

Stepping Motors

Stepping Motor and Driver Packages

## DC Power Supply Input

*α*STEP AR Series

CRK Series

RBK Series

CMK Series

Introduction

0.36°/Geared  
*α*STEP  
AR  
AC Input Motor & Driver

0.36°/Geared  
*α*STEP  
AR

0.36°/0.72°/  
Geared  
CRK  
DC Input Motor & Driver

1.8°/Geared  
RBK  
DC Input Motor & Driver

0.9°/1.8°/Geared  
CMK

0.72°  
PK

1.8°/Geared  
High-Torque  
PKP  
Motor Only

0.9°/1.8°/Geared  
PK

Controllers  
SG8030JY

Accessories

	Page
<i>α</i> STEP AR Series.....	A-98
CRK Series.....	A-146
RBK Series.....	A-192
CMK Series.....	A-218

# 0.36° Closed Loop Stepping Motor and Driver Package $\alpha$ STEP High-Efficiency AR Series

● Connection information ●  
 Technical reference → Page G-1  
 Safety standards → Page H-2

This series substantially reduces heat generation from the motor through the use of high-efficiency technology. It allows you to take advantage of the beneficial features of the stepping motor to perform quick positioning operations over a short distance repeatedly without worrying about the duty cycle.



● For detailed product safety standard information including standards, file number and certification body, please visit [www.orientalmotor.eu](http://www.orientalmotor.eu).



## Features

### ● Incorporating Our Unique Closed Loop Control

For details, refer to “Overview of Stepping Motor and Driver Packages  $\alpha$ STEP” on page A-18.

### ● Maintaining All the Beneficial Features of a Stepping Motor

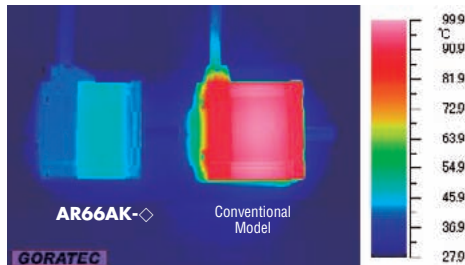
For details, refer to “Overview of Stepping Motor and Driver Packages  $\alpha$ STEP” on page A-18.

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

#### ◇ Lower Heat Generation

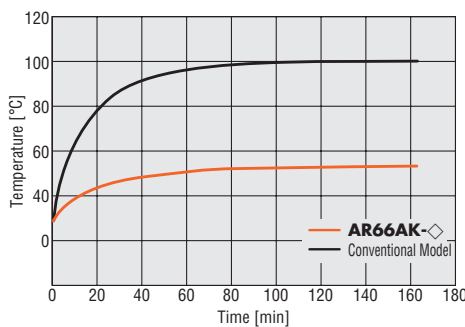
The **AR** Series utilizes high-efficiency technology to achieve a significant reduction in the amount of heat generated from the motor.

#### ● Temperature Distribution by Thermography



Comparison under the same conditions

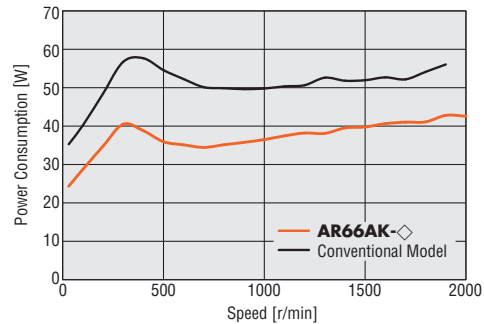
#### ● Motor Case Temperature under Same Operating Conditions



#### ◇ Energy-Saving

Power consumption: up to **30%** less than a conventional model

#### ● Power Consumption



CO<sub>2</sub> emission: up to **30%** less\* than a conventional model

\*Assuming operation at a duty of 40%

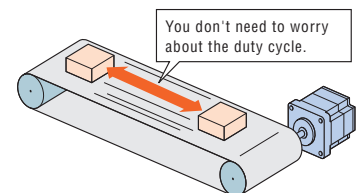
#### ◇ Continuous Operation or Operation at a high Duty Cycle

The **AR** Series can be operated at high frequency.

You can drive the motor continuously.

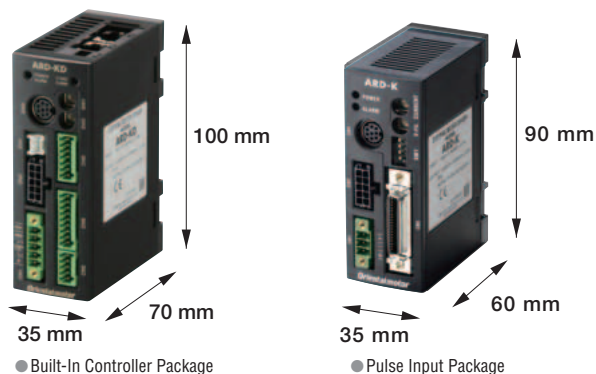
#### Note

● If 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.



## ● Compact DC Input Driver with Plastic Case

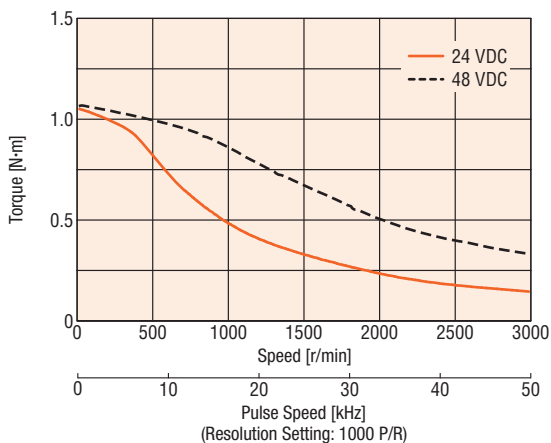
The compact DC power input driver is covered by a plastic case. The compact size is great for space-saving. You can attach this driver to a 35 mm width DIN rail through one-step operation, no screw is needed. (DIN rail mounting is the only way to install the driver.)



## ◇ 24/48 VDC

Choose the appropriate power supply 24 VDC or 48 VDC for your application. Motor torque at speed will be increased when 48 VDC is input rather than 24 VDC. (Only 24 VDC input is available for motor frame size 28 mm motors.)

## AR66AK-◇




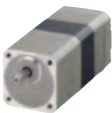

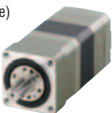
## ● Selectable Drivers by System

For details, refer to “Overview of Stepping Motor and Driver Packages **αSTEP**” on page A-18.

- Introduction
- AC Input Motor & Driver
  - 0.36°/Geared AR
  - 0.72°/Geared RK
- DC Input Motor & Driver
  - 0.36°/Geared AR
  - 0.36°/0.72°/Geared CRK
  - 1.8°/Geared RBK
  - 0.9°/1.8°/Geared CMK
- Motor Only
  - 0.72° PK
  - 1.8°/Geared High-Torque PKP
  - 0.9°/1.8°/Geared PK
- Controllers  
SG8030JY
- Accessories

## Motor Lineup

### Characteristics Comparison for Motors and Geared Motors

Motor Type Geared Type	Features	Permissible Torque Maximum Torque (N·m)	Backlash [arc min (degrees)]	Basic Resolution [deg/step]	Output Shaft Speed [r/min]
<b>Standard</b> 	· Basic model of the AR Series	Maximum Holding Torque 2	—	0.36	4000
<b>Low backlash</b> <b>TH Geared</b> (Parallel shaft) 	· A wide variety of low gear ratios, high-speed operations · Gear Ratio Types 3.6, 7.2, 10, 20, 30	12	45 (0.75)	0.012	500
<b>Low backlash</b> <b>PS Geared</b> (Planetary) 	· High Permissible Torque/Maximum Torque · A wide variety of gear ratios for selecting the desired step angle · Center Shaft · Gear Ratio Types 5, 7.2, 10, 25, 36, 50	Permissible Torque 37    Maximum Torque 60	35 (0.59)	0.0072	600
<b>Non-backlash</b> <b>PN Geared</b> (Planetary) 	· High Speed (Low gear ratio), High Positioning Accuracy · High Permissible Torque/Maximum Torque · A wide variety of gear ratios for selecting the desired step angle · Center Shaft · Gear Ratio Types 5, 7.2, 10, 25, 36, 50	Permissible Torque 37    Maximum Torque 60	3 (0.05)	0.0072	600
<b>Non-backlash</b> <b>Harmonic Geared</b> (Harmonic drive) 	· High Positioning Accuracy · High Permissible Torque/Maximum Torque · High Gear Ratio, High Resolution · Center Shaft · Gear Ratio Types 50, 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 frame size and gear ratio.

## Range of Motor Frame Size

The following motor frame sizes are available, depending on whether a pulse input package or built-in controller package is used. ("□42" indicates a motor frame size of 42 mm.)

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

\*1 Harmonic geared type

\*2 Geared type

### Vacuum Type

Vacuum type is also available. For details, please contact the nearest Oriental Motor sales office.



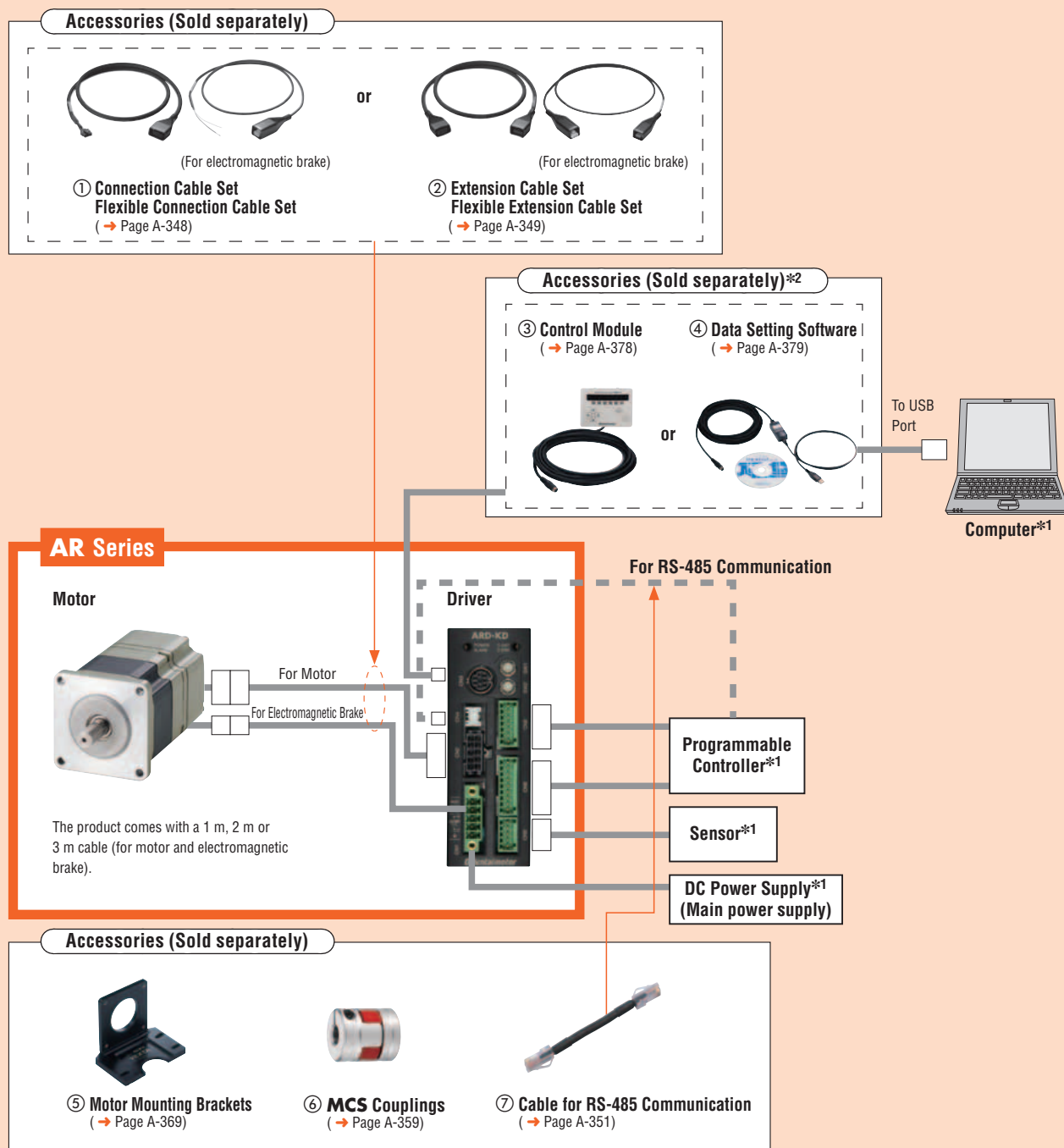
## System Configuration

### Built-In Controller Package Standard Type with Electromagnetic Brake

An example of a system configuration when used with either I/O control or RS-485 communication.

\*1 Not supplied

\*2 This is required for driving I/O control.



Number	Name	Overview
①	Connection Cable Set Flexible Connection Cable Set	This cable set is used to connect the motor and driver without using the included cables.
②	Extension Cable Set Flexible Extension Cable Set	This cable set is used to extend the wiring distance between the motor and driver using the included cables.
③	Control Module	This control module lets you set (edit, monitor, operate) various data and enables extended functions. Comes with a communication cable (5 m).
④	Data Setting Software	This data setting software lets you set (edit, monitor, operate) various data and enables extended functions. Comes with a PC interface cable (5 m) and a USB cable (0.5 m).
⑤	Motor Mounting Brackets	Dedicated mounting bracket for the motor.
⑥	MCS Couplings	Coupling that connects the motor shaft to the driven shaft.
⑦	Cable for RS-485 Communication	These cables are used to link drivers when a built-in controller type is being operated in a multi-drop manner.

### System Configuration Example



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

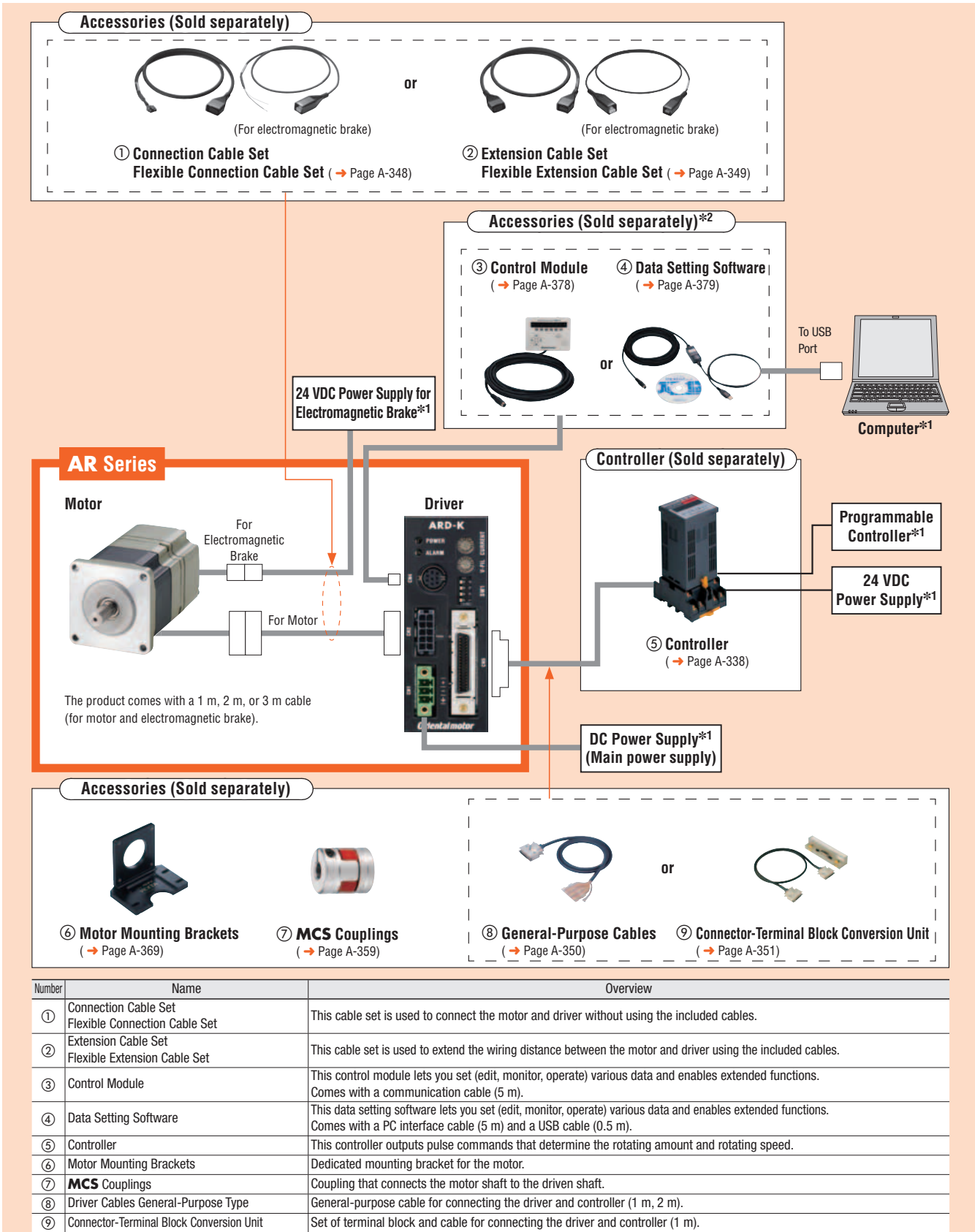
## System Configuration

### Pulse Input Package Standard Type with Electromagnetic Brake

An example of a single-axis system configuration with the **SG8030JY** controller.

\*1 Not supplied

\*2 This is required for driving I/O control.



### System Configuration Example

AR Series	Sold Separately			
	Controller	Motor Mounting Bracket	Flexible Coupling	Connector-Terminal Block Conversion Unit (1 m)
<b>AR66MK-3</b>	<b>SG8030JY-U</b>	<b>PAL2P-5</b>	<b>MCS201010</b>	<b>CC36T1</b>

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

## Product Number Code

# AR 6 6 □ A K D - PS 10 - 1

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

①	Series Name	<b>AR: AR Series</b>
②	Motor Frame Size	<b>2:</b> 28 mm (30 mm) <b>4:</b> 42 mm <b>6:</b> 60 mm <b>9:</b> 85 mm (90 mm)
③	Motor Case Length	
④	Motor Classification	
⑤	Motor Type	<b>A:</b> Standard (Single shaft) <b>B:</b> Standard (Double shaft) <b>M:</b> Electromagnetic Brake Type
⑥	Power Supply Voltage	<b>K:</b> DC Power Supply

## Product Line

### Built-In Controller Package

#### ◇ Standard Type

Product Name (Single shaft)	Product Name (Double shaft)
<b>AR24SAKD-◇</b>	<b>AR24SBKD-◇</b>
<b>AR26SAKD-◇</b>	<b>AR26SBKD-◇</b>
<b>AR46AKD-◇</b>	<b>AR46BKD-◇</b>
<b>AR66AKD-◇</b>	<b>AR66BKD-◇</b>
<b>AR69AKD-◇</b>	<b>AR69BKD-◇</b>
<b>AR98AKD-◇</b>	<b>AR98BKD-◇</b>

#### ◇ Standard Type with Electromagnetic Brake

Product Name
<b>AR46MKD-◇</b>
<b>AR66MKD-◇</b>
<b>AR69MKD-◇</b>
<b>AR98MKD-◇</b>

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

Product Name	Product Name
<b>AR24SAKD-T7.2-◇</b>	
<b>AR24SAKD-T10-◇</b>	
<b>AR24SAKD-T20-◇</b>	
<b>AR24SAKD-T30-◇</b>	
<b>AR46AKD-T3.6-◇</b>	<b>AR46MKD-T3.6-◇</b>
<b>AR46AKD-T7.2-◇</b>	<b>AR46MKD-T7.2-◇</b>
<b>AR46AKD-T10-◇</b>	<b>AR46MKD-T10-◇</b>
<b>AR46AKD-T20-◇</b>	<b>AR46MKD-T20-◇</b>
<b>AR46AKD-T30-◇</b>	<b>AR46MKD-T30-◇</b>
<b>AR66AKD-T3.6-◇</b>	<b>AR66MKD-T3.6-◇</b>
<b>AR66AKD-T7.2-◇</b>	<b>AR66MKD-T7.2-◇</b>
<b>AR66AKD-T10-◇</b>	<b>AR66MKD-T10-◇</b>
<b>AR66AKD-T20-◇</b>	<b>AR66MKD-T20-◇</b>
<b>AR66AKD-T30-◇</b>	<b>AR66MKD-T30-◇</b>
<b>AR98AKD-T3.6-◇</b>	<b>AR98MKD-T3.6-◇</b>
<b>AR98AKD-T7.2-◇</b>	<b>AR98MKD-T7.2-◇</b>
<b>AR98AKD-T10-◇</b>	<b>AR98MKD-T10-◇</b>
<b>AR98AKD-T20-◇</b>	<b>AR98MKD-T20-◇</b>
<b>AR98AKD-T30-◇</b>	<b>AR98MKD-T30-◇</b>

⑦	Driver Type	<b>D:</b> Built-In Controller Package Blank: Pulse Input Package
⑧	Gearhead Type	Blank: Standard Type <b>T: TH</b> Geared Type <b>PS: PS</b> Geared Type <b>N: PN</b> Geared Type <b>H:</b> Harmonic Geared Type
⑨	Gear Ratio	
⑩	Cable Length (Included)	<b>1:</b> 1 m <b>2:</b> 2 m <b>3:</b> 3 m

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

Product Name	Product Name
<b>AR24SAKD-PS5-◇</b>	
<b>AR24SAKD-PS7-◇</b>	
<b>AR24SAKD-PS10-◇</b>	
<b>AR46AKD-PS5-◇</b>	<b>AR46MKD-PS5-◇</b>
<b>AR46AKD-PS7-◇</b>	<b>AR46MKD-PS7-◇</b>
<b>AR46AKD-PS10-◇</b>	<b>AR46MKD-PS10-◇</b>
<b>AR46AKD-PS25-◇</b>	<b>AR46MKD-PS25-◇</b>
<b>AR46AKD-PS36-◇</b>	<b>AR46MKD-PS36-◇</b>
<b>AR46AKD-PS50-◇</b>	<b>AR46MKD-PS50-◇</b>
<b>AR66AKD-PS5-◇</b>	<b>AR66MKD-PS5-◇</b>
<b>AR66AKD-PS7-◇</b>	<b>AR66MKD-PS7-◇</b>
<b>AR66AKD-PS10-◇</b>	<b>AR66MKD-PS10-◇</b>
<b>AR66AKD-PS25-◇</b>	<b>AR66MKD-PS25-◇</b>
<b>AR66AKD-PS36-◇</b>	<b>AR66MKD-PS36-◇</b>
<b>AR66AKD-PS50-◇</b>	<b>AR66MKD-PS50-◇</b>
<b>AR98AKD-PS5-◇</b>	<b>AR98MKD-PS5-◇</b>
<b>AR98AKD-PS7-◇</b>	<b>AR98MKD-PS7-◇</b>
<b>AR98AKD-PS10-◇</b>	<b>AR98MKD-PS10-◇</b>
<b>AR98AKD-PS25-◇</b>	<b>AR98MKD-PS25-◇</b>
<b>AR98AKD-PS36-◇</b>	<b>AR98MKD-PS36-◇</b>
<b>AR98AKD-PS50-◇</b>	<b>AR98MKD-PS50-◇</b>

