Oriental motor

NEW
PRODUCTS

RoHS RoHS-Compliant

High-Efficiency Closed Loop Stepping Motor and Driver Package

AR Series

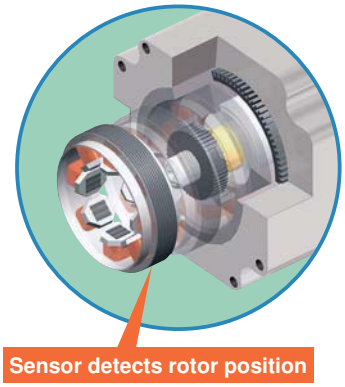
24/48 VDC Input Types

Standard Type/**TH** Geared Type/**PN** Geared Type/**Harmonic** Geared Type

High-Efficiency Stepping Motor and Driver Package **AR** Series can Achieve Continuous Operation.

Using Oriental Motor's Original Closed Loop Control Technology

The **AR** Series uses our closed loop control to maintain positioning operation even during abrupt load fluctuations and accelerations. The rotor position detection sensor monitors the rotation. When an overload condition is detected, the **AR** Series will instantaneously regain control using the closed loop mode. When an overload condition continues the **AR** Series will output an alarm signal, thereby providing reliability equal to that of a servo motor.

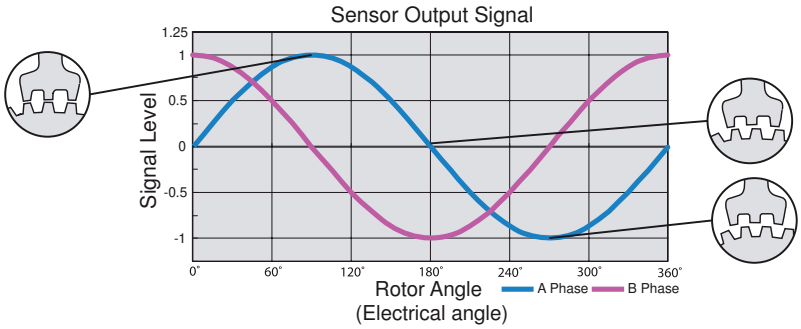


■ Rotor Position Detection Sensor

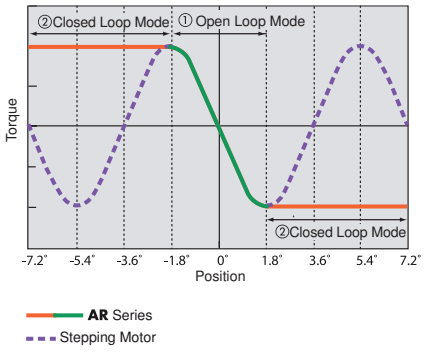
The rotor position detection sensor uses the change in inductance caused by change in the distance between the stator teeth and the teeth on the sensor rotor to detect rotor position.

Features

- This structure can be made small and thin, so the overall size of the motor can be reduced.
- High resolution
- This structure does not use electronic parts, so it is not affected by heat or vibration.

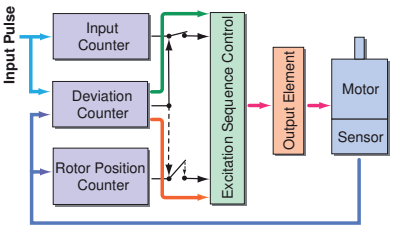


■ Angle – Torque Characteristics



① If the positioning deviation is less than ±1.8°, the motor runs in open loop mode like a stepping motor.
② If the positioning deviation is ±1.8° or more, the motor runs in closed loop mode and the position is corrected by exciting the motor windings to generate maximum torque based on the rotor position.

■ Control Diagram



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

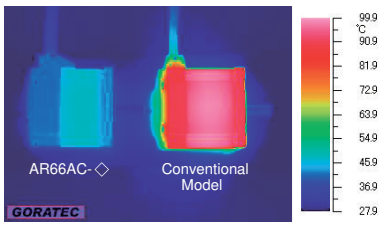
During Overload Condition (Positioning deviation is ± 1.8° or more)
The closed loop mode is engaged to maintain the positioning operation.

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

■ Lower Heat Generation

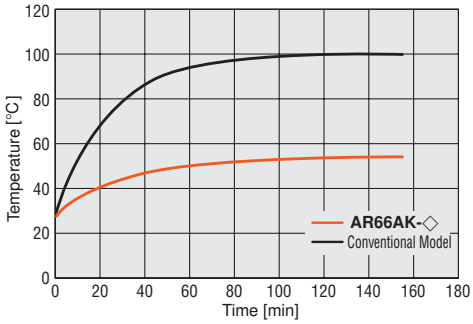
The **AR** Series utilizes high-efficiency technology to achieve a significant reduction in the amount of heat generated from the motor.

● Temperature Distribution by Thermography



Comparison under the same conditions

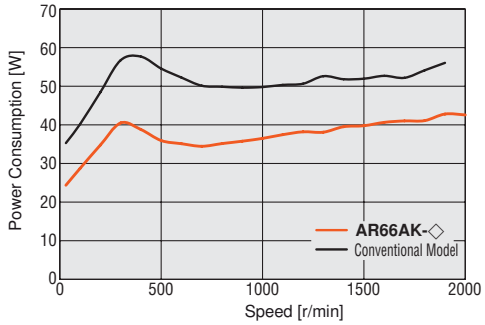
● Motor Case Temperature under Same Operating Conditions



■ Energy-Saving

Power consumption: up to **40** % less than a conventional model (also by Oriental Motor)

● Power Consumption

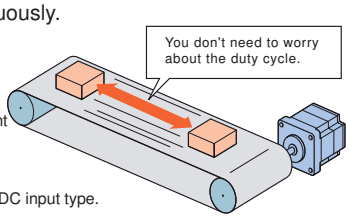


CO_2 emission: up to **40** % less * than a conventional model (also by Oriental Motor)

✻ 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:

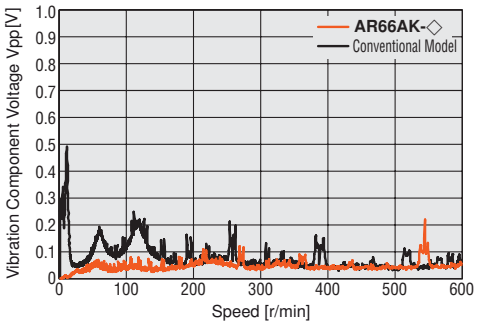
● If the motor is operated continuously, a heat sink of a capacity at least equivalent to an aluminum plate with a size of 250 x 250 mm*, 6 mm thick is required.

✻ For AC input type. 100 x 100 mm for DC input type.

A Stepping Motor Offering Advanced Characteristics That's Also Easier to Use.

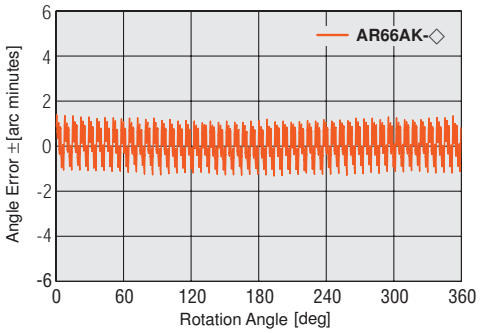
■ Low Vibration

In addition to the microstep drive system, the **AR** Series also uses the smooth drive function to allow for smoother motion.
The smooth drive function automatically implements microstep drive based on the same travel amount and speed used in the full-step mode, without changing the pulse input settings.



■ Improved Angle Accuracy

The **AR** Series uses improved current control technology to improve the stop position accuracy of the motor. The result is greater positioning accuracy.
AR66AC-3: ± 3 arc minutes (0.05°)
Conventional Model: ± 5 arc minutes (0.08°)



■ High Response

■ No Tuning

■ No Hunting

■ Higher Resolution, Larger Inertial Load

AR Series DC Input Type Lineup

Standard Type

Standard Type with Electromagnetic Brake

Each "package" consists of a motor and a driver.

An electromagnetic brake is available on all types of motors.

● A cable needed for connection between the motor and driver is included.

Characteristics Comparison for Motors and Geared Motors

Motor Type / Geared Type	Features	Permissible Torque (Maximum Torque [N·m])	Backlash [arc/min]	Basic Resolution [deg/step]	Output Shaft Speed [r/min]
Standard 	・Basic model of the **AR** Series	Maximum Holding Torque 4	——	0.36	4000
Low backlash **TH Geared** (Parallel shaft) 	・A wide variety of low gear ratios, high-speed operations ・Gear ratios: 1:3.6, 1:7.2, 1:10, 1:20, 1:30	12	45	0.012	500
Non-backlash **PN Geared** (Planetary) 	・High speed (low gear ratio), high accuracy positioning ・High permissible/maximum torque ・A wide variety of gear ratios for selecting the desired step angle (resolution) ・Centered output shaft ・Gear ratios: 1:5, 1:7.2, 1:10, 1:25, 1:36, 1:50	Permissible Torque 37 / Maximum Torque 60	3	0.0072	600
Non-backlash **Harmonic Geared** (Harmonic drive) 	・High accuracy positioning ・High permissible/maximum torque ・High gear ratios, high resolution ・Centered output shaft ・Gear ratios: 1:50, 1:100	Permissible Torque 37 / Maximum Torque 55	0	0.0036	70

Note:

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

● **Each type offers various motor frame sizes in accordance with the motor type, as shown below.** [□42 : indicates a motor frame size of 42 mm.]

	Power Supply Voltage	Motor Type			
		Standard Type	**TH** Geared Type	**PN** Geared Type	**Harmonic** Geared Type
	24/48 VDC	□ 42 □ 60 □ 85	□ 42 □ 60 □ 90		

● An electromagnetic brake is available on all types of motors.

Features of the **AR** Series DC Input Type

Easy to use, Compact Driver

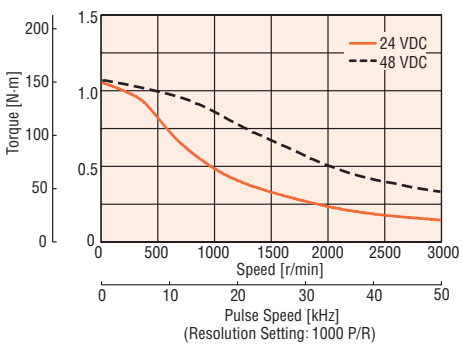
Compact DC Input Driver with Plastic Case

Compact DC power input driver is covered by a plastic case. The compact size is great for space-saving.

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.

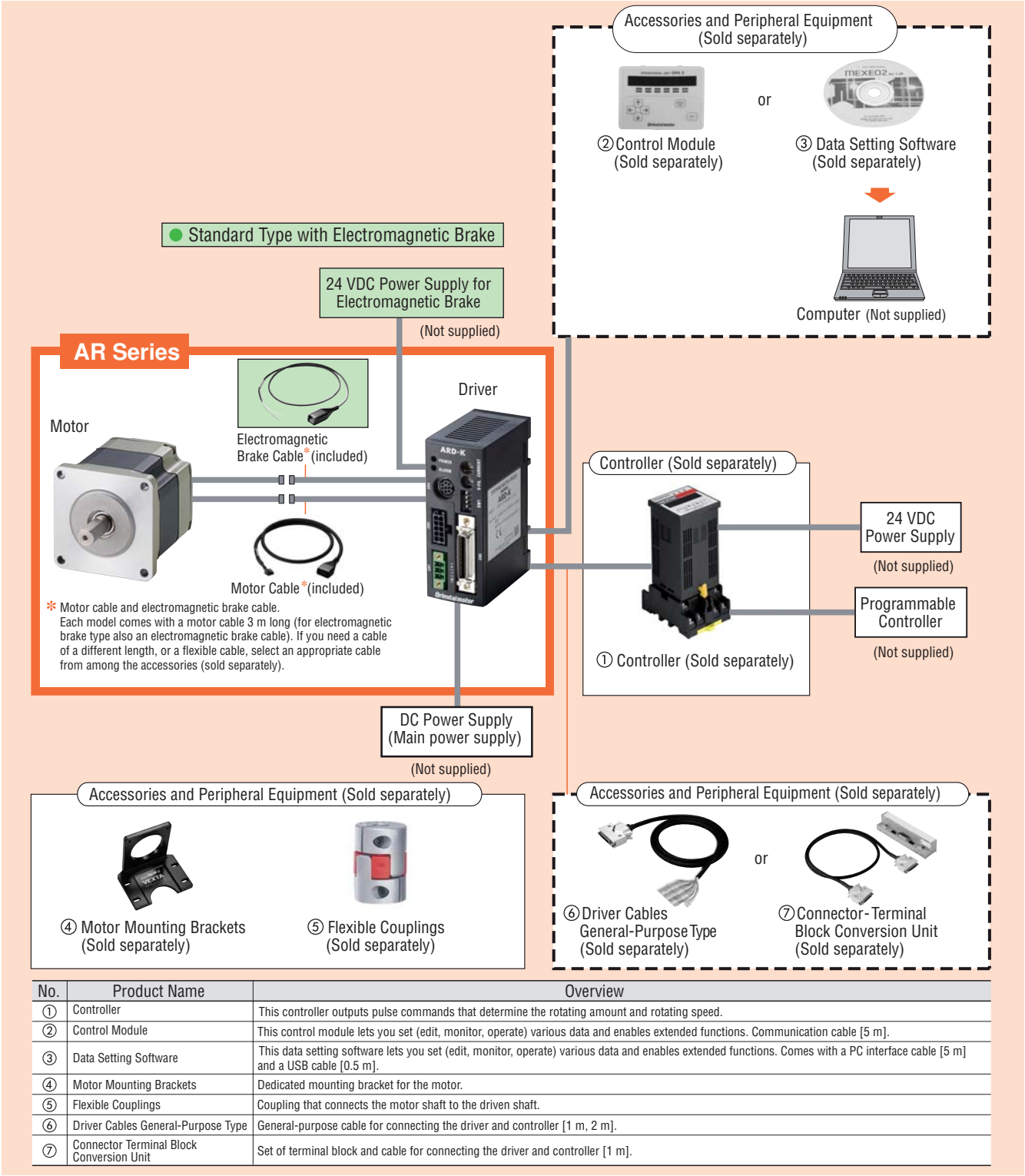
AR66AK-3



System Configuration

● Standard Type and ●Standard Type with Electromagnetic Brake

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



No.	Product Name	Overview
①	Controller	This controller outputs pulse commands that determine the rotating amount and rotating speed.
②	Control Module	This control module lets you set (edit, monitor, operate) various data and enables extended functions. Communication cable [5 m].
③	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].
④	Motor Mounting Brackets	Dedicated mounting bracket for the motor.
⑤	Flexible Couplings	Coupling that connects the motor shaft to the driven shaft.
⑥	Driver Cables General-Purpose Type	General-purpose cable for connecting the driver and controller [1 m, 2 m].
⑦	Connector Terminal Block Conversion Unit	Set of terminal block and cable for connecting the driver and controller [1 m].

● Example of System Configuration

Standard Type

AR Series		Controller (Sold separately)	Motor Mounting Bracket (Sold separately)	Flexible Coupling (Sold separately)	Connector - Terminal Block Conversion Unit [1 m] (Sold separately)
AR66AK-3	+	SG8030JY-D	PAL2P-5	MCS300610	CC36T1

Standard Type with Electromagnetic Brake

AR Series		Controller (Sold separately)	Motor Mounting Bracket (Sold separately)	Flexible Coupling (Sold separately)	Connector - Terminal Block Conversion Unit [1 m] (Sold separately)
AR66MK-3	+	SG8030JY-D	PAL2P-5	MCS300610	CC36T1

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

Safety Standards and CE Marking

Product	CE Markings
Motor	EMC Directives
Driver	

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

Product Number Code

●Standard Type

AR 6 6 M K - 3
① ② ③ ④ ⑤ ⑥

①	Series	**AR** : **AR** Series
②	Motor Frame Size	**4** : 42 mm **6** : 60 mm **9** : 85 mm
③	Motor Case Length	
④	Motor Type	**A** : Standard (Single shaft) **B** : Standard (Double shaft) **M** : Electromagnetic Brake Type
⑤	Power Supply Voltage	**K** : 24/48 VDC
⑥	Cable Length (Included)	**1** : 1 m **2** : 2 m **3** : 3 m

●Geared Type

AR 6 6 A K - N 50 - 3
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Series	**AR** : **AR** Series
②	Motor Frame Size	**4** : 42 mm **6** : 60 mm **9** : 90 mm
③	Motor Case Length	
④	Motor Type	**A** : Standard (Single shaft) **M** : Electromagnetic Brake Type
⑤	Power Supply Voltage	**K** : 24/48 VDC
⑥	Gearhead Type	**T** : **TH** Geared Type **N** : **PN** Geared Type **H** : Harmonic Geared Type
⑦	Gear Ratio	
⑧	Cable Length (Included)	**1** : 1 m **2** : 2 m **3** : 3 m

Product Line

●Standard Type

Power Supply Voltage	Model (Single shaft)	Model (Double shaft)
24/48 VDC	**AR46AK-** ◇	**AR46BK-** ◇
	AR66AK- ◇	**AR66BK-** ◇
	AR69AK- ◇	**AR69BK-** ◇
	AR98AK- ◇	**AR98BK-** ◇

● Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name. Select a desired cable length from 1 m, 2 m or 3 m.

