⚠ Safety Precautions

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

- The factories which manufacture the products listed in this catalogue have obtained Quality Management Systems ISO9001 and Environment Management Systems ISO14001.
- The content listed in this catalogue such as performance and specifications of the products are subject to change without notice for improvements.
- The price of all products listed in this catalogue does not include the consumption tax etc.
- For details of the products, please contact the nearest sales office.
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Orientalmotor

Hybrid Control System αSTEP

AR Series

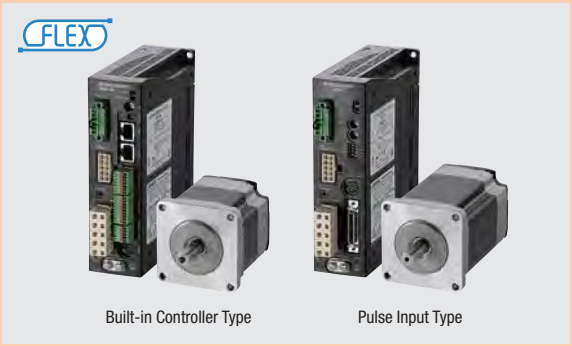
Lineup Added

Closed Loop Stepping Motor and Driver

αSTEP

Hybrid Control System αSTEP
AR Series AC Input

●For detailed information about regulations and standards, please see the Oriental Motor website.



Stepper motor based hybrid motors utilize a unique control system combining the benefits of "open loop control" and "closed loop control". During normal conditions, these motors provide high response through synchronous operation with commands using open loop control. In an overload situation, the motor position is corrected with the closed loop control and operation is maintained. These are motors that are both easy to use and highly reliable.

- ●High Reliability with Closed Loop Control
- ●High Efficiency Technology Reduces Motor Heat Generation
- ●Capable of High Positioning Accuracy
- ●2 Driver Types to Choose from
  Built-in Controller Type FLEX / Pulse Input Type

FLEX What is FLEX?

FLEX is the collective name for products that support I/O control, Modbus (RTU) control, and FA network control via network converters. These products enable simple connection and simple control, shortening the total lead time for system construction.

Features

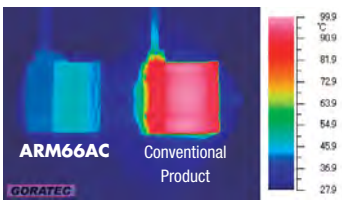
High Reliability with Closed Loop Control

Continuous Operation Utilizing High-Efficiency Technology

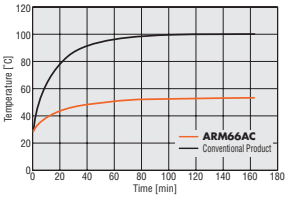
●Lower Heat Generation

Heat generation by the motor has been significantly reduced through higher efficiency.

●Temperature Distribution by Thermography



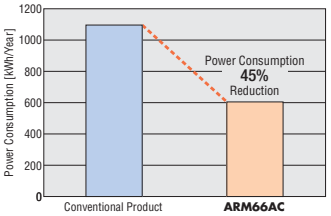
●Motor Case Temperature under Same Operating Conditions



Comparison under the same conditions

●45% Less Power Consumption* than Conventional Oriental Motor Products Due to Energy-Saving Features

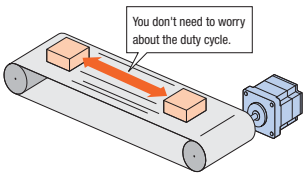
●Power Consumption



*Operating Condition
- Speed: 1000 r/min, load factor 50%
- Operating Time: 24 hours of operation, 365 days/year (70% operating, 25% stand-by, 5% off)
- Power Supply Input: Single-Phase 200 - 230 VAC

●Continuous Operation (Operation at a High Duty Cycle)

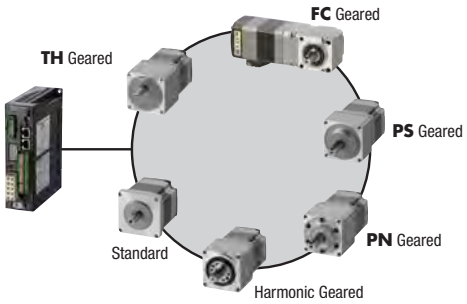
The **AR** Series can be operated at high frequency.
The motor can operate continuously



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

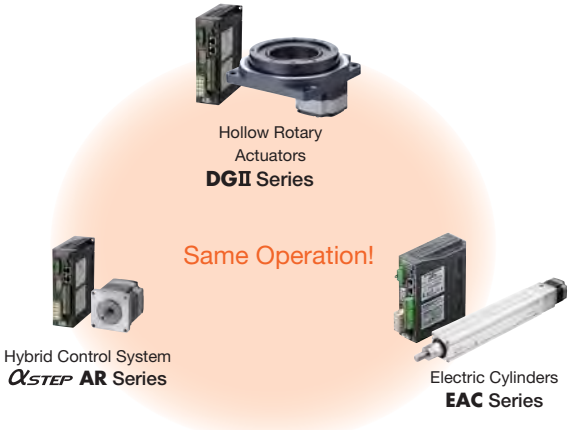
A Single Driver to Support a Variety of Motors

The driver is equipped with an automatic recognition function, which recognizes the attached motor.
Various types of motors, such as the standard type and the geared type, can be attached to a single driver. Therefore, there is no need to change the driver to match the motor to be attached. Maintenance is easier.



Actuators Equipped with **AR** Series

All of the products equipped with the **AR** series feature standardized controllability.



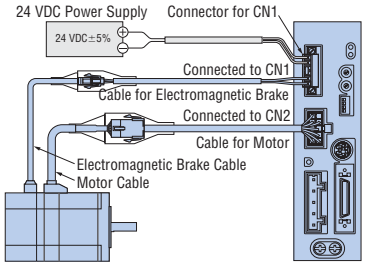
Easy to Use with High Functionality

Automatically Controlled Electromagnetic Brake

It is not necessary to provide a separate circuit to control the electromagnetic brake. The electromagnetic brake is released when the motor is excited (= the current ON input is turned ON), and activated to hold the load in position when the excitation is cut off (= the current ON input is turned OFF).

Note

- A separate 24 VDC power supply is required excluding the pulse input type driver.
- A separate 24 VDC power supply is required for electromagnetic brake control.



Separation of Main Power and Control Power

The control power-input terminals are provided separately from the main power terminals. This means that even when the main power is cut off due to an emergency stop, etc., the current position can still be detected and alarm information can still be checked, as long as the power (24 VDC) is supplied to the control power-input terminals.

- For the pulse input type, operation is also possible with the main power supply only.

Up to 30 m Wiring Distance Between Motor and Driver

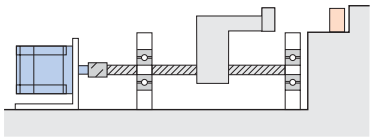
A connection cable can be used to extend the wiring distance up to 30 m. Extension cables and flexible extension cables are available as accessories (sold separately).

Push-Motion Operation

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

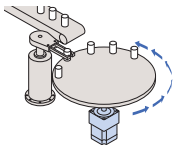
Note

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



Position Control in the Same Direction

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



✻When building an absolute system, the accessory battery is necessary (sold separately).

Also Supports Absolute Systems

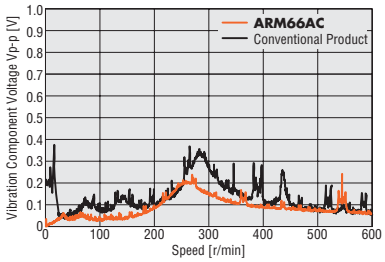
You can build an absolute system that detects absolute positions by connecting the accessory battery (sold separately).
(Available only on the built-in controller type.)

- Battery Set (Sold separately)

A Stepper Motor with Advanced Characteristics, Easier to Use

Low Vibration

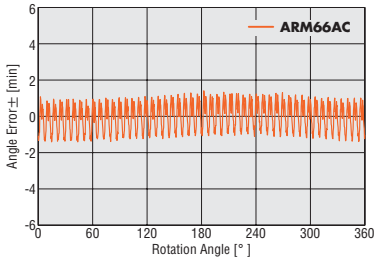
In addition to the microstep drive system, a smooth drive function is equipped to achieve smoother operation.
The smooth drive function automatically implements microstep drive based on the same traveling amount and traveling speed used in the full step mode, without changing the pulse input settings.



Improved Angular Accuracy

The improved current control technology improves the stop position accuracy of the motor. The result is greater positioning accuracy.

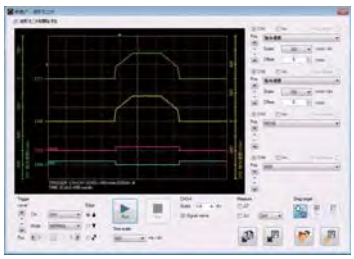
ARM66AC : ±3 arcmin (degrees)
Conventional Product: ±5 arcmin (degrees)



Easy Setting and Easy Monitoring

By using the **MEXE02** support software, a computer can be used to change operating data or parameters, as well as to perform monitoring.

- Monitoring of Operating Condition by Waveform



A highly efficient monitoring function that allows for easy identification of the motor and I/O status at a glance.

Complying with Various Standards to Support Diverse Equipment Designs

Motor Protection Degree: IP65*

The motor complies with the requirements of protection degree IP65* (except for the motor mounting surface and connectors).
This means that the enclosure prevents intrusion of dust that can otherwise inhibit normal operation.

✻For double shaft products, the degree of protection is IP20.

Conforms to International Safety Standards

These products are recognized by UL/CSA and they also bear the CE Marking as a proof of conformance to the Low Voltage and EMC Directives.

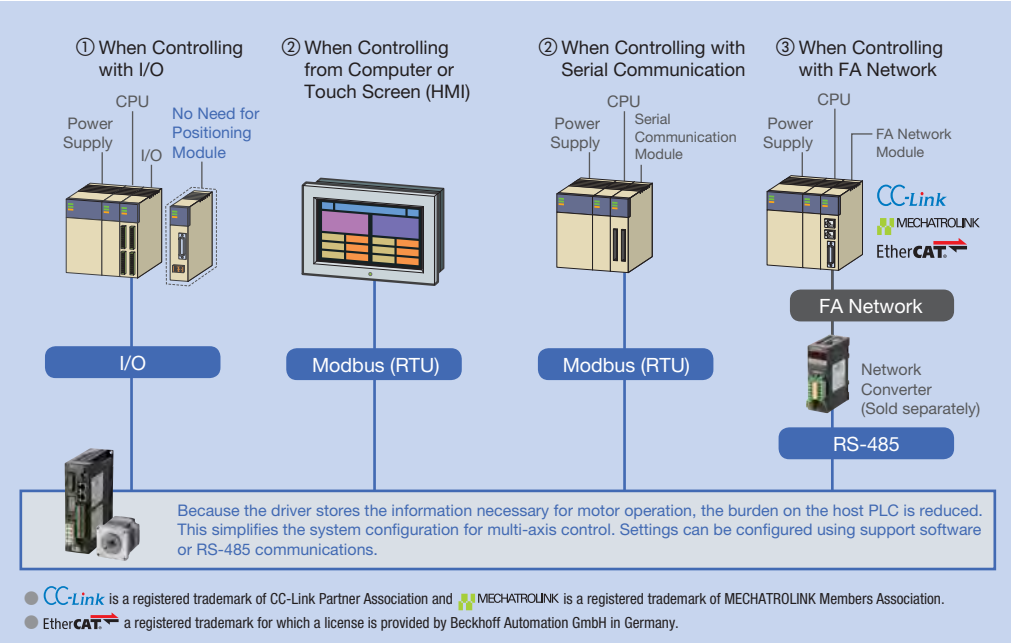
Conforms to Semiconductor Equipment Materials International Standard "SEMI F47"

These products comply with the SEMI Standard on power supply voltage drop, and accordingly can be used effectively in semiconductor manufacturing apparatuses.
Effective for use in semiconductor equipment.
The customer is advised to always evaluate the motor on the actual equipment.

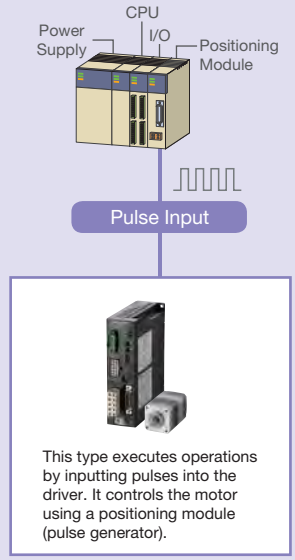
2 Driver Types Available Depending on the System Configuration

2 types of **AR** Series drivers are available, depending on the master control system in use.

Built-in Controller Type FLEX



Pulse Input Type



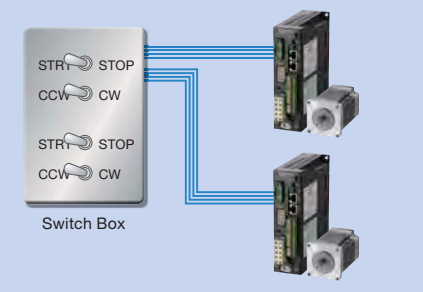
This type executes operations by inputting pulses into the driver. It controls the motor using a positioning module (pulse generator).

Control System Configuration for Built-in Controller Type

① I/O Control

The positioning module (pulse generator) function is built into the driver, and therefore an operation system using I/O can be created by connecting directly to a switch box or PLC. A positioning module is not necessary on the PLC side, saving space and simplifying the system.

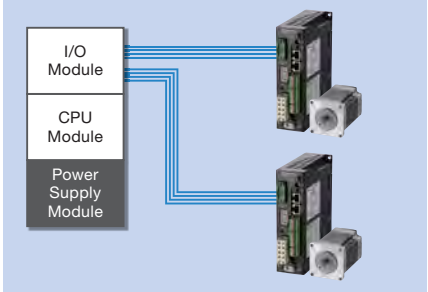
Example of Using a Switch Box



Operating data is set in the driver, and the motor can be started or stopped simply by connecting a switch. Control can be performed easily without using PLC.

Easy Control | Low-Cost Design

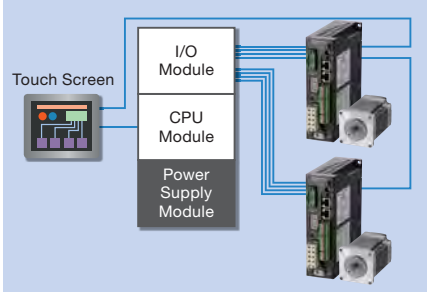
Example of Using PLC



When using PLC, an operation system can be created by connecting directly to an I/O module. A positioning module is not necessary on the PLC side, therefore space is saved and the system is simplified.

Easy Control | Low-Cost Design | Space Saving

Example of Using PLC and a Touch Screen



Normally, the motor is started and stopped with I/O. Changing the operating data settings and displaying the monitors and alarms is performed with the touch screen using Modbus (RTU) communication. When there is a lot of setup work, changes can be easily performed on the touch screen, and the burden of creating ladders is reduced.

Easy Control | Support for Small Lots of Multiple Products

② Control via Modbus (RTU)/RS-485 Communication

RS-485 communication can be used to set operating data and parameters and input operation commands. Up to 31 drivers can be connected to 1 serial communication module. There is a function that enables multiple motors to be started simultaneously. The Modbus (RTU) protocol is supported and can be used to connect to touch screens and computers.

Easy Control | Simple Wiring | Supports Brands of Serial Module | Motor Controlled by Computer | Simplified System

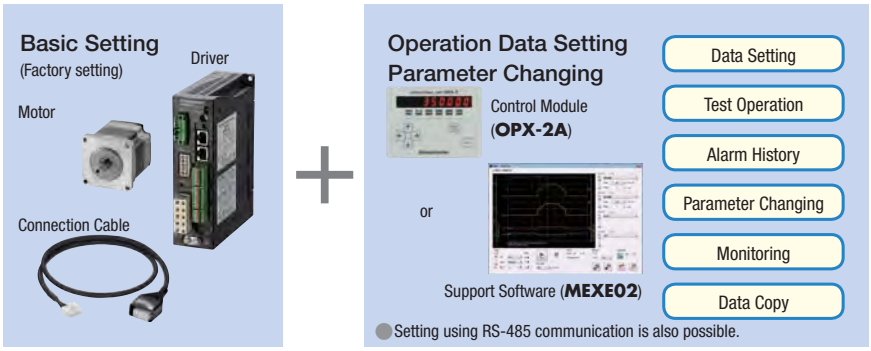
③ Control via FA Network

By using a network converter (sold separately), CC-Link, MECHATROLINK or EtherCAT communication are possible. These can be used to set operating data and parameters and input operation commands.

Easy Control | Simple Wiring | Multi-Axis Control at Low Cost

Built-in Controller Type FLEX

Because the driver has the information necessary for motor operation, the burden on the host PLC is reduced. The system configuration when using multi-axis control has been simplified.
Settings are configured using a control module **OPX-2A** (sold separately), support software **MEXE02** or RS-485 communication.



Operation Types

In the built-in controller type, the operating speed and traveling amount of the motor are set with operating data, and operation is performed according to the selected operating data. There are four types of motor operations.

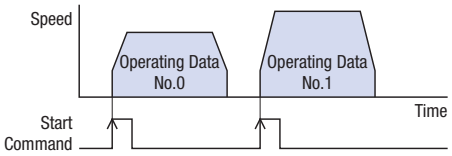
Item		Description	
Common	Control Method	I/O control	
		RS-485 Communication	Network converter connection
			Modbus RTU protocol connection
	Position Command Input	Setting with operating data number	Command range for each point: −8388608～8388607 [step] (Setting unit: 1 [step])
	Speed Command Input	Setting with operating data number	Command Range: 0～1000000 [Hz] (Setting unit: 1 [Hz])
	Acceleration/ Deceleration Command Input	Set with the operating data number or parameter. The acceleration/deceleration rate [ms/kHz] or acceleration/deceleration time [s] can be selected. Command Range: 0.001～1000.000 [ms/kHz] (Setting unit: 0.001 [ms/kHz]) 0.001～1000.000 [s] (Setting unit: 0.001[s])	
	Acceleration/ Deceleration Processing	Velocity filter, movement average filter	
Return-To-Home Operation	Return-to-Home Modes	2-Sensor Mode	A return-to-home operation that uses a limit sensor (+LS, −LS)
		3-Sensor Mode	A return-to-home operation that uses a limit sensor and a HOME sensor.
		Pushing Mode*1	A return-to-home operation by pressing the table against the mechanical end of a linear slide, etc.
		Position Preset	A function where P-PRESET is input at the desired position to confirm the home position.
			The home position can be set to the desired value.
Positioning Operation	Number of Positioning Points	64 points (No. 0～63)	
	Operating Modes	Incremental mode (Relative positioning)	
		Absolute mode (Absolute positioning)	
	Operation Functions	Independent Operation	A PTP (Point to Point) positioning operation.
		Linked Operation	A multistep speed-change positioning operation that is linked with operating data.
		Linked Operation 2	A positioning operation with a timer that is linked with operating data. The timer (dwell time) can be set from 0～50.000 [s]. (Setting unit: 0.001 [s])
		Push-Motion Operation*1	Continuous pressurizing position operations are performed with respect to the load. Maximum speed of operation is 500 [r/min] on the motor shaft.
	Start Methods	Operating Data Selection Method	Starts the positioning operation when START is input after selecting M0～M5.
		Direct Method (Direct positioning)	Starts the positioning operation with the operating data number set in the parameters when MS0～MS5 is input.
		Sequential Method (Sequential positioning)	Starts the positioning operation in sequence from operating data No. 0 each time SSTART is input.
Continuous Operation	Number of Speed Points	64 points (No. 0～63)	
	Speed Change Method	Changes the operating data number.	
Other Operations	JOG Operation	Regular feed is performed by inputting +JOG or −JOG.	
	Automatic Return Operation	When the motor position is moved by an external force while the motor is in a non-excitation state, it automatically returns to the position where it originally stopped.	
	Control Mode*2	The normal mode and the current control mode can be selected.	
Absolute Backup		You can build an absolute system by using a battery (accessory).	

*1 Do not perform push-motion operation using geared type motors. Doing so may damage the motor or gear unit.
*2 Except to further reduce heat generation or noise, using normal mode is recommended.

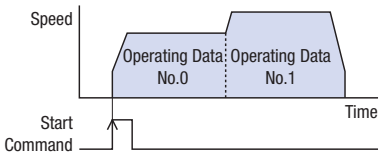
Positioning Operation

<Operation Functions>

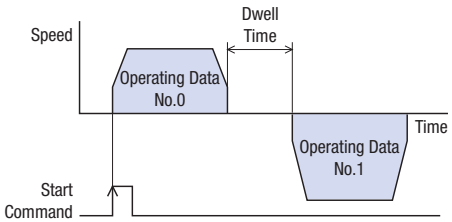
- Independent Operation



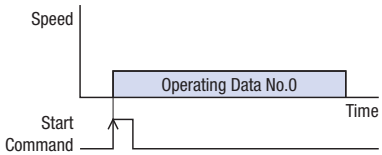
- Linked Operation



- Linked Operation 2



- Push-Motion Operation



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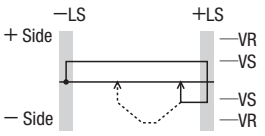
<Start Methods>

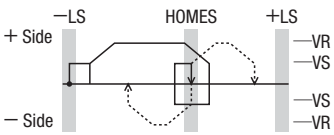
- Operating Data Selection Method
- Direct Positioning
- Sequential Positioning

Return-To-Home Operation

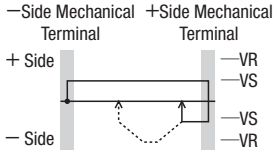
- 2-Sensor Mode



- 3-Sensor Mode

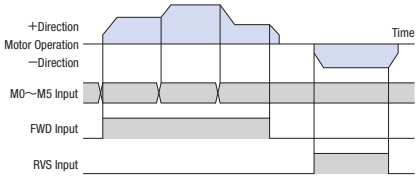


- Pushing Mode



- Position Preset

Continuous Operation



Other Operations

- JOG Operation (Test operation)
- Automatic Return Operation

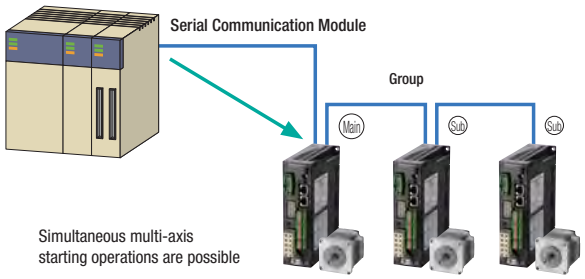
Equipped with a sequence for return-to-home operation that reduces the burden of the host master and the hassle of creating a ladder.

Group Send Function

Modbus (RTU) communication and FA network have a function that enables multiple motors to be started simultaneously.
Multiple drivers can be grouped together, and when an operation command is sent to the master driver, all the drivers that belong to the same group as the master driver will operate simultaneously.

- Modbus (RTU) control: Support for simultaneous start, changes to traveling amount and speed and monitoring
- FA network control: Simultaneous start only

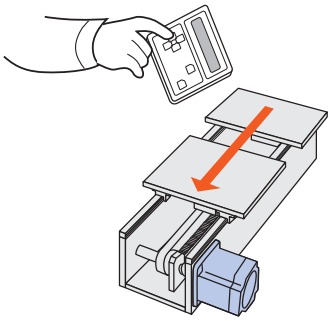
- Example of Modbus (RTU) Communication Control



Teaching Function

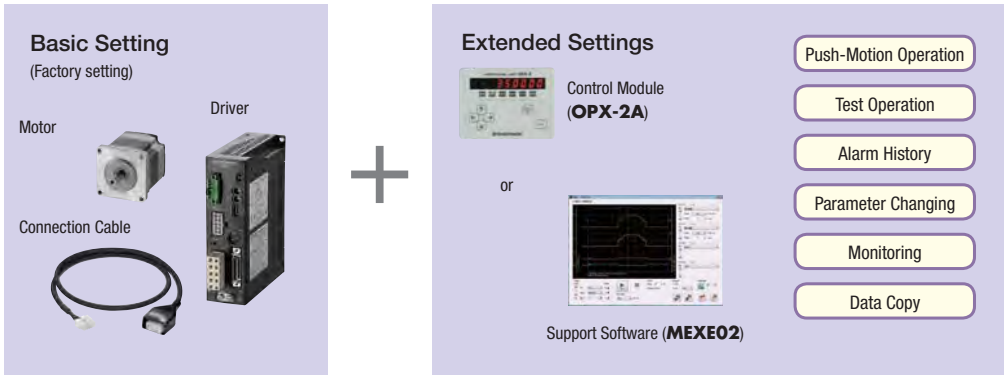
Teaching can be performed with the **OPX-2A** control module (sold separately) or the **MEXE02*** support software. The table is moved to the desired position, and the position data at that time is stored as the positioning data.

*The support software can be downloaded from the website. Please contact Oriental Motor for details.



Pulse Input Type

The control module **OPX-2A** (sold separately) and support software **MEXE02** can be used to change the parameters, display the alarm history, and perform various types of monitoring.



Main Additional Functions Available with Extended Settings

Item		Overview	Basic Setting	Extended Settings
Selection of Pulse Input Mode		1-pulse input mode or 2-pulse input (negative logic) mode can be selected.	●	●
		In addition to the normal settings, the phase difference input can also be set. · 1-pulse input mode (positive logic/negative logic) · 2-pulse input mode (positive logic/negative logic) · Phase difference input (1-multiplication/2-multiplication/4-multiplication)	–	●
Resolution Setting		The resolution can be selected with a function switch (D0, D1, CS0, CS1).	●	●
		The function switch can be used to the change each of the corresponding electronic gear values (D0, D1, CS0, CS1).	–	●
Running Current Setting		The running current setting can be changed with the current setting switch (CURRENT).	●	●
		The value corresponding to each stage of the current setting switch (CURRENT), 0～F (16 stages), can be changed.	–	●
Standstill Current Ratio Setting		The ratio of the standstill current relative to the running current can be set.	–	●
Motor Rotational Coordinates Setting		The rotational coordinates for the motor can be set.	–	●
Current On Signal (C-ON input)		The input signal for the excitation of the motor.	●	●
		The logic of the C-ON input during power supply input can be set.	–	●
Return to Excitation Position Operation During Current On Enable/Disable		Set whether or not to return to the excitation position (deviation 0 position) during current on.	–	●
I/O Input Signal Mode Selection		Input to select the push-motion operation*1.	–	●
Alarm Code Signal Enable/Disable		Set to output the code when an alarm occurs.	–	●
END Output Signal Range Setting		The END output signal range can be changed.	–	●
END Output Signal Offset		The END output signal value can be offset.	–	●
A/B Phase Output		This can be used to confirm the position of the motor.	●	●
Timing Output Signal		This is output each time the motor rotates 7.2°.	●	●
Velocity Filter Setting		Applies a filter to the operation command to control the motor action.	●	●
		The values corresponding to each of 0～F (16 stages) for the setting switch.	–	●
Control Mode	Vibration Suppression Function for Normal Mode	This can be set to suppress resonant vibration during rotation.	–	●
		This can be set to suppress vibration during acceleration, and deceleration, and when stopped.	–	●
	Gain Adjustment for Current Control Mode*2	Adjusts the position and speed loop gain.	–	●
		Adjusts the speed integration time constant.	–	●
		Sets the damping control vibration frequency.	–	●
		Sets whether to enable or disable damping control.	–	●
Selection of Motor Excitation Position at Power On		The motor excitation position for when the power is on can be selected.	–	●
Control Module Setting		Select whether to use symbols or an absolute value display for the speed display of the control module.	–	●
		The geared motor gear ratio for the speed monitor can be set.	–	●

*1 Do not perform push-motion operation using geared type motors. Doing so may damage the motor or gear unit.
*2 Except to further reduce heat generation or noise, using normal mode is recommended.

Product Line of Motors

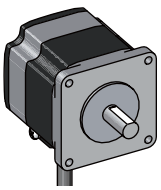
Types and Features of Standard and Geared Motors

Type	Features	Permissible Torque and Max. Instantaneous Torque [N·m]	Backlash [arcmin (degrees)]	Basic Resolution [deg/step]	Output Shaft Speed [r/min]
Standard Type  Motor shaft shape: Shaft flat on one side/round shaft	•Basic motor of the **AR** Series	Maximum Holding Torque: 4	——	0.36	4000
Low Backlash — **TH** Geared Type (Spur Gear Mechanism)  Selection of the cable drawing direction: Downward/upward/right/left	•A wide variety of low gear ratios, high-speed operations •Gear ratio: 3.6, 7.2, 10, 20, 30	Permissible Torque: 12	10	0.012	500
Low Backlash — **FC** Geared Type (Face gear mechanism) 	•Right-angle shaft gear for positioning •Center Shaft •Gear ratio: 7.2, 10, 20, 30	Permissible Torque: 10.5	10	0.012	416
Low Backlash — **PS** Geared Type (Planetary Gear Mechanism) 	•High permissible torque/max. instantaneous torque •A wide variety of gear ratios for selecting the desired step angle •Center shaft •Gear ratio: 5, 7.2, 10, 25, 36, 50	Permissible Torque: 37; Max. Instantaneous Torque: 60	7	0.0072	600
Non-Backlash — **PN** Geared Type (Planetary Gear Mechanism) 	•High speed (low gear ratio), high positioning accuracy •High permissible torque/max. instantaneous torque •A wide variety of gear ratios for selecting the desired step angle •Center shaft •Gear ratio: 5, 7.2, 10, 25, 36, 50	Permissible Torque: 37; Max. Instantaneous Torque: 60	2	0.0072	600
Non-Backlash — **Harmonic Geared Type** (Harmonic Drive®) 	•High positioning accuracy •High permissible torque/max. instantaneous torque •High gear ratio, high resolution •Center shaft •Gear ratio: 50, 100	Permissible Torque: 37; Max. Instantaneous Torque: 55	0	0.0036	70

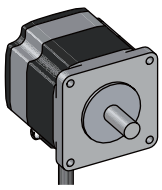
Note

- Please use the above values as reference to see the differences between each type. These values vary depending on the motor frame size and gear ratio.
- HarmonicPlanetary, HarmonicDrive and are registered trademarks or trademarks of Harmonic Drive Systems Inc.

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



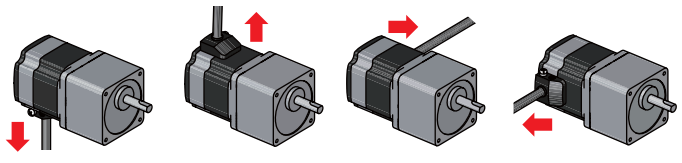
Shaft Flat on One Side



Round Shaft

Standard Type

Frame Size \ Shaft Shape	Shaft Flat on One Side	Round Shaft
42 mm	●	●
60 mm	●	●
85 mm	●	●



Downward Upward Rightward Leftward

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

TH Geared Type

Frame Size	Cable Drawing Direction			
	Downward	Upward	Rightward	Leftward
42 mm	●	●	●	●
60 mm	●	●	●	●
90 mm	●	●	●	●

Power Supply Input and Frame Size

Driver Type	Power Supply Input	Motor Type	
		Standard Type	**TH** Geared Type **FC** Geared Type **PS** Geared Type **PN** Geared Type Harmonic Geared Type
Built-in Controller Type 	Single-Phase 100-120 VAC Single-Phase 200-240 VAC	□42 □60 □85	□42 □60 □90*
Pulse Input Type 	Single-Phase 100-115 VAC Single-Phase 200-230 VAC Three-Phase 200-230 VAC	□42 □60 □85	□42 □60 □90*

● □42: Indicates a motor frame size of 42 mm.

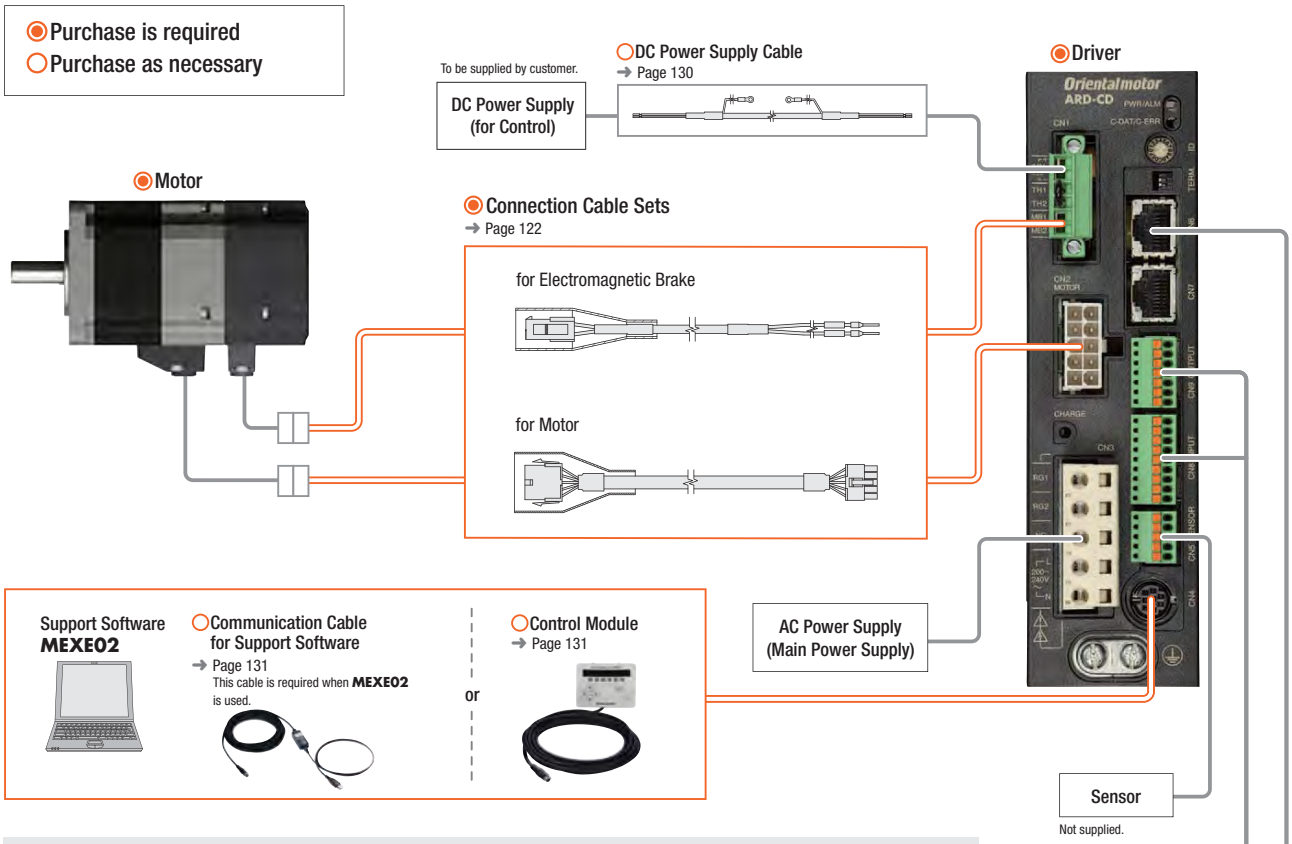
● Electromagnetic brake models are available for all types. (Except **FC** geared type).

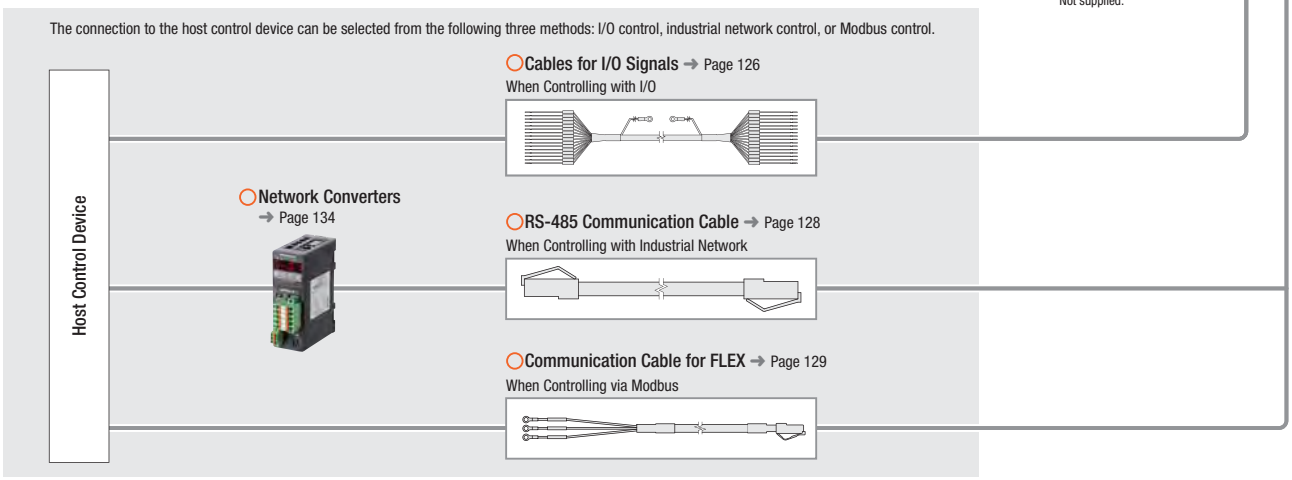
*Except **FC** geared type.

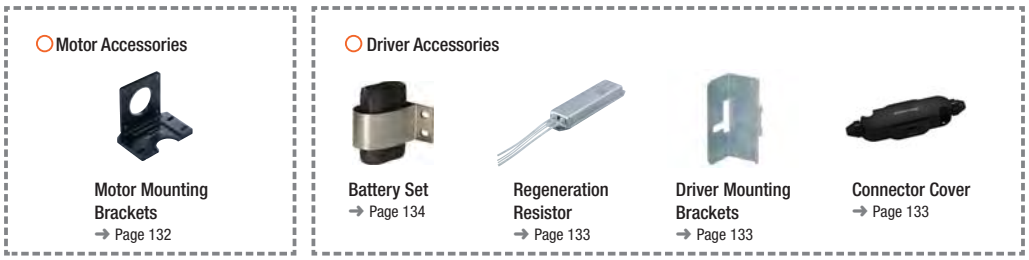
System Configuration

Combination of Standard Type Motor with an Electromagnetic Brake and Built-in Controller Type Driver

A configuration example of I/O control with a built-in controller type driver or using RS-485 communication is shown below.