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

Product Name	Product Name
<b>AR24SAKD-N5-◇</b>	
<b>AR24SAKD-N7.2-◇</b>	
<b>AR24SAKD-N10-◇</b>	
<b>AR46AKD-N5-◇</b>	<b>AR46MKD-N5-◇</b>
<b>AR46AKD-N7.2-◇</b>	<b>AR46MKD-N7.2-◇</b>
<b>AR46AKD-N10-◇</b>	<b>AR46MKD-N10-◇</b>
<b>AR66AKD-N5-◇</b>	<b>AR66MKD-N5-◇</b>
<b>AR66AKD-N7.2-◇</b>	<b>AR66MKD-N7.2-◇</b>
<b>AR66AKD-N10-◇</b>	<b>AR66MKD-N10-◇</b>
<b>AR66AKD-N25-◇</b>	<b>AR66MKD-N25-◇</b>
<b>AR66AKD-N36-◇</b>	<b>AR66MKD-N36-◇</b>
<b>AR66AKD-N50-◇</b>	<b>AR66MKD-N50-◇</b>
<b>AR98AKD-N5-◇</b>	<b>AR98MKD-N5-◇</b>
<b>AR98AKD-N7.2-◇</b>	<b>AR98MKD-N7.2-◇</b>
<b>AR98AKD-N10-◇</b>	<b>AR98MKD-N10-◇</b>
<b>AR98AKD-N25-◇</b>	<b>AR98MKD-N25-◇</b>
<b>AR98AKD-N36-◇</b>	<b>AR98MKD-N36-◇</b>
<b>AR98AKD-N50-◇</b>	<b>AR98MKD-N50-◇</b>

◇ Harmonic Geared Type ◇ Harmonic Geared Type with Electromagnetic Brake

Product Name	Product Name
AR24SAKD-H50-◇ AR24SAKD-H100-◇	-
AR46AKD-H50-◇ AR46AKD-H100-◇	AR46MKD-H50-◇ AR46MKD-H100-◇
AR66AKD-H50-◇ AR66AKD-H100-◇	AR66MKD-H50-◇ AR66MKD-H100-◇
AR98AKD-H50-◇ AR98AKD-H100-◇	AR98MKD-H50-◇ AR98MKD-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 Package

◇ Standard Type

Product Name (Single shaft)	Product Name (Double shaft)
AR24SAK-◇ AR26SAK-◇ AR46AK-◇ AR66AK-◇ AR69AK-◇ AR98AK-◇	AR24SBK-◇ AR26SBK-◇ AR46BK-◇ AR66BK-◇ AR69BK-◇ AR98BK-◇

◇ Standard Type with Electromagnetic Brake

Product Name
AR46MK-◇ AR66MK-◇ AR69MK-◇ AR98MK-◇

◇ TH Geared Type ◇ TH Geared Type with Electromagnetic Brake

Product Name	Product Name
AR24SAK-T7.2-◇ AR24SAK-T10-◇ AR24SAK-T20-◇ AR24SAK-T30-◇	-
AR46AK-T3.6-◇ AR46AK-T7.2-◇ AR46AK-T10-◇ AR46AK-T20-◇ AR46AK-T30-◇	AR46MK-T3.6-◇ AR46MK-T7.2-◇ AR46MK-T10-◇ AR46MK-T20-◇ AR46MK-T30-◇
AR66AK-T3.6-◇ AR66AK-T7.2-◇ AR66AK-T10-◇ AR66AK-T20-◇ AR66AK-T30-◇	AR66MK-T3.6-◇ AR66MK-T7.2-◇ AR66MK-T10-◇ AR66MK-T20-◇ AR66MK-T30-◇
AR98AK-T3.6-◇ AR98AK-T7.2-◇ AR98AK-T10-◇ AR98AK-T20-◇ AR98AK-T30-◇	AR98MK-T3.6-◇ AR98MK-T7.2-◇ AR98MK-T10-◇ AR98MK-T20-◇ AR98MK-T30-◇

◇ Harmonic Geared Type ◇ Harmonic Geared Type with Electromagnetic Brake

Product Name	Product Name
AR24SAK-H50-◇ AR24SAK-H100-◇	-
AR46AK-H50-◇ AR46AK-H100-◇	AR46MK-H50-◇ AR46MK-H100-◇
AR66AK-H50-◇ AR66AK-H100-◇	AR66MK-H50-◇ AR66MK-H100-◇
AR98AK-H50-◇ AR98AK-H100-◇	AR98MK-H50-◇ AR98MK-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, Connector for Sensor Signal, Connector for Power Input Terminal, 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 A-349.

\*Only with Electromagnetic Brake Type.

◇ PS Geared Type ◇ PS Geared Type with Electromagnetic Brake

Product Name	Product Name
AR24SAK-PS5-◇ AR24SAK-PS7-◇ AR24SAK-PS10-◇	-
AR46AK-PS5-◇ AR46AK-PS7-◇ AR46AK-PS10-◇ AR46AK-PS25-◇ AR46AK-PS36-◇ AR46AK-PS50-◇	AR46MK-PS5-◇ AR46MK-PS7-◇ AR46MK-PS10-◇ AR46MK-PS25-◇ AR46MK-PS36-◇ AR46MK-PS50-◇
AR66AK-PS5-◇ AR66AK-PS7-◇ AR66AK-PS10-◇ AR66AK-PS25-◇ AR66AK-PS36-◇ AR66AK-PS50-◇	AR66MK-PS5-◇ AR66MK-PS7-◇ AR66MK-PS10-◇ AR66MK-PS25-◇ AR66MK-PS36-◇ AR66MK-PS50-◇
AR98AK-PS5-◇ AR98AK-PS7-◇ AR98AK-PS10-◇ AR98AK-PS25-◇ AR98AK-PS36-◇ AR98AK-PS50-◇	AR98MK-PS5-◇ AR98MK-PS7-◇ AR98MK-PS10-◇ AR98MK-PS25-◇ AR98MK-PS36-◇ AR98MK-PS50-◇

◇ PN Geared Type ◇ PN Geared Type with Electromagnetic Brake

Product Name	Product Name
AR24SAK-N5-◇ AR24SAK-N7.2-◇ AR24SAK-N10-◇	-
AR46AK-N5-◇ AR46AK-N7.2-◇ AR46AK-N10-◇	AR46MK-N5-◇ AR46MK-N7.2-◇ AR46MK-N10-◇
AR66AK-N5-◇ AR66AK-N7.2-◇ AR66AK-N10-◇ AR66AK-N25-◇ AR66AK-N36-◇ AR66AK-N50-◇	AR66MK-N5-◇ AR66MK-N7.2-◇ AR66MK-N10-◇ AR66MK-N25-◇ AR66MK-N36-◇ AR66MK-N50-◇
AR98AK-N5-◇ AR98AK-N7.2-◇ AR98AK-N10-◇ AR98AK-N25-◇ AR98AK-N36-◇ AR98AK-N50-◇	AR98MK-N5-◇ AR98MK-N7.2-◇ AR98MK-N10-◇ AR98MK-N25-◇ AR98MK-N36-◇ AR98MK-N50-◇

The following items are included in each product.

Motor, Driver, Cable for Motor, Cable for Electromagnetic Brake\*, Connector for I/O Signal, Connector for Main Power Input/Frame Ground Terminal, 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 A-349.

\*Only with Electromagnetic Brake Type.



## Step Angle 0.36° Frame Size 28 mm, 42 mm, 60 mm, 85 mm

### Standard Type

### Specifications RoHS

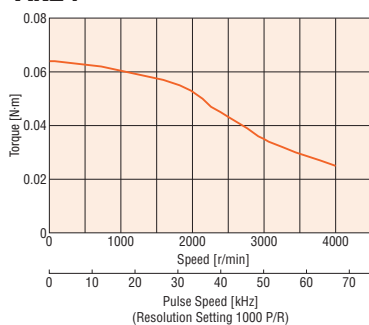


Product Name	Built-In Controller Package Pulse Input Package	AR24S□KD-◇	AR26S□KD-◇	AR46□KD-◇	AR66□KD-◇	AR69□KD-◇	AR98□KD-◇
		AR24S□K-◇	AR26S□K-◇	AR46□K-◇	AR66□K-◇	AR69□K-◇	AR98□K-◇
Maximum Holding Torque	N-m	0.055	0.12	0.3	1	2	
Holding Torque at Motor Standstill	Power ON	0.027	0.06	0.15	0.5	1	
	Electromagnetic Brake	—	—	0.15	0.5	1	
Rotor Inertia	J: kg-m <sup>2</sup>	11×10 <sup>-7</sup>	20×10 <sup>-7</sup>	58×10 <sup>-7</sup> [73×10 <sup>-7</sup> ]*1	380×10 <sup>-7</sup> [500×10 <sup>-7</sup> ]*1	750×10 <sup>-7</sup> [870×10 <sup>-7</sup> ]*1	1100×10 <sup>-7</sup> [1220×10 <sup>-7</sup> ]*1
Resolution	Resolution Setting: 1000 P/R	0.36°/Pulse					
Degree of Protection		Motor: IP20 Driver: IP20 (IP10)*2			Motor: IP54 (Excluding the installation surface and connectors. IP20 for double shaft type) Driver: IP20 (IP10)*2		
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		
	Maximum 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		

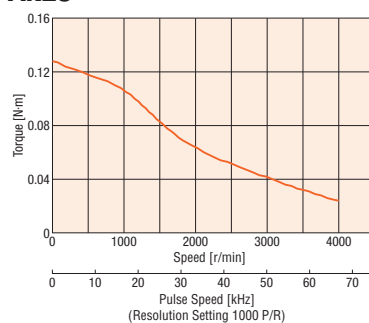
- Either **A** (single shaft), **B** (double shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
- Either **A** (single shaft) or **B** (double shaft) indicating the configuration is entered where the box □ is located within the product name of **AR24** and **AR26**.
- 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 values inside the brackets [ ] represent the specification for the electromagnetic brake type.
- \*2 The values inside the parentheses ( ) represent the specification for the built-in controller package.
- \*3 When running the motor at 48 VDC, the load inertia should be under 10 times of the rotor inertia and allow for a safety factor of 2 or more times the required torque.
- \*4 For pulse input package, a separate power supply for electromagnetic brakes is required.
- \*5 If the wiring distance between the motor and driver is extended to 20 m min. using an accessory cable (sold separately), the 24 VDC±4% specification applies.

### Speed – Torque Characteristics

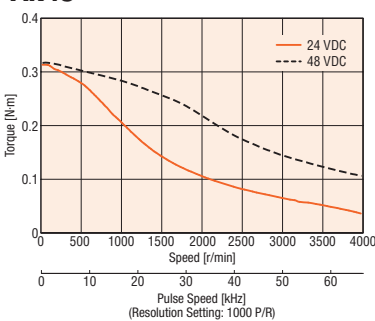
**AR24**



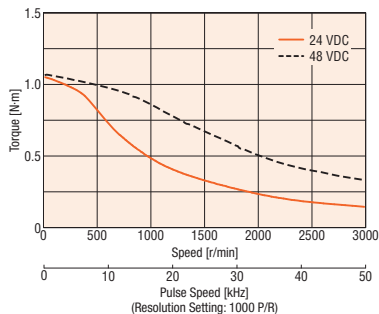
**AR26**



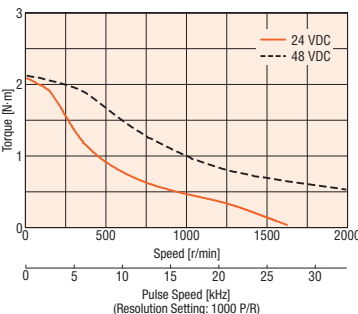
**AR46**



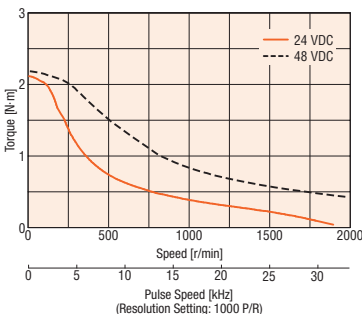
**AR66**



**AR69**



**AR98**



#### Note

- Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.

# TH Geared Type Frame Size 28 mm

## Specifications RoHS

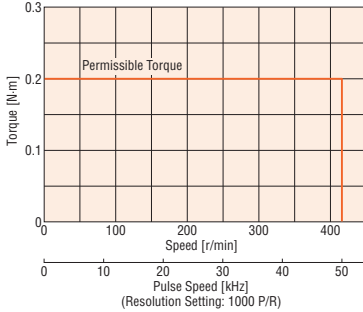


Product Name	Built-In Controller Package	AR24SAKD-T7.2-◇	AR24SAKD-T10-◇	AR24SAKD-T20-◇	AR24SAKD-T30-◇
	Pulse Input Package	AR24SAK-T7.2-◇	AR24SAK-T10-◇	AR24SAK-T20-◇	AR24SAK-T30-◇
Maximum Holding Torque	N·m	0.2	0.3	0.4	0.5
Rotor Inertia	J: kg·m <sup>2</sup>	$11 \times 10^{-7}$			
Gear Ratio		7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	0.2	0.3	0.4	0.5
Holding Torque at Motor Standstill	Power ON	N·m	0.13	0.19	0.38
Permissible Speed Range	r/min	0~416	0~300	0~150	0~100
Backlash	arc min (degrees)	60 (1°)			
Degree of Protection		Motor: IP20 Driver: IP20 (IP10)*			
Power Supply Input	Voltage	24 VDC $\pm$ 10% (24 VDC $\pm$ 5%)*			
	Maximum Input Current	A 0.9 (1.3)*			

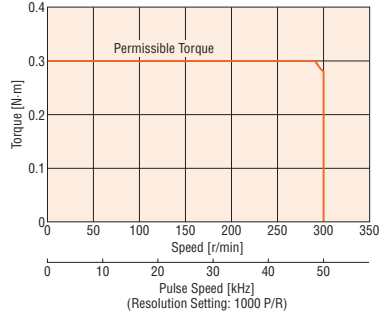
● A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.  
\*The values inside the parentheses ( ) represent the specification for the built-in controller package.

## Speed – Torque Characteristics

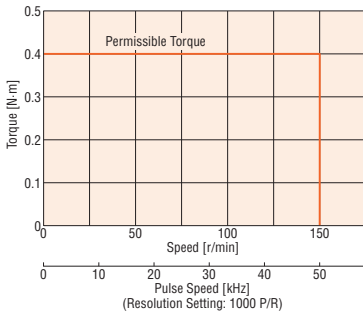
**AR24 Gear Ratio 7.2**



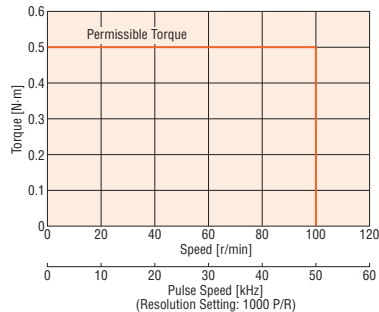
**AR24 Gear Ratio 10**



**AR24 Gear Ratio 20**



**AR24 Gear Ratio 30**



**Note**

● Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.

## TH Geared Type Frame Size 42 mm

### Specifications RoHS

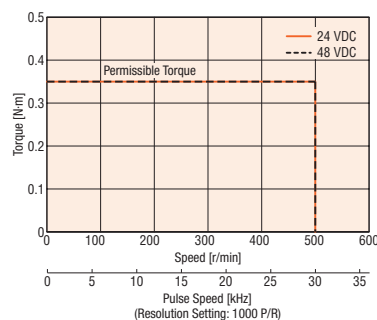


Product Name	Built-In Controller Package	AR46□KD-T3.6-◇	AR46□KD-T7.2-◇	AR46□KD-T10-◇	AR46□KD-T20-◇	AR46□KD-T30-◇
	Pulse Input Package	AR46□K-T3.6-◇	AR46□K-T7.2-◇	AR46□K-T10-◇	AR46□K-T20-◇	AR46□K-T30-◇
Maximum Holding Torque	N·m	0.35	0.7	1	1.5	
Rotor Inertia	J: kg·m <sup>2</sup>	58×10 <sup>-7</sup> [73×10 <sup>-7</sup> ]*1				
Gear Ratio		3.6	7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	0.35	0.7	1	1.5	
Holding Torque at Power ON	N·m	0.33	0.67	0.93	1.5	
Motor Standstill 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 min (degrees)	45 (0.75)	25 (0.42)		15 (0.25)	
Degree of Protection		Motor: IP54 (Excluding the installation surface and connectors) Driver: IP20 (IP10)*2				
Power Supply Input	Voltage	24 VDC±10% (24 VDC±5%)*2/48 VDC±5%				
	Maximum Input Current	A 1.4 (1.8)*2				
Electromagnetic Brake*3	Power Supply Input	24 VDC±5%*4 0.08A				

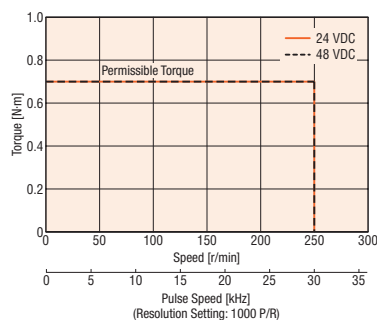
- Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name. A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
- \*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
- \*2 The values inside the parentheses ( ) represent the specification for the built-in controller package.
- \*3 For pulse input package, a separate power supply for electromagnetic brakes is required.
- \*4 If the wiring distance between the motor and driver is extended to 20 m min. using an accessory cable (sold separately), the 24 VDC±4% specification applies.

### Speed – Torque Characteristics

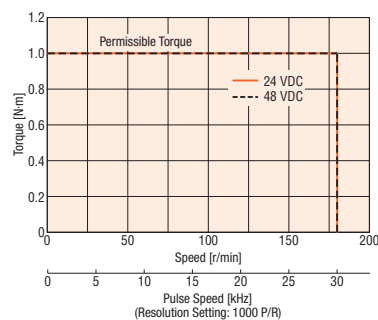
**AR46 Gear Ratio 3.6**



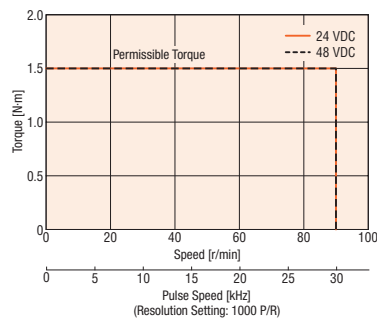
**AR46 Gear Ratio 7.2**



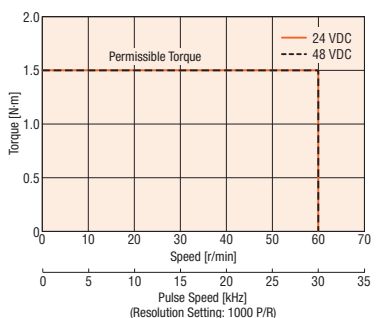
**AR46 Gear Ratio 10**



**AR46 Gear Ratio 20**



**AR46 Gear Ratio 30**



**Note**

● Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.

# TH Geared Type Frame Size 60 mm

## Specifications RoHS



Product Name	Built-In Controller Package	AR66□KD-T3.6-◇	AR66□KD-T7.2-◇	AR66□KD-T10-◇	AR66□KD-T20-◇	AR66□KD-T30-◇
	Pulse Input Package	AR66□K-T3.6-◇	AR66□K-T7.2-◇	AR66□K-T10-◇	AR66□K-T20-◇	AR66□K-T30-◇
Maximum Holding Torque	N·m	1.25	2.5	3	3.5	4
Rotor Inertia	J: kg·m <sup>2</sup>	380 × 10 <sup>-7</sup> [500 × 10 <sup>-7</sup> ]*1				
Gear Ratio		3.6	7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R	0.17°/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 Power ON	N·m	1.1	2.2	3	3.5	4
Motor Standstill 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 min (degrees)	35 (0.59°)	15 (0.25°)		10 (0.17°)	
Degree of Protection		Motor: IP54 (Excluding the installation surface and connectors) Driver: IP20 (IP10)*2				
Power Supply Input	Voltage	24 VDC ± 10% (24 VDC ± 5%)*2 / 48 VDC ± 5%*3				
	Maximum Input Current	A 3.1 (3.8)*2				
Electromagnetic Brake*4	Power Supply Input	24 VDC ± 5%*5 0.25A				

● 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 values inside the brackets [ ] represent the specification for the electromagnetic brake type.

\*2 The values inside the parentheses ( ) represent the specification for the built-in controller package.

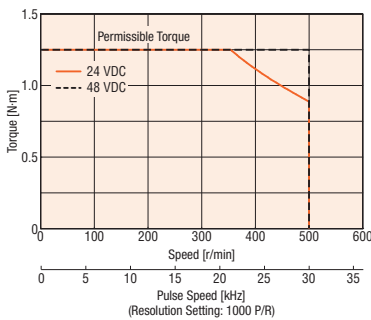
\*3 When running the motor at 48 VDC, the load inertia should be under 10 times of the rotor inertia and allow for a safety factor of 2 or more times the required torque.

\*4 For pulse input package, a separate power supply for electromagnetic brakes is required.

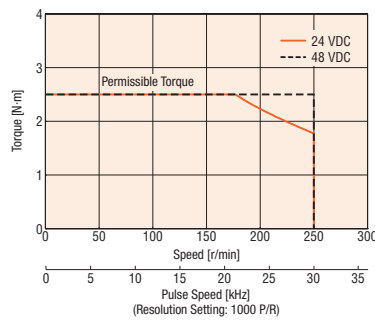
\*5 If the wiring distance between the motor and driver is extended to 20 m min. using an accessory cable (sold separately), the 24 VDC ± 4% specification applies.

## Speed – Torque Characteristics

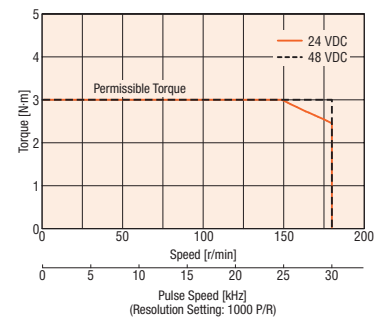
**AR66 Gear Ratio 3.6**



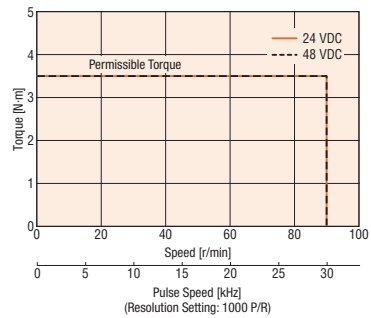
**AR66 Gear Ratio 7.2**



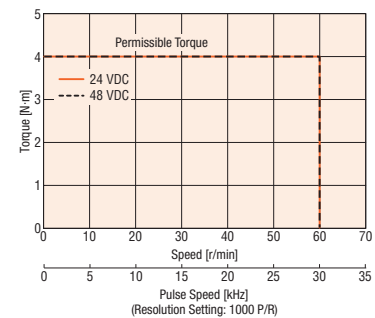
**AR66 Gear Ratio 10**



**AR66 Gear Ratio 20**



**AR66 Gear Ratio 30**



### Note

● Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.

