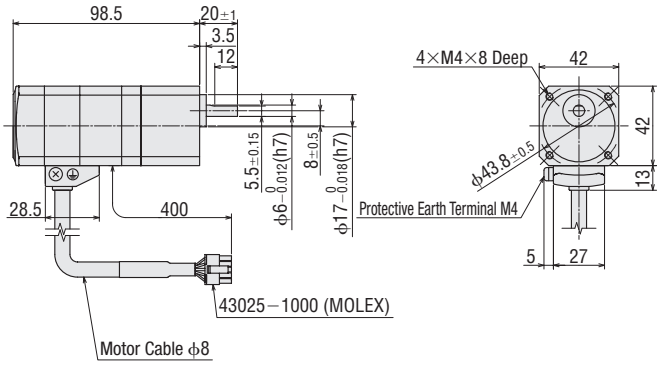
## Frame Size 28 mm

| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR24SAKD-T■-◇** | **AR24SAK-T■-◇** | ARM24SAK-T■ | **7.2**, **10**, **20**, **30** | 0.21 | B707 |




## Frame Size 42 mm

| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR46SAKD-T■-◇** | **AR46SAK-T■-◇** | ARM46SAK-T■ | **3.6**, **7.2**, **10**, **20**, **30** | 0.59 | B726 |

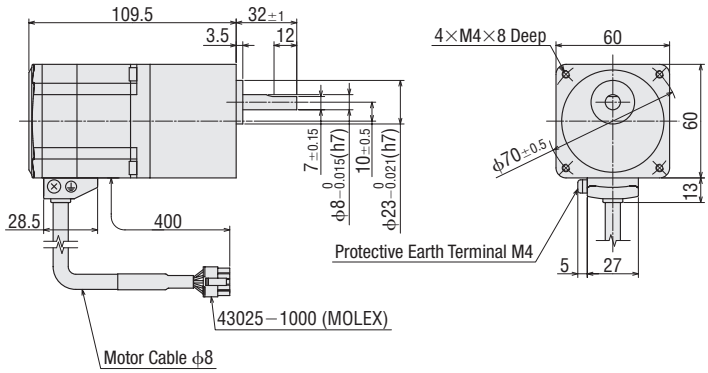



● A number indicating the gear ratio is entered where the box ■ is located within the product name.

● A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

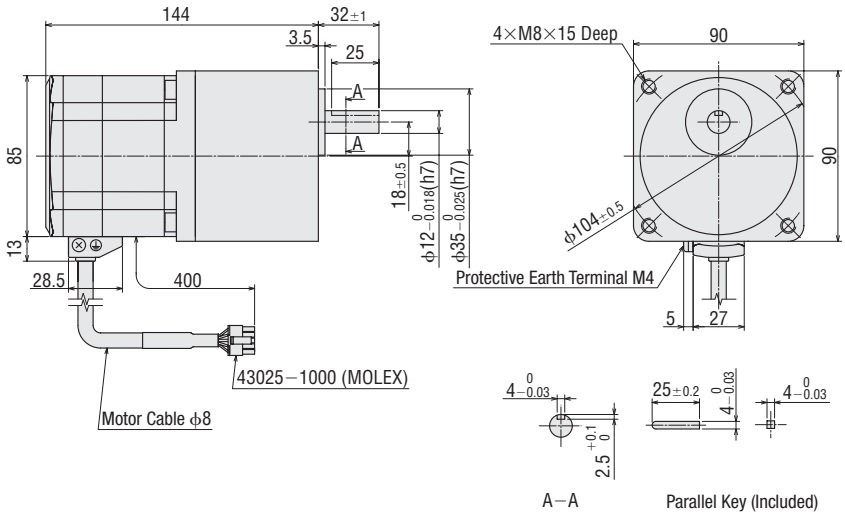
### Frame Size 60 mm

| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR66SAKD-T■-◇** | **AR66SAK-T■-◇** | ARM66SAK-T■ | **3.6**, **7.2**, **10**, **20**, **30** | 1.27 | B727 |




### Frame Size 90 mm

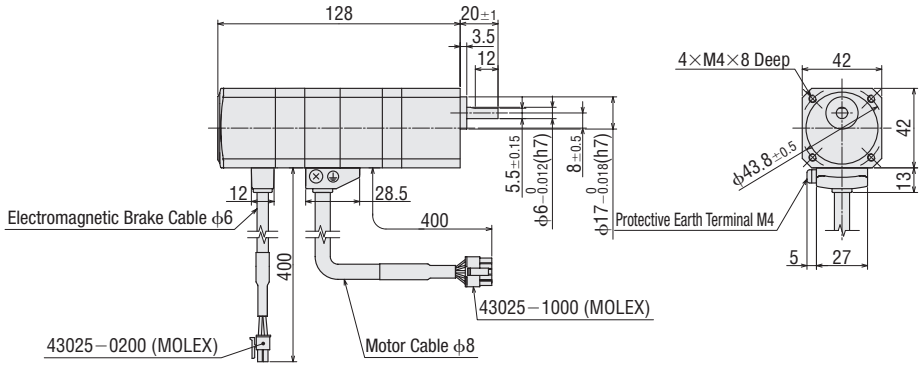
| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR98SAKD-T■-◇** | **AR98SAK-T■-◇** | ARM98SAK-T■ | **3.6**, **7.2**, **10**, **20**, **30** | 3 | B728 |




### ◇**TH** Geared Type with Electromagnetic Brake

### Frame Size 42 mm

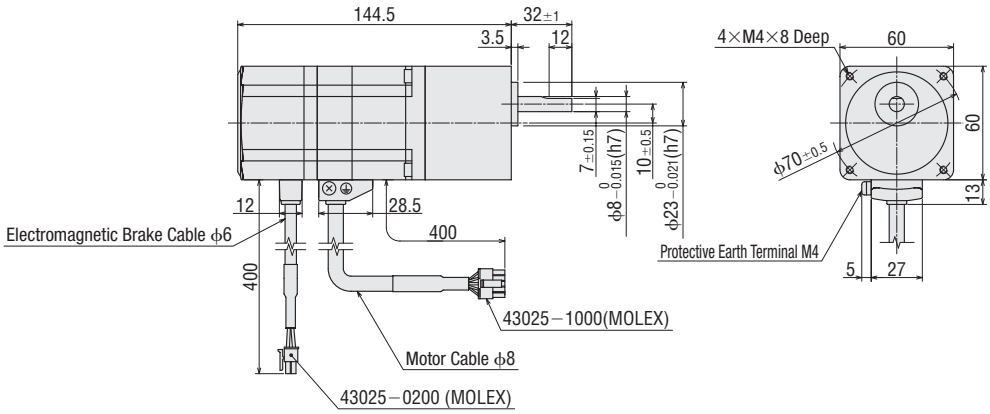
| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR46SMKD-T■-◇** | **AR46SMK-T■-◇** | ARM46SMK-T■ | **3.6**, **7.2**, **10**, **20**, **30** | 0.72 | B729 |




● A number indicating the gear ratio is entered where the box ■ is located within the product name.
● A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

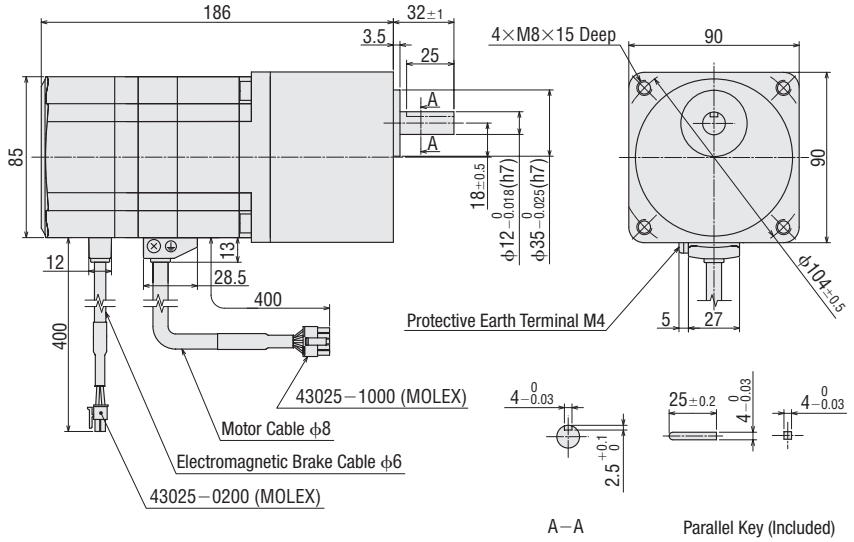
## Frame Size 60 mm

| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR66SMKD-T■-◇** | **AR66SMK-T■-◇** | ARM66SMK-T■ | **3.6**, **7.2**, **10**, **20**, **30** | 1.53 | B730 |




## Frame Size 90 mm

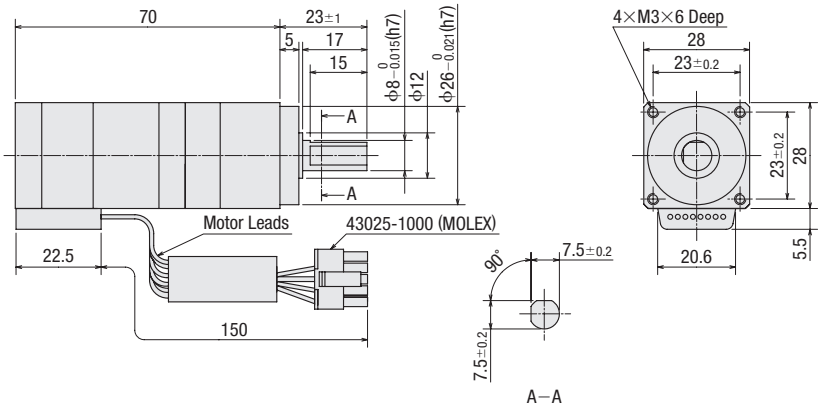
| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR98SMKD-T■-◇** | **AR98SMK-T■-◇** | ARM98SMK-T■ | **3.6**, **7.2**, **10**, **20**, **30** | 3.5 | B731 |




## ◇**PS** Geared Type

## Frame Size 28 mm

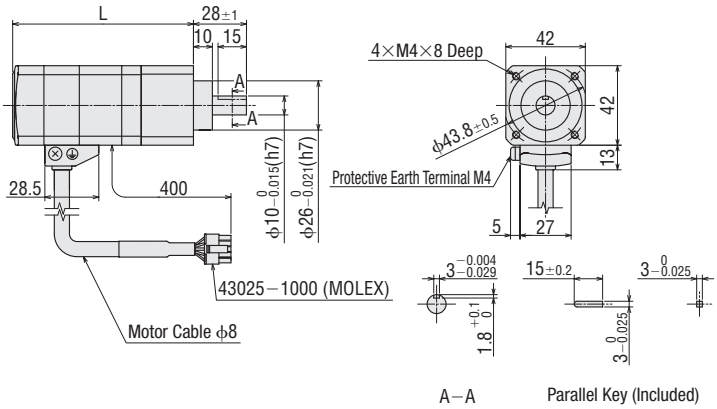
| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR24SAKD-PS■-◇** | **AR24SAK-PS■-◇** | ARM24SAK-PS■ | **5**, **7.2**, **10** | 0.25 | B708 |




●A number indicating the gear ratio is entered where the box ■ is located within the product name.
●A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

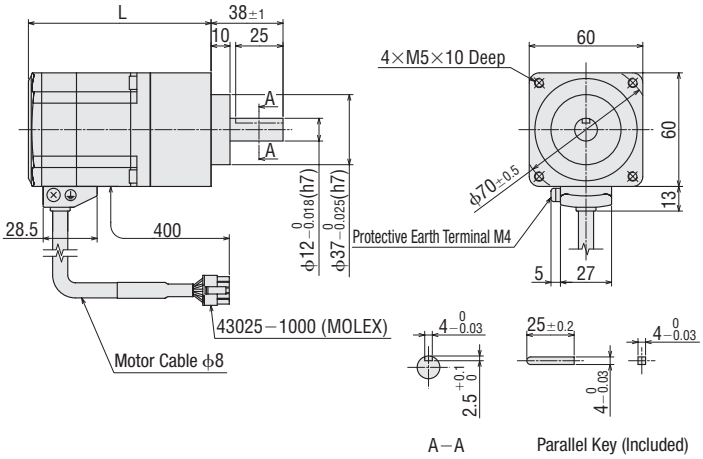
## Frame Size 42 mm

| Product Name | | Motor Product Name | Gear Ratio | L | Mass kg | CAD |
|---|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | | |
| **AR46SAKD-PS■-◇** | **AR46SAK-PS■-◇** | ARM46SAK-PS■ | **5**, **7.2**, **10** | 95.5 | 0.64 | B742 |
| | | | **25**, **36**, **50** | 119 | 0.79 | B743 |



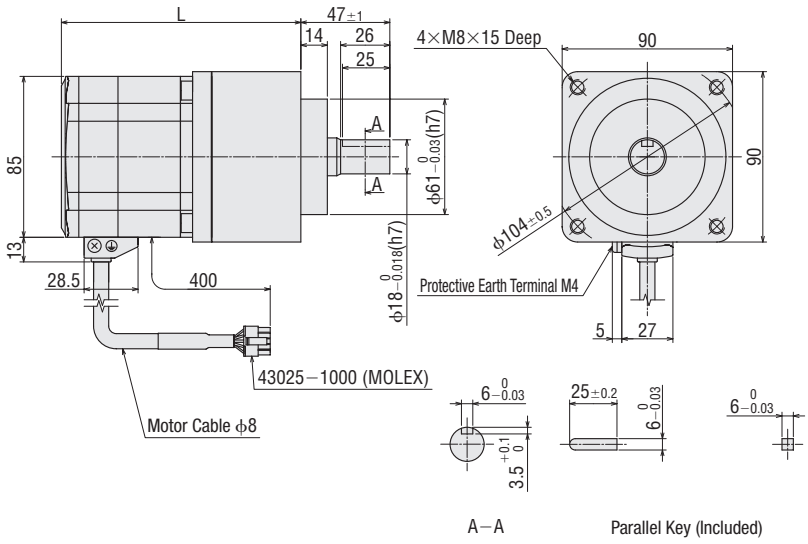

## Frame Size 60 mm

| Product Name | | Motor Product Name | Gear Ratio | L | Mass kg | CAD |
|---|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | | |
| **AR66SAKD-PS■-◇** | **AR66SAK-PS■-◇** | ARM66SAK-PS■ | **5**, **7.2**, **10** | 96.5 | 1.27 | B744 |
| | | | **25**, **36**, **50** | 116.5 | 1.57 | B745 |




## Frame Size 90 mm

| Product Name | | Motor Product Name | Gear Ratio | L | Mass kg | CAD |
|---|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | | |
| **AR98SAKD-PS■-◇** | **AR98SAK-PS■-◇** | ARM98SAK-PS■ | **5**, **7.2**, **10** | 126.5 | 3.2 | B746 |
| | | | **25**, **36**, **50** | 154 | 4 | B747 |

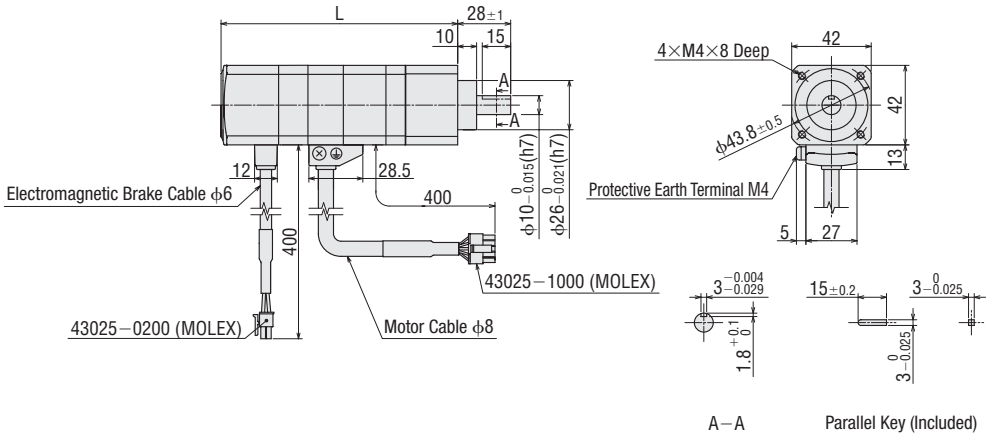



● A number indicating the gear ratio is entered where the box ■ is located within the product name.
● A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