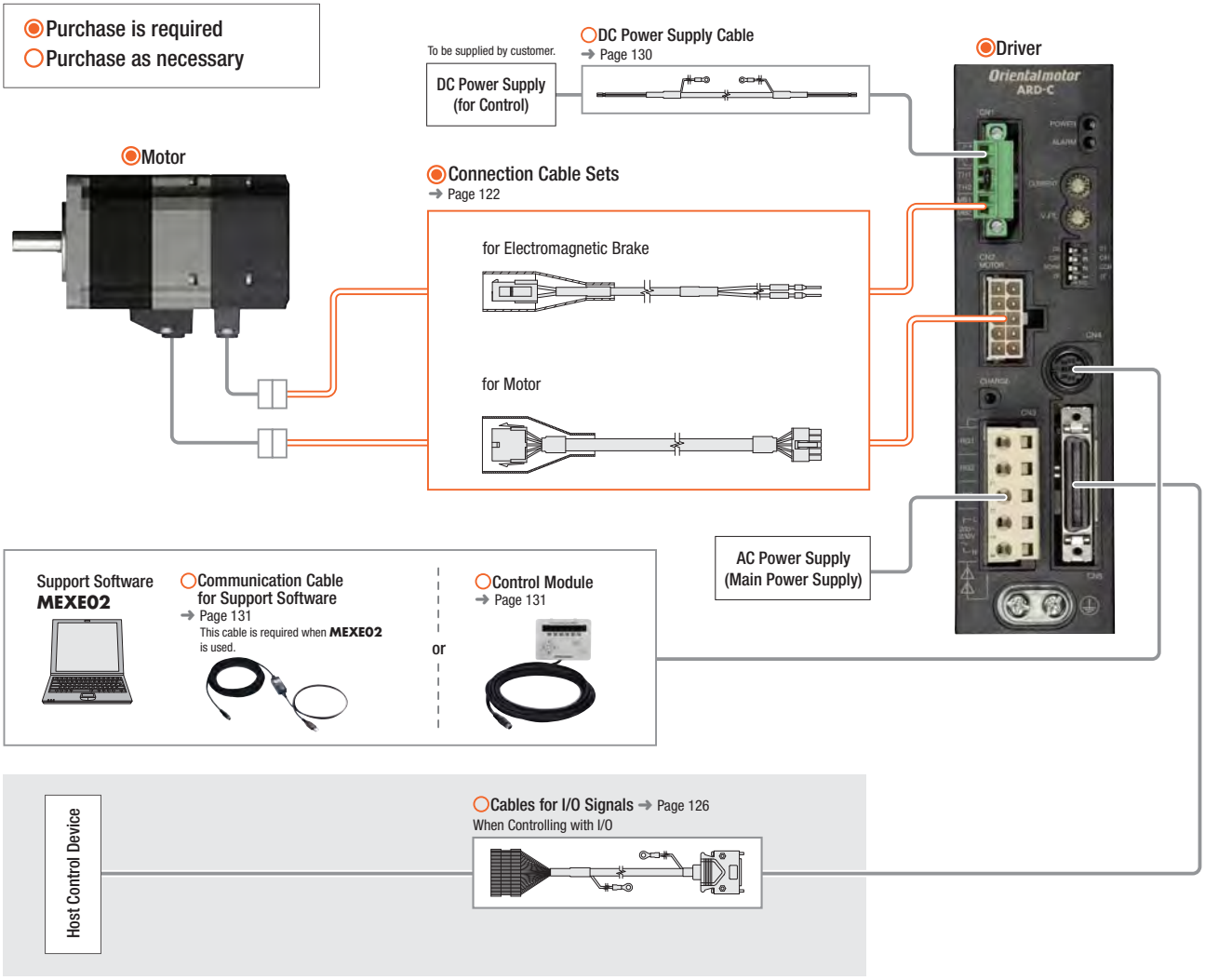
● Example of System Conguration Pricing

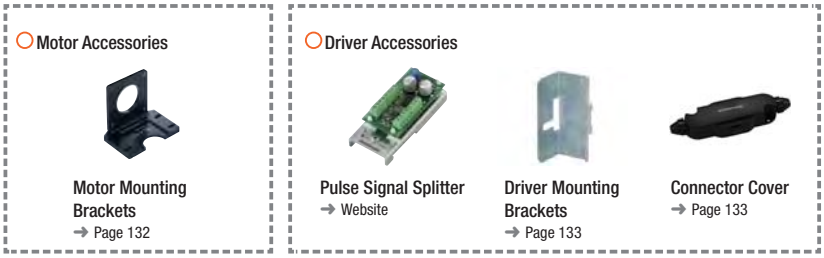
Motor		Driver		Cables			Accessories	
				Connection Cable Set (1 m)	I/O Signal Cable for General Purpose (0.5 m)		Motor Mounting Bracket	Driver Mounting Bracket
ARM66MC	+	ARD-CD	+	CC010VAFB	CC06D005B-1	+	PAL2P-5	MADP06
◉		◉		◉	○		○	○

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

Combination of Standard Type Motor with an Electromagnetic Brake and Pulse Input Type Driver

An example of single-axis system configuration with the programmable controller (Equipped with the pulse oscillation function) is shown below.





Example of System Conguration Pricing

Motor		Driver		Cables		Accessories	
				Connection Cable Set (1 m)	I/O Signal Cable with Connector (1 m)	Motor Mounting Bracket	Driver Mounting Bracket
ARM66MC	+	ARD-C	+	CC010VAFB	CC36D1E	PAL2P-5	MADP06
◉		◉		◉	○	○	○

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

Product Number

Motor

◇Standard Type

ARM 6 6 A 0 C

① ② ③ ④ ⑤ ⑥

◇**PS**, **PN**, Harmonic Geared Type

ARM 6 6 A C - N 5

① ② ③ ④ ⑥ ⑦ ⑧

①	Motor Type	**ARM**: **AR** Series Motor
②	Motor Frame Size	**4**: 42 mm **6**: 60 mm **9**: 85 mm (Geared Type is 90 mm)
③	Motor Case Length	
④	Output Shaft Features	**A**: Single Shaft **B**: Double Shaft **M**: With Electromagnetic Brake
⑤	Additional Function*	**0**: Round Shaft Type
⑥	Motor Power Supply Input	**C**: AC Power Supply Input Type
⑦	Geared Type	**PS**: **PS** Geared Type **N**: **PN** Geared Type **H**: Harmonic Geared Type
⑧	Gear Ratio	

*The standard motor without a number indicating the additional function in the product name is the type shaft flat on one side.

◇**TH** Geared Type

ARM 6 6 A C - T 7.2 U

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Motor Type	**ARM**: **AR** Series Motor
②	Motor Frame Size	**4**: 42 mm **6**: 60 mm **9**: 90 mm
③	Motor Case Length	
④	Output Shaft Features	**A**: Single Shaft **M**: With Electromagnetic Brake
⑤	Motor Power Supply Input	**C**: AC Power Supply Input Type
⑥	Geared Type	**T**: **TH** Geared Type
⑦	Gear Ratio	
⑧	Cable Outlet Direction	**R**: Rightward Direction **U**: Upward Direction **L**: Leftward Direction

◇**FC** Geared Type

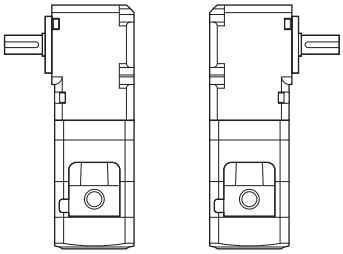
ARM 6 6 A C - FC 7.2 L A

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①	Motor Type	**ARM**: **AR** Series Motor
②	Motor Frame Size	**4**: 42 mm **6**: 60 mm
③	Motor Case Length	
④	Output Shaft Features	**A**: Single Shaft
⑤	Motor Power Supply Input	**C**: AC Power Supply Input Type
⑥	Geared Type	**FC**: **FC** Geared Type
⑦	Gear Ratio	
⑧	Output Shaft Direction*	**L**: L Shaft (Left) **R**: R Shaft (Right)
⑨	Gearhead Identification	**A**: Solid Shaft

*Output gear shaft direction when seen from the cable outlet side.

L: L Shaft (Left) **R**: R Shaft (Right)



Driver

ARD - C D

① ② ③

①	Driver Type	**ARD**: **AR** Series Driver
②	Power Supply Input	Built-in Controller Type **A**: Single-Phase 100-120 VAC **C**: Single-Phase 200-240 VAC Pulse Input Type **A**: Single-Phase 100-115 VAC **C**: Single-Phase 200-230 VAC **S**: Three-Phase 200-230 VAC
③	Type	**D**: Built-in Controller Type Blank: Pulse Input Type

Product Line

Motors, drivers, and connection cables must be ordered separately. Connection Cables ➜ Page 120

Motor

◇Standard Type

Frame Size	Product Name (Single Shaft)	Product Name (Double Shaft)
42 mm	**ARM46A□C**	**ARM46B□C**
60 mm	**ARM66A□C**	**ARM66B□C**
	ARM69A□C	**ARM69B□C**
85 mm	**ARM98A□C**	**ARM98B□C**
	ARM911A□C	**ARM911B□C**

●The number **0** (round shaft type) indicating the shaft shape is entered where the box □ is located within the product name. One side flat shaft type will have no "□" within the product name.

◇Standard Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**ARM46M□C**
60 mm	**ARM66M□C**
	ARM69M□C
85 mm	**ARM98M□C**

●The number **0** (round shaft type) indicating the shaft shape is entered where the box □ is located within the product name. One side flat shaft type will have no "□" within the product name.

◇**TH** Geared Type

Frame Size	Product Name
42 mm	**ARM46AC-T3.6■**
	ARM46AC-T7.2■
	ARM46AC-T10■
	ARM46AC-T20■
	ARM46AC-T30■
60 mm	**ARM66AC-T3.6■**
	ARM66AC-T7.2■
	ARM66AC-T10■
	ARM66AC-T20■
	ARM66AC-T30■
90 mm	**ARM98AC-T3.6■**
	ARM98AC-T7.2■
	ARM98AC-T10■
	ARM98AC-T20■
	ARM98AC-T30■

●Either **R** (rightward direction), **U** (upward direction), or **L** (leftward direction) indicating the cable outlet direction is entered where the box ■ is located within the product name. The product with the cable leading downward direction will have no "■" within the product name.

◇**TH** Geared Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**ARM46MC-T3.6■**
	ARM46MC-T7.2■
	ARM46MC-T10■
	ARM46MC-T20■
	ARM46MC-T30■
60 mm	**ARM66MC-T3.6■**
	ARM66MC-T7.2■
	ARM66MC-T10■
	ARM66MC-T20■
	ARM66MC-T30■
90 mm	**ARM98MC-T3.6■**
	ARM98MC-T7.2■
	ARM98MC-T10■
	ARM98MC-T20■
	ARM98MC-T30■

●Either **R** (rightward direction), **U** (upward direction), or **L** (leftward direction) indicating the cable outlet direction is entered where the box ■ is located within the product name. The product with the cable leading downward direction will have no "■" within the product name.

◇**FC** Geared Type

Frame Size	Product Name
42 mm	**ARM46AC-FC7.2LA**
	ARM46AC-FC7.2RA
	ARM46AC-FC10LA
	ARM46AC-FC10RA
	ARM46AC-FC20LA
	ARM46AC-FC20RA
	ARM46AC-FC30LA
	ARM46AC-FC30RA
60 mm	**ARM66AC-FC7.2LA**
	ARM66AC-FC7.2RA
	ARM66AC-FC10LA
	ARM66AC-FC10RA
	ARM66AC-FC20LA
	ARM66AC-FC20RA
	ARM66AC-FC30LA
	ARM66AC-FC30RA

◇**PS** Geared Type

Frame Size	Product Name
42 mm	**ARM46AC-PS5**
	ARM46AC-PS7
	ARM46AC-PS10
	ARM46AC-PS25
	ARM46AC-PS36
	ARM46AC-PS50
60 mm	**ARM66AC-PS5**
	ARM66AC-PS7
	ARM66AC-PS10
	ARM66AC-PS25
	ARM66AC-PS36
	ARM66AC-PS50
90 mm	**ARM98AC-PS5**
	ARM98AC-PS7
	ARM98AC-PS10
	ARM98AC-PS25
	ARM98AC-PS36
	ARM98AC-PS50

◇**PS** Geared Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**ARM46MC-PS5**
	ARM46MC-PS7
	ARM46MC-PS10
	ARM46MC-PS25
	ARM46MC-PS36
	ARM46MC-PS50
60 mm	**ARM66MC-PS5**
	ARM66MC-PS7
	ARM66MC-PS10
	ARM66MC-PS25
	ARM66MC-PS36
	ARM66MC-PS50
90 mm	**ARM98MC-PS5**
	ARM98MC-PS7
	ARM98MC-PS10
	ARM98MC-PS25
	ARM98MC-PS36
	ARM98MC-PS50

◇**PN** Geared Type

Frame Size	Product Name
42 mm	**ARM46AC-N5**
	ARM46AC-N7.2
	ARM46AC-N10
60 mm	**ARM66AC-N5**
	ARM66AC-N7.2
	ARM66AC-N10
	ARM66AC-N25
	ARM66AC-N36
	ARM66AC-N50
90 mm	**ARM98AC-N5**
	ARM98AC-N7.2
	ARM98AC-N10
	ARM98AC-N25
	ARM98AC-N36
	ARM98AC-N50

◇**PN** Geared Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**ARM46MC-N5**
	ARM46MC-N7.2
	ARM46MC-N10
60 mm	**ARM66MC-N5**
	ARM66MC-N7.2
	ARM66MC-N10
	ARM66MC-N25
	ARM66MC-N36
	ARM66MC-N50
90 mm	**ARM98MC-N5**
	ARM98MC-N7.2
	ARM98MC-N10
	ARM98MC-N25
	ARM98MC-N36
	ARM98MC-N50

◇Harmonic Geared Type

Frame Size	Product Name
42 mm	**ARM46AC-H50**
	ARM46AC-H100
60 mm	**ARM66AC-H50**
	ARM66AC-H100
90 mm	**ARM98AC-H50**
	ARM98AC-H100

◇Harmonic Geared Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**ARM46MC-H50**
	ARM46MC-H100
60 mm	**ARM66MC-H50**
	ARM66MC-H100
90 mm	**ARM98MC-H50**
	ARM98MC-H100

Driver

◇Built-in Controller Type

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

◇Pulse Input Type

Power Supply Input	Product Name
Single-Phase 100-115 VAC	**ARD-A**
Single-Phase 200-230 VAC	**ARD-C**
Three-Phase 200-230 VAC	**ARD-S**

Connection Cable Sets/Flexible Connection Cable Sets

Use a flexible connection cable set if the cable will be bent. Extension cables and flexible extension cables that can extend the connection cables are available. Connection Cables ➜ Page 122

Included

Motor

Type \ Included		Parallel Key	Operating Manual
Standard Type		–	1 Copy
TH Geared Type	Frame Size 42 mm	–	
	Frame Size 60 mm	–	
	Frame Size 90 mm	1 pc.	
FC Geared Type		1 pc.	
PS Geared Type		1 pc.	
PN Geared Type		1 pc.	
Harmonic Geared Type		1 pc.	

●For the functions and operations of the products, refer to the user manual. Since the user manual is not provided with the products, please request it to the nearest Oriental Motor sales office, or download from the Oriental Motor website.

Driver

Type \ Included	Connector	Operating Manual
Built-in Controller Type	・CN1 Connector (1 pc.) ・CN3 Connector (1 pc.) ・CN5 Connector (1 pc.) ・CN8 Connector (1 pc.) ・CN9 Connector (1 pc.) ・Connector Wiring Lever (1 pc.)	1 Copy
Pulse Input Type	・CN1 Connector (1 pc.) ・CN3 Connector (1 pc.) ・CN5 Connector (1 pc.) ・Connector Wiring Lever (1 pc.)	

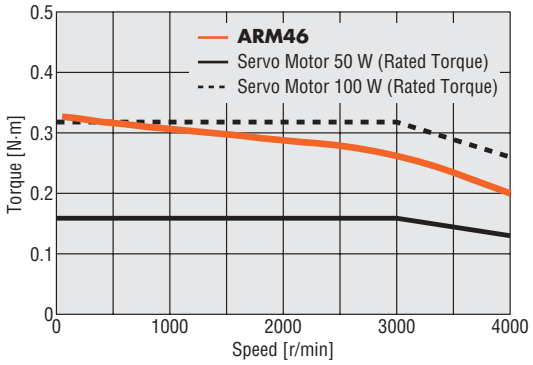
αSTEP AR Series Output Power Guidelines

For servo motor output power (W), the output power (W) is indicated as the "rated output power" when the motor is running at the "rated speed."
However, αSTEP **AR** Seriess with high positioning accuracy and high torque in the medium/low-speed range do not have "rated speeds" so no "rated output power" is listed.
For reference purposes, the following lists the servo motor rated torque (W) corresponding to the rated torque of each **AR** Series standard type motor.

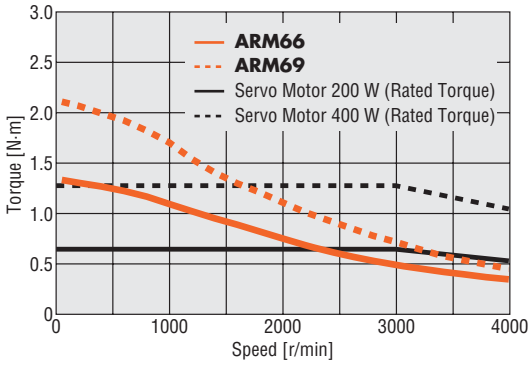
AR Series (Standard Type)		Servo Motor with Rated Torque or Equivalent (Reference)
Frame Size	Product Name	
42 mm	**ARM46**	50 to 100 W Rated Torque or Equivalent
60 mm	**ARM66**	100 to 200 W Rated Torque or Equivalent
	ARM69	200 to 400 W Rated Torque or Equivalent
85 mm	**ARM98**	400 to 750 W Rated Torque or Equivalent
	ARM911	

✻Each price shows an example of the total price of a motor, a driver, and a 1 m connection cable.

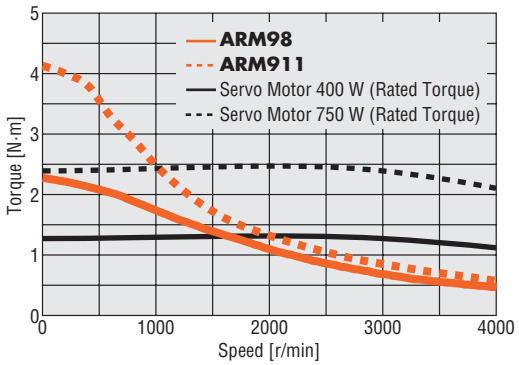
● Frame Size 42 mm



● Frame Size 60 mm



● Frame Size 85 mm



● Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.

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

Specifications

Motor Product Name	Single Shaft		**ARM46A□C**	**ARM66A□C**	**ARM69A□C**	**ARM98A□C**	**ARM911A□C**
	Double Shaft		**ARM46B□C**	**ARM66B□C**	**ARM69B□C**	**ARM98B□C**	**ARM911B□C**
	With Electromagnetic Brake		**ARM46M□C**	**ARM66M□C**	**ARM69M□C**	**ARM98M□C**	–
Driver Product Name	Built-in Controller		**ARD-AD** (Single-Phase 100-120 VAC), **ARD-CD** (Single-Phase 200-240 VAC)				
	Pulse Input		**ARD-A** (Single-Phase 100-115 VAC), **ARD-C** (Single-Phase 200-230 VAC), **ARD-S** (Three-Phase 200-230 VAC)				
Maximum Holding Torque		N·m	0.3	1.2	2		4
Holding Torque at Motor Standstill	Power ON	N·m	0.15	0.6	1		2
	Electromagnetic Brake	N·m	0.15	0.6	1		–
Rotor Inertia		J: kg·m^2	58×10^{-7} [73×10^{-7}]*2	380×10^{-7} [500×10^{-7}]*2	750×10^{-7} [870×10^{-7}]*2	1100×10^{-7} [1220×10^{-7}]*2	2200×10^{-7}
Resolution	Resolution Setting: 1000 P/R		0.36°/Pulse				
Power Supply Input	Voltage/Frequency	Built-in Controller	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC −15 to +6% 50/60 Hz				
		Pulse Input	Single-Phase 100-115 VAC, Single-Phase 200-230 VAC, Three-Phase 200-230 VAC −15 to +10% 50/60 Hz				
	Input Current A	Built-in Controller, Single-Phase 100-120 VAC	2.4	3.6	4.9	4.6	5.9
		Built-in Controller, Single-Phase 200-240 VAC	1.5	2.3	3	2.9	3.7
		Pulse Input, Single-Phase 100-115 VAC	2.9	4.4	6.1	5.5	6.5
		Pulse Input, Single-Phase 200-230 VAC	1.9	2.7	3.8	3.4	4.1
		Pulse Input, Three-Phase 200-230 VAC	1	1.4	2	1.8	2.2
Control Voltage*3	Built-in Controller		24 VDC ±5%*4 0.25A [0.33 A]*2	24 VDC ±5%*4 0.25 A [0.5 A]*2			24 VDC ±5%*4 0.25 A
	Pulse Input		24 VDC ±5%*4 0.5A [0.58 A]*2	24 VDC ±5%*4 0.5A [0.75 A]*2			

● The number **0** (round shaft type) indicating the shaft shape is entered where the box □ is located within the product name.
One side flat shaft type will have no "□" within the product name.

*1 Only for the pulse input type.

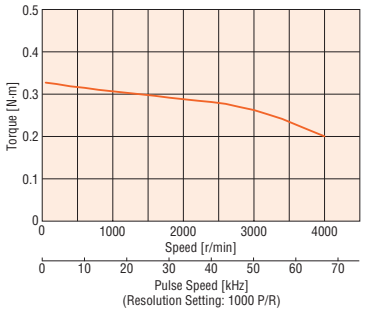
*2 The values in brackets [ ] include the inertia of electromagnetic brake.

*3 For pulse input type driver, a separate power supply for electromagnetic brake is required for the electromagnetic brake product.

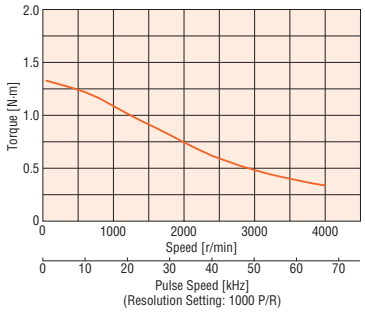
*4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

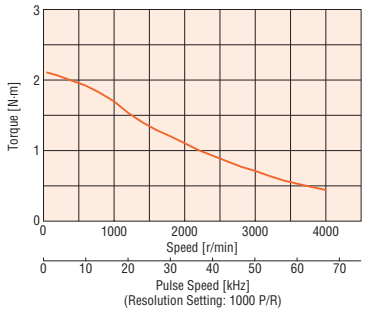
ARM46



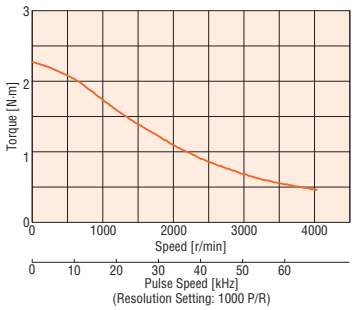
ARM66



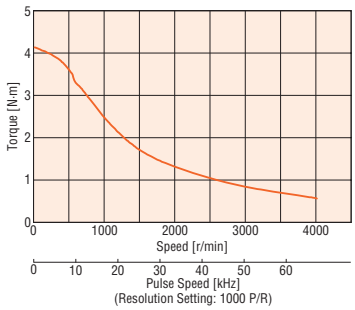
ARM69



ARM98



ARM911



Note

● Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.

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

TH Geared Type Frame Size 42 mm

Specifications

Motor Product Name	Single Shaft		**ARM46AC-T3.6**□	**ARM46AC-T7.2**□	**ARM46AC-T10**□	**ARM46AC-T20**□	**ARM46AC-T30**□
	With Electromagnetic Brake		**ARM46MC-T3.6**□	**ARM46MC-T7.2**□	**ARM46MC-T10**□	**ARM46MC-T20**□	**ARM46MC-T30**□
Driver Product Name	Built-in Controller		**ARD-AD** (Single-Phase 100-120 VAC), **ARD-CD** (Single-Phase 200-240 VAC)				
	Pulse Input		**ARD-A** (Single-Phase 100-115 VAC), **ARD-C** (Single-Phase 200-230 VAC), **ARD-S** (Three-Phase 200-230 VAC)				
Maximum Holding Torque		N·m	0.35	0.7	1	1.5	
Rotor Inertia		J: kg·m^2	58×10^{-7} [73×10^{-7}]*2				
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 Motor Standstill	Power ON	N·m	0.34	0.69	0.96	1.4	1.5
	Electromagnetic Brake	N·m	0.34	0.69	0.96	1.4	1.5
Speed Range		r/min	0 to 500	0 to 250	0 to 180	0 to 90	0 to 60
Backlash		arcmin	45 (0.75°)	25 (0.42°)		15 (0.25°)	
Power Supply Input	Voltage/Frequency	Built-in Controller	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC −15 to +6% 50/60 Hz				
		Pulse Input	Single-Phase 100-115 VAC, Single-Phase 200-230 VAC, Three-Phase 200-230 VAC −15 to +10% 50/60 Hz				
	Input Current A	Built-in Controller: Single-Phase 100-120 VAC	2.4				
		Built-in Controller: Single-Phase 200-240 VAC	1.5				
		Pulse Input: Single-Phase 100-115 VAC	2.9				
		Pulse Input: Single-Phase 200-230 VAC	1.9				
		Pulse Input: Three-Phase 200-230 VAC	1				
Control Voltage*3	Built-in Controller		24 VDC ±5%*4 0.25A [0.33 A]*2				
	Pulse Input		24 VDC ±5%*4 0.5A [0.58 A]*2				

● Either **R** (rightward direction), **U** (upward direction), or **L** (leftward direction) indicating the cable outlet direction is entered where the box □ is located within the product name.
For the cable leading downward, there will be no "□" within the product name.

*1 Only for the pulse input type.

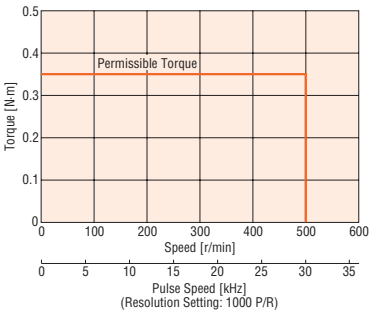
*2 The values in brackets [ ] include the inertia of electromagnetic brake.

*3 For pulse input type driver, a separate power supply for electromagnetic brake is required for the electromagnetic brake product.

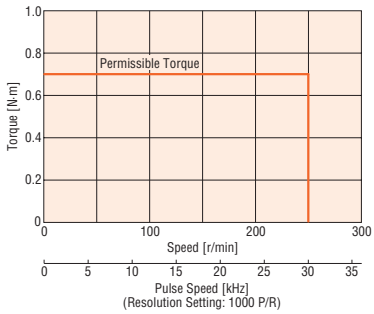
*4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

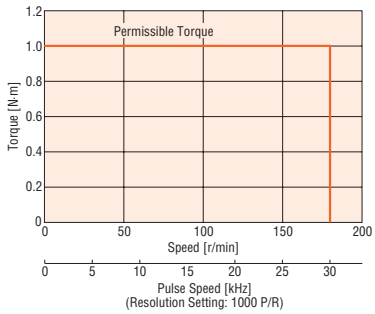
ARM46 Gear Ratio **3.6**



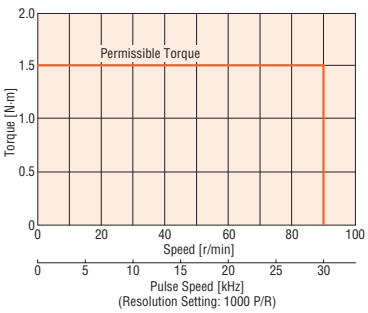
ARM46 Gear Ratio **7.2**



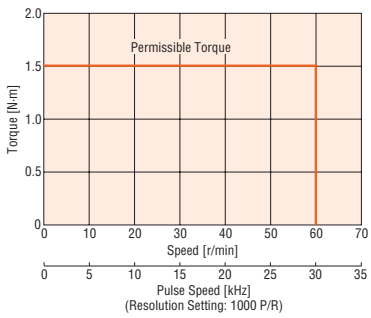
ARM46 Gear Ratio **10**



ARM46 Gear Ratio **20**



ARM46 Gear Ratio **30**



Note

● Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.

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

TH Geared Type Frame Size 60 mm

Specifications

Motor Product Name	Single Shaft		**ARM66AC-T3.6**□	**ARM66AC-T7.2**□	**ARM66AC-T10**□	**ARM66AC-T20**□	**ARM66AC-T30**□
	With Electromagnetic Brake		**ARM66MC-T3.6**□	**ARM66MC-T7.2**□	**ARM66MC-T10**□	**ARM66MC-T20**□	**ARM66MC-T30**□
Driver Product Name	Built-in Controller		**ARD-AD** (Single-Phase 100-120 VAC), **ARD-CD** (Single-Phase 200-240 VAC)				
	Pulse Input		**ARD-A** (Single-Phase 100-115 VAC), **ARD-C** (Single-Phase 200-230 VAC), **ARD-S** (Three-Phase 200-230 VAC)				
Maximum Holding Torque		N·m	1.25	2.5	3	3.5	4
Rotor Inertia		J: kg·m^2	380×10^{-7} [500×10^{-7}]*2				
Gear Ratio			3.6	7.2	10	20	30
Resolution		Resolution Setting: 1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque		N·m	1.25	2.5	3	3.5	4
Holding Torque at Motor Standstill	Power ON	N·m	1.25	2.5	3	3.5	4
	Electromagnetic Brake	N·m	1.25	2.5	3	3.5	4
Speed Range		r/min	0 to 500	0 to 250	0 to 180	0 to 90	0 to 60
Backlash		arcmin	35 (0.59°)	15 (0.25°)		10 (0.17°)	
Power Supply Input	Voltage/Frequency	Built-in Controller	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC −15 to +6% 50/60 Hz				
		Pulse Input	Single-Phase 100-115 VAC, Single-Phase 200-230 VAC, Three-Phase 200-230 VAC −15 to +10% 50/60 Hz				
	Input Current A	Built-in Controller, Single-Phase 100-120 VAC	3.6				
		Built-in Controller, Single-Phase 200-240 VAC	2.3				
		Pulse Input, Single-Phase 100-115 VAC	4.4				
		Pulse Input, Single-Phase 200-230 VAC	2.7				
		Pulse Input, Three-Phase 200-230 VAC	1.4				
Control Voltage*3	Built-in Controller		24 VDC ±5%*4 0.25A [0.5 A]*2				
	Pulse Input		24 VDC ±5%*4 0.5A [0.75 A]*2				

● Either **R** (rightward direction), **U** (upward direction), or **L** (leftward direction) indicating the cable outlet direction is entered where the box □ is located within the product name.
For the cable leading downward, there will be no "□" within the product name.

*1 Only for the pulse input type.

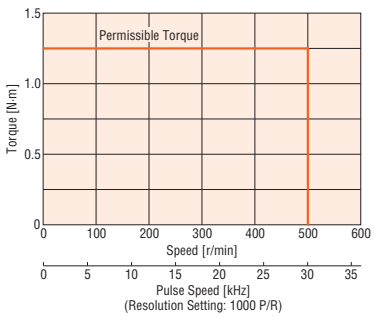
*2 The values in brackets [ ] include the inertia of electromagnetic brake.

*3 For pulse input type driver, a separate power supply for electromagnetic brake is required for the electromagnetic brake product.

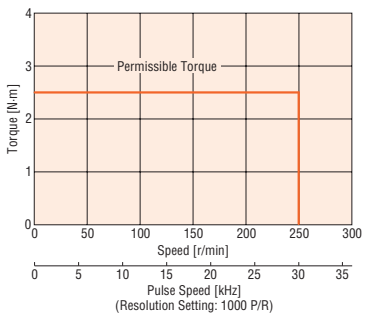
*4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

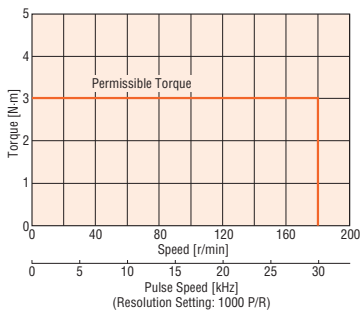
ARM66 Gear Ratio **3.6**



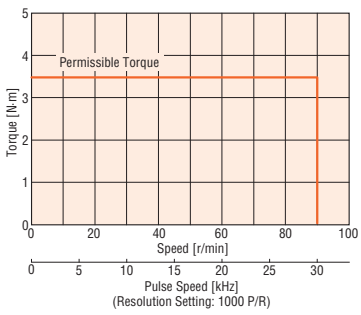
ARM66 Gear Ratio **7.2**



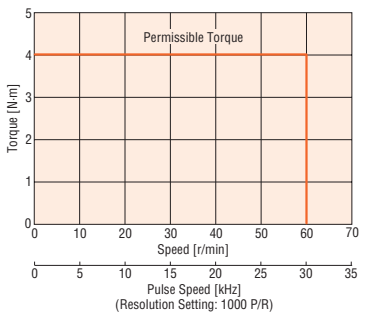
ARM66 Gear Ratio **10**



ARM66 Gear Ratio **20**



ARM66 Gear Ratio **30**



Note

● Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.

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

TH Geared Type Frame Size 90 mm

Specifications

Motor Product Name	Single Shaft		**ARM98AC-T3.6**□	**ARM98AC-T7.2**□	**ARM98AC-T10**□	**ARM98AC-T20**□	**ARM98AC-T30**□
	With Electromagnetic Brake		**ARM98MC-T3.6**□	**ARM98MC-T7.2**□	**ARM98MC-T10**□	**ARM98MC-T20**□	**ARM98MC-T30**□
Driver Product Name	Built-in Controller		**ARD-AD** (Single-Phase 100-120 VAC), **ARD-CD** (Single-Phase 200-240 VAC)				
	Pulse Input		**ARD-A** (Single-Phase 100-115 VAC), **ARD-C** (Single-Phase 200-230 VAC), **ARD-S** (Three-Phase 200-230 VAC)				
Maximum Holding Torque		N·m	4.5	9		12	
Rotor Inertia		J: kg·m^2	1100×10^{-7} [1220×10^{-7}]*2				
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 Motor Standstill	Power ON	N·m	3.6	7.2	9	10	12
	Electromagnetic Brake	N·m	3.6	7.2	9	10	12
Speed Range		r/min	0～500	0 to 250	0 to 180	0 to 90	0 to 60
Backlash		arcmin	25 (0.42°)	15 (0.25°)		10 (0.17°)	
Power Supply Input	Voltage/Frequency	Built-in Controller	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC −15 to +6% 50/60 Hz				
		Pulse Input	Single-Phase 100-115 VAC, Single-Phase 200-230 VAC, Three-Phase 200-230 VAC −15 to +10% 50/60 Hz				
	Input Current A	Built-in Controller: Single-Phase 100-120 VAC	4.6				
		Built-in Controller: Single-Phase 200-240 VAC	2.9				
		Pulse Input: Single-Phase 100-115 VAC	5.5				
		Pulse Input: Single-Phase 200-230 VAC	3.4				
		Pulse Input: Three-Phase 200-230 VAC	1.8				
Control Voltage*3	Built-in Controller		24 VDC ±5%*4 0.25A [0.5 A]*2				
	Pulse Input		24 VDC ±5%*4 0.5A [0.75 A]*2				

● Either **R** (rightward direction), **U** (upward direction), or **L** (leftward direction) indicating the cable outlet direction is entered where the box □ is located within the product name.
For the cable leading downward, there will be no "□" within the product name.

*1 Only for the pulse input type.

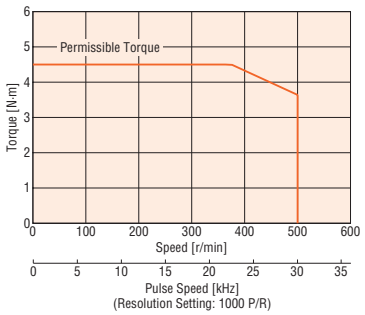
*2 The values in brackets [ ] include the inertia of electromagnetic brake.

*3 For pulse input type driver, a separate power supply for electromagnetic brake is required for the electromagnetic brake product.