## TH Geared Type Frame Size 90 mm

### Specifications RoHS

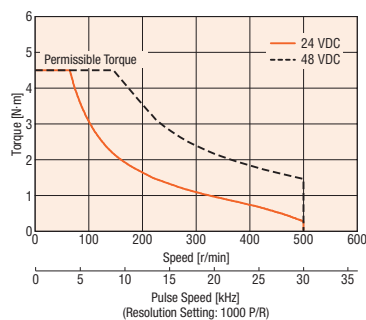


Product Name	Built-In Controller Package	AR98□KD-T3.6-◇	AR98□KD-T7.2-◇	AR98□KD-T10-◇	AR98□KD-T20-◇	AR98□KD-T30-◇
	Pulse Input Package	AR98□K-T3.6-◇	AR98□K-T7.2-◇	AR98□K-T10-◇	AR98□K-T20-◇	AR98□K-T30-◇
Maximum Holding Torque	N·m	4.5		9		12
Rotor Inertia	J: kg·m <sup>2</sup>	1100×10 <sup>-7</sup> [1220×10 <sup>-7</sup> ]*1				
Gear Ratio		3.6	7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	4.5		9		12
Holding Torque at Power ON	N·m	3.6	7.2	9		12
Motor Standstill 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 min (degrees)	25 (0.42°)		15 (0.25°)		10 (0.17°)
Degree of Protection		Motor: IP54 (Excluding the installation surface and connectors) Driver: IP20 (IP10)*2				
Power Supply Input	Voltage	24 VDC±10% (24 VDC±5%)*2/48 VDC±5%*3				
	Maximum Input Current	A 2.5 (3.1)*2				
Electromagnetic Brake*4	Power Supply Input	24 VDC±5%*5 0.25A				

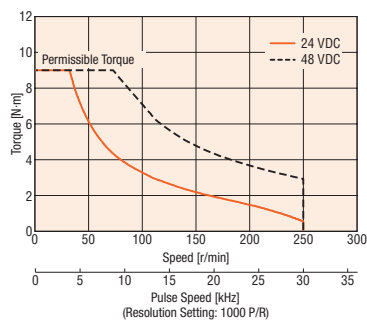
- Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
- A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
- \*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
- \*2 The values inside the parentheses ( ) represent the specification for the built-in controller package.
- \*3 When running the motor at 48 VDC, the load inertia should be under 10 times of the rotor inertia and allow for a safety factor of 2 or more times the required torque.
- \*4 For pulse input package, a separate power supply for electromagnetic brakes is required.
- \*5 If the wiring distance between the motor and driver is extended to 20 m min. using an accessory cable (sold separately), the 24 VDC±4% specification applies.

### Speed – Torque Characteristics

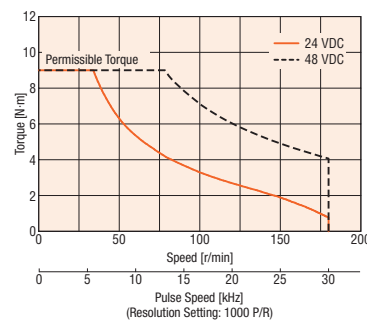
AR98 Gear Ratio 3.6



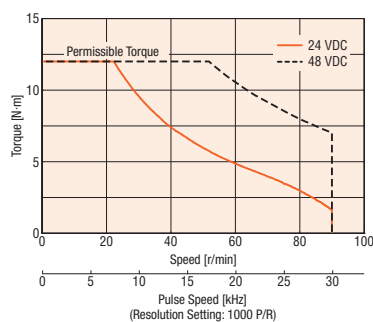
AR98 Gear Ratio 7.2



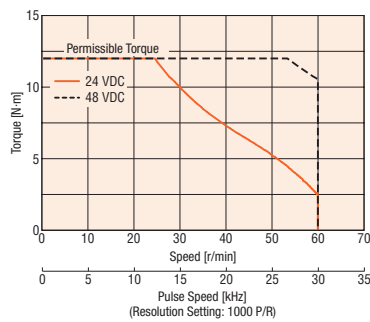
AR98 Gear Ratio 10



AR98 Gear Ratio 20



AR98 Gear Ratio 30



#### Note

- Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.

# PS Geared Type Frame Size 28 mm

## Specifications RoHS

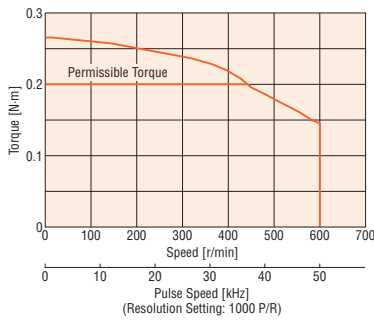


Product Name	Built-In Controller Package		AR24SAKD-PS5-◇	AR24SAKD-PS7-◇	AR24SAKD-PS10-◇
	Pulse Input Package		AR24SAK-PS5-◇	AR24SAK-PS7-◇	AR24SAK-PS10-◇
Maximum Holding Torque	N·m		0.2	0.3	0.5
Rotor Inertia	J: kg·m <sup>2</sup>		11 × 10 <sup>-7</sup>		
Gear Ratio			5	7.2	10
Resolution	Resolution Setting: 1000 P/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	Power ON	N·m	0.13	0.19	0.27
Permissible Speed Range	r/min		0~600	0~416	0~300
Backlash	arc min (degrees)		35 (0.59°)		
Degree of Protection			Motor: IP20 Driver: IP20 (IP10)*		
Power Supply Input	Voltage		24 VDC ± 10% (24 VDC ± 5%)*		
	Maximum Input Current		0.9 (1.3)*		

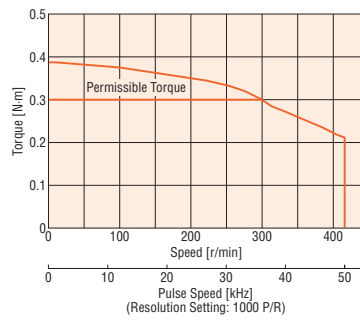
● A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.  
\*The values inside the parentheses ( ) represent the specification for the built-in controller package.

## Speed – Torque Characteristics

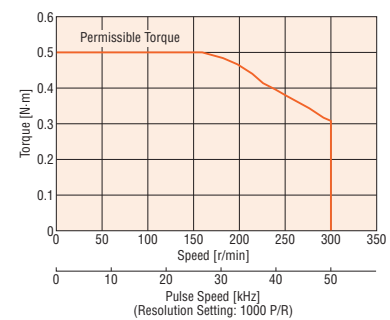
**AR24 Gear Ratio 5**



**AR24 Gear Ratio 7.2**



**AR24 Gear Ratio 10**



**Note**

● Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.

## PS Geared Type Frame Size 42 mm

### Specifications RoHS

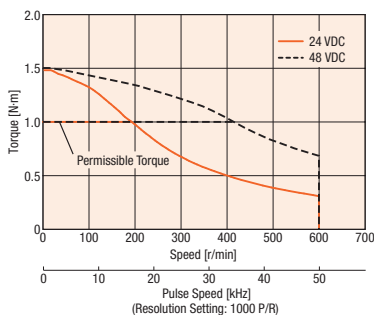


Product Name	Built-In Controller Package Pulse Input Package	AR46□KD-PS5-◇	AR46□KD-PS7-◇	AR46□KD-PS10-◇	AR46□KD-PS25-◇	AR46□KD-PS36-◇	AR46□KD-PS50-◇
		AR46□K-PS5-◇	AR46□K-PS7-◇	AR46□K-PS10-◇	AR46□K-PS25-◇	AR46□K-PS36-◇	AR46□K-PS50-◇
Maximum Holding Torque	N·m	1	1.5	2.5	3		
Rotor Inertia	J: kg·m <sup>2</sup>	$58 \times 10^{-7} [73 \times 10^{-7}]^{*1}$					
Gear Ratio		5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque	N·m	1	1.5	2.5	3		
Maximum Torque	N·m	1.5	2	6			
Holding Torque at Power ON	N·m	0.75	1	1.5	2.5	3	
Motor Standstill 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 min (degrees)	25 (0.42°)					
Degree of Protection		Motor: IP54 (Excluding the installation surface and connectors) Driver: IP20 (IP10) <sup>*2</sup>					
Power Supply Input Voltage		24 VDC ± 10% (24 VDC ± 5%) <sup>*2</sup> / 48 VDC ± 5%					
Power Supply Input Maximum Input Current	A	1.4 (1.8) <sup>*2</sup>					
Electromagnetic Brake <sup>*3</sup> Power Supply Input		24 VDC ± 5% <sup>*4</sup> 0.08A					

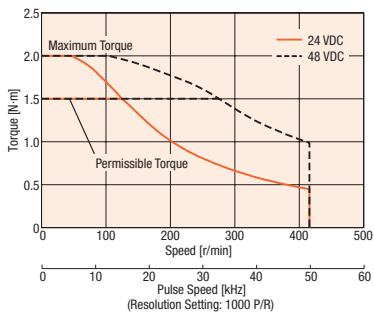
- Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.  
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
- \*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
- \*2 The values inside the parentheses ( ) represent the specification for the built-in controller package.
- \*3 For pulse input package, a separate power supply for electromagnetic brakes is required.
- \*4 If the wiring distance between the motor and driver is extended to 20 m min. using an accessory cable (sold separately), the 24 VDC ± 4% specification applies.

### Speed – Torque Characteristics

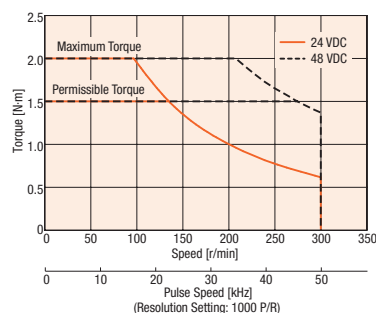
**AR46 Gear Ratio 5**



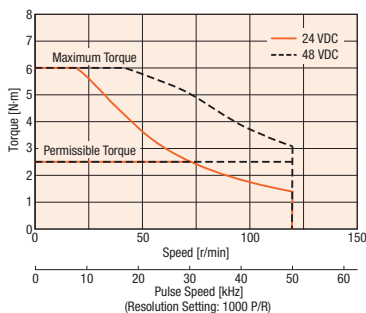
**AR46 Gear Ratio 7.2**



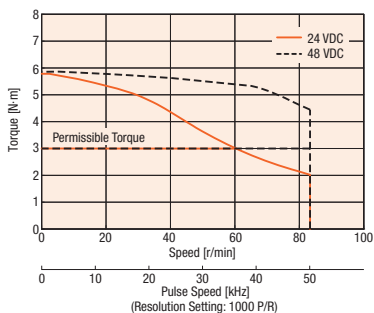
**AR46 Gear Ratio 10**



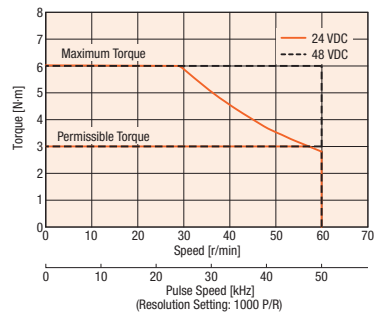
**AR46 Gear Ratio 25**



**AR46 Gear Ratio 36**



**AR46 Gear Ratio 50**



#### Note

- Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.

# PS Geared Type Frame Size 60 mm

## Specifications RoHS

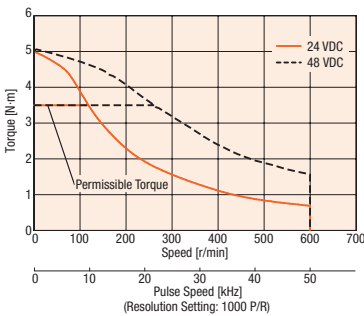


Product Name	Built-In Controller Package	AR66□KD-PS5-◇	AR66□KD-PS7-◇	AR66□KD-PS10-◇	AR66□KD-PS25-◇	AR66□KD-PS36-◇	AR66□KD-PS50-◇
	Pulse Input Package	AR66□K-PS5-◇	AR66□K-PS7-◇	AR66□K-PS10-◇	AR66□K-PS25-◇	AR66□K-PS36-◇	AR66□K-PS50-◇
Maximum Holding Torque	N·m	3.5	4	5	8		
Rotor Inertia	J: kg·m <sup>2</sup>	380 × 10 <sup>-7</sup> [500 × 10 <sup>-7</sup> ]*1					
Gear Ratio		5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque	N·m	3.5	4	5	8		
Maximum Torque	N·m	7	9	11	16	20	
Holding Torque at	Power ON	2.5	3.6	5	7.6	8	
Motor Standstill	Electromagnetic Brake	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 min (degrees)	15 (0.25°)					
Degree of Protection		Motor: IP54 (Excluding the installation surface and connectors) Driver: IP20 (IP10)*2					
Power Supply Input	Voltage	24 VDC ± 10% (24 VDC ± 5%)*2/48 VDC ± 5%*3					
	Maximum Input Current	3.1 (3.8)*2					
Electromagnetic Brake*4	Power Supply Input	24 VDC ± 5%*5 0.25A					

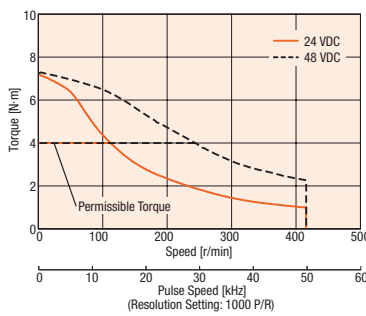
- Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.  
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
- \*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
- \*2 The values inside the parentheses ( ) represent the specification for the built-in controller package.
- \*3 When running the motor at 48 VDC, the load inertia should be under 10 times of the rotor inertia and allow for a safety factor of 2 or more times the required torque.
- \*4 For pulse input package, a separate power supply for electromagnetic brakes is required.
- \*5 If the wiring distance between the motor and driver is extended to 20 m min. using an accessory cable (sold separately), the 24 VDC ± 4% specification applies.

## Speed – Torque Characteristics

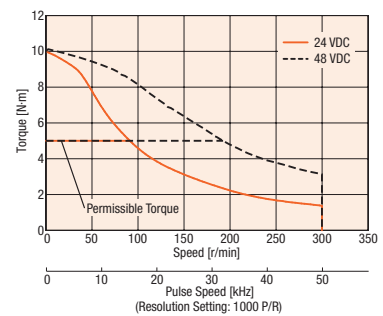
**AR66 Gear Ratio 5**



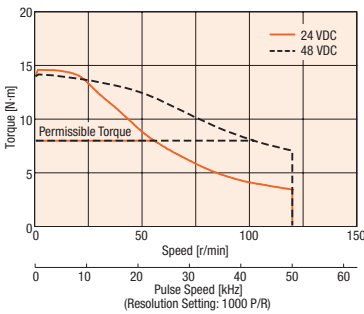
**AR66 Gear Ratio 7.2**



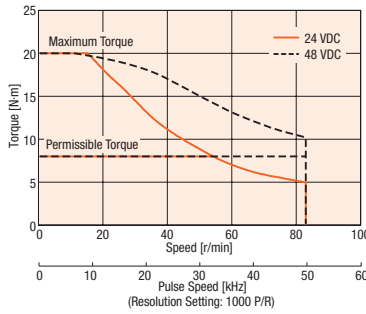
**AR66 Gear Ratio 10**



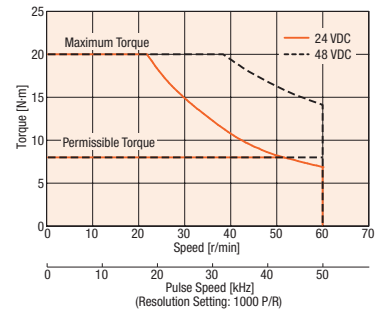
**AR66 Gear Ratio 25**



**AR66 Gear Ratio 36**



**AR66 Gear Ratio 50**



**Note**

● Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.



## PS Geared Type Frame Size 90 mm

### Specifications RoHS



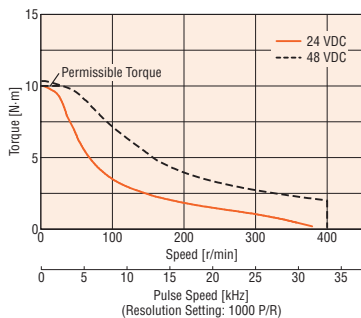
Product Name	Built-In Controller Package	AR98□KD-PS5-◇	AR98□KD-PS7-◇	AR98□KD-PS10-◇	AR98□KD-PS25-◇	AR98□KD-PS36-◇	AR98□KD-PS50-◇
	Pulse Input Package	AR98□K-PS5-◇	AR98□K-PS7-◇	AR98□K-PS10-◇	AR98□K-PS25-◇	AR98□K-PS36-◇	AR98□K-PS50-◇
Maximum Holding Torque	N·m	10	14	20	37		
Rotor Inertia	J: kg·m <sup>2</sup>	1100×10 <sup>-7</sup> [1220×10 <sup>-7</sup> ]*1					
Gear Ratio		5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque	N·m	10	14	20	37		
Maximum Torque	N·m	28	35		56	60	
Holding Torque at Power ON	N·m	5	7.2	10	25	36	37
Motor Standstill 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 min (degrees)	15 (0.25°)					
Degree of Protection		Motor: IP54 (Excluding the installation surface and connectors) Driver: IP20 (IP10)*2					
Power Supply Input	Voltage	24 VDC±10% (24 VDC±5%)*2/48 VDC±5%*3					
	Maximum Input Current	2.5 (3.1)*2					
Electromagnetic Brake*4	Power Supply Input	24 VDC±5%*5 0.25A					

● 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.

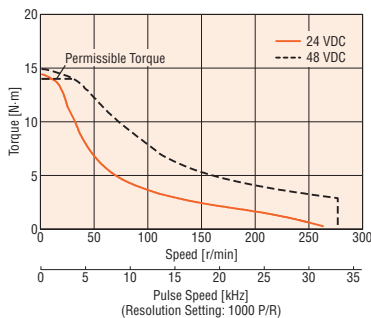
- \*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
- \*2 The values inside the parentheses ( ) represent the specification for the built-in controller package.
- \*3 When running the motor at 48 VDC, the load inertia should be under 10 times of the rotor inertia and allow for a safety factor of 2 or more times the required torque.
- \*4 For pulse input package, a separate power supply for electromagnetic brakes is required.
- \*5 If the wiring distance between the motor and driver is extended to 20 m min. using an accessory cable (sold separately), the 24 VDC±4% specification applies.

### Speed – Torque Characteristics

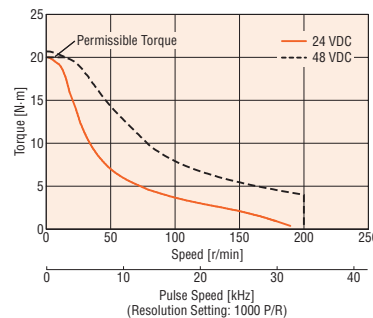
**AR98 Gear Ratio 5**



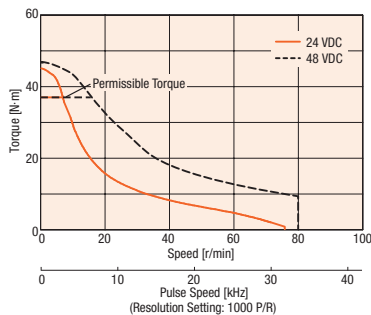
**AR98 Gear Ratio 7.2**



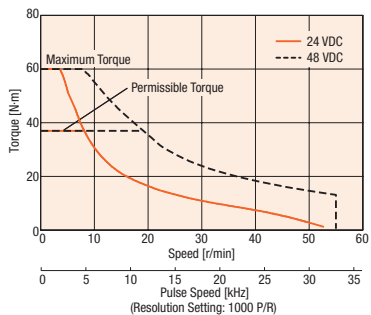
**AR98 Gear Ratio 10**



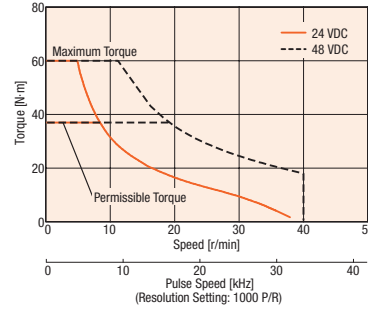
**AR98 Gear Ratio 25**



**AR98 Gear Ratio 36**



**AR98 Gear Ratio 50**



#### Note

● Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.

# PN Geared Type Frame Size 28 mm

## Specifications RoHS



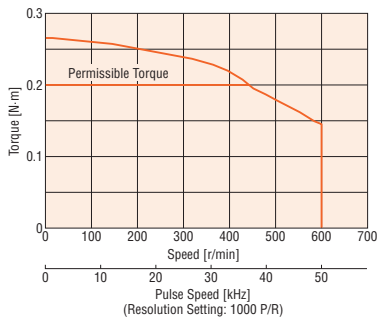
Product Name	Built-In Controller Package		AR24SAKD-N5-◇	AR24SAKD-N7.2-◇	AR24SAKD-N10-◇
	Pulse Input Package		AR24SAK-N5-◇	AR24SAK-N7.2-◇	AR24SAK-N10-◇
Maximum Holding Torque	N·m		0.2	0.3	0.5
Rotor Inertia	J: kg·m <sup>2</sup>		11 × 10 <sup>-7</sup>		
Gear Ratio			5	7.2	10
Resolution	Resolution Setting: 1000 P/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	Power ON	N·m	0.13	0.19	0.27
Permissible Speed Range	r/min		0~600	0~416	0~300
Backlash	arc min (degrees)		3 (0.05°)		
Degree of Protection			Motor: IP20 Driver: IP20 (IP10)*		
Power Supply Input	Voltage		24 VDC ± 10% (24 VDC ± 5%)*		
	Maximum Input Current		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.

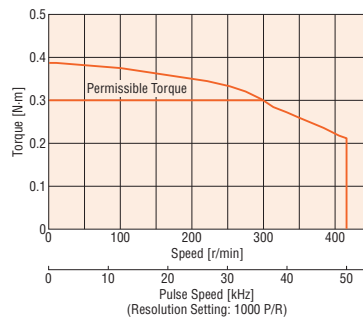
\*The values inside the parentheses ( ) represent the specification for the built-in controller package.

## Speed – Torque Characteristics

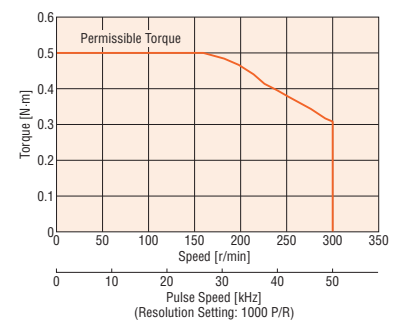
**AR24 Gear Ratio 5**



**AR24 Gear Ratio 7.2**



**AR24 Gear Ratio 10**



### Note

● Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.

## PN Geared Type Frame Size 42 mm

### Specifications

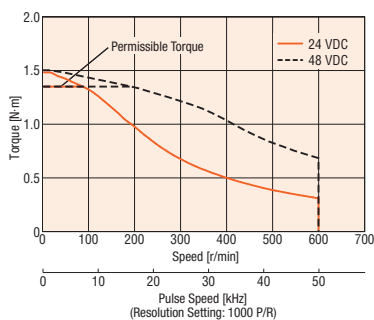


Product Name	Built-In Controller Package	AR46□KD-N5-◇	AR46□KD-N7.2-◇	AR46□KD-N10-◇
	Pulse Input Package	AR46□K-N5-◇	AR46□K-N7.2-◇	AR46□K-N10-◇
Maximum Holding Torque	N·m	1.35		1.5
Rotor Inertia	J: kg·m <sup>2</sup>		$58 \times 10^{-7} [73 \times 10^{-7}]^{*1}$	
Gear Ratio		5	7.2	10
Resolution	Resolution Setting: 1000 P/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 Power ON	N·m	0.75	1	1.5
Motor Standstill Electromagnetic Brake	N·m	0.75	1	1.5
Permissible Speed Range	r/min	0~600	0~416	0~300
Backlash	arc min (degrees)	2 (0.034°)		
Degree of Protection		Motor: IP54 (Excluding the installation surface and connectors) Driver: IP20 (IP10)*2		
Power Supply Input	Voltage	24 VDC ± 10% (24 VDC ± 5%)*2 / 48 VDC ± 5%		
	Maximum Input Current	1.4 (1.8)*2		
Electromagnetic Brake*3	Power Supply Input	24 VDC ± 5%*4 0.08A		

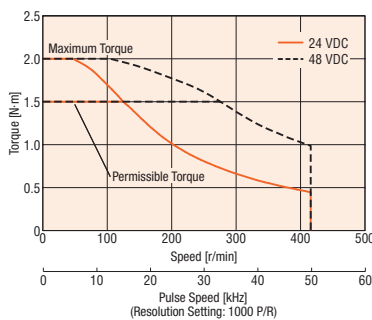
- Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
- A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
- \*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
- \*2 The values inside the parentheses ( ) represent the specification for the built-in controller package.
- \*3 For pulse input package, a separate power supply for electromagnetic brakes is required.
- \*4 If the wiring distance between the motor and driver is extended to 20 m min. using an accessory cable (sold separately), the 24 VDC ± 4% specification applies.