The following items are included in each product.

Motor, Driver, Motor Cable,* I/O Signal Connector, Connector for Power Supply Input/ Frame Ground Terminal, Operating Manual

* The product includes a motor cable of 1 m, 2 m or 3 m.
If you need a cable of a different length, or a flexible cable, select an appropriate cable from among the accessories (sold separately).

●Standard Type with Electromagnetic Brake

Power Supply Voltage	Model
24/48 VDC	**AR46MK-** ◇
	AR66MK- ◇
	AR69MK- ◇
	AR98MK- ◇

● Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name. Select a desired cable length from 1 m, 2 m or 3 m.

The following items are included in each product.

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

* The product includes a motor cable and an electromagnetic brake cable of 1 m, 2 m or 3 m.
If you need a cable of a different length, or a flexible cable, select an appropriate cable from among the accessories (sold separately).

TH Geared Type

Power Supply Voltage	Model
24/48 VDC	**AR46AK-T3.6-**◇
	AR46AK-T7.2-◇
	AR46AK-T10-◇
	AR46AK-T20-◇
	AR46AK-T30-◇
	AR66AK-T3.6-◇
	AR66AK-T7.2-◇
	AR66AK-T10-◇
	AR66AK-T20-◇
	AR66AK-T30-◇
	AR98AK-T3.6-◇
	AR98AK-T7.2-◇
	AR98AK-T10-◇
	AR98AK-T20-◇
	AR98AK-T30-◇

PN Geared Type

Power Supply Voltage	Model
24/48 VDC	**AR46AK-N5-**◇
	AR46AK-N7.2-◇
	AR46AK-N10-◇
	AR66AK-N5-◇
	AR66AK-N7.2-◇
	AR66AK-N10-◇
	AR66AK-N25-◇
	AR66AK-N36-◇
	AR66AK-N50-◇
	AR98AK-N5-◇
	AR98AK-N7.2-◇
	AR98AK-N10-◇
	AR98AK-N25-◇
	AR98AK-N36-◇
	AR98AK-N50-◇

Harmonic Geared Type

Power Supply Voltage	Model
24/48 VDC	**AR46AK-H50-**◇
	AR46AK-H100-◇
	AR66AK-H50-◇
	AR66AK-H100-◇
	AR98AK-H50-◇
	AR98AK-H100-◇

● Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name. Select a desired cable length from 1 m, 2 m or 3 m.

The following items are included in each product.

Motor, Shaft Parallel Key,*1 Driver, Motor Cable,*2 I/O Signal Connector, Connector for Power Supply Input/Frame Ground Terminal, Operating Manual

*1 Only for products with a key slot on the output shaft.

*2 The product includes a motor cable of 1 m, 2 m or 3 m.
If you need a cable of a different length, or a flexible cable, select an appropriate cable from among the accessories (sold separately).

TH Geared Type with Electromagnetic Brake

Power Supply Voltage	Model
24/48 VDC	**AR46MK-T3.6-**◇
	AR46MK-T7.2-◇
	AR46MK-T10-◇
	AR46MK-T20-◇
	AR46MK-T30-◇
	AR66MK-T3.6-◇
	AR66MK-T7.2-◇
	AR66MK-T10-◇
	AR66MK-T20-◇
	AR66MK-T30-◇
	AR98MK-T3.6-◇
	AR98MK-T7.2-◇
	AR98MK-T10-◇
	AR98MK-T20-◇
	AR98MK-T30-◇

PN Geared Type with Electromagnetic Brake

Power Supply Voltage	Model
24/48 VDC	**AR46MK-N5-**◇
	AR46MK-N7.2-◇
	AR46MK-N10-◇
	AR66MK-N5-◇
	AR66MK-N7.2-◇
	AR66MK-N10-◇
	AR66MK-N25-◇
	AR66MK-N36-◇
	AR66MK-N50-◇
	AR98MK-N5-◇
	AR98MK-N7.2-◇
	AR98MK-N10-◇
	AR98MK-N25-◇
	AR98MK-N36-◇
	AR98MK-N50-◇

Harmonic Geared Type with Electromagnetic Brake

Power Supply Voltage	Model
24/48 VDC	**AR46MK-H50-**◇
	AR46MK-H100-◇
	AR66MK-H50-◇
	AR66MK-H100-◇
	AR98MK-H50-◇
	AR98MK-H100-◇

● Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name. Select a desired cable length from 1 m, 2 m or 3 m.

The following items are included in each product.

Motor, Shaft Parallel Key,*1 Driver, Motor Cable and Electromagnetic Brake Cable,*2 I/O Signal Connector, Connector for Power Supply Input/Frame Ground Terminal, Surge Suppressor, Operating Manual

*1 Only for products with a key slot on the output shaft.

*2 The product includes a motor cable and an electromagnetic brake cable of 1 m, 2 m or 3 m. If you need a cable of a different length, or a flexible cable, select an appropriate cable from among the accessories (sold separately).

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

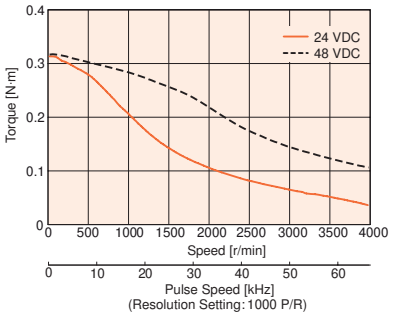
Specifications RoHS

Model			AR46AK-◇	AR66AK-◇	AR69AK-◇	AR98AK-◇
		Standard (Single shaft)	AR46AK-◇	AR66AK-◇	AR69AK-◇	AR98AK-◇
		Standard (Double shaft) *4	AR46BK-◇	AR66BK-◇	AR69BK-◇	AR98BK-◇
		Electromagnetic Brake	AR46MK-◇	AR66MK-◇	AR69MK-◇	AR98MK-◇
Maximum Holding Torque		N·m	0.3	1	2	
Rotor Inertia		J: kg·m²	58×10^{-7} [73×10^{-7}] *1	380×10^{-7} [500×10^{-7}] *1	750×10^{-7} [870×10^{-7}] *1	1100×10^{-7} [1220×10^{-7}] *1
Resolution	Resolution Setting: 1000P/R		0.36°/Pulse			
Power Source			24 VDC ±10% 1.4 A/ 48 VDC ±5% 1.4 A	24 VDC ±10% 3.1 A/ 48 VDC ±5% 3.1 A *5	24 VDC ±10% 3.0 A/ 48 VDC ±5% 3.0 A *5	24 VDC ±10% 2.5 A/ 48 VDC ±5% 2.5 A *5
Electromagnetic Brake *3	Type		Active when the power is off			
	Power Supply Input		24 VDC ±5% *2 0.1A	24 VDC ±5% *2 0.3A		
	Power Consumption	W	2	6		
	Excitation Current	A	0.08	0.25		
	Static Friction Torque	N·m	0.15	0.6	1	
Mass	Motor	kg	0.47 [0.62] *1	0.9 [1.2] *1	1.4 [1.7] *1	1.9 [2.5] *1
	Driver	kg	0.17			
Dimension No.	Motor		1 [4] *1	2 [5] *1		3 [6] *1
	Driver		25			
	Cable		26			

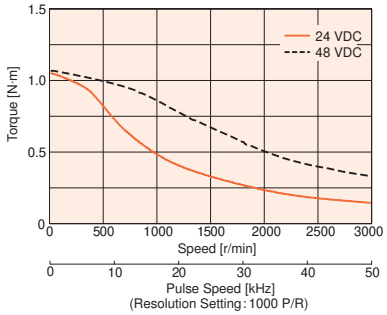
*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
*2 If the distance between the motor and driver is extended to 20 m or longer, use a power supply of 24 VDC ± 4%.
*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used to stop the motor. Also, a separate power supply is required for the electromagnetic brakes.
*4 With a double shaft model, the output shaft located on the opposite side of the motor output shaft is used to install a slit disk or similar device. Do not apply any load torque, overhung load or thrust load on this output shaft.
*5 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 acceleration torque.

Speed – Torque Characteristics

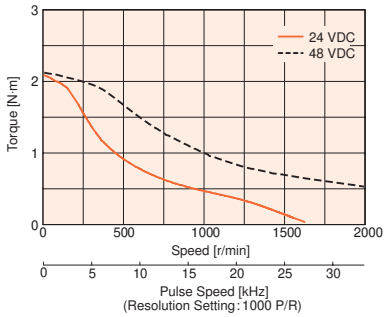
AR46□K-◇



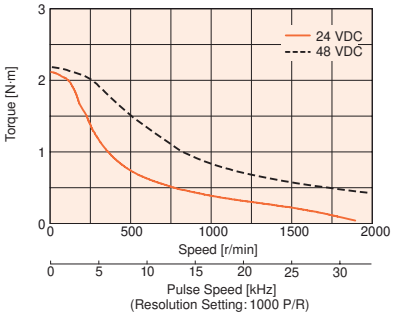
AR66□K-◇



AR69□K-◇



AR98□K-◇



Notes:
- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100ºC.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

- Enter **A** (single shaft), **B** (double shaft) or **M** (electromagnetic brake) in the box (□) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

TH Geared Type Motor Frame Size **42** mm

Specifications RoHS

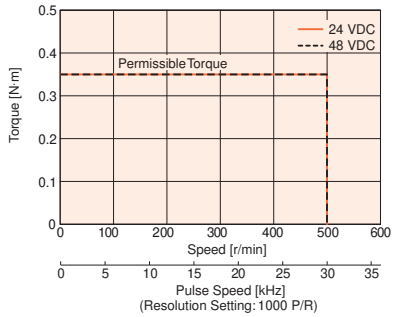
Model	Standard (Single shaft)	AR46AK-T3.6-◇	AR46AK-T7.2-◇	AR46AK-T10-◇	AR46AK-T20-◇	AR46AK-T30-◇
	Electromagnetic Brake	AR46MK-T3.6-◇	AR46MK-T7.2-◇	AR46MK-T10-◇	AR46MK-T20-◇	AR46MK-T30-◇
Maximum Holding Torque	N·m	0.35	0.7	1	1.5	
Rotor Inertia	J: kg·m²	58 x 10⁻⁷ [73 x 10⁻⁷] *1				
Backlash	arc minute (degrees)	45 (0.75°)	25 (0.417°)		15 (0.25°)	
Permissible Speed Range	r/min	0 ~ 500	0 ~ 250	0 ~ 180	0 ~ 90	0 ~ 60
Gear Ratio		1: 3.6	1: 7.2	1: 10	1: 20	1: 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	
Power Source		24 VDC ±10% 1.4 A/48 VDC ± 5% 1.4A				
Electromagnetic Brake *3	Type	Active when the power is off				
	Power Supply Input	24 VDC ± 5% *2 0.1A				
	Power Consumption W	2				
	Excitation Current A	0.08				
	Static Friction Torque N·m	0.18	0.35	0.5	0.75	
Mass	Motor kg	0.62 [0.77] *1				
	Driver kg	0.17				
Dimension No.	Motor	7 [10] *1				
	Driver	25				
	Cable	26				

*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
*2 If the distance between the motor and driver is extended to 20 m or longer, use a power supply of 24 VDC ± 4%.
*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used to stop the motor. Also, a separate power supply is required for the electromagnetic brakes.

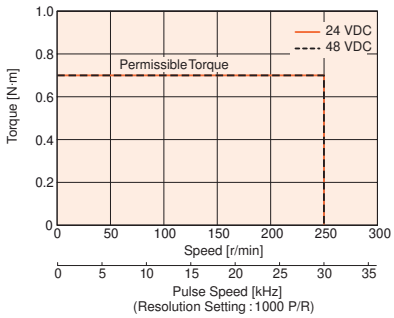
Note:
- Direction of rotation of the motor and that of the gear output shaft are the same for the gear ratios 1:3.6, 1:7.2 and 1:10. It is opposite for 1:20 and 1:30 gear ratios.

Speed – Torque Characteristics

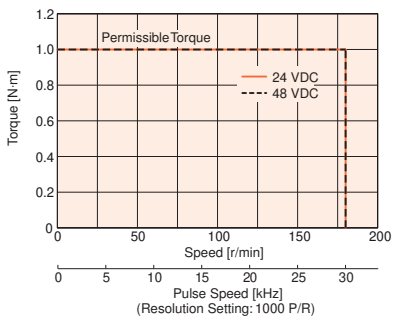
AR46 □K-T3.6-◇



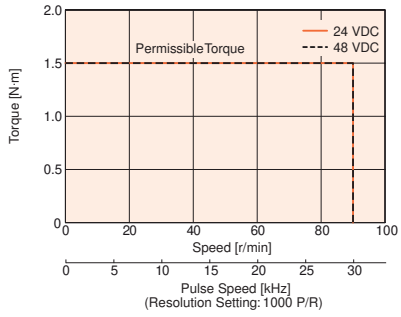
AR46 □K-T7.2-◇



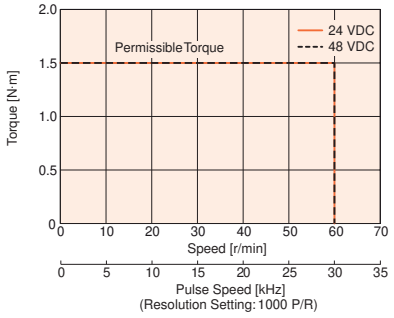
AR46 □K-T10-◇



AR46 □K-T20-◇



AR46 □K-T30-◇



Notes:
- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100ºC.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

- Enter **A** (single shaft) or **M** (electromagnetic brake) in the box (□) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

TH Geared Type Motor Frame Size **60** mm

Specifications RoHS

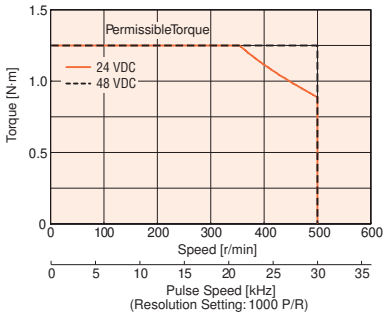
Model	Standard (Single shaft)	AR66AK-T3.6-◇	AR66AK-T7.2-◇	AR66AK-T10-◇	AR66AK-T20-◇	AR66AK-T30-◇
	Electromagnetic Brake	AR66MK-T3.6-◇	AR66MK-T7.2-◇	AR66MK-T10-◇	AR66MK-T20-◇	AR66MK-T30-◇
Maximum Holding Torque	N·m	1.25	2.5	3	3.5	4
Rotor Inertia	J: kg·m²	380×10^{-7}[500×10^{-7}] *1				
Backlash	arc minute (degrees)	35 (0.584°)	15 (0.25°)		10 (0.167°)	
Permissible Speed Range	r/min	0～500	0～250	0～180	0～90	0～60
Gear Ratio		1:3.6	1:7.2	1:10	1:20	1:30
Resolution	Resolution Setting:1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	1.25	2.5	3	3.5	4
Power Source		24 VDC ±10% 3.1A/48 VDC±5% 3.1A*4				
Electromagnetic Brake*3	Type	Active when the power is off				
	Power Supply Input	24 VDC ± 5%*2 0.3A				
	Power Consumption W	6				
	Excitation Current A	0.25				
	Static Friction Torque N·m	0.63	1.25	1.5	1.75	2
Mass	Motor kg	1.3 [1.6] *1				
	Driver kg	0.17				
Dimension No.	Motor	8 [11] *1				
	Driver	25				
	Cable	26				

*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
*2 If the distance between the motor and driver is extended to 20 m or longer, use a power supply of 24 VDC ± 4%.
*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used to stop the motor. Also, a separate power supply is required for the electromagnetic brakes.
*4 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 acceleration torque.

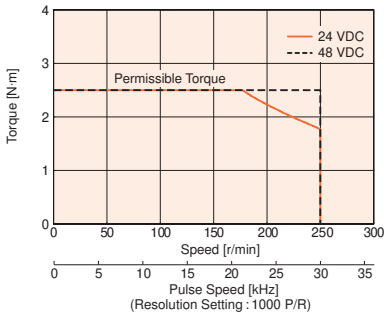
Note:
- Direction of rotation of the motor and that of the gear output shaft are the same for the gear ratios 1:3.6, 1:7.2 and 1:10. It is opposite for 1:20 and 1:30 gear ratios.