## ◇**PS** Geared Type with Electromagnetic Brake

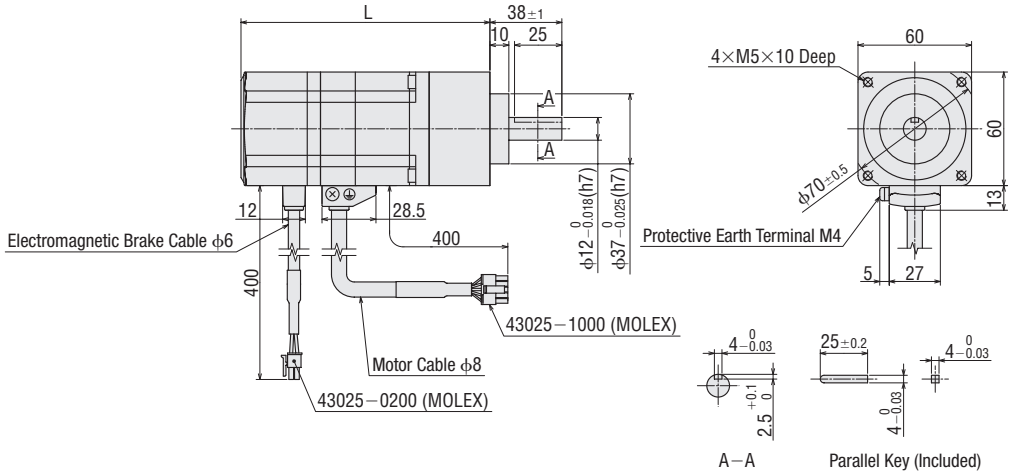
### Frame Size 42 mm

| Product Name | | Motor Product Name | Gear Ratio | L | Mass kg | CAD |
|---|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | | |
| **AR46SMKD-PS■-◇** | **AR46SMK-PS■-◇** | ARM46SMK-PS■ | **5**, **7.2**, **10** | 125 | 0.77 | B748 |
| | | | **25**, **36**, **50** | 148.5 | 0.92 | B749 |



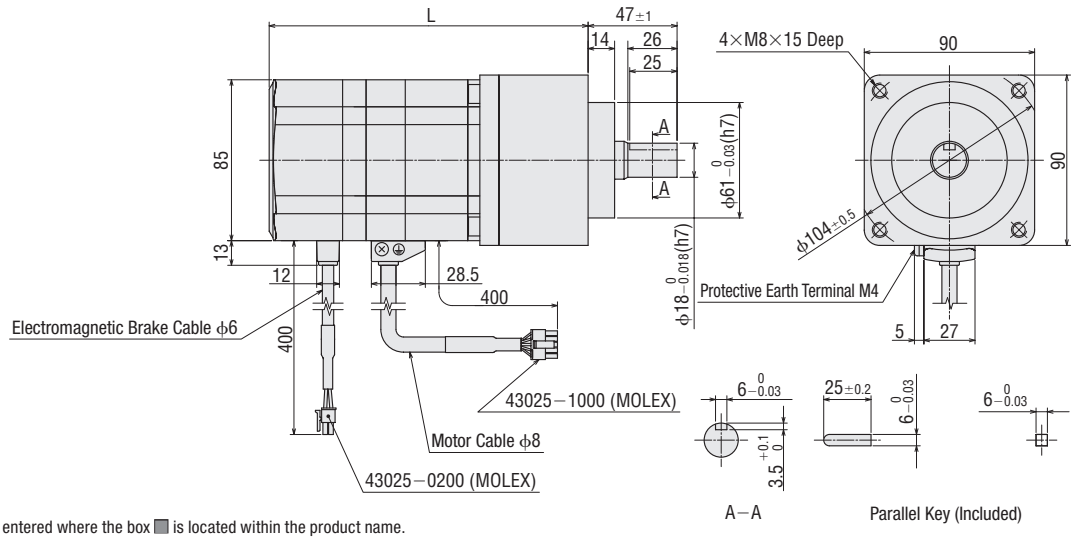

### Frame Size 60 mm

| Product Name | | Motor Product Name | Gear Ratio | L | Mass kg | CAD |
|---|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | | |
| **AR66SMKD-PS■-◇** | **AR66SMK-PS■-◇** | ARM66SMK-PS■ | **5**, **7.2**, **10** | 131.5 | 1.53 | B750 |
| | | | **25**, **36**, **50** | 151.5 | 1.83 | B751 |




### Frame Size 90 mm

| Product Name | | Motor Product Name | Gear Ratio | L | Mass kg | CAD |
|---|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | | |
| **AR98SMKD-PS■-◇** | **AR98SMK-PS■-◇** | ARM98SMK-PS■ | **5**, **7.2**, **10** | 168.5 | 3.7 | B752 |
| | | | **25**, **36**, **50** | 196 | 4.5 | B753 |

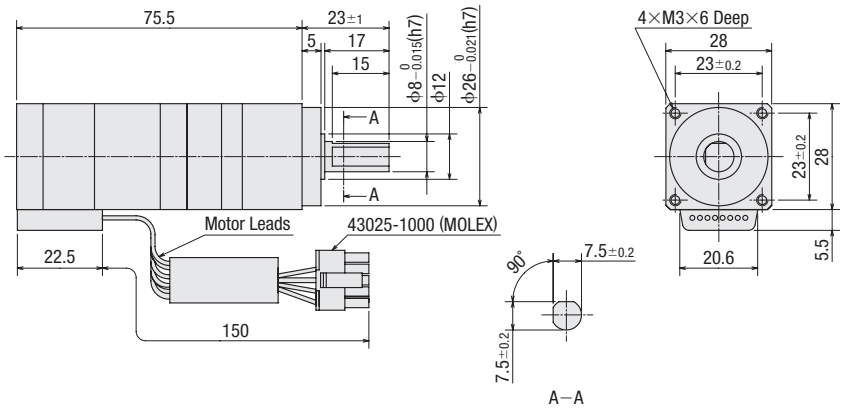



●A number indicating the gear ratio is entered where the box ■ is located within the product name.
●A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

## ◇**PN** Geared Type

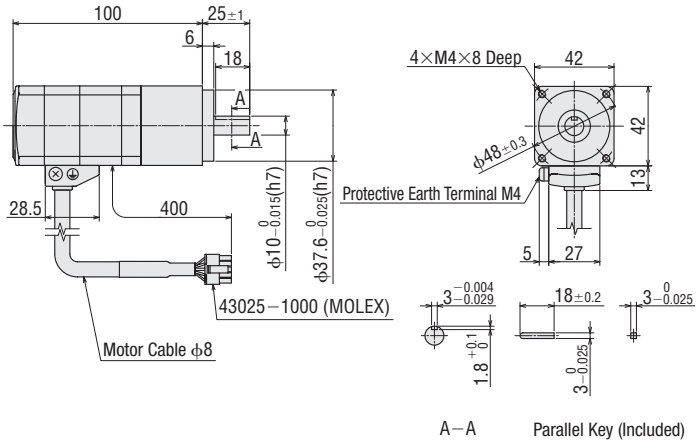
### Frame Size 28 mm

| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR24SAKD-N■-◇** | **AR24SAK-N■-◇** | ARM24SAK-N■ | **5**, **7.2**, **10** | 0.28 | B709 |



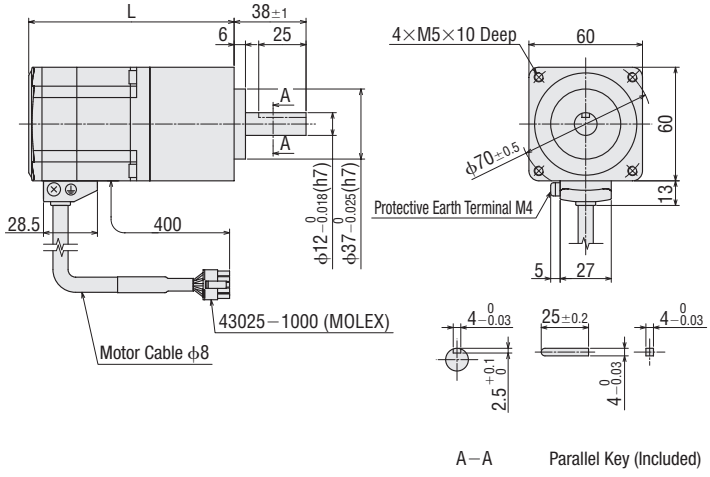

### Frame Size 42 mm

| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR46SAKD-N■-◇** | **AR46SAK-N■-◇** | ARM46SAK-N■ | **5**, **7.2**, **10** | 0.7 | B732 |




### Frame Size 60 mm

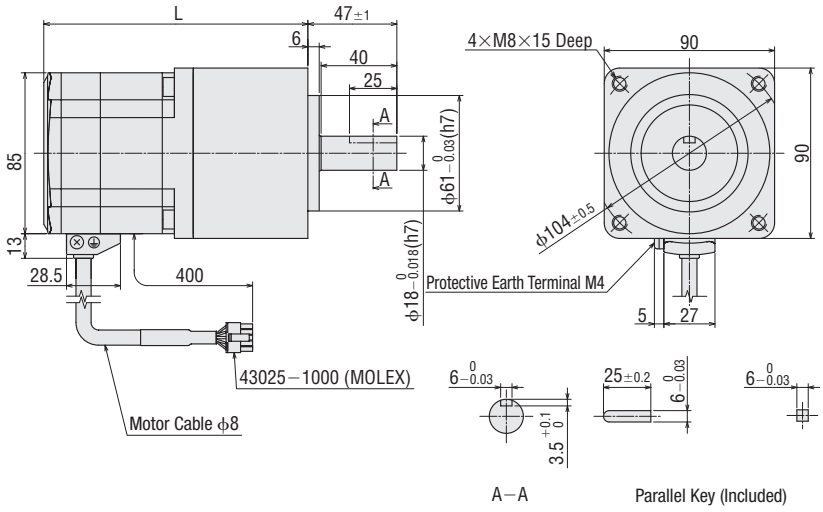
| Product Name | | Motor Product Name | Gear Ratio | L | Mass kg | CAD |
|---|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | | |
| **AR66SAKD-N■-◇** | **AR66SAK-N■-◇** | ARM66SAK-N■ | **5**, **7.2**, **10** | 108.5 | 1.47 | B733 |
| | | | **25**, **36**, **50** | 124.5 | 1.7 | B734 |




● A number indicating the gear ratio is entered where the box ■ is located within the product name.
● A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

### Frame Size 90 mm

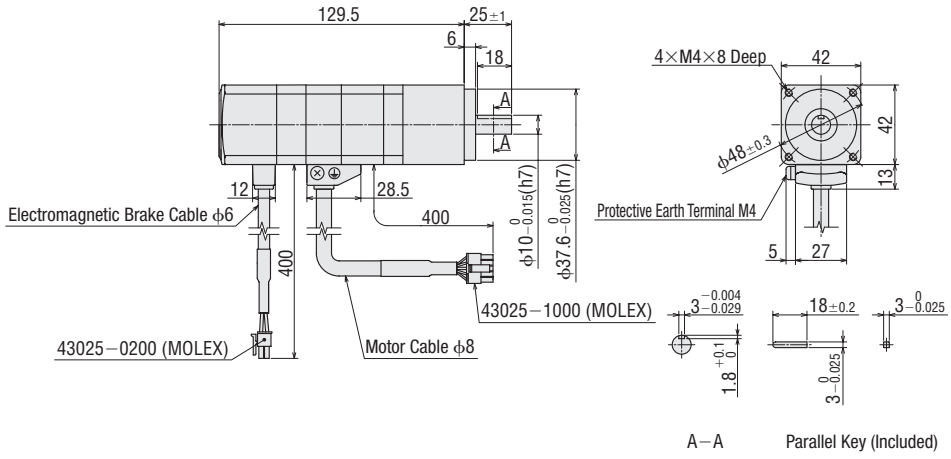
| Product Name | | Motor Product Name | Gear Ratio | L | Mass kg | CAD |
|---|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | | |
| **AR98SAKD-N■-◇** | **AR98SAK-N■-◇** | ARM98SAK-N■ | **5**, **7.2**, **10** | 139.5 | 3.7 | B735 |
| | | | **25**, **36**, **50** | 162.5 | 4.4 | B736 |




### ◇**PN** Geared Type with Electromagnetic Brake

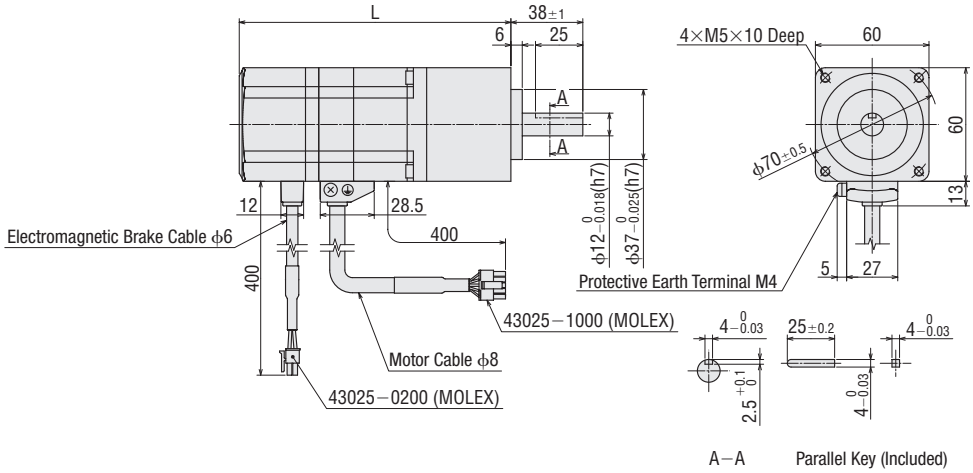
### Frame Size 42 mm

| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR46SMKD-N■-◇** | **AR46SMK-N■-◇** | ARM46SMK-N■ | **5**, **7.2**, **10** | 0.83 | B737 |




### Frame Size 60 mm

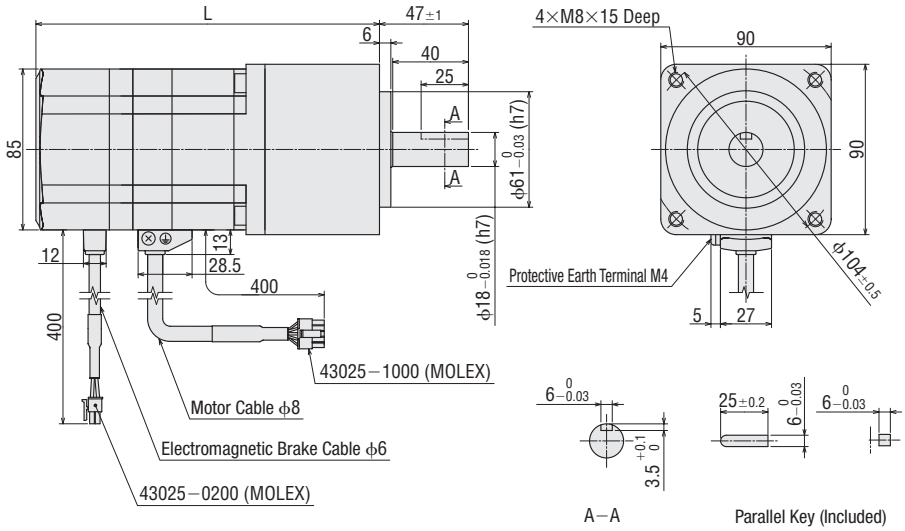
| Product Name | | Motor Product Name | Gear Ratio | L | Mass kg | CAD |
|---|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | | |
| **AR66SMKD-N■-◇** | **AR66SMK-N■-◇** | ARM66SMK-N■ | **5**, **7.2**, **10** | 143.5 | 1.73 | B738 |
| | | | **25**, **36**, **50** | 159.5 | 1.96 | B739 |




● A number indicating the gear ratio is entered where the box ■ is located within the product name.
● A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