### Speed – Torque Characteristics

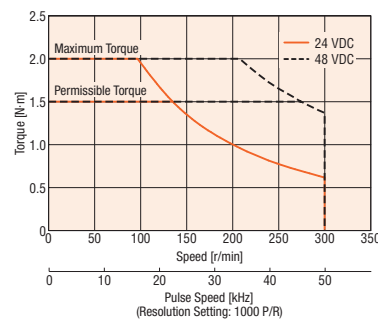
AR46 Gear Ratio 5



AR46 Gear Ratio 7.2



AR46 Gear Ratio 10



**Note**

- Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.

# PN Geared Type Frame Size 60 mm

## Specifications RoHS

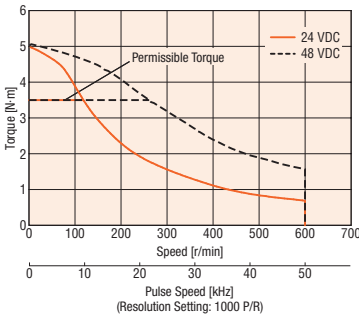


Product Name	Built-In Controller Package	AR66□KD-N5-◇	AR66□KD-N7.2-◇	AR66□KD-N10-◇	AR66□KD-N25-◇	AR66□KD-N36-◇	AR66□KD-N50-◇
	Pulse Input Package	AR66□K-N5-◇	AR66□K-N7.2-◇	AR66□K-N10-◇	AR66□K-N25-◇	AR66□K-N36-◇	AR66□K-N50-◇
Maximum Holding Torque	N·m	3.5	4	5	8		
Rotor Inertia	J: kg·m <sup>2</sup>	380 × 10 <sup>-7</sup> [500 × 10 <sup>-7</sup> ]*1					
Gear Ratio		5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque	N·m	3.5	4	5	8		
Maximum Torque	N·m	7	9	11	16	20	
Holding Torque at Motor Standstill	Power ON	2.5	3.6	5	7.6	8	
	Electromagnetic Brake	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 min (degrees)	2 (0.034°)			3 (0.05°)		
Degree of Protection		Motor: IP54 (Excluding the installation surface and connectors) Driver: IP20 (IP10)*2					
Power Supply Input	Voltage	24 VDC ± 10% (24 VDC ± 5%)*2/48 VDC ± 5%*3					
	Maximum Input Current	3.1 (3.8)*2					
Electromagnetic Brake*4	Power Supply Input	24 VDC ± 5%*5 0.25 A					

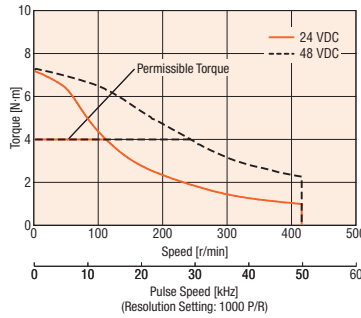
- Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
- A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
- \*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
- \*2 The values inside the parentheses ( ) represent the specification for the built-in controller package.
- \*3 When running the motor at 48 VDC, the load inertia should be under 10 times of the rotor inertia and allow for a safety factor of 2 or more times the required torque.
- \*4 For pulse input package, a separate power supply for electromagnetic brakes is required.
- \*5 If the wiring distance between the motor and driver is extended to 20 m min. using an accessory cable (sold separately), the 24 VDC ± 4% specification applies.

## Speed – Torque Characteristics

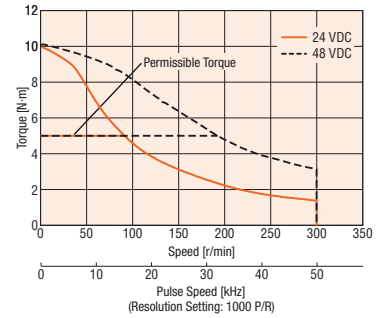
**AR66 Gear Ratio 5**



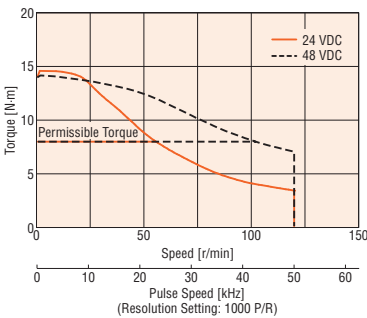
**AR66 Gear Ratio 7.2**



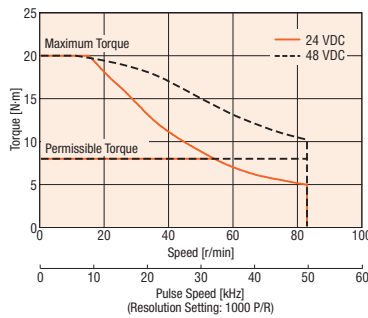
**AR66 Gear Ratio 10**



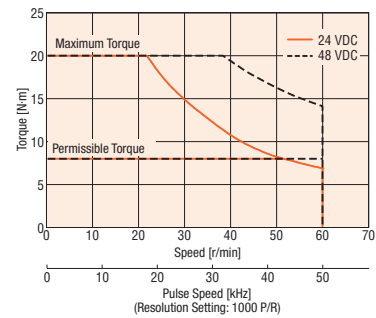
**AR66 Gear Ratio 25**



**AR66 Gear Ratio 36**



**AR66 Gear Ratio 50**



**Note**

● Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.

## PN Geared Type Frame Size 90 mm

### Specifications RoHS

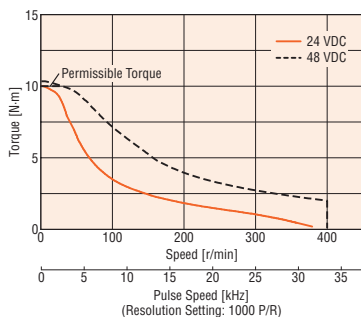


Product Name	Built-In Controller Package	AR98□KD-N5-◇	AR98□KD-N7.2-◇	AR98□KD-N10-◇	AR98□KD-N25-◇	AR98□KD-N36-◇	AR98□KD-N50-◇
	Pulse Input Package	AR98□K-N5-◇	AR98□K-N7.2-◇	AR98□K-N10-◇	AR98□K-N25-◇	AR98□K-N36-◇	AR98□K-N50-◇
Maximum Holding Torque	N·m	10	14	20	37		
Rotor Inertia	J: kg·m <sup>2</sup>	1100×10 <sup>-7</sup> [1220×10 <sup>-7</sup> ]*1					
Gear Ratio		5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque	N·m	10	14	20	37		
Maximum Torque	N·m	28	35		56	60	
Holding Torque at Power ON	N·m	5	7.2	10	25	36	37
Motor Standstill 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 min (degrees)	2 (0.034°)			3 (0.05°)		
Degree of Protection		Motor: IP54 (Excluding the installation surface and connectors) Driver: IP20 (IP10)*2					
Power Supply Input	Voltage	24 VDC±10% (24 VDC±5%)*2/48 VDC±5%*3					
	Maximum Input Current	2.5 (3.1)*2					
Electromagnetic Brake*4	Power Supply Input	24 VDC±5%*5 0.25 A					

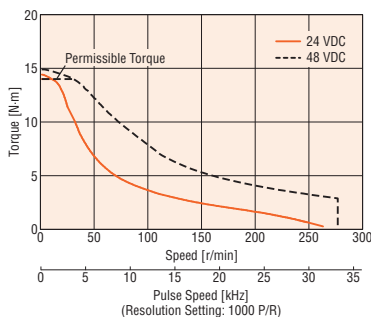
- Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.  
A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
- \*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
- \*2 The values inside the parentheses ( ) represent the specification for the built-in controller package.
- \*3 When running the motor at 48 VDC, the load inertia should be under 10 times of the rotor inertia and allow for a safety factor of 2 or more times the required torque.
- \*4 For pulse input package, a separate power supply for electromagnetic brakes is required.
- \*5 If the wiring distance between the motor and driver is extended to 20 m min. using an accessory cable (sold separately), the 24 VDC±4% specification applies.

### Speed – Torque Characteristics

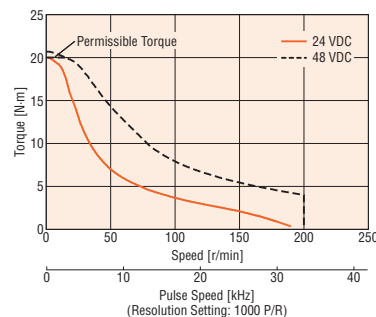
**AR98 Gear Ratio 5**



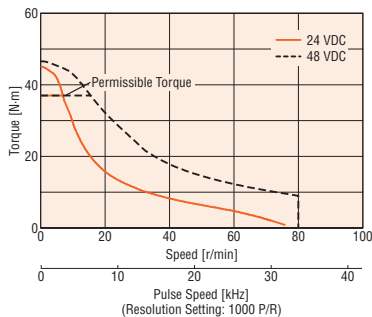
**AR98 Gear Ratio 7.2**



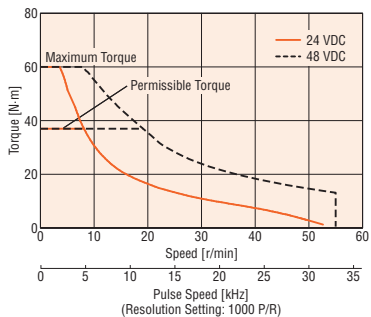
**AR98 Gear Ratio 10**



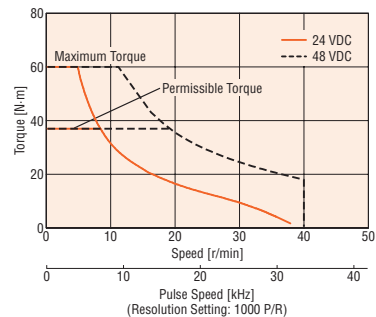
**AR98 Gear Ratio 25**



**AR98 Gear Ratio 36**



**AR98 Gear Ratio 50**



#### Note

- Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.

# Harmonic Geared Type Frame Size 30 mm, 42 mm

## Specifications RoHS

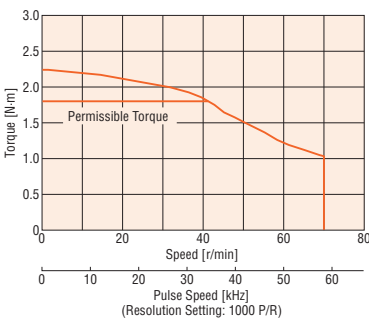


Product Name	Built-In Controller Package	AR24SAKD-H50-◇	AR24SAKD-H100-◇	AR46□KD-H50-◇	AR46□KD-H100-◇
	Pulse Input Package	AR24SAK-H50-◇	AR24SAK-H100-◇	AR46□K-H50-◇	AR46□K-H100-◇
Maximum Holding Torque	N·m	1.8	2.4	3.5	5
Rotor Inertia	J: kg·m <sup>2</sup>	$14 \times 10^{-7}$			
Gear Ratio		50	100	50	100
Resolution	Resolution Setting: 1000 P/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	Power ON Electromagnetic Brake	N·m N·m	1.3 —	2.4 —	3.5 3.5
Lost Motion (Load Torque)	arc min	1.5 max. ( $\pm 0.09$ N·m)	1.5 max. ( $\pm 0.12$ N·m)	1.5 max. ( $\pm 0.16$ N·m)	1.5 max. ( $\pm 0.2$ N·m)
Permissible Speed Range	r/min	0~70	0~35	0~70	0~35
Degree of Protection		Motor: IP20 Driver: IP20 (IP10)*2		Motor: IP54 (Excluding the installation surface and connectors) Driver: IP20 (IP10)*2	
Power Supply Input	Voltage	24 VDC $\pm 10\%$ (24 VDC $\pm 5\%$ )*2		24 VDC $\pm 10\%$ (24 VDC $\pm 5\%$ )*2/48 VDC $\pm 5\%$	
	Maximum Input Current	A		1.4 (1.8)*2	
Electromagnetic Brake*3	Power Supply Input	—		24 VDC $\pm 5\%$ *4 0.08A	

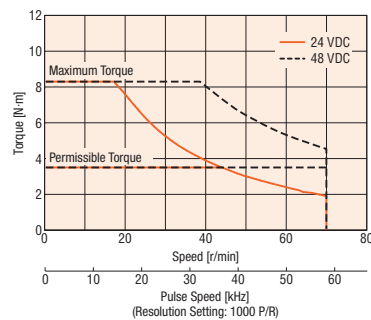
- Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
- A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
- \*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
- \*2 The values inside the parentheses ( ) represent the specification for the built-in controller package.
- \*3 For pulse input package, a separate power supply for electromagnetic brakes is required.
- \*4 If the wiring distance between the motor and driver is extended to 20 m min. using an accessory cable (sold separately), the 24 VDC  $\pm 4\%$  specification applies.

## Speed – Torque Characteristics

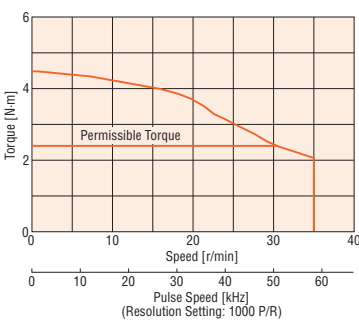
**AR24 Gear Ratio 50**



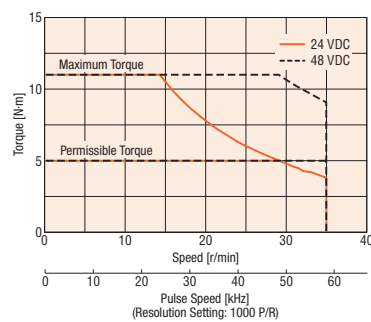
**AR46 Gear Ratio 50**



**AR24 Gear Ratio 100**



**AR46 Gear Ratio 100**



**Note**

- Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.
- In order to prevent fatigue of the gear grease in the harmonic gear, keep the temperature of the gear case under 70°C.

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

### Specifications RoHS

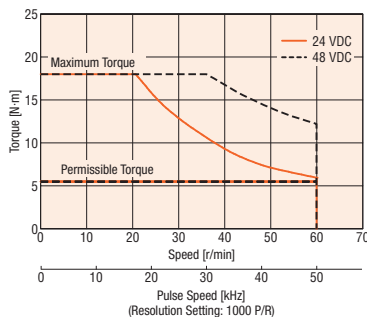


Product Name	Built-In Controller Package	AR66□KD-H50-◇	AR66□KD-H100-◇	AR98□KD-H50-◇	AR98□KD-H100-◇
	Pulse Input Package	AR66□K-H50-◇	AR66□K-H100-◇	AR98□K-H50-◇	AR98□K-H100-◇
Maximum Holding Torque	N·m	5.5	8	25	37
Rotor Inertia	J: kg·m <sup>2</sup>	415×10 <sup>-7</sup> [535×10 <sup>-7</sup> ]*1		1300×10 <sup>-7</sup> [1420×10 <sup>-7</sup> ]*1	
Gear Ratio		50	100	50	100
Resolution	Resolution Setting: 1000 P/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	Power ON Electromagnetic Brake	N·m N·m	5.5 5.5	8 8	25 25
Lost Motion (Load Torque)	arc min	0.7 max. (±0.28 N·m)		1.5 max. (±1.2 N·m)	
Permissible Speed Range	r/min	0~60	0~30	0~40	0~20
Degree of Protection		Motor: IP54 (Excluding the installation surface and connectors) Driver: IP20 (IP10)*2			
Power Supply Input	Voltage	24 VDC±10% (24 VDC±5%)*2/48 VDC±5%*3			
	Maximum Input Current	3.1 (3.8)*2		2.5 (3.1)*2	
Electromagnetic Brake*4	Power Supply Input	24 VDC±5%*5 0.25A			

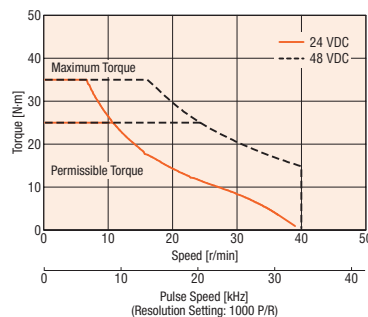
- Either **A** (single shaft) or **M** (electromagnetic brake) indicating the configuration is entered where the box □ is located within the product name.
- A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.
- \*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
- \*2 The values inside the parentheses ( ) represent the specification for the built-in controller package.
- \*3 When running the motor at 48 VDC, the load inertia should be under 10 times of the rotor inertia and allow for a safety factor of 2 or more times the required torque.
- \*4 For pulse input package, a separate power supply for electromagnetic brakes is required.
- \*5 If the wiring distance between the motor and driver is extended to 20 m min. using an accessory cable (sold separately), the 24 VDC±4% specification applies.

### Speed – Torque Characteristics

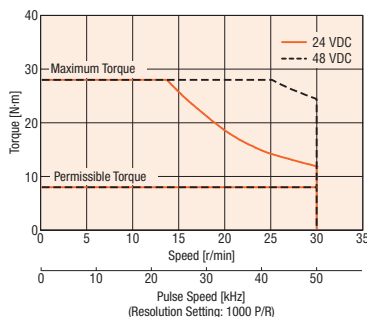
#### AR66 Gear Ratio 50



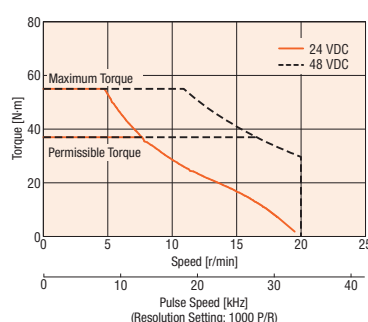
#### AR98 Gear Ratio 50



#### AR66 Gear Ratio 100



#### AR98 Gear Ratio 100



#### Note

- Pay attention to heat dissipation from the motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C.
- In order to prevent fatigue of the gear grease in the harmonic gear, keep the temperature of the gear case under 70°C.

## Driver Specifications

		Built-In Controller Package	Pulse Input Package
Maximum Input Pulse Frequency		—	When the host controller is a line driver output: 500 kHz (When the pulse duty is 50%) When the host controller is an open-collector output: 250 kHz (When the pulse duty is 50%)*
Number of Positioning Data Sets		64 Points	—
Positioning Operation	One-Shot	○	—
	Linked	○	—
	Linked 2	○	—
	Sequential	○	—
	Direct	○	—
	Pushing	○	○
Continuous Operation		○	—
JOG Operation		○	—
Return-To-Home Operation		○	—
Test Operation		○	○
Control Module <b>OPX-2A</b>		○	○
Data Setting Software <b>MEXE02</b>		○	○

\*Value applies when an accessory general-purpose cable (**CC36D1-1**) is used.  
General-purpose cable → Page A-350

## Built-In Controller Package RS-485 Communication Specifications

Protocol	Modbus protocol (Modbus RTU mode)
Electrical Characteristics	EIA-485 compliance Twisted-pair wire (TIA/EIA-568B CAT5e or greater recommended) is used up to a total extension length of 50 m.
Transmission/Reception Mode	Half-duplex communication
Baud Rate	9600 bps/19200 bps/38400 bps/57600 bps/115200 bps
Physical Layer	Asynchronous mode (data: 8-bit, stop bit: 1-bit/2-bit, parity: none/odd/even)
Connection Type	Up to 31 units can be connected to one programmable controller (master equipment).

## General Specifications

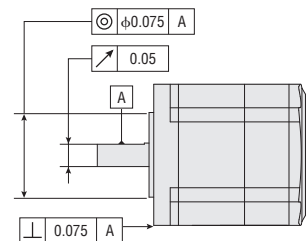
		Motor	Driver	
			Built-In Controller Package	Pulse Input Package
Thermal Class		130 (B)	—	
Insulation Resistance		100 M $\Omega$ or more when 500 VDC megger is applied between the following places: · Case – Motor and sensor windings · Case – Electromagnetic brake windings	100 M $\Omega$ or more when 500 VDC megger is applied between the following places: · FG terminal – Power supply terminal	—
Dielectric Strength		Sufficient to withstand the following for 1 minute: · Case – Motor and sensor windings 1.0 kVAC 50 Hz or 60 Hz · Case – Electromagnetic brake windings 1.0 kVAC 50 Hz or 60 Hz	Sufficient to withstand the following for 1 minute: · FG terminal – Power supply terminal 500 VAC 50 Hz or 60 Hz	—
Operating Environment (In Operation)	Ambient Temperature	–10~+50°C (non-freezing)*1: Standard type, <b>TH, PS, PN</b> geared type 0~+40°C (non-freezing)*1: Harmonic geared type	0~+50°C (non-freezing)	
	Ambient Humidity	85% or less (non-condensing)		
	Atmosphere	No corrosive gases, dust, water or oil		
Stop Position Accuracy		<b>AR24, AR26, AR46:</b> $\pm 4$ arc minutes ( $\pm 0.067^\circ$ ) <b>AR66, AR69, AR98:</b> $\pm 3$ arc minutes ( $\pm 0.05^\circ$ )		
Shaft Runout		0.05 T. I. R. (mm)*2	—	
Concentricity for Shaft in the Mounting Pilot		0.075 T. I. R. (mm)*2	—	
Perpendicularity for Shaft of the Mounting Surface		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 shaft center.

### Note

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



## Permissible Overhung Load and Permissible Thrust Load

→ Page A-14

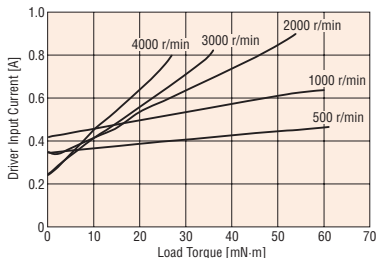


## Load Torque – Driver Input Current Characteristics

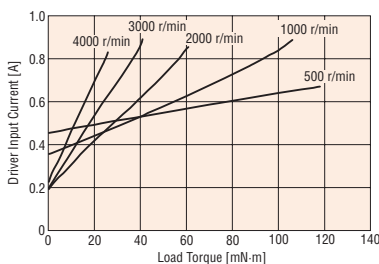
This is the relationship between the load torque and driver input current at each speed when the motor is operated. From these characteristics, the current capacity required when used for multiple axes can be estimated. For geared motors, convert to torque and speed at the motor shaft. (The values are for pulse input packages.)