Speed – Torque Characteristics

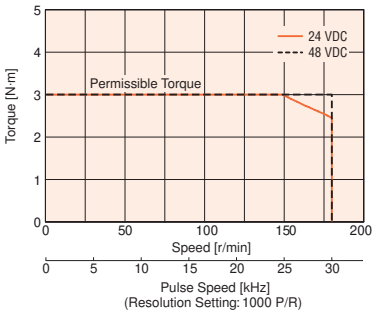
AR66 □ K-T3.6-◇



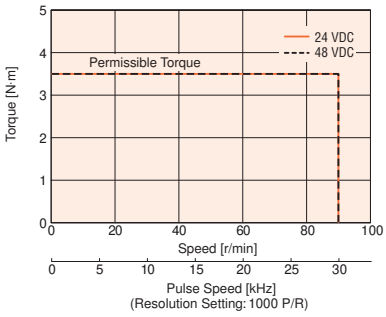
AR66 □ K-T7.2-◇



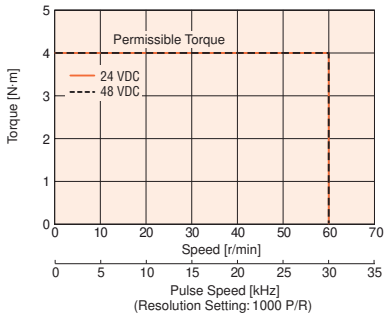
AR66 □ K-T10-◇



AR66 □ K-T20-◇



AR66 □ K-T30-◇



Notes:
- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100ºC.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

- Enter **A** (single shaft) or **M** (electromagnetic brake) in the box (□) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

TH Geared Type Motor Frame Size **90** mm

Specifications RoHS

Model	Standard (Single shaft)	AR98AK-T3.6-◇	AR98AK-T7.2-◇	AR98AK-T10-◇	AR98AK-T20-◇	AR98AK-T30-◇
	Electromagnetic Brake	AR98MK-T3.6-◇	AR98MK-T7.2-◇	AR98MK-T10-◇	AR98MK-T20-◇	AR98MK-T30-◇
Maximum Holding Torque	N·m	4.5	9		12	
Rotor Inertia	J:kg·m²	1100 x 10⁻⁷ [1220 x 10⁻⁷] ※1				
Backlash	arc minute (degrees)	25 (0.417°)	15 (0.25°)		10 (0.167°)	
Permissible Speed Range	r/min	0～500	0～250	0～180	0～90	0～60
Gear Ratio		1:3.6	1:7.2	1:10	1:20	1:30
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	
Power Source		24 VDC ± 10% 2.5 A/48 VDC ± 5% 2.5 A ※4				
Electromagnetic Brake※3	Type	Active when the power is off				
	Power Supply Input	24 VDC ± 5% ※2 0.3 A				
	Power Consumption W	6				
	Excitation Current A	0.25				
	Static Friction Torque N·m	2.25	4.5		6	
Mass	Motor kg	3.1 [3.7] ※1				
	Driver kg	0.17				
Dimension No.	Motor	9 [12] ※1				
	Driver	25				
	Cable	26				

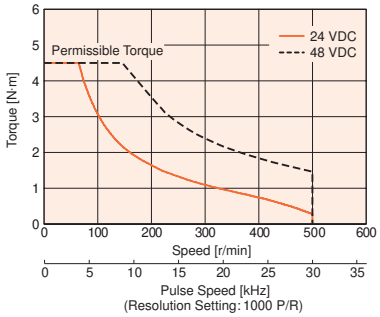
※1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
※2 If the distance between the motor and driver is extended to 20 m or longer, use a power supply of 24 VDC ± 4%.
※3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used to stop the motor. Also, a separate power supply is required for the electromagnetic brakes.
※4 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 acceleration torque.

Note:

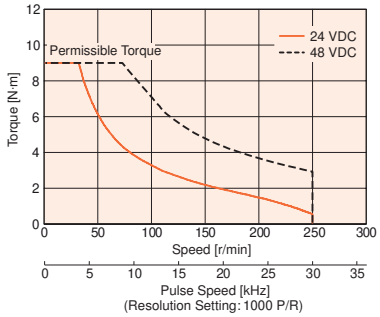
- Direction of rotation of the motor and that of the gear output shaft are the same for the gear ratios 1:3.6, 1:7.2 and 1:10. It is opposite for 1:20 and 1:30 gear ratios.

Speed – Torque Characteristics

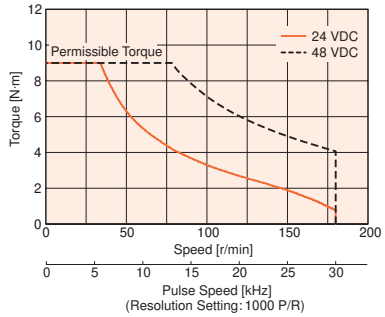
AR98 ☐ K-T3.6-◇



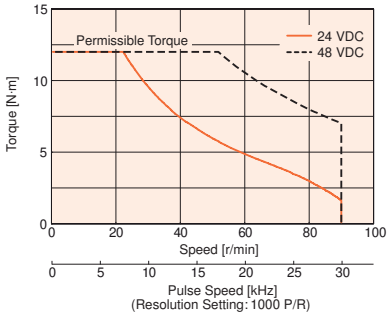
AR98 ☐ K-T7.2-◇



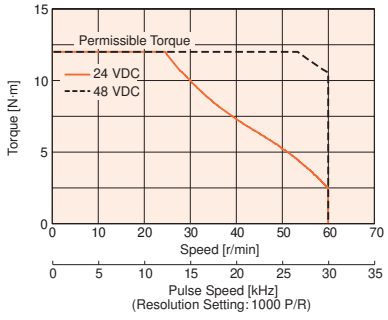
AR98 ☐ K-T10-◇



AR98 ☐ K-T20-◇



AR98 ☐ K-T30-◇



Notes:

- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100ºC.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

- Enter **A** (single shaft) or **M** (electromagnetic brake) in the box (☐) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

PN Geared Type Motor Frame Size **42** mm

Specifications RoHS CE

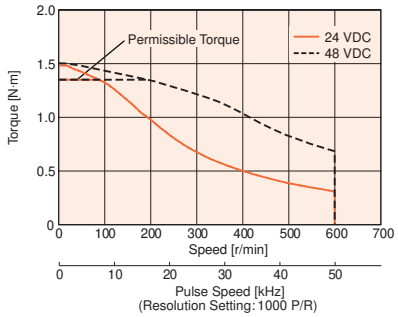
Model		Standard (Single shaft)	AR46AK-N5-◇	AR46AK-N7.2-◇	AR46AK-N10-◇
		Electromagnetic Brake	AR46MK-N5-◇	AR46MK-N7.2-◇	AR46MK-N10-◇
Maximum Holding Torque		N·m	1.35	1.5	
Rotor Inertia		J: kg·m^2	58×10^{-7} [73×10^{-7}] ✻1		
Backlash		arc minute (degrees)	2(0.034°)		
Angular Transmission Error		arc minute (degrees)	6(0.1°)		
Permissible Speed Range		r/min	0～600	0～416	0～300
Gear Ratio			1:5	1:7.2	1:10
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 ✻3		N·m	1.5	2	
Power Source			24 VDC ± 10% 1.4 A/48 VDC ± 5% 1.4A		
Electromagnetic Brake ✻4	Type		Active when the power is off		
	Power Supply Input		24 VDC ± 5% ✻2 0.1A		
	Power Consumption	W	2		
	Excitation Current	A	0.08		
	Static Friction Torque	N·m	0.68	0.75	
Mass	Motor	kg	0.73 [0.88] ✻1		
	Driver	kg	0.17		
Dimension No.	Motor		13 [16] ✻1		
	Driver		25		
	Cable		26		

✻1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
✻2 If the distance between the motor and driver is extended to 20 m or longer, use a power supply of 24 VDC ± 4%.
✻3 The value of maximum torque is for gear. For output torque for geared motor, refer to the speed — torque characteristics.
✻4 The electromagnetic brakes are for holding the position when the power is off. They cannot be used to stop the motor. Also, a separate power supply is required for the electromagnetic brakes.

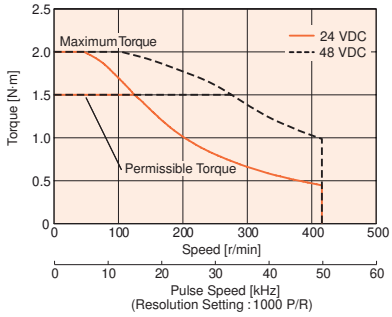
Note:
- Direction of rotation of the motor and that of the gear output shaft are the same.

Speed – Torque Characteristics

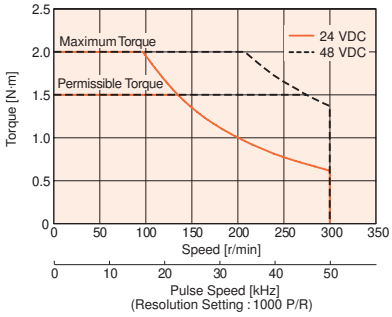
AR46 □ K-N5-◇



AR46 □ K-N7.2-◇



AR46 □ K-N10-◇



Notes:
- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100ºC.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

- Enter **A** (single shaft) or **M** (electromagnetic brake) in the box (□) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

PN Geared Type Motor Frame Size **60** mm

Specifications RoHS

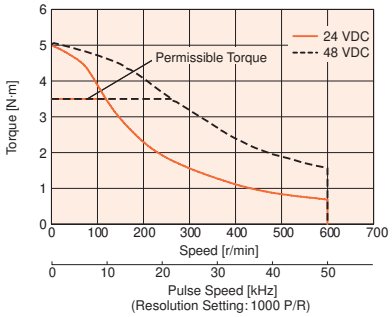
Model	Standard (Single shaft)	AR66AK-N5-◇	AR66AK-N7.2-◇	AR66AK-N10-◇	AR66AK-N25-◇	AR66AK-N36-◇	AR66AK-N50-◇
	Electromagnetic Brake	AR66MK-N5-◇	AR66MK-N7.2-◇	AR66MK-N10-◇	AR66MK-N25-◇	AR66MK-N36-◇	AR66MK-N50-◇
Maximum Holding Torque	N·m	3.5	4	5	8		
Rotor Inertia	J: kg·m²	380 x 10⁻⁷ [500 x 10⁻⁷] *1					
Backlash	arc minute (degrees)	2 (0.034°)			3 (0.05°)		
Angular Transmission Error	arc minute (degrees)	5 (0.0834°)					
Permissible Speed Range	r/min	0 ~ 600	0~416	0~300	0~120	0~83	0~60
Gear Ratio		1:5	1:7.2	1:10	1:25	1:36	1:50
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 *3	N·m	7	9	11	16	20	
Power Source		24 VDC ± 10% 3.1A/48 VDC ± 5% 3.1A *5					
Electromagnetic Brake *4	Type	Active when the power is off					
	Power Supply Input	24 VDC ± 5% *2 0.3 A					
	Power Consumption W	6					
	Excitation Current A	0.25					
	Static Friction Torque N·m	1.75	2	2.5	4		
Mass	Motor kg	1.5 [1.8] *1			1.73 [2] *1		
	Driver kg	0.17					
Dimension No.	Motor	14 [17] *1					
	Driver	25					
	Cable	26					

*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
*2 If the distance between the motor and driver is extended to 20 m or longer, use a power supply of 24 VDC ± 4%.
*3 The value of maximum torque is for gear. For output torque for geared motor, refer to the speed – torque characteristics.
*4 The electromagnetic brakes are for holding the position when the power is off. They cannot be used to stop the motor. Also, a separate power supply is required for the electromagnetic brakes.
*5 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 acceleration torque.

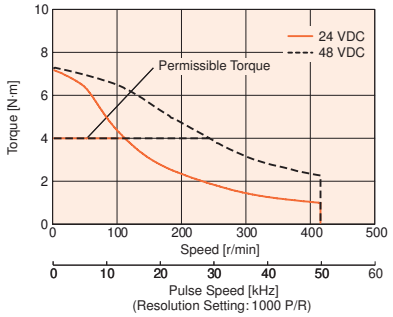
Note:
- Direction of rotation of the motor shaft and that of the gear output shaft are the same.

Speed – Torque Characteristics

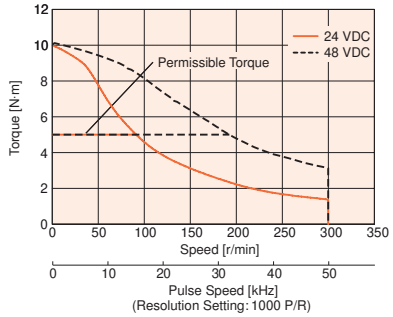
AR66 □ K-N5-◇



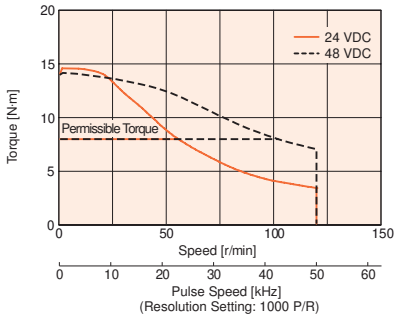
AR66 □ K-N7.2-◇



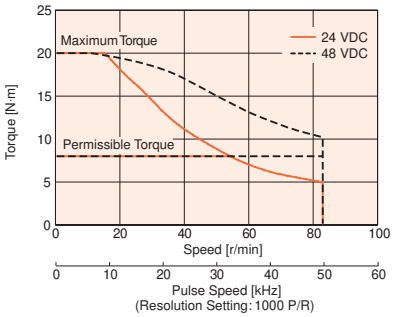
AR66 □ K-N10-◇



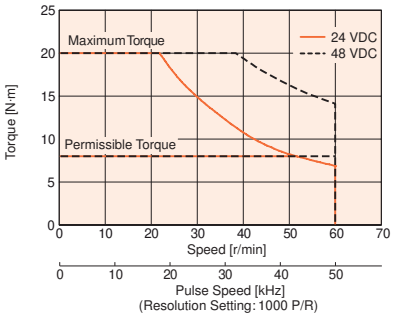
AR66 □ K-N25-◇



AR66 □ K-N36-◇



AR66 □ K-N50-◇



Notes:
- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100ºC.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

- Enter **A** (single shaft) or **M** (electromagnetic brake) in the box (□) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

PN Geared Type Motor Frame Size **90** mm

Specifications RoHS

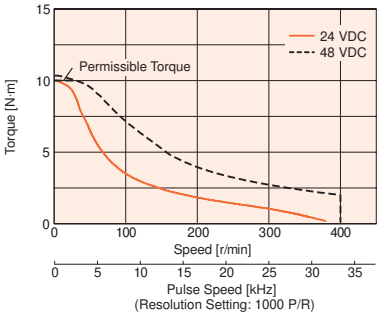
Model	Standard (Single shaft)	AR98AK-N5-◇	AR98AK-N7.2-◇	AR98AK-N10-◇	AR98AK-N25-◇	AR98AK-N36-◇	AR98AK-N50-◇
	Electromagnetic Brake	AR98MK-N5-◇	AR98MK-N7.2-◇	AR98MK-N10-◇	AR98MK-N25-◇	AR98MK-N36-◇	AR98MK-N50-◇
Maximum Holding Torque	N·m	10	14	20	37		
Rotor Inertia	J: kg·m²	1100 x 10⁻⁷ [1220 x 10⁻⁷] *1					
Backlash	arc minute (degrees)	2 (0.034°)			3 (0.05°)		
Angular Transmission Error	arc minute (degrees)	4 (0.067°)					
Permissible Speed Range	r/min	0 ~ 400	0 ~ 277	0 ~ 200	0 ~ 80	0 ~ 55	0 ~ 40
Gear Ratio		1:5	1:7.2	1:10	1:25	1:36	1:50
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 *3	N·m	28	35		56	60	
Power Source		24 VDC ± 10% 2.5A/48 VDC ± 5% 2.5 A *5					
Electromagnetic Brake *4	Type	Active when the power is off					
	Power Supply Input	24 VDC ± 5% *2 0.3A					
	Power Consumption W	6					
	Excitation Current A	0.25					
	Static Friction Torque N·m	4.5	6.5	9	18.5		
Mass	Motor kg	3.8 [4.4] *1			4.5 [5.1] *1		
	Driver kg	0.17					
Dimension No.	Motor	15 [18] *1					
	Driver	25					
	Cable	26					

*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
*2 If the distance between the motor and driver is extended to 20 m or longer, use a power supply of 24 VDC ± 4%.
*3 The value of maximum torque is for gear. For output torque for geared motor, refer to the speed – torque characteristics.
*4 The electromagnetic brakes are for holding the position when the power is off. They cannot be used to stop the motor. Also, a separate power supply is required for the electromagnetic brakes.
*5 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 acceleration torque.