### Frame Size 90 mm

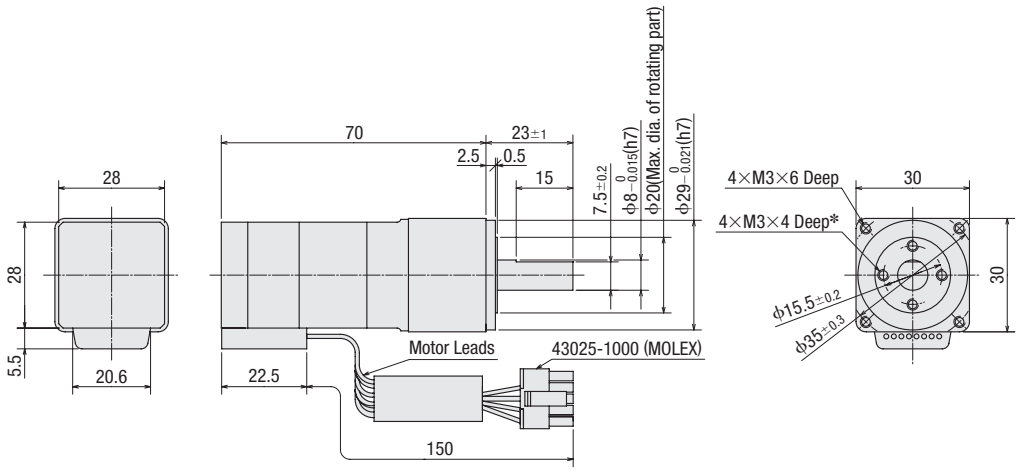
| Product Name | | Motor Product Name | Gear Ratio | L | Mass kg | CAD |
|---|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | | |
| **AR98SMKD-N■-◇** | **AR98SMK-N■-◇** | ARM98SMK-N■ | **5**, **7.2**, **10** | 181.5 | 4.2 | B740 |
| | | | **25**, **36**, **50** | 204.5 | 4.9 | B741 |




### ◇Harmonic Geared Type

### Frame Size 30 mm

| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR24SAKD-H■-◇** | **AR24SAK-H■-◇** | ARM24SAK-H■ | **50**, **100** | 0.24 | B710 |

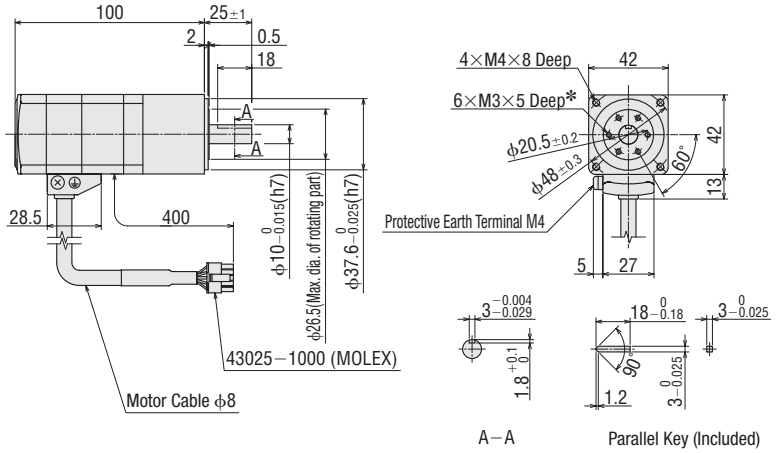



✻The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

●A number indicating the gear ratio is entered where the box ■ is located within the product name.
●A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

## Frame Size 42 mm

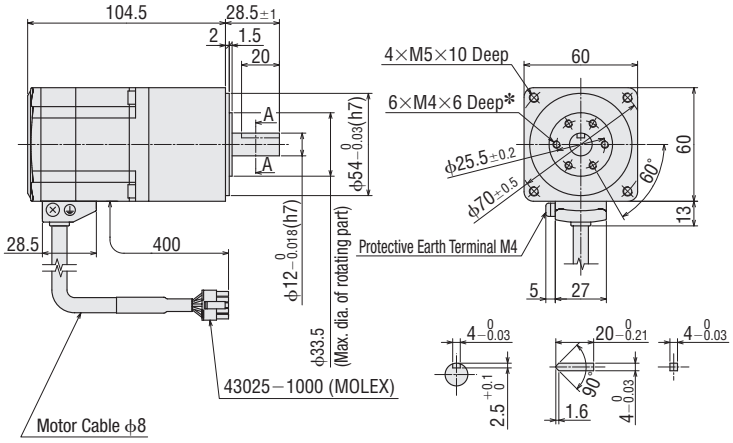
| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR46SAKD-H■-◇** | **AR46SAK-H■-◇** | ARM46SAK-H■ | **50, 100** | 0.65 | B754 |




✻The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

## Frame Size 60 mm

| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR66SAKD-H■-◇** | **AR66SAK-H■-◇** | ARM66SAK-H■ | **50, 100** | 1.38 | B755 |

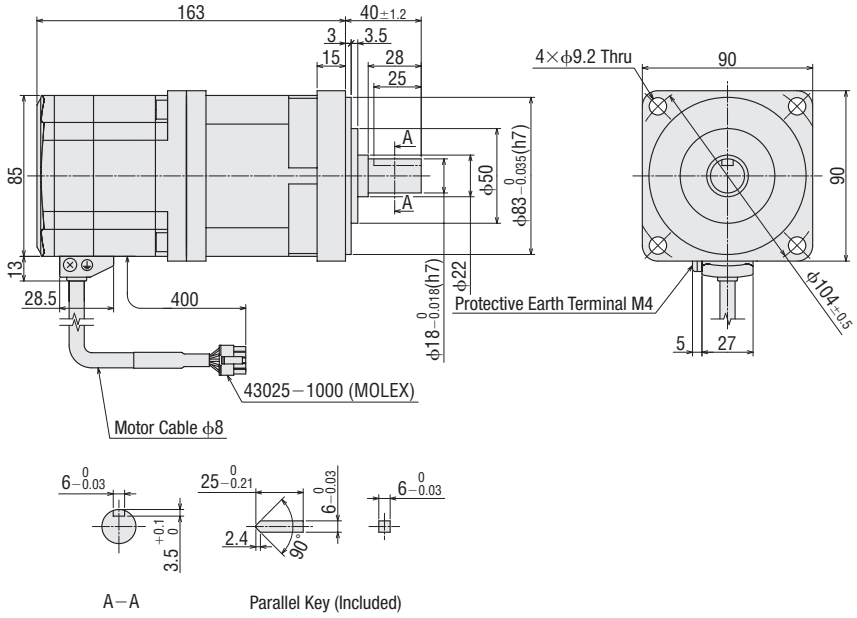



✻The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

● A number indicating the gear ratio is entered where the box ■ is located within the product name.
● A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

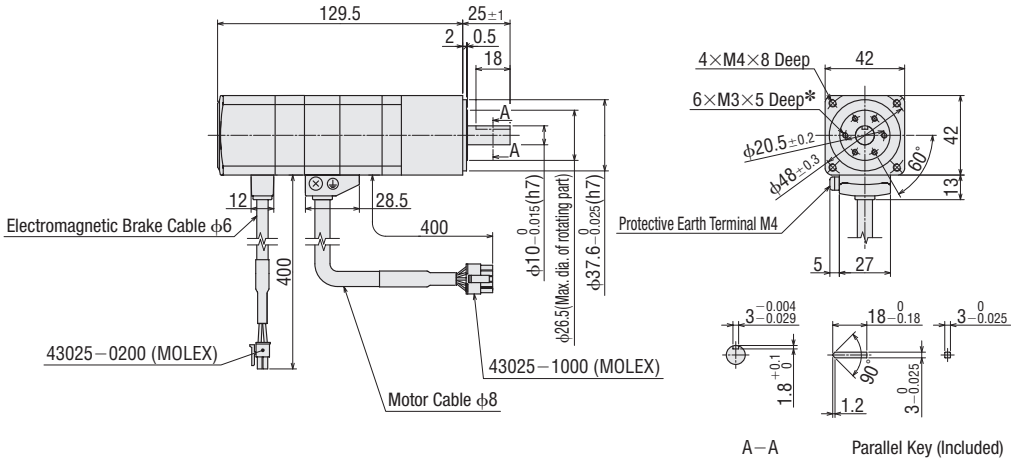
### Frame Size 90 mm

| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR98SAKD-H■-◇** | **AR98SAK-H■-◇** | ARM98SAK-H■ | **50**, **100** | 3.9 | B756 |




### ◇Harmonic Geared Type with Electromagnetic Brake
### Frame Size 42 mm

| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR46SMKD-H■-◇** | **AR46SMK-H■-◇** | ARM46SMK-H■ | **50**, **100** | 0.78 | B757 |

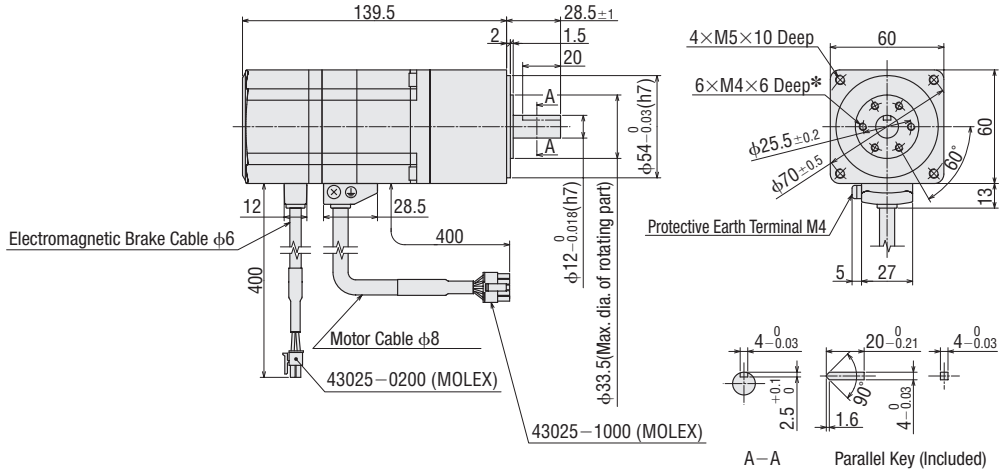



*The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

● A number indicating the gear ratio is entered where the box ■ is located within the product name.
● A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

## Frame Size 60 mm

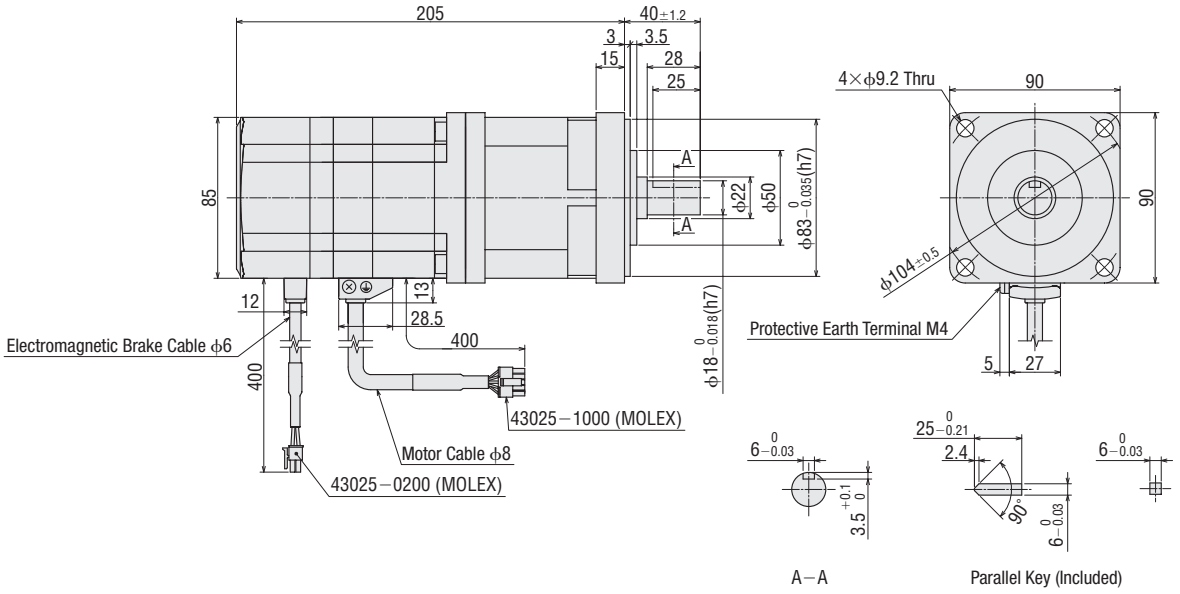
| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR66SMKD-H■-◇** | **AR66SMK-H■-◇** | ARM66SMK-H■ | **50**, **100** | 1.64 | B758 |




*The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

## Frame Size 90 mm

| Product Name | | Motor Product Name | Gear Ratio | Mass kg | CAD |
|---|---|---|---|---|---|
| Built-in Controller | Pulse Input | | | | |
| **AR98SMKD-H■-◇** | **AR98SMK-H■-◇** | ARM98SMK-H■ | **50**, **100** | 4.4 | B759 |



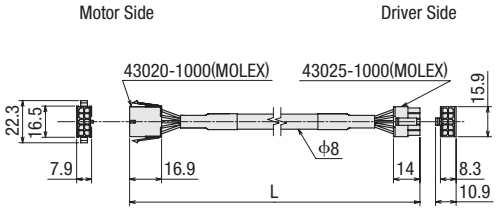

●A number indicating the gear ratio is entered where the box ■ is located within the product name.
●A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

## Cables for Motor (Included), Cables for Electromagnetic Brake (Included)

### Common to All Types

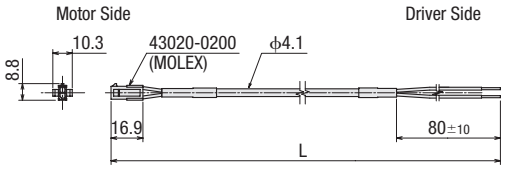
#### •Cable for Motor

| Cable Type | Length L (m) |
|---|---|
| Cable for Motor 1 m | 1 |
| Cable for Motor 2 m | 2 |
| Cable for Motor 3 m | 3 |




#### •Cables for Electromagnetic Brake (Electromagnetic brake type only)

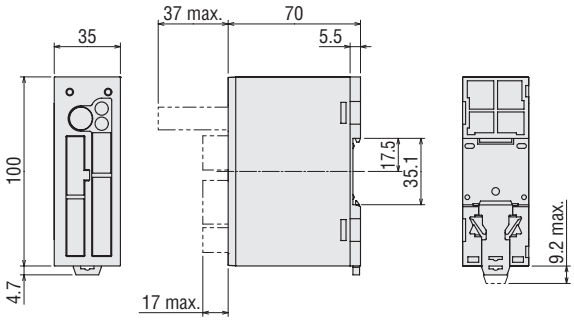
| Cable Type | Length L (m) |
|---|---|
| Cable for Electromagnetic Brake 1 m | 1 |
| Cable for Electromagnetic Brake 2 m | 2 |
| Cable for Electromagnetic Brake 3 m | 3 |




## Driver

### Built-in Controller Type

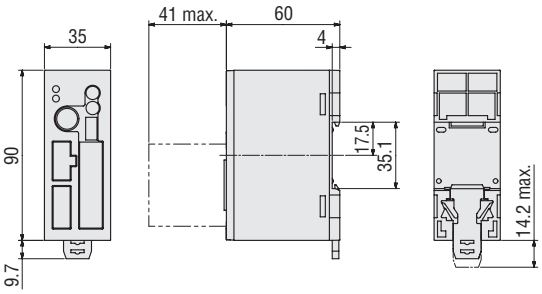
Mass: 0.17 kg CAD B711




●Included
- Power Input Terminal Connector (CN1)
  - Connector: MC1,5/5-STF-3,5 (PHOENIX CONTACT Inc.)
- Sensor Signal Connector (CN5)
  - Connector: FK-MC0,5/5-ST-2,5 (PHOENIX CONTACT Inc.)
- Input Signal Connector (CN8)
  - Connector: FK-MC0,5/9-ST-2,5 (PHOENIX CONTACT Inc.)
- Output Signal Connector (CN9)
  - Connector: FK-MC0,5/7-ST-2,5 (PHOENIX CONTACT Inc.)