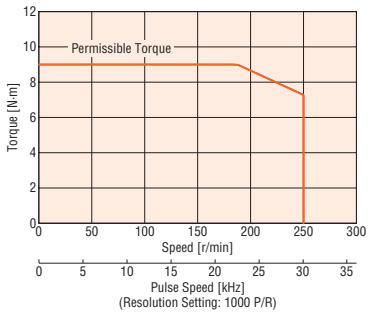
*4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

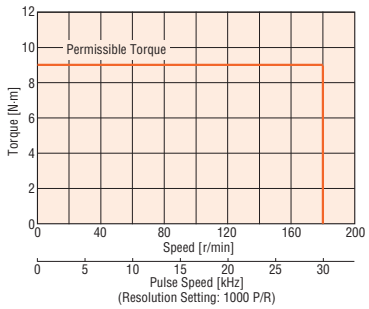
ARM98 Gear Ratio **3.6**



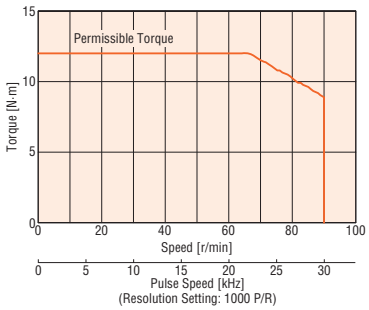
ARM98 Gear Ratio **7.2**



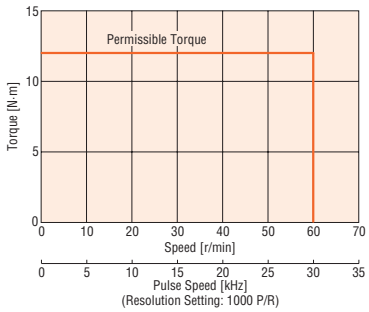
ARM98 Gear Ratio **10**



ARM98 Gear Ratio **20**



ARM98 Gear Ratio **30**



Note

● Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.

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

FC Geared Type Frame Size 42 mm

Specifications

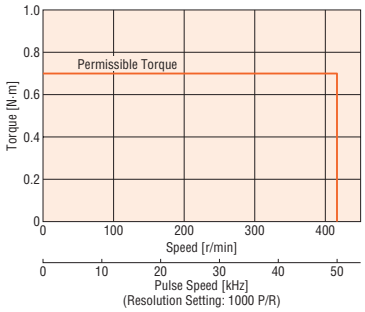
Motor Product Name				ARM46AC-FC7.2□A	ARM46AC-FC10□A	ARM46AC-FC20□A	ARM46AC-FC30□A
Driver Product Name		Built-in Controller		**ARD-AD** (Single-Phase 100-120 VAC), **ARD-CD** (Single-Phase 200-240 VAC)			
		Pulse Input		**ARD-A** (Single-Phase 100-115 VAC), **ARD-C** (Single-Phase 200-230 VAC), **ARD-S** (Three-Phase 200-230 VAC)			
Maximum Holding Torque			N·m	0.7	1	2	3
Rotor Inertia			J: kg·m^2	58×10^{-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	0.7	1	2	3
Holding Torque at Motor Standstill			N·m	0.7	1	2	3
Speed Range			r/min	0 to 416	0 to 300	0 to 150	0 to 100
Backlash			arcmin	25 (0.42°)		15 (0.25°)	
Power Supply Input	Voltage/Frequency	Built-in Controller		Single-Phase 100-120 VAC, Single-Phase 200-240 VAC −15 to +6% 50/60 Hz			
		Pulse Input		Single-Phase 100-115 VAC, Single-Phase 200-230 VAC, Three-Phase 200-230 VAC −15 to +10% 50/60 Hz			
	Input Current A	Built-in Controller	Single-Phase 100-120 VAC	2.4			
			Single-Phase 200-240 VAC	1.5			
		Pulse Input	Single-Phase 100-115 VAC	2.9			
			Single-Phase 200-230 VAC	1.9			
			Three-Phase 200-230 VAC	1			
Control Voltage		Built-in Controller		24 VDC ±5% 0.25 A			
		Pulse Input		24 VDC ±5% 0.5 A			

● Either **L** (L shaft: left), or **R** (R shaft: right) indicating the gearhead output shaft direction is entered where the box □ is located within the product name.

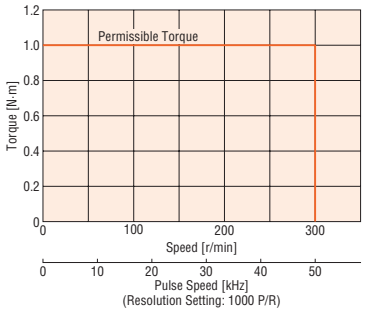
✻Only for the pulse input type.

Speed - Torque Characteristics (Reference values)

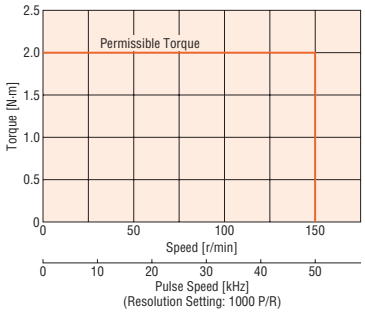
ARM46 Gear Ratio **7.2**



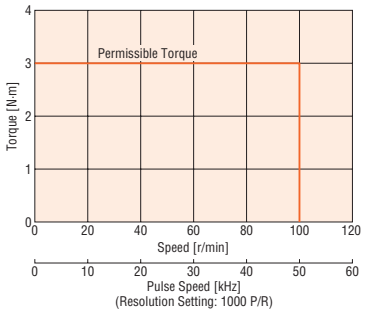
ARM46 Gear Ratio **10**



ARM46 Gear Ratio **20**



ARM46 Gear Ratio **30**



Note

● Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.

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

FC Geared Type Frame Size 60 mm

Specifications

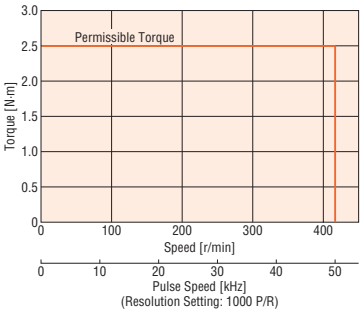
Motor Product Name				ARM66AC-FC7.2□A	ARM66AC-FC10□A	ARM66AC-FC20□A	ARM66AC-FC30□A
Driver Product Name			Built-in Controller	**ARD-AD** (Single-Phase 100-120 VAC), **ARD-CD** (Single-Phase 200-240 VAC)			
			Pulse Input	**ARD-A** (Single-Phase 100-115 VAC), **ARD-C** (Single-Phase 200-230 VAC), **ARD-S** (Three-Phase 200-230 VAC)			
Maximum Holding Torque			N·m	2.5	3.5	7	10.5
Rotor Inertia			J: kg·m^2	380×10^{-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	2.5	3.5	7	10.5
Holding Torque at Motor Standstill			N·m	2.5	3.5	7	10.5
Speed Range			r/min	0 to 416	0 to 300	0 to 150	0 to 100
Backlash			arcmin	15 (0.25°)		10 (0.17°)	
Power Supply Input	Voltage/ Frequency	Built-in Controller		Single-Phase 100-120 VAC, Single-Phase 200-240 VAC −15 to +6% 50/60 Hz			
		Pulse Input		Single-Phase 100-115 VAC, Single-Phase 200-230 VAC, Three-Phase 200-230 VAC −15 to +10% 50/60 Hz			
	Input Current A	Built-in Controller	Single-Phase 100-120 VAC	3.6			
			Single-Phase 200-240 VAC	2.3			
		Pulse Input	Single-Phase 100-115 VAC	4.4			
			Single-Phase 200-230 VAC	2.7			
			Three-Phase 200-230 VAC	1.4			
Control Voltage		Built-in Controller		24 VDC ±5% 0.25 A			
		Pulse Input		24 VDC ±5% 0.5 A			

● Either **L** (L shaft: left), or **R** (R shaft: right) indicating the gearhead output shaft direction is entered where the box □ is located within the product name.

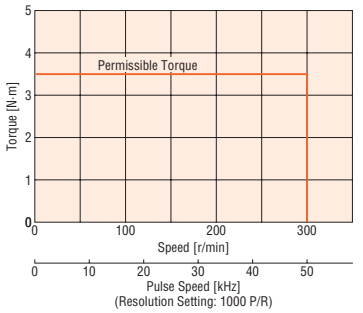
✻Only for the pulse input type.

Speed - Torque Characteristics (Reference values)

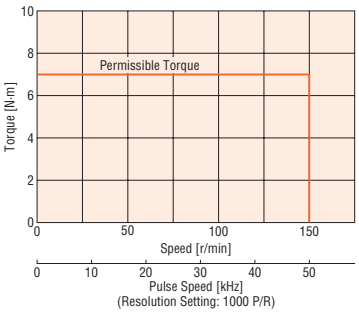
ARM66 Gear Ratio **7.2**



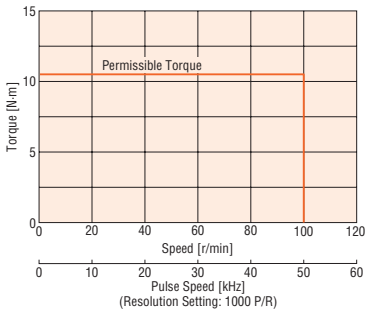
ARM66 Gear Ratio **10**



ARM66 Gear Ratio **20**



ARM66 Gear Ratio **30**



Note

● Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.

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

PS Geared Type Frame Size 42 mm

Specifications

Motor Product Name	Single Shaft		**ARM46AC-PS5**	**ARM46AC-PS7**	**ARM46AC-PS10**	**ARM46AC-PS25**	**ARM46AC-PS36**	**ARM46AC-PS50**
	With Electromagnetic Brake		**ARM46MC-PS5**	**ARM46MC-PS7**	**ARM46MC-PS10**	**ARM46MC-PS25**	**ARM46MC-PS36**	**ARM46MC-PS50**
Driver Product Name	Built-in Controller		**ARD-AD** (Single-Phase 100-120 VAC), **ARD-CD** (Single-Phase 200-240 VAC)					
	Pulse Input		**ARD-A** (Single-Phase 100-115 VAC), **ARD-C** (Single-Phase 200-230 VAC), **ARD-S** (Three-Phase 200-230 VAC)					
Maximum Holding Torque		N·m	1	1.5		2.5	3	
Rotor Inertia		J: kg·m^2	58×10^{-7} [73×10^{-7}]*2					
Gear Ratio			5	7.2	10	25	36	50
Resolution		Resolution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque		N·m	1	1.5		2.5	3	
Maximum Instantaneous Torque*		N·m	*	2		6		
Holding Torque at Motor Standstill	Power ON	N·m	0.75	1	1.5	2.5	3	
	Electromagnetic Brake	N·m	0.75	1	1.5	2.5	3	
Speed Range		r/min	0 to 600	0 to 416	0 to 300	0 to 120	0 to 83	0 to 60
Backlash		arcmin	15 (0.25°)					
Power Supply Input	Voltage/Frequency	Built-in Controller	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC −15 to +6% 50/60 Hz					
		Pulse Input	Single-Phase 100-115 VAC, Single-Phase 200-230 VAC, Three-Phase 200-230 VAC −15 to +10% 50/60 Hz					
	Input Current A	Built-in Controller: Single-Phase 100-120 VAC	2.4					
		Built-in Controller: Single-Phase 200-240 VAC	1.5					
		Pulse Input: Single-Phase 100-115 VAC	2.9					
		Pulse Input: Single-Phase 200-230 VAC	1.9					
		Pulse Input: Three-Phase 200-230 VAC	1					
Control Voltage*3	Built-in Controller		24 VDC ±5%*4 0.25A [0.33 A]*2					
	Pulse Input		24 VDC ±5%*4 0.5A [0.58 A]*2					

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

*1 Only for the pulse input type.

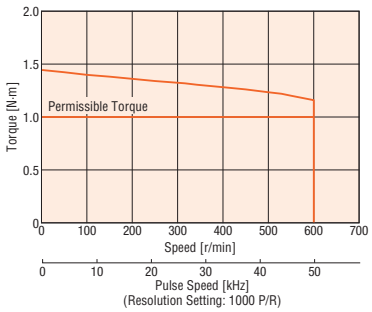
*2 The values in brackets [ ] include the inertia of electromagnetic brake.

*3 For pulse input type driver, a separate power supply for electromagnetic brake is required for the electromagnetic brake product.

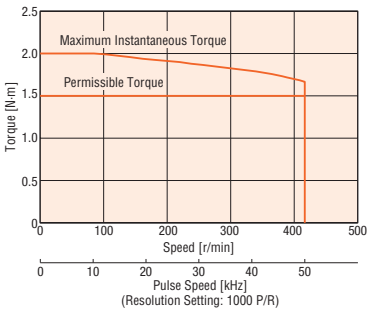
*4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

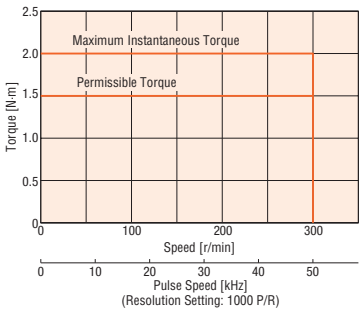
ARM46 Gear Ratio **5**



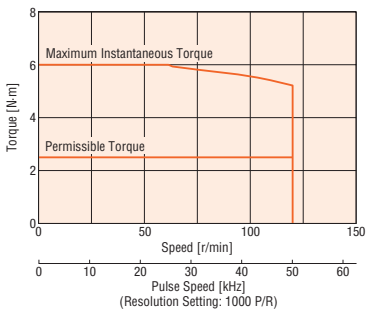
ARM46 Gear Ratio **7.2**



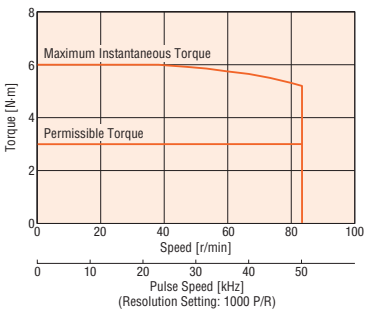
ARM46 Gear Ratio **10**



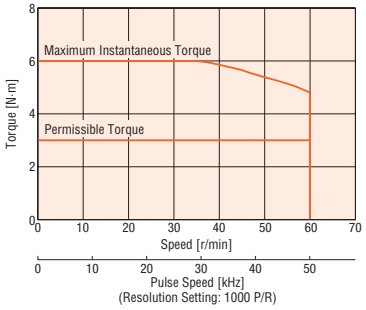
ARM46 Gear Ratio **25**



ARM46 Gear Ratio **36**



ARM46 Gear Ratio **50**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.

PS Geared Type Frame Size 60 mm

Specifications

Motor Product Name	Single Shaft		**ARM66AC-PS5**	**ARM66AC-PS7**	**ARM66AC-PS10**	**ARM66AC-PS25**	**ARM66AC-PS36**	**ARM66AC-PS50**
	With Electromagnetic Brake		**ARM66MC-PS5**	**ARM66MC-PS7**	**ARM66MC-PS10**	**ARM66MC-PS25**	**ARM66MC-PS36**	**ARM66MC-PS50**
Driver Product Name	Built-in Controller		**ARD-AD** (Single-Phase 100-120 VAC), **ARD-CD** (Single-Phase 200-240 VAC)					
	Pulse Input		**ARD-A** (Single-Phase 100-115 VAC), **ARD-C** (Single-Phase 200-230 VAC), **ARD-S** (Three-Phase 200-230 VAC)					
Maximum Holding Torque		N·m	3.5	4	5	8		
Rotor Inertia		J: kg·m^2	380×10^{-7} [500×10^{-7}]✻2					
Gear Ratio			5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R		0.072º/Pulse	0.05º/Pulse	0.036º/Pulse	0.0144º/Pulse	0.01º/Pulse	0.0072º/Pulse
Permissible Torque		N·m	3.5	4	5	8		
Maximum Instantaneous Torque✻		N·m	✻	✻	11	16	✻	20
Holding Torque at Motor Standstill	Power ON	N·m	3	4	5	8		
	Electromagnetic Brake	N·m	3	4	5	8		
Speed Range		r/min	0 to 600	0 to 416	0 to 300	0 to 120	0 to 83	0 to 60
Backlash		arcmin	7 (0.12º)			9 (0.15º)		
Power Supply Input	Voltage/Frequency	Built-in Controller	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC −15 to +6% 50/60 Hz					
		Pulse Input	Single-Phase 100-115 VAC, Single-Phase 200-230 VAC, Three-Phase 200-230 VAC −15 to +10% 50/60 Hz					
	Input Current A	Built-in Controller: Single-Phase 100-120 VAC	3.6					
		Built-in Controller: Single-Phase 200-240 VAC	2.3					
		Pulse Input: Single-Phase 100-115 VAC	4.4					
		Pulse Input: Single-Phase 200-230 VAC	2.7					
		Pulse Input: Three-Phase 200-230 VAC	1.4					
Control Voltage✻3	Built-in Controller		24 VDC ±5%✻4 0.25A [0.5 A]✻2					
	Pulse Input		24 VDC ±5%✻4 0.5A [0.75 A]✻2					

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

✻1 Only for the pulse input type.

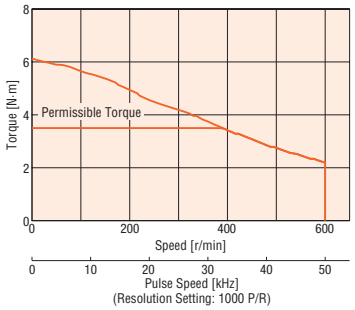
✻2 The values in brackets [ ] include the inertia of electromagnetic brake.

✻3 For pulse input type driver, a separate power supply for electromagnetic brake is required for the electromagnetic brake product.

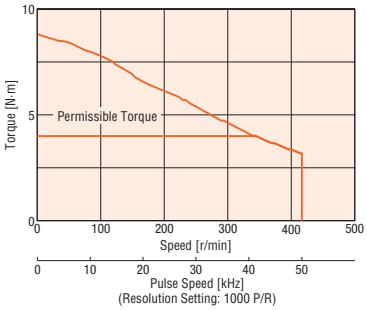
✻4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

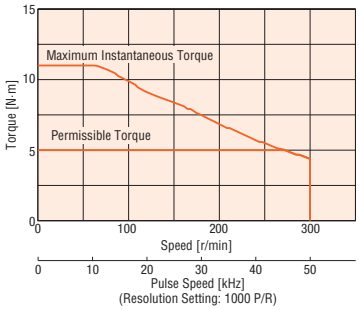
ARM66 Gear Ratio **5**



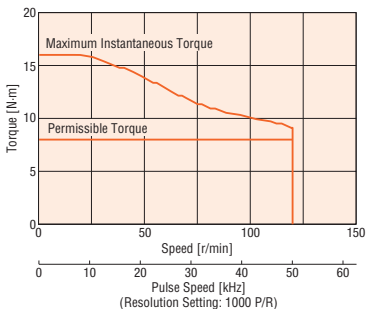
ARM66 Gear Ratio **7.2**



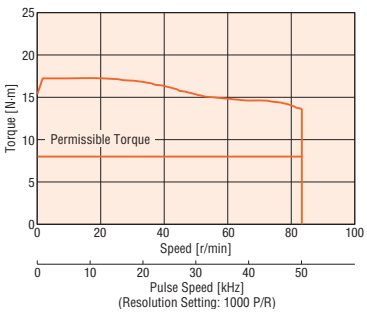
ARM66 Gear Ratio **10**



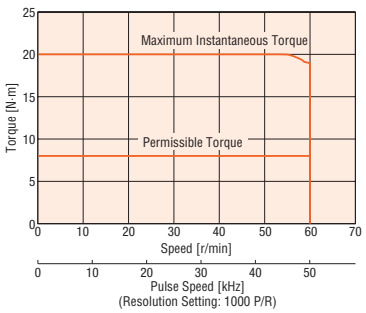
ARM66 Gear Ratio **25**



ARM66 Gear Ratio **36**



ARM66 Gear Ratio **50**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100ºC or less.

PS Geared Type Frame Size 90 mm

Specifications

Motor Product Name	Single Shaft		ARM98AC-PS5	ARM98AC-PS7	ARM98AC-PS10	ARM98AC-PS25	ARM98AC-PS36	ARM98AC-PS50
	With Electromagnetic Brake		ARM98MC-PS5	ARM98MC-PS7	ARM98MC-PS10	ARM98MC-PS25	ARM98MC-PS36	ARM98MC-PS50
Driver Product Name	Built-in Controller		**ARD-AD** (Single-Phase 100-120 VAC), **ARD-CD** (Single-Phase 200-240 VAC)					
	Pulse Input		**ARD-A** (Single-Phase 100-115 VAC), **ARD-C** (Single-Phase 200-230 VAC), **ARD-S** (Three-Phase 200-230 VAC)					
Maximum Holding Torque		N·m	10	14	20	37		
Rotor Inertia		J: kg·m^2	1100×10^{-7} [1220×10^{-7}]*2					
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 Instantaneous Torque*		N·m	*	*	*	*	60	
Holding Torque at Motor Standstill	Power ON	N·m	5	7.2	10	25	36	37
	Electromagnetic Brake	N·m	5	7.2	10	25	36	37
Speed Range		r/min	0～600	0～416	0～300	0～120	0～83	0～60
Backlash		arcmin	7 (0.12°)			9 (0.15°)		
Power Supply Input	Voltage/Frequency	Built-in Controller	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC −15 to +6% 50/60 Hz					
		Pulse Input	Single-Phase 100-115 VAC, Single-Phase 200-230 VAC, Three-Phase 200-230 VAC −15 to +10% 50/60 Hz					
	Input Current A	Built-in Controller: Single-Phase 100-120 VAC	4.6					
		Built-in Controller: Single-Phase 200-240 VAC	2.9					
		Pulse Input: Single-Phase 100-115 VAC	5.5					
		Pulse Input: Single-Phase 200-230 VAC	3.4					
		Pulse Input: Three-Phase 200-230 VAC	1.8					
Control Voltage*3	Built-in Controller		24 VDC ±5%*4 0.25A [0.5 A]*2					
	Pulse Input		24 VDC ±5%*4 0.5A [0.75 A]*2					

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

*1 Only for the pulse input type.

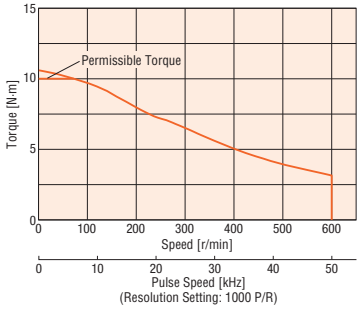
*2 The values in brackets [ ] include the inertia of electromagnetic brake.

*3 For pulse input type driver, a separate power supply for electromagnetic brake is required for the electromagnetic brake product.

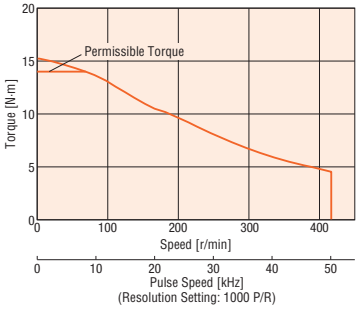
*4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

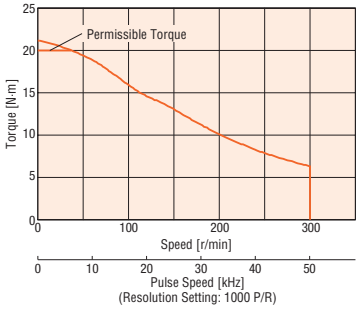
ARM98 Gear Ratio **5**



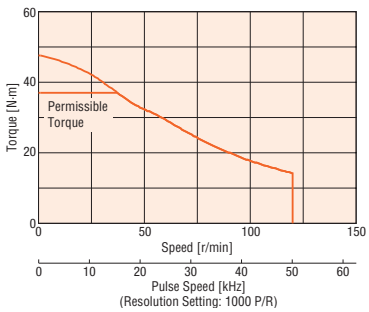
ARM98 Gear Ratio **7.2**



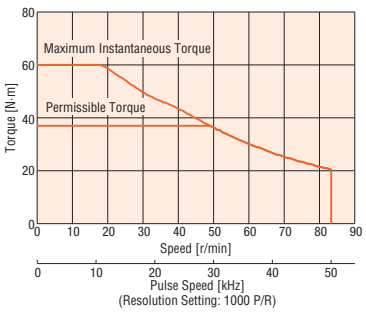
ARM98 Gear Ratio **10**



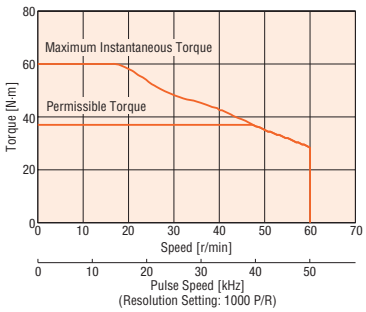
ARM98 Gear Ratio **25**



ARM98 Gear Ratio **36**



ARM98 Gear Ratio **50**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.

PN Geared Type Frame Size 42 mm

Specifications

Motor Product Name	Single Shaft		**ARM46AC-N5**	**ARM46AC-N7.2**	**ARM46AC-N10**
	With Electromagnetic Brake		**ARM46MC-N5**	**ARM46MC-N7.2**	**ARM46MC-N10**
Driver Product Name	Built-in Controller		**ARD-AD** (Single-Phase 100-120 VAC), **ARD-CD** (Single-Phase 200-240 VAC)		
	Pulse Input		**ARD-A** (Single-Phase 100-115 VAC), **ARD-C** (Single-Phase 200-230 VAC), **ARD-S** (Three-Phase 200-230 VAC)		
Maximum Holding Torque		N·m	1.35	1.5	
Rotor Inertia		J: kg·m^2	58×10^{-7} [73×10^{-7}]*2		
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 Instantaneous Torque*		N·m	*	2	
Holding Torque at Motor Standstill	Power ON	N·m	0.75	1	1.5
	Electromagnetic Brake	N·m	0.75	1	1.5
Speed Range		r/min	0 to 600	0 to 416	0 to 300
Backlash		arcmin	2 (0.034°)		
Power Supply Input	Voltage/Frequency	Built-in Controller	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC −15 to +6% 50/60 Hz		
		Pulse Input	Single-Phase 100-115 VAC, Single-Phase 200-230 VAC, Three-Phase 200-230 VAC −15 to +10% 50/60 Hz		
	Input Current A	Built-in Controller: Single-Phase 100-120 VAC	2.4		
		Built-in Controller: Single-Phase 200-240 VAC	1.5		
		Pulse Input: Single-Phase 100-115 VAC	2.9		
		Pulse Input: Single-Phase 200-230 VAC	1.9		
		Pulse Input: Three-Phase 200-230 VAC	1		
Control Voltage*3	Built-in Controller		24 VDC ±5%*4 0.25A [0.33 A]*2		
	Pulse Input		24 VDC ±5%*4 0.5A [0.58 A]*2		

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

*1 Only for the pulse input type.

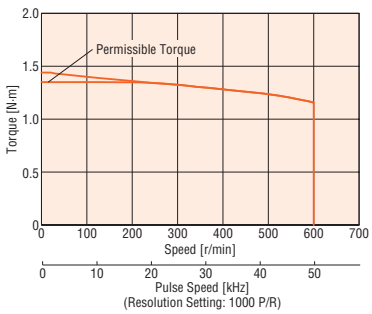
*2 The values in brackets [ ] include the inertia of electromagnetic brake.

*3 For pulse input type driver, a separate power supply for electromagnetic brake is required for the electromagnetic brake product.

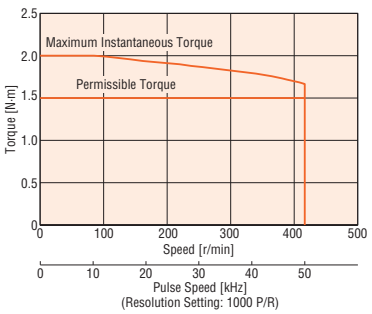
*4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

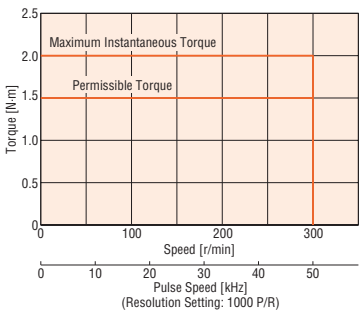
ARM46 Gear Ratio **5**



ARM46 Gear Ratio **7.2**



ARM46 Gear Ratio **10**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.

PN Geared Type Frame Size 60 mm

Specifications

Motor Product Name	Single Shaft		**ARM66AC-N5**	**ARM66AC-N7.2**	**ARM66AC-N10**	**ARM66AC-N25**	**ARM66AC-N36**	**ARM66AC-N50**
	With Electromagnetic Brake		**ARM66MC-N5**	**ARM66MC-N7.2**	**ARM66MC-N10**	**ARM66MC-N25**	**ARM66MC-N36**	**ARM66MC-N50**
Driver Product Name	Built-in Controller		**ARD-AD** (Single-Phase 100-120 VAC), **ARD-CD** (Single-Phase 200-240 VAC)					
	Pulse Input		**ARD-A** (Single-Phase 100-115 VAC), **ARD-C** (Single-Phase 200-230 VAC), **ARD-S** (Three-Phase 200-230 VAC)					
Maximum Holding Torque		N·m	3.5	4	5	8		
Rotor Inertia		J: kg·m^2	380×10^{-7} [500×10^{-7}]✻2					
Gear Ratio			5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R		0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque		N·m	3.5	4	5	8		
Maximum Instantaneous Torque✻		N·m	✻	✻	11	16	✻	20
Holding Torque at Motor Standstill	Power ON	N·m	3	4	5	8		
	Electromagnetic Brake	N·m	3	4	5	8		
Speed Range		r/min	0～600	0～416	0～300	0～120	0～83	0～60
Backlash		arcmin	2 (0.034°)			3 (0.05°)		
Power Supply Input	Voltage/Frequency	Built-in Controller	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC −15 to +6% 50/60 Hz					
		Pulse Input	Single-Phase 100-115 VAC, Single-Phase 200-230 VAC, Three-Phase 200-230 VAC −15 to +10% 50/60 Hz					
	Input Current A	Built-in Controller: Single-Phase 100-120 VAC	3.6					
		Built-in Controller: Single-Phase 200-240 VAC	2.3					
		Pulse Input: Single-Phase 100-115 VAC	4.4					
		Pulse Input: Single-Phase 200-230 VAC	2.7					
		Pulse Input: Three-Phase 200-230 VAC	1.4					
Control Voltage✻3	Built-in Controller		24 VDC ±5%✻4 0.25A [0.5 A]✻2					
	Pulse Input		24 VDC ±5%✻4 0.5A [0.75 A]✻2					

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

✻1 Only for the pulse input type.

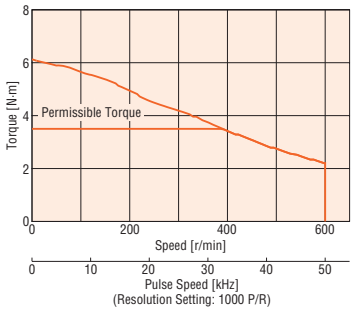
✻2 The values in brackets [ ] include the inertia of electromagnetic brake.

✻3 For pulse input type driver, a separate power supply for electromagnetic brake is required for the electromagnetic brake product.

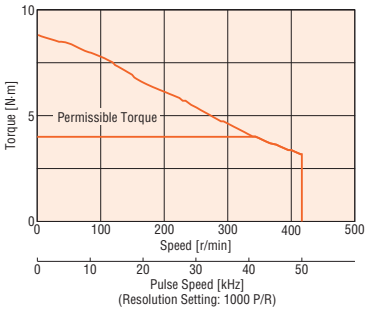
✻4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

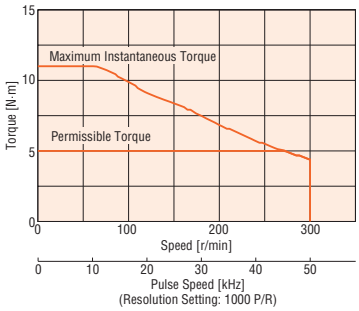
ARM66 Gear Ratio **5**



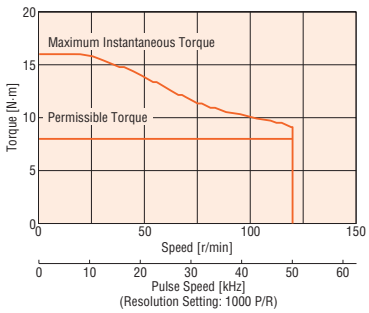
ARM66 Gear Ratio **7.2**



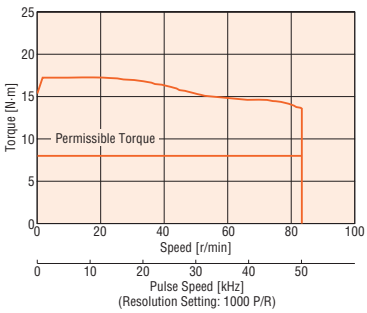
ARM66 Gear Ratio **10**



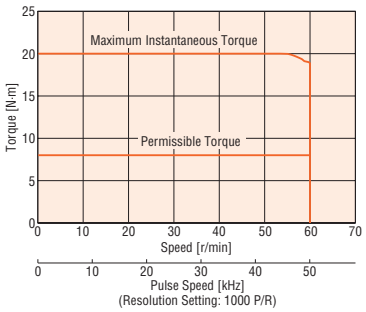
ARM66 Gear Ratio **25**



ARM66 Gear Ratio **36**



ARM66 Gear Ratio **50**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.

PN Geared Type Frame Size 90 mm

Specifications

Motor Product Name	Single Shaft		**ARM98AC-N5**	**ARM98AC-N7.2**	**ARM98AC-N10**	**ARM98AC-N25**	**ARM98AC-N36**	**ARM98AC-N50**
	With Electromagnetic Brake		**ARM98MC-N5**	**ARM98MC-N7.2**	**ARM98MC-N10**	**ARM98MC-N25**	**ARM98MC-N36**	**ARM98MC-N50**
Driver Product Name	Built-in Controller		**ARD-AD** (Single-Phase 100-120 VAC), **ARD-CD** (Single-Phase 200-240 VAC)					
	Pulse Input		**ARD-A** (Single-Phase 100-115 VAC), **ARD-C** (Single-Phase 200-230 VAC), **ARD-S** (Three-Phase 200-230 VAC)					
Maximum Holding Torque		N·m	10	14	20	37		
Rotor Inertia		J: kg·m^2	1100×10^{-7} [1220×10^{-7}]*2					
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 Instantaneous Torque*		N·m	*	*	*	*	60	
Holding Torque at Motor Standstill	Power ON	N·m	5	7.2	10	25	36	37
	Electromagnetic Brake	N·m	5	7.2	10	25	36	37
Speed Range		r/min	0 to 600	0 to 416	0 to 300	0 to 120	0 to 83	0 to 60
Backlash		arcmin	2 (0.034°)			3 (0.05°)		
Power Supply Input	Voltage/Frequency	Built-in Controller	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC −15 to +6% 50/60 Hz					
		Pulse Input	Single-Phase 100-115 VAC, Single-Phase 200-230 VAC, Three-Phase 200-230 VAC −15 to +10% 50/60 Hz					
	Input Current A	Built-in Controller: Single-Phase 100-120 VAC	4.6					
		Built-in Controller: Single-Phase 200-240 VAC	2.9					
		Pulse Input: Single-Phase 100-115 VAC	5.5					
		Pulse Input: Single-Phase 200-230 VAC	3.4					
		Pulse Input: Three-Phase 200-230 VAC	1.8					
Control Voltage*3	Built-in Controller		24 VDC ±5%*4 0.25A [0.5 A]*2					
	Pulse Input		24 VDC ±5%*4 0.5A [0.75 A]*2					

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

*1 Only for the pulse input type.

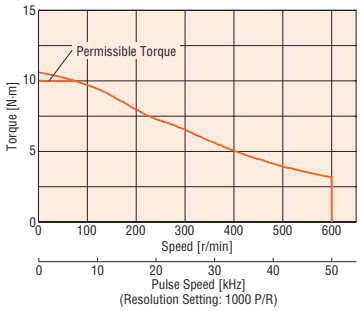
*2 The values in brackets [ ] include the inertia of electromagnetic brake.

*3 For pulse input type driver, a separate power supply for electromagnetic brake is required for the electromagnetic brake product.

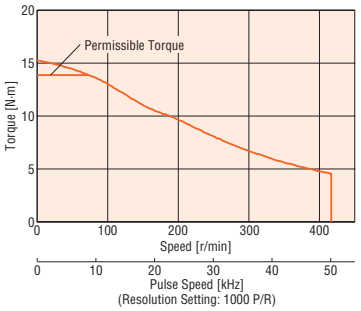
*4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

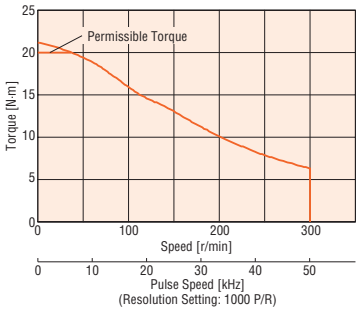
ARM98 Gear Ratio **5**



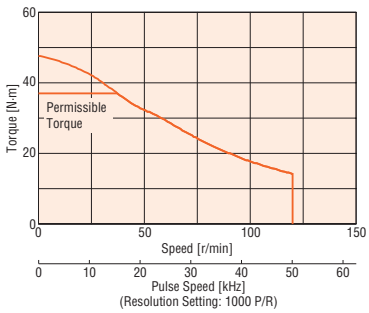
ARM98 Gear Ratio **7.2**



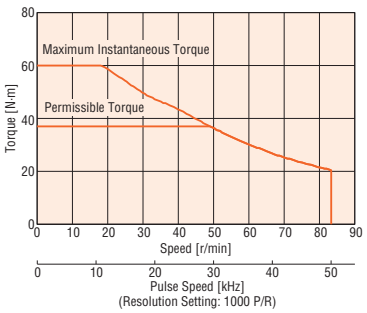
ARM98 Gear Ratio **10**



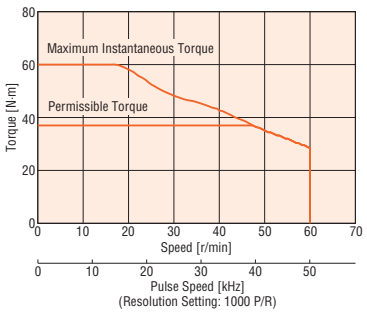
ARM98 Gear Ratio **25**



ARM98 Gear Ratio **36**



ARM98 Gear Ratio **50**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.