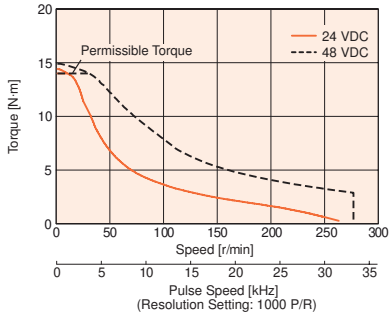
Note:
- Direction of rotation of the motor shaft and that of the gear output shaft are the same.

Speed – Torque Characteristics

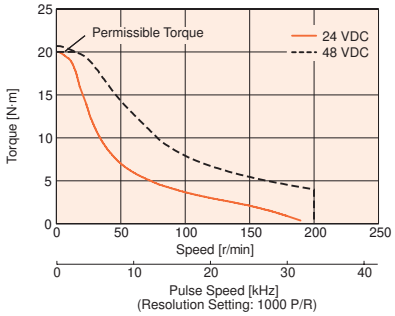
AR98 □ K-N5-◇



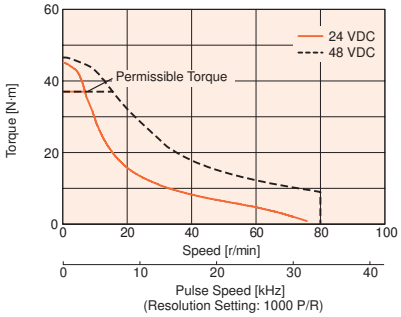
AR98 □ K-N7.2-◇



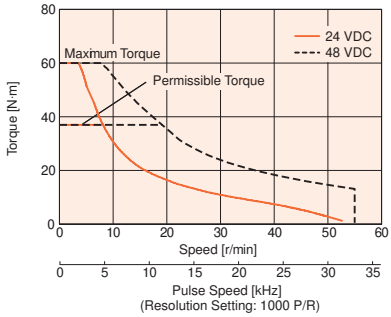
AR98 □ K-N10-◇



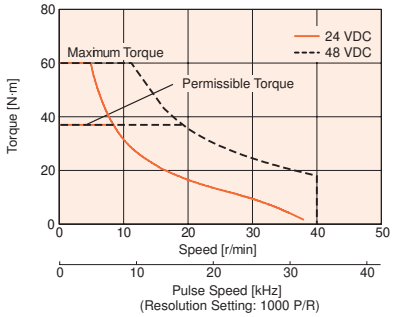
AR98 □ K-N25-◇



AR98 □ K-N36-◇



AR98 □ K-N50-◇



Notes:
- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100ºC.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

- Enter **A** (single shaft) or **M** (electromagnetic brake) in the box (□) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

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

Specifications RoHS

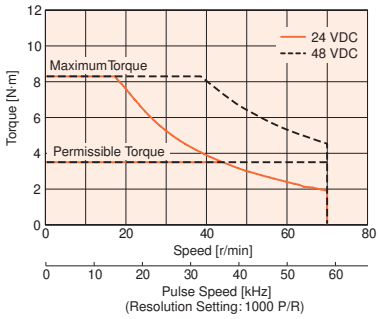
Model			AR46AK-H50-◇	AR46AK-H100-◇	AR66AK-H50-◇	AR66AK-H100-◇	AR98AK-H50-◇	AR98AK-H100-◇
	Standard (Single shaft)		AR46MK-H50-◇	AR46MK-H100-◇	AR66MK-H50-◇	AR66MK-H100-◇	AR98MK-H50-◇	AR98MK-H100-◇
Maximum Holding Torque		N·m	3.5	5	5.5	8	25	37
Rotor Inertia		J: kg·m²	75×10^{-7} [90×10^{-7}] *1		415×10^{-7} [535×10^{-7}] *1		1300×10^{-7} [1420×10^{-7}] *1	
Permissible Speed Rang		r/min	0~70	0~35	0~60	0~30	0~40	0~20
Gear Ratio			1:50	1:100	1:50	1:100	1:50	1:100
Resolution	Resolution Setting: 1000 P/R		0.0072°/Pulse	0.0036°/Pulse	0.0072°/Pulse	0.0036°/Pulse	0.0072°/Pulse	0.0036°/Pulse
Permissible Torque		N·m	3.5	5	5.5	8	25	37
Maximum Torque		N·m	8.3	11	18	28	35	55
Lost Motion (Load torque)		arc minute (degrees)	1.5 max. (0.025°) (±0.16 N·m)	1.5 max. (0.025°) (±0.2 N·m)	0.7 max. (0.012°) (±0.28 N·m)	0.7 max. (0.012°) (±0.39 N·m)	1.5 max. (0.025°) (±1.2 N·m)	
Power Source			24 VDC ±10% 1.4 A/48 VDC ±5% 1.4 A		24 VDC ±10% 3.1 A/48 VDC ±5% 3.1A*4		24 VDC ±10% 2.5 A/48 VDC ±5% 2.5A*4	
Electromagnetic Brake *3	Type		Active when the power is off					
	Power Supply Input		24 VDC ± 5% *2 0.1 A		24 VDC ± 5% *2 0.3 A			
	Power Consumption	W	2		6			
	Excitation Current	A	0.08		0.25			
	Static Friction Torque	N·m	1.75	2.5	2.75	4	12.5	18.5
Mass	Motor	kg	0.68 [0.83] *1		1.41 [1.71] *1		4 [4.6] *1	
	Driver	kg	0.17					
Dimension No.	Motor		19 [22] *1		20 [23] *1		21 [24] *1	
	Driver		25					
	Cable		26					

*1 The values inside the brackets [ ] represent the specification for the electromagnetic brake type.
*2 If the distance between the motor and driver is extended to 20 m or longer, use a power supply of 24 VDC ± 4%.
*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used to stop the motor. Also, a separate power supply is required for the electromagnetic brakes.
*4 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 acceleration torque.

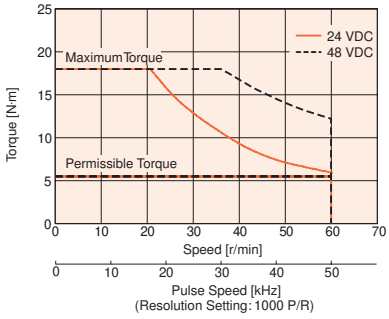
Note:
- The inertia represents a sum of the inertia of the harmonic gear converted to a motor shaft value, and the rotor inertia. Direction of rotation of the motor shaft and that of the gear output shaft are the opposite.

Speed – Torque Characteristics

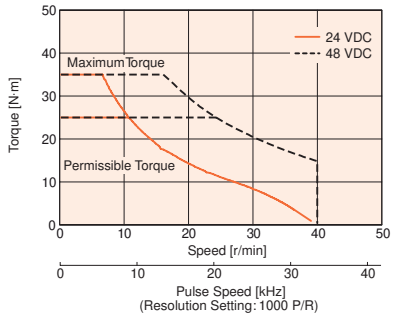
AR46 □ K-H50-◇



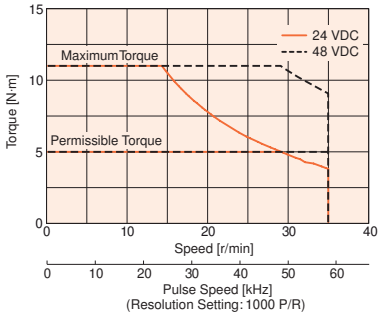
AR66 □ K-H50-◇



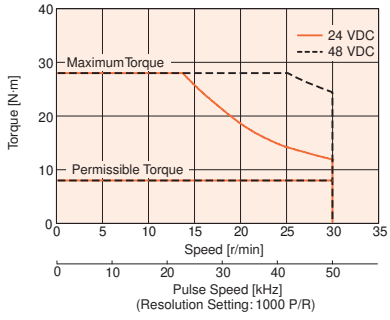
AR98 □ K-H50-◇



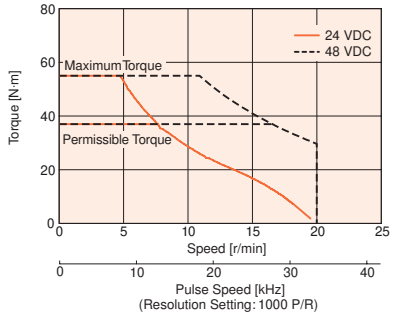
AR46 □ K-H100-◇



AR66 □ K-H100-◇



AR98 □ K-H100-◇



Notes:
- Pay attention to heat dissipation from motor as there will be a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100ºC.
- In order to prevent fatigue of the gear grease in the harmonic gear, keep the temperature of the gear case under 70°C.
- The driver's automatic current cutback function at motor standstill reduces maximum holding torque by approximately 50%.

- Enter **A** (single shaft) or **M** (electromagnetic brake) in the box (□) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

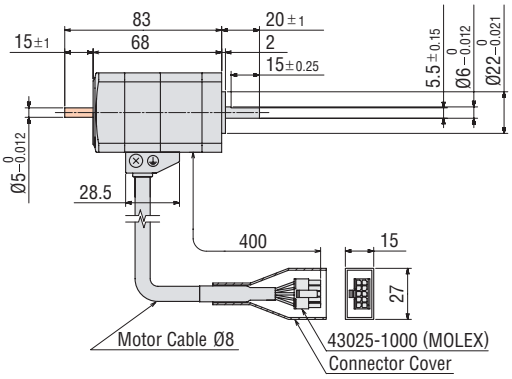
Dimensions (Unit = mm)

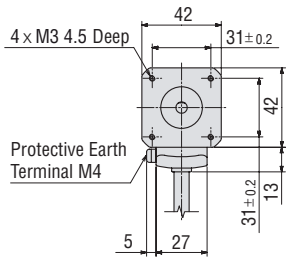
Motor

◇Standard Type

1 □42 mm

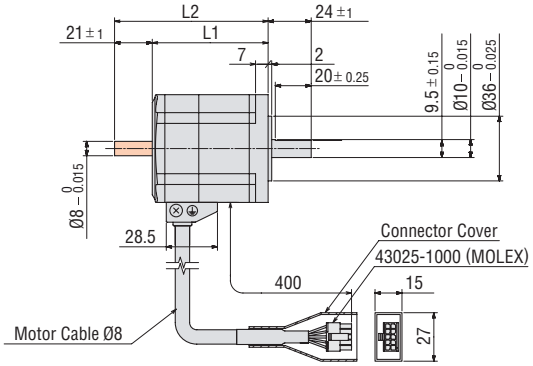
Model	Motor Model	Mass kg
AR46AK-◇	ARM46AK	0.47
AR46BK-◇	ARM46BK	

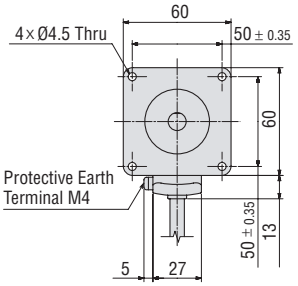




2 □60 mm

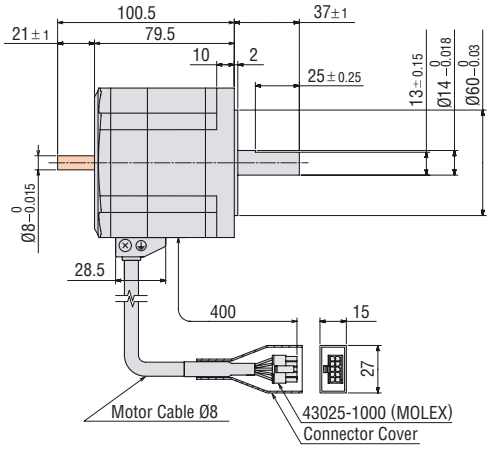
Model	Motor Model	L1	L2	Mass kg
AR66AK-◇	ARM66AK	64.5	–	0.9
AR66BK-◇	ARM66BK		85.5	
AR69AK-◇	ARM69AK	90	–	1.4
AR69BK-◇	ARM69BK		111	

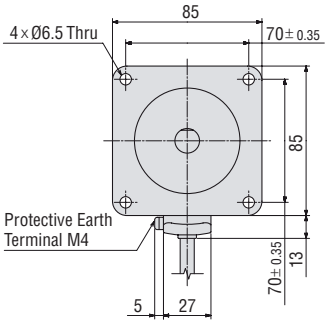




3 □85 mm

Model	Motor Model	Mass kg
AR98AK-◇	ARM98AK	1.9
AR98BK-◇	ARM98BK	



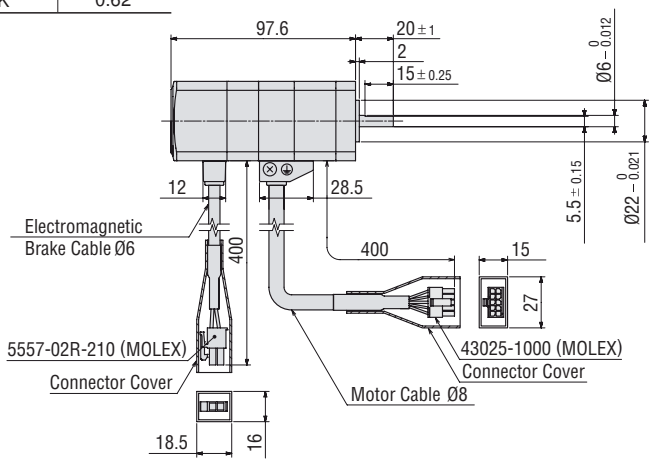


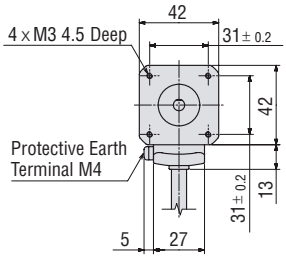
- These dimensions are for double shaft models. For single shaft models, ignore the shaded ( ) areas.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

◇ Standard Type with Electromagnetic Brake

4 □ 42 mm

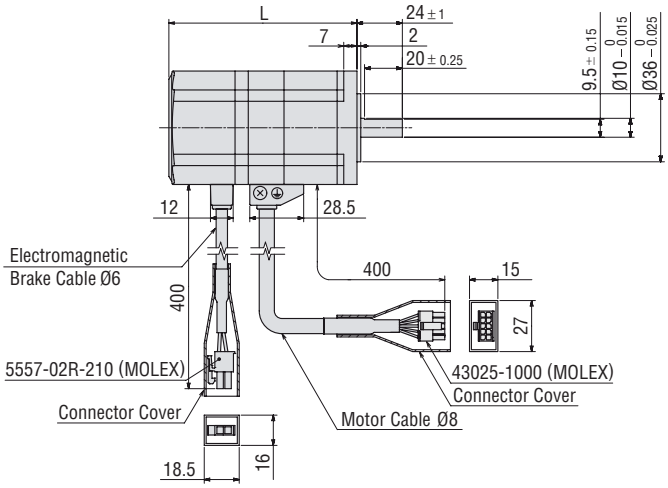
Model	Motor Model	Mass kg
AR46MK-◇	ARM46MK	0.62

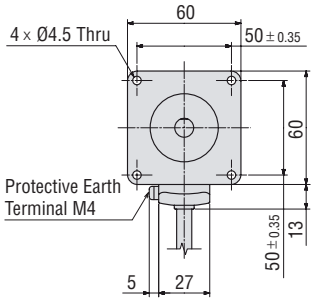




5 □ 60 mm

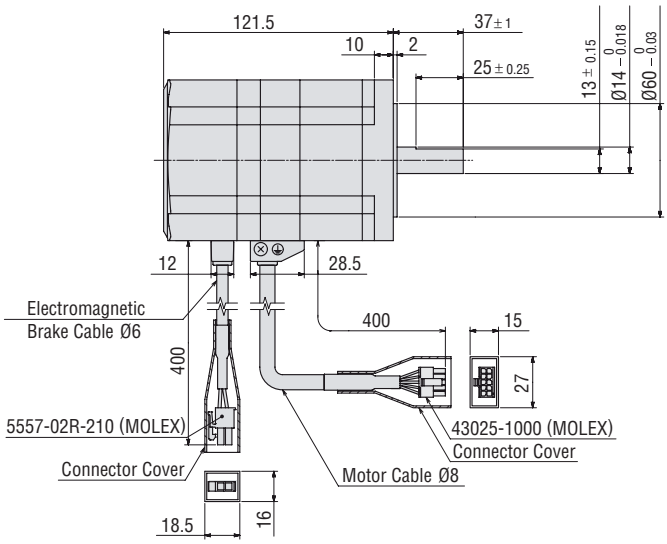
Model	Motor Model	L	Mass kg
AR66MK-◇	ARM66MK	99.5	1.2
AR69MK-◇	ARM69MK	125	1.7