### Pulse Input Type

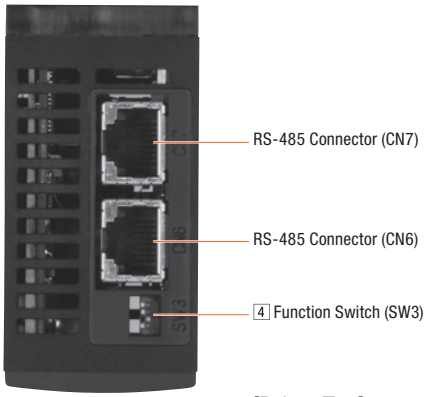
Mass: 0.17 kg CAD B546



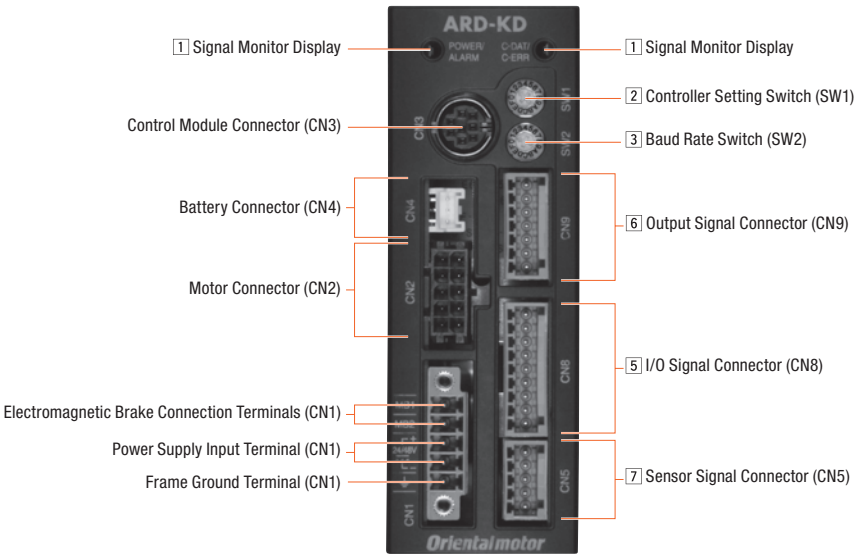

●Included
- Control I/O Signal Connector (CN5)
  - Case: 10336-52A0-008 (SUMITOMO 3M)
  - Connector: 10136-3000PE (SUMITOMO 3M)
- Power Supply Input and Frame Ground Terminal Connector (CN1)
  - Connector: MC1,5/3-STF-3,5 (PHOENIX CONTACT Inc.)

# Connection and Operation (Built-in controller type)

## Names and Functions of Driver Parts




[Driver Top]




### 1 Signal Monitor Display

#### ◇LED Indicator

| Indication | Color | Function | Lighting Condition |
|---|---|---|---|
| POWER | Green | Power Supply Indication | When the power supply is input |
| ALARM | Red | Alarm Indication | Blinks when protective functions are activated. |
| C-DAT | Green | Communication Indication | When communication data is being exchanged |
| C-ERR | Red | Communication Error Indication | When communication data is in error |

### 2 Controller Setting Switch (SW1)

| Indication | Function |
|---|---|
| SW1 | Set this when you are using RS-485 communication. Set the controller number (Factory Setting: 0). |

### 3 Baud Rate Switch (SW2)

| Indication | Function |
|---|---|
| SW2 | Set this when you are using RS-485 communication. Set the baud rate (Factory Setting: 7). |

#### ◇RS-485 Baud Rate Setting

| No. | Baud Rate (bps) |
|---|---|
| 0 | 9600 |
| 1 | 19200 |
| 2 | 38400 |
| 3 | 57600 |
| 4 | 115200 |
| 5～6 | Not used |
| 7 | 625000 (Connection with a network converter) |
| 8～F | Not used |

### 4 Function Switch (SW3)

| Indication | No. | Function |
|---|---|---|
| SW3 | 1 | Set the controller number (Factory Setting: 0) in combination with Controller Setting Switch (SW1). |
| | 2 | Set the RS-485 protocol (Factory Setting: OFF). |
| | 3 | Not used. |
| | 4 | Set the RS-485 termination (120Ω) (Factory Setting: OFF).<br>OFF: Termination disabled<br>ON: Termination enabled |

### ◇RS-485 Protocol Setting

| No. \ Destination | Connection with a network converter | Modbus RTU Mode |
|---|---|---|
| 2 | OFF | ON |

### 5 I/O Signal Connector (CN8)

| Indication | Pin No. | Signal Name | Initial Value | |
|---|---|---|---|---|
| CN8 | 1 | IN0 | HOME | Executes a return-to-home operation. |
| | 2 | IN1 | START | Executes a positioning operation. |
| | 3 | IN2 | M0 | Use these three bits to select the operation data No. |
| | 4 | IN3 | M1 | |
| | 5 | IN4 | M2 | |
| | 6 | IN5 | FREE | Stop motor excitation and release the electromagnetic brake. |
| | 7 | IN6 | STOP | Stops the motor. |
| | 8 | IN7 | ALM-RST | Resets the current alarm. |

●Assign functions by setting parameters. Initial values are shown above. For details, refer to the user's manual.

The following input signals can be assigned to input terminals IN0 to 7.

| Input Signal | | | | |
|---|---|---|---|---|
| 0: Not used | 8: MS0 | 18: STOP | 36:R4 | 45:R13 |
| 1:FWD | 9:MS1 | 24:ALM-RST | 37:R5 | 46:R14 |
| 2:RVS | 10:MS2 | 25:P-PRESET | 38:R6 | 47:R15 |
| 3:HOME | 11:MS3 | 26:P-CLR | 39:R7 | 48:M0 |
| 4:START | 12:MS4 | 27:HMI | 40:R8 | 49:M1 |
| 5:SSTART | 13:MS5 | 32:R0 | 41:R9 | 50:M2 |
| 6:+JOG | 16:FREE | 33:R1 | 42:R10 | 51:M3 |
| 7:−JOG | 17:C-ON | 34:R2 | 43:R11 | 52:M4 |
| | | 35:R3 | 44:R12 | 53:M5 |

### 6 Output Signal Connector (CN9)

| Indication | Pin No. | Signal Name | Initial Value | |
|---|---|---|---|---|
| CN9 | 1 | OUT0 | HOME-P | This signal is output when the motor is at the home position. |
| | 2 | OUT1 | END | This signal is output when the positioning operation is complete. |
| | 3 | OUT2 | AREA1 | This signal is output when the motor is in area 1. |
| | 4 | OUT3 | READY | This signal is output when the driver is ready. |
| | 5 | OUT4 | WNG | This output signal indicates the driver warning status. |
| | 6 | OUT5 | ALM | This output signal indicates the driver alarm status (normally closed). |

●Assign functions by setting parameters. Initial values are shown above. For details, refer to the user's manual.

The following output signals can be assigned to output terminals OUT0 to 5.

| Output Signal | | | | | |
|---|---|---|---|---|---|
| 0: Not used | 9:MS1_R | 33:R1 | 42:R10 | 51:M3_R | 67:READY |
| 1:FWD_R | 10:MS2_R | 34:R2 | 43:R11 | 52:M4_R | 68:MOVE |
| 2:RVS_R | 11:MS3_R | 35:R3 | 44:R12 | 53:M5_R | 69:END |
| 3:HOME_R | 12:MS4_R | 36:R4 | 45:R13 | 60:+LS_R | 70:HOME-P |
| 4:START_R | 13:MS5_R | 37:R5 | 46:R14 | 61:−LS_R | 71:TLC |
| 5:SSTART_R | 16:FREE_R | 38:R6 | 47:R15 | 62:HOMES_R | 72:TIM |
| 6:+JOG_R | 17:C-ON_R | 39:R7 | 48:M0_R | 63:SLIT_R | 73:AREA1 |
| 7:−JOG_R | 18:STOP_R | 40:R8 | 49:M1_R | 65:ALM | 74:AREA2 |
| 8:MS0_R | 32:R0 | 41:R9 | 50:M2_R | 66:WNG | 75:AREA3 |
| | | | | | 80:S-BSY |

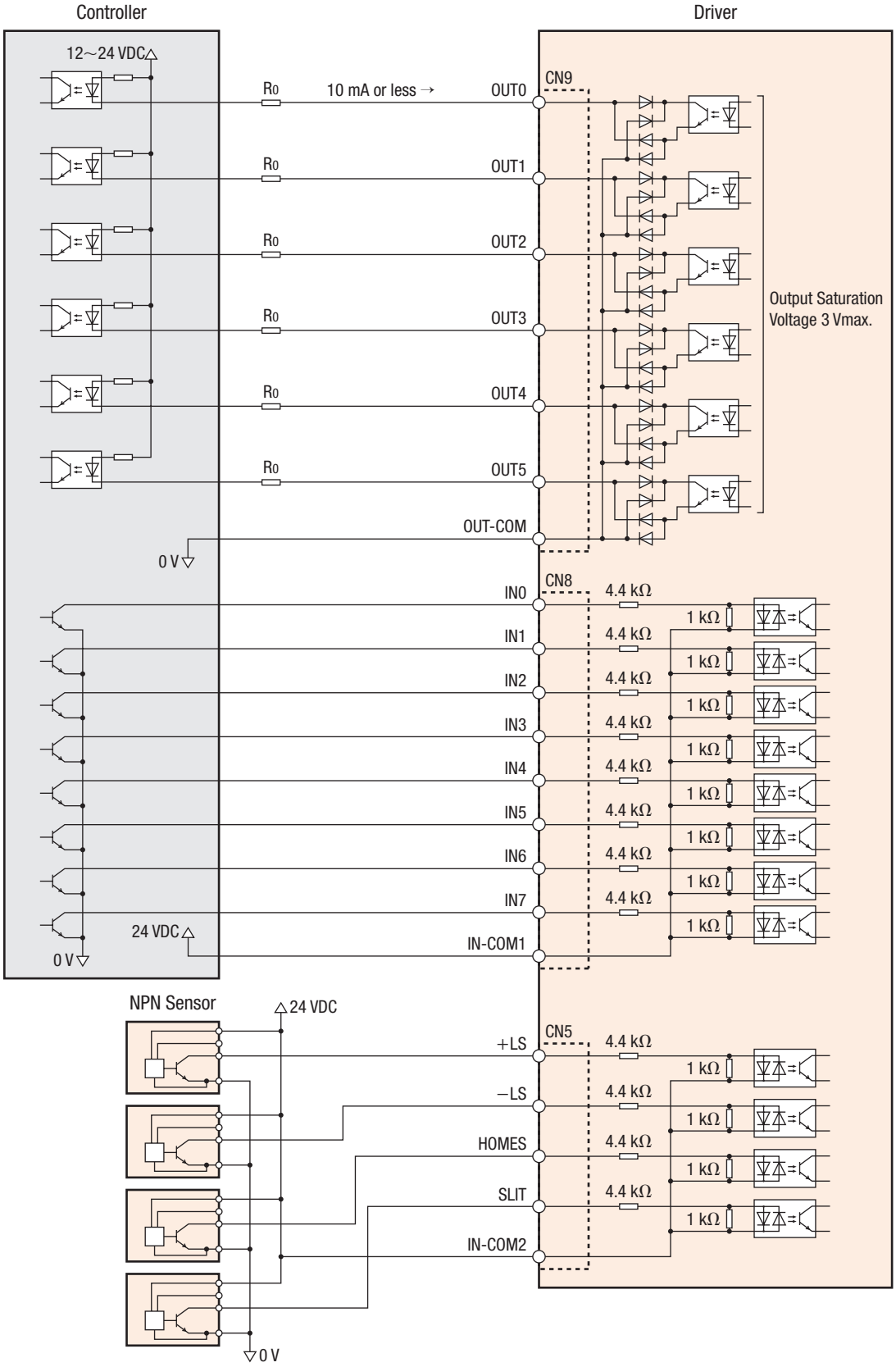
### 7 Sensor Signal Input (CN5)

| Indication | Pin No. | Signal Name | Initial Value |
|---|---|---|---|
| CN5 | 1 | +LS | +side limit sensor input |
| | 2 | −LS | −side limit sensor input |
| | 3 | HOMES | Mechanical home sensor input |
| | 4 | SLIT | Slit Sensor Input |
| | 5 | IN-COM2 | Sensor common |

## Connection Diagram

### ◇Connection to Programmable Controller

#### •Connecting to a Current Sink Output Circuit

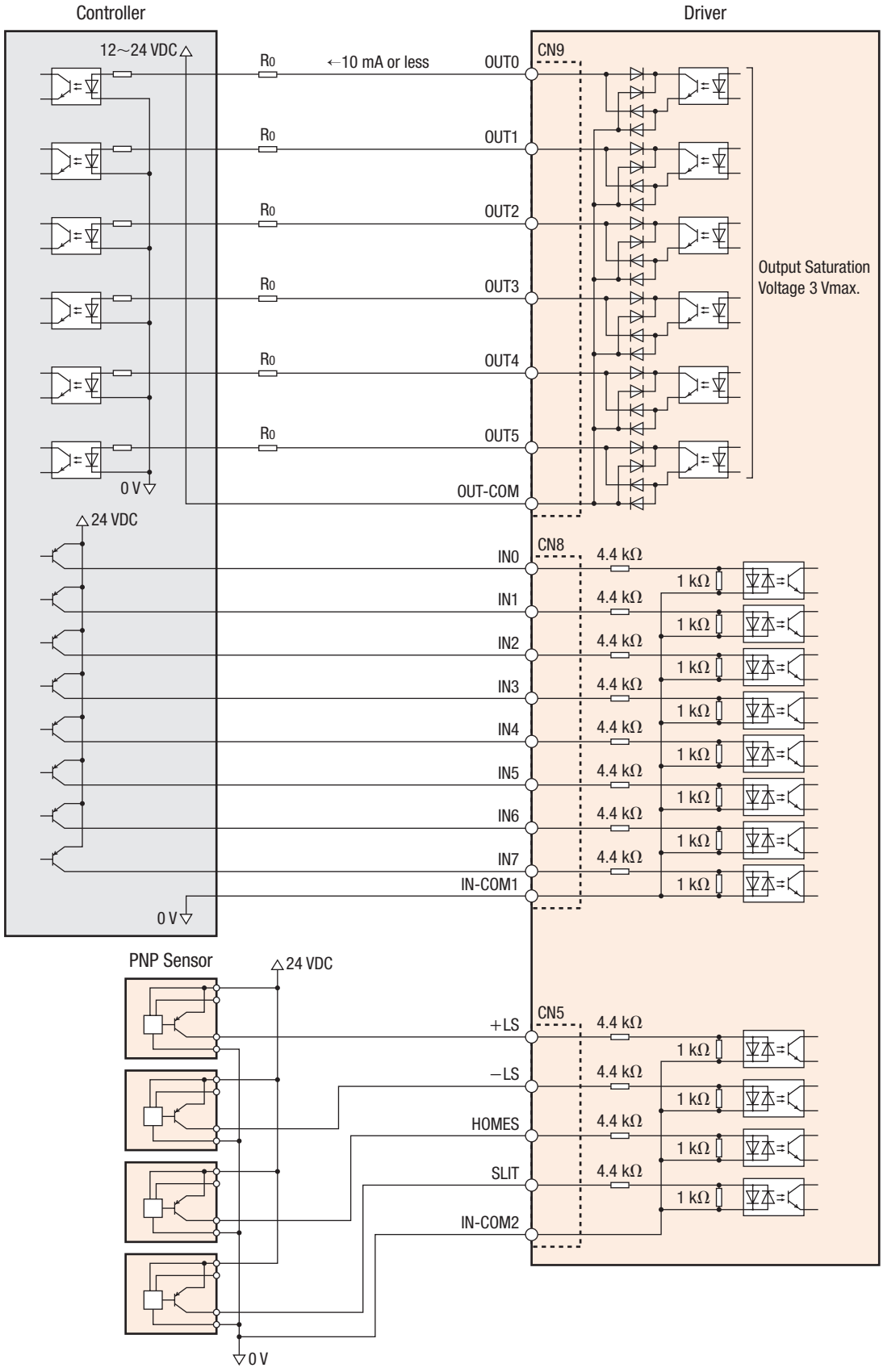



Note

- Use 24 VDC input signals.
- Use 24 VDC output signals at 10 mA or less. When the current value exceeds 10 mA, connect the external resistor $R_0$ to keep the current 10 mA or less.
- The maximum output signal saturation voltage is 3 V.
- Provide a distance of at least 200 mm between the signal lines and power lines (power supply lines, motor lines, etc.).
  Do not run the signal lines in the same duct 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 to Programmable Controller