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

Specifications

Motor Product Name	Single Shaft		**ARM46AC-H50**	**ARM46AC-H100**	**ARM66AC-H50**	**ARM66AC-H100**	**ARM98AC-H50**	**ARM98AC-H100**
	With Electromagnetic Brake		**ARM46MC-H50**	**ARM46MC-H100**	**ARM66MC-H50**	**ARM66MC-H100**	**ARM98MC-H50**	**ARM98MC-H100**
Driver Product Name	Built-in Controller		**ARD-AD** (Single-Phase 100-120 VAC), **ARD-CD** (Single-Phase 200-240 VAC)					
	Pulse Input		**ARD-A** (Single-Phase 100-115 VAC), **ARD-C** (Single-Phase 200-230 VAC), **ARD-S** (Three-Phase 200-230 VAC)					
Maximum Holding Torque		N·m	3.5	5	5.5	8	25	37
Rotor Inertia		J: kg·m^2	75×10^{-7} [90×10^{-7}]*2		415×10^{-7} [535×10^{-7}]*2		1300×10^{-7} [1420×10^{-7}]*2	
Gear Ratio			50	100	50	100	50	100
Resolution	Resolution Setting: 1000 P/R		0.0072°/Pulse	0.0036°/Pulse	0.0072°/Pulse	0.0036°/Pulse	0.0072°/Pulse	0.0036°/Pulse
Permissible Torque		N·m	3.5	5	5.5	8	25	37
Maximum Instantaneous Torque		N·m	8.3	11	18	28	35	55
Holding Torque at Motor Standstill	Power ON	N·m	3.5	5	5.5	8	25	37
	Electromagnetic Brake	N·m	3.5	5	5.5	8	25	37
Speed Range		r/min	0 to 70	0 to 35	0 to 70	0 to 35	0 to 70	0 to 35
Lost Motion (Load Torque)		arcmin	1.5 max. (±0.16 N·m)	1.5 max. (±0.2 N·m)	0.7 max. (±0.28 N·m)	0.7 max. (±0.39 N·m)	1.5 max. (±1.2 N·m)	
Power Supply Input	Voltage/Frequency	Built-in Controller	Single-Phase 100-120 VAC, Single-Phase 200-240 VAC −15 to +6% 50/60 Hz					
		Pulse Input	Single-Phase 100-115 VAC, Single-Phase 200-230 VAC, Three-Phase 200-230 VAC −15 to +10% 50/60 Hz					
	Input Current A	Built-in Controller: Single-Phase 100-120 VAC	2.4		3.6		4.6	
		Built-in Controller: Single-Phase 200-240 VAC	1.5		2.3		2.9	
		Pulse Input: Single-Phase 100-115 VAC	2.9		4.4		5.5	
		Pulse Input: Single-Phase 200-230 VAC	1.9		2.7		3.4	
		Pulse Input: Three-Phase 200-230 VAC	1		1.4		1.8	
Control Voltage*3	Built-in Controller		24 VDC ±5%*4 0.25A [0.33 A]*2		24 VDC ±5%*4 0.25A [0.5 A]*2			
	Pulse Input		24 VDC ±5%*4 0.5A [0.58 A]*2		24 VDC ±5%*4 0.5A [0.75 A]*2			

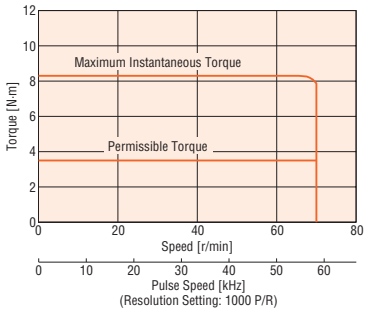
*1 Only for the pulse input type.
*2 The values in brackets [ ] include the inertia of electromagnetic brake.
*3 For pulse input type driver, a separate power supply for electromagnetic brake is required for the electromagnetic brake product.
*4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Note

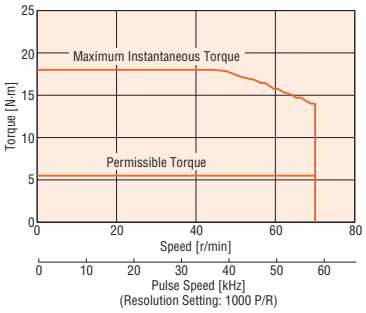
- The rotor inertia represents a sum of the inertia of the harmonic gear converted to motor shaft values.

Speed - Torque Characteristics (Reference values)

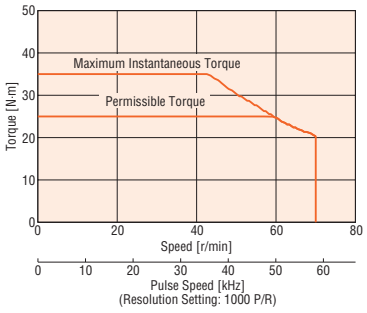
ARM46 Gear Ratio **50**



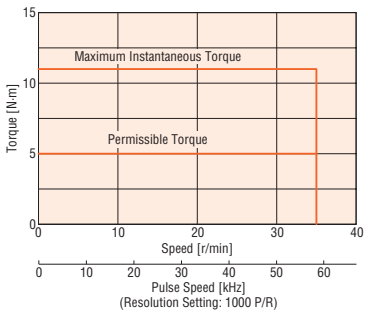
ARM66 Gear Ratio **50**



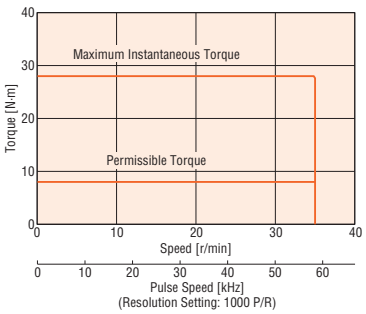
ARM98 Gear Ratio **50**



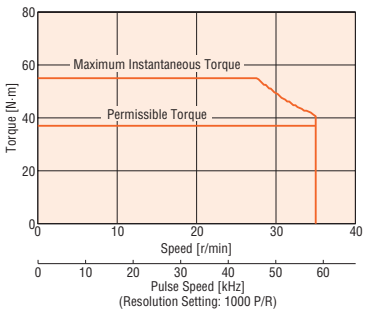
ARM46 Gear Ratio **100**



ARM66 Gear Ratio **100**



ARM98 Gear Ratio **100**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.

Driver Specifications

Driver Type			Built-in Controller Type		Pulse Input Type		
Driver Product Name			**ARD-AD**	**ARD-CD**	**ARD-A**	**ARD-C**	**ARD-S**
I/O Function	Maximum Input Pulse Frequency		–		Line driver output by Host controller: 500 kHz (When the pulse duty is 50%) Open-collector output by Host controller: 250 kHz (When the pulse duty is 50%)✻1 Negative Logic Pulse Input (Initial value)		
	Positioning Data Points		64 points		–		
	Direct Input		8 points		8 points		
	Direct Output		6 points		9 points		
	RS-485 Communication Remote Input		16 points		–		
	RS-485 Communication Remote Output		16 points		–		
Setting Tool	Support Software **MEXE02**		○		○		
	Control Module **OPX-2A**		○		○		
Coordinate Management Method	Absolute System		○		–		
Operation	Positioning Operation	Single-Motion Operation	○		–		
		Linked Operation	○		–		
		Sequential Operation	○		–		
		Direct Operation	○		–		
		Push-Motion Operation	○		○✻2		
	Continuous Operation		○		–		
	Return-to-Home Operation		○		–		
	JOG Operation/Test Operation		○		○✻2		
Monitor/Information		Waveform Monitoring	○		○		
		Overload Detection	○		○		
		Overheat Detection (Motor and driver)	○		○		
		Position and Speed Information	○		○		
		Temperature Detection (Motor and driver)	–		–		
		Motor Load Factor	–		–		
		Travel Distance/Integrated Travel Distance	–		–		
Alarm			○		○		

✻1 The value when the I/O signal cable **CC36D1E** (sold separately) is used. I/O signal cable ➜ Page 126

✻2 This operation is set by an extended function (**MEXE02** or **OPX-2A**)

RS-485 Communication Specification

Protocol	Modbus RTU Mode
Electrical Characteristics	EIA-485 based, Straight Cable Use a shielded twisted pair cable (TIA/EIA-568B CAT5e or higher is recommended) and keep the total wiring distance including extension to 50 m or less.✻
Communication Mode	Half duplex, asynchronous communication (data: 8 bits, stop bit: 1 bit or 2 bits, parity: none, even, or odd)
Transmission Rate	Select either from 9600 bps, 19200 bps, 38400 bps, 57600 bps, or 115200 bps.
Connection Units	Up to 31 drivers can be connected to a single programmable controller (master device).

✻If the motor cable or power supply cable generates an undesirable amount of noise depending on the wiring or configuration, shield the cable or install a ferrite core.

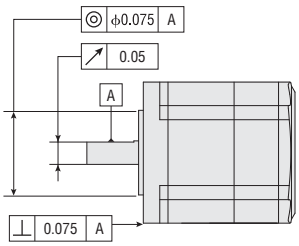
General Specifications

		Motor	Driver	
			Built-in Controller Type	Pulse Input Type
Thermal Class		130 (B)	–	
Insulation Resistance		100 MΩ or more when 500 VDC megger is applied between the following places: ・Case - Motor and Sensor Windings ・Case - Electromagnetic Brake Windings	100 MΩ or more when 500 VDC megger is applied between the following places: ・PE Terminal - Power Supply Terminal ・Signal I/O Terminal - Power Supply Terminal	
Dielectric Strength		Sufficient to withstand the followings for 1 minute: ・Case - Motor and Sensor Windings 1.5 kVAC 50 Hz/60 Hz ・Case - Electromagnetic Brake Windings 1.5 kVAC 50 Hz/60 Hz	Sufficient to withstand the followings for 1 minute: ・PE Terminal - Power Supply Terminal 1.8 kVAC 50 Hz/60 Hz ・Signal I/O Terminal - Power Supply Terminal 1.9 kVAC 50 Hz/60 Hz	・PE Terminal - Power Supply Terminal 1.5 kVAC 50 Hz/60 Hz ・Signal I/O Terminal - Power Supply Terminal 1.8 kVAC 50 Hz/60 Hz
Operating Environment (In operation)	Ambient Temperature	−10 to + 50ºC (Non-freezing)*1: Standard Type, **TH**, **FC**, **PS**, and **PN** Geared Type 0 to + 40ºC (Non-freezing)*1: Harmonic Geared Type	0 to + 55ºC (Non-freezing)*2	0 to + 50ºC (Non-freezing)*2
	Ambient Humidity	85% or less (Non-condensing)		
	Surrounding Atmosphere	No corrosive gas or dust. No water or oil.		
Degree of Protection		Standard Type (Single Shaft) and Geared Type: IP65 (Excluding the mounting surface and connector) Standard Type (Double Shaft): IP20	IP10	IP20
Stop Position Accuracy		**ARM46**: ±4 arcmin (±0.067º) **ARM66**, **ARM69**, **ARM98**, **ARM911**: ±3 arcmin (±0.05º)		
Shaft Runout		0.05 T.I.R. (mm)*3	–	
Concentricity of Installing Pilot to the Shaft		0.075 T.I.R. (mm)*3	–	
Perpendicularity of Installation Surface to the Shaft		0.075 T.I.R. (mm)*3	–	

*1 When installing a motor to a heat sink of a capacity at least equivalent to an aluminum plate, 250×250 mm, thickness 6 mm.
*2 When installing a motor to a heat sink of a capacity at least equivalent to an aluminum plate, 200×200 mm, thickness 2 mm.
*3 T.I.R. (Total Indicator Reading): The total dial gauge reading when the measurement section is rotated once around the reference axis center.

Note

● Disconnect the motor and driver when taking an insulation resistance measurement or performing a dielectric voltage withstand test.



Electromagnetic Brake Specifications

Product Name		ARM46	ARM66	ARM69	ARM98
Brake Type		Power Off Activated Type			
Power Supply Voltage		24 VDC ±5%*			
Power Supply Current	A	0.08	0.25		
Brake Operating Time	ms	20			
Brake Releasing Time	ms	30			
Time Rating		Continuous			

*For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 m to 30 m using a cable.

● The product names are listed such that the applicable product names can be determined.

Load Torque - Driver Input Current Characteristics

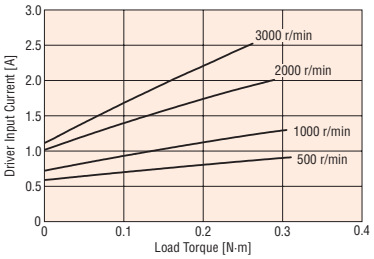
This is the relationship between the load torque and driver input current at each speed when the motor is operated. From these characteristics, the current capacity required when used for multiple axes can be estimated. For geared motors, convert to torque and speed at the motor shaft.

Motor Shaft Speed = Gear Output Shaft Speed × Gear Ratio [r/min]

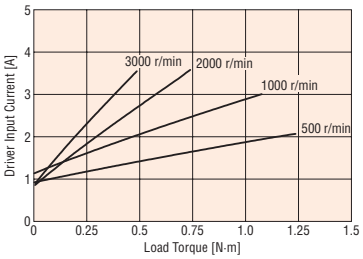
$$\text{Motor Shaft Torque} = \frac{\text{Gear Output Shaft Torque}}{\text{Gear Ratio}} \text{ [N·m]}$$

Single-Phase 100-115 (120) VAC

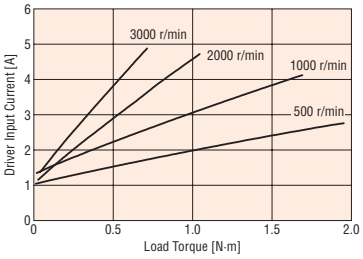
ARM46□C



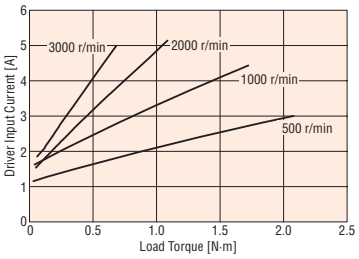
ARM66□C



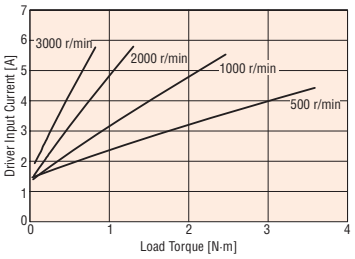
ARM69□C



ARM98□C

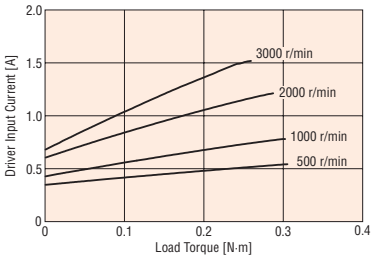


ARM911□C

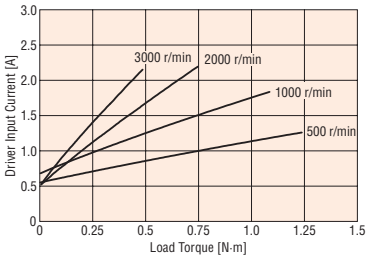


Single-Phase 200-230 (240) VAC

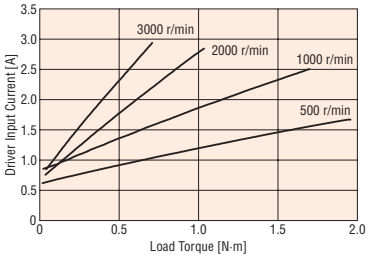
ARM46□C



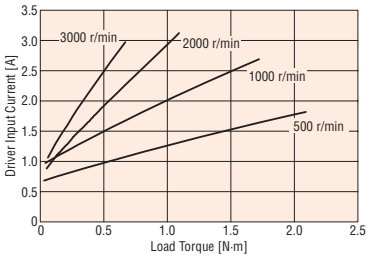
ARM66□C



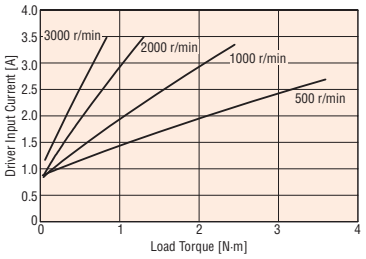
ARM69□C



ARM98□C

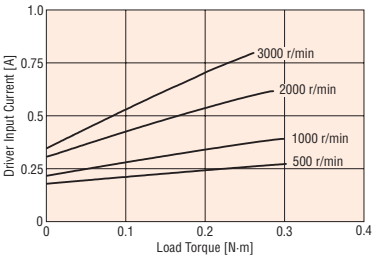


ARM911□C

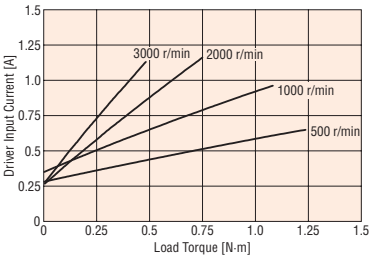


Three-Phase 200-230 VAC

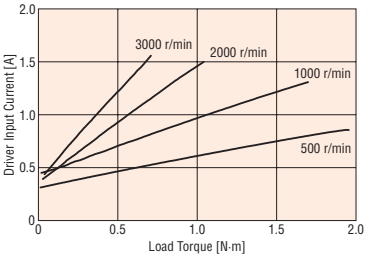
ARM46□C



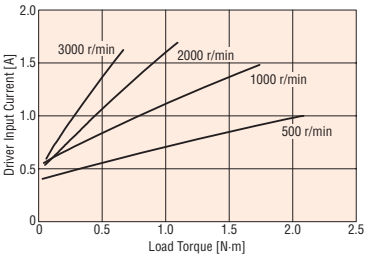
ARM66□C



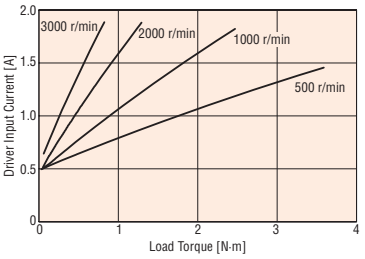
ARM69□C



ARM98□C



ARM911□C



Note

For built-in controller type, the reference value is approx. 0.1 A lower.

Permissible Radial Load and Permissible Axial Load, Permissible Moment Load

➜ Page 116, Page 117

Rotational Direction

➜ Page 117

Dimensions (Unit: mm)

Motor

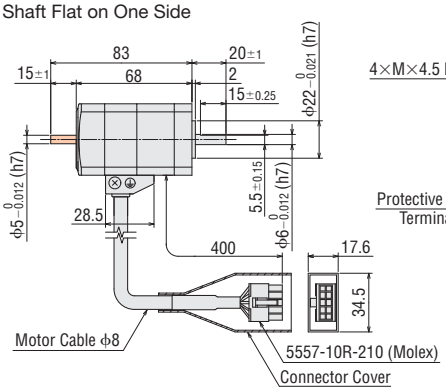
◇Standard Type

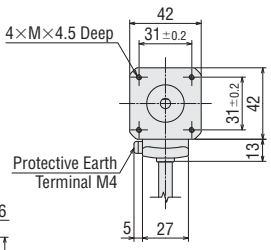
Frame Size 42 mm

2D & 3D CAD

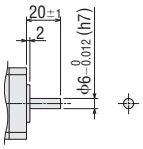
Shaft Type	Product Name	Mass kg	2D CAD
Shaft Flat on One Side	**ARM46AC**	0.47	B447
	ARM46BC		
Round Shaft	**ARM46A0C**		B1369A
	ARM46B0C		B1369B

Shaft Flat on One Side





Round Shaft

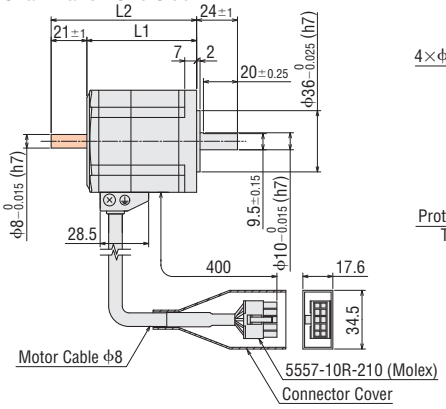


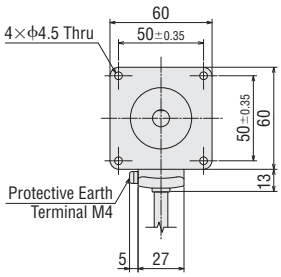
Frame Size 60 mm

2D & 3D CAD

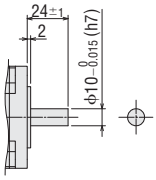
Shaft Type	Product Name	L1	L2	Mass kg	2D CAD
Shaft Flat on One Side	**ARM66AC**	64.5	–	0.9	B448
	ARM66BC		85.5		
Round Shaft	**ARM66A0C**		–		B1371A
	ARM66B0C		85.5		B1371B
Shaft Flat on One Side	**ARM69AC**	90	–	1.4	B449
	ARM69BC		111		
Round Shaft	**ARM69A0C**		–		B1373A
	ARM69B0C		111		B1373B

Shaft Flat on One Side





Round Shaft



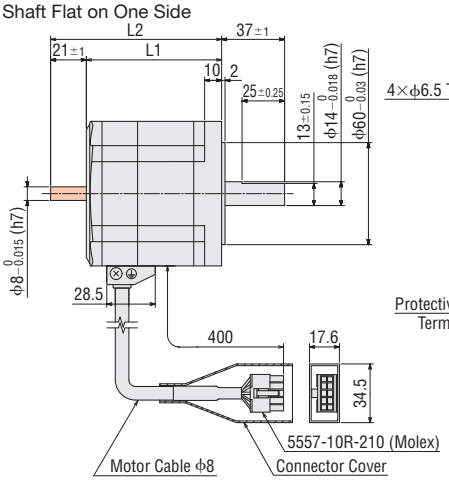
● These dimensions are for double shaft motors. For single shaft motors, ignore the shaded areas.

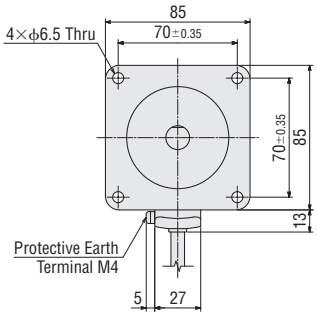
Frame Size 85 mm

2D & 3D CAD

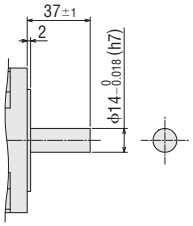
Shaft Type	Product Name	L1	L2	Mass kg	2D CAD
Shaft Flat on One Side	**ARM98AC**	79.5	–	1.9	B455
	ARM98BC		100.5		
Round Shaft	**ARM98A0C**		–		B1375A
	ARM98B0C		100.5		B1375B
Shaft Flat on One Side	**ARM911AC**	109.5	–	3	B456
	ARM911BC		130.5		
Round Shaft	**ARM911A0C**		–		B1377A
	ARM911B0C		130.5		B1377B

Shaft Flat on One Side





Round Shaft



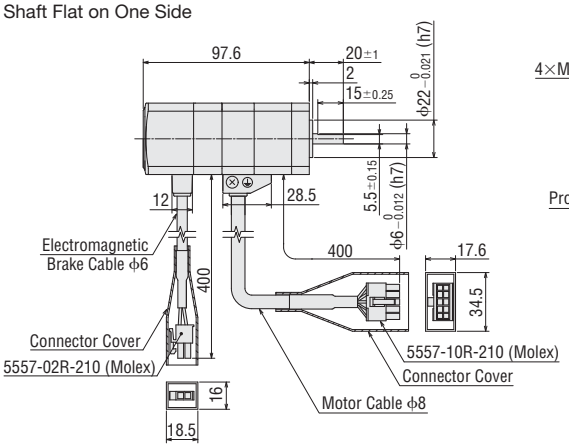
◇Standard Type with Electromagnetic Brake

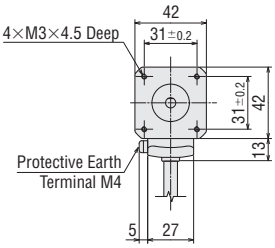
Frame Size 42 mm

2D & 3D CAD

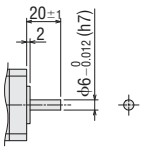
Shaft Type	Product Name	Mass kg	2D CAD
Shaft Flat on One Side	**ARM46MC**	0.62	B450
Round Shaft	**ARM46M0C**		B1370

Shaft Flat on One Side





Round Shaft



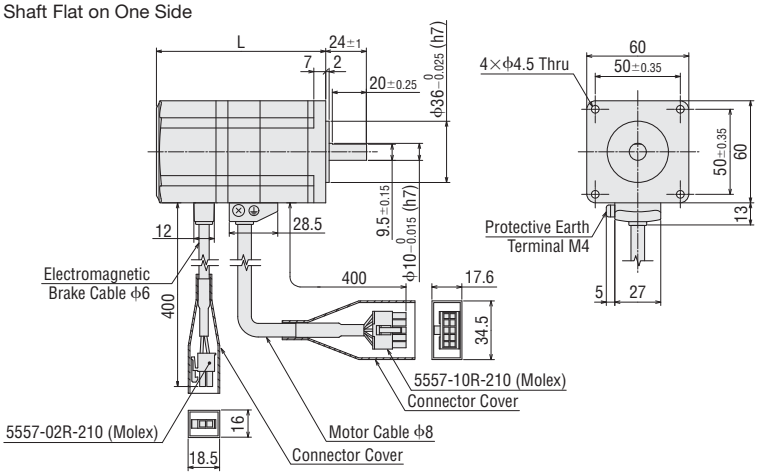
● The dimensions of standard type frame size 85 mm is for double shaft motor. For single shaft motor, ignore the shaded area.

Frame Size 60 mm

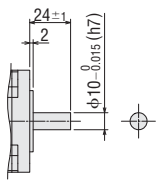
2D & 3D CAD

Shaft Type	Product Name	L	Mass kg	2D CAD
Shaft Flat on One Side	**ARM66MC**	99.5	1.2	B451
Round Shaft	**ARM66M0C**			B1372
Shaft Flat on One Side	**ARM69MC**	125	1.7	B452
Round Shaft	**ARM69M0C**			B1374

Shaft Flat on One Side



Round Shaft

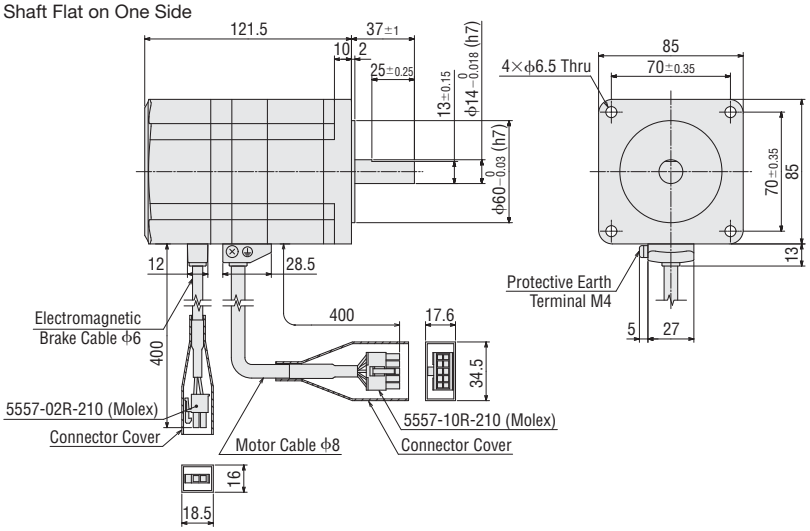


Frame Size 85 mm

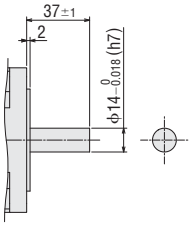
2D & 3D CAD

Shaft Type	Product Name	Mass kg	2D CAD
Shaft Flat on One Side	**ARM98MC**	2.5	B457
Round Shaft	**ARM98M0C**		B1376

Shaft Flat on One Side



Round Shaft

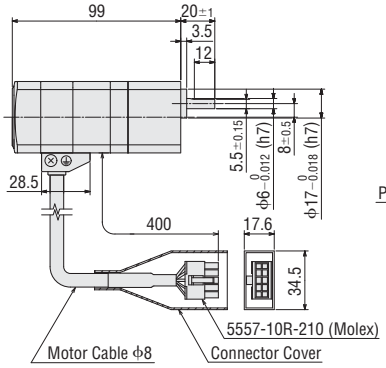


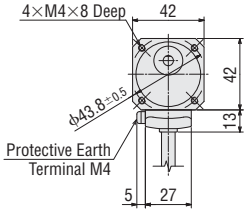
◇TH Geared Type

Frame Size 42 mm

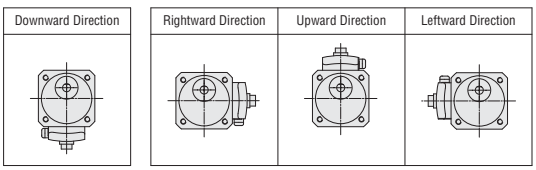
2D & 3D CAD

Cable Outlet Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward Direction	**ARM46AC-T□**	**3.6, 7.2, 10, 20, 30**	0.62	B458
Rightward Direction	**ARM46AC-T□R**			B1378
Upward Direction	**ARM46AC-T□U**			B1379
Leftward Direction	**ARM46AC-T□L**			B1380





● Cable Drawing Direction



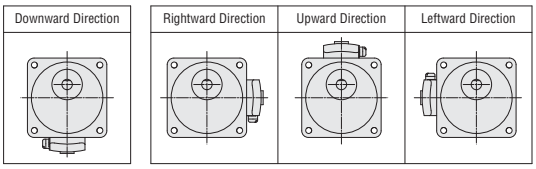
● A number indicating the gear ratio is specified where the box ■ is located within the product name.

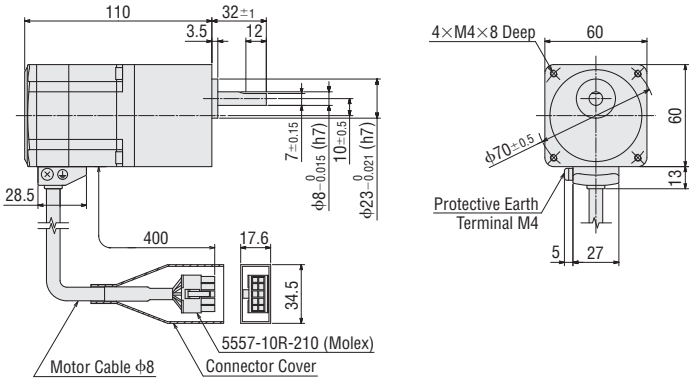
Frame Size 60 mm

2D & 3D CAD

Cable Outlet Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward Direction	**ARM66AC-T■**	**3.6**, **7.2**, **10**, **20**, **30**	1.3	B459
Rightward Direction	**ARM66AC-T■R**			B1384
Upward Direction	**ARM66AC-T■U**			B1385
Leftward Direction	**ARM66AC-T■L**			B1386

● Cable Drawing Direction



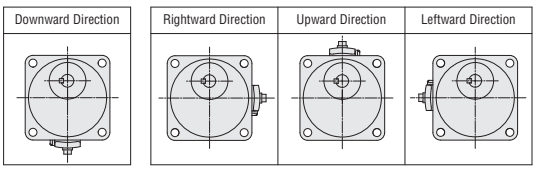


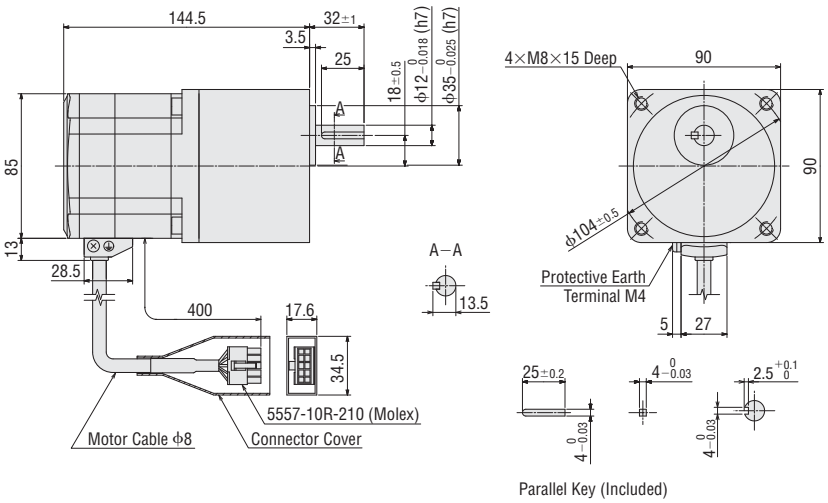
Frame Size 90 mm

2D & 3D CAD

Cable Outlet Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward Direction	**ARM98AC-T■**	**3.6**, **7.2**, **10**, **20**, **30**	3.1	B460
Rightward Direction	**ARM98AC-T■R**			B1390
Upward Direction	**ARM98AC-T■U**			B1391
Leftward Direction	**ARM98AC-T■L**			B1392

● Cable Drawing Direction





Parallel Key (Included)

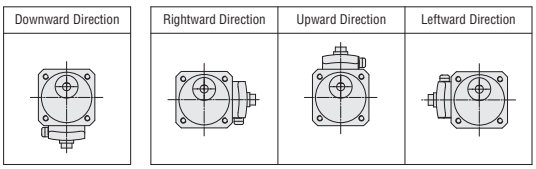
◇**TH** Geared Type with Electromagnetic Brake

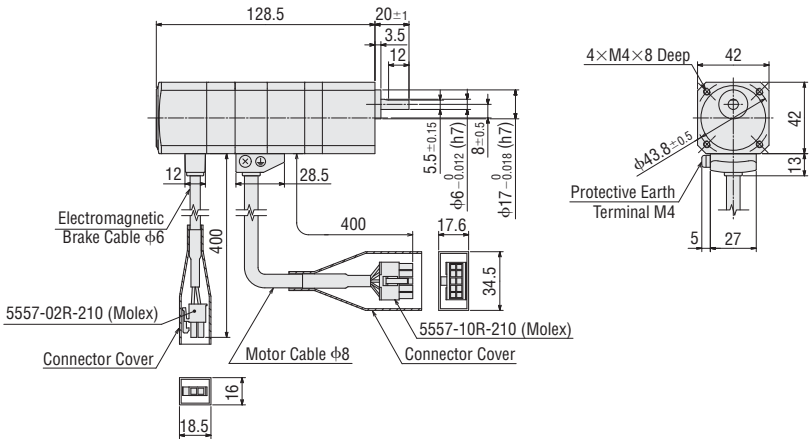
Frame Size 42 mm

2D & 3D CAD

Cable Outlet Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward Direction	**ARM46MC-T■**	**3.6**, **7.2**, **10**, **20**, **30**	0.77	B461
Rightward Direction	**ARM46MC-T■R**			B1381
Upward Direction	**ARM46MC-T■U**			B1382
Leftward Direction	**ARM46MC-T■L**			B1383

● Cable Drawing Direction





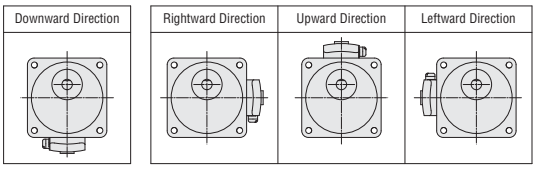
● A number indicating the gear ratio is specified where the box ■ is located within the product name.