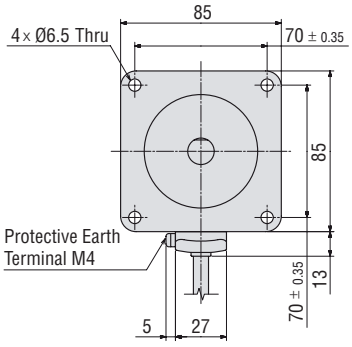




6 □ 85 mm

Model	Motor Model	Mass kg
AR98MK-◇	ARM98MK	2.5



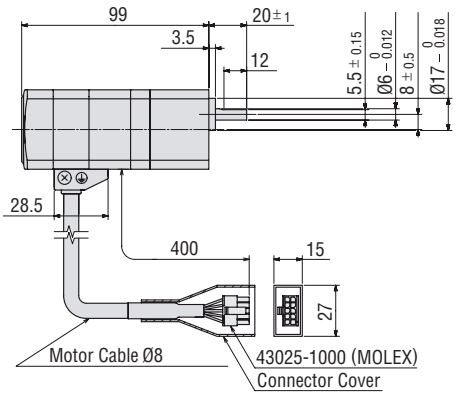


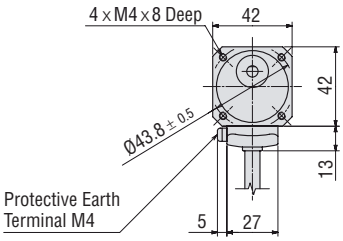
● Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

◇**TH** Geared Type

7 □42 mm

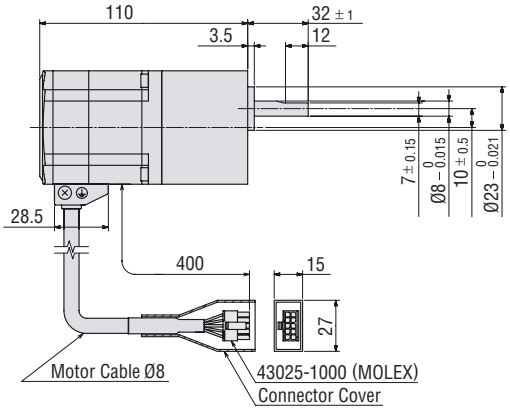
Model	Motor Model	Gear Ratio	Mass kg
AR46AK-T ■-◇	ARM46AK-T■	**3.6 , 7.2 , 10 , 20 , 30**	0.62

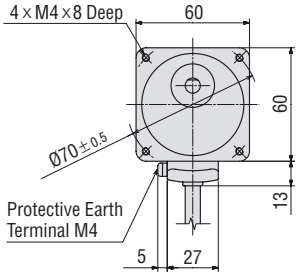




8 □60 mm

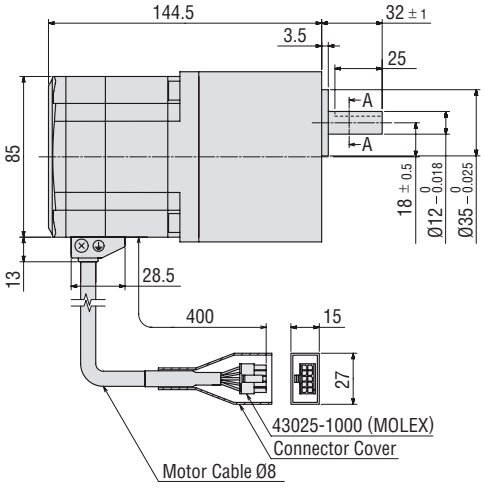
Model	Motor Model	Gear Ratio	Mass kg
AR66AK-T ■-◇	ARM66AK-T■	**3.6 , 7.2 , 10 , 20 , 30**	1.3

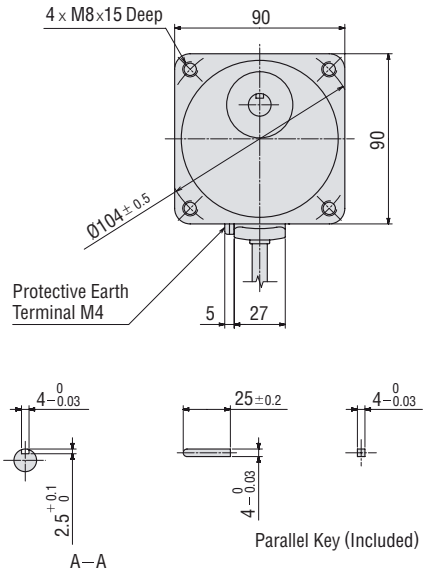




9 □90 mm

Model	Motor Model	Gear Ratio	Mass kg
AR98AK-T ■-◇	ARM98AK-T■	**3.6 , 7.2 , 10 , 20 , 30**	3.1



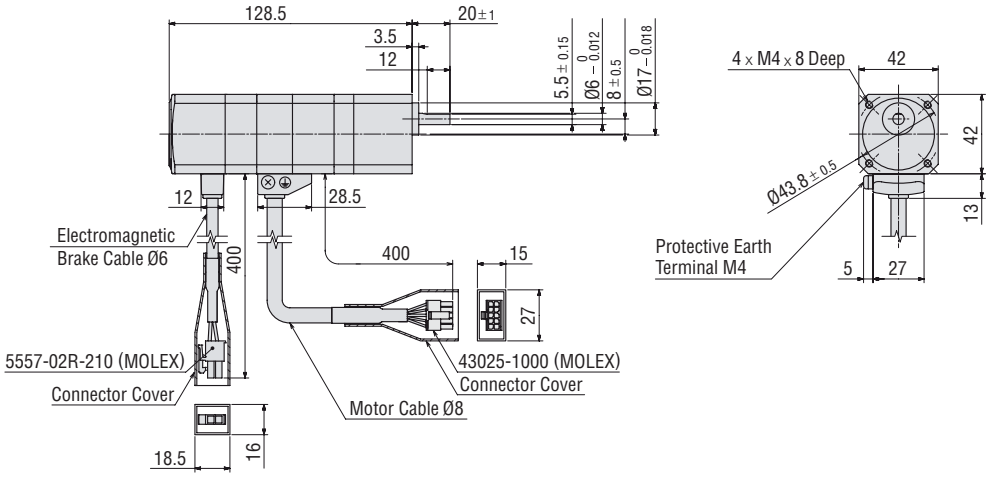


- Enter the gear ratio in the box (■) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

◇**TH** Geared Type with Electromagnetic Brake

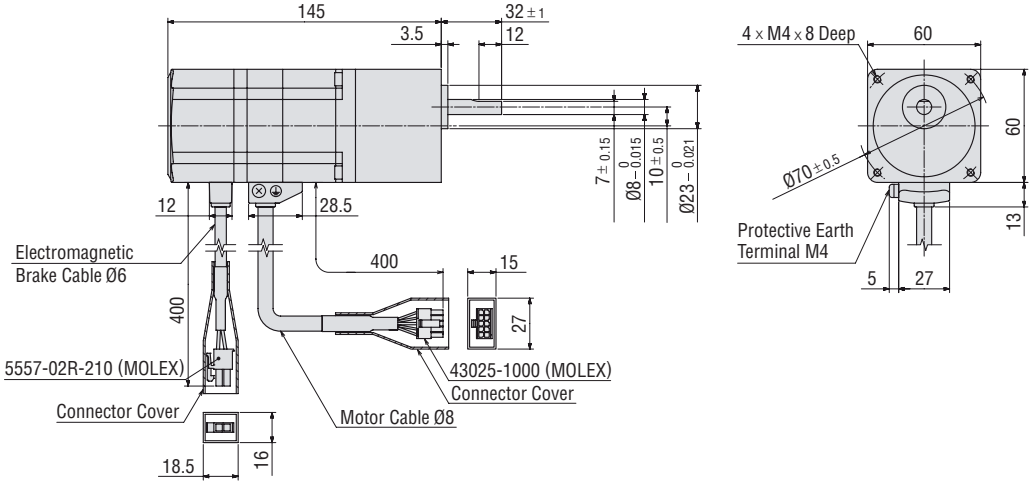
10 □42 mm

Model	Motor Model	Gear Ratio	Mass kg
AR46MK-T ■-◇	ARM46MK-T■	**3.6 , 7.2 , 10 , 20 , 30**	0.77



11 □60 mm

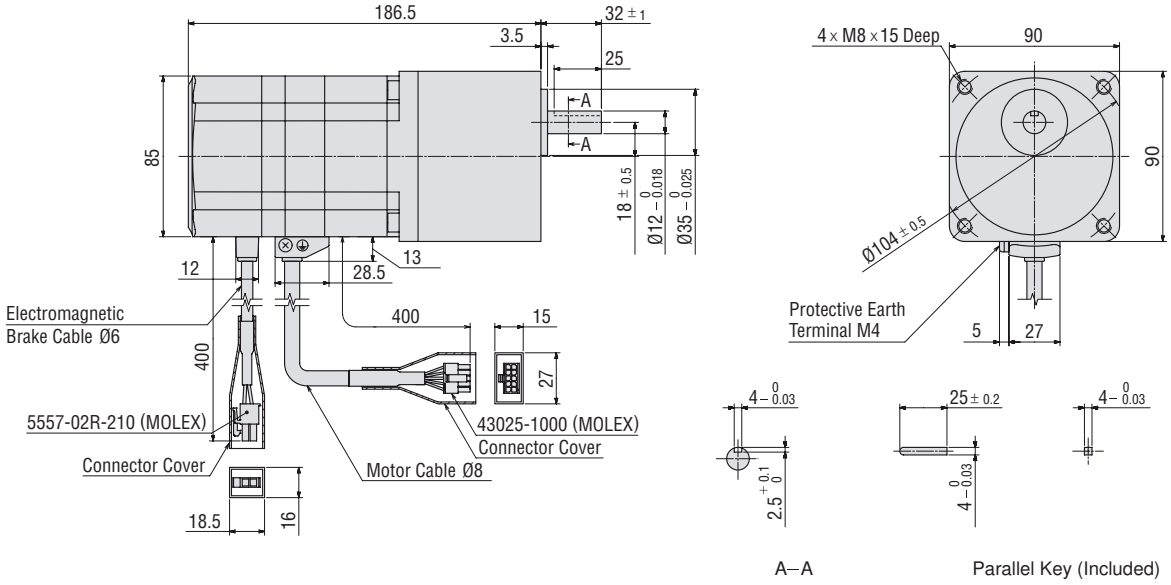
Model	Motor Model	Gear Ratio	Mass kg
AR66MK-T ■-◇	ARM66MK-T■	**3.6 , 7.2 , 10 , 20 , 30**	1.6



- Enter the gear ratio in the box (■) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

12 □90 mm

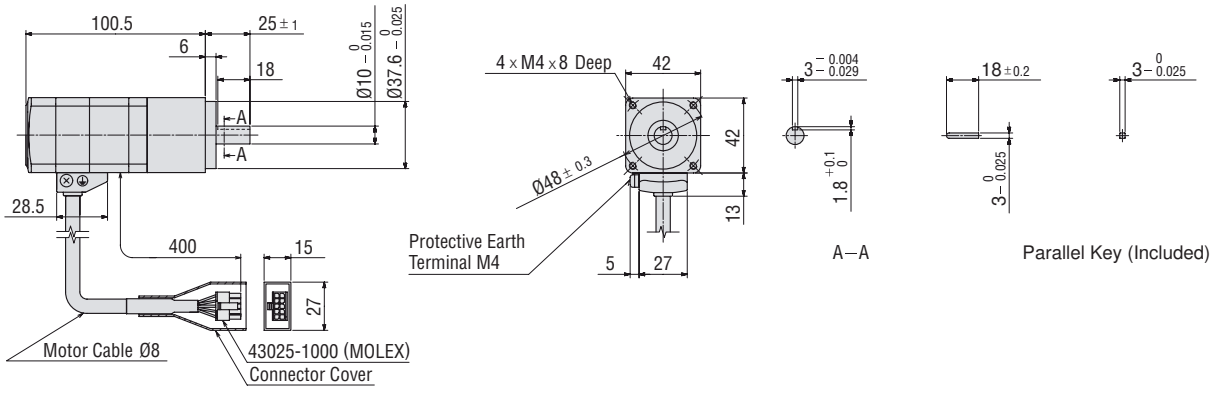
Model	Motor Model	Gear Ratio	Mass kg
AR98MK-T ■-◇	ARM98MK-T■	**3.6 , 7.2 , 10 , 20 , 30**	3.7



◇**PN** Geared Type

13 □42 mm

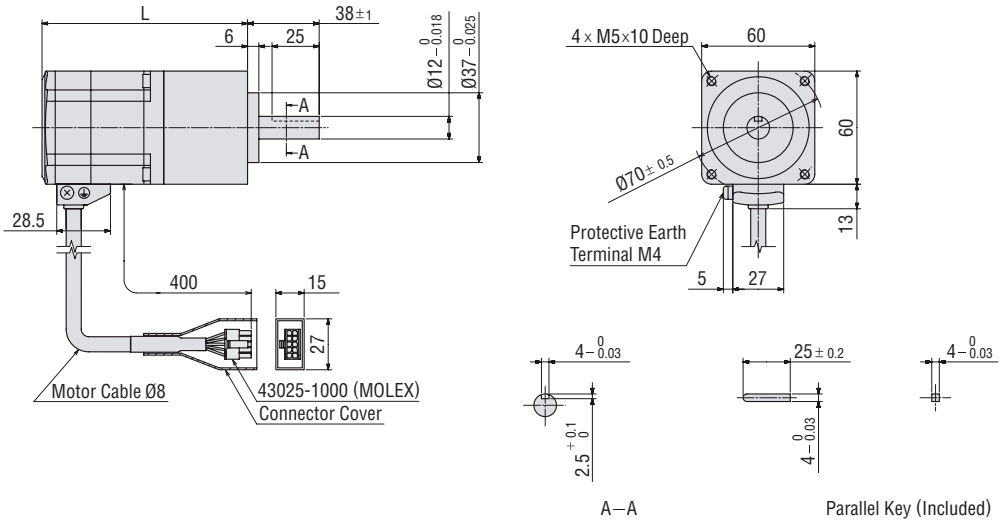
Model	Motor Model	Gear Ratio	Mass kg
AR46AK-N ■-◇	ARM46AK-N■	**5 , 7.2 , 10**	0.73



● Enter the gear ratio in the box (■) within the model name.
● Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

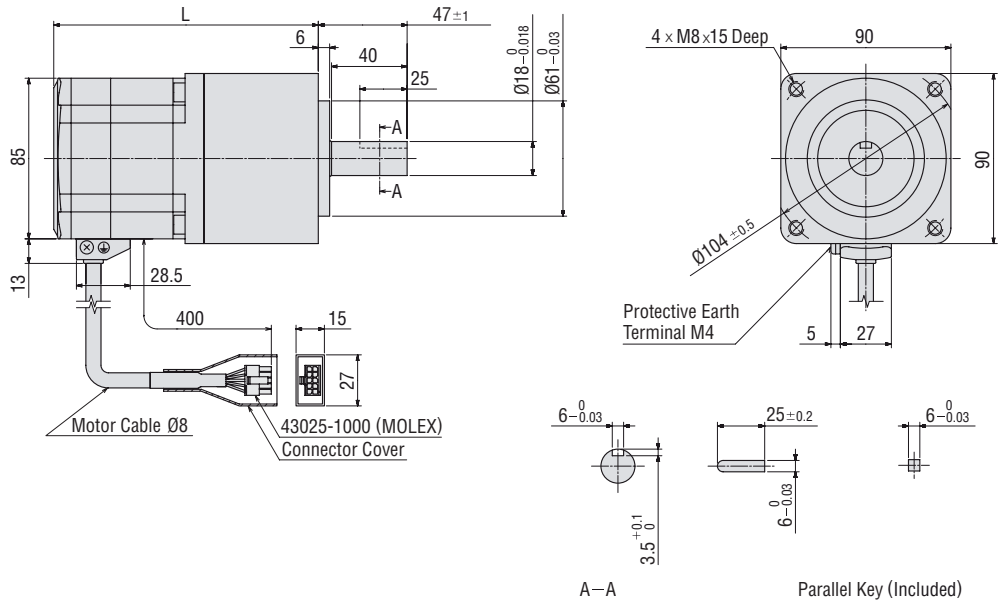
14 □60 mm

Model	Motor Model	Gear Ratio	L	Mass kg
AR66AK-N ■-◇	ARM66AK-N■	**5 , 7.2 , 10**	109	1.5
		25 , 36 , 50	125	1.73



15 □90 mm

Model	Motor Model	Gear Ratio	L	Mass kg
AR98AK-N ■-◇	ARM98AK-N■	**5 , 7.2 , 10**	140	3.8
		25 , 36 , 50	163	4.5