•Connecting to a Current Source Output Circuit

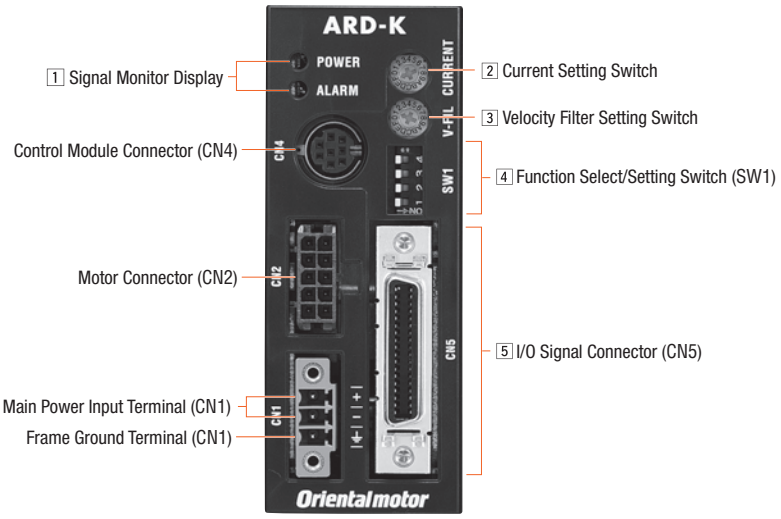



Note

- Use 24 VDC input signals.
- Use 24 VDC output signals at 10 mA or less. When the current value exceeds 10 mA, connect the external resistor $R_0$ to keep the current 10 mA or less.
- The maximum output signal saturation voltage is 3 V.
- Provide a distance of at least 200 mm between the signal lines and power lines (power supply lines, motor lines, etc.). Do not run the signal lines in the same duct 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 and Operation (Pulse input type)

## Names and Functions of Driver Parts




### 1 Signal Monitor Display

#### ◇LED Indicator

| Indication | Color | Function | Lighting Condition |
|---|---|---|---|
| POWER | Green | Power Supply Indication | When the main power supply is input |
| ALARM | Red | Alarm Indication | Blinks when protective functions are activated. |

#### ◇Alarm Contents

| Blink Count | Function | Operating Condition |
|---|---|---|
| 2 | Overheat Protection | When the temperature inside the driver exceeds 85˚C |
| | Overload | When the amount of time during which the load torque exceeded the maximum torque exceeds the overload detection time. (Default Value: 5 seconds) |
| | Overspeed | The motor output shaft speed exceeds 4500 r/min. |
| | Command Pulse Error | The command pulse value becomes abnormal. |
| 3 | Overvoltage Protection | The primary voltage of the driver's inverter exceeds the upper limit. |
| | Undervoltage | The primary voltage of the driver's inverter drops below the lower limit. |
| 4 | Excessive Positioning Deviation Error at Current On | The positioning deviation exceeds the overflow revolutions. (Default Value: 3 revolutions) |
| | Excessive Positioning Deviation Error at Current Off | The current is turned on even though the positioning deviation when the current is turned off was equal to or greater than the permissible value. (Default Value: 100 revolutions or more) |
| 7 | Operation Data Error | Return to electrical home operation is performed while an operation data error warning is present. |
| | Electronic Gear Setting Error | The resolution set by the electronic gear is outside the specified range. |
| 8 | Sensor Error during Operation | A sensor error occurs while the motor is rotating. |
| | Initial Sensor Error | The power source is turned on when the motor cable is not connected to the driver. |
| | Initial Rotor Revolution Error | The main power supply is turned on while the motor is rotating. |
| | Motor Combination Error | A motor not supported by the driver is connected. |
| 9 | EEPROM Error | A motor control parameter is damaged. |

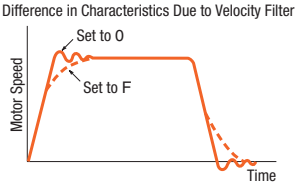
### 2 Current Setting Switch

| Indication | Switch Name | Function |
|---|---|---|
| CURRENT | Current Setting Switch | This switch adjusts the operating current. It is used to limit the torque and temperature rise.<br>A desired current can be set as a percentage (%) of the rated output power current.<br>Factory Setting: F |

### 3 Velocity Filter Setting Switch

| Indication | Switch Name | Function |
|---|---|---|
| V-FIL | Velocity Filter Setting Switch | This switch adjusts the motor response.<br>Adjust the switch if you want to suppress motor vibration or<br>cause the motor to start/stop smoothly.<br>"0" and "F" correspond to the minimum and maximum velocity filter settings, respectively.<br>Factory Setting: 1 |

Difference in Characteristics Due to Velocity Filter



### 4 Function Select/Setting Switch (SW1)

| Indication | Switch Name | Function |
|---|---|---|
| 4 | Resolution Select Switch D0/D1 CS0/CS1 | These switches are used to set the resolution per rotation of the motor output shaft.<br>4: OFF, 3: OFF → 1000 pulses (0.36°/step) [Factory setting]<br>4: OFF, 3: ON → 10000 pulses (0.036°/step)<br>4: ON, 3: OFF → 500 pulses (0.72°/step)<br>4: ON, 3: ON → 5000 pulses (0.072°/step) |
| 3 | | |
| 2 | Control Modes Select Switch NORM/CCM | This switch toggles the driver between the normal mode and current control mode. In the current control mode, noise and vibration can be reduced although the motor synchronicity may reduce.<br>OFF: Normal Mode [Factory setting]<br>ON: Current Control Mode |
| 1 | Pulse Input Mode Select Switch 2P/1P | This switch toggles the pulse input mode between 1-pulse input mode and 2-pulse input mode.<br>OFF: 2-Pulse Input Mode [Factory setting]<br>ON: 1-Pulse Input Mode |

### 5 I/O Signal Connector (CN5, 36 pins)

| Indication | I/O | Pin No. | Code | | Signal Name | |
|---|---|---|---|---|---|---|
| | | | Positioning Operation | Push-Motion Operation*1 | Positioning Operation | Push-Motion Operation*1 |
| CN5 | — | 1 | — | | — | |
| | Output Power | 2 | GND | | Ground connection | |
| | | 3 | ASG+ | | A-Phase Pulse Output Signal (Line driver) | |
| | | 4 | ASG− | | | |
| | | 5 | BSG+ | | B-Phase Pulse Output Signal (Line driver) | |
| | | 6 | BSG− | | | |
| | | 7 | TIM1+ | | Timing Output (Line driver) | |
| | | 8 | TIM1− | | | |
| | | 9 | ALM+ | | Alarm Output | |
| | | 10 | ALM− | | | |
| | | 11 | WNG+ | | Warning Output | |
| | | 12 | WNG− | | | |
| | | 13 | END+ | | Positioning Completion Output | |
| | | 14 | END− | | | |
| | | 15 | READY+/AL0+*1 | | Operation Ready Complete Output/Alarm Code 0 Output*1 | |
| | | 16 | READY−/AL0−*1 | | | |
| | | 17 | TLC+/AL1+*1 | | Torque Limiting Output/Alarm Code 1 Output*1 | |
| | | 18 | TLC−/AL1−*1 | | | |
| | | 19 | TIM2+/AL2+*1 | | Timing Output (Open collector)/Alarm Code 2 Output*1 | |
| | | 20 | TIM2−/AL2−*1 | | | |
| | | 21 | GND | | Ground connection | |
| | Input | 22 | IN−COM | | Input Signal Common | |
| | | 23 | C−ON*2 | | Current On Input*2 | |
| | | 24 | CLR/ALM−RST | | Deviation Counter Clear Input/Alarm Reset Input | |
| | | 25 | CCM | | Current Control Mode ON Input | |
| | | 26 | CS | T−MODE*1 | Resolution Select Input | Push-Motion Operation ON*1 |
| | | 27 | — | M0*1 | — | Push-Current Setting Select Input*1 |
| | | 28 | RETURN | M1*1 | Return To Electrical Home Operation | |
| | | 29 | P−RESET | M2*1 | Position Reset Input | |
| | | 30 | FREE | | Excitation OFF | |
| | | 31 | CW+/PLS+ | | CW Pulse Signal Input/Pulse Input (+5 V/line driver) | |
| | | 32 | CW−/PLS− | | | |
| | | 33 | CW+24/PLS+24V | | CW Pulse Signal Input/Pulse Input (+24 V) | |
| | | 34 | CCW+24/DIR+24V | | CCW Pulse Signal Input/Rotation Direction Input (+24 V) | |
| | | 35 | CCW+/DIR+ | | CCW Pulse Signal Input/Rotation Direction Input (+5 V/line driver) | |
| | | 36 | CCW−/DIR− | | | |

*1 The signal will become effective if the applicable setting has been changed using the accessory control module **OPX-2A** or data setting software **MEXE02** (both sold separately).

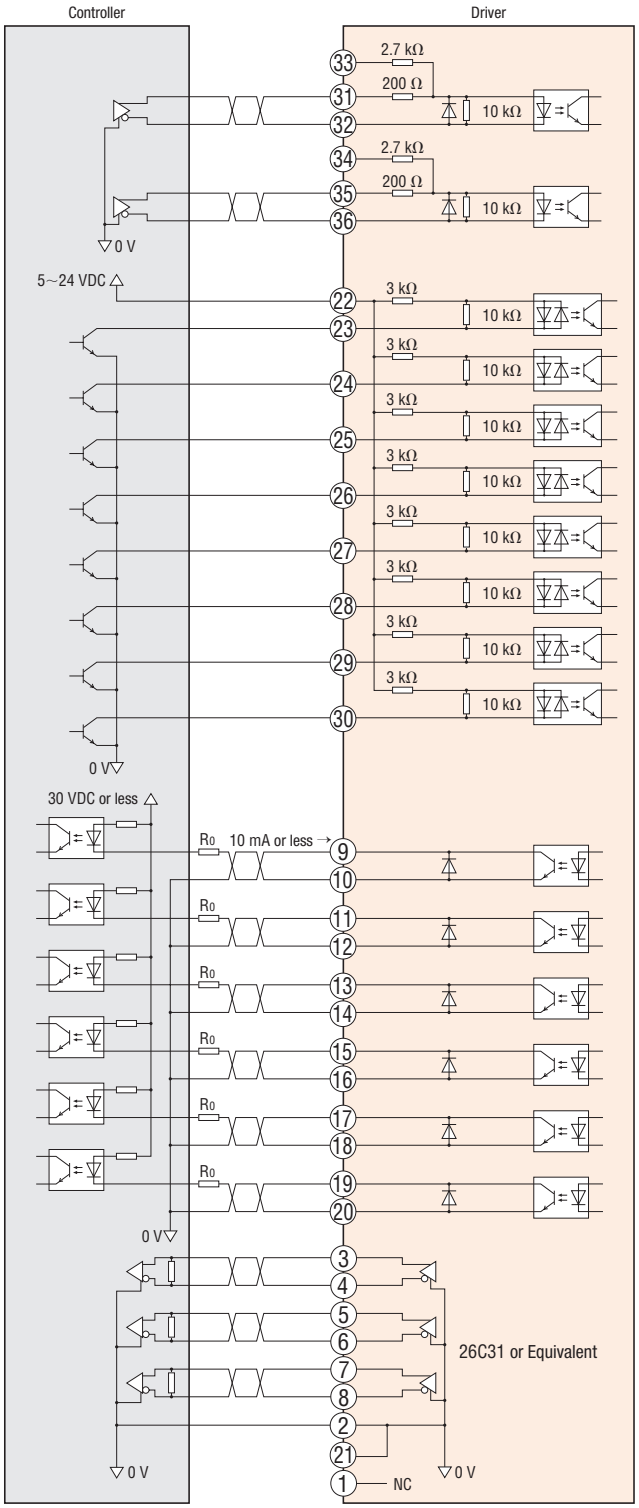
*2 The factory setting of current ON input is normally open. When operating the motor, be sure to turn the current ON input "ON." If you are not using the current ON input, use the accessory control module **OPX-2A** or data setting software **MEXE02** to set the input logic to normally closed.

## Connection Diagram

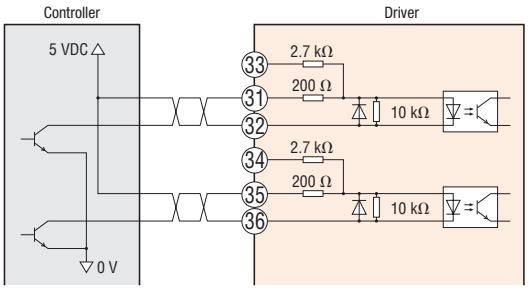
### ◇Connection to Programmable Controller

#### •Connecting to a Current Sink Output Circuit

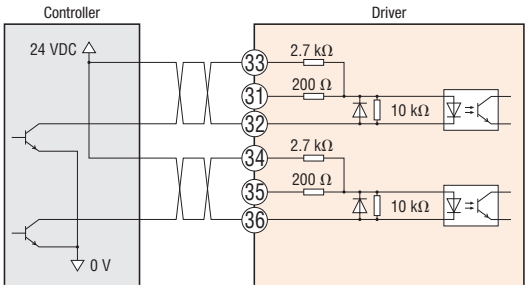
When pulse input is of line driver type




When pulse input is of 5 V type




When pulse input is of 24 V type



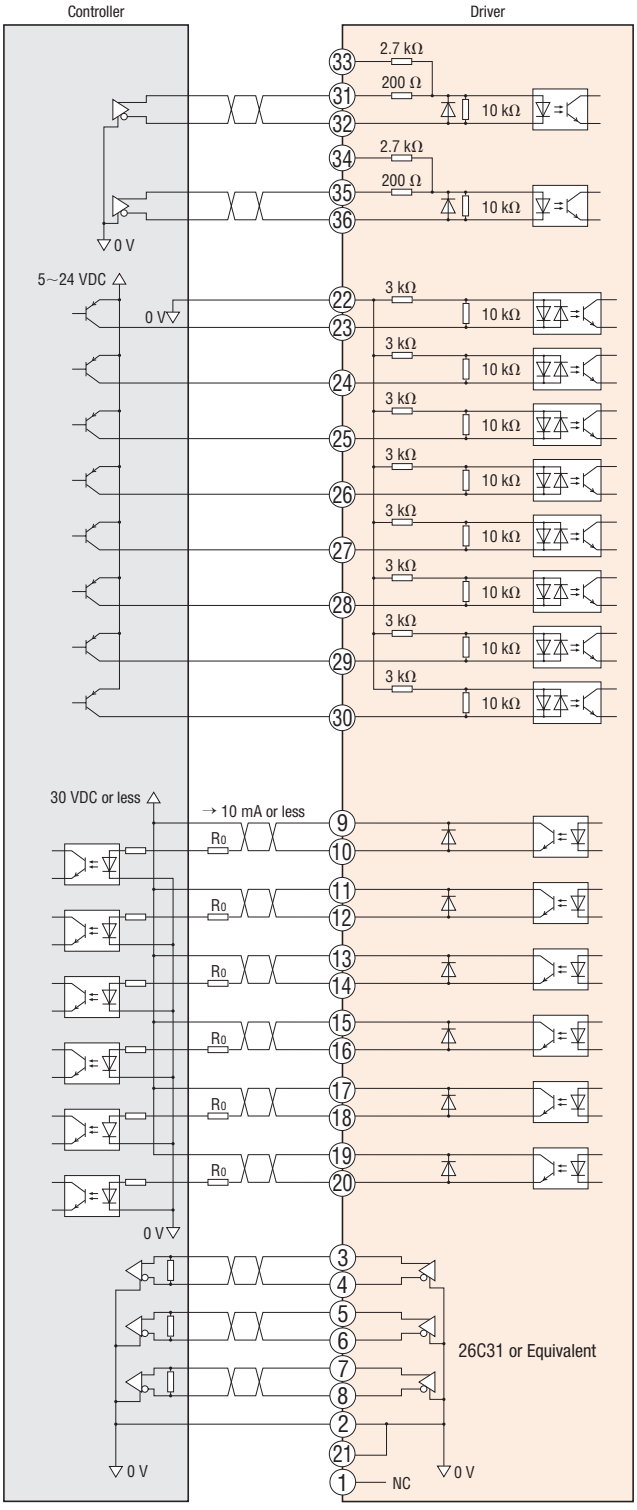

**Note**

- Use 30 VDC or less for the output signals. When the current value exceeds 10 mA, connect the external resistor $R_0$.
- Connect a termination resistor of 100 Ω or more between the line receiver inputs.
- Use multi-core, twisted-pair shielded wires of AWG 28~24 (0.08~0.2 $mm^2$) for the I/O signal lines (CN5), and keep wiring as short as possible (within 2 m).
- Note that as the length of the pulse signal line increases, the maximum transmission frequency decreases.
- Provide a distance of 200 mm min. between the I/O signal lines and power lines (AC lines, motor lines and other large-current circuits).