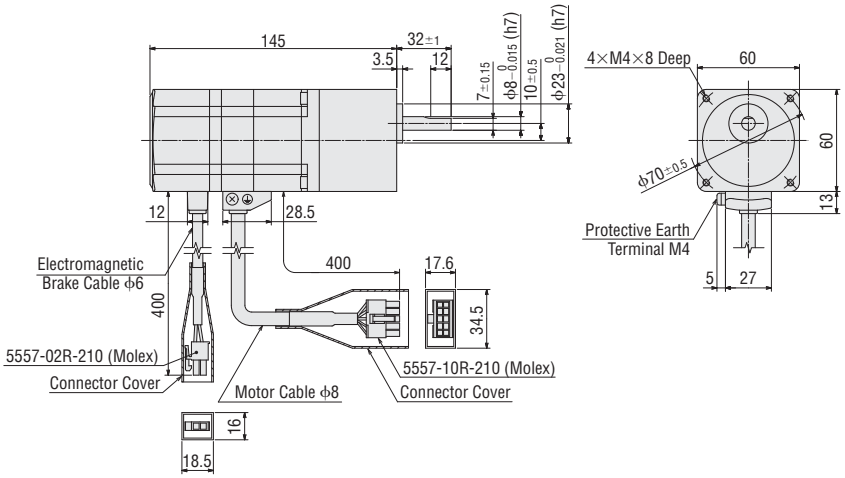
Frame Size 60 mm

2D & 3D CAD

Cable Outlet Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward Direction	**ARM66MC-T■**	**3.6, 7.2, 10, 20, 30**	1.6	B462
Rightward Direction	**ARM66MC-T■R**			B1387
Upward Direction	**ARM66MC-T■U**			B1388
Leftward Direction	**ARM66MC-T■L**			B1389

Cable Drawing Direction



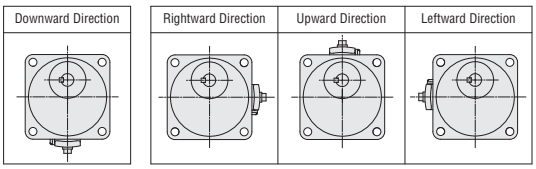


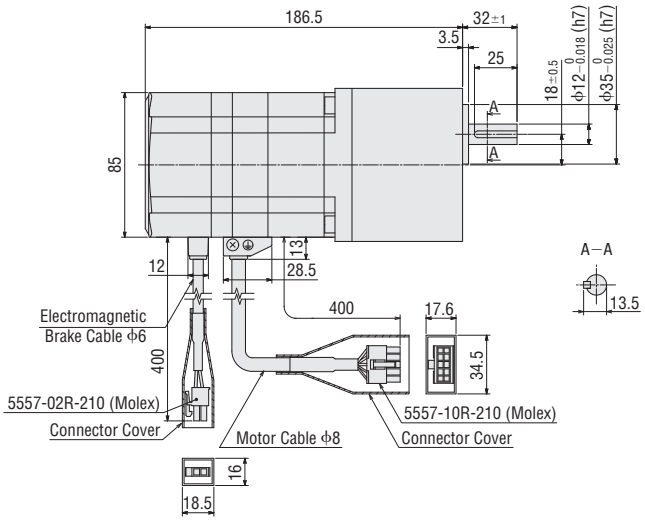
Frame Size 90 mm

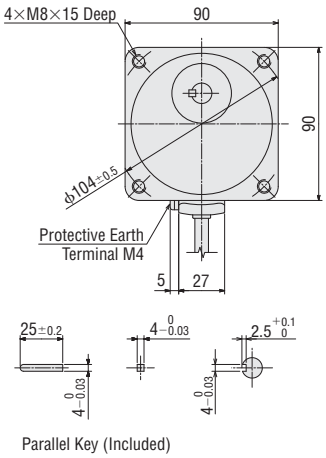
2D & 3D CAD

Cable Outlet Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward Direction	**ARM98MC-T■**	**3.6, 7.2, 10, 20, 30**	3.7	B463
Rightward Direction	**ARM98MC-T■R**			B1393
Upward Direction	**ARM98MC-T■U**			B1394
Leftward Direction	**ARM98MC-T■L**			B1395

Cable Drawing Direction





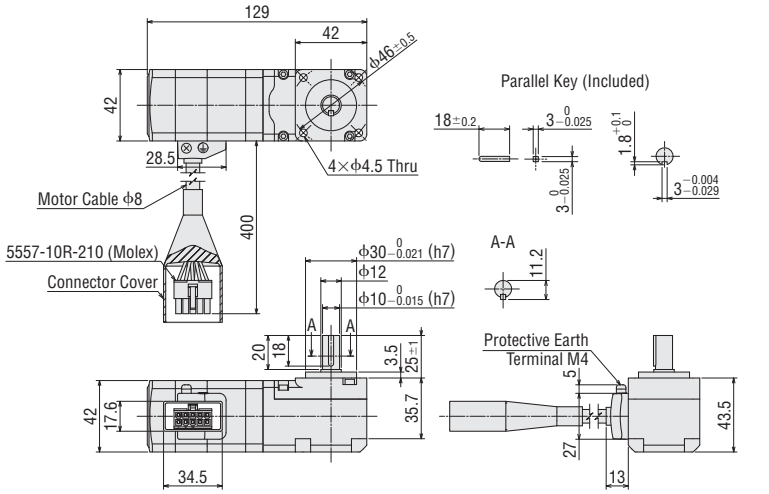


● A number indicating the gear ratio is specified where the box ■ is located within the product name.

◇**FC** Geared Type

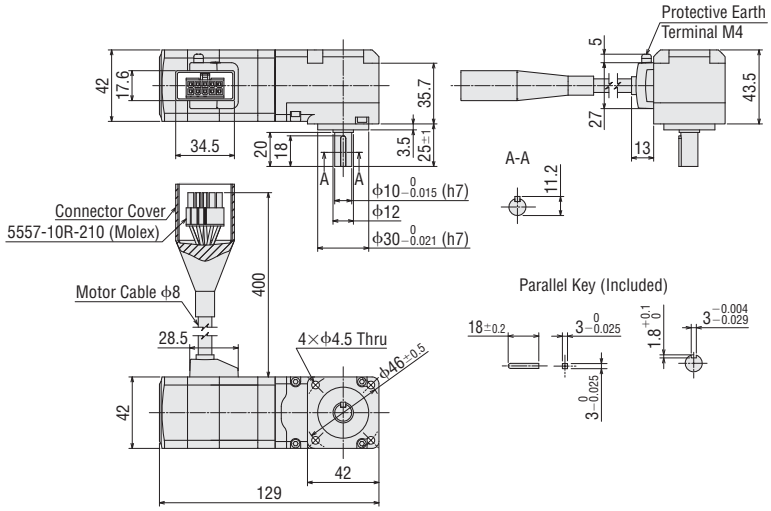
Frame Size 42 mm　Output Shaft Direction: L Shaft (Left)　2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM46AC-FC□LA	**7.2**, **10**, **20**, **30**	0.82	B1231



Frame Size 42 mm　Output Shaft Direction: R Shaft (Right)　2D & 3D CAD

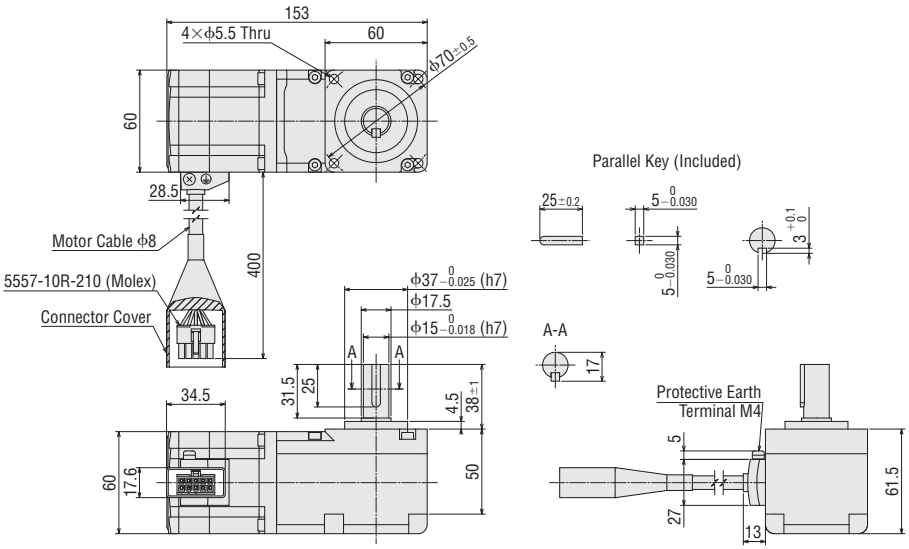
Product Name	Gear Ratio	Mass kg	2D CAD
ARM46AC-FC□RA	**7.2**, **10**, **20**, **30**	0.82	B1232



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

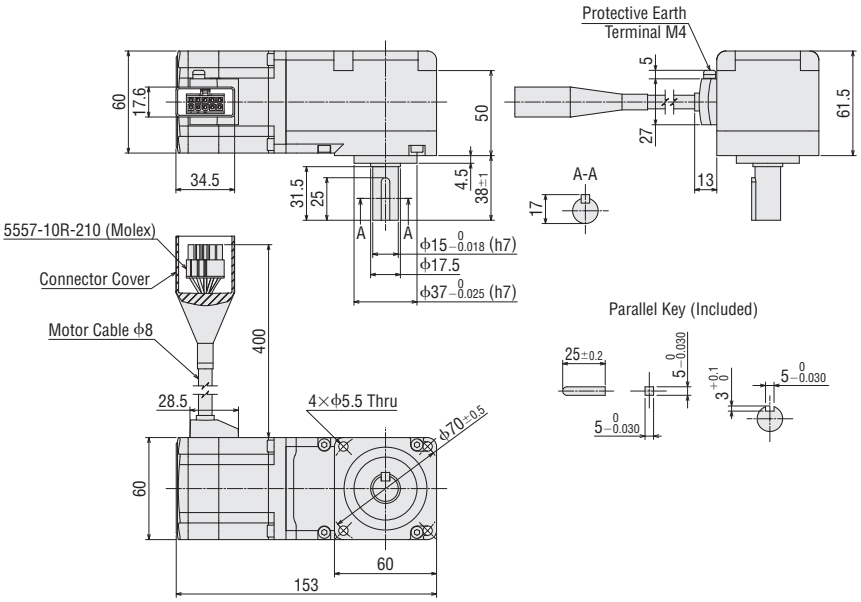
Frame Size 60 mm Output Shaft Direction: L Shaft (Left) 2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM66AC-FC□LA	**7.2, 10, 20, 30**	1.8	B1233



Frame Size 60 mm Output Shaft Direction: R Shaft (Right) 2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM66AC-FC□RA	**7.2, 10, 20, 30**	1.8	B1234



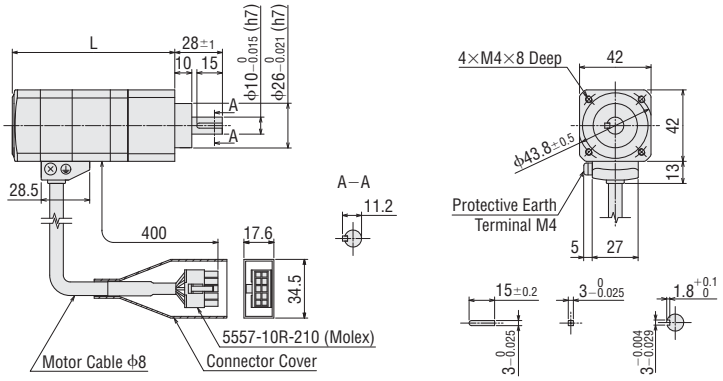
● A number indicating the gear ratio is specified where the box ■ is located within the product name.

◇**PS** Geared Type

Frame Size 42 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM46AC-PS■	**5**, **7.2**, **10**	96	0.67	B666
	25, **36**, **50**	119.5	0.82	B667

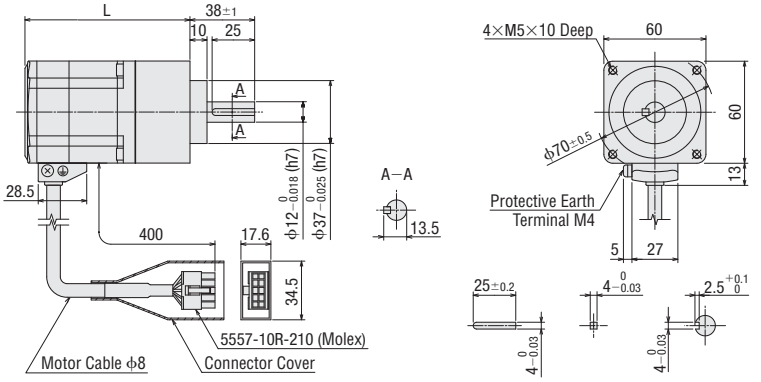


Parallel Key (Included)

Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM66AC-PS■	**5**, **7.2**, **10**	97	1.3	B670
	25, **36**, **50**	117	1.6	B671

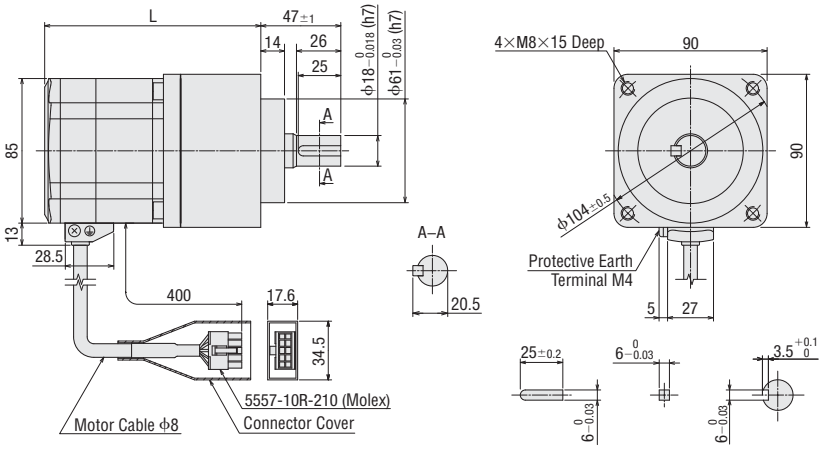


Parallel Key (Included)

Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM98AC-PS■	**5**, **7.2**, **10**	127	3.3	B674
	25, **36**, **50**	154.5	4.1	B675



Parallel Key (Included)

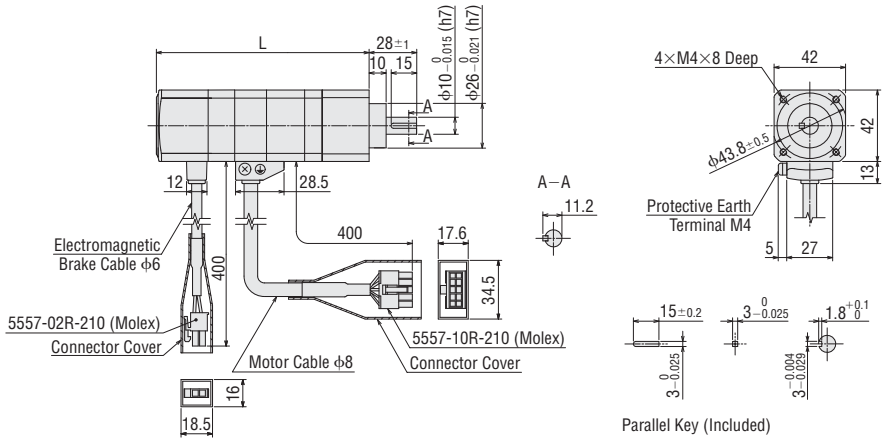
● A number indicating the gear ratio is specified where the box ■ is located within the product name.

◇**PS** Geared Type with Electromagnetic Brake

Frame Size 42 mm

2D & 3D CAD

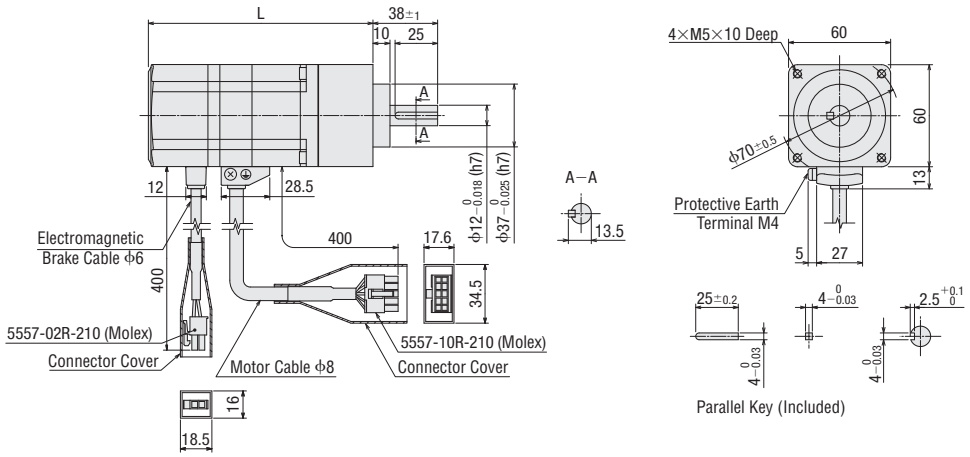
Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM46MC-PS■	**5**, **7.2**, **10**	125.5	0.82	B668
	25, **36**, **50**	149	0.97	B669



Frame Size 60 mm

2D & 3D CAD

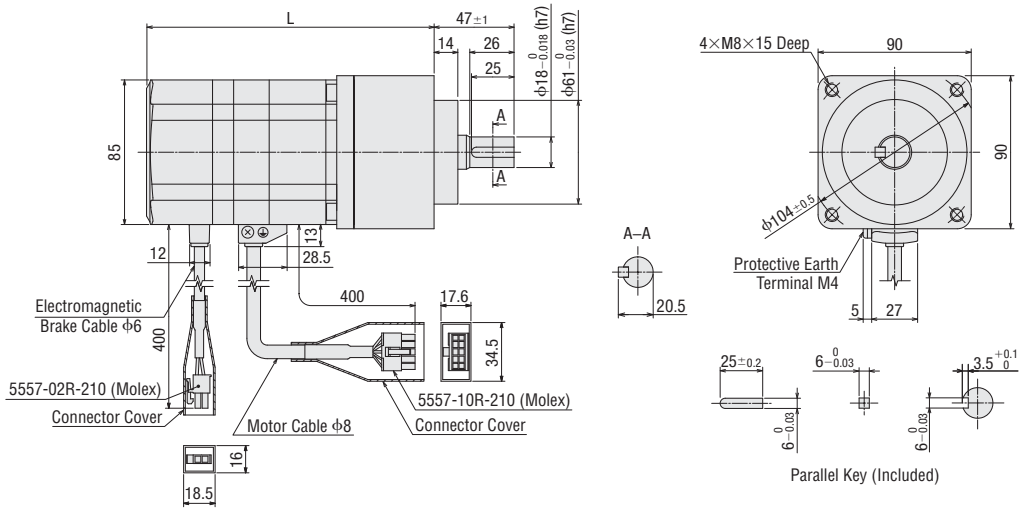
Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM66MC-PS■	**5**, **7.2**, **10**	132	1.6	B672
	25, **36**, **50**	152	1.9	B673



Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM98MC-PS■	**5**, **7.2**, **10**	169	3.9	B676
	25, **36**, **50**	196.5	4.7	B677



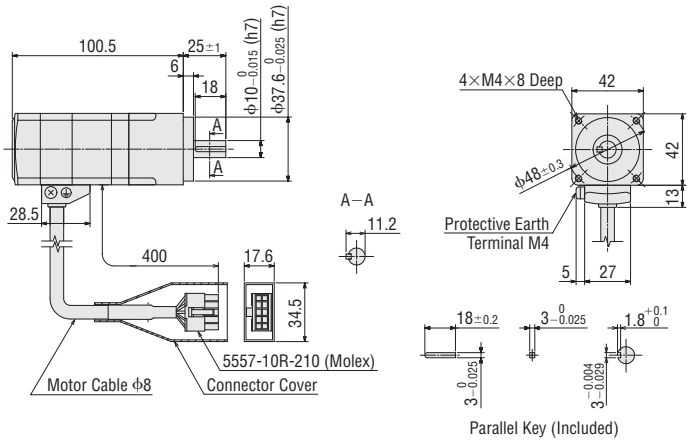
● A number indicating the gear ratio is specified where the box ■ is located within the product name.

◇**PN** Geared Type

Frame Size 42 mm

2D & 3D CAD

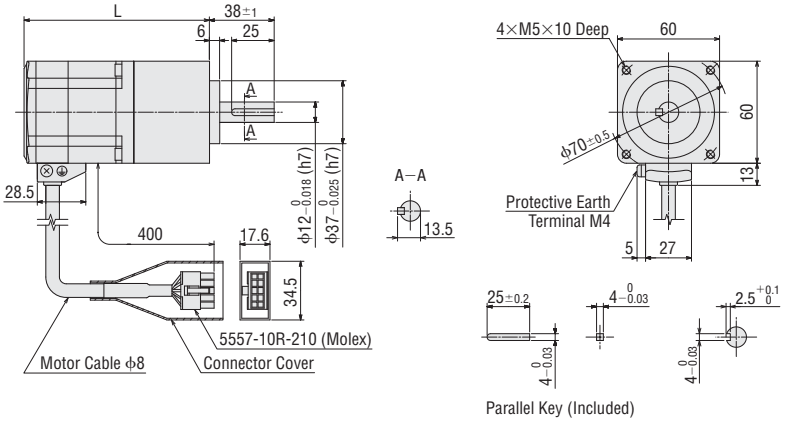
Product Name	Gear Ratio	Mass kg	2D CAD
ARM46AC-N■	**5**, **7.2**, **10**	0.73	B476



Frame Size 60 mm

2D & 3D CAD

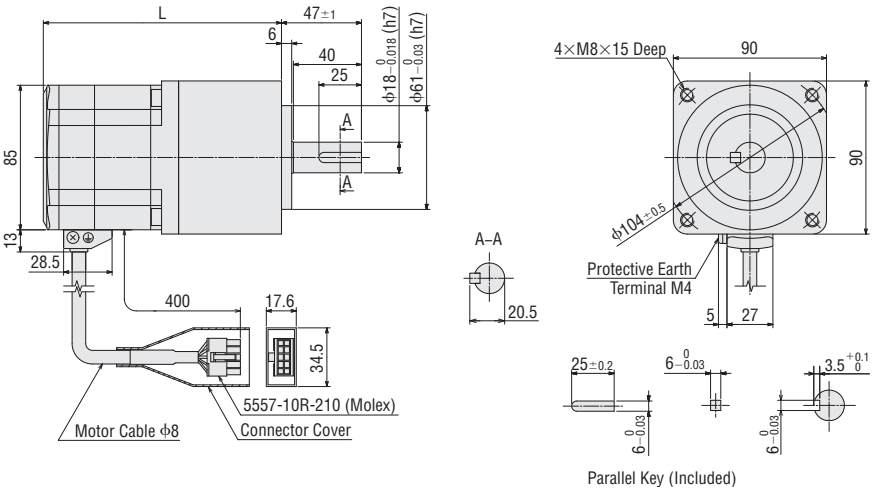
Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM66AC-N■	**5**, **7.2**, **10**	109	1.5	B477
	25, **36**, **50**	125	1.73	B478



Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM98AC-N■	**5**, **7.2**, **10**	140	3.8	B479
	25, **36**, **50**	163	4.5	B480



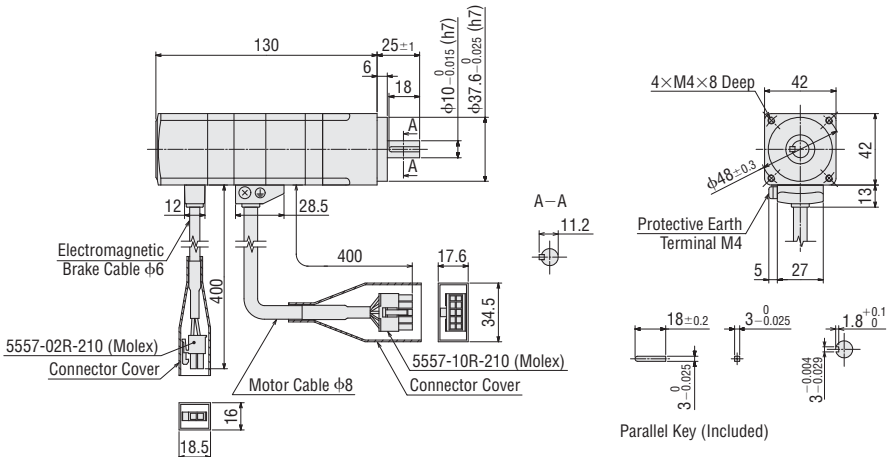
●A number indicating the gear ratio is specified where the box ■ is located within the product name.

◇**PN** Geared Type with Electromagnetic Brake

Frame Size 42 mm

2D & 3D CAD

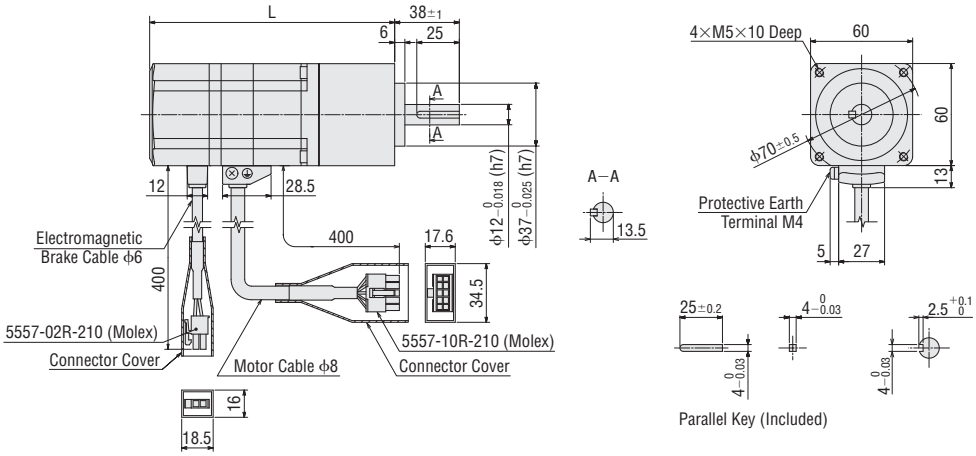
Product Name	Gear Ratio	Mass kg	2D CAD
ARM46MC-N■	**5**, **7.2**, **10**	0.88	B481



Frame Size 60 mm

2D & 3D CAD

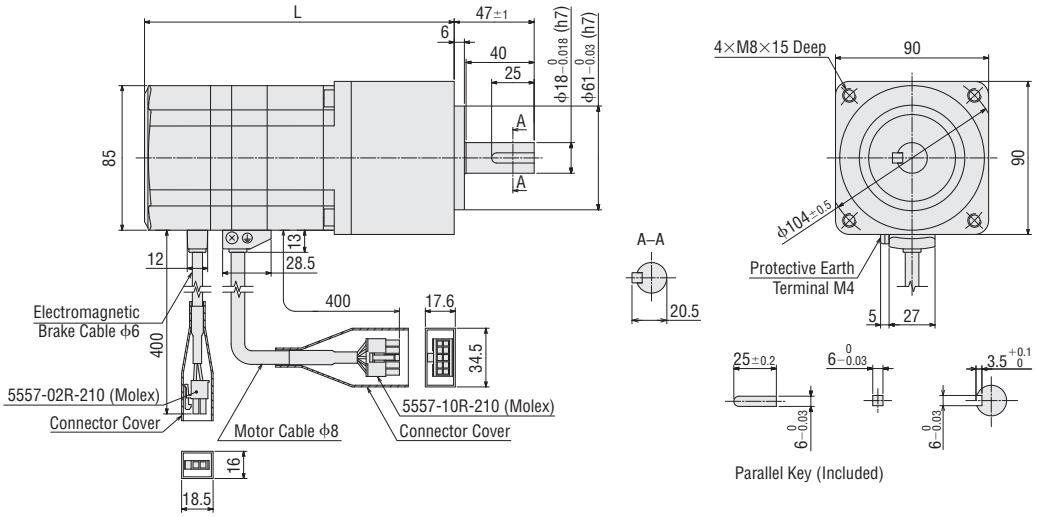
Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM66MC-N■	**5**, **7.2**, **10**	144	1.8	B482
	25, **36**, **50**	160	2	B483



Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM98MC-N■	**5**, **7.2**, **10**	182	4.4	B484
	25, **36**, **50**	205	5.1	B485



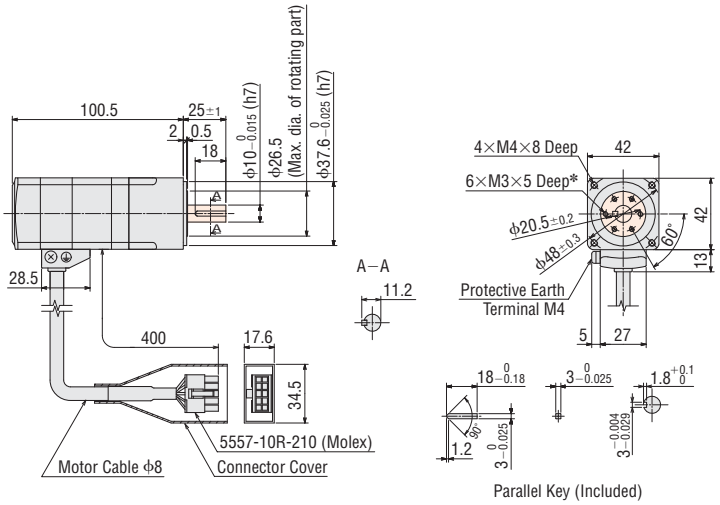
● A number indicating the gear ratio is specified where the box ■ is located within the product name.

◇Harmonic Geared Type

Frame Size 42 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM46AC-H■	**50, 100**	0.68	B486

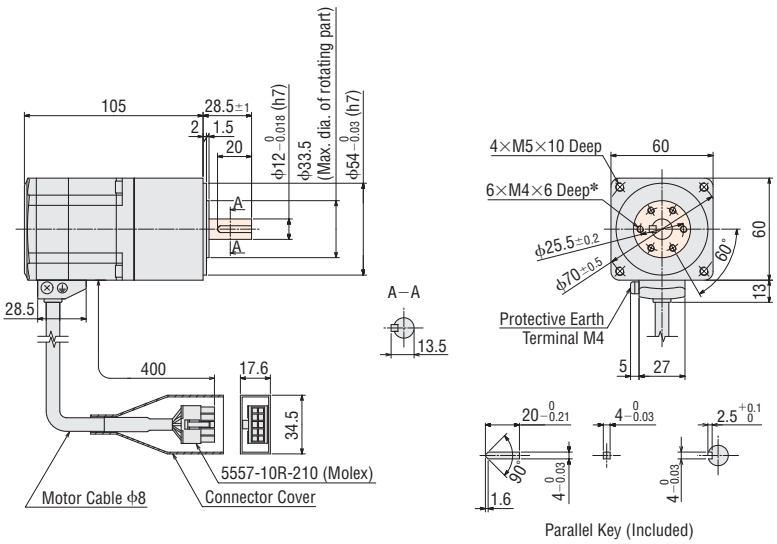


✻The position of the output shaft relative to the screw holes on the rotating part cannot be specified. Adjust the position via the size of the screw holes on the load installation surface.

Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM66AC-H■	**50, 100**	1.41	B487



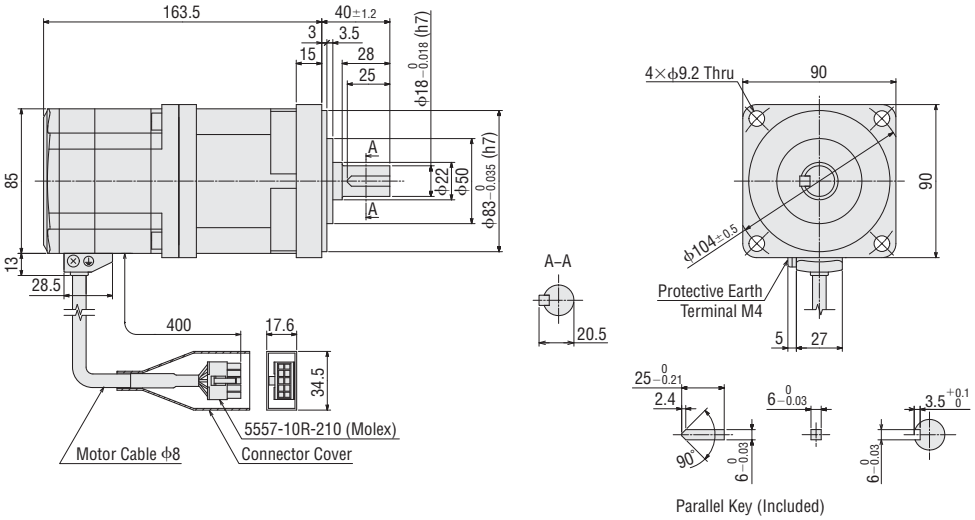
✻The position of the output shaft relative to the screw holes on the rotating part cannot be specified. Adjust the position via the size of the screw holes on the load installation surface.

● The ▭ shaded areas are rotating parts.
● A number indicating the gear ratio is specified where the box ■ is located within the product name.

Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM98AC-H■	**50, 100**	4	B488

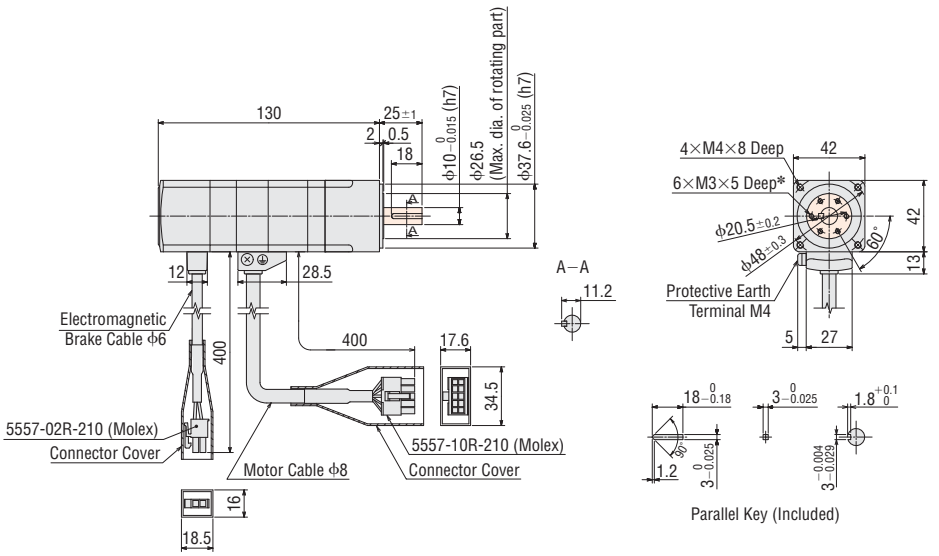


◇Harmonic Geared Type with Electromagnetic Brake

Frame Size 42 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM46MC-H■	**50, 100**	0.83	B489



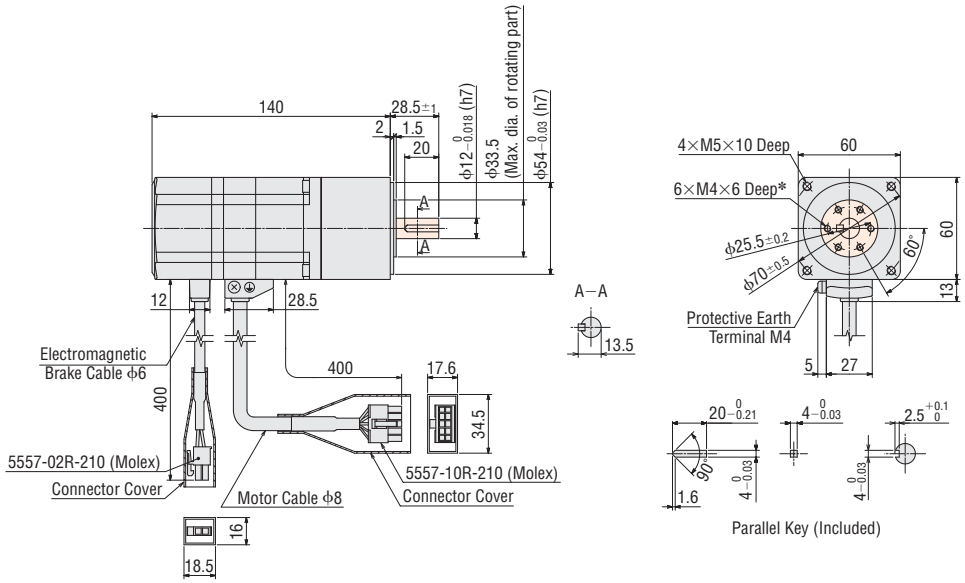
*The position of the output shaft relative to the screw holes on the rotating part cannot be specified. Adjust the position via the size of the screw holes on the load installation surface.

● The ▭ shaded areas are rotating parts.
● A number indicating the gear ratio is specified where the box ■ is located within the product name.

Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM66MC-H■	**50, 100**	1.71	B490

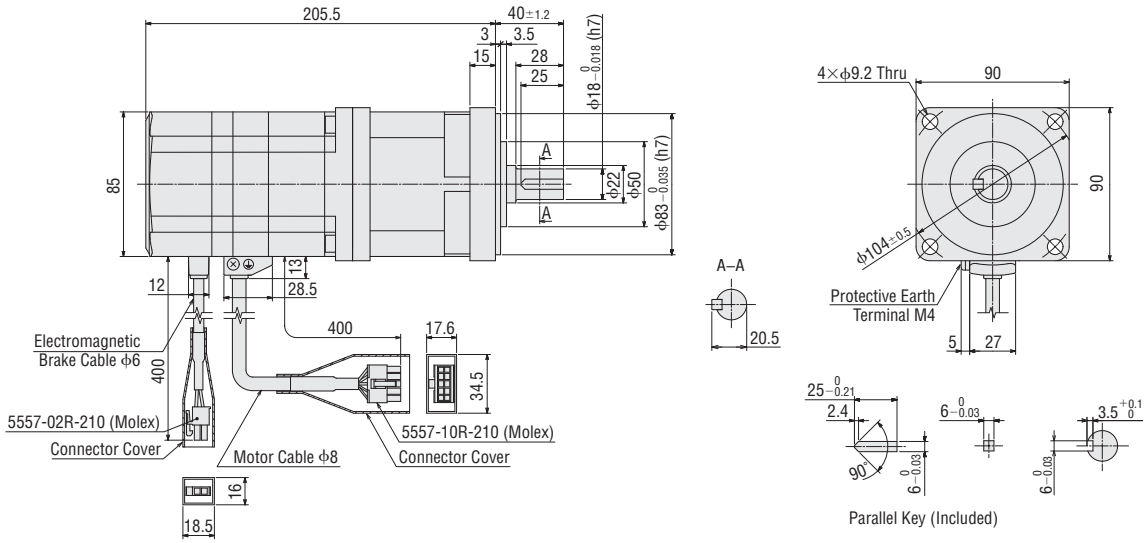


✻The position of the output shaft relative to the screw holes on the rotating part cannot be specified. Adjust the position via the size of the screw holes on the load installation surface.

Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM98MC-H■	**50, 100**	4.6	B491



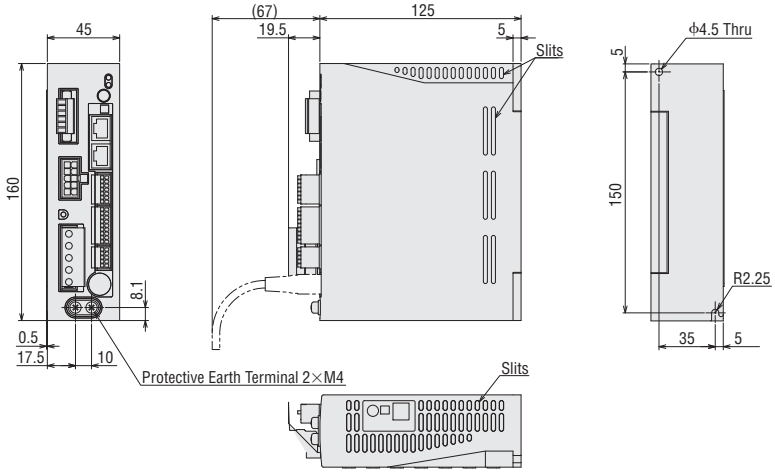
● The ▭ shaded areas are rotating parts.
● A number indicating the gear ratio is specified where the box ■ is located within the product name.