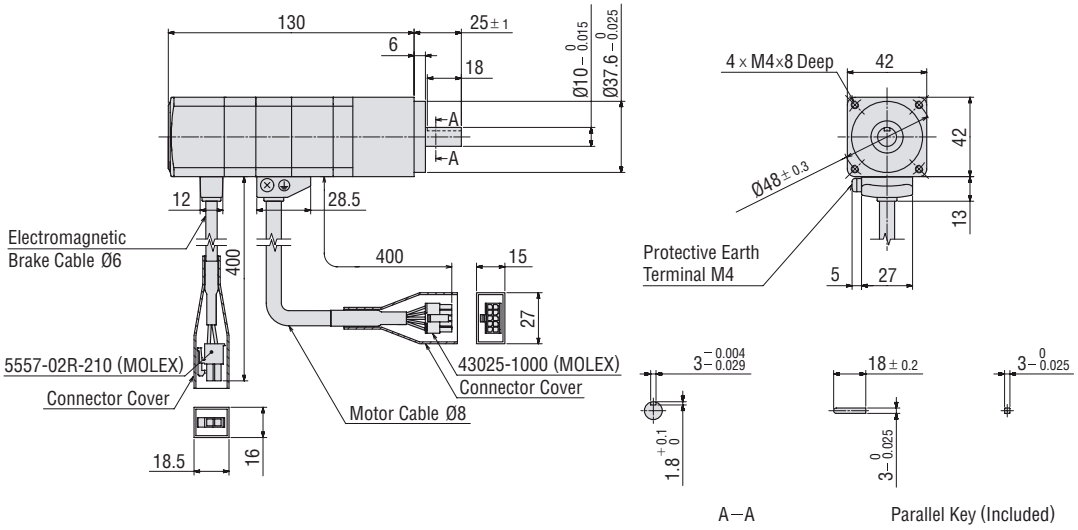


● Enter the gear ratio in the box (■) within the model name.
● Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

◇**PN** Geared Type with Electromagnetic Brake

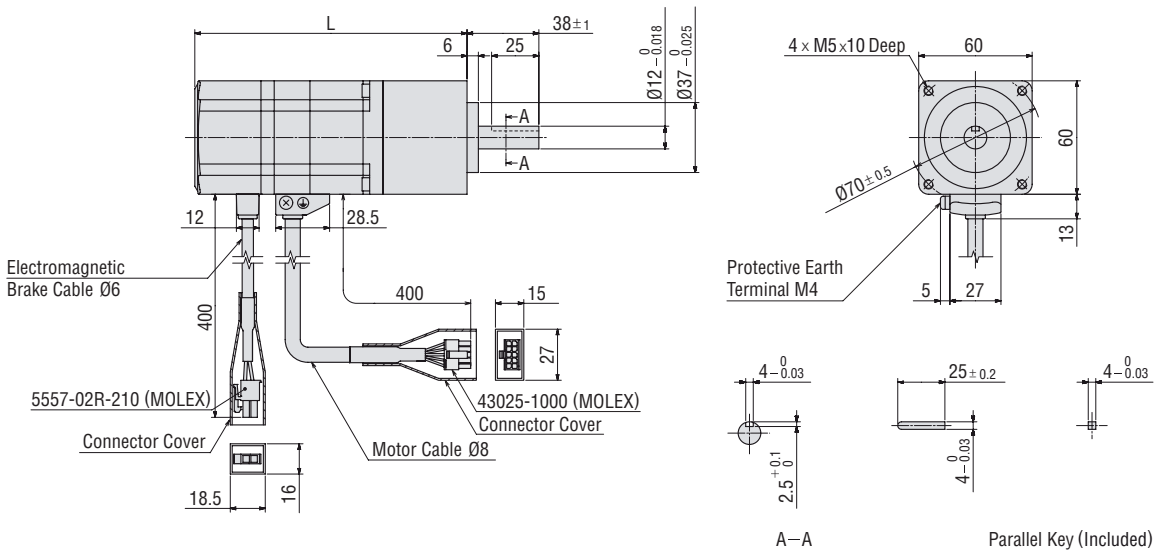
16 □42 mm

Model	Motor Model	Gear Ratio	Mass kg
AR46MK-N ■-◇	ARM46MK-N ■	**5 , 7.2 , 10**	0.88



17 □60 mm

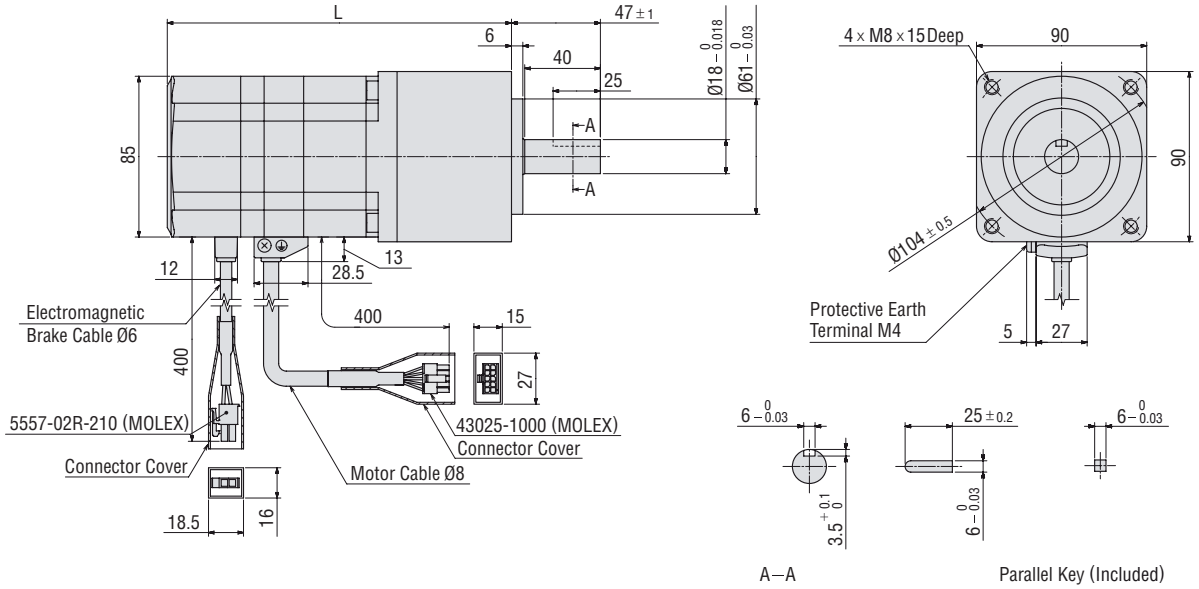
Model	Motor Model	Gear Ratio	L	Mass kg
AR66MK-N ■-◇	ARM66MK-N ■	**5 , 7.2 , 10**	144	1.8
		25 , 36 , 50	160	2.0



- Enter the gear ratio in the box (■) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

18 □90 mm

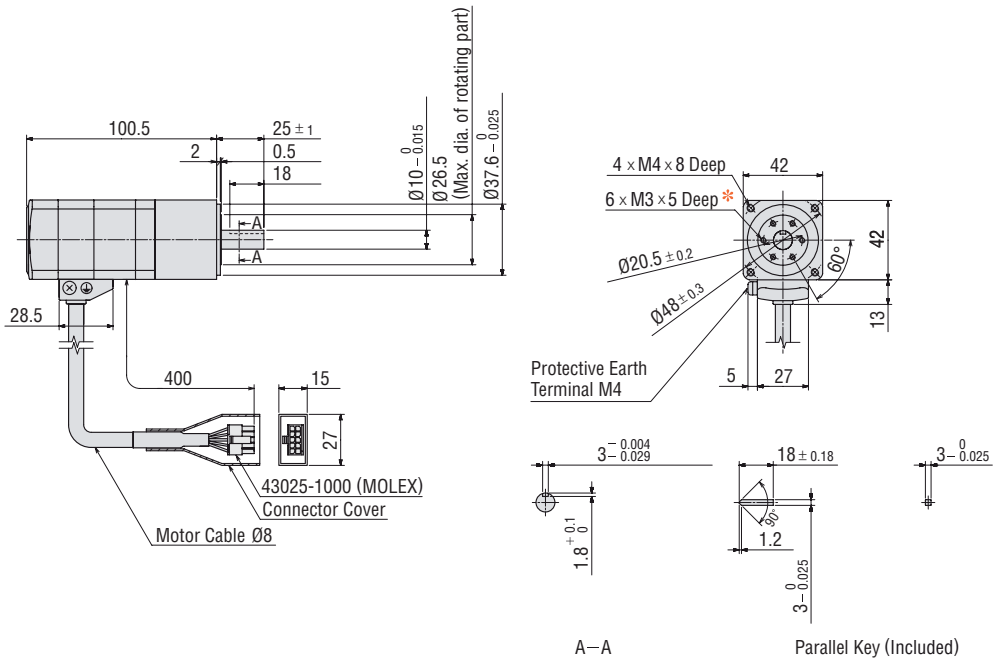
Model	Motor Model	Gear Ratio	L	Mass kg
AR98MK-N ■-◇	ARM98MK-N ■	**5 , 7.2 , 10**	182	4.4
		25 , 36 , 50	205	5.1



◇Harmonic Geared Type

19 □42 mm

Model	Motor Model	Gear Ratio	Mass kg
AR46AK-H ■-◇	ARM46AK-H ■	**50 , 100**	0.68

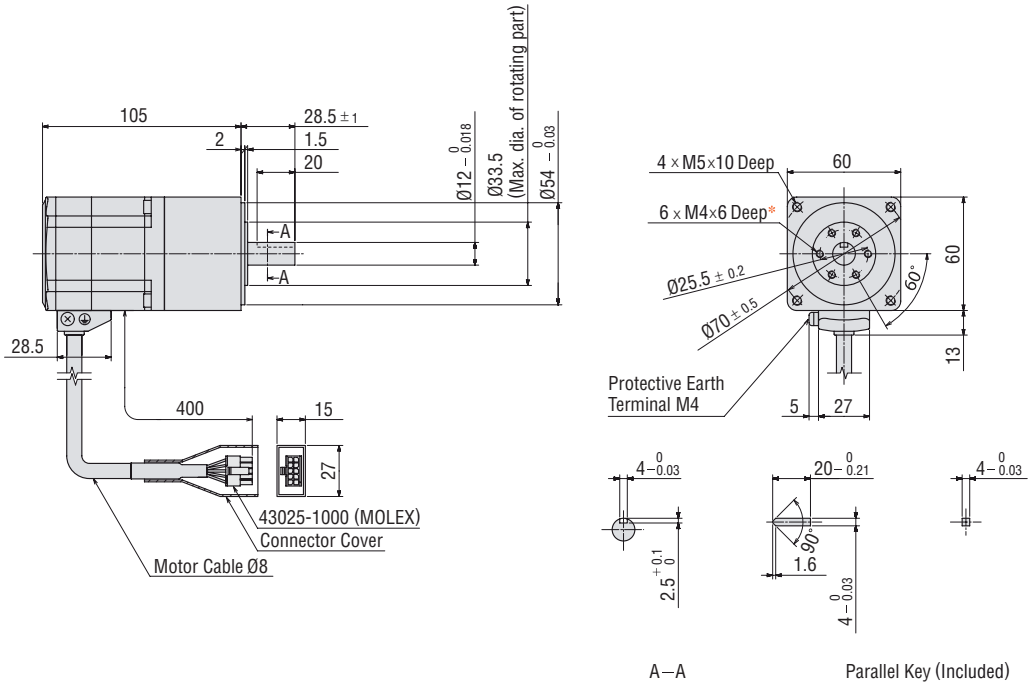


✻The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

- Enter the gear ratio in the box (■) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

20 □60 mm

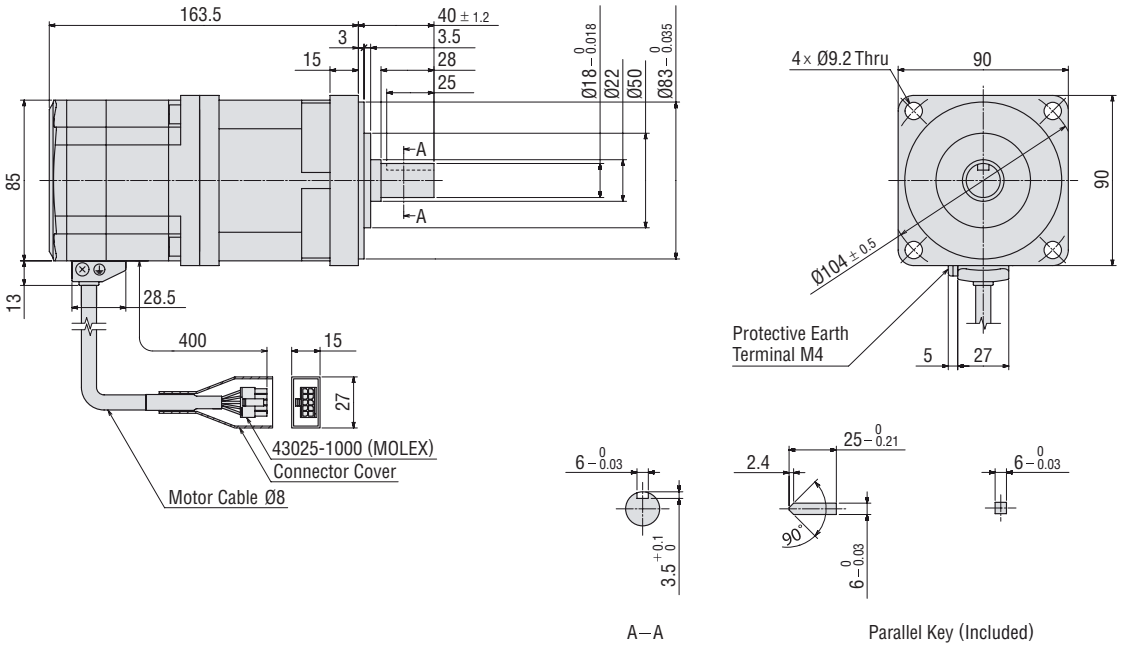
Model	Motor Model	Gear Ratio	Mass kg
AR66AK-H ■-◇	ARM66AK-H ■	**50 , 100**	1.41



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

21 □90 mm

Model	Motor Model	Gear Ratio	Mass kg
AR98AK-H ■-◇	ARM98AK-H■	**50 , 100**	4.0

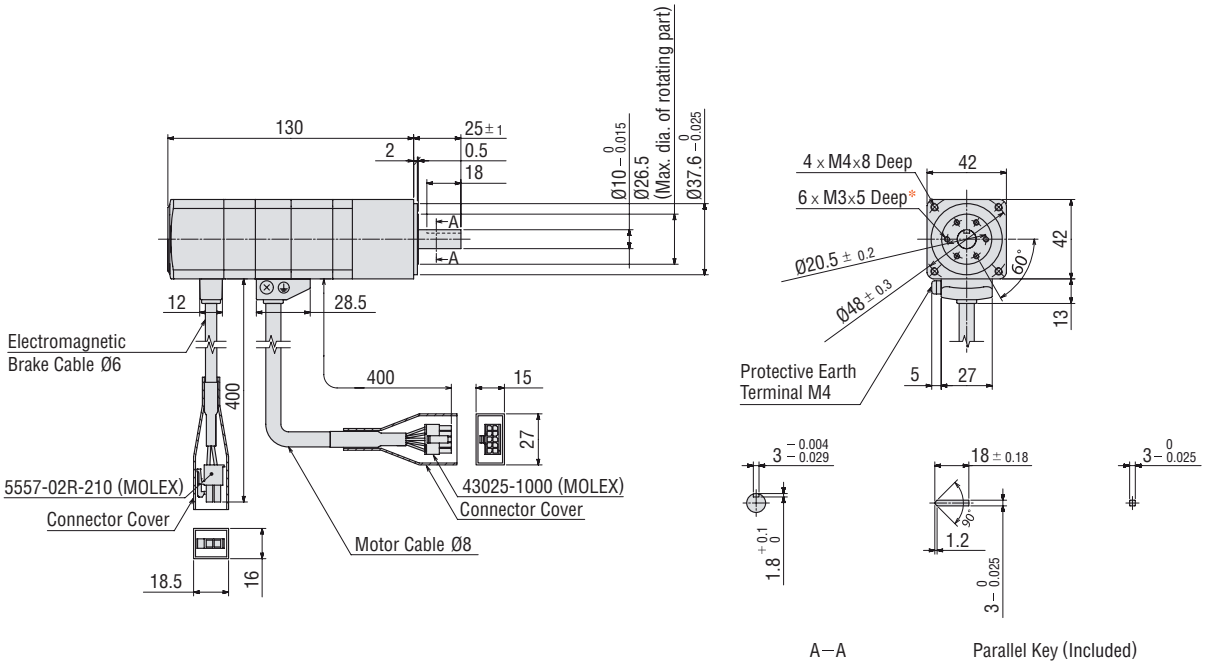


- Enter the gear ratio in the box (■) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