### ● 24 VDC

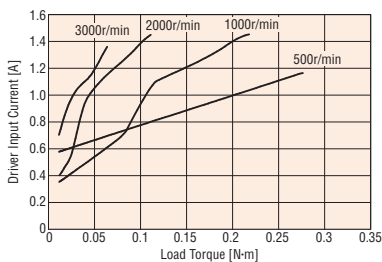
#### AR24



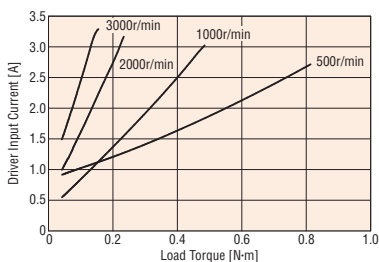
#### AR26



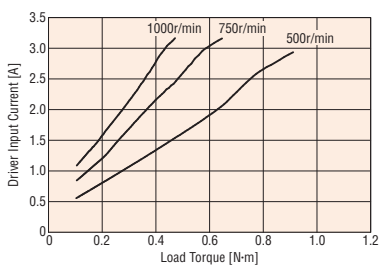
#### AR46



#### AR66



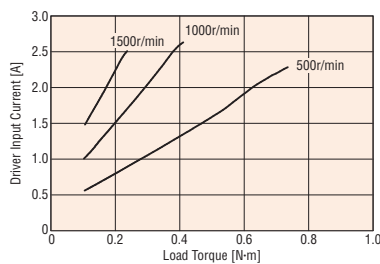
#### AR69



$$\text{Motor shaft speed [r/min]} = \text{Gear output shaft speed} \times \text{Gear ratio}$$

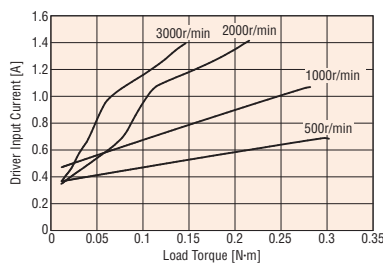
$$\text{Motor shaft torque [N-m]} = \frac{\text{Gear output shaft torque}}{\text{Gear ratio}}$$

#### AR98

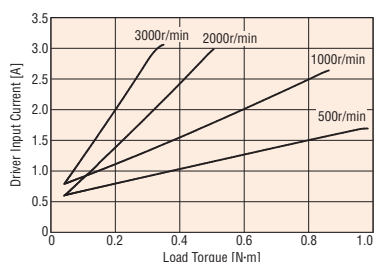


### ● 48 VDC

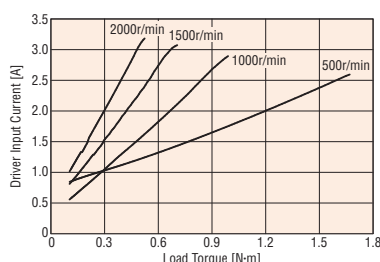
#### AR46



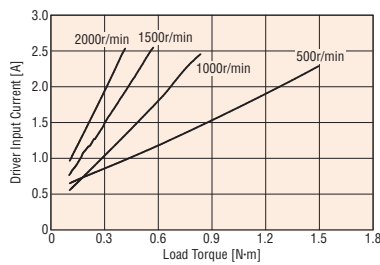
#### AR66



#### AR69



#### AR98



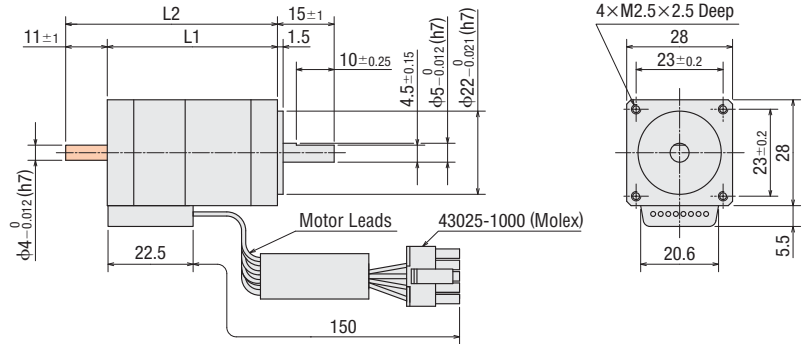
**Dimensions** (Unit = mm)

● Motors

◇ Standard Type

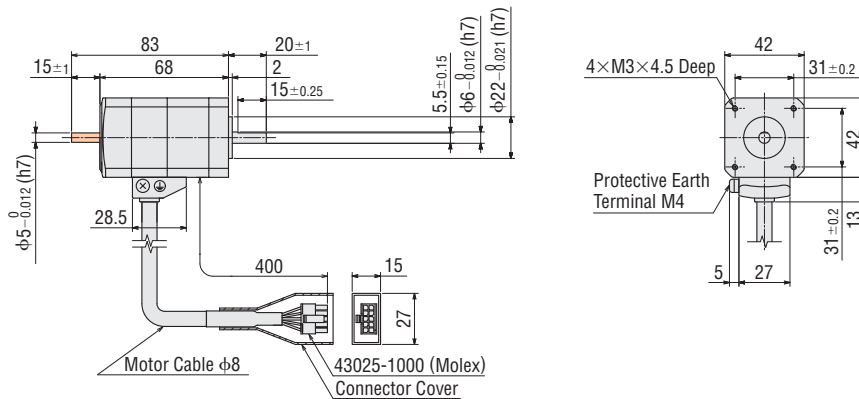
Frame Size 28 mm

Product Name		Motor Product Name	L1	L2	Mass kg
Built-In Controller	Pulse Input				
AR24SAKD-◇	AR24SAK-◇	ARM24SAK	45	—	0.15
AR24SBKD-◇	AR24SBK-◇	ARM24SBK	—	56	—
AR26SAKD-◇	AR26SAK-◇	ARM26SAK	65	—	0.22
AR26SBKD-◇	AR26SBK-◇	ARM26SBK	—	76	—



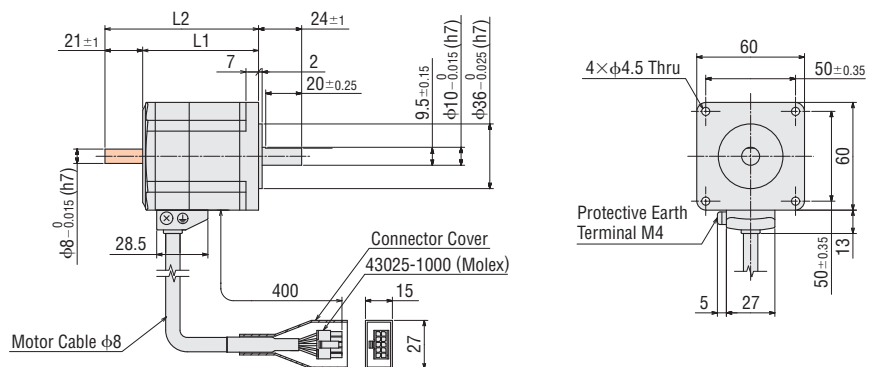
Frame Size 42 mm

Product Name		Motor Product Name	Mass kg
Built-In Controller	Pulse Input		
AR46AKD-◇	AR46AK-◇	ARM46AK	0.47
AR46BKD-◇	AR46BK-◇	ARM46BK	—



Frame Size 60 mm

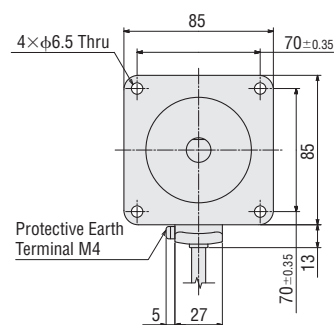
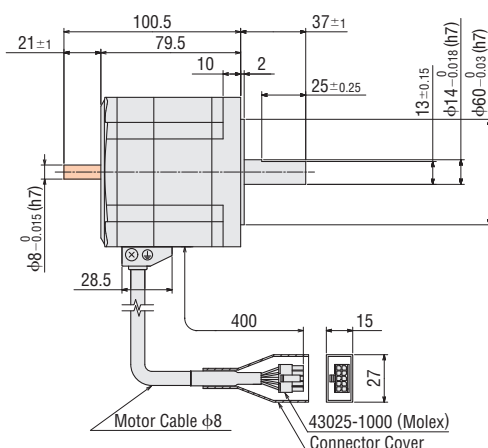
Product Name		Motor Product Name	L1	L2	Mass kg
Built-In Controller	Pulse Input				
AR66AKD-◇	AR66AK-◇	ARM66AK	64.5	—	0.9
AR66BKD-◇	AR66BK-◇	ARM66BK	—	85.5	—
AR69AKD-◇	AR69AK-◇	ARM69AK	90	—	1.4
AR69BKD-◇	AR69BK-◇	ARM69BK	—	111	—



● 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  areas.

## Frame Size 85 mm

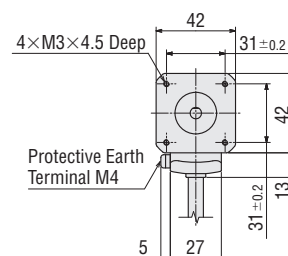
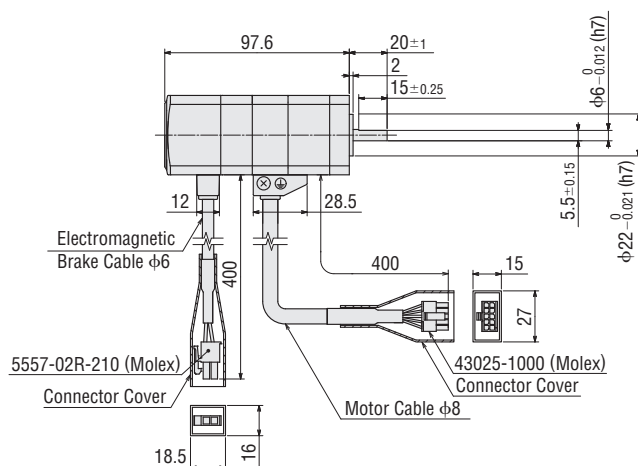
Product Name		Motor Product Name	Mass kg
Built-In Controller	Pulse Input		
<b>AR98AKD</b> -◇	<b>AR98AK</b> -◇	ARM98AK	1.9
<b>AR98BKD</b> -◇	<b>AR98BK</b> -◇	ARM98BK	



### ◇ Standard Type with Electromagnetic Brake

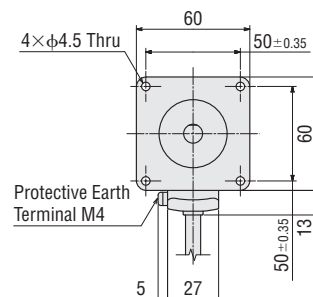
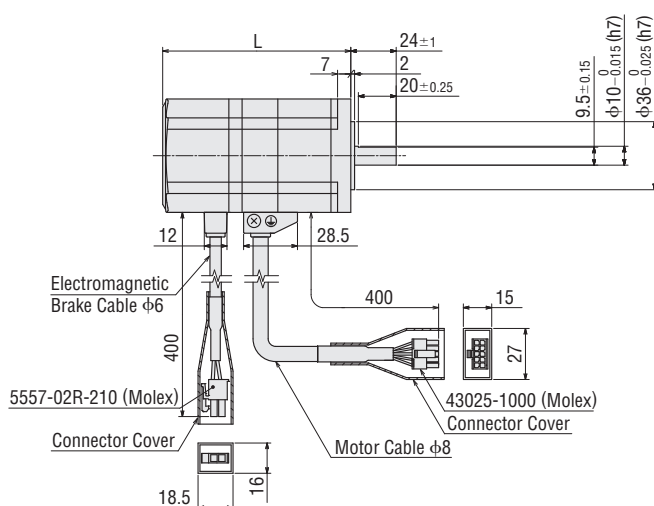
## Frame Size 42 mm


Product Name		Motor Product Name	Mass kg
Built-In Controller	Pulse Input		
<b>AR46MKD</b> -◇	<b>AR46MK</b> -◇	ARM46MK	0.62



## Frame Size 60 mm

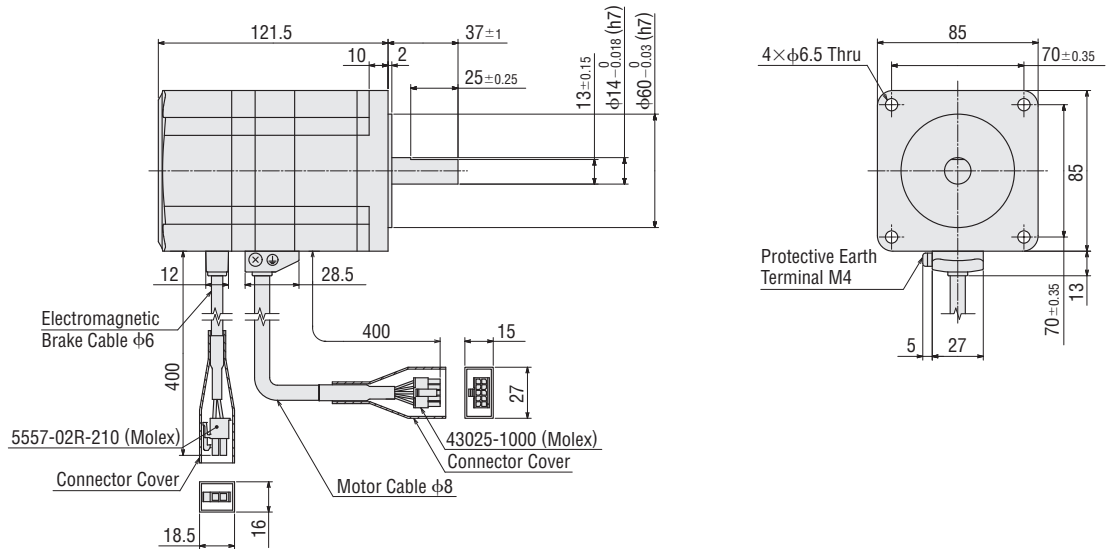
Product Name		Motor Product Name	L	Mass kg
Built-In Controller	Pulse Input			
<b>AR66MKD</b> -◇	<b>AR66MK</b> -◇	ARM66MK	99.5	1.2
<b>AR69MKD</b> -◇	<b>AR69MK</b> -◇	ARM69MK	125	1.7



- 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  areas.

Frame Size 85 mm

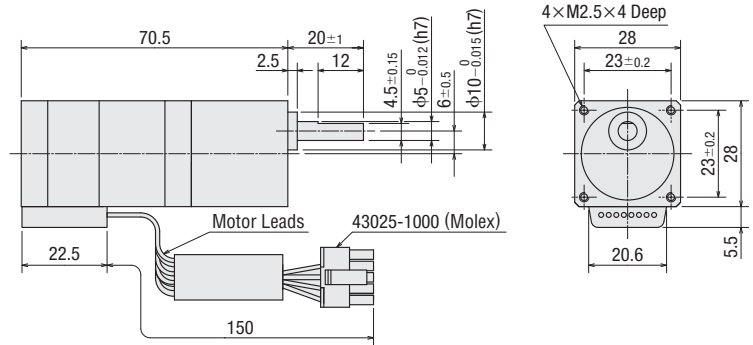
Product Name		Motor Product Name	Mass kg
Built-In Controller	Pulse Input		
AR98MKD-◇	AR98MK-◇	ARM98MK	2.5



◇ TH Geared Type

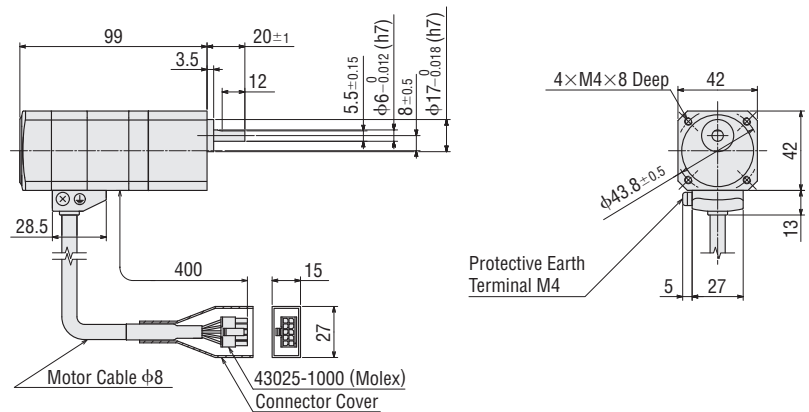
Frame Size 28 mm

Product Name		Motor Product Name	Gear Ratio	Mass kg
Built-In Controller	Pulse Input			
AR24SAKD-T-◇	AR24SAK-T-◇	ARM24SAK-T	7.2, 10, 20, 30	0.21



Frame Size 42 mm

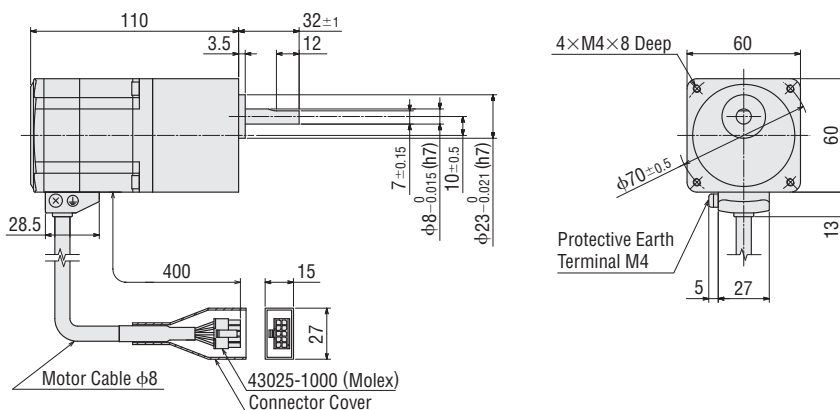
Product Name		Motor Product Name	Gear Ratio	Mass kg
Built-In Controller	Pulse Input			
AR46AKD-T-◇	AR46AK-T-◇	ARM46AK-T	3.6, 7.2, 10, 20, 30	0.62



- 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.

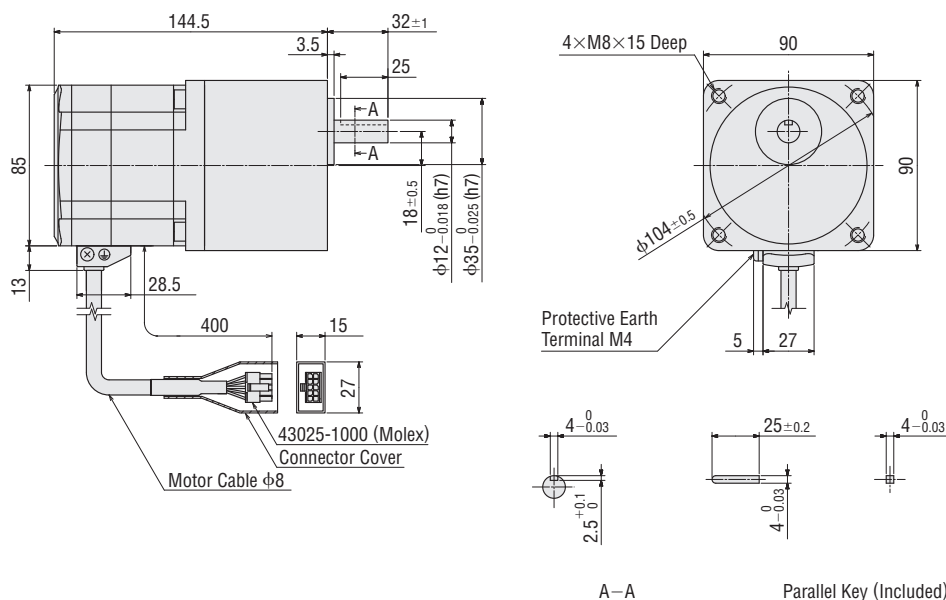
## Frame Size 60 mm

Product Name		Motor Product Name	Gear Ratio	Mass kg
Built-In Controller	Pulse Input			
<b>AR66AKD-T</b> ◊	<b>AR66AK-T</b> ◊	ARM66AK-T ■	<b>3.6, 7.2, 10, 20, 30</b>	1.3



## Frame Size 90 mm

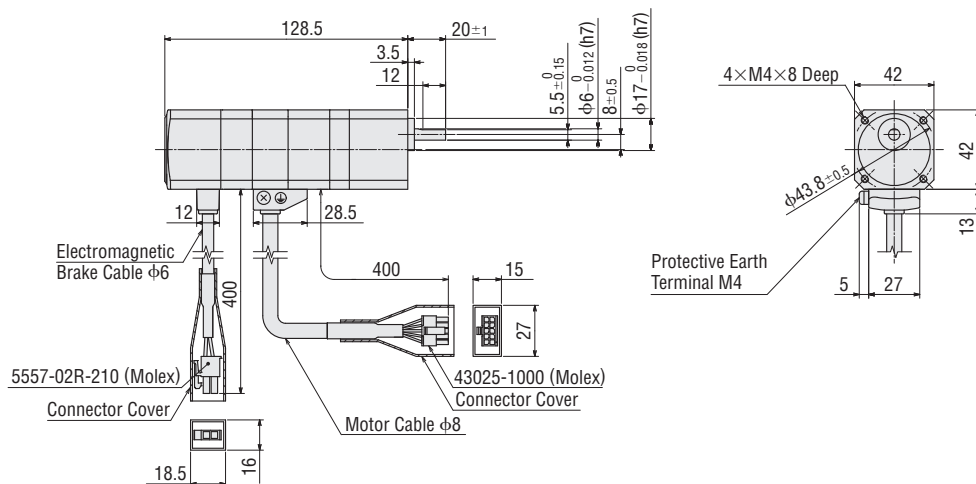
Product Name		Motor Product Name	Gear Ratio	Mass kg
Built-In Controller	Pulse Input			
<b>AR98AKD-T</b> ◊	<b>AR98AK-T</b> ◊	ARM98AK-T ■	<b>3.6, 7.2, 10, 20, 30</b>	3.1



## ◊ TH Geared Type with Electromagnetic Brake

### Frame Size 42 mm

Product Name		Motor Product Name	Gear Ratio	Mass kg
Built-In Controller	Pulse Input			
<b>AR46MKD-T</b> ◊	<b>AR46MK-T</b> ◊	ARM46MK-T ■	<b>3.6, 7.2, 10, 20, 30</b>	0.77

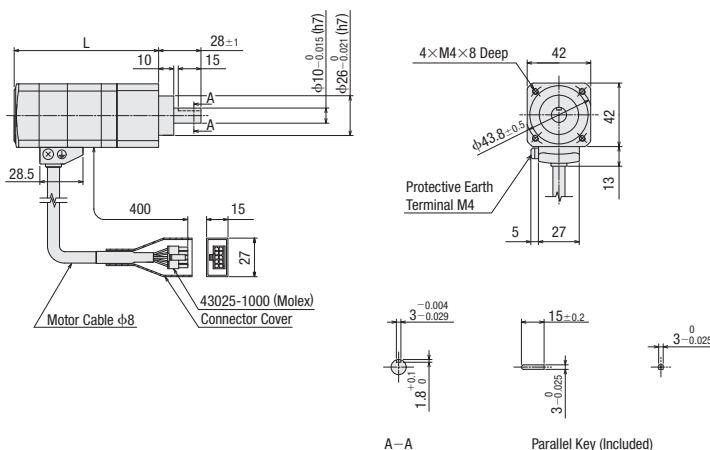


- A number indicating the gear ratio is entered where the box ■ is located within the product name.
- A number indicating the desired length of **1** (1 m), **2** (2 m) or **3** (3 m) for the cable included with the product is entered where the box ◊ is located within the product name.