Driver

◇Built-in Controller Type

Product Name: **ARD-CD**, **ARD-AD**

Mass: 0.75 kg 2D CAD B797 3D CAD



●Included

Connector for 24 VDC Power Supply Input/Regeneration Resistor Thermal Input/Electromagnetic Brake Connection Terminals (CN1)
- Connector: MC1,5/6-STF-3,5 (Phoenix Contact)

Sensor Signal Connector (CN5)
- Connector: FK-MC0,5/5-ST-2,5 (Phoenix Contact)

Input Signal Connector (CN8)
- Connector: FK-MC0,5/9-ST-2,5 (Phoenix Contact)

Output Signal Connector (CN9)
- Connector: FK-MC0,5/7-ST-2,5 (Phoenix Contact)

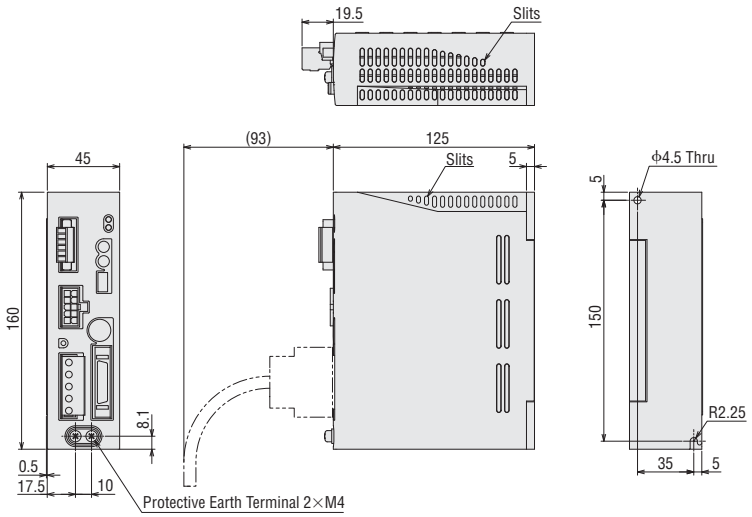
Connector for Regeneration Resistor Input/Main Power Supply Input Terminals (CN3)
- Connector: 54928-0570 (Molex)

Connector Wiring Lever

◇Pulse Input Type

Product Name: **ARD-A**, **ARD-C**, **ARD-S**

Mass: 0.75 kg 2D CAD B454 3D CAD



●Included

Connector for 24 VDC Power Supply Input/Regeneration Resistor Thermal Input/Electromagnetic Brake Connection Terminals (CN1)
- Connector: MC1,5/6-STF-3,5 (Phoenix Contact)

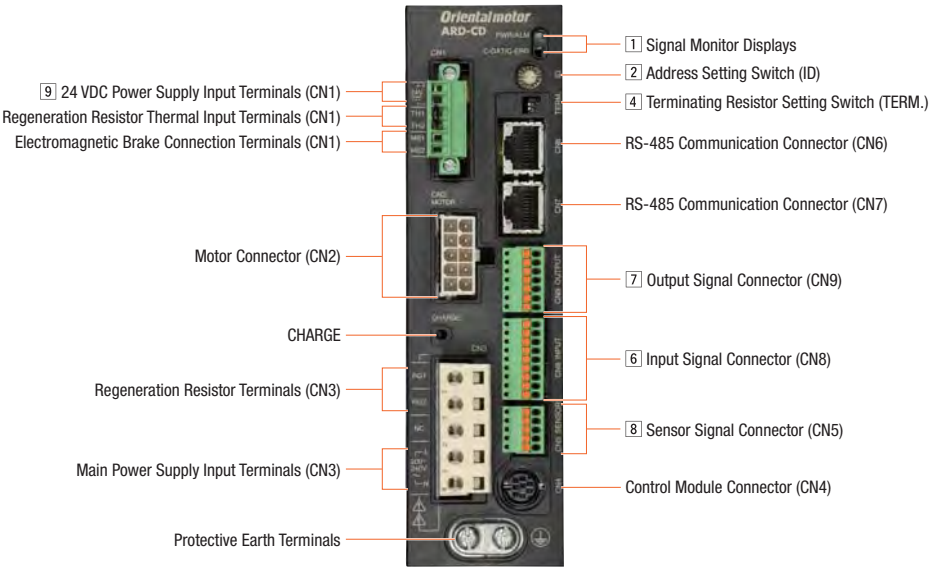
I/O Signals Connector (CN5)
- Case: 10336-52A0-008 (3M Japan Limited)
- Connector: 10136-3000PE (3M Japan Limited)

Connector for Regeneration Resistor Input/Main Power Supply Input Terminals (CN3)
- Connector: 54928-0570 (Molex)

Connector Wiring Lever

Connection and Operation (Built-in controller type)

Names and Functions of Driver Parts



[Driver Bottom]

1 Signal Monitor Displays

◇LED Indicators

Indication	Color	Function	Description
PWR	Green	Power Supply Indication	This LED is lit while the 24 VDC power supply is input.
ALM	Red	Alarm Indication	This LED blinks if an alarm (protective function) generates.
C-DAT	Green	Communication Indication	This LED is lit when communication data is being received or sent.
C-ERR	Red	Communication Error Indication	This LED is lit when a communication data error occurs.

2 Address Setting Switch (ID)

Indication	Switch Name	Function
ID	Address Setting Switch	Sets when using the driver via RS-485 communication. Sets the address number (Factory setting: 0).

3 Baud Rate Setting Switch (SW2)

Indication	Switch Name	Function
SW2	Baud Rate Setting Switch	Sets when using the driver via RS-485 communication. Sets the transmission rate of RS-485 communication. (Factory setting: 7)

◇RS-485 Baud Rate Setting

No.	Transmission Rate (bps)
0	9600
1	19200
2	38400
3	57600
4	115200
5 to 6	Not used
7	625000 (Network Converter)
8 to F	Not used

4 Terminating Resistor Setting Switch (TERM.)

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

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

5 Function Setting Switch (SW4)

Indication	No.	Function
SW4	1	Use in combination with the address setting switch (ID) to set the address number (Factory setting: OFF).
	2	Sets the protocol of RS-485 communication. (Factory setting: OFF)

◇RS-485 Communication Protocol Setting

Connection / No.	Network Converter	Modbus RTU Mode
2	OFF	ON

6 Input Signal Connector (CN8)

Indication	Pin No.	Signal Name	Description	
CN8	1	IN0	HOME	This signal is used to perform return-to-home operation.
	2	IN1	START	This signal is used to perform positioning operation.
	3	IN2	M0	This signal is used to select the operation data number using 3 bits.
	4	IN3	M1	
	5	IN4	M2	
	6	IN5	FREE	This signal is used to put the motor into a non-excitation state and release the electromagnetic brake.
	7	IN6	STOP	This signal is used to stop the motor.
	8	IN7	ALM-RST	This signal is used to reset the alarm.
	9	IN-COM1	Input signals common	

✻Assignable functions can be set using parameters. Initial values are shown above. For details, see the User Manual.

The following input signals can be assigned to input terminals IN0 to IN7.

Input Signals								
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	

7 Output Signal Connector (CN9)

Indication	Pin No.	Signal Name	Description	
CN9	1	OUT0	HOME-P	This signal is output when the motor is in the home position.
	2	OUT1	END	This signal is output when the positioning operation is completed.
	3	OUT2	AREA1	This signal is output when the motor is within the range of area 1.
	4	OUT3	READY	This signal is output when the driver is ready for operation.
	5	OUT4	WNG	The warning status for the driver is output.
	6	OUT5	ALM	The alarm status for the driver is output (normally closed).
	7	OUT-COM	Output signals common	

✻Assignable functions can be set using parameters. Initial values are shown above. For details, see the User Manual.

The following output signals can be assigned to output terminals OUT0 to OUT5.

Output Signals							
0: Not used	7: −JOG_R	16: FREE_R	36: R4	43: R11	50: M2_R	63: SLIT_R	71: TLC
1: FWD_R	8: MS0_R	17: C-ON_R	37: R5	44: R12	51: M3_R	65: ALM	72: TIM
2: RVS_R	9: MS1_R	18: STOP_R	38: R6	45: R13	52: M4_R	66: WNG	73: AREA1
3: HOME_R	10: MS2_R	32: R0	39: R7	46: R14	53: M5_R	67: READY	74: AREA2
4: START_R	11: MS3_R	33: R1	40: R8	47: R15	60: +LS_R	68: MOVE	75: AREA3
5: SSTART_R	12: MS4_R	34: R2	41: R9	48: M0_R	61: −LS_R	69: END	80: S-BSY
6: +JOG_R	13: MS5_R	35: R3	42: R10	49: M1_R	62: HOMES_R	70: HOME-P	82: MPS

8 Sensor Signal Connector (CN5)

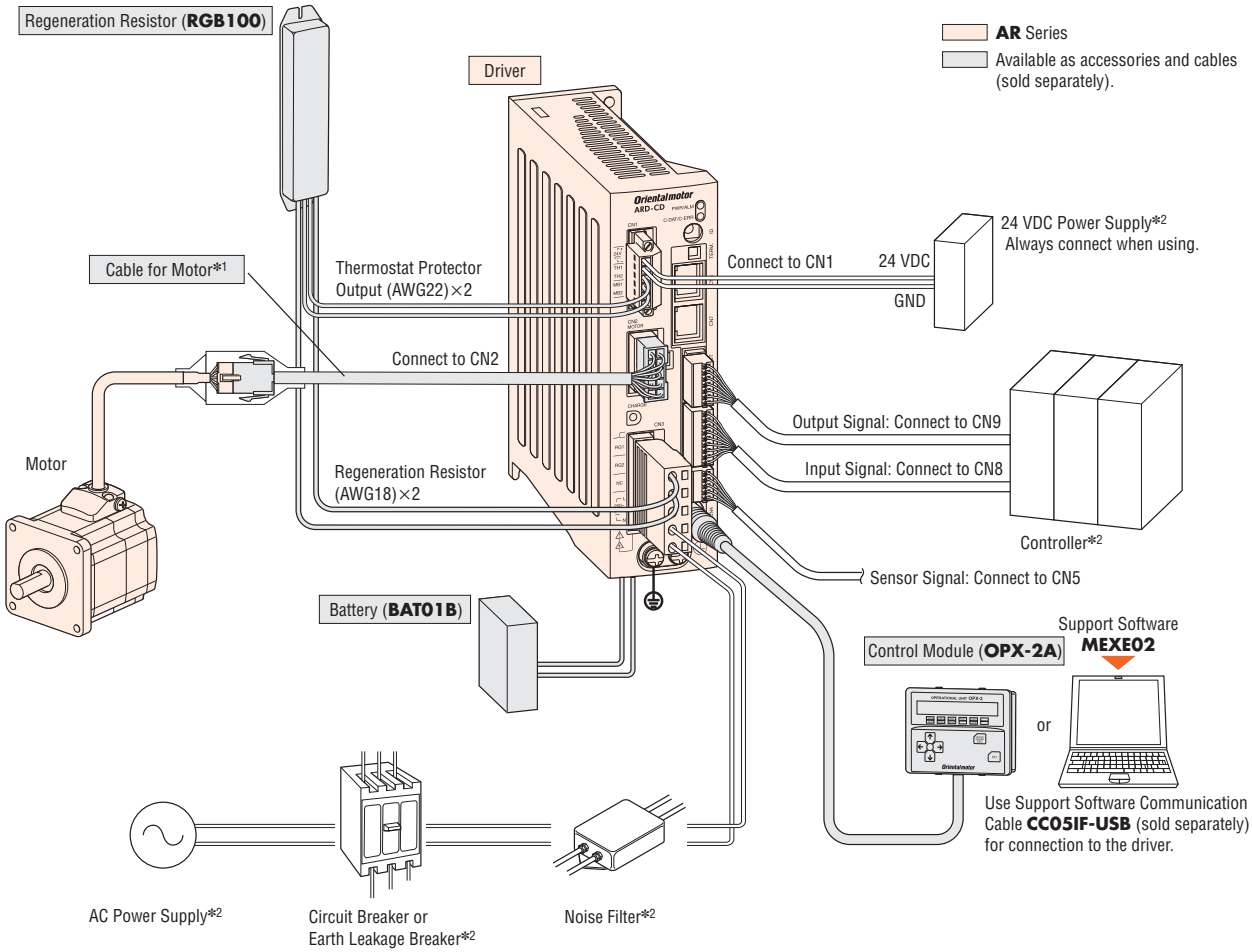
Indication	Pin No.	Signal Name	Description
CN5	1	+LS	+ Side Limit Sensor Input
	2	−LS	− Side Limit Sensor Input
	3	HOMES	Mechanical Home Sensor Input
	4	SLIT	Slit Sensor Input
	5	IN-COM2	Common for Sensors

9 24 VDC Power Supply Input/Regeneration Resistor Thermal Input/Electromagnetic Brake Connection Terminals (CN1)

Indication	I/O	Terminal Name	Description
24V+	Input	24 VDC Power Supply Input Terminal +	The power supply for the driver control circuit. Always connect when using.
24V−		24 VDC Power Supply Input Terminal −	
TH1		Regeneration Resistor Thermal Input Terminal	Connect the regeneration resistor **RGB100** (sold separately). When not connecting a regeneration resistor, short these 2 terminals to each other.
TH2		Regeneration Resistor Thermal Input Terminal	
MB1	Output	Electromagnetic Brake Connection Terminal −	Connect the lead wires from the electromagnetic brake.
MB2		Electromagnetic Brake Connection Terminal +	

Connection Diagram

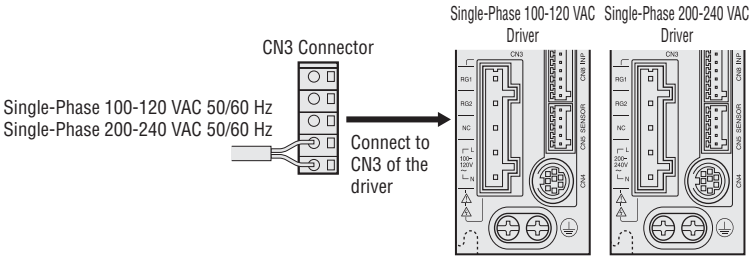
◇Connections with Peripheral Equipment



*1 When wiring the motor and the driver, keep a maximum distance of 30 m.
*2 Not supplied.

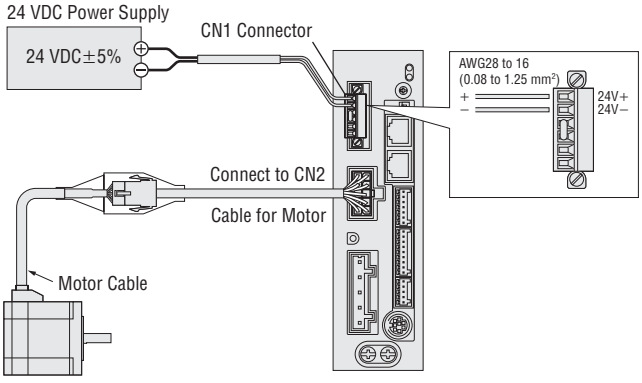
◇Connecting the Main Power Supply

Furnish the following cable for the power supply lines.
Single-Phase 100-120 VAC: Three-Core Cable [AWG16 to 14 (1.25 to 2.0 mm^2)]
Single-Phase 200-240 VAC: Three-Core Cable [AWG16 to 14 (1.25 to 2.0 mm^2)]

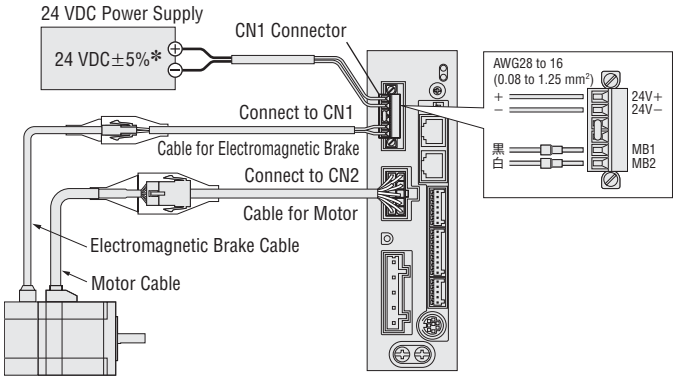


◇Connecting the Control Power Supply

Prepare a 24 VDC power supply.



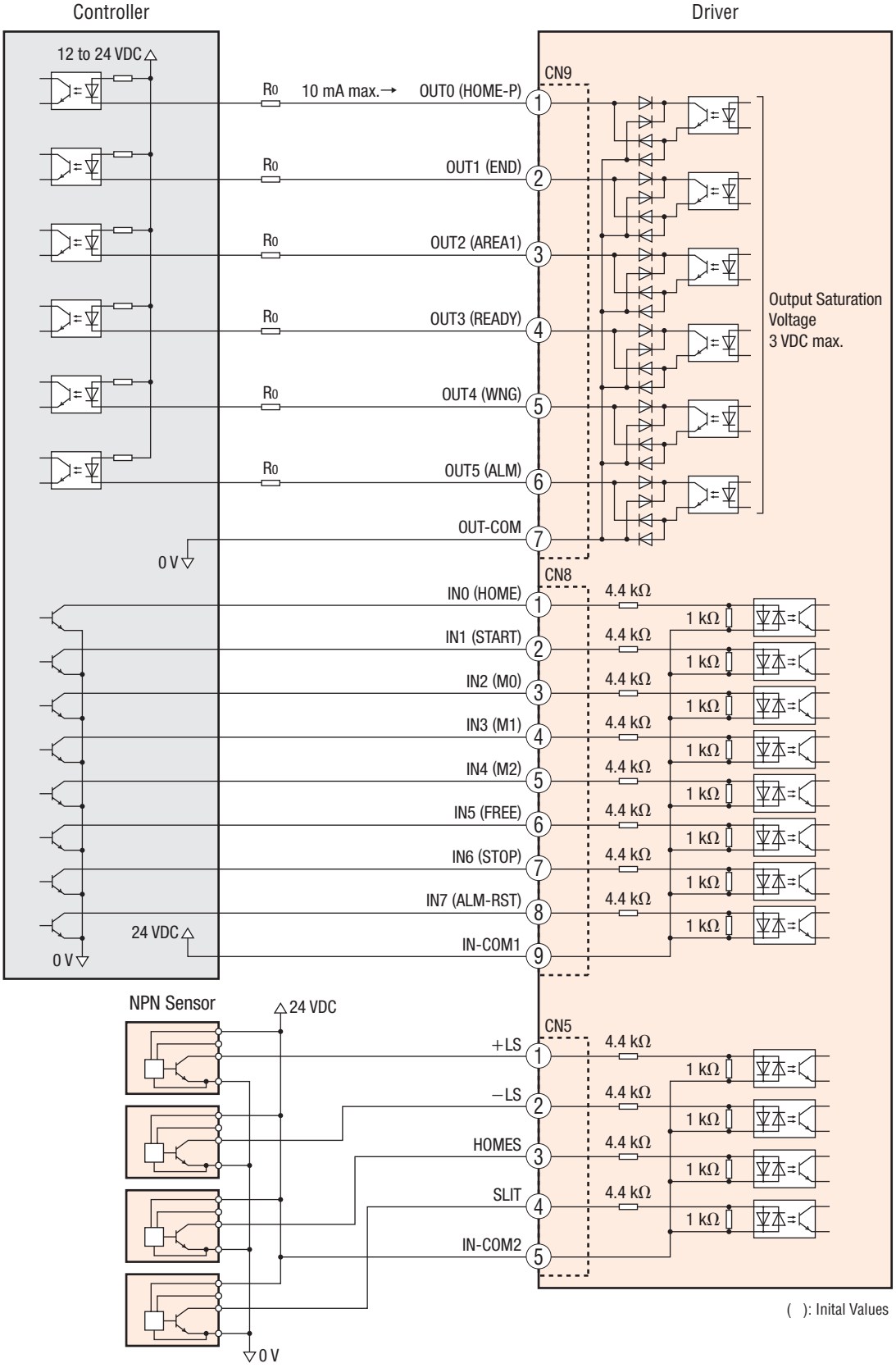
◇Connecting the Electromagnetic Brake



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

◇Connecting to a Host Controller

•Connecting to a Current Sink Output Circuit

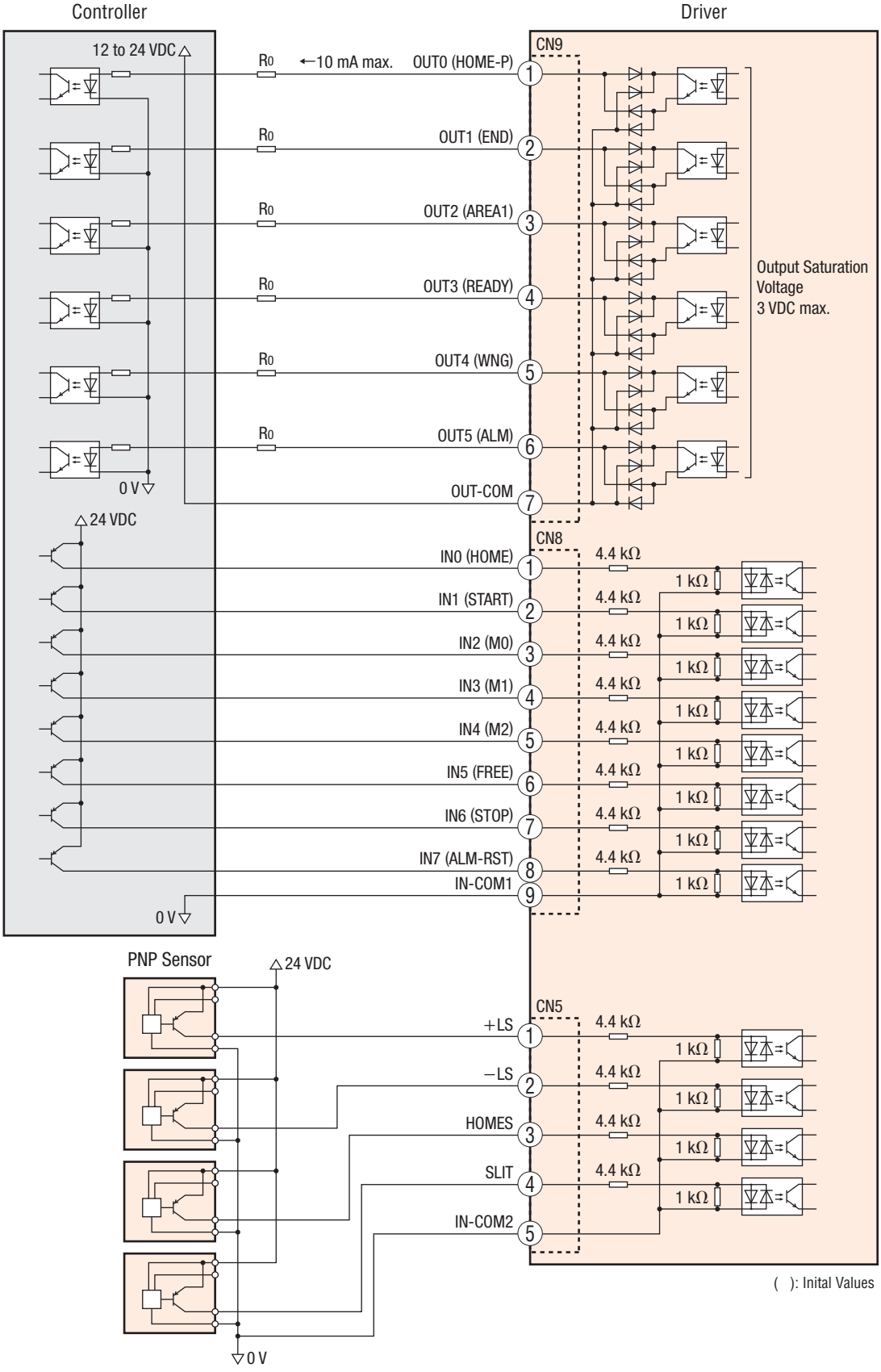


Note

- Use 24 VDC for the input signals.
- Use output signal at 12 to 24 VDC 10 mA or less. When the current value exceeds 10 mA, connect an external resistor R0 to reduce the current to 10 mA or less.
- The maximum saturation voltage for the output signals is 3 VDC.
- Provide a distance of 200 mm or more between the signal lines and power lines (power supply lines, motor lines).
  Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

◇Connecting to a Host Controller

•Connecting to a Current Source Output Circuit

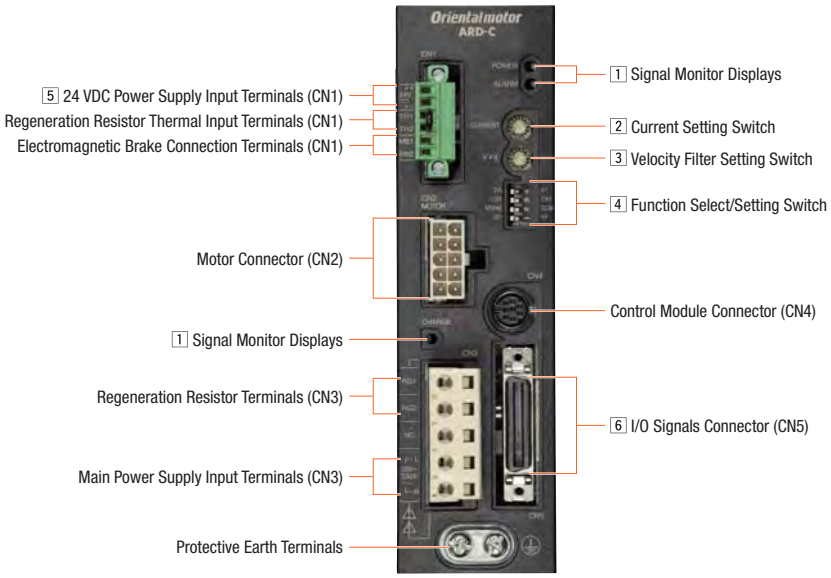


Note

- Use 24 VDC for the input signals.
- Use output signal at 12 to 24 VDC 10 mA or less. When the current value exceeds 10 mA, connect an external resistor R_0 to reduce the current to 10 mA or less.
- The maximum saturation voltage for the output signals is 3 VDC.
- Provide a distance of 200 mm or more between the signal lines and power lines (power supply lines, motor lines).
  Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

Connection and Operation (Pulse input type)

Names and Functions of Driver Parts



1 Signal Monitor Displays

◇LED Indicators

Indication	Color	Function	Description
POWER	Green	Power Supply Indication	This LED is lit while the power supply or 24 VDC power supply is input.
ALARM	Red	Alarm Indication	This LED blinks if an alarm (protective function) generates.
CHARGE	Red	Power Supply Indication	This LED is lit while the power supply is input.

◇Alarms

No. of ALARM LED Blinks	Function	Condition
2	Overheat Protection	When the temperature inside the driver exceeds 85ºC
	Overload	When the accumulated value for the time that the load torque exceeds the maximum torque exceeds the overload detection time (Initial Value: 5 seconds)
	Overspeed	When the motor output shaft speed exceeds 4500 r/min
	Command Pulse Error	When an error has occurred for the command pulse value
	Regeneration Resistor Overheat	The thermostat for regeneration resistor signal is activated.
3	Overvoltage Protection	When the primary voltage of the driver's inverter exceeds the upper limit value
	Main Power Supply Error	The main power is cut off when an operation command is input.
	Undervoltage	When the primary voltage of the driver's inverter has fallen below the lower limit
4	Overflow during All Windings On	When the positioning deviation has exceeded the overflow rotation amount (Initial value: 3 rotations)
	Overflow during All Windings Off	When all winding on was performed even though the positioning deviation during all windings off was above the permissible value (Initial Value: 100 rotations minimum)
5	Overcurrent	An excessive current flows through the inverter power element inside the driver.
	Drive Circuit Error	The power cable of the motor is disconnected.
7	Operating Data Error	When a return-to-electrical home operation was performed when an operating data error warning occurred
	Electronic Gear Setting Error	When the resolution set by the electronic gear is outside the range of the specifications
8	Sensor Error during Operation	When an abnormality has occurred in a sensor while the motor is rotating
	Sensor Error during Initialization	When the main power supply was turned on before the motor cable was connected to the driver
	Initial Rotor Rotation Error	When the main power supply was turned on while the motor was rotating
	Motor Combination Error	When a motor that cannot be combined with the driver was connected
9	EEPROM Error	When a motor control parameter is damaged

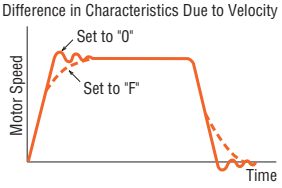
2 Current Setting Switch

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. Factory setting: F

3 Velocity Filter Setting Switch

Indication	Switch Name	Function
V-FIL	Velocity Filter Setting Switch	Adjust the responsiveness of the motor. Adjust to suppress the vibration of the motor or make starting and stopping smoother. The minimum value of the velocity filter is "0" and the maximum value is "F". Factory Setting: 1

Difference in Characteristics Due to Velocity Filter



4 Function Select/Setting Switch

Indication	Switch Name	Function
D0/D1 CS0/CS1	Resolution Select Switches	These two switches are used to set the resolution per revolution of the motor output shaft. "D0" "CS0" → 1000 pulse (0.36º/step) [Factory setting] "D0" "CS1" → 10000 pulse (0.036º/step) "D1" "CS0" → 500 pulse (0.72º/step) "D1" "CS1" → 5000 pulse (0.072º/step)
NORM/ CCM	Control Mode Select Switch	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. "NORM": Normal mode [Factory setting] "CCM": Current control mode
2P/1P	Pulse Input Mode Switch	This switch is used to toggle between the 1-pulse input mode and 2-pulse input mode according to the pulse output mode of the controller. "2P": 2-pulse input mode [Factory setting] "1P": 1-pulse input mode

5 24 VDC Power Supply Input/Regeneration Resistor Thermal Input/Electromagnetic Brake Connection Terminals (CN1)

Indication	I/O	Terminal Name	Description
24V+	Input	24 VDC Power Supply Input Terminal +	Connect a power supply to these terminals if you want to supply the control power separately from the main power. Supply of the control power is optional. If you are using an electromagnetic brake motor, connect a power supply to these terminals for the electromagnetic brake power.
24V−		24 VDC Power Supply Input Terminal −	
TH1		Regeneration Resistor Thermal Input Terminal	Connect the regeneration resistor **RGB100** (sold separately). When not connecting a regeneration resistor, short these 2 terminals to each other.
TH2		Regeneration Resistor Thermal Input Terminal	
MB1	Output	Electromagnetic Brake Connection Terminal −	Connect the lead wires from the electromagnetic brake.
MB2		Electromagnetic Brake Connection Terminal +	

6 I/O Signal Connector (CN5, 36 pins)

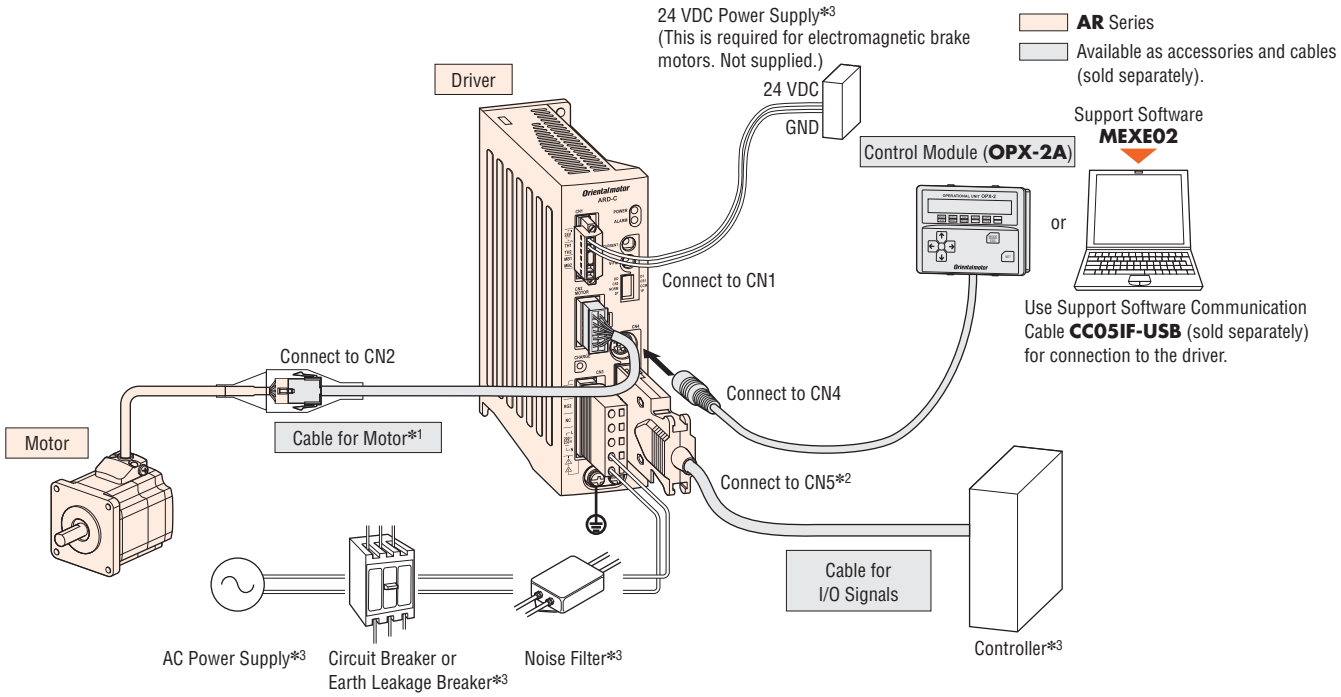
Indication	I/O	Pin No.	Signal		Signal Name	
			Positioning Operation	Push-Motion Operation*1	Positioning Operation	Push-Motion Operation*1
CN5	−	1	−		−	
	Output	2	GND		Ground Connection	
		3	ASG+		A-Phase Pulse Output (Line Driver)	
		4	ASG−			
		5	BSG+		B-Phase Pulse Output (Line Driver)	
		6	BSG−			
		7	TIM1+		Timing Output (Line Driver)	
		8	TIM1−			
		9	ALM+		Alarm Output	
		10	ALM−			
		11	WNG+		Warning Output	
		12	WNG−			
		13	END+		Positioning Completion 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	
	Input	22	IN-COM		Input Signals 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 Selection Input	Push-Motion Operation ON*1
		27	−	M0*1	−	Push-Current Setting Selection Input*1
		28	RETURN	M1*1	Return to Electrical Home Operation	
		29	P-RESET	M2*1	Position Reset Input	
		30	FREE		Excitation OFF, Electromagnetic Brake Release	
		31	CW+/PLS+		Pulse Input/CW Pulse Input (+5 VDC/Line driver)	
		32	CW−/PLS−			
		33	CW+24/PLS+24V		Pulse Input/CW Pulse Input (+24 VDC)	
		34	CCW+24/DIR+24V		Direction Input/CCW Pulse Input (+24 VDC)	
		35	CCW+/DIR+		Direction Input/CCW Pulse Input (+5 VDC/Line Driver)	
		36	CCW−/DIR−			

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

*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 closed with a control module **OPX-2A** (sold separately) or a support software **MEXE02** when the C-ON input is not used.

Connection Diagram

◇Connections with Peripheral Equipment



*1 When wiring the motor and the driver, keep a maximum distance of 30 m.

*2 The control I/O connector (CN5) is included with the product, but an accessory general-purpose cable (sold separately) must be purchased.

*3 Not supplied.

◇Connecting the Main Power Supply

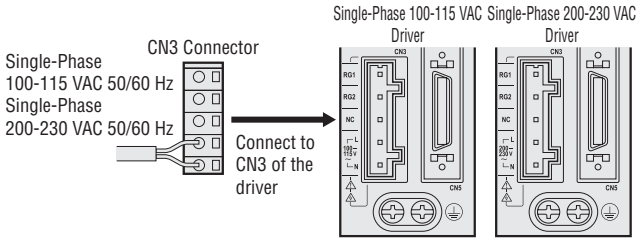
Furnish the following cable for the power supply lines.

Single-Phase 100-115 VAC: Three-Core Cable [AWG16 to 14 (1.25 to 2.0 mm^2)]

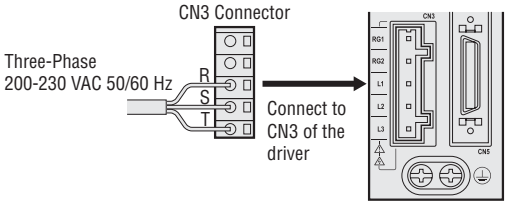
Single-Phase 200-230 VAC: Three-Core Cable [AWG16 to 14 (1.25 to 2.0 mm^2)]

Three-Phase 200-230 VAC: 4-core Cable [AWG16 to 14 (1.25 to 2.0 mm^2)]

- Single-Phase 100-115 VAC/Single-Phase 200-230 VAC



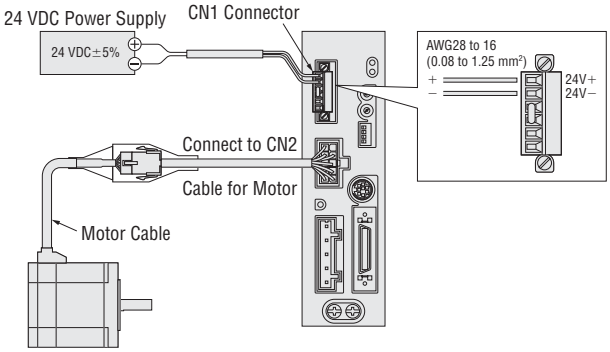
- Three-Phase 200-230 VAC



◇Connecting the Control Power Supply

To separate the main power supply and control power supply, prepare a 24 VDC power supply.