◇Harmonic Geared Type with Electromagnetic Brake

22 □42 mm

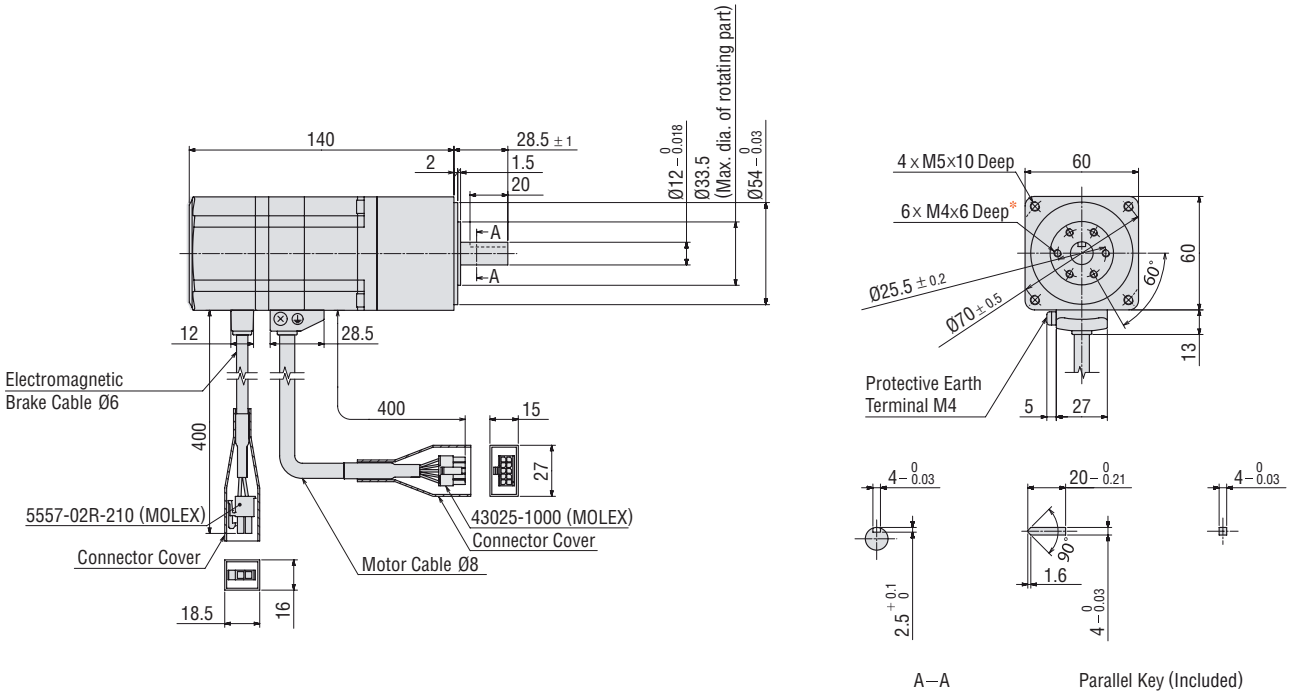
Model	Motor Model	Gear Ratio	Mass kg
AR46MK-H ■-◇	ARM46MK-H■	**50 , 100**	0.83



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

23 □60 mm

Model	Motor Model	Gear Ratio	Mass kg
AR66MK-H ■-◇	ARM66MK-H■	**50 , 100**	1.71

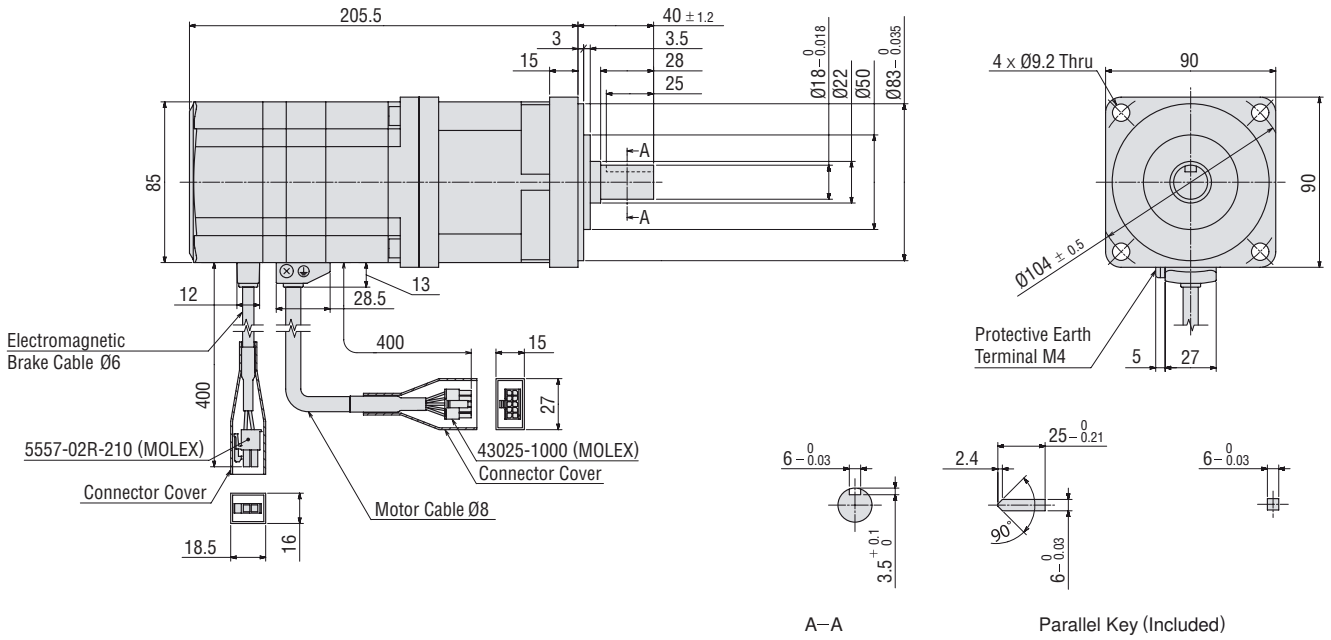


*The position of the output shaft relative to the screw holes on the rotating part is arbitrary.

- Enter the gear ratio in the box (■) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

24 □90 mm

Model	Motor Model	Gear Ratio	Mass kg
AR98MK-H ■-◇	ARM98MK-H■	**50 , 100**	4.6

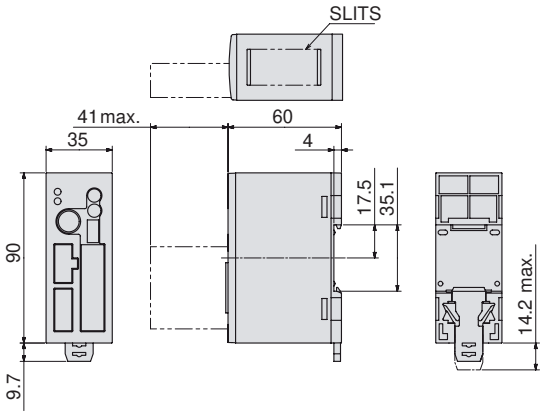


- Enter the gear ratio in the box (■) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.

Driver

25 Common to All DC Types

Mass: 0.17 kg

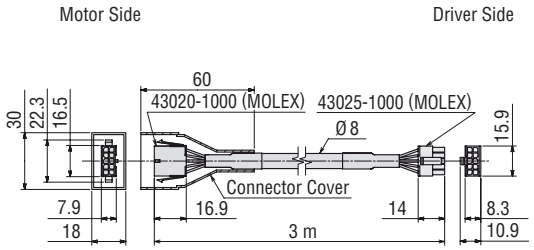


- Control I/O Connector (CN5)
  Cover Assembly: 54331-1361 (MOLEX)
  Connector: 54306-3619 (MOLEX)
- Connector for Power Supply Input/Frame Ground Terminal (CN1)
  Connector: MC1.5/3-STF-3.5 (PHOENIX CONTACT)

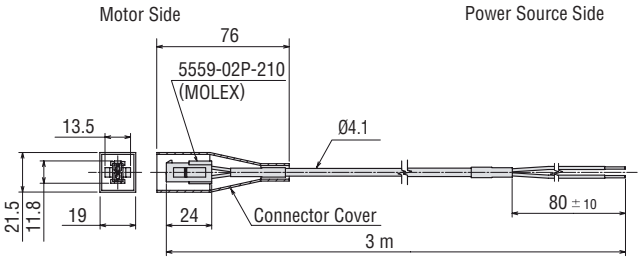
Motor Cable (Included), Electromagnetic Brake Cable (Included)

26 Common to All DC Types

• Motor Cables



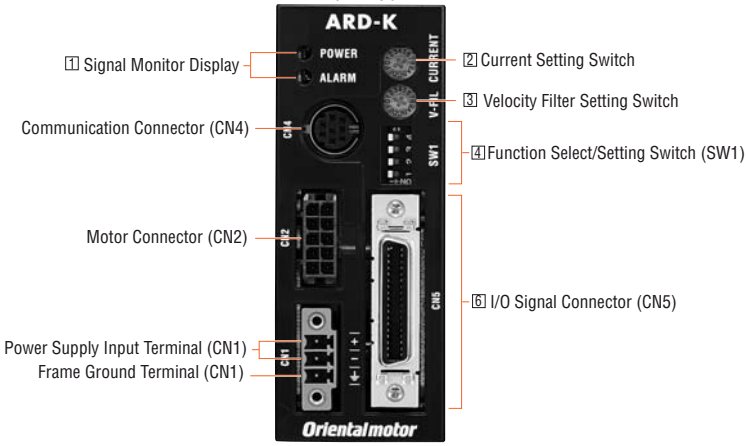
• Electromagnetic Brake Cables (Only for electromagnetic brake type)



Connection and Operation

Names and Functions of Driver Parts

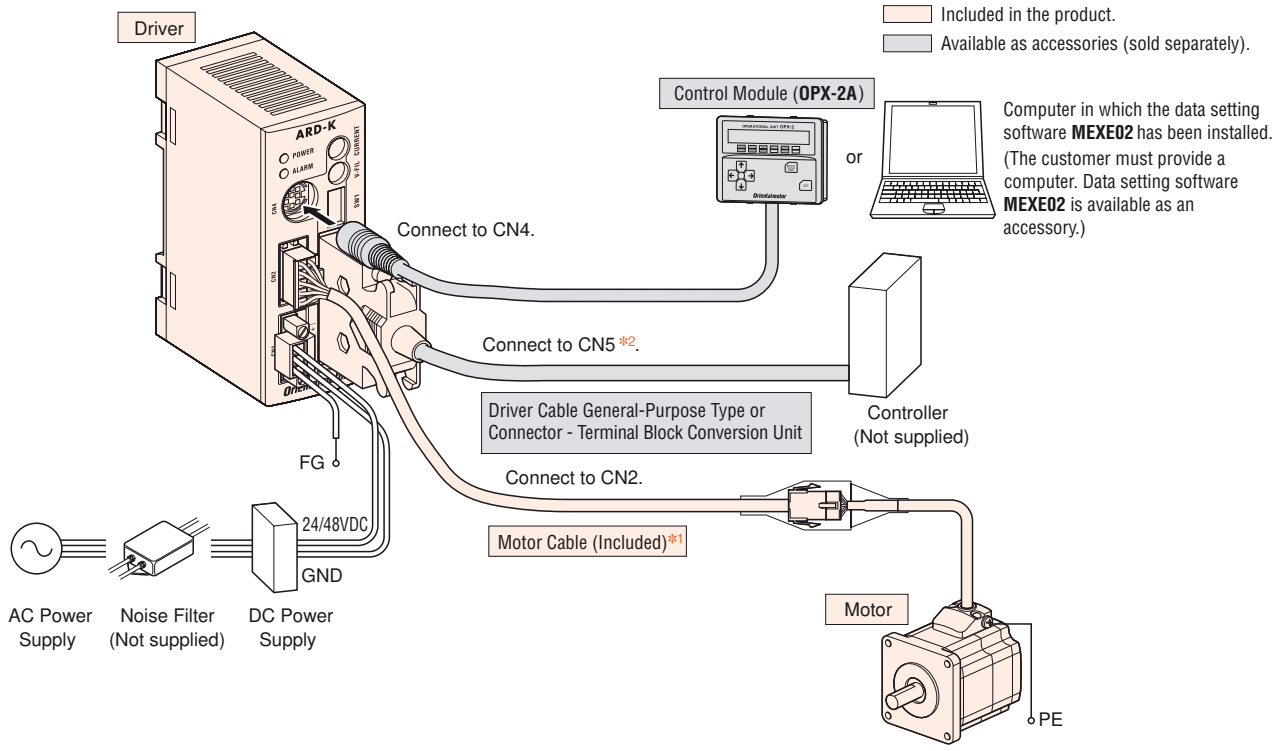
DC Input Type



Connection Diagram

◇Connection to Peripheral Equipment

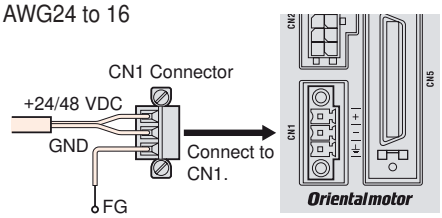
• DC Input Type



*1 Each model comes with a motor cable 3 m long. If you need a cable of a different length, or a flexible cable, select an appropriate cable from among the accessories (sold separately).
*2 Each model comes with a control I/O connector (CN5), but you must select the driver cable general-purpose type or connector-terminal block conversion unit, both of which are provided as accessories (sold separately).

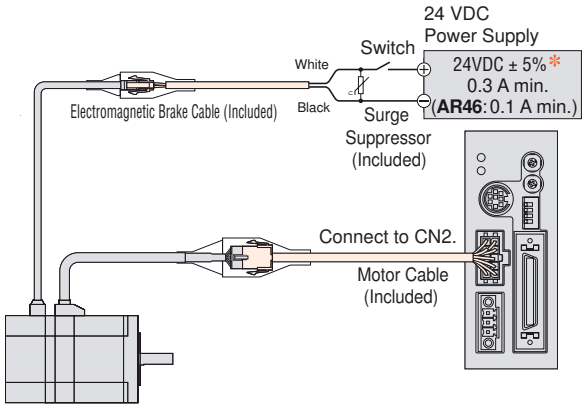
◇Connecting a Main Power Supply

Use the following cable for the power supply line;
AWG24 to 16



◇Connecting the Electromagnetic Brake

Provide a 24 VDC power supply



*If the distance between the motor and driver is extended to 20 m or longer, use a power supply of 24 VDC ± 4%.

Note:

- To protect the switch contacts and prevent noise, always connect the surge suppressor. (The surge suppressor is included with electromagnetic brake motors.)

Accessories (Sold separately)

Data Setting Software RoHS

Extended functions of the **AR** Series are available. You can change the internal parameters or set the push-motion operation using a PC.

Product Line

Model
MEXE02

PC interface cable of 5 m and USB cable of 0.5 m are included.

Operating Software

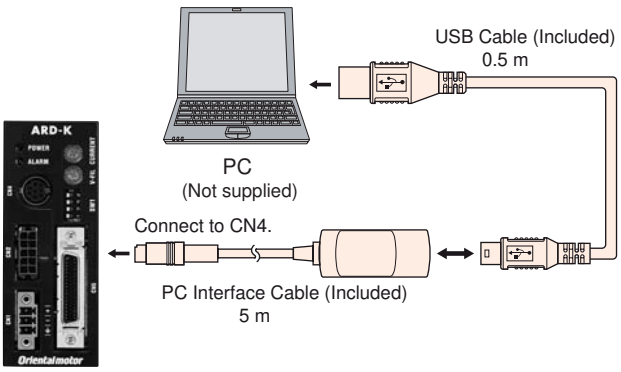
Windows® 2000 Professional Service Pack 4 or later
Windows® XP Home Edition Service Pack 2 or later *
Windows® XP Professional Service Pack 2 or later *
Windows® Vista Home Basic Service Pack 1 or later *
Windows® Vista Home Premium Service Pack 1 or later *
Windows® Vista Business Service Pack 1 or later *
Windows® Vista Ultimate Service Pack 1 or later *

* MEXE02 is not available for 64-bit (x64, IA64) Windows XP and Windows Vista.