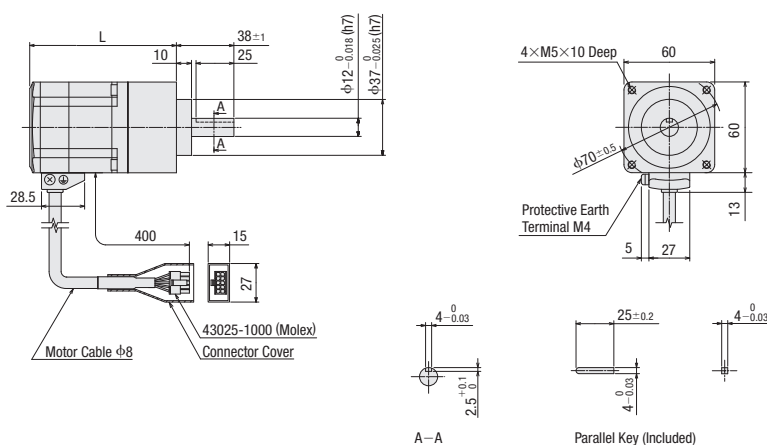
## Frame Size 42 mm

Product Name		Motor Product Name	Gear Ratio	L	Mass kg
Built-In Controller	Pulse Input				
AR46AKD-PS■-◇	AR46AK-PS■-◇	ARM46AK-PS■	5, 7, 2, 10	96	0.67
			25, 36, 50	119.5	0.82



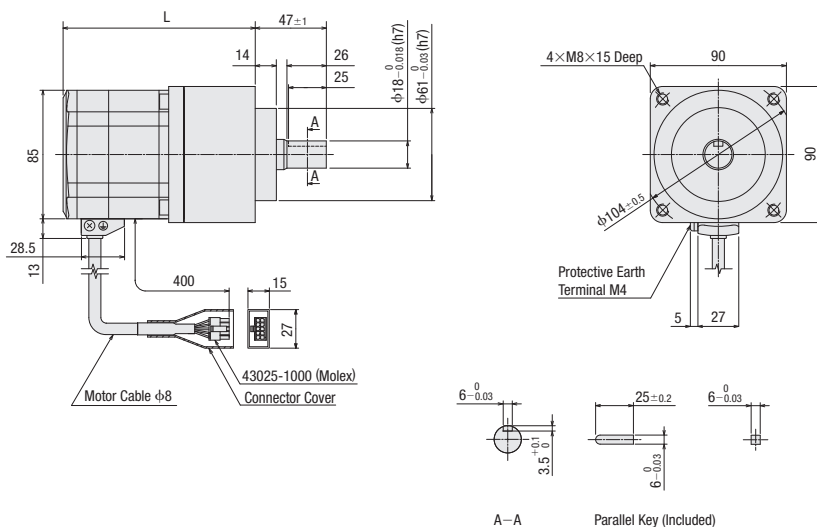
## Frame Size 60 mm

Product Name		Motor Product Name	Gear Ratio	L	Mass kg
Built-In Controller	Pulse Input				
AR66AKD-PS■-◇	AR66AK-PS■-◇	ARM66AK-PS■	5, 7, 2, 10	97	1.3
			25, 36, 50	117	1.6



## Frame Size 90 mm

Product Name		Motor Product Name	Gear Ratio	L	Mass kg
Built-In Controller	Pulse Input				
AR98AKD-PS■-◇	AR98AK-PS■-◇	ARM98AK-PS■	5, 7, 2, 10	127	3.3
			25, 36, 50	154.5	4.1

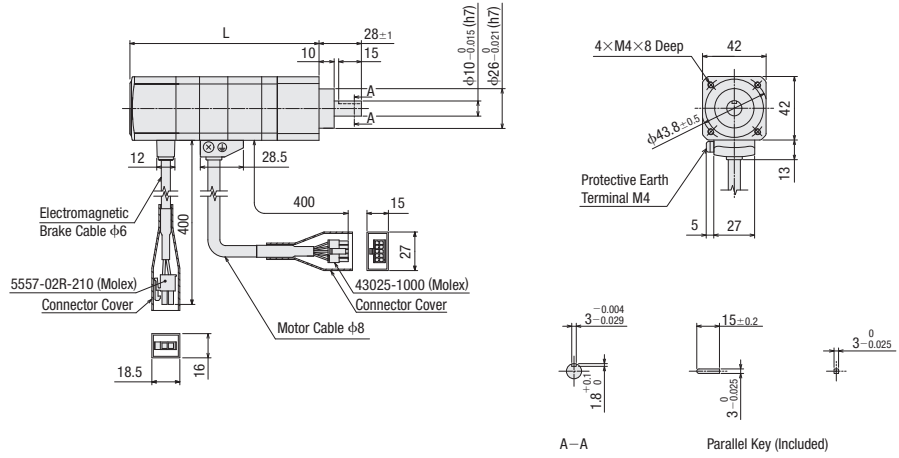


- A number indicating the gear ratio is entered where the box ■ is located within the product name.
- A number indicating the desired length of 1 (1 m), 2 (2 m) or 3 (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.

◇ PS Geared Type with Electromagnetic Brake

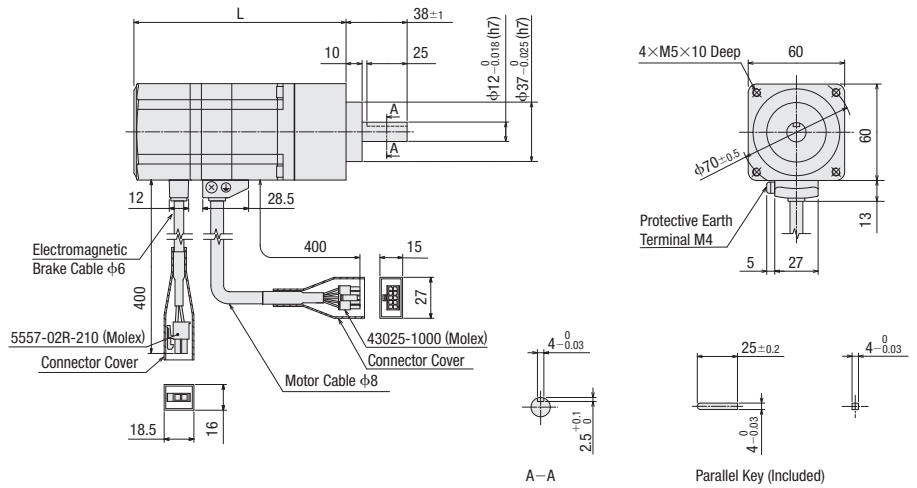
Frame Size 42 mm

Product Name		Motor Product Name	Gear Ratio	L	Mass kg
Built-In Controller	Pulse Input				
<b>AR46MKD-PS</b> ■-◇	<b>AR46MK-PS</b> ■-◇	ARM46MK-PS■	<b>5, 7, 2, 10</b>	125.5	0.82
			<b>25, 36, 50</b>	149	0.97



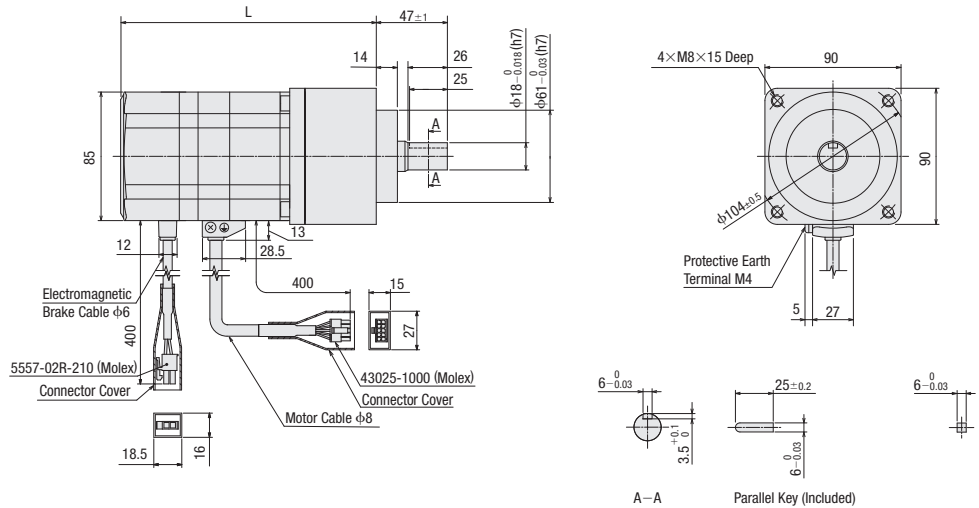
Frame Size 60 mm

Product Name		Motor Product Name	Gear Ratio	L	Mass kg
Built-In Controller	Pulse Input				
<b>AR66MKD-PS</b> ■-◇	<b>AR66MK-PS</b> ■-◇	ARM66MK-PS■	<b>5, 7, 2, 10</b>	132	1.6
			<b>25, 36, 50</b>	152	1.9



Frame Size 90 mm

Product Name		Motor Product Name	Gear Ratio	L	Mass kg
Built-In Controller	Pulse Input				
<b>AR98MKD-PS</b> ■-◇	<b>AR98MK-PS</b> ■-◇	ARM98MK-PS■	<b>5, 7, 2, 10</b>	169	3.9
			<b>25, 36, 50</b>	196.5	4.7



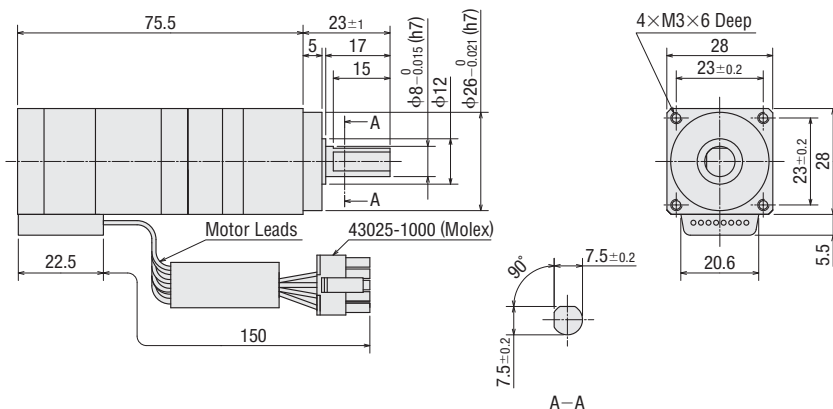
- A number indicating the gear ratio is entered where the box ■ is located within the product name.
- A number indicating the desired length of 1 (1 m), 2 (2 m) or 3 (3 m) for the cable included with the product is entered where the box ◇ is located within the product name.



## ◇ PN Geared Type

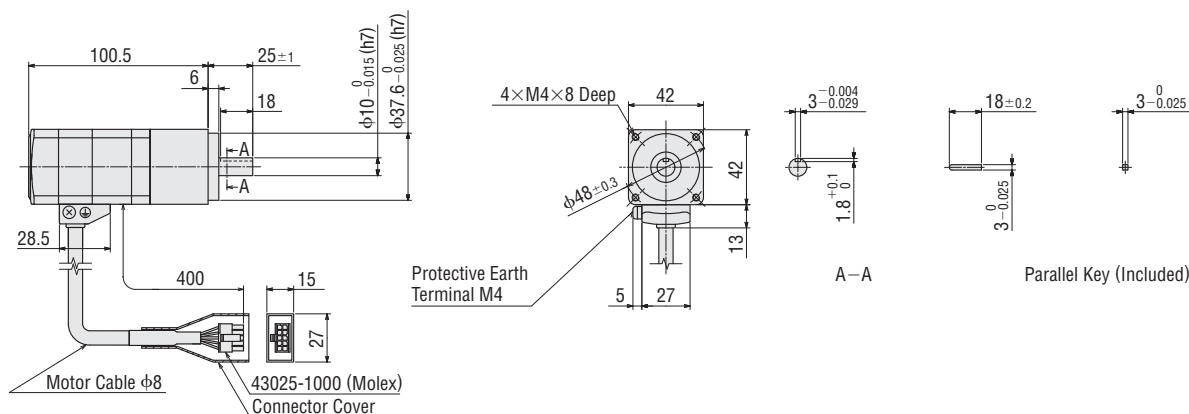
### Frame Size 28 mm

Product Name		Motor Product Name	Gear Ratio	Mass kg
Built-In Controller	Pulse Input			
<b>AR24SAKD-N</b> ■-◇	<b>AR24SAK-N</b> ■-◇	ARM24SAK-N■	<b>5, 7.2, 10</b>	0.28



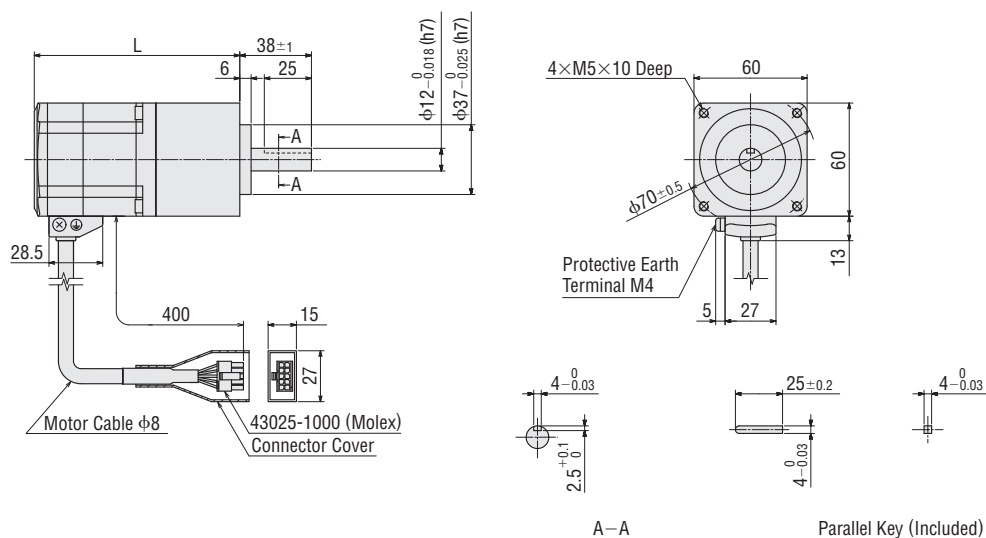
### Frame Size 42 mm

Product Name		Motor Product Name	Gear Ratio	Mass kg
Built-In Controller	Pulse Input			
<b>AR46AKD-N</b> ■-◇	<b>AR46AK-N</b> ■-◇	ARM46AK-N■	<b>5, 7.2, 10</b>	0.73



### Frame Size 60 mm

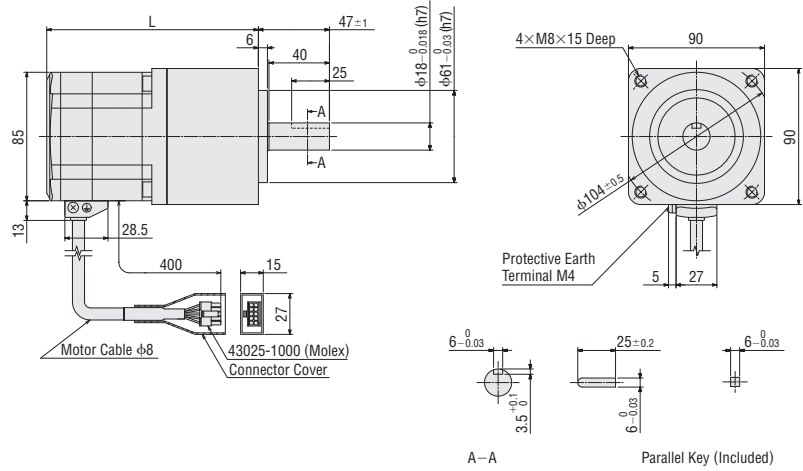
Product Name		Motor Product Name	Gear Ratio	L	Mass kg
Built-In Controller	Pulse Input				
<b>AR66AKD-N</b> ■-◇	<b>AR66AK-N</b> ■-◇	ARM66AK-N■	<b>5, 7.2, 10</b>	109	1.5
			<b>25, 36, 50</b>	125	1.73



- 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

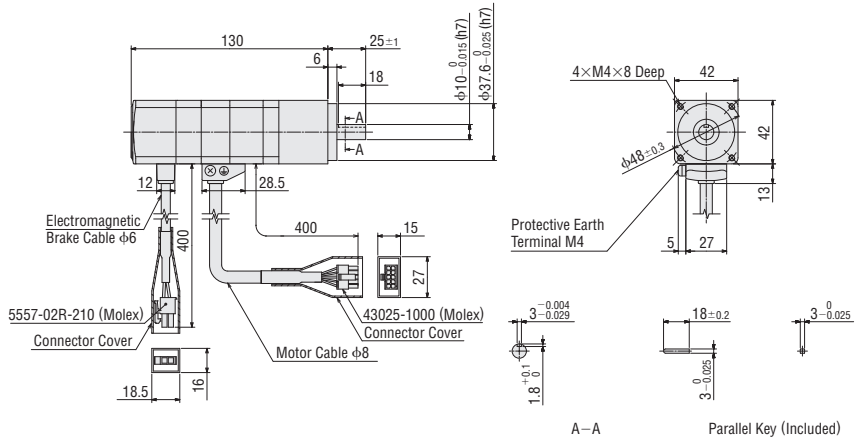
Product Name		Motor Product Name	Gear Ratio	L	Mass kg
Built-In Controller	Pulse Input				
<b>AR98AKD-N</b> ■-◇	<b>AR98AK-N</b> ■-◇	ARM98AK-N■	<b>5, 7.2, 10</b>	140	3.8
			<b>25, 36, 50</b>	163	4.5



◇ PN Geared Type with Electromagnetic Brake

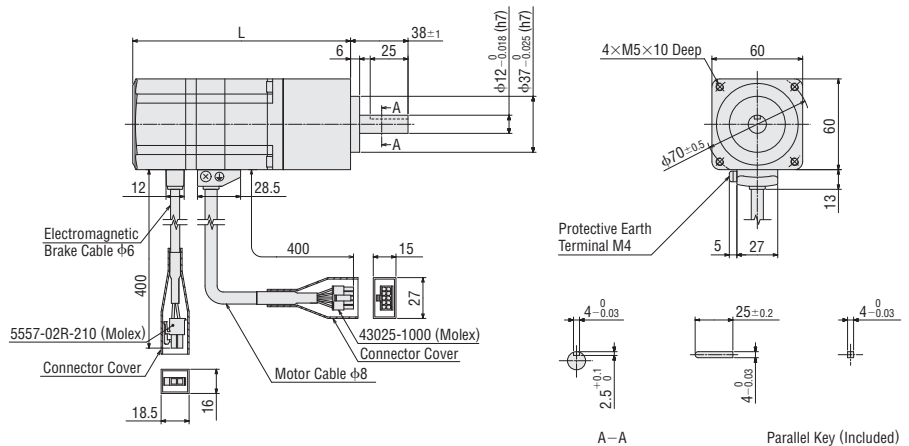
Frame Size 42 mm

Product Name		Motor Product Name	Gear Ratio	Mass kg
Built-In Controller	Pulse Input			
<b>AR46MKD-N</b> ■-◇	<b>AR46MK-N</b> ■-◇	ARM46MK-N■	<b>5, 7.2, 10</b>	0.88



Frame Size 60 mm

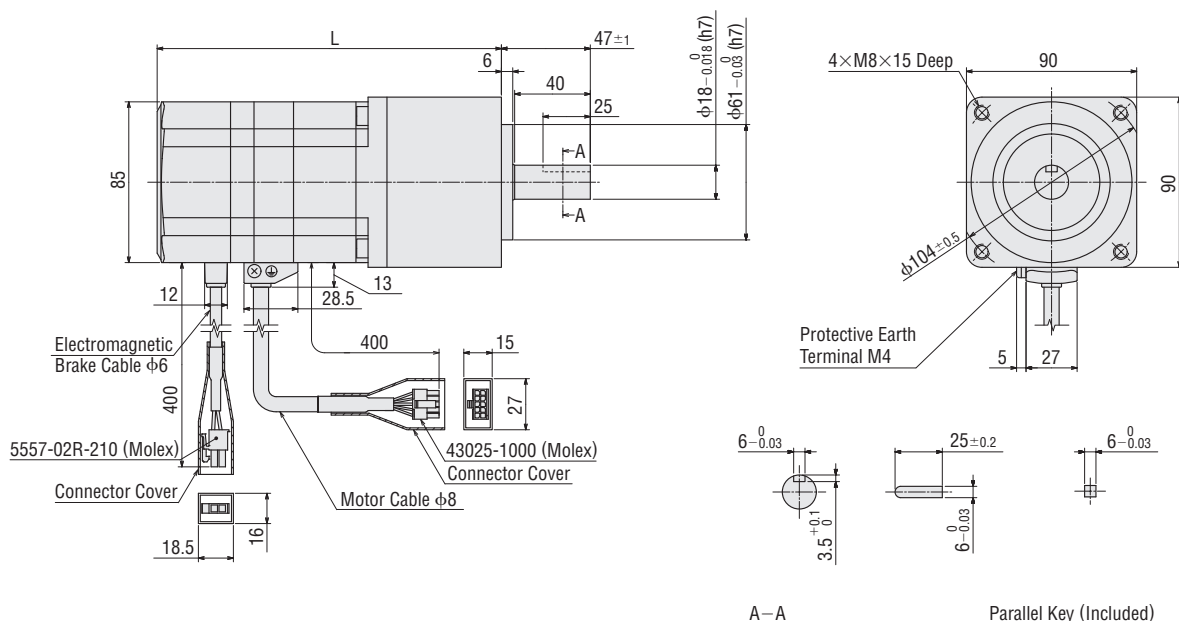
Product Name		Motor Product Name	Gear Ratio	L	Mass kg
Built-In Controller	Pulse Input				
<b>AR66MKD-N</b> ■-◇	<b>AR66MK-N</b> ■-◇	ARM66MK-N■	<b>5, 7.2, 10</b>	144	1.8
			<b>25, 36, 50</b>	160	2.0



● 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

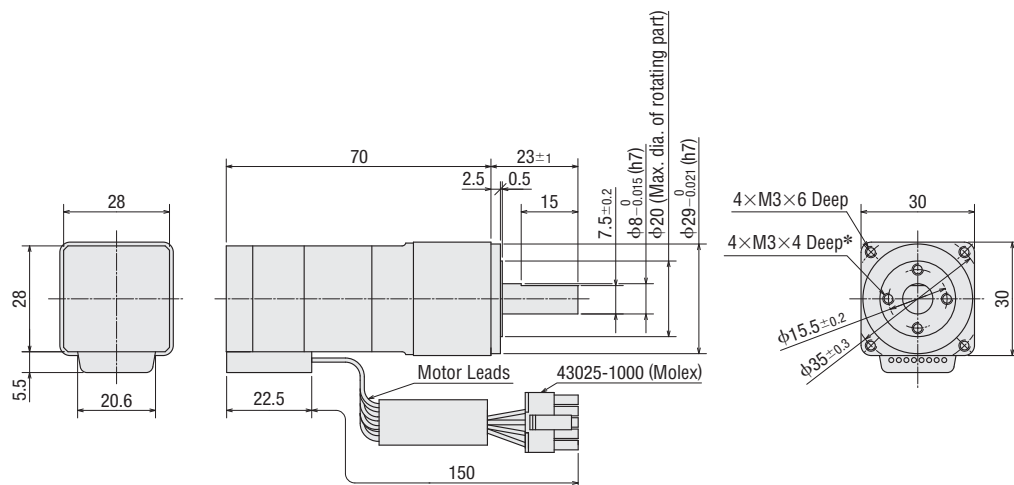
Product Name		Motor Product Name	Gear Ratio	L	Mass kg
Built-In Controller	Pulse Input				
<b>AR98MKD-N</b> ■-◇	<b>AR98MK-N</b> ■-◇	ARM98MK-N■	<b>5, 7, 2, 10</b>	182	4.4
			<b>25, 36, 50</b>	205	5.1



### ◇ Harmonic Geared Type

## Frame Size 30 mm

Product Name		Motor Product Name	Gear Ratio	Mass kg
Built-In Controller	Pulse Input			
<b>AR24SAKD-H</b> ■-◇	<b>AR24SAK-H</b> ■-◇	ARM24SAK-H■	<b>50, 100</b>	0.24