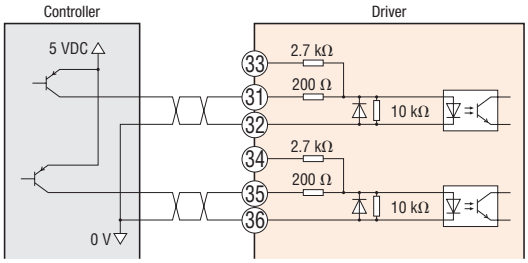
## ◇Connection to Programmable Controller

### •Connecting to a Current Source Output Circuit

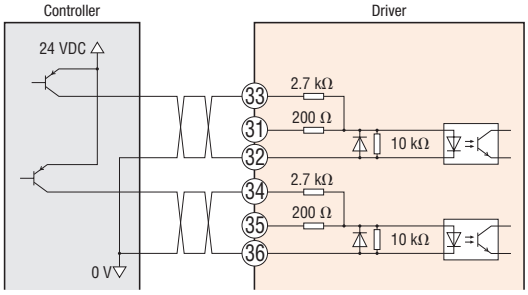
When pulse input is of line driver type




When pulse input is of 5 V type




When pulse input is of 24 V type




**Note**

- Use 30 VDC or less for the output signals. When the current value exceeds 10 mA, connect the external resistor $R_0$.
- Connect a termination resistor of 100 Ω or more between the line receiver inputs.
- Use multi-core, twisted-pair shielded wires of AWG 28~24 (0.08~0.2 $mm^2$) for the I/O signal lines (CN5), and keep wiring as short as possible (within 2 m).
- Note that as the length of the pulse signal line increases, the maximum transmission frequency decreases.
- Provide a distance of 200 mm min. between the I/O signal lines and power lines (AC lines, motor lines and other large-current circuits).

# Motor and Driver Combinations

Product names for motor and driver combinations are shown below.

| Type | Built-in Controller Type | | | Pulse Input Type | | |
|---|---|---|---|---|---|---|
| | Product Name | Motor Product Name | Driver Product Name | Product Name | Motor Product Name | Driver Product Name |
| Standard Type | **AR24S**□**KD-**◇*1<br>**AR26S**□**KD-**◇*1 | ARM24S□K<br>ARM26S□K | ARD-KD | **AR24S**□**K-**◇*1<br>**AR26S**□**K-**◇*1 | ARM24S□K<br>ARM26S□K | ARD-K |
| | **AR46S**□**KD-**◇*2 | ARM46S□K | | **AR46S**□**K-**◇*2 | ARM46S□K | |
| | **AR66S**□**KD-**◇*2<br>**AR69S**□**KD-**◇*2 | ARM66S□K<br>ARM69S□K | | **AR66S**□**K-**◇*2<br>**AR69S**□**K-**◇*2 | ARM66S□K<br>ARM69S□K | |
| | **AR98S**□**KD-**◇*2 | ARM98S□K | | **AR98S**□**K-**◇*2 | ARM98S□K | |
| **TH** Geared Type | **AR24SAKD-T**■**-**◇ | ARM24SAK-T■ | | **AR24SAK-T**■**-**◇ | ARM24SAK-T■ | |
| | **AR46S**□**KD-T**■**-**◇ | ARM46S□K-T■ | | **AR46S**□**K-T**■**-**◇ | ARM46S□K-T■ | |
| | **AR66S**□**KD-T**■**-**◇ | ARM66S□K-T■ | | **AR66S**□**K-T**■**-**◇ | ARM66S□K-T■ | |
| | **AR98S**□**KD-T**■**-**◇ | ARM98S□K-T■ | | **AR98S**□**K-T**■**-**◇ | ARM98S□K-T■ | |
| **PS** Geared Type | **AR24SAKD-PS**■**-**◇ | ARM24SAK-PS■ | | **AR24SAK-PS**■**-**◇ | ARM24SAK-PS■ | |
| | **AR46S**□**KD-PS**■**-**◇ | ARM46S□K-PS■ | | **AR46S**□**K-PS**■**-**◇ | ARM46S□K-PS■ | |
| | **AR66S**□**KD-PS**■**-**◇ | ARM66S□K-PS■ | | **AR66S**□**K-PS**■**-**◇ | ARM66S□K-PS■ | |
| | **AR98S**□**KD-PS**■**-**◇ | ARM98S□K-PS■ | | **AR98S**□**K-PS**■**-**◇ | ARM98S□K-PS■ | |
| **PN** Geared Type | **AR24SAKD-N**■**-**◇ | ARM24SAK-N■ | | **AR24SAK-N**■**-**◇ | ARM24SAK-N■ | |
| | **AR46S**□**KD-N**■**-**◇ | ARM46S□K-N■ | | **AR46S**□**K-N**■**-**◇ | ARM46S□K-N■ | |
| | **AR66S**□**KD-N**■**-**◇ | ARM66S□K-N■ | | **AR66S**□**K-N**■**-**◇ | ARM66S□K-N■ | |
| | **AR98S**□**KD-N**■**-**◇ | ARM98S□K-N■ | | **AR98S**□**K-N**■**-**◇ | ARM98S□K-N■ | |
| Harmonic Geared Type | **AR24SAKD-H**■**-**◇ | ARM24SAK-H■ | | **AR24SAK-H**■**-**◇ | ARM24SAK-H■ | |
| | **AR46S**□**KD-H**■**-**◇ | ARM46S□K-H■ | | **AR46S**□**K-H**■**-**◇ | ARM46S□K-H■ | |
| | **AR66S**□**KD-H**■**-**◇ | ARM66S□K-H■ | | **AR66S**□**K-H**■**-**◇ | ARM66S□K-H■ | |
| | **AR98S**□**KD-H**■**-**◇ | ARM98S□K-H■ | | **AR98S**□**K-H**■**-**◇ | ARM98S□K-H■ | |

● Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
A number indicating the gear ratio is entered where the box ■ is located within the product name.
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

*1 Either **A** (single shaft) or **B** (double shaft) indicating the motor shaft configuration is entered where the box □ is located within **AR24S**□**K**(**D**)**-**◇ and **AR26S**□**K**(**D**)**-**◇.

*2 Either **A** (single shaft), **B** (double shaft), or **M** (electromagnetic brake) indicating the motor shaft configuration is entered where the box □ is located within **AR46S**□**K**(**D**)**-**◇, **AR66S**□**K**(**D**)**-**◇, **AR69S**□**K**(**D**)**-**◇, and **AR98S**□**K**(**D**)**-**◇.

# Extended Functions

With the accessory control module **OPX-2A** or data setting software **MEXE02**, extended functions of the **AR** Series are available. You can change the internal parameters of the driver, perform test operations and monitor the operation.

Control Module **OPX-2A**
➜ Page 53

Data Setting Software **MEXE02**
➜ Page 54

**Computer**
(Not supplied.)

## Parameter Settings (For pulse input type)

You can set the advanced settings of the signals and change the generation condition of the alarm.

| | | |
|---|---|---|
| Application Parameters | Running Current | Current value assigned to the operating current setting switch |
| | Velocity Filter | Filter time constant assigned to the speed filter setting switch |
| | I/O | Input signal mode Positioning operation/push-motion operation switching |
| | | Alarm code signal enabled/disabled |
| | | C-ON signal logic |
| | | Output condition for END signal (output width) |
| | | Current value applicable to push-motion operation |
| | Normal Mode | Standstill current in the normal mode |
| | | Speed difference gain in the normal mode |
| | Current Control Mode | Position loop gain in the current control mode |
| | | Speed loop gain in the current control mode |
| | | Speed loop integral time constant in the current control mode |
| | | Damping control enabled/disabled in the current control mode |
| | | Damping control vibration frequency in the current control mode |
| | Alarm and Warning | Operation data error warning enabled/disabled |
| | | Generation condition of excessive positioning deviation alarm at current on |
| | | Generation condition of overflow rotation alarm during current off |
| | | Generation condition of overload alarm |
| | | Generation condition of excessive positioning deviation warning |
| | | Generation condition of overvoltage warning |
| | | Generation condition of undervoltage warning |
| | | Generation condition of overheat warning |
| | | Generation condition of overload warning |
| | | Generation condition of overspeed warning |
| | Return To Electrical Home Operation | Operating speed for return to electrical home operation |
| | | Acceleration/deceleration rate for return to electrical home operation |
| | | Starting speed for return to electrical home operation |
| | Test Operation | Operating speed for test operation |
| | | Acceleration/deceleration rate for test operation |
| | | Starting speed for test operation |
| | Control Module | Speed monitor display Show the speed on the control module with a sign or as an absolute value |
| | | Gear ratio for geared motor used for speed monitor |
| System Parameters (Becomes effective after the power is cycled.) | Electronic Gear | Resolution assigned to each resolution select switch |
| | Operation Setting | Pulse Input Mode |
| | | Smooth drive enabled/disabled |
| | | Initial motor excitation position at power on Detected position/electrical angle 0° switching |
| | | Automatic return operation at current ON enabled/disabled |
| | | Motor rotation direction |

## Monitor

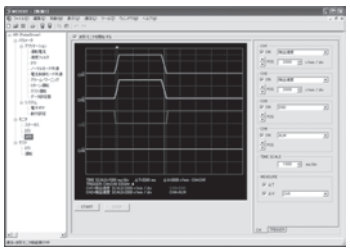
You can monitor various signals, alarms and motor speeds/positions, and also perform test operations.

| | |
|---|---|
| Monitor | Monitor positions |
| | Monitor speeds |
| | I/O Monitoring |
| Waveform Monitoring* | Monitor positions* |
| | Monitor speeds* |
| | Measure waveforms* |
| | Save waveforms* |
| Testing | Perform test operation (JOG operation) |
| | Monitor conditions during test operation |
| | Return To Electrical Home Operation |
| | Forcibly turn output signals ON/OFF |
| Alarm | Check content when generated |
| | Check alarm history (10 most recent alarms) |
| | Clear alarm history |
| | Release |
| Warning | Check content when generated |
| | Check alarm history (10 most recent alarms) |
| | Clear alarm history |

*This function is available only when the data setting software (**MEXE02**) is used.

### Waveform Monitoring

You can monitor various signals and motor speeds/positions using waveforms.



## Others

| |
|---|
| Electrical home reset |
| Parameter initialization |

# How to Read Specifications Table

| | Product Name | | Built-in Controller | AR46S□KD-◇ | AR46S□KD-N5-◇ |
|---|---|---|---|---|---|
| | | | Pulse Input | AR46S□K-◇ | AR46S□K-N5-◇ |
| ① | Maximum Holding Torque | | N·m | 0.3 | 1.35 |
| ② | Rotor Inertial Moment | | J: kg·m$^2$ | $58\times10^{-7}$[$73\times10^{-7}$]*1 | $58\times10^{-7}$[$73\times10^{-7}$]*1 |
| ③ | Gear Ratio | | | – | 5 |
| ④ | Resolution | | When Set to 1000P/R | 0.36°/Pulse | 0.072°/Pulse |
| ⑤ | Permissible Torque | | N·m | – | 1.35 |
| ⑥ | Maximum Torque | | N·m | – | 1.5 |
| ⑦ | Holding Torque at Motor Standstill | | While Power is SuppliedN·m | 0.15 | 0.75 |
| | | | Electromagnetic BrakeN·m | 0.15 | 0.75 |
| ⑧ | Permissible Speed Range | | r/min | – | 0～600 |
| ⑨ | Backlash | | arc minute (degrees) | – | 2(0.034°) |
| ⑩ | Power Supply Input | | Voltage | 24 VDC±10% (24 VDC±5%)*2/48 VDC±5% | |
| | | | Input Current A | 1.4(1.8)*2 | |
| | Electromagnetic Brake*3 | | Power Supply Input | 24 VDC±5%*4 0.08 A | |

*1 The brackets [ ] indicate the specifications for the electromagnetic brake type.
*2 The parentheses () indicate the specifications for the built-in controller type.
*3 For the pulse input type, a separate power supply for the electromagnetic brake is also required.
*4 If the wiring distance between the motor and driver is extended to 20 m or longer using an accessory cable (sold separately), the 24 VDC±4% specification applies.

### ①Maximum Holding Torque
The maximum holding torque (holding force) the motor has when power (rated current) is being supplied but the motor shaft is not rotating. (With geared types, the value of holding torque considers the permissible strength of the gear.)

### ②Rotor Inertial Moment
This refers to the inertia of rotor inside the motor. This is necessary when the required torque (acceleration torque) for the motor is calculated.

### ③Gear Ratio
This is the ratio in rotation speed between the input speed from the motor and the speed of the gear output shaft. For example, the gear ratio 10 indicates the input speed from the motor is 10 r/min and the output gear shaft is 1 r/min.

### ④Resolution
The resolution is the angular distance (in degrees) that the motor moves at the input of one pulse from the driver. It differs depending on the motor structure and excitation mode.

### ⑤Permissible Torque
The permissible torque represents the maximum torque that can be applied continuously to the output gear shaft. For the types other than the **PS**, **PN** and harmonic geared types, the total torque including acceleration and deceleration torque should also not exceed the permissible torque.

### ⑥Maximum Torque
(**PS** geared, **PN** geared and harmonic geared type only)
This is the max. torque that can be applied to the gear output shaft during acceleration/deceleration such as when an inertial load is started and stopped.

### ⑦Holding Torque at Motor Standstill
While Power is Supplied: The holding torque when the automatic current cutback function is activated
Electromagnetic Brake: Static friction torque that the electromagnetic brake can generate when stopped (The electromagnetic brake is a power off activated type.)

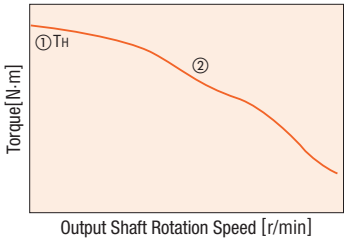
### ⑧Permissible Speed Range
This is the range for rotation on the gear output shaft.

### ⑨Backlash
This is the play of the gear output shaft when the motor shaft is fixed. When positioning in bi-direction, the positioning accuracy is affected.

### ⑩Power Supply Input
The current value of the power input is the max. input current value. (The input current varies according to the rotation speed.)

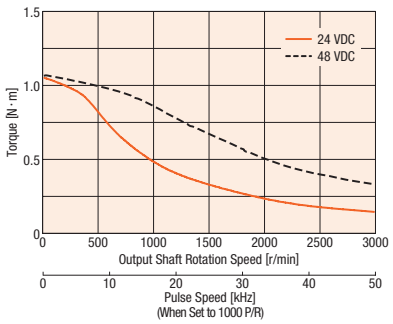
# How to Read Speed – Torque Characteristics

The characteristics diagram below is the characteristics that indicate the relationship between the speed and torque when a stepping motor is driven. The required speed and torque is always used when selecting a stepping motor. On the graph of characteristics, the horizontal axis expresses the speed at motor output shaft while the vertical axis expresses the torque.




### ①Max. Holding Torque
The maximum holding torque (holding force) the stepping motor has when power (rated current) is being supplied but the motor shaft is not rotating.

### ②Pullout Torque
The pullout torque is the maximum torque that can be output at a given speed. When selecting a motor, ensure that the required torque falls within this curve.
The following figure shows the speed – torque characteristics of **AR66SAK-◇**.




● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the temperature of the motor case at approximately 100°C.

# Accessory (Sold separately)

## Control Module RoHS

You can use these to set drivers' internal parameters and set and change data.
You can also use these to set speeds, monitor the I/O, and perform teaching.