Computer

CPU	Pentium Ⅲ 800 MHz or more (The OS must be supported.)
Display Resolution	XGA (1024×768) or higher resolution video adapter and monitor
Memory	Windows® 2000 Professional : 448 MB or more Windows® XP Home Edition, Professional: 512 MB or more Windows® Vista Home Basic : 896 MB or more Windows® Vista Home Premium, Business Ultimate: 1.4 GB or more
Free Hard Disk Space	Available disk space of 30 MB or more
USB Port	USB 1 port
Disk Device	CD-ROM drive

Connection between Computer and Driver



Control Module RoHS

Extended functions of the **AR** Series are available. You can change the internal parameters or set the push-motion operation.

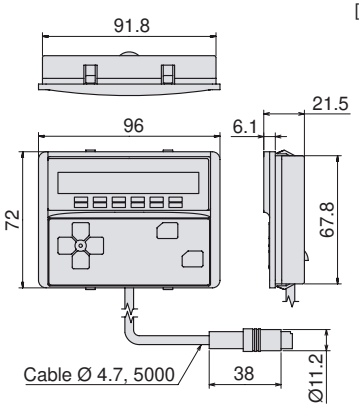
Product Line

Model
OPX-2A

Dimensions (Unit = mm)

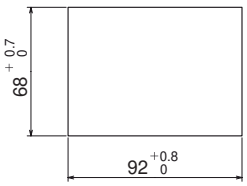
Control Module

Mass: 0.25 kg



Panel Cut-Out for Control Module

[Thickness of the mounting plate: 1 ~ 3 mm]

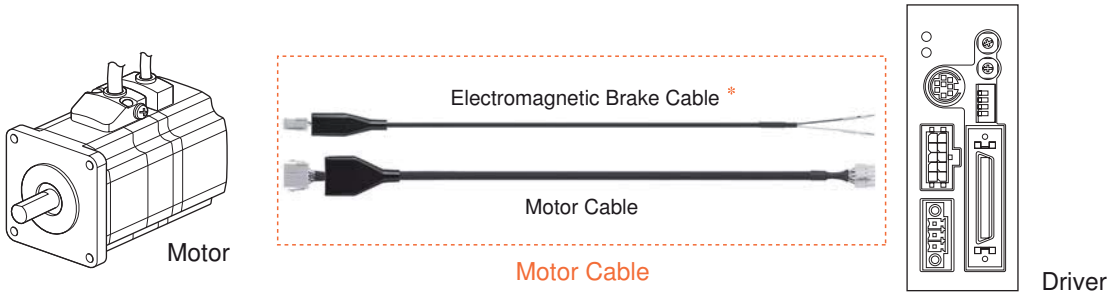


Motor Cables RoHS
Extension Cables RoHS

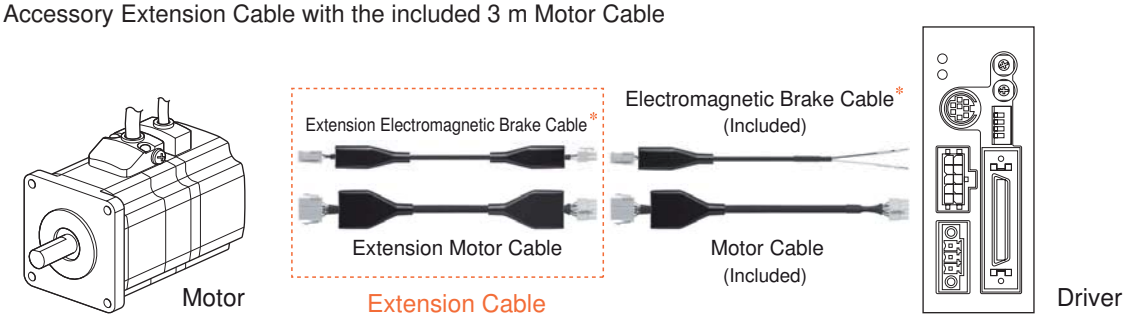
The **AR** Series comes with a 3 m cable for connection between the motor and driver. When it is necessary to have a connection of a different length between motor and driver, a motor cable or extension cable must be used. Use a flexible motor cable if the cable will be flexed repeatedly.

System Configuration

Using an Accessory Motor Cable (Not using the 3 m cable included in the **AR** Series)



Using an Accessory Extension Cable with the included 3 m Motor Cable



* Electromagnetic brake cable and extension electromagnetic cable are for electromagnetic brake motors. For DC input type, connect the lead wires of the electromagnetic brake cable to the 24 VDC power supply, not to the driver.

Note:

- Keep the total cable length below 30 m when connecting a cable included in the **AR** Series and an extension cable.

Type of Cables

Motor Cables

Cable Category	Cable Type	Contents
Standard Cable	Motor cable	Motor cable
	Cable set for electromagnetic brake motor	Motor cable Electromagnetic brake cable
Flexible Cable	Flexible motor cable	Flexible motor cable
	Flexible cable set for electromagnetic brake motor	Flexible motor cable Flexible electromagnetic brake cable

Extension Cables

Cable Category	Cable Type	Contents
Standard Extension Cable	Extension motor cable	Extension motor cable
	Extension cable set for electromagnetic brake motor	Extension motor cable Extension electromagnetic brake cable
Flexible Extension Cable	Flexible extension motor cable	Flexible extension motor cable
	Flexible extension cable set for electromagnetic brake motor	Flexible extension motor cable Flexible extension electromagnetic brake cable

- Flexible Cable: A flexible cable offering excellent flexibility. Use this cable when the cable is bent and flexed repeatedly
- Cable Set for Electromagnetic Brake Motor: Choose the cable set for electromagnetic brake motor consisting of a motor cable and an electromagnetic brake cable for electromagnetic brake motors.

For DC Input Type

◇ Motor Cables

Motor Cable

Motor Cable

Electromagnetic Brake Cable

Motor Cables

Model	Length L m
CC010VAF2	1
CC020VAF2	2
CC030VAF2	3
CC050VAF2	5
CC070VAF2	7
CC100VAF2	10
CC150VAF2	15
CC200VAF2	20
CC300VAF2	30

Flexible Motor Cables

Model	Length L m
CC010VAR2	1
CC020VAR2	2
CC030VAR2	3
CC050VAR2	5
CC070VAR2	7
CC100VAR2	10
CC150VAR2	15
CC200VAR2	20
CC300VAR2	30

Cable Set for Electromagnetic Brake Motor

Model	Length L m
CC010VAFB2	1
CC020VAFB2	2
CC030VAFB2	3
CC050VAFB2	5
CC070VAFB2	7
CC100VAFB2	10
CC150VAFB2	15
CC200VAFB2	20
CC300VAFB2	30

Flexible Cable Set for Electromagnetic Brake Motor

Model	Length L m
CC010VARB2	1
CC020VARB2	2
CC030VARB2	3
CC050VARB2	5
CC070VARB2	7
CC100VARB2	10
CC150VARB2	15
CC200VARB2	20
CC300VARB2	30

◇ Extension Cables

Extension Motor Cable

Extension Motor Cable

Extension Electromagnetic Brake Cable

Extension Motor Cables

Model	Length L m
CC010VAFT2	1
CC020VAFT2	2
CC030VAFT2	3
CC050VAFT2	5
CC070VAFT2	7
CC100VAFT2	10
CC150VAFT2	15
CC200VAFT2	20

Flexible Extension Motor Cables

Model	Length L m
CC010VART2	1
CC020VART2	2
CC030VART2	3
CC050VART2	5
CC070VART2	7
CC100VART2	10
CC150VART2	15
CC200VART2	20

Extension Cable Set for Electromagnetic Brake Motor

Model	Length L m
CC010VAFBT2	1
CC020VAFBT2	2
CC030VAFBT2	3
CC050VAFBT2	5
CC070VAFBT2	7
CC100VAFBT2	10
CC150VAFBT2	15
CC200VAFBT2	20

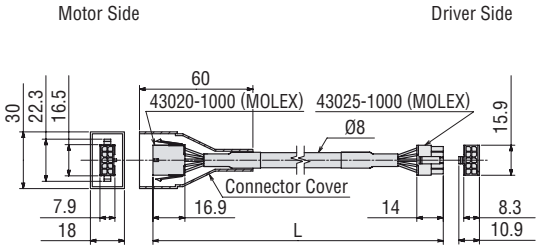
Flexible Extension Cable Set for Electromagnetic Brake Motor

Model	Length L m
CC010VARBT2	1
CC020VARBT2	2
CC030VARBT2	3
CC050VARBT2	5
CC070VARBT2	7
CC100VARBT2	10
CC150VARBT2	15
CC200VARBT2	20

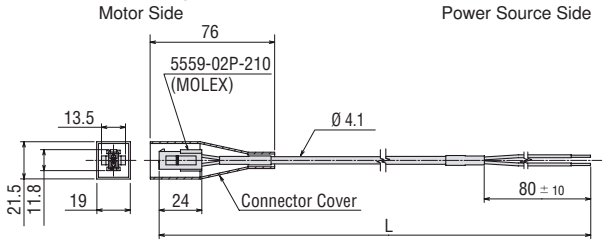
Dimensions (Unit = mm)

◇ Motor Cables

Motor Cable, Flexible Motor Cable

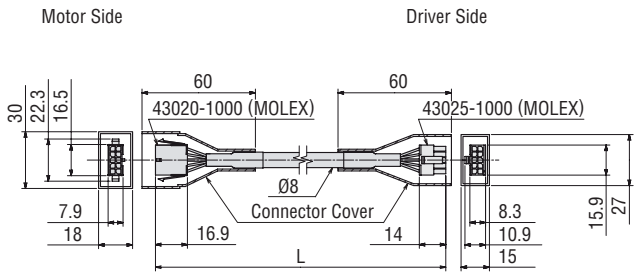


Electromagnetic Brake Cable, Flexible Electromagnetic Brake Cable

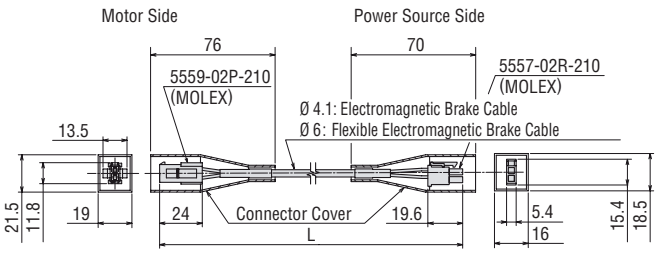


◇ Extension Cables

Extension Motor Cable, Flexible Extension Motor Cable



Extension Electromagnetic Brake Cable, Flexible Extension Electromagnetic Brake Cable



Driver Cables

1 General-Purpose Type RoHS

This is a shielded cable equipped with, at one end of the cable, the half-pitch connector that snaps onto the driver.

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

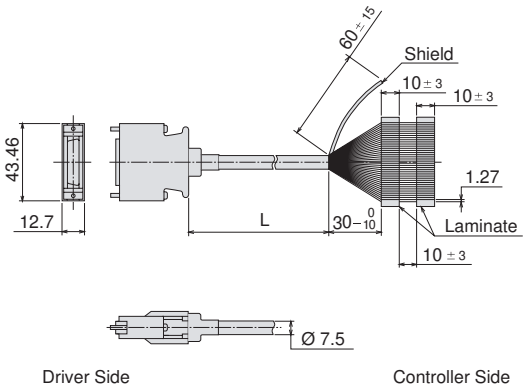
Product Line

Model	Applicable Connector	Length L m
CC36D1-1	CN5 (36 pins)	1
CC36D2-1		2

Dimensions (Unit = mm)

CC36D1-1, CC36D2-1

Conductor: AWG28



2 Connector – Terminal Block Conversion Unit RoHS

CC36T1

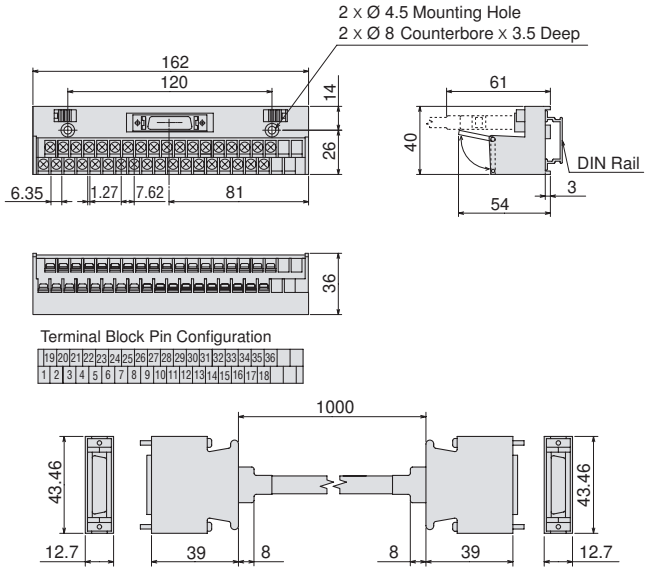
A conversion unit that connects a driver to a host controller using a terminal block.
- With a signal name plate for easy, one-glance identification of driver signal names
- DIN-rail mountable
- Cable length: 1 m

Product Line

Model	Applicable Connector	Length m
CC36T1	CN5 (36 pins)	1

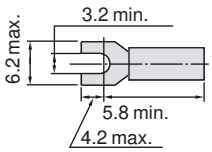
Dimensions (Unit = mm)

CC36T1



- Recommended Crimp Terminals
- Terminal screw size: M3
- Tightening torque: 1.2 N·m
- Applicable minimum lead wire: AWG22

Note:
- Round terminals cannot be used.



Flexible Couplings RoHS
MCS Couplings

Features of MCS Couplings

This three-piece coupling adopts an aluminum alloy hub and a resin spider. The simple construction ensures that the high torque generated by a geared motor can be transmitted reliably. The proper elasticity of the spider suppresses motor vibration.

- High strength (suitable for geared motors) has been realized.
- A spider (material: polyurethane) controls the vibration generated by the motor.
- No backlash

Product Number Code

MCS 30 08 12

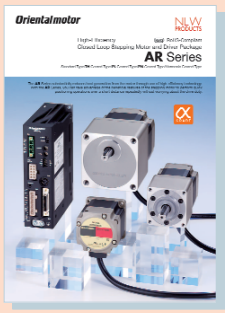
① ② ③ ④

①	**MCS** Couplings
②	Outer Diameter of Coupling
③	Inner Diameter d1 (Smaller side) [**F04** represents Ø 6.35 mm]
④	Inner Diameter d2 (Larger side) [**F04** represents Ø 6.35 mm]

Product Line

Model
MCS14 □
MCS20 □
MCS30 □
MCS40 □
MCS55 □
MCS65 □

- Enter the inner diameters of coupling in the box (□) within the model name.



AR Series
AC Input Type
You can order the catalogue separately.

Motor Mounting Brackets RoHS

Mounting brackets are convenient for installation and securing a stepping motor and/or a geared stepping motor.

Product Line

Standard Type

Material: Aluminum alloy

Model	Applicable Product
PAF0P	**AR46**□□**-**◇
PAL0PA	**AR46**□□**-**◇
PAL2P-5	**AR66**□□**-**◇ **AR69**□□**-**◇
PAL4P-5	**AR98** □□**-**◇ **AR911**□□**-**◇ *

- Enter **A** (single shaft), **B** (double shaft) or **M** (electromagnetic brake) in the box (□) within the model name. Enter the power supply voltage (**A**, **C**, **S** or **K**) in the box (□) within the model name. Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.
- The mounting bracket base is built with holes large enough to allow for alignment adjustments in the horizontal direction.
- These mounting brackets can be perfectly fitted to the pilot of the stepping motors. (Except for **PAL0P**)

* Enter **A** (single shaft) or **B** (double shaft) in the box (□) within the model name of AR911□□**-**◇. Enter the power supply voltage (**A**, **C** or **S**) in the box (□) within the model name of AR911□□**-**◇.

Note:

- They cannot be used with geared stepping motors.

Geared Type

Material: Aluminum alloy

Model	Applicable Product
SOL0B	**AR46**□□**-T**■**-**◇
SOL2A	**AR66**□□**-T**■**-**◇
SOL5B	**AR98**□□**-T**■**-**◇

- Enter **A** (single shaft), **B** (double shaft) or **M** (electromagnetic brake) in the box (□) within the model name. Enter the power supply voltage (**A**, **C**, **S** or **K**) in the box (□) within the model name.
- Enter the gear ratio in the box (■) within the model name.
- Enter the length of included cable **1** (1 m), **2** (2 m) or **3** (3 m) in the box (◇) within the model name.
- The mounting bracket base is built with holes large enough to allow for alignment adjustments in the horizontal direction.
- No screws are supplied for installing. Appropriate screws must be purchased separately.

This product is manufactured at a plant certified with the international standards **ISO 9001** (for quality assurance) and **ISO 14001** (for systems of environmental management).

Specifications are subject to change without notice.
This catalogue was published in February, 2010.

Orientalmotor

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UK/022010/VERS02
Printed in Germany