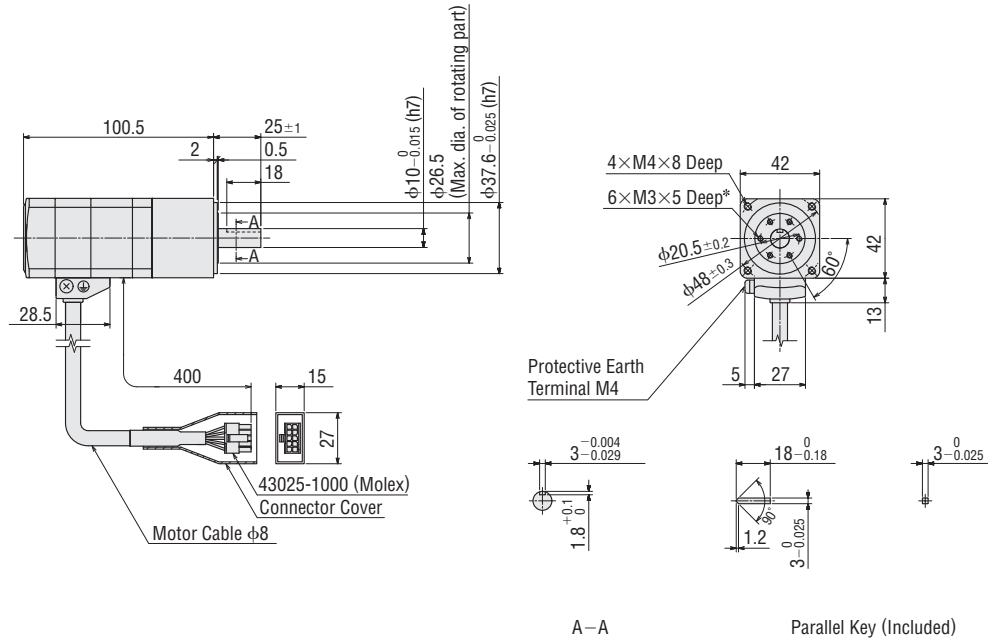


\*The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

- 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

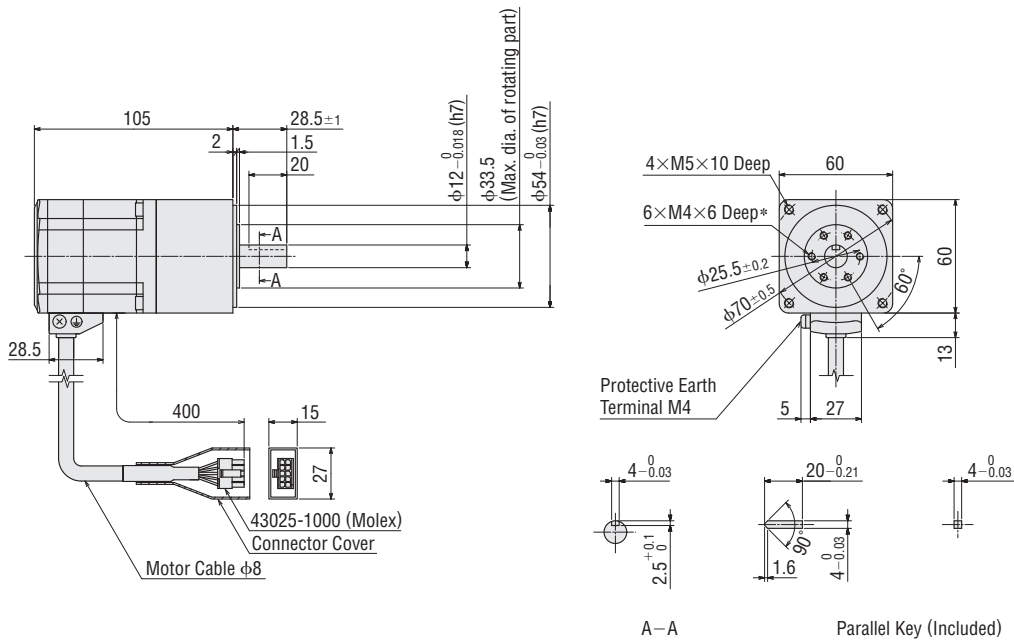
Product Name		Motor Product Name	Gear Ratio	Mass kg
Built-In Controller	Pulse Input			
AR46AKD-H <span style="border: 1px solid black; padding: 0 2px;"> </span> <span style="border: 1px solid black; padding: 0 2px;">◇</span>	AR46AK-H <span style="border: 1px solid black; padding: 0 2px;"> </span> <span style="border: 1px solid black; padding: 0 2px;">◇</span>	ARM46AK-H <span style="border: 1px solid black; padding: 0 2px;"> </span>	<b>50, 100</b>	0.68



\*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
Built-In Controller	Pulse Input			
AR66AKD-H <span style="border: 1px solid black; padding: 0 2px;"> </span> <span style="border: 1px solid black; padding: 0 2px;">◇</span>	AR66AK-H <span style="border: 1px solid black; padding: 0 2px;"> </span> <span style="border: 1px solid black; padding: 0 2px;">◇</span>	ARM66AK-H <span style="border: 1px solid black; padding: 0 2px;"> </span>	<b>50, 100</b>	1.41

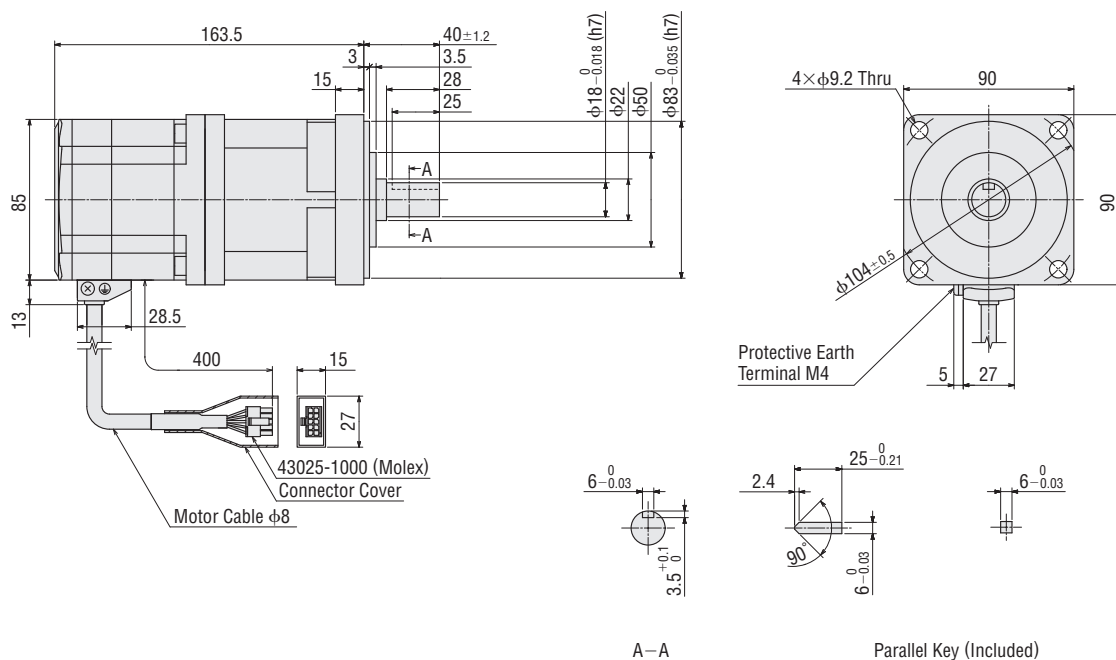


\*The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

- 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

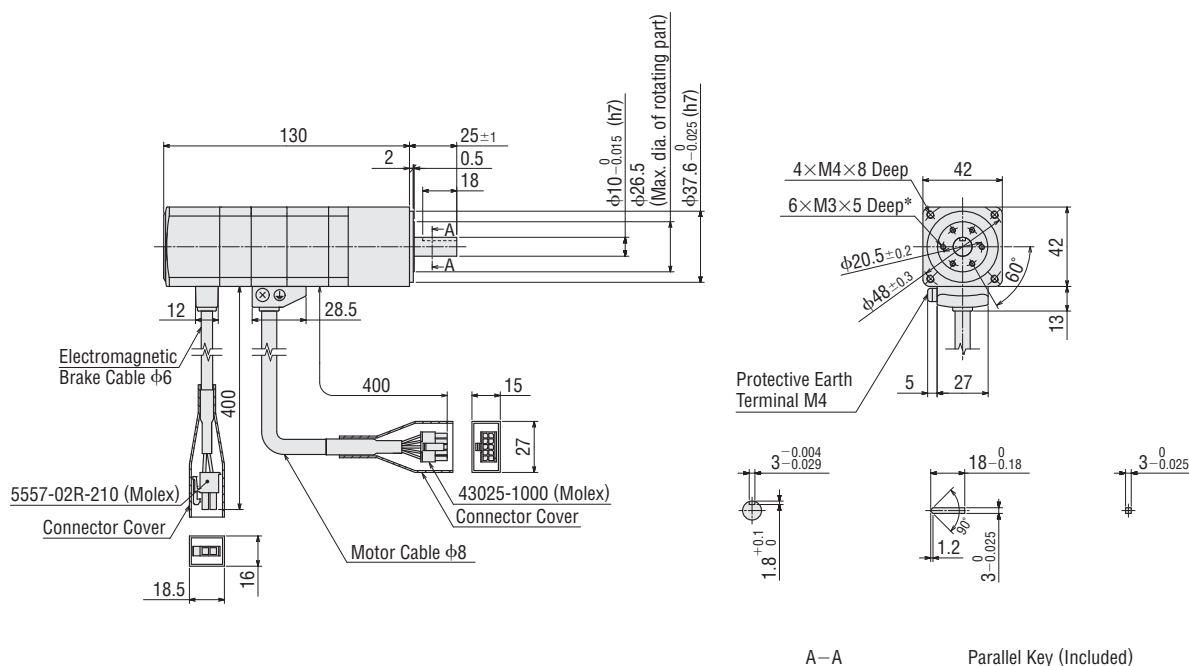
Product Name		Motor Product Name	Gear Ratio	Mass kg
Built-In Controller	Pulse Input			
<b>AR98AKD-H</b> ◊	<b>AR98AK-H</b> ◊	ARM98AK-H	<b>50, 100</b>	4.0



## ◊ Harmonic Geared Type with Electromagnetic Brake

### Frame Size 42 mm

Product Name		Motor Product Name	Gear Ratio	Mass kg
Built-In Controller	Pulse Input			
<b>AR46MKD-H</b> ◊	<b>AR46MK-H</b> ◊	ARM46MK-H	<b>50, 100</b>	0.83

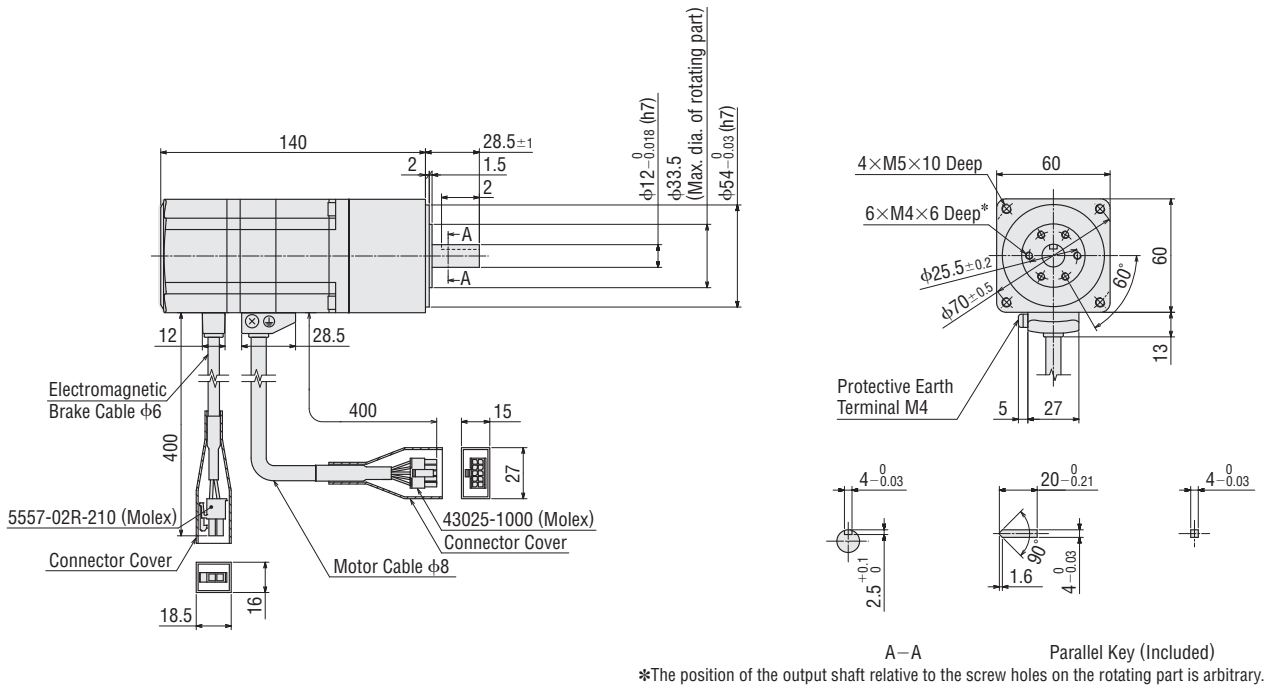


\*The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

- 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.

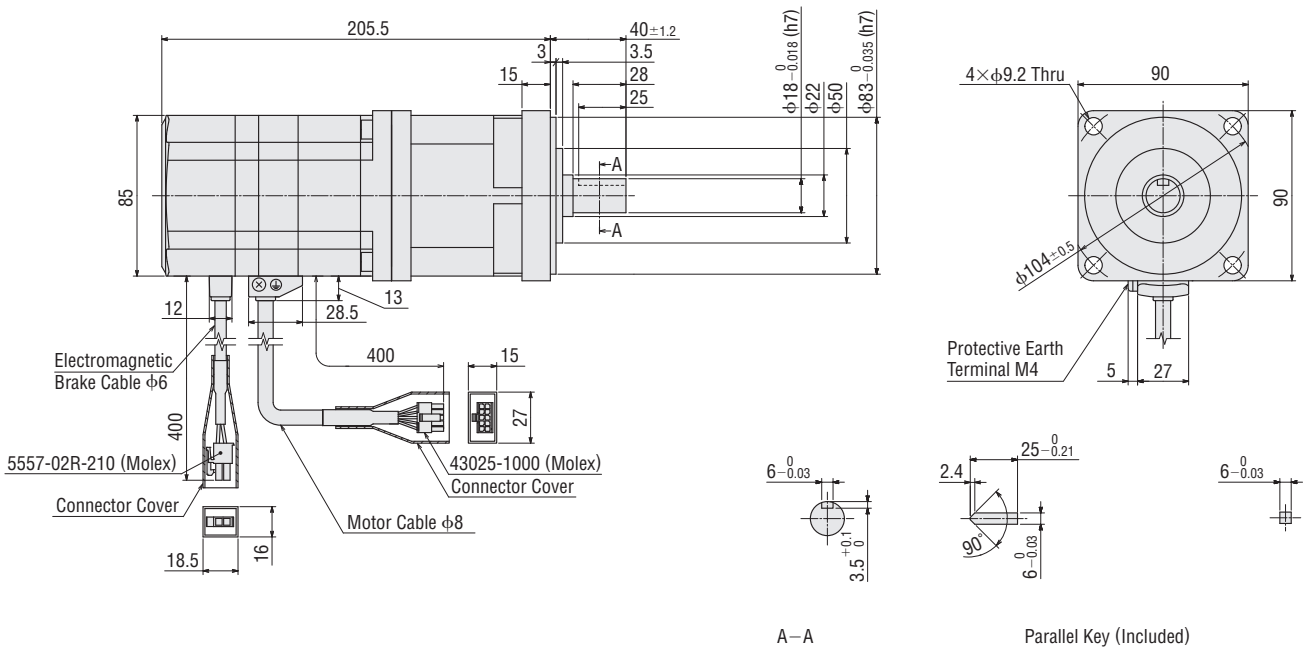
Frame Size 60 mm

Product Name		Motor Product Name	Gear Ratio	Mass kg
Built-In Controller	Pulse Input			
AR66MKD-H $\square$ - $\diamond$	AR66MK-H $\square$ - $\diamond$	ARM66MK-H $\square$	50, 100	1.71



Frame Size 90 mm

Product Name		Motor Product Name	Gear Ratio	Mass kg
Built-In Controller	Pulse Input			
AR98MKD-H $\square$ - $\diamond$	AR98MK-H $\square$ - $\diamond$	ARM98MK-H $\square$	50, 100	4.6



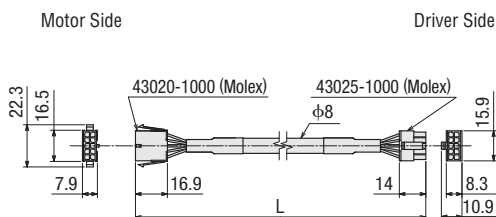
● A number indicating the gear ratio is entered where the box  $\square$  is located within the product name.  
 ● A number indicating the desired length of 1 (1 m), 2 (2 m) or 3 (3 m) for the cable included with the product is entered where the box  $\diamond$  is located within the product name.

## ● Connection Cables (Included)

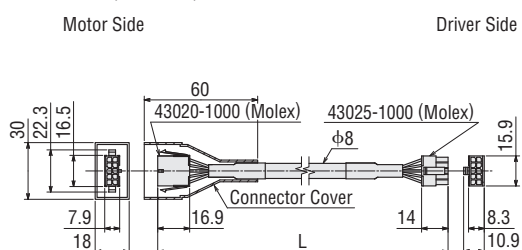
### ● Cable for Motor

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

### For AR24 and AR26

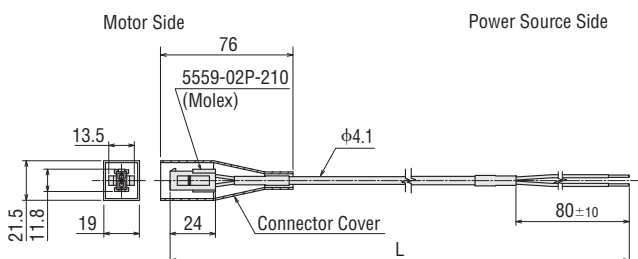


### For AR46, AR66, AR69 and AR98



### ● Cable for Electromagnetic Brake (Only for electromagnetic brake type)

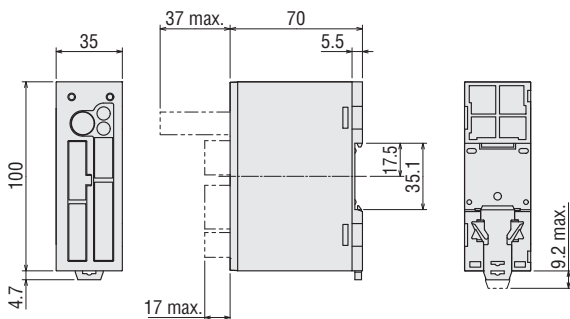
Cable Type	Length L (m)
Cable for Electromagnetic Brake 1 m	1
Cable for Electromagnetic Brake 2 m	2
Cable for Electromagnetic Brake 3 m	3



## ● Drivers

### Built-In Controller Package

Mass: 0.17 kg

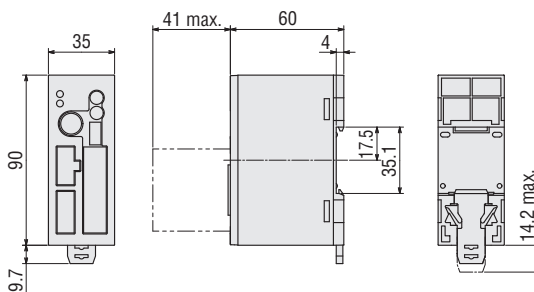


### ● Accessories

- Connector for Power Input Terminal (CN1)  
Connector: MC1,5/5-STF-3,5 (PHOENIX CONTACT GmbH & Co. KG)
- Connector for Sensor Signal (CN5)  
Connector: FK-MC0,5/5-ST-2,5 (PHOENIX CONTACT GmbH & Co. KG)
- Connector for Input Signal (CN8)  
Connector: FK-MC0,5/9-ST-2,5 (PHOENIX CONTACT GmbH & Co. KG)
- Connector for Output Signal (CN9)  
Connector: FK-MC0,5/7-ST-2,5 (PHOENIX CONTACT GmbH & Co. KG)

### Pulse Input Package

Mass: 0.17 kg

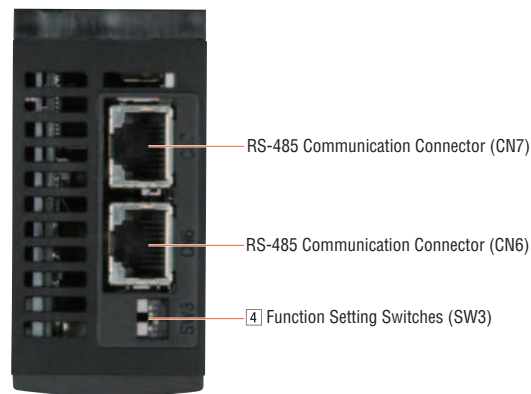


### ● Accessories

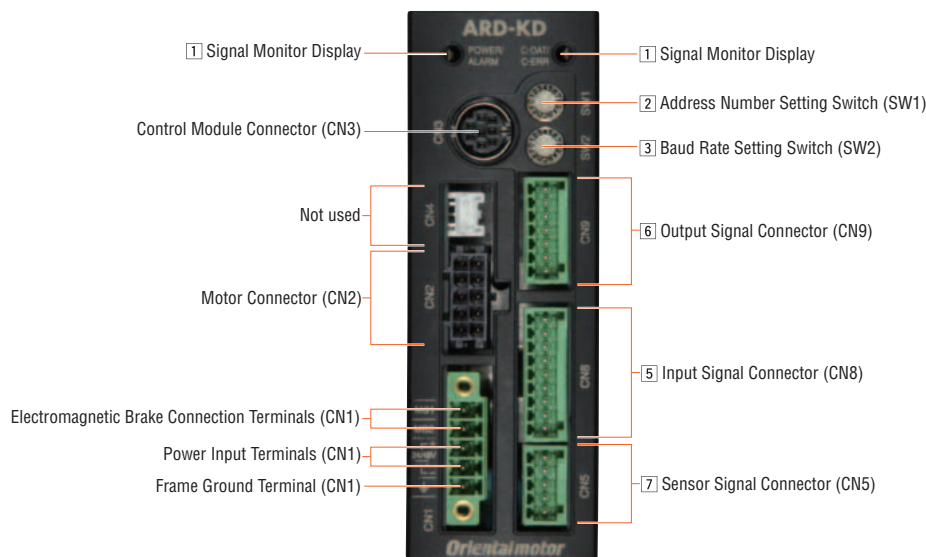
- Connector for Control I/O (CN5)  
Case: 10336-52A0-008 (Sumitomo 3M Limited)  
Connector: 10136-3000PE (Sumitomo 3M Limited)
- Connector for Power Supply Input/Frame Ground Terminal (CN1)  
Connector: MC1,5/3-STF-3,5 (PHOENIX CONTACT GmbH & Co. KG)

## Connection and Operation (Built-In Controller Package)

### Names and Functions of Driver Parts



[Top of the Driver]



#### 1 Signal Monitor Display

##### ◇ LED Indicators

Indication	Color	Function	When Activated
POWER	Green	Power Supply Indication	Lights when power is on.
ALARM	Red	Alarm Indication	Blinks when protective functions are activated.
C-DAT	Green	Communication Indication	Blinks or illuminate when communication data is received or sent.
C-ERR	Red	Communication Error Indication	Illuminates when there is an error with communication data.

#### 2 Address Number Setting Switch (SW1)

Indication	Switch Name	Function
SW1	Address Number Setting Switch	Set the address number for RS-485 communication (Factory Setting: 0).

#### 3 Baud Rate Setting Switch (SW2)

Indication	Switch Name	Function
SW2	Baud Rate Setting Switch	Set the baud rate for RS-485 communications (Factory Setting: 7).

##### ◇ Setting the Baud Rate for RS-485 Communications

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



## 4 Function Setting Switches (SW3)

Indication	No.	Function
SW3	1	This sets the address number in combination with the address setting switch (SW1) (Factory setting: OFF).
	2	This sets the protocol for RS-485 communication (Factory setting: OFF).
	3	Not used.
	4	Set the termination resistor (120 Ω) for RS-485 communication (Factory setting: OFF). OFF: No termination resistor ON: Set the termination resistor

## ◇ RS-485 Communication Protocol Setting

No.	Destination	—	Modbus RTU Mode
2		OFF	ON

## 5 Input Signal Connector (CN8)

Indication	Pin No.	Signal Name	Initial Value
CN8	1	IN0	HOME This performs the return-to-home operation.
	2	IN1	START This performs the positioning operation.
	3	IN2	M0
	4	IN3	M1 The operating data number is selected using 3 bits.
	5	IN4	M2
	6	IN5	FREE Stop motor excitation and releases the electromagnetic brake.
	7	IN6	STOP This stops the motor.
	8	IN7	ALM-RST This resets the current alarm.