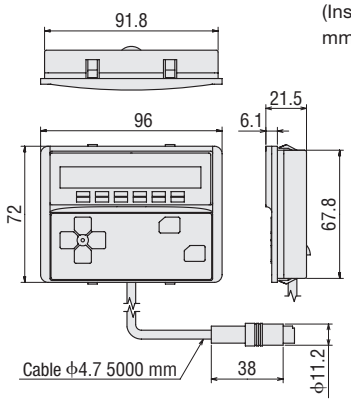
### Product Line

| Product Name |
|---|
| **OPX-2A** |

### Dimensions (Unit = mm)

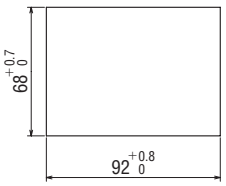
#### Control Module

Mass: 0.25kg CAD B453




#### Panel Cut-Out for Control Module

(Installation Plate Thickness 1~3 mm)



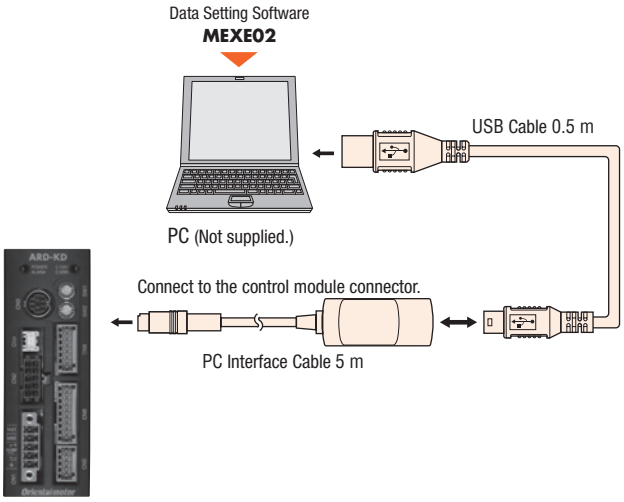
# Communication Cable for the Data Setting Software RoHS

This cable is required to connect the driver to the PC where the data setting software is installed.

## Product Line

| Product Name |
|---|
| **CC05IF-USB** |

## PC and Driver Connection




Note

- To connect the driver to a PC, you must install a dedicated software driver in the PC.

### Data Setting Software MEXE02

The data setting software can be downloaded from our website. It is also available on CD-ROM.
For details, make a request on our website, or contact the nearest Oriental Motor sales office.
http://www.orientalmotor.com.sg/

## PC System Requirements

### Operating System (OS)

- Microsoft Windows 2000 Professional Service Pack 4
  Be sure to install Update Rollup 1 provided by Microsoft.
  To check whether Update Rollup 1 is installed, use "Add or Remove Programs."

Only the following 32-bit (x86) and 64-bit (x64) OS versions are supported.

- Microsoft Windows XP Home Edition Service Pack 3
- Microsoft Windows XP Professional Service Pack 2
- Microsoft Windows XP Professional Service Pack 3*
- Microsoft Windows Vista Home Basic Service Pack 2
- Microsoft Windows Vista Home Premium Service Pack 2
- Microsoft Windows Vista Business Service Pack 2
- Microsoft Windows Vista Ultimate Service Pack 2
- Microsoft Windows Vista Enterprise Service Pack 2
- Microsoft Windows 7 Starter Service Pack 1
- Microsoft Windows 7 Home Premium Service Pack 1
- Microsoft Windows 7 Professional Service Pack 1
- Microsoft Windows 7 Ultimate Service Pack 1
- Microsoft Windows 7 Enterprise Service Pack 1

*32-bit (x86) version only

### PC

| | |
|---|---|
| Recommended CPU*1 | Intel Core processor 2 GHz or higher (Must be compatible with the OS) |
| Display | Video Adapter and Monitor with Resolution of XGA (1024×768) min. |
| Recommended Memory*1 | 32-bit (x86) version: 1 GB or more<br>64-bit (x64) version: 2 GB or more |
| Hard Disk*2 | Free disk space of 30 MB or more |
| USB Port | USB1.1 × 1 port |
| Disk Device | CD-ROM drive (for installing the software) |

*1 Must satisfy the operating requirements of the OS
*2 **MEXE02** requires Microsoft .NET Framework 2.0 Service Pack 2. When the service pack is not installed, it will automatically be installed. This will require up to 500 MB of additional free space on your PC.

Note

- Depending on the system environment that you are using, the required memory and hard disk space may vary.

- Windows and Windows Vista are registered trademarks of Microsoft Corporation in the United States and other countries.

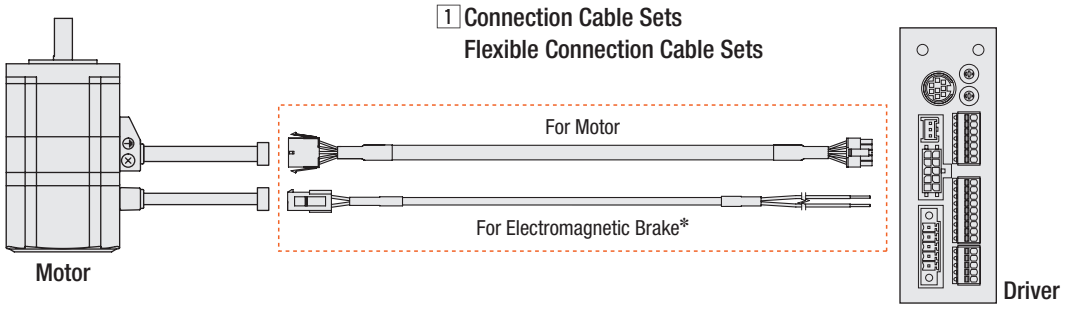
# 1 Connection Cable Sets RoHS, Flexible Connection Cable Sets RoHS
# 2 Extension Cable Sets RoHS, Flexible Extension Cable Sets RoHS

The **AR** Series comes with a cable of 1 m, 2 m or 3 m for a connection between the motor and driver.
When the distance between the motor and driver is extended to 3 m or longer, a connection cable set or extension cable set must be used.
Use a flexible connection cable set or flexible extension cable set if the cable will be flexed repeatedly.

## System Configuration

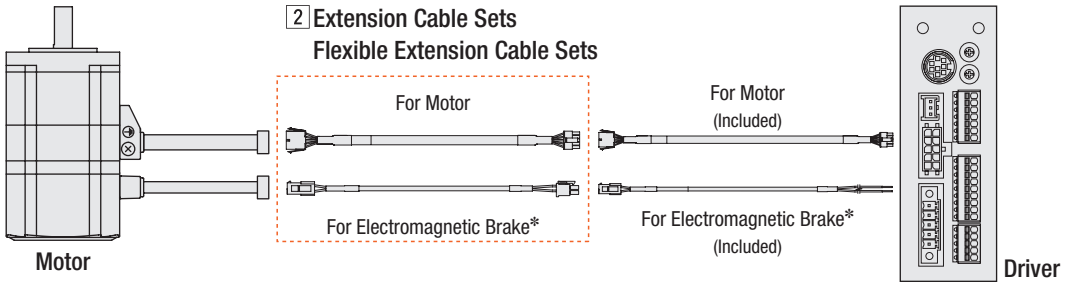
### When Connecting the Motor and Driver without Using an Included Cable

Use a connection cable set.
Use a flexible connection cable set if the cable will be bent.




### When Extending the Distance between the Motor and the Driver Using an Included Cable

Use an extension cable set and connect it to the included cable.
Use a flexible extension cable added if the cable will be bent.




*Cables for electromagnetic brake are for use when using electromagnetic brake type motors.

Note

- Keep the overall cable length 30 m or less when using an extension cable set or a flexible extension cable set to connect with a cable included with the **AR** Series.
- For the pulse input type, a separate power supply for electromagnetic brakes is also required.

# 1 Connection Cable Sets RoHS, Flexible Connection Cable Sets RoHS

## Product Line

### Connection Cable Sets

◇For Standard Type Motor

Cable for Motor

| Product Name | Length L (m) |
|---|---|
| **CC050VA2F2** | 5 |
| **CC070VA2F2** | 7 |
| **CC100VA2F2** | 10 |
| **CC150VA2F2** | 15 |
| **CC200VA2F2** | 20 |
| **CC300VA2F2** | 30 |

◇For Electromagnetic Brake Type Motor

Cable for Motor

Cable for Electromagnetic Brake

| Product Name | Length L (m) |
|---|---|
| **CC050VA2FB2** | 5 |
| **CC070VA2FB2** | 7 |
| **CC100VA2FB2** | 10 |
| **CC150VA2FB2** | 15 |
| **CC200VA2FB2** | 20 |
| **CC300VA2FB2** | 30 |

### Flexible Connection Cable Sets

◇For Standard Type Motor

Cable for Motor

| Product Name | Length L(m) |
|---|---|
| **CC010VA2R2** | 1 |
| **CC020VA2R2** | 2 |
| **CC030VA2R2** | 3 |
| **CC050VA2R2** | 5 |
| **CC070VA2R2** | 7 |
| **CC100VA2R2** | 10 |
| **CC150VA2R2** | 15 |
| **CC200VA2R2** | 20 |
| **CC300VA2R2** | 30 |

◇For Electromagnetic Brake Type Motor

Cable for Motor

Cable for Electromagnetic Brake

| Product Name | Length L(m) |
|---|---|
| **CC010VA2RB2** | 1 |
| **CC020VA2RB2** | 2 |
| **CC030VA2RB2** | 3 |
| **CC050VA2RB2** | 5 |
| **CC070VA2RB2** | 7 |
| **CC100VA2RB2** | 10 |
| **CC150VA2RB2** | 15 |
| **CC200VA2RB2** | 20 |
| **CC300VA2RB2** | 30 |

# 2 Extension Cable Sets RoHS, Flexible Extension Cable Sets RoHS

### Extension Cable Sets

◇For Standard Type Motor

Cable for Motor

| Product Name | Length L(m) |
|---|---|
| **CC010VA2F2** | 1 |
| **CC020VA2F2** | 2 |
| **CC030VA2F2** | 3 |
| **CC050VA2F2** | 5 |
| **CC070VA2F2** | 7 |
| **CC100VA2F2** | 10 |
| **CC150VA2F2** | 15 |
| **CC200VA2F2** | 20 |

◇For Electromagnetic Brake Type Motor

Cable for Motor

Cable for Electromagnetic Brake

| Product Name | Length L(m) |
|---|---|
| **CC010VA2FBT2** | 1 |
| **CC020VA2FBT2** | 2 |
| **CC030VA2FBT2** | 3 |
| **CC050VA2FBT2** | 5 |
| **CC070VA2FBT2** | 7 |
| **CC100VA2FBT2** | 10 |
| **CC150VA2FBT2** | 15 |
| **CC200VA2FBT2** | 20 |

### Flexible Extension Cable Sets

◇For Standard Type Motor

Cable for Motor

| Product Name | Length L(m) |
|---|---|
| **CC010VA2R2** | 1 |
| **CC020VA2R2** | 2 |
| **CC030VA2R2** | 3 |
| **CC050VA2R2** | 5 |
| **CC070VA2R2** | 7 |
| **CC100VA2R2** | 10 |
| **CC150VA2R2** | 15 |
| **CC200VA2R2** | 20 |

◇For Electromagnetic Brake Type Motor

Cable for Motor

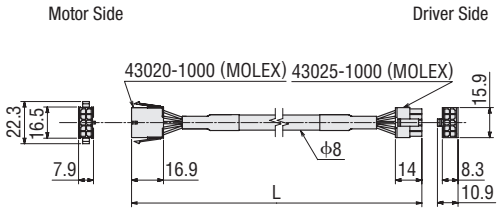
Cable for Electromagnetic Brake

| Product Name | Length L(m) |
|---|---|
| **CC010VA2RBT2** | 1 |
| **CC020VA2RBT2** | 2 |
| **CC030VA2RBT2** | 3 |
| **CC050VA2RBT2** | 5 |
| **CC070VA2RBT2** | 7 |
| **CC100VA2RBT2** | 10 |
| **CC150VA2RBT2** | 15 |
| **CC200VA2RBT2** | 20 |

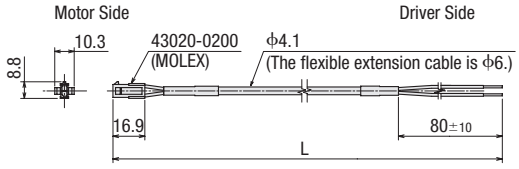
## Dimension (Unit = mm)

### Connection Cable

◇Cable for Motor

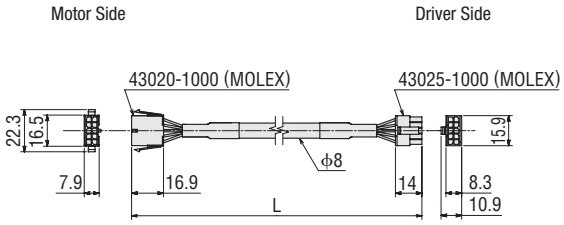



◇Cable for Electromagnetic Brake

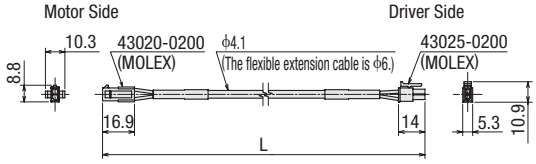



### Extension Cable

◇Extension Cable for Motor

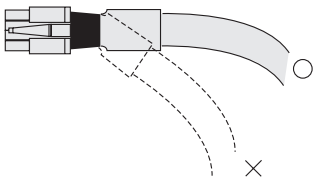



◇Cable for Electromagnetic Brake

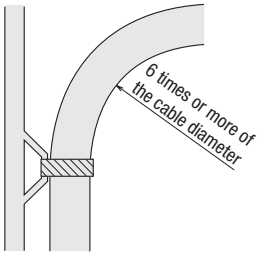



## Note on use of flexible extension cable

①Do not allow the cable to bend at the cable connector.

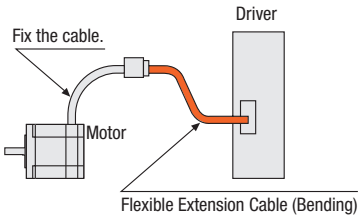


②For the bending radius, use at 6 times or more of the cable diameter.

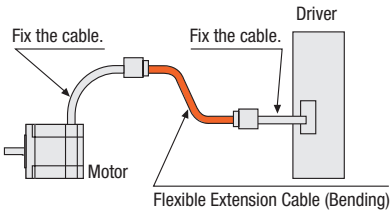



③The cable from the motor and the accessory cable are not for bending. If the motor cable is to be bent, bend it at the flexible cable.

- Flexible Connection Cable




- Flexible Extension Cable



# Driver Cable

## 1 General-Purpose Cable RoHS

This shielded cable has a half-pitch connector at one end of the cable for easy connecting to the driver.

Note

- Note that as the length of the pulse signal line between the driver and controller increases, the maximum transmission frequency decreases.
- Install a connector that matches the controller you are using to the other end of the cable.

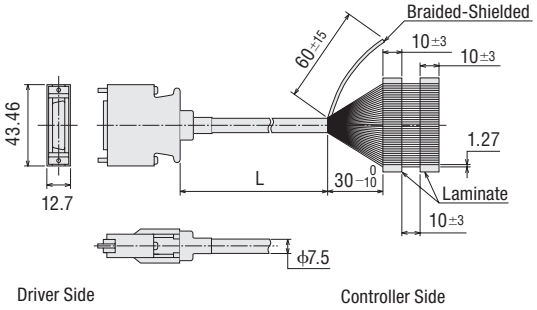
### Product Line

| Product Name | Applicable | Length L (m) |
|---|---|---|
| **CC36D1-1** | **ARD-K** For CN5 (36 pins) | 1 |
| **CC36D2-1** | | 2 |

### Dimension (Unit = mm)

**CC36D1-1, CC36D2-1**

Conductor: AWG28 (0.08 mm²)




## 2 Connector - Terminal Block Conversion Unit RoHS

CC36T1

This is 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
- DIN-rail installable
- Cable Length: 1 m

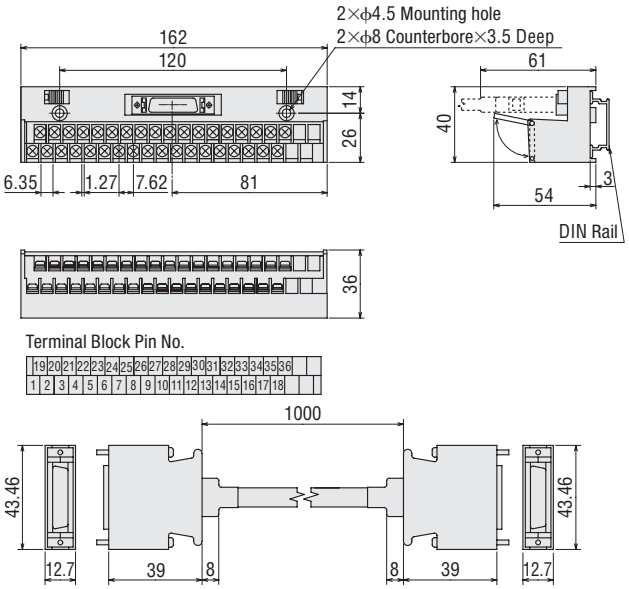
### Product Line

| Product Name | Applicable | Length m |
|---|---|---|
| **CC36T1** | **ARD-K** For CN5 (36 pins) | 1 |

### Dimension (Unit = mm)

**CC36T1**

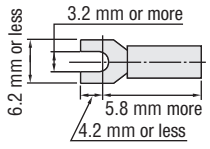
CAD B438




- Applicable Crimp Terminal
  - Terminal Screw Size: M3
  - Tightening Torque: 1.2 N·m
  - Minimum Applicable Lead Wire: AWG22 (0.3 mm²)

Note

- Round terminals cannot be used.