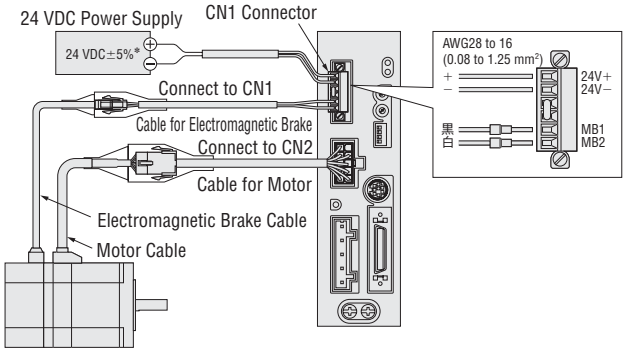
The control power supply is not mandatory.



◇Connecting the Electromagnetic Brake

Prepare a 24 VDC power supply.

The main power supply and control power supply are separated in this case too.

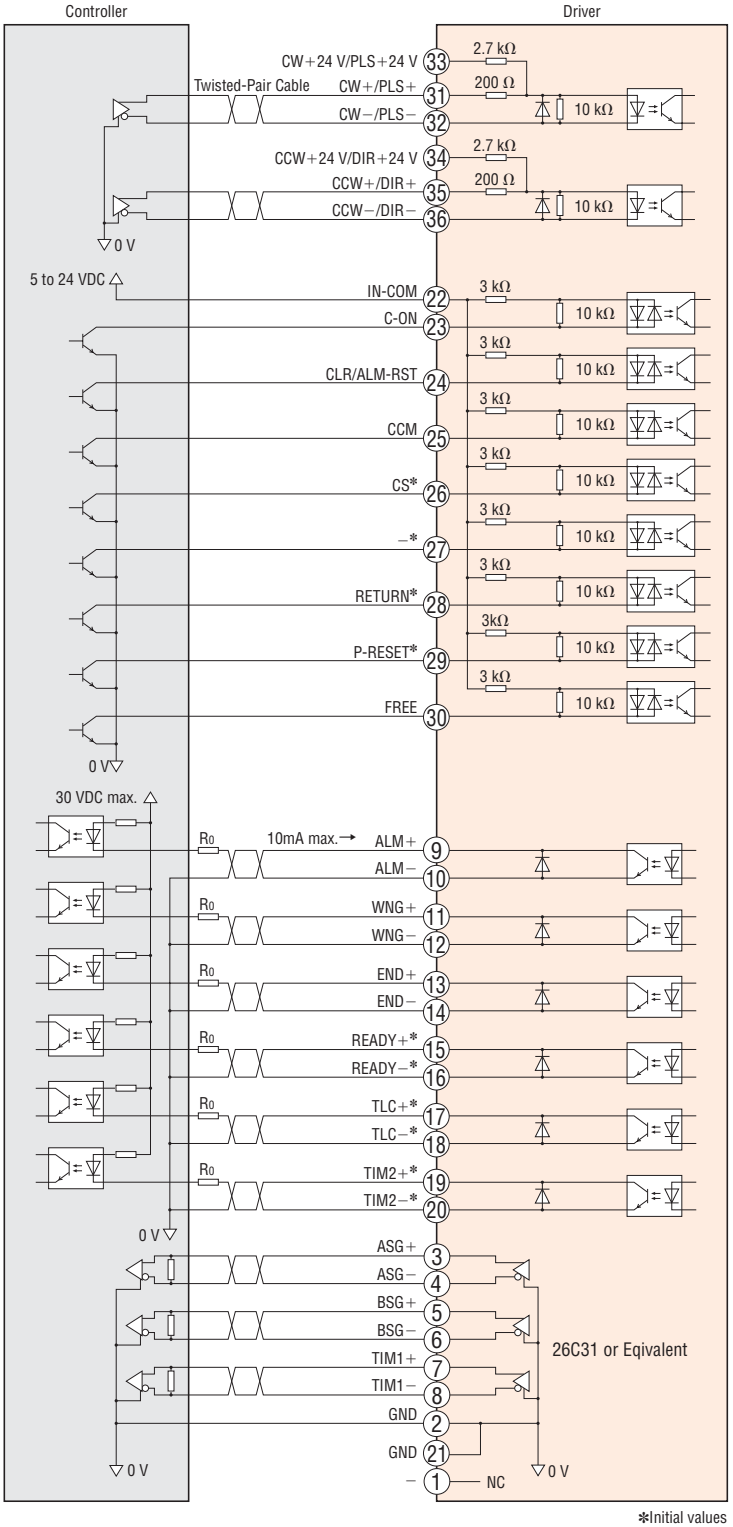


*If the wiring distance between the motor and driver is extended to 20 m or longer using an accessory cable (sold separately), the 24 VDC ±4% specification applies.

◇Connecting to a Host Controller

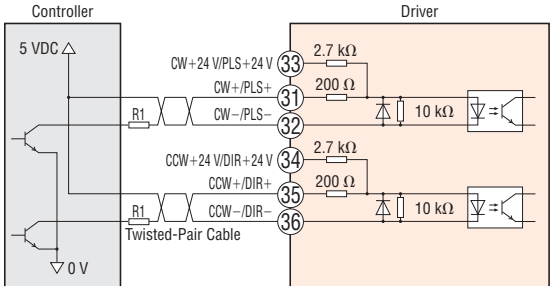
•Connecting to a Current Sink Output Circuit

When the pulse input is the line driver



*Initial values

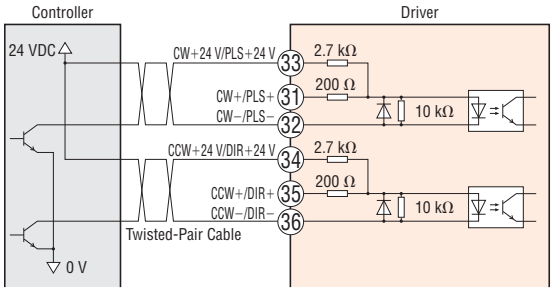
When the pulse input is open collector (input voltage 5 VDC)



Note

- When a 12 VDC is applied, be sure to connect an external resistor R1 (1 kΩ, 0.25 W or more) so that current exceeding 20 mA does not flow to the circuit.

When the pulse input is open collector (input voltage 24 VDC)



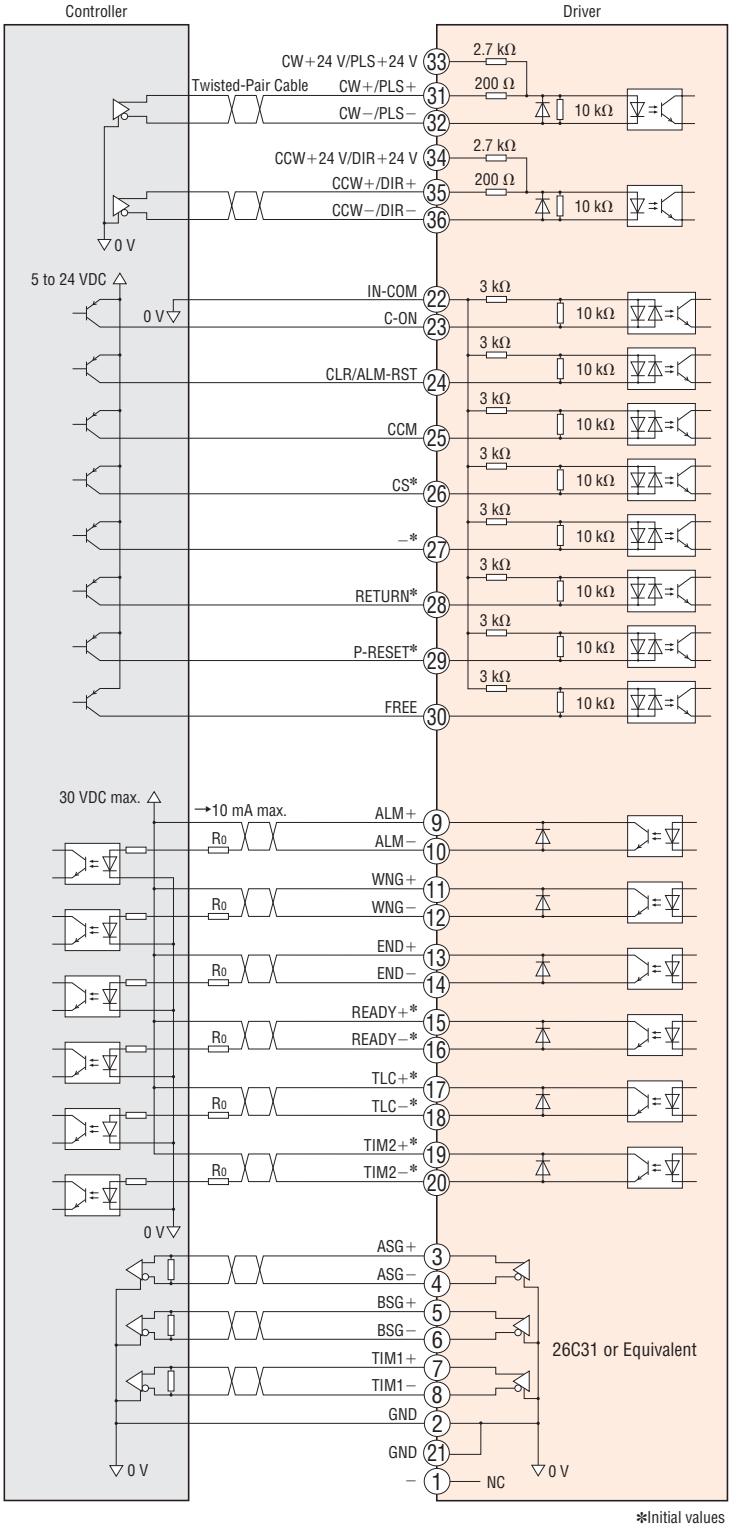
Note

- Use output signals at 30 VDC or less. When the current value exceeds 10 mA, connect an external resistor Ro.
- Connect a terminating resistor of 100 Ω or more between the input of the line receiver terminals.
- For the control I/O signal lines (CN5), use a multi-core shielded twisted-pair wire [AWG28 to 24 (0.08 to 0.2 mm^2)] and keep the wiring length as short as possible (no more than 2 m).
- Note that as the length of the pulse line increases, the maximum transmission frequency decreases.
- Provide a distance of 200 mm or more between the control I/O signal lines and power lines (power supply lines, motor lines and other large-current circuits).

◇Connecting to a Host Controller

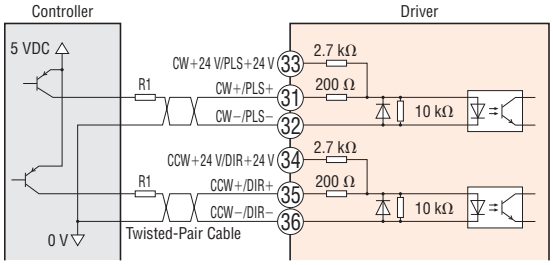
•Connecting to a Current Source Output Circuit

When the pulse input is the line driver



*Initial values

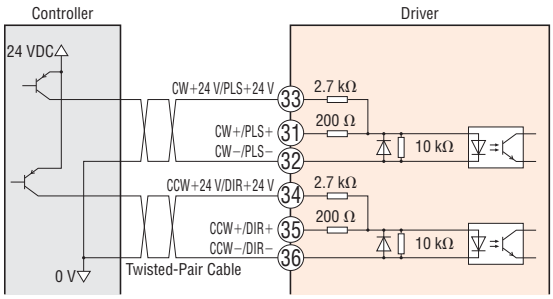
When the pulse input is open collector (input voltage 5 VDC)



Note

- When a 12 VDC is applied, be sure to connect an external resistor R1 (1 kΩ, 0.25 W or more) so that current exceeding 20 mA does not flow to the circuit.

When the pulse input is open collector (input voltage 24 VDC)



Note

- Use output signals at 30 VDC or less. When the current value exceeds 10 mA, connect an external resistor R_0.
- Connect a terminating resistor of 100 Ω or more between the input of the line receiver terminals.
- For the control I/O signal lines (CN5), use a multi-core shielded twisted-pair wire [AWG28 to 24 (0.08 to 0.2 mm^2)] and keep the wiring length as short as possible (no more than 2 m).
- Note that as the length of the pulse line increases, the maximum transmission frequency decreases.
- Provide a distance of 200 mm or more between the control I/O signal lines and power lines (power supply lines, motor lines and other large-current circuits).

Hybrid Control System αSTEP
AR Series DC Input

For detailed information about regulations and standards, please see the Oriental Motor website.

Built-in Controller Type

Pulse Input Type

Stepper motor based hybrid motors utilize a unique control system combining the benefits of "open loop control" and "closed loop control". During normal conditions, these motors provide high response through synchronous operation with commands using open loop control. In an overload situation, the motor position is corrected with the closed loop control and operation is maintained. These are motors that are both easy to use and highly reliable.

- High Reliability with Closed Loop Control
- High Efficiency Technology Reduces Motor Heat Generation
- Capable of High Positioning Accuracy
- 2 Driver Types to Choose from
  Built-in Controller Type FLEX / Pulse Input Type

What is FLEX?

FLEX is the collective name for products that support I/O control, Modbus (RTU) control, and FA network control via network converters.These products enable simple connection and simple control, shortening the total lead time for system construction.

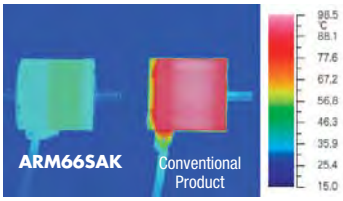
Features

Continuous Operation Utilizing High-Efficiency Technology

Lower Heat Generation

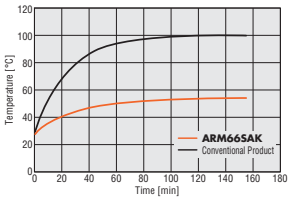
Heat generation by the motor has been significantly reduced through higher efficiency.

Temperature Distribution by Thermography



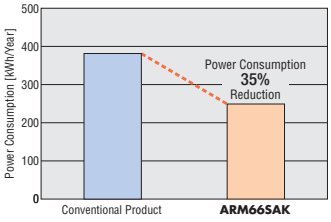
Comparison under the Same Conditions.

Motor Case Temperature under Same Operating Conditions



35% Less Power Consumption* than Conventional Oriental Motor Products Due to Energy-Saving Features

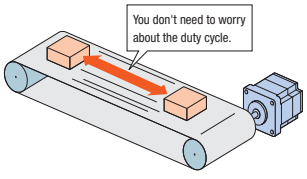
Power Consumption



*Operating Condition
- Speed: 400 r/min, load factor 50%
- Operating Time: 24 hours of operation, 365 days/year (70% operating, 25% stand-by, 5% off)
- Power Supply Voltage: 24 VDC

Continuous Operation (Operation at a High Duty Cycle)

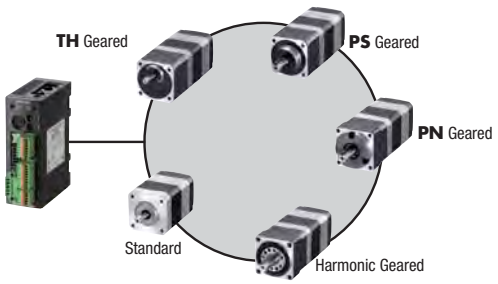
The **AR** Series can be operated at high frequency.
The motor can operate continuously.



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.

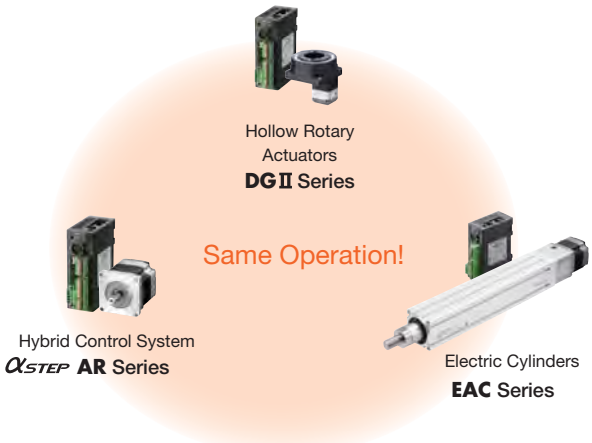
A Single Driver to Support a Variety of Motors

The driver is equipped with an automatic recognition function, which recognizes the attached motor. Various types of motors, such as the standard type and the geared type, can be attached to a single driver. Therefore, there is no need to change the driver to match the motor to be attached. Maintenance is easier.



Products Equipped with the **AR** Series

All of the products equipped with the **AR** series feature standardized controllability.



Highly Functional, Compact Driver

Compact DC Power Supply Input Driver

This a compact driver. This contributes to space saving for the control box and equipment. The driver can be installed directly to a DIN rail, so no screws are necessary.

Built-in Controller Type

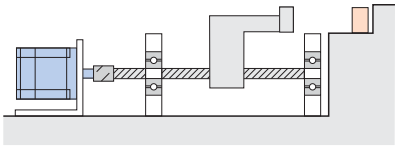
Pulse Input Type

Push-Motion Operation

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

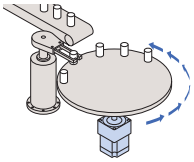
Note

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



Position Control in the Same Direction

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



✻When building an absolute system, the accessory battery is necessary (sold separately).

Also Supports Absolute Systems

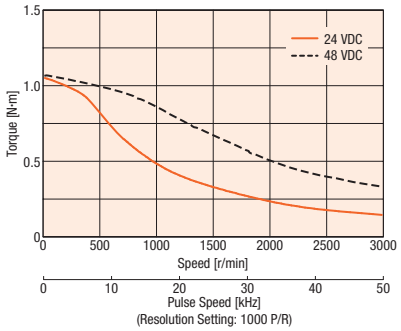
You can build an absolute system that detects absolute positions by connecting the accessory battery (sold separately). (Available only on the built-in controller type.)

Battery Set (Sold separately)

48 VDC Compatible

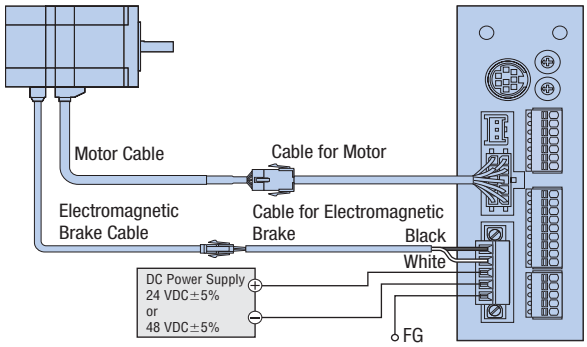
The motor runs on a 24 VDC or 48 VDC power supply. Choose the power supply that you have available. The torque is higher when 48 VDC is used rather than 24 VDC. (Frame size 20 mm and 28 mm only accepts 24 VDC input.)

ARM66SAK



Automatically Controlled Electromagnetic Brake

For built-in controller types, customers need not provide a separate circuit to control the electromagnetic brake. The electromagnetic brake is released when the motor is excited (= the current ON input is turned ON), and activated to hold the load in position when the excitation is cut off (= the current ON input is turned OFF). (Available only on the built-in controller type.)



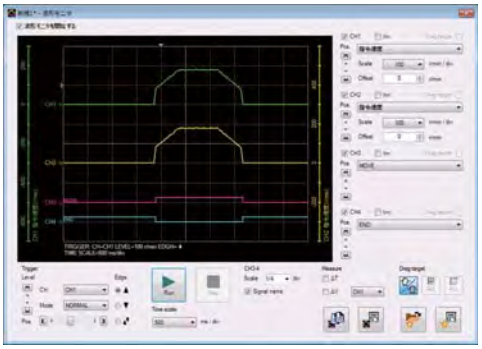
Up to 30 m Wiring Distance Between Motor and Driver

This series uses an included cable or accessory cable that can extend the wiring distance between the motor and driver up to 30 m. Extension cables and flexible extension cables are available as accessories (sold separately).

Easy Setting and Easy Monitoring

By using the **MEXE02** support software, a computer can be used to change operating data or parameters, as well as to perform monitoring.

Monitoring of Operating Condition by Waveform (**MEXE02**)

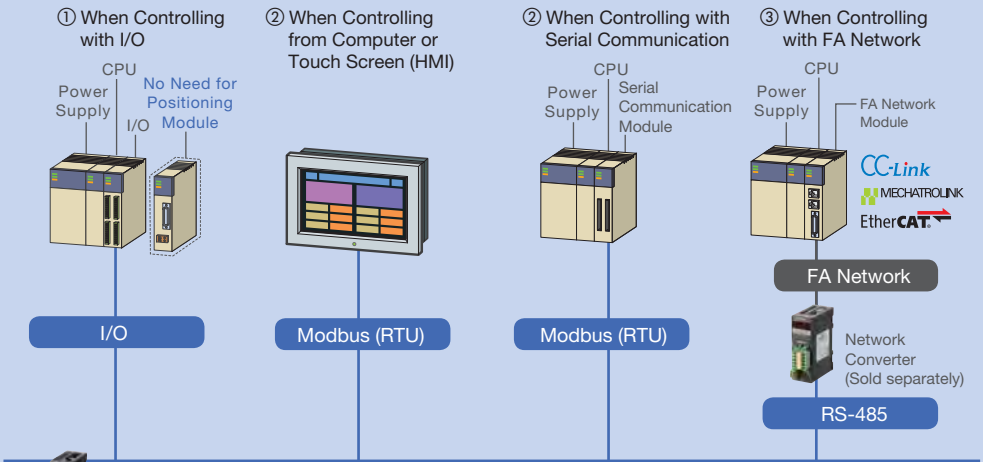


A highly efficient monitoring function that allows for easy identification of the motor and I/O status at a glance.

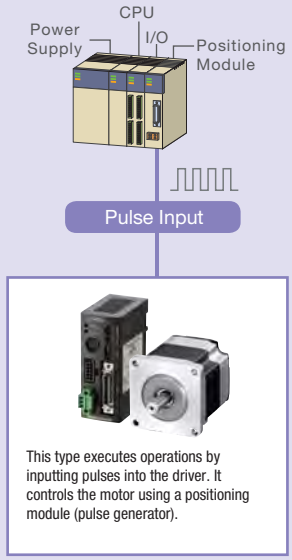
2 Driver Types Available Depending on the System Configuration

2 types of **AR** Series drivers are available, depending on the master control system in use.

Built-in Controller Type FLEX



Pulse Input Type



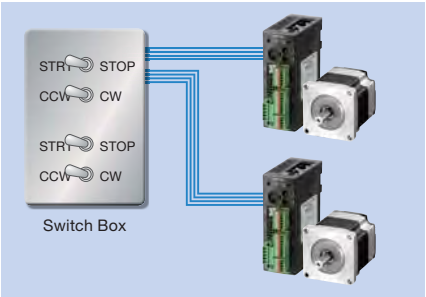
This type executes operations by inputting pulses into the driver. It controls the motor using a positioning module (pulse generator).

Control System Configuration for Built-in Controller Type

① I/O Control

The positioning module (pulse generator) function is built into the driver, and therefore an operation system using I/O can be created by connecting directly to a switch box or PLC. A positioning module is not necessary on the PLC side, saving space and simplifying the system.

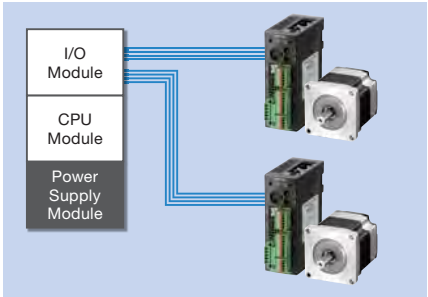
Example of Using a Switch Box



Operating data is set in the driver, and the motor can be started or stopped simply by connecting a switch. Control can be performed easily without using PLC.

Easy Control | Low-Cost Design

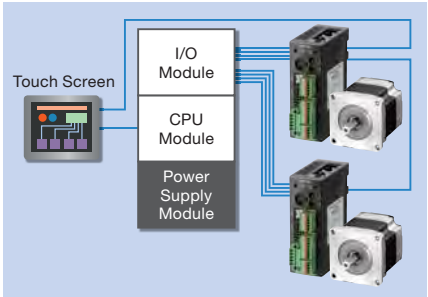
Example of Using PLC



When using PLC, an operation system can be created by connecting directly to an I/O module. A positioning module is not necessary on the PLC side, therefore space is saved and the system is simplified.

Easy Control | Low-Cost Design | Space Saving

Example of Using PLC and a Touch Screen



Normally, the motor is started and stopped with I/O. Changing the operating data settings and displaying the monitors and alarms is performed with the touch screen using Modbus (RTU) communication. When there is a lot of setup work, changes can be easily performed on the touch screen, and the burden of creating ladders is reduced.

Easy Control | Support for Small Lots of Multiple Products

② Control via Modbus (RTU)/RS-485 Communication

RS-485 communication can be used to set operating data and parameters and input operation commands. Up to 31 drivers can be connected to 1 serial communication module. There is a function that enables multiple motors to be started simultaneously. The Modbus (RTU) protocol is supported and can be used to connect to touch screens and computers.

Easy Control | Simple Wiring | Supports Brands of Serial Module | Motor Controlled by Computer | Simplified System

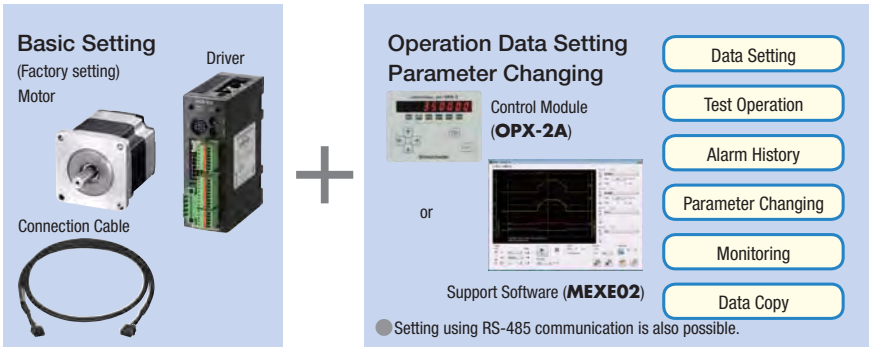
③ Control via FA Network

By using a network converter (sold separately), CC-Link, MECHATROLINK or EtherCAT communication are possible. These can be used to set operating data and parameters and input operation commands.

Easy Control | Simple Wiring | Multi-Axis Control at Low Cost

Built-in Controller Type FLEX

Because the driver has the information necessary for motor operation on built-in controller types, the burden on the host PLC is reduced.
The system configuration when using multi-axis control has been simplified.
Settings are configured using a control module **OPX-2A** (sold separately), support software **MEXE02** or RS-485 communication.



Operation Types

In the built-in controller type, the operating speed and traveling amount of the motor are set with operating data, and operation is performed according to the selected operating data. There are four types of motor operations.

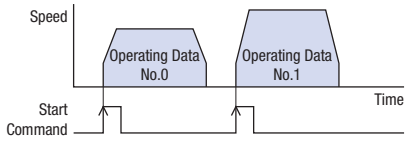
Item		Description	
Common	Control Method	I/O control	
		RS-485 Communication	Network Converter Connection
			Modbus RTU Protocol Connection
	Position Command Input	Setting with operating data number	Command range for each point: −8388608～8388607 [step] (Setting unit: 1 [step])
	Speed Command Input	Setting with operating data number	Command Range: 0～1000000 [Hz] (Setting unit: 1 [Hz])
	Acceleration/ Deceleration Command Input	Set with the operating data number or parameter. The acceleration/deceleration rate [ms/kHz] or acceleration/deceleration time [s] can be selected. Command Range: 0.001～1000.000 [ms/kHz] (Setting unit: 0.001 [ms/kHz]) 0.001～1000.000 [s] (Setting unit: 0.001 [s])	
	Acceleration/ Deceleration Processing	Velocity Filter, Movement Average Filter	
Return-to-Home Operation	Return-to-Home Modes	2-Sensor Mode	A return-to-home operation that uses a limit sensor (+LS, −LS).
		3-Sensor Mode	A return-to-home operation that uses a limit sensor and a HOME sensor.
		Pushing Mode*1	A return-to-home operation by pressing the table against the mechanical end of a linear slide, etc.
		Position Preset	A function where P-PRESET is input at the desired position to confirm the home position.
			The home position can be set to the desired value.
Positioning Operation	Number of Positioning Points	64 points (No. 0～63)	
	Operating Modes	Incremental mode (Relative positioning)	
		Absolute mode (Absolute positioning)	
	Operation Functions	Independent Operation	A PTP (Point to Point) positioning operation.
		Linked Operation	A multistep speed-change positioning operation that is linked with operating data.
		Linked Operation 2	A positioning operation with a timer that is linked with operating data. The timer (dwell time) can be set from 0～50.000 [s]. (Setting unit: 0.001 [s])
		Push-Motion Operation*1	Continuous pressurizing position operations are performed with respect to the load. Maximum speed of operation is 500 [r/min] on the motor shaft.
	Start Methods	Operating Data Selection Method	Starts the positioning operation when START is input after selecting M0～M5.
		Direct Method (Direct positioning)	Starts the positioning operation with the operating data number set in the parameters when MS0～MS5 is input.
		Sequential Method (Sequential positioning)	Starts the positioning operation in sequence from operating data No. 0 each time SSTART is input.
Continuous Operation	Number of Speed Points	64 points (No. 0～63)	
	Speed Change Method	Changes the operating data number.	
Other Operations	JOG Operation	Regular feed is performed by inputting +JOG or −JOG.	
	Automatic Return Operation	When the motor position is moved by an external force while the motor is in a non-excitation state, it automatically returns to the position where it originally stopped.	
	Control Mode*2	The normal mode and the current control mode can be selected.	
Absolute Backup		You can build an absolute system by using a battery (accessory).	

*1 Do not perform push-motion operation using geared type motors. Doing so may damage the motor or gear unit.
*2 Except to further reduce heat generation or noise, using normal mode is recommended.

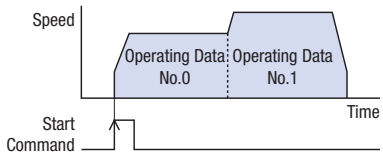
Positioning Operation

<Operation Functions>

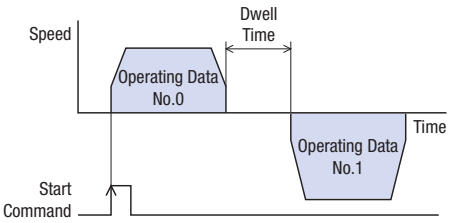
- Independent Operation



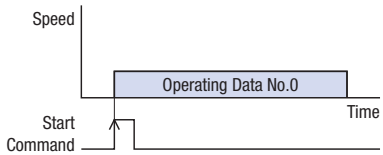
- Linked Operation



- Linked Operation 2



- Push-Motion Operation

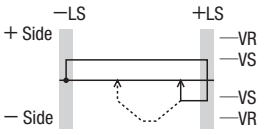


<Start Methods>

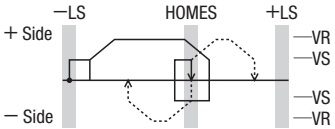
- Operating Data Selection Method
- Direct Positioning
- Sequential Positioning

Return-to-Home Operation

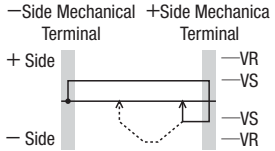
- 2-Sensor Mode



- 3-Sensor Mode

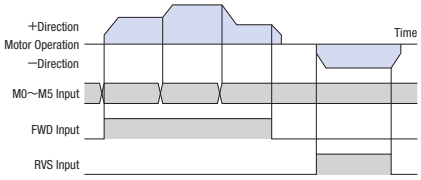


- Pushing Mode



- Position Preset

Continuous Operation



Other Operations

- JOG Operation (Test operation)
- Automatic Return Operation

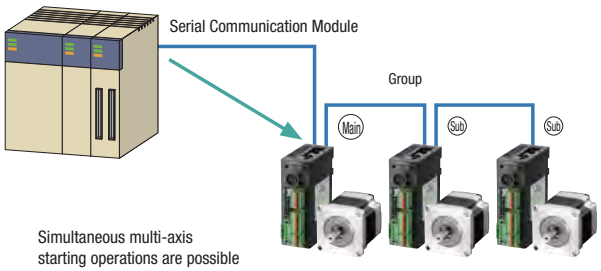
Equipped with a sequence for return-to-home operation that reduces the burden of the host master and the hassle of creating a ladder.

Group Send Function

Modbus (RTU) communication and FA network have a function that enables multiple motors to be started simultaneously.
Multiple drivers can be grouped together, and when an operation command is sent to the master driver, all the drivers that belong to the same group as the master driver will operate simultaneously.

- Modbus (RTU) Control: Support for simultaneous start, changes to traveling amount and speed and monitoring
- FA network control: Simultaneous start only

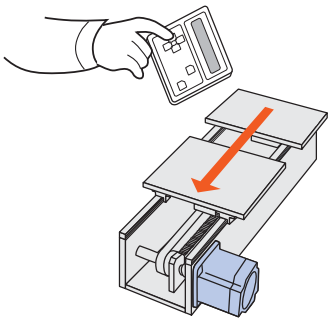
- Example of Modbus (RTU) Communication Control



Teaching Function

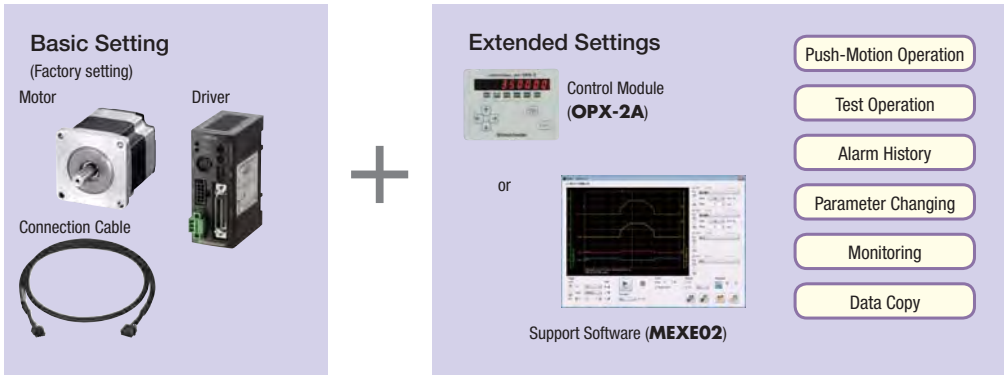
Teaching can be performed with the **OPX-2A** control module (sold separately) or the **MEXE02*** support software. The table is moved to the desired position, and the position data at that time is stored as the positioning data.

*The support software can be downloaded from the website. Please contact us for details.



Pulse Input Type

The control module **OPX-2A** (sold separately) and support software **MEXE02** can be used to change the parameters, display the alarm history, and perform various types of monitoring.



Main Additional Functions Available with Extended Settings

Item		Overview	Basic Setting	Extended Settings
Selection of Pulse Input Mode		1-pulse input mode or 2-pulse input (negative logic) mode can be selected.	●	●
		In addition to the normal settings, the phase difference input can also be set. · 1-pulse input mode (positive logic/negative logic) · 2-pulse input mode (positive logic/negative logic) · Phase difference input (1-multiplication/2-multiplication/4-multiplication)	–	●
Resolution Setting		The resolution can be selected with a function switch (D0, D1, CS0, CS1).	●	●
		The function switch can be used to the change each of the corresponding electronic gear values (D0, D1, CS0, CS1).	–	●
Running Current Setting		The running current setting can be changed with the current setting switch (CURRENT).	●	●
		The value corresponding to each stage of the current setting switch (CURRENT), 0～F (16 stages), can be changed.	–	●
Standstill Current Ratio Setting		The ratio of the standstill current relative to the running current can be set.	–	●
Motor Rotational Coordinates Setting		The rotational coordinates for the motor can be set.	–	●
Current On Signal (C-ON input)		The input signal for the excitation of the motor.	●	●
		The logic of the C-ON input during power supply input can be set.	–	●
Return to Excitation Position Operation During Current On Enable/Disable		Set whether or not to return to the excitation position (deviation 0 position) during current on.	–	●
I/O Input Signal Mode Selection		Input to select the push-motion operation*1	–	●
Alarm Code Signal Enable/Disable		Set to output the code when an alarm occurs.	–	●
END Output Signal Range Setting		The END output signal range can be changed.	–	●
END Output Signal Offset		The END output signal value can be offset.	–	●
A/B Phase Output		This can be used to confirm the position of the motor.	●	●
Timing Output Signal		This is output each time the motor rotates 7.2°.	●	●
Velocity Filter Setting		Applies a filter to the operation command to control the motor action.	●	●
		The values corresponding to each of 0～F (16 levels) for the setting switch.	–	●
Control Mode	Vibration Suppression Function for Normal Mode	This can be set to suppress resonant vibration during rotation.	–	●
		This can be set to suppress vibration during acceleration, and deceleration, and when stopped.	–	●
	Gain Adjustment for Current Control Mode*2	Adjusts the position and speed loop gain.	–	●
		Adjusts the speed integration time constant.	–	●
		Sets the damping control vibration frequency.	–	●
		Sets whether to enable or disable damping control.	–	●
Selection of Motor Excitation Position at Power On		The motor excitation position for when the power is on can be selected.	–	●
Control Module Setting		Select whether to use symbols or an absolute value display for the speed display of the control module.	–	●
		The geared motor gear ratio for the speed monitor can be set.	–	●

*1 Do not perform push-motion operation using geared type motors. Doing so may damage the motor or gear unit.
*2 Except to further reduce heat generation or noise, using normal mode is recommended.