\*Assigned functions are set by means of the parameter settings. The above is the initial value. For details, refer to the User's Manual.

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

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

## 6 Output Signal Connector (CN9)

Indication	Pin No.	Signal Name	Initial Value
CN9	1	OUT0	HOME-P Output when the motor is home.
	2	OUT1	END Output when the positioning operation has finished.
	3	OUT2	AREA1 Output when the motor is in area 1.
	4	OUT3	READY Output when driver operation preparations have finished.
	5	OUT4	WNG The driver's warning status is output.
	6	OUT5	ALM The driver's alarm status is output (normally closed).

\* Assigned functions are set by means of the parameter settings. The above is the initial value. For details, refer to the User's Manual.

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

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

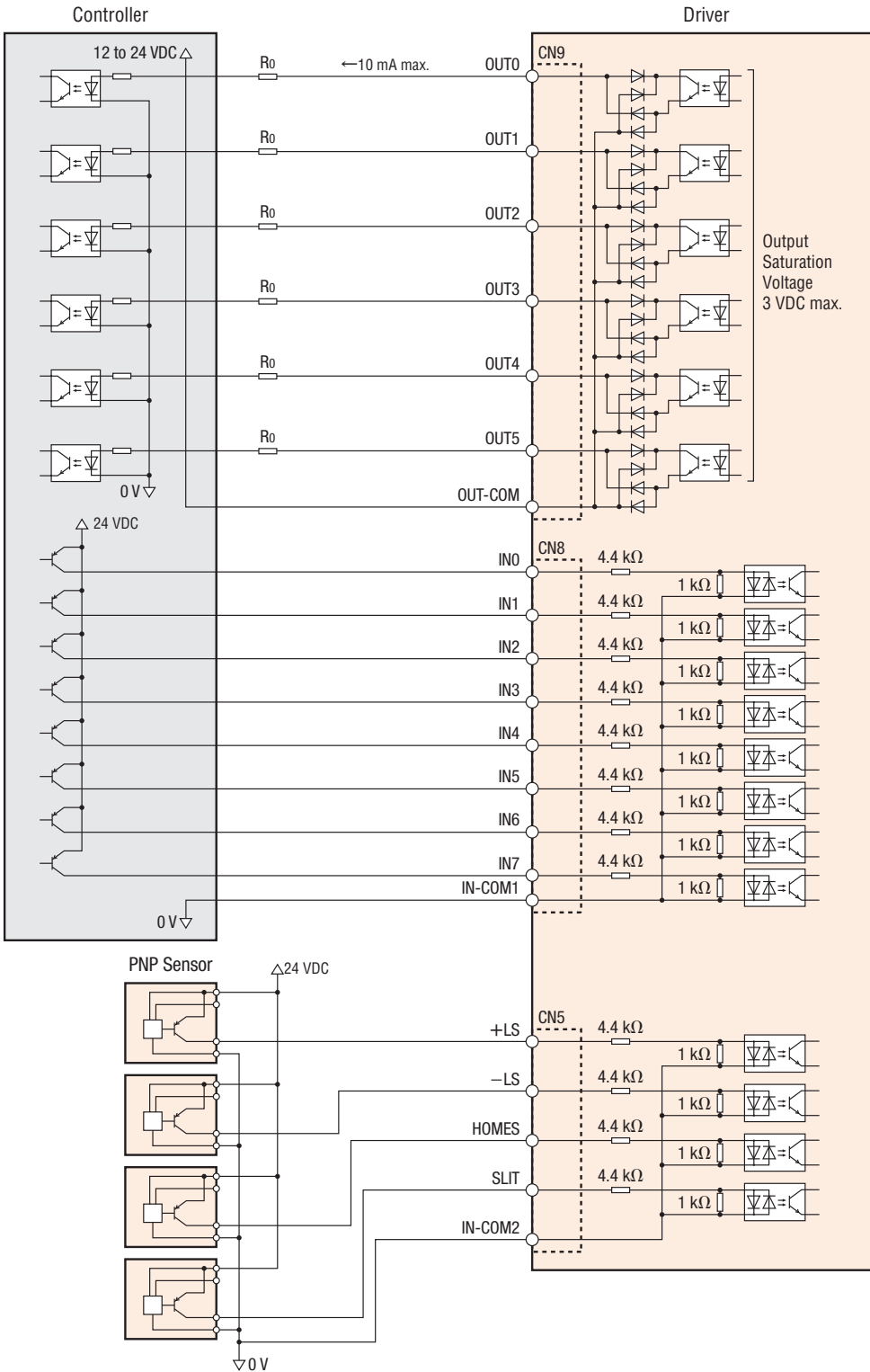
## 7 Sensor Signal Connector (CN5)

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

◇ Connecting to a Host Controller

● Connecting to a Current Source Output Circuit



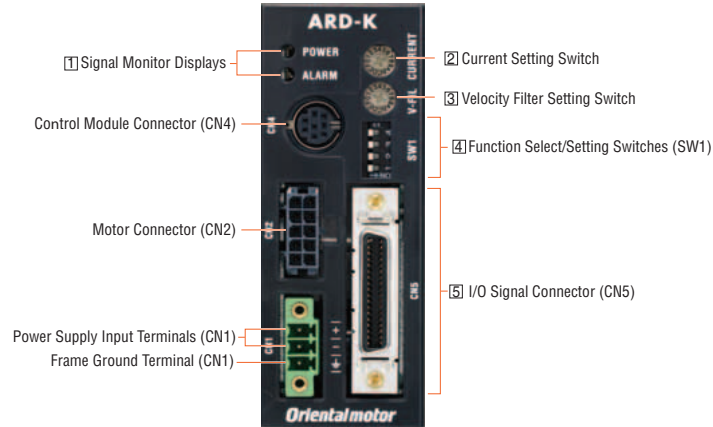
Note

- Use input signals at 24 VDC.
- Use output signals at 24 VDC or less. If the current exceeds 10 mA, connect an external resistor  $R_o$ .
- The saturation voltage of the output signal is 3 VDC max.
- Provide a minimum distance of 200 mm between the signal lines and power lines (AC lines, motor lines). Do not run the signal lines in the same duct as power lines nor 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 Package)

### Names and Functions of Driver Parts



#### 1 Signal Monitor Displays

##### ◇ LED Displays

Indication	Color	Function	When Activated
POWER	Green	Power supply indication	Lights when power is on.
ALARM	Red	Alarm indication	Blinks when protective functions are activated.

##### ◇ Alarms

Blink Count	Function	When Activated
2	Overheat	The temperature inside the driver rises above 85°C.
	Overload	When the amount of time during which the load torque exceeds 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	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	Overflow rotation during current on	The position deviation exceeds the overflow revolutions. (Default value: 3 revolutions)
	Overflow rotation during current off	The current is turned on even though the position deviation when the current is turned off was equal to or greater than the permissible value. (Default value: 100 revolutions or more)
7	Abnormal operation data	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 rotation error	The main power is turned on while the motor is rotating.
9	Motor combination error	A motor not supported by the driver is connected.
	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. A desired current can be set as a percentage (%) of the rated output current. The factory setting is "F".

#### 3 Velocity Filter Setting Switch

Indication	Switch Name	Function
V-FIL	Velocity filter setting switch	<p>This switch adjusts the motor response. Adjust the switch if you want to suppress motor vibration or cause the motor to start/stop smoothly. "0" and "F" correspond to the minimum and maximum velocity filter settings, respectively. The factory setting is "1."</p> <p>The difference in characteristics made by the velocity filter</p>

## 4] Function Select/Setting Switches (SW1)

Indication	Switch Name	Function
4	Resolution select switches "D0/D1" "CS0/CS1"	These switches are used to set the resolution per rotation of the motor output shaft. "4:OFF" "3:OFF"→1000 pulse (0.36°/step) [Factory setting] "4:OFF" "3:ON"→10000 pulse (0.036°/step)
3		"4:ON" "3:OFF"→500 pulse (0.72°/step) "4:ON" "3:ON"→5000 pulse (0.072°/step)
2	Control mode select switches "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. "OFF": Normal mode [Factory setting] "ON": Current control mode
1	Pulse input mode switch "2P/1P"	The settings of this switch are compatible with the following two types of pulse input modes: "ON": 1-pulse input mode [Factory setting] "OFF": 2-pulse input mode

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

Indication	Input/Output	Pin No.	Signal		Signal Name	
			Positioning Operation	Push-Motion Operation*1	Positioning Operation	Push-Motion Operation*1
CN5	Output	1	-		-	
		2	GND		Ground connection	
		3	ASG +		A-phase pulse output (line driver)	
		4	ASG -			
		5	BSG +		B-phase pulse output (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 complete output	
		14	END -			
		15	READY + /AL0 + *1		Operation ready complete output/Alarm code output 0*1	
		16	READY - /AL0 - *1			
		17	TLC + /AL1 + *1		Torque limit output /Alarm code output 1*1	
		18	TLC - /AL1 - *1			
		19	TIM2 + /AL2 + *1		Timing output (open-collector)/Alarm code output 2*1	
		20	TIM2 - /AL2 - *1			
		21	GND		Ground connection	
	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	PLS + /CW +		Pulse input/CW pulse input (+5 V/line driver)		
	32	PLS - /CW -				
	33	PLS + 24 /CW + 24V		Pulse input/CW pulse input (+24V)		
	34	DIR + 24 /CCW + 24V		Direction input/CCW pulse input (+24V)		
	35	DIR + /CCW +		Direction input/CCW pulse input (+5 V/line driver)		
	36	DIR - /CCW -				

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

\*2 The factory setting of the C-ON input is normally open. Be sure to turn the C-ON input ON when operating the motor.

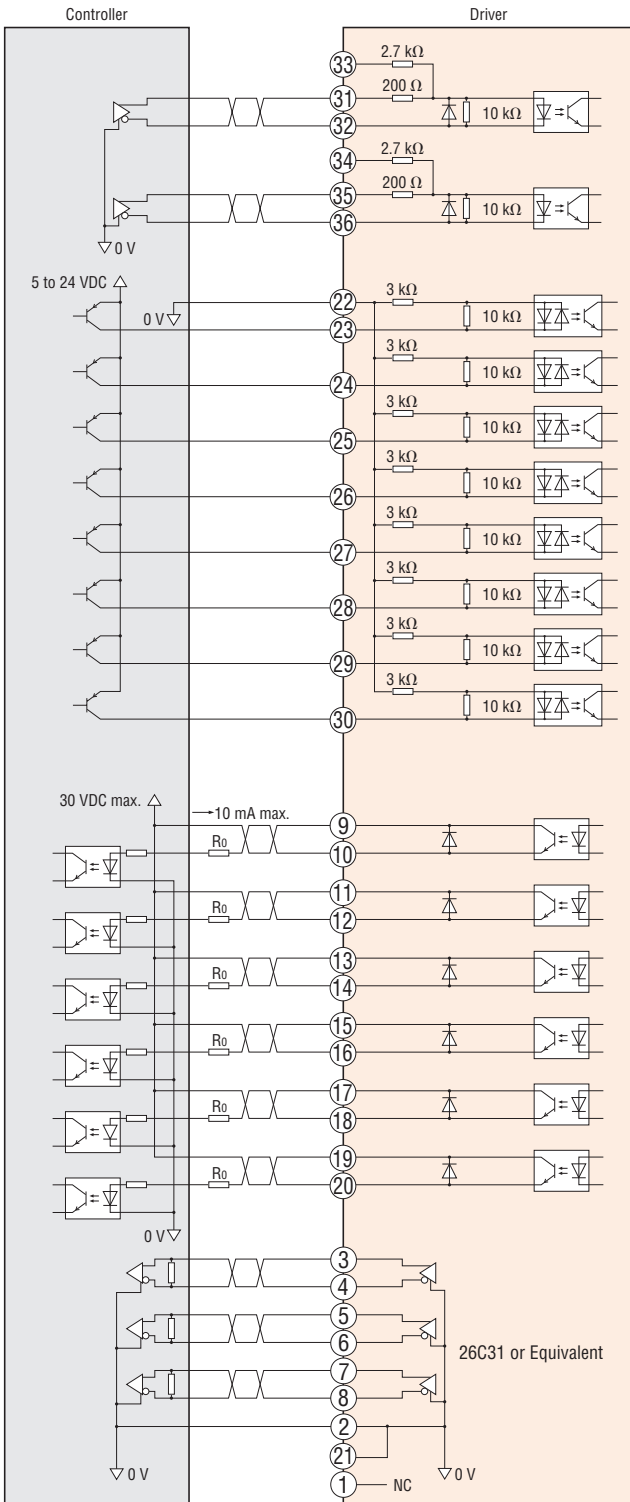
Set the C-ON input to normally close with a control module (**OPX-2A**, sold separately) or a data setting software (**MEXE02**, sold separately) when the C-ON input is not used.

● Connection Diagram

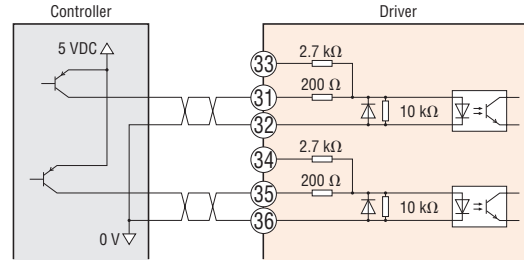
◇ Connecting to a Host Controller

● Connecting to a Current Source Output Circuit

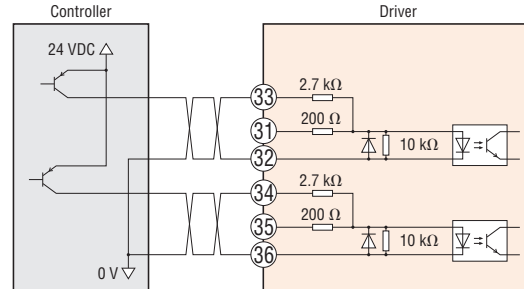
When pulse input is of line driver type



When pulse input is of 5 VDC type



When pulse input is of 24 VDC type



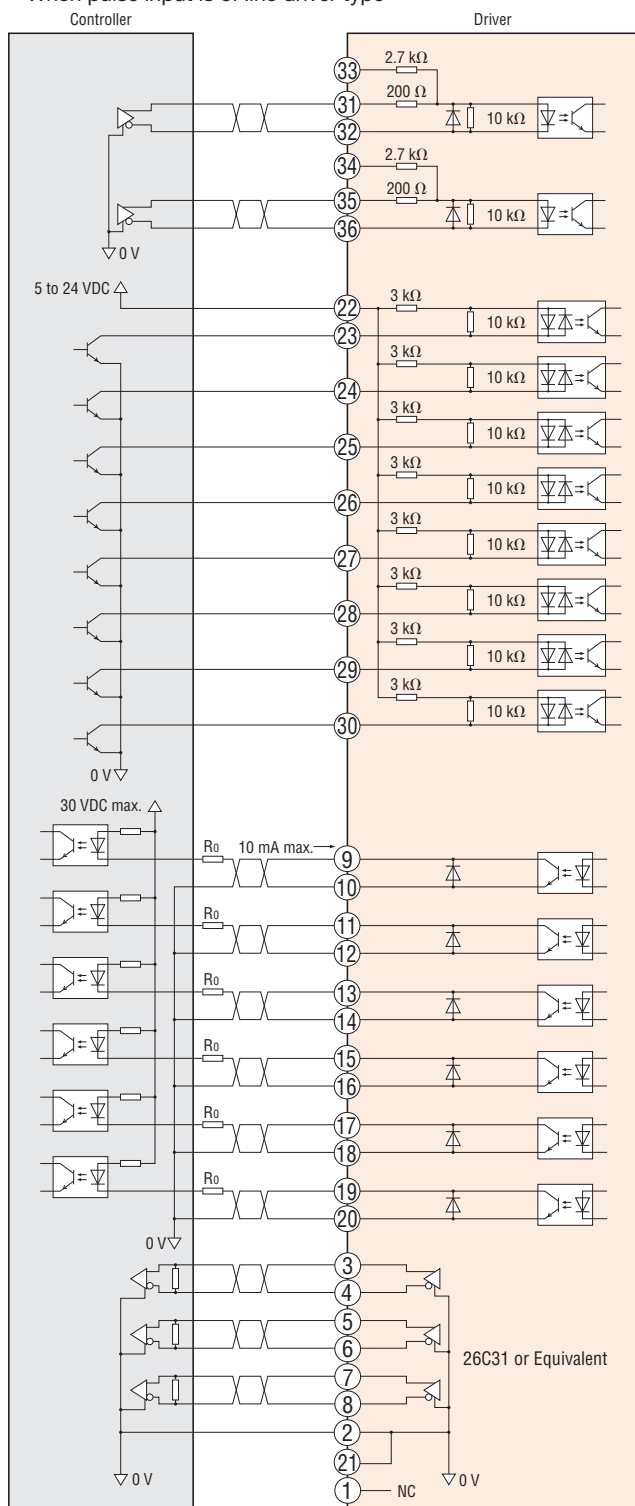
**Note**

- Use output signals at 30 VDC or less. If the current exceeds 10 mA, connect an external resistor  $R_o$ .
- Connect a terminal resistor of 100  $\Omega$  or more between the input of the line receiver terminals.
- Use a multi-core, twisted-pair shielded wire of AWG28 to 24 (0.08 to 0.2 mm<sup>2</sup>) for the control input/output signal line (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 minimum distance of 200 mm between the control I/O signal lines and power lines (AC lines, motor lines and other large-current circuits). Do not run the control I/O signal lines in the same duct as power lines or bundle them with power lines.

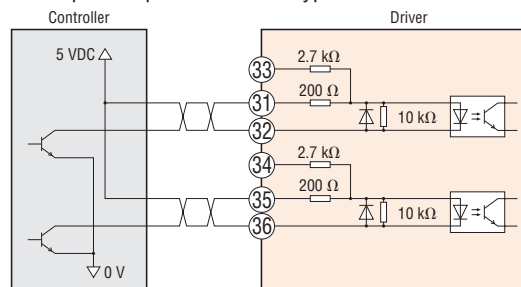
## ◇ Connecting to a Host Controller

### ● Connecting to a Current Sink Output Circuit

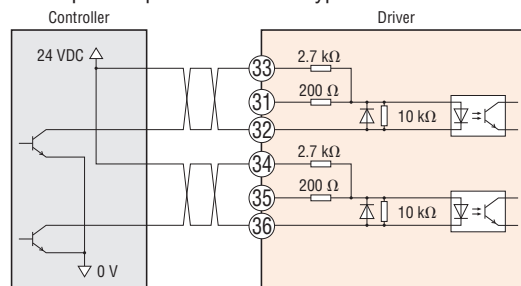
When pulse input is of line driver type



When pulse input is of 5 VDC type



When pulse input is of 24 VDC type



#### Note

- Use output signals at 30 VDC or less. If the current exceeds 10 mA, connect an external resistor  $R_0$ .
- Connect a terminal resistor of 100  $\Omega$  or more between the input of the line receiver terminals.
- Use a multi-core, twisted-pair shielded wire of AWG28 to 24 (0.08 to 0.2 mm<sup>2</sup>) for the control input/output signal line (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 minimum distance of 200 mm between the control I/O signal lines and power lines (AC lines, motor lines and other large-current circuits). Do not run the control I/O signal lines in the same duct as power lines or bundle them with power lines.

## Motor and Driver Combinations

Product names for motor and driver combinations are shown below.

Type	Built-In Controller Package			Pulse Input Package		
	Product Name	Motor Product Name	Driver Product Name	Product Name	Motor Product Name	Driver Product Name
Standard Type	<b>AR24S</b> □ <b>KD</b> -◇*1	ARM24S□K	ARD-KD	<b>AR24S</b> □ <b>K</b> -◇*1	ARM24S□K	ARD-K
	<b>AR26S</b> □ <b>KD</b> -◇*1	ARM26S□K		<b>AR26S</b> □ <b>K</b> -◇*1	ARM26S□K	
	<b>AR46</b> □ <b>KD</b> -◇*2	ARM46□K		<b>AR46</b> □ <b>K</b> -◇*2	ARM46□K	
	<b>AR66</b> □ <b>KD</b> -◇*2	ARM66□K		<b>AR66</b> □ <b>K</b> -◇*2	ARM66□K	
	<b>AR69</b> □ <b>KD</b> -◇*2	ARM69□K		<b>AR69</b> □ <b>K</b> -◇*2	ARM69□K	
<b>AR98</b> □ <b>KD</b> -◇*2	ARM98□K	<b>AR98</b> □ <b>K</b> -◇*2		ARM98□K		
TH Geared Type	<b>AR24SAKD</b> -T□-◇	ARM24SAK-T□		<b>AR24SAK</b> -T□-◇	ARM24SAK-T□	
	<b>AR46</b> □ <b>KD</b> -T□-◇	ARM46□K-T□		<b>AR46</b> □ <b>K</b> -T□-◇	ARM46□K-T□	
	<b>AR66</b> □ <b>KD</b> -T□-◇	ARM66□K-T□		<b>AR66</b> □ <b>K</b> -T□-◇	ARM66□K-T□	
	<b>AR98</b> □ <b>KD</b> -T□-◇	ARM98□K-T□		<b>AR98</b> □ <b>K</b> -T□-◇	ARM98□K-T□	
PS Geared Type	<b>AR24SAKD</b> -PS□-◇	ARM24SAK-PS□	<b>AR24SAK</b> -PS□-◇	ARM24SAK-PS□		
	<b>AR46</b> □ <b>KD</b> -PS□-◇	ARM46□K-PS□	<b>AR46</b> □ <b>K</b> -PS□-◇	ARM46□K-PS□		
	<b>AR66</b> □ <b>KD</b> -PS□-◇	ARM66□K-PS□	<b>AR66</b> □ <b>K</b> -PS□-◇	ARM66□K-PS□		
	<b>AR98</b> □ <b>KD</b> -PS□-◇	ARM98□K-PS□	<b>AR98</b> □ <b>K</b> -PS□-◇	ARM98□K-PS□		
PN Geared Type	<b>AR24SAKD</b> -N□-◇	ARM24SAK-N□	<b>AR24SAK</b> -N□-◇	ARM24SAK-N□		
	<b>AR46</b> □ <b>KD</b> -N□-◇	ARM46□K-N□	<b>AR46</b> □ <b>K</b> -N□-◇	ARM46□K-N□		
	<b>AR66</b> □ <b>KD</b> -N□-◇	ARM66□K-N□	<b>AR66</b> □ <b>K</b> -N□-◇	ARM66□K-N□		
	<b>AR98</b> □ <b>KD</b> -N□-◇	ARM98□K-N□	<b>AR98</b> □ <b>K</b> -N□-◇	ARM98□K-N□		
Harmonic Geared Type	<b>AR24SAKD</b> -H□-◇	ARM24SAK-H□	<b>AR24SAK</b> -H□-◇	ARM24SAK-H□		
	<b>AR46</b> □ <b>KD</b> -H□-◇	ARM46□K-H□	<b>AR46</b> □ <b>K</b> -H□-◇	ARM46□K-H□		
	<b>AR66</b> □ <b>KD</b> -H□-◇	ARM66□K-H□	<b>AR66</b> □ <b>K</b> -H□-◇	ARM66□K-H□		
	<b>AR98</b> □ <b>KD</b> -H□-◇	ARM98□K-H□	<b>AR98</b> □ <b>K</b> -H□-◇	ARM98□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 the product name of **AR24S**□**K(D)**-◇ or **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 the product name of **AR46**□**K(D)**-◇, **AR66**□**K(D)**-◇, **AR69**□**K(D)**-◇ or **AR98**□**K(D)**-◇.