# Battery Set RoHS

You need to connect a battery set to use a built-in controller driver as an absolute backup system.

## Product Line

| Product Name | Applicable |
|---|---|
| **BAT01B** | **ARD-KD** |

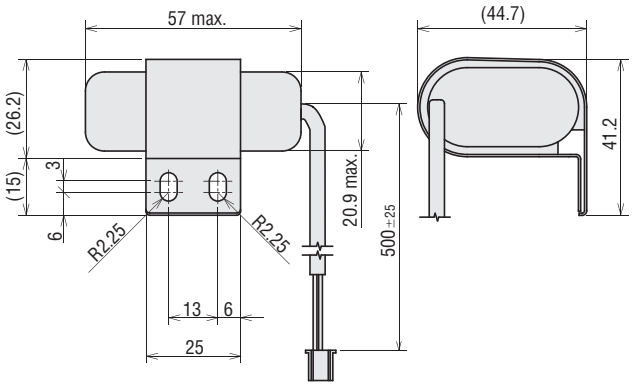
## Specifications

| Item | Content |
|---|---|
| Battery Type | Sealed nickel-metal hydride rechargeable single cells |
| Nominal Voltage | 2.4 V |
| Rated Capacity | 1900 mAh |
| Expected Life | Approx. 4 years*1 |
| Charge Time | 32 hours*1 |
| Data Retention Period | Approx. 360 hours (approx. 15 days)*1*2 |
| Operating Ambient Temperature | 0～+40˚C (non-freezing) |
| Operating Ambient Humidity | 45～85% (non-condensing) |

*1 At an ambient temperature of 20˚C
*2 After the power is cut OFF at full charge

## Dimensions (Unit = mm)

Mass: 0.1kg
CAD B560



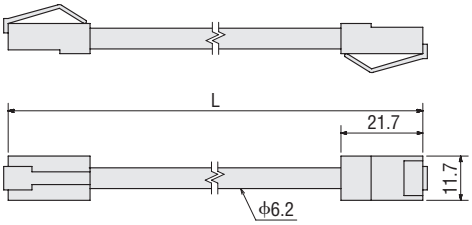

# RS-485 Cable RoHS

This cable is used to connect built-in controller drivers with each other for multi-axis operation.

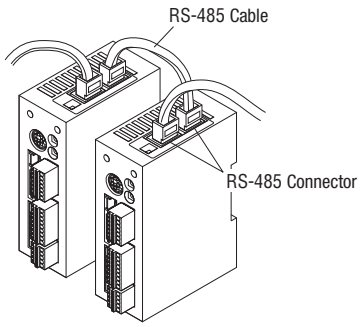
## Product Line

| Product Name | Applicable | Length L (m) |
|---|---|---|
| **CC001-RS4** | **ARD-KD** | 0.1 |
| **CC002-RS4** | | 0.25 |

## Dimensions (Unit = mm)




Connection Example




# Network Converter RoHS

The network converter converts higher layer protocol to Oriental Motor's proprietary RS-485 protocol. It enables you to control Oriental Motor's RS-485 compatible products under higher layer protocol environment.

## Product Line

| Network Type | Product Name |
|---|---|
| CC-Link-Compatible | **NETC01-CC** |
| MECHATROLINK-Ⅱ Compatible | **NETC01-M2** |
| MECHATROLINK-Ⅲ Compatible | **NETC01-M3** |

**NETC01-CC**

**NETC01-M2**

**NETC01-M3**

# Flexible Coupling

A flexible coupling ideal for the **AR** Series is available. Once you have decided on a type and/or applications of motor/gear, you can select the recommended size of coupling easily. All motor shaft diameters of stepping motor packages are available (including geared motors).

**MCV** Coupling

**MC** Coupling

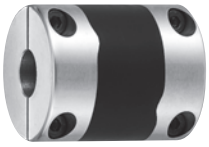
**MCS** Coupling

## Selecting a Coupling

| Motor Type / Coupling Type | Standard | **TH** Geared<br>**PS** Geared<br>**PN** Geared<br>Harmonic Geared | Application |
|---|---|---|---|
| **MCV** Coupling | ◎ | – | High position accuracy and vibration suppression |
| **MC** Coupling | ◎ | – | High Positioning Accuracy |
| **MCS** Coupling | ○ | ◎ | High Strength and High Positioning Accuracy |

# MCV Coupling RoHS

This one-piece coupling is made by forming a rubber isolator in an aluminum alloy hub.



## 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.

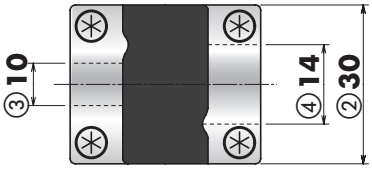
## Product Number Code

**MCV 30 10 14**

① ② ③ ④

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

● 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.

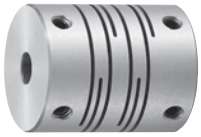



## Coupling Selection Table

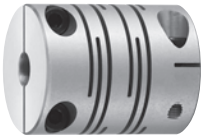
| Series | | | Coupling Type | Motor Shaft Diameter mm | | Driven Shaft Diameter mm | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type | Frame Size | Product Name | | | | **03** | **04** | **05** | **06** | **06A** | **08** | **10** | **12** | **14** | **15** |
| | | | | | | ϕ3 | ϕ4 | ϕ5 | ϕ6 | ϕ6.35 | ϕ8 | ϕ10 | ϕ12 | ϕ14 | ϕ15 |
| Standard Type | 28 mm | **AR24**, **AR26** | **MCV15** | **05** | ϕ5 | ● | ● | ● | ● | | | | | | |
| | 42 mm | **AR46** | **MCV19** | **06** | ϕ6 | | | ● | ● | | ● | | | | |
| | 60 mm | **AR66**, **AR69** | **MCV25** | **10** | ϕ10 | | | | ● | ● | ● | ● | ● | | |
| | 85 mm | **AR98** | **MCV30** | **14** | ϕ14 | | | | | | ● | ● | ● | ● | ● |

# MC Coupling RoHS

This is a slit-type one-piece coupling.



Set Screw Type



Clamp Type

## Product Line

### Set Screw Type

| Product Name |
|---|
| **MC12□S** |
| **MC16□S** |
| **MC25□S** |
| **MC32□S** |

### Clamp Type

| Product Name |
|---|
| **MC12□C2** |
| **MC16□C2** |
| **MC25□C2** |
| **MC32□C2** |

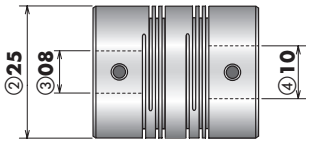
● A number indicating the coupling inner diameter is entered where the box □ is located within the product name.

## Product Number Code

**MC 25 08 10 S**

① ② ③ ④ ⑤

| | |
|---|---|
| ① | **MC** Coupling |
| ② | Outer Diameter of Coupling |
| ③ | Inner Diameter d1 (Smaller side) (**06A** represents ϕ6.35 mm.) |
| ④ | Inner Diameter d2 (Larger inner diameter) |
| ⑤ | Connection Method **S** : Set Screw Type<br>**C2** : Clamp Type |




● 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

| Series | | | Coupling Type | Motor Shaft Diameter mm | | Driven Shaft Diameter mm | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type | Frame Size | Product Name | | | | **04** | **05** | **06** | **06A** | **08** | **10** | **12** | **14** | **16** |
| | | | | | | ϕ4 | ϕ5 | ϕ6 | ϕ6.35 | ϕ8 | ϕ10 | ϕ12 | ϕ14 | ϕ16 |
| Standard Type | 28 mm | **AR24, AR26** | **MC12** | **05** | ϕ5 | ◎ | ◎ | ○ | | | | | | |
| | 42 mm | **AR46** | **MC16** | **06** | ϕ6 | ○ | ◎ | ○ | | ○ | | | | |
| | 60 mm | **AR66** | **MC25** | **10** | ϕ10 | | | ◎ | ◎ | ◎ | ◎ | ○ | | |
| | | **AR69** | **MC32** | **10** | ϕ10 | | | | ◎ | ◎ | ◎ | ◎ | ◎ | |
| | 85 mm | **AR98** | **MC32** | **14** | ϕ14 | | | | | | ◎ | ◎ | ◎ | ○ |

◎ Common for both the set screw type and clamp type
○ Only for the set screw type

# MCS Coupling RoHS

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

## Product Line

| Product Name |
|---|
| **MCS14**□ |
| **MCS20**□ |
| **MCS30**□ |
| **MCS40**□ |
| **MCS55**□ |
| **MCS65**□ |

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

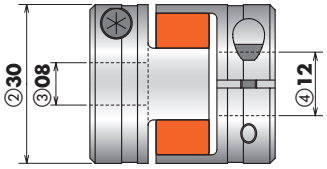
## Product Number Code

**MCS 30 08 12**

① ② ③ ④

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

| Type | Frame Size | Product Name | Gear Ratio | Coupling Type | Motor Shaft Diameter mm | | Driven Shaft Diameter mm | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 04 | 05 | 06 | F04 | 08 | 10 | 12 | 14 | 15 | 16 | 18 | 20 | 22 | 24 | 25 |
| | | | | | | | ϕ4 | ϕ5 | ϕ6 | ϕ6.35 | ϕ8 | ϕ10 | ϕ12 | ϕ14 | ϕ15 | ϕ16 | ϕ18 | ϕ20 | ϕ22 | ϕ24 | ϕ25 |
| **TH** Geared Type | 28 mm | **AR24-T**□ | **7.2, 10 20, 30** | **MCS14** | **05** | ϕ5 | ● | ● | ● | | | | | | | | | | | | |
| | 42 mm | **AR46-T**□ | **3.6, 7.2, 10** | **MCS20** | **06** | ϕ6 | | ● | ● | ● | ● | ● | | | | | | | | | |
| | | | **20, 30** | **MCS30** | **06** | ϕ6 | | | ● | ● | ● | ● | ● | ● | ● | ● | | | | | |
| | 60 mm | **AR66-T**□ | **3.6, 7.2** | **MCS30** | **08** | ϕ8 | | | ● | ● | ● | ● | ● | ● | ● | ● | | | | | |
| | | | **10, 20, 30** | **MCS40** | **08** | ϕ8 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| | 90 mm | **AR98-T**□ | **3.6, 7.2, 10 20, 30** | **MCS55** | **12** | ϕ12 | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | |
| **PS** Geared Type | 28 mm | **AR24-PS**□ | **5, 7.2, 10** | **MCS20** | **08** | ϕ8 | | ● | ● | ● | ● | ● | | | | | | | | | |
| | 42 mm | **AR46-PS**□ | **5, 7.2, 10** | **MCS30** | **10** | ϕ10 | | | ● | ● | ● | ● | ● | ● | ● | ● | | | | | |
| | | | **25, 36, 50** | **MCS40** | **10** | ϕ10 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| | 60 mm | **AR66-PS**□ | **5, 7.2** | **MCS40** | **12** | ϕ12 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| | | | **10, 25, 36, 50** | **MCS55** | **12** | ϕ12 | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | |
| | 90 mm | **AR98-PS**□ | **5, 7.2, 10 25, 36, 50** | **MCS65** | **18** | ϕ18 | | | | | | | | | | ● | ● | ● | ● | ● | ● |
| **PN** Geared Type | 28 mm | **AR24-N**□ | **5, 7.2, 10** | **MCS20** | **08** | ϕ8 | | ● | ● | ● | ● | ● | | | | | | | | | |
| | 42 mm | **AR46-N**□ | **5, 7.2, 10** | **MCS30** | **10** | ϕ10 | | | ● | ● | ● | ● | ● | ● | ● | ● | | | | | |
| | 60 mm | **AR66-N**□ | **5, 7.2** | **MCS40** | **12** | ϕ12 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| | | | **10, 25, 36, 50** | **MCS55** | **12** | ϕ12 | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | |
| | 90 mm | **AR98-N**□ | **5, 7.2, 10 25, 36, 50** | **MCS65** | **18** | ϕ18 | | | | | | | | | | ● | ● | ● | ● | ● | ● |
| Harmonic Geared Type | 30 mm | **AR24-H**□ | **50, 100** | **MCS30** | **08** | ϕ8 | | | ● | ● | ● | ● | ● | ● | ● | ● | | | | | |
| | 42 mm | **AR46-H**□ | **50, 100** | **MCS40** | **10** | ϕ10 | | | | | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| | 60 mm | **AR66-H**□ | **50, 100** | **MCS55** | **12** | ϕ12 | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | |
| | 90 mm | **AR98-H**□ | **50, 100** | **MCS65** | **18** | ϕ18 | | | | | | | | | | ● | ● | ● | ● | ● | ● |

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

# Motor Installation Bracket RoHS

Installation brackets are convenient for installation and securing a stepping motor and geared type stepping motor.

## Product Line

### Standard Type

Material: Aluminum alloy

| Product Name | Motor Frame Size | Applicable Product |
|---|---|---|
| **PAF0P** | 42 mm | **AR46** |
| **PAL0P** | | |
| **PAL2P-5** | 60 mm | **AR66**<br>**AR69** |
| **PAL4P-5** | 85 mm | **AR98** |

- The installation bracket base is built with holes large enough to allow for adjustments of belt tension after a motor is installed.
- These installation brackets can be perfectly fitted to the pilot of the stepping motors (excluding **PAL0P**).

Note

- Not available for geared type.

### TH Geared Type

Material: Aluminum alloy

| Product Name | Motor Frame Size | Applicable Product |
|---|---|---|
| **SOL0B** | 42 mm | **AR46** |
| **SOL2A** | 60 mm | **AR66** |
| **SOL5B** | 90 mm | **AR98** |

- Use the screws provided to install the **SOL2A**.
  Since screws are not included with **SOL0B**, and **SOL5B**, prepare appropriate screws separately.

### PS Geared Type, PN Geared Type

Material: SS400
Surface Treatment: Electroless nickel plating

| Product Name | Motor Frame Size | Applicable Product |
|---|---|---|
| **PLA60G** | 60 mm | **AR66** |
| **PLA90G** | 90 mm | **AR98** |

- The installation bracket base is built with holes large enough to allow for adjustments of belt tension after a motor is installed.
- Motor installation screws are included.

### Harmonic Geared Type

Material: SS400
Surface Treatment: Electroless nickel plating

| Product Name | Motor Frame Size | Applicable Product |
|---|---|---|
| **PLA60H** | 60 mm | **AR66** |
| **PLA90H** | 90 mm | **AR98** |

- The installation bracket base is built with holes large enough to allow for adjustments of belt tension after a motor is installed.
- Motor installation screws are included.

For details on accessories, refer to Oriental Motor General Catalogue 2011/2012 or the personal Web catalogue on our website.
http://www.orientalmotor.com.sg/

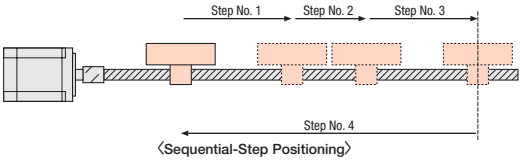
# Controller (Sold separately)

## Stored-Data Type Controller
## PG1200 RoHS

## Features

All operations including data setting can easily be performed using the 4 touch pads on the panel. In addition, the number of signal lines is reduced to a minimum for easy operation and connection.
Jerk Limiting Control Function Suppresses Motor Drive Vibration

- Sequential-Step Positioning Operation/External Signal Operation Possible
- Maximum Oscillation Frequency 200 kHz
- 1-Pulse Output/2-Pulse Output Mode Select Possible



〈Sequential-Step Positioning〉

Recessed Installation Model　DIN Rail Installation Model

## Product Line

### Sink Logic

| Product Line | Product Name |
|---|---|
| DIN Rail Installation Model | **PG1200N-D** |
| Recessed Installation Model | **PG1200N-U** |

### Source Logic

| Product Line | Product Name |
|---|---|
| DIN Rail Installation Model | **PG1200P-D** |
| Recessed Installation Model | **PG1200P-U** |

## ⚠ 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.
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