Product Line of Motors

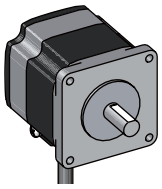
Types and Features of Standard and Geared Motors

	Type	Features	Permissible Torque and Max. Instantaneous Torque [N·m]	Backlash [arcmin (degrees)]	Basic Resolution [deg/step]	Output Shaft Speed [r/min]
	Standard Type  Motor shaft shape: Shaft flat on one side/round shaft	•Basic motor of the **AR** Series	Maximum Holding Torque: 2	—	0.36	4000
Low Backlash	**TH** Geared Type (Spur Gear Mechanism)  Selection of the cable drawing direction: Downward/upward/right/left *Excluding **ARM24**	•A wide variety of low gear ratios, high-speed operations •Gear ratio: 3.6, 7.2, 10, 20, 30	Permissible Torque: 12	10	0.012	500
Low Backlash	**PS** Geared Type (Planetary Gear Mechanism) 	•High permissible torque/max. instantaneous torque •A wide variety of gear ratios for selecting the desired step angle •Center shaft •Gear ratio: 5, 7.2, 10, 25, 36, 50	Maximum Holding Torque: 60 Permissible Torque: 37	7	0.0072	600
Non-Backlash	**PN** Geared Type (Planetary Gear Mechanism 	•High speed (low gear ratio), high positioning accuracy •High permissible torque/max. instantaneous torque •A wide variety of gear ratios for selecting the desired step angle •Center shaft •Gear ratio: 5, 7.2, 10, 25, 36, 50	Maximum Holding Torque: 60 Permissible Torque: 37	2	0.0072	600
Non-Backlash	**Harmonic Geared Type** (Harmonic Drive) 	•High positioning accuracy •High permissible torque/max. instantaneous torque •High gear ratio, high resolution •Center shaft •Gear ratio: 50, 100	Maximum Holding Torque: 55 Permissible Torque: 37	0	0.0036	70

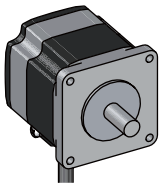
Note

- Please use the above values as reference to see the differences between each type. These values vary depending on the motor frame size and gear ratio.
- HarmonicPlanetary, HarmonicDrive and are registered trademarks or trademarks of Harmonic Drive Systems Inc.

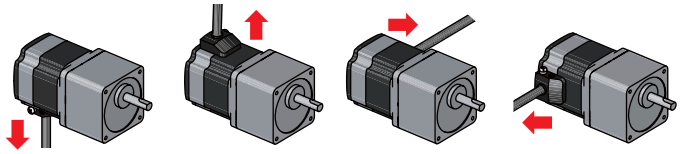
You can select the shaft shape and cable drawing direction depending on the application.



Shaft Flat on One side



Round Shaft



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

Standard Type

Frame Size \ Shaft Shape	Shaft Flat on One Side	Round Shaft
20 mm	●	●
28 mm	●	●
42 mm	●	●
60 mm	●	●
85 mm	●	●

TH Geared Type

Frame Size	Cable Drawing Direction			
	Downward	Upward	Rightward	Leftward
28 mm	●	—	—	—
42 mm	●	●	●	●
60 mm	●	●	●	●
90 mm	●	●	●	●

Power Supply Input and Frame Size

Driver Type	Power Supply Input	Motor Type	
		Standard Type	**TH** Geared Type **PS** Geared Type **PN** Geared Type Harmonic Geared Type
Built-in Controller Type 	24 VDC/48 VDC*1	□20 □28 □42 □60 □85	□28*2 □42 □60 □90
Pulse Input Type 	24 VDC/48 VDC*1	□20 □28 □42 □60 □85	□28*2 □42 □60 □90

●□42: Indicates a motor frame size of 42 mm.
●Electromagnetic brake models are available for all types.
*1 Only 24 VDC input is available for □20 and □28 motors.
*2 □30 for the harmonic geared type.

Conforms to Various Directives

◇Components Conforming to International Safety Standards

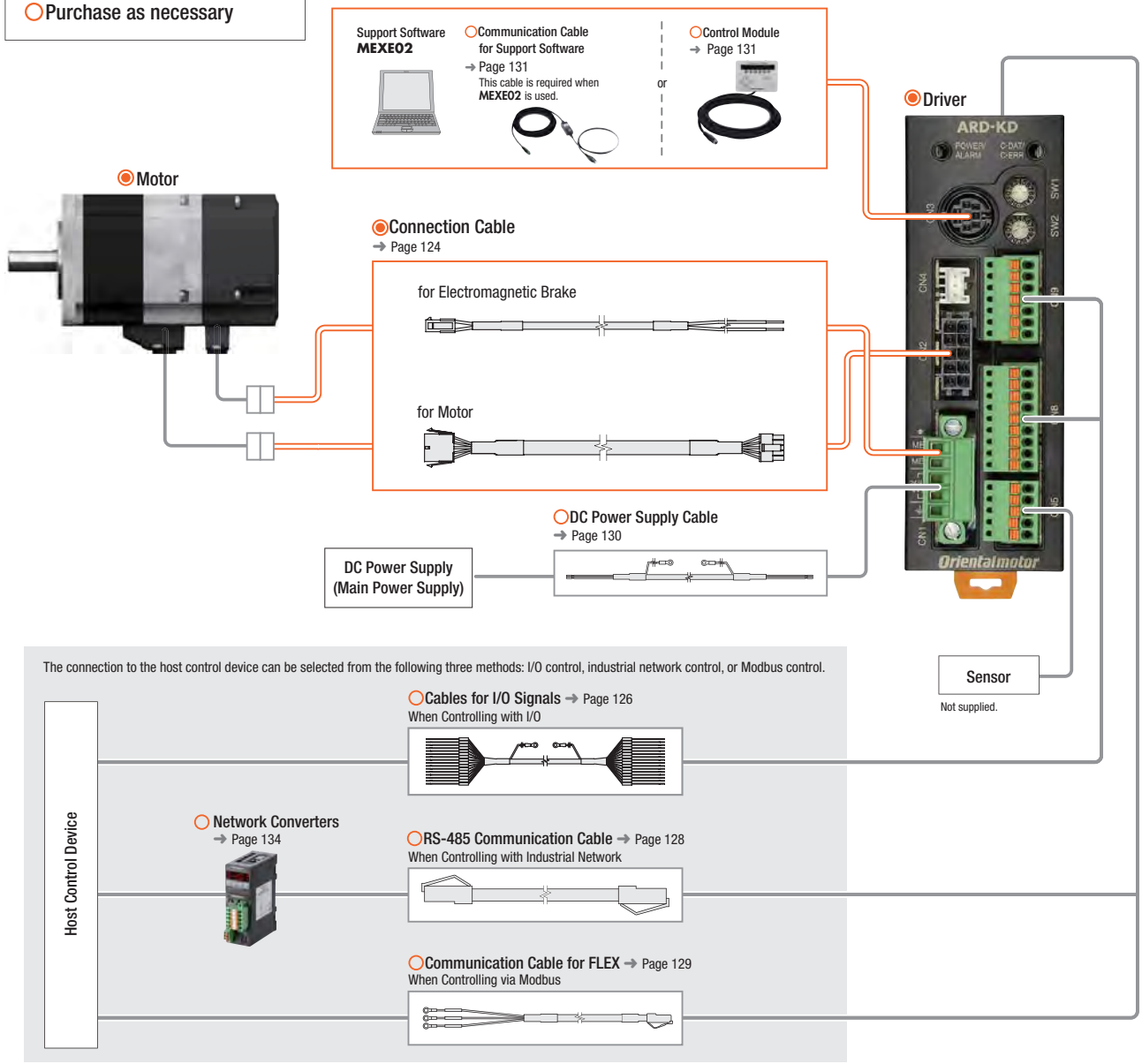
UL Standards certified
(Except for motor frame size of 20 mm and 28 mm)
This product has a CE Marking (EMC Directive) affixed under the Low Voltage Directive.

System Configuration

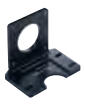
Combination of Standard Type Motor with an Electromagnetic Brake and Built-in Controller Type Driver

A configuration example of I/O control with a built-in controller type driver or using RS-485 communication is shown below.

◉Purchase is required
○Purchase as necessary



○Motor Accessories



Motor Mounting Brackets
→ Page 132

○Driver Accessories

Battery Set
→ Page 134

Driver Mounting Brackets
→ Page 133

Connector Cover
→ Page 133

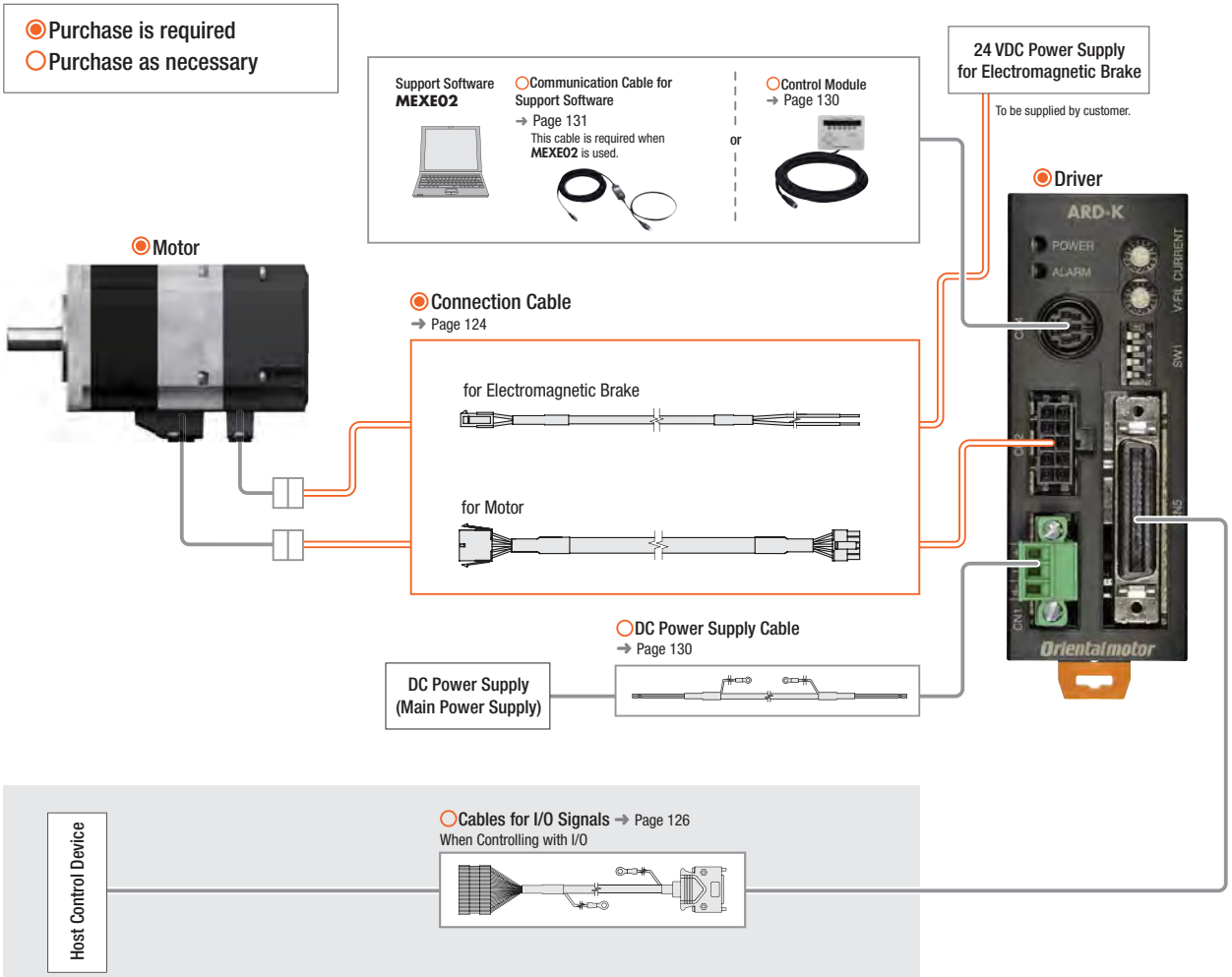
● Example of System Conguration Pricing

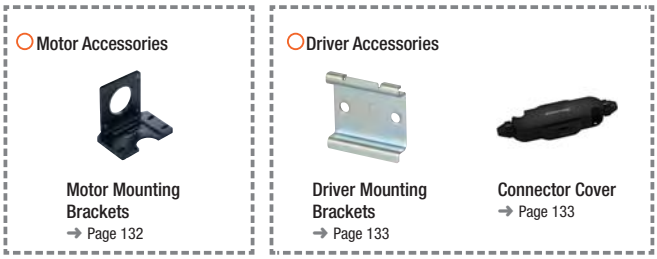
Motor		Driver		Cables			Accessories	
				Connection Cable Set (1 m)	I/O Signal Cable for General Purpose (0.5 m)		Motor Mounting Bracket	Driver Mounting Bracket
ARM66SMK	+	ARD-KD	+	CC010VA2FB2	CC06D005B-1	+	PAL2P-5	MAFP02
◉		◉		◉	○		○	○

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

Combination of Standard Type Motor with an Electromagnetic Brake and Pulse Input Type Driver

An example of single-axis system configuration with the programmable controller (Equipped with the pulse oscillation function) is shown below.





Example of System Conguration Pricing

Motor		Driver		Cables			Accessories	
				Connection Cable Set (1 m)	I/O Signal Cable with Connector (1 m)		Motor Mounting Bracket	Driver Mounting Bracket
ARM66SMK	+	ARD-K	+	CC010VA2FB2	CC36D1E	+	PAL2P-5	MAFP02
◉		◉		◉	○		○	○

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

Product Number

Motor

◇Standard Type

ARM 2 4 S A 0 K

① ② ③ ④ ⑤ ⑥ ⑦

◇**PS**, **PN**, Harmonic Geared Type

ARM 2 4 S A K - PS 10

① ② ③ ④ ⑤ ⑦ ⑧ ⑨

①	Motor Type	**ARM**: **AR** Series Motor
②	Motor Frame Size	**1**: 20 mm **2**: 28 mm (Harmonic Geared Type is 30 mm) **4**: 42 mm **6**: 60 mm **9**: 85 mm (Geared Type is 90 mm)
③	Motor Case Length	
④	Motor Identification	
⑤	Output Shaft Features	**A**: Single Shaft **B**: Double Shaft **M**: With Electromagnetic Brake
⑥	Additional Function*	**0**: Round Shaft Type
⑦	Motor Power Supply Input	**K**: DC Power Supply Input Type
⑧	Geared Type	**PS**: **PS** Geared Type **N**: **PN** Geared Type **H**: Harmonic Geared Type
⑨	Gear Ratio	

*The standard motor without a number indicating the additional function in the product name is the type shaft flat on one side.

◇**TH** Geared Type

ARM 6 6 S A K - T 7.2 U

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①	Motor Type	**ARM**: **AR** Series Motor
②	Motor Frame Size	**2**: 28 mm **4**: 42 mm **6**: 60 mm **9**: 90 mm
③	Motor Case Length	
④	Motor Identification	
⑤	Output Shaft Features	**A**: Single Shaft **M**: With Electromagnetic Brake
⑥	Motor Power Supply Input	**K**: DC Power Supply Input Type
⑦	Geared Type	**T**: **TH** Geared Type
⑧	Gear Ratio	
⑨	Cable Outlet Direction	**R**: Rightward Direction **U**: Upward Direction **L**: Leftward Direction

Driver

ARD - K D

① ② ③

①	Driver Type	**ARD**: **AR** Series Driver
②	Power Supply Input	**K**: 24 VDC/48 VDC
③	Type	**D**: Built-in Controller Type Blank: Pulse Input Type

Product Line

Motors, drivers, and connection cables must be ordered separately. Connection Cables ➜ Page 120

Motor

◇Standard Type

Frame Size	Product Name (Single Shaft)	Product Name (Double Shaft)
20 mm	**ARM14SA□K**	**ARM14SB□K**
	ARM15SA□K	**ARM15SB□K**
28 mm	**ARM24SA□K**	**ARM24SB□K**
	ARM26SA□K	**ARM26SB□K**
42 mm	**ARM46SA□K**	**ARM46SB□K**
60 mm	**ARM66SA□K**	**ARM66SB□K**
	ARM69SA□K	**ARM69SB□K**
85 mm	**ARM98SA□K**	**ARM98SB□K**

● The number **0** (round shaft type) indicating the shaft shape is entered where the box □ is located within the product name. One side flat shaft type will have no "□" within the product name.

◇Standard Type with Electromagnetic Brake

Frame Size	Product Name
28 mm	**ARM24SM□K**
	ARM26SM□K
42 mm	**ARM46SM□K**
60 mm	**ARM66SM□K**
	ARM69SM□K
85 mm	**ARM98SM□K**

● The number **0** (round shaft type) indicating the shaft shape is entered where the box □ is located within the product name. One side flat shaft type will have no "□" within the product name.

◇TH Geared Type

Frame Size	Product Name
28 mm	**ARM24SAK-T7.2**
	ARM24SAK-T10
	ARM24SAK-T20
	ARM24SAK-T30
42 mm	**ARM46SAK-T3.6■**
	ARM46SAK-T7.2■
	ARM46SAK-T10■
	ARM46SAK-T20■
	ARM46SAK-T30■
60 mm	**ARM66SAK-T3.6■**
	ARM66SAK-T7.2■
	ARM66SAK-T10■
	ARM66SAK-T20■
	ARM66SAK-T30■
90 mm	**ARM98SAK-T3.6■**
	ARM98SAK-T7.2■
	ARM98SAK-T10■
	ARM98SAK-T20■
	ARM98SAK-T30■

● Either **R** (rightward direction), **U** (upward direction), or **L** (leftward direction) indicating the cable outlet direction is entered where the box ■ is located within the product name. The product with the cable leading downward direction will have no "■" within the product name.

◇TH Geared Type with Electromagnetic Brake

Frame Size	Product Name
28 mm	**ARM24SMK-T7.2**
	ARM24SMK-T10
	ARM24SMK-T20
	ARM24SMK-T30
42 mm	**ARM46SMK-T3.6■**
	ARM46SMK-T7.2■
	ARM46SMK-T10■
	ARM46SMK-T20■
	ARM46SMK-T30■
60 mm	**ARM66SMK-T3.6■**
	ARM66SMK-T7.2■
	ARM66SMK-T10■
	ARM66SMK-T20■
	ARM66SMK-T30■
90 mm	**ARM98SMK-T3.6■**
	ARM98SMK-T7.2■
	ARM98SMK-T10■
	ARM98SMK-T20■
	ARM98SMK-T30■

● Either **R** (rightward direction), **U** (upward direction), or **L** (leftward direction) indicating the cable outlet direction is entered where the box ■ is located within the product name. The product with the cable leading downward direction will have no "■" within the product name.

◇**PS** Geared Type

Frame Size	Product Name
28 mm	**ARM24SAK-PS5**
	ARM24SAK-PS7
	ARM24SAK-PS10
42 mm	**ARM46SAK-PS5**
	ARM46SAK-PS7
	ARM46SAK-PS10
	ARM46SAK-PS25
	ARM46SAK-PS36
	ARM46SAK-PS50
60 mm	**ARM66SAK-PS5**
	ARM66SAK-PS7
	ARM66SAK-PS10
	ARM66SAK-PS25
	ARM66SAK-PS36
	ARM66SAK-PS50
90 mm	**ARM98SAK-PS5**
	ARM98SAK-PS7
	ARM98SAK-PS10
	ARM98SAK-PS25
	ARM98SAK-PS36
	ARM98SAK-PS50

◇**PS** Geared Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**ARM46SMK-PS5**
	ARM46SMK-PS7
	ARM46SMK-PS10
	ARM46SMK-PS25
	ARM46SMK-PS36
	ARM46SMK-PS50
60 mm	**ARM66SMK-PS5**
	ARM66SMK-PS7
	ARM66SMK-PS10
	ARM66SMK-PS25
	ARM66SMK-PS36
	ARM66SMK-PS50
90 mm	**ARM98SMK-PS5**
	ARM98SMK-PS7
	ARM98SMK-PS10
	ARM98SMK-PS25
	ARM98SMK-PS36
	ARM98SMK-PS50

◇**PN** Geared Type

Frame Size	Product Name
28 mm	**ARM24SAK-N5**
	ARM24SAK-N7.2
	ARM24SAK-N10
42 mm	**ARM46SAK-N5**
	ARM46SAK-N7.2
	ARM46SAK-N10
60 mm	**ARM66SAK-N5**
	ARM66SAK-N7.2
	ARM66SAK-N10
	ARM66SAK-N25
	ARM66SAK-N36
	ARM66SAK-N50
90 mm	**ARM98SAK-N5**
	ARM98SAK-N7.2
	ARM98SAK-N10
	ARM98SAK-N25
	ARM98SAK-N36
	ARM98SAK-N50

◇**PN** Geared Type with Electromagnetic Brake

Frame Size	Product Name
42 mm	**ARM46SMK-N5**
	ARM46SMK-N7.2
	ARM46SMK-N10
60 mm	**ARM66SMK-N5**
	ARM66SMK-N7.2
	ARM66SMK-N10
	ARM66SMK-N25
	ARM66SMK-N36
	ARM66SMK-N50
90 mm	**ARM98SMK-N5**
	ARM98SMK-N7.2
	ARM98SMK-N10
	ARM98SMK-N25
	ARM98SMK-N36
	ARM98SMK-N50

◇Harmonic Geared Type

Frame Size	Product Name
30 mm	**ARM24SAK-H50**
	ARM24SAK-H100
42 mm	**ARM46SAK-H50**
	ARM46SAK-H100
60 mm	**ARM66SAK-H50**
	ARM66SAK-H100
90 mm	**ARM98SAK-H50**
	ARM98SAK-H100

◇Harmonic Geared Type with Electromagnetic Brake

Frame Size	Product Name
30 mm	**ARM24SMK-H50**
	ARM24SMK-H100
42 mm	**ARM46SMK-H50**
	ARM46SMK-H100
60 mm	**ARM66SMK-H50**
	ARM66SMK-H100
90 mm	**ARM98SMK-H50**
	ARM98SMK-H100

Driver

◇Built-in Controller Type

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

◇Pulse Input Type

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

Connection Cable Sets/Flexible Connection Cable Sets

Use a flexible connection cable set if the cable will be bent. Extension cables and flexible extension cables that can extend the connection cables are available. Connection Cables ➜ Page 122

Included

Motor

Type \ Included		Parallel Key	Varistor	Operating Manual
Standard Type		–	1 pc. (Electromagnetic Brake Type Only)	1 Copy
TH Geared Type	Frame Size 28 mm	–		
	Frame Size 42 mm	–		
	Frame Size 60 mm	–		
	Frame Size 90 mm	1 pc.		
PS Geared Type **PN** Geared Type Harmonic Geared Type	Frame Size 28 mm	–		
	Frame Size 30 mm	–		
	Frame Size 42 mm	1 pc.		
	Frame Size 60 mm	1 pc.		
	Frame Size 90 mm	1 pc.		

Driver

Type \ Included	Connector	Operating Manual
Built-in Controller Type	・CN1 Connector (1 pc.) ・CN5 Connector (1 pc.) ・CN8 Connector (1 pc.) ・CN9 Connector (1 pc.)	1 Copy
Pulse Input Type	・CN1 Connector (1 pc.) ・CN5 Connector (1 pc.)	

Standard Type Frame Size 20 mm, 28 mm

Specifications

Motor Product Name	Single Shaft	**ARM14SA□K**	**ARM15SA□K**	**ARM24SA□K**	**ARM26SA□K**
	Double Shaft	**ARM14SB□K**	**ARM15SB□K**	**ARM24SB□K**	**ARM26SB□K**
	With Electromagnetic Brake	–	–	**ARM24SM□K**	**ARM26SM□K**
Driver Product Name	Built-in Controller	**ARD-KD**			
	Pulse Input	**ARD-K**			
Maximum Holding Torque	N·m	0.017	0.032	0.055	0.12
Holding Torque at Motor Standstill	Power ON N·m	0.009	0.016	0.027	0.06
	Electromagnetic Brake N·m	–	–	0.027	0.06
Rotor Inertia	J: kg·m^2	2.1×10^{-7}	3.4×10^{-7}	11×10^{-7} [16×10^{-7}]✻1	20×10^{-7} [25×10^{-7}]✻1
Resolution	Resolution Setting: 1000 P/R	0.36°/Pulse			
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)✻2			
	Input Current A	0.4	0.5	0.9 (1.3)✻2	
Electromagnetic Brake✻3	Power Supply Input	–	–	24 VDC ±5%✻4 0.05 A	

- The number **0** (round shaft type) indicating the shaft shape is entered where the box □ is located within the product name.
  One side flat shaft type will have no "□" within the product name.

✻1 The values in brackets [ ] include the inertia of electromagnetic brake.

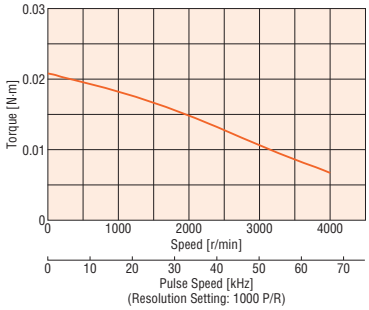
✻2 The values in parentheses ( ) represent the specifications of built-in controller type driver.

✻3 For pulse input type driver, a separate power supply for electromagnetic brake is required.

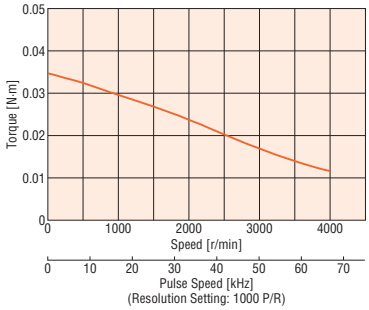
✻4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

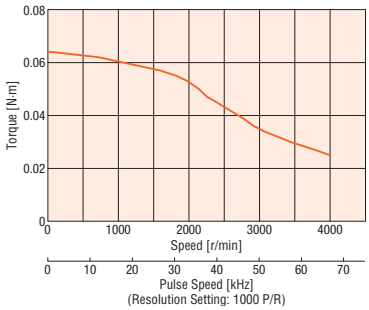
ARM14



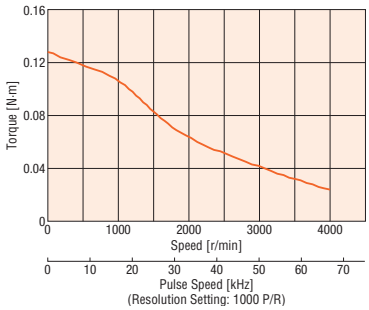
ARM15



ARM24



ARM26



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.

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

Specifications

Motor Product Name	Single Shaft		**ARM46SA□K**	**ARM66SA□K**	**ARM69SA□K**	**ARM98SA□K**
	Double Shaft		**ARM46SB□K**	**ARM66SB□K**	**ARM69SB□K**	**ARM98SB□K**
	With Electromagnetic Brake		**ARM46SM□K**	**ARM66SM□K**	**ARM69SM□K**	**ARM98SM□K**
Driver Product Name	Built-in Controller		**ARD-KD**			
	Pulse Input		**ARD-K**			
Maximum Holding Torque		N·m	0.3	1	2	
Holding Torque at Motor Standstill	Power ON	N·m	0.15	0.5	1	
	Electromagnetic Brake	N·m	0.15	0.5	1	
Rotor Inertia		J: kg·m^2	58×10^{-7} $[73\times10^{-7}]$*1	380×10^{-7} $[500\times10^{-7}]$*1	750×10^{-7} $[870\times10^{-7}]$*1	1100×10^{-7} $[1220\times10^{-7}]$*1
Resolution	Resolution Setting: 1000 P/R		0.36°/Pulse			
Power Supply Input	Voltage		24 VDC ±10% (24 VDC ±5%)*2/ 48 VDC ±5%	24 VDC ±10% (24 VDC ±5%)*2/48 VDC ±5%*3		
	Input Current	A	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 0.08 A	24 VDC ±5%*5 0.25 A		

● The number **0** (round shaft type) indicating the shaft shape is entered where the box □ is located within the product name.
One side flat shaft type will have no "□" within the product name.

*1 The values in brackets [ ] include the inertia of electromagnetic brake.

*2 The values in parentheses ( ) represent the specifications of built-in controller type driver.

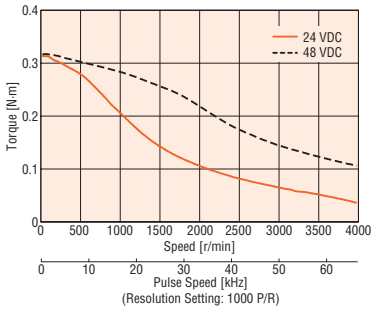
*3 When the motor is operated with 48 VDC input, as a reference, keep the load inertia 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating theacceleration torque.

*4 For pulse input type driver, a separate power supply for electromagnetic brake is required.

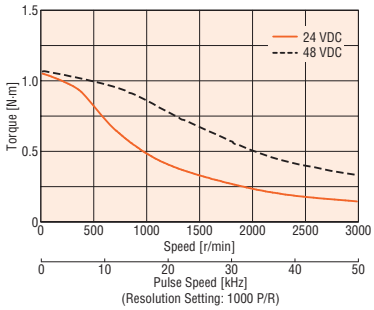
*5 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

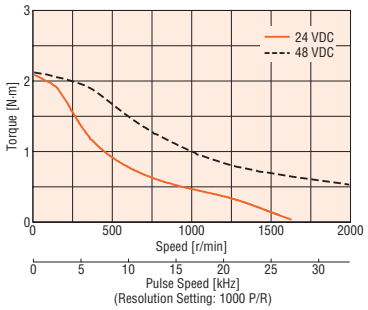
ARM46



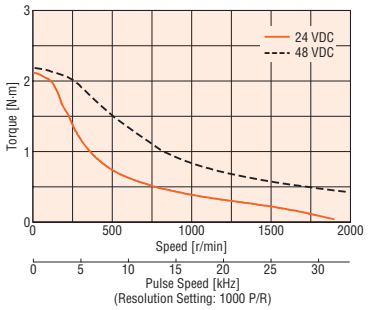
ARM66



ARM69



ARM98



Note

● Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100ºC or less.
(When conforming to the UL Standards, the temperature of the motor case must be kept at 75ºC or less, since the motor is recognized as heat-resistant class A.)

TH Geared Type Frame Size 28 mm

Specifications

Motor Product Name	Single Shaft	ARM24SAK-T7.2	ARM24SAK-T10	ARM24SAK-T20	ARM24SAK-T30
	With Electromagnetic Brake	ARM24SMK-T7.2	ARM24SMK-T10	ARM24SMK-T20	ARM24SMK-T30
Driver Product Name	Built-in Controller	ARD-KD			
	Pulse Input	ARD-K			
Maximum Holding Torque	N·m	0.2	0.3	0.4	0.5
Rotor Inertia	J: kg·m^2	11×10^{-7} [16×10^{-7}]*1			
Gear Ratio		7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	0.2	0.3	0.4	0.5
Holding Torque at Motor Standstill	Power ON N·m	0.13	0.19	0.38	0.5
	Electromagnetic Brake N·m	0.13	0.19	0.38	0.5
Speed Range	r/min	0 to 416	0 to 300	0 to 150	0 to 100
Backlash	arcmin	60 (1°)			
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)*2			
	Input Current A	0.9 (1.3)*2			
Electromagnetic Brake*3	Power Supply Input	24 VDC ±5%*4 0.05 A			

*1 The values in brackets [ ] include the inertia of electromagnetic brake.

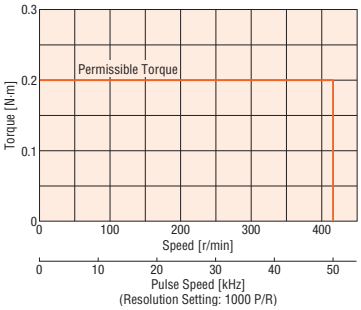
*2 The values in parentheses ( ) represent the specifications of built-in controller type driver.

*3 For pulse input type driver, a separate power supply for electromagnetic brake is required.

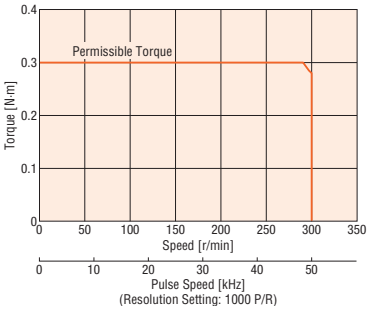
*4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

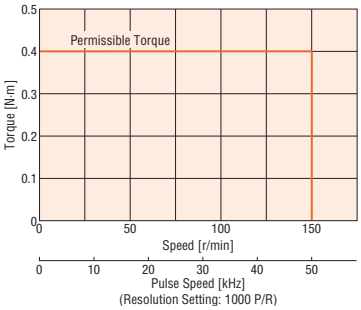
ARM24 Gear Ratio **7.2**



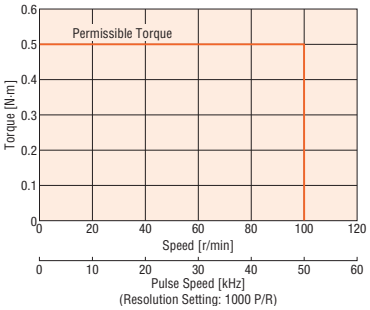
ARM24 Gear Ratio **10**



ARM24 Gear Ratio **20**



ARM24 Gear Ratio **30**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.

TH Geared Type Frame Size 42 mm

Specifications

Motor Product Name	Single Shaft	ARM46SAK-T3.6□	ARM46SAK-T7.2□	ARM46SAK-T10□	ARM46SAK-T20□	ARM46SAK-T30□
	With Electromagnetic Brake	ARM46SMK-T3.6□	ARM46SMK-T7.2□	ARM46SMK-T10□	ARM46SMK-T20□	ARM46SMK-T30□
Driver Product Name	Built-in Controller	ARD-KD				
	Pulse Input	ARD-K				
Maximum Holding Torque	N·m	0.35	0.7	1	1.5	
Rotor Inertia	J: kg·m^2	58×10^{-7} [73×10^{-7}]*1				
Gear Ratio		3.6	7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	0.35	0.7	1	1.5	
Holding Torque at Motor Standstill	Power ON N·m	0.33	0.67	0.93	1.5	
	Electromagnetic Brake N·m	0.33	0.67	0.93	1.5	
Speed Range	r/min	0 to 500	0 to 250	0 to 180	0 to 90	0 to 60
Backlash	arcmin	45 (0.75°)	25 (0.42°)		15 (0.25°)	
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)*2/48 VDC ±5%				
	Input Current A	1.4 (1.8)*2				
Electromagnetic Brake*3	Power Supply Input	24 VDC ±5%*4 0.08 A				

- Either **R** (rightward direction), **U** (upward direction), or **L** (leftward direction) indicating the cable outlet direction is entered where the box □ is located within the product name. For the cable leading downward, there will be no "□" within the product name.

*1 The values in brackets [ ] include the inertia of electromagnetic brake.

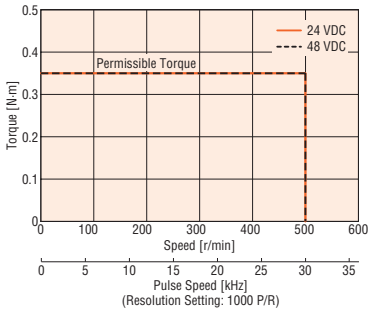
*2 The values in parentheses ( ) represent the specifications of built-in controller type driver.

*3 For pulse input type driver, a separate power supply for electromagnetic brake is required.

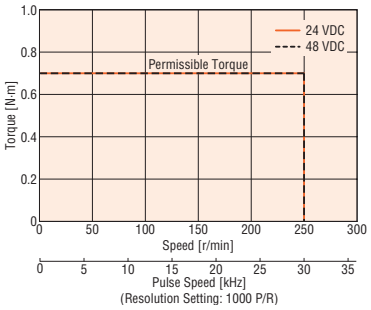
*4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

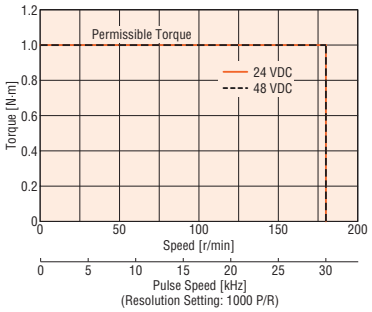
ARM46 Gear Ratio **3.6**



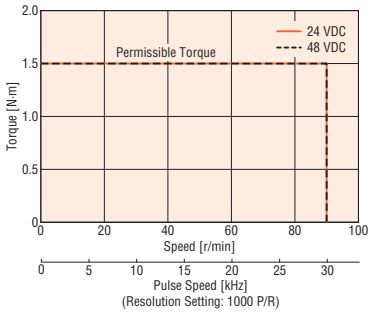
ARM46 Gear Ratio **7.2**



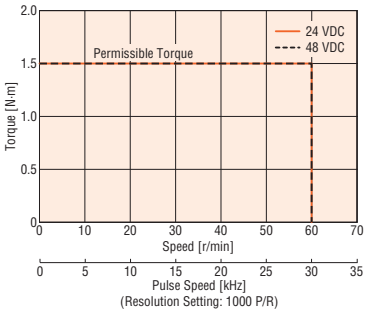
ARM46 Gear Ratio **10**



ARM46 Gear Ratio **20**



ARM46 Gear Ratio **30**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less. (When conforming to the UL Standards, the temperature of the motor case must be kept at 75°C or less, since the motor is recognized as heat-resistant class A.)

TH Geared Type Frame Size 60 mm

Specifications

Motor Product Name	Single Shaft	ARM66SAK-T3.6□	ARM66SAK-T7.2□	ARM66SAK-T10□	ARM66SAK-T20□	ARM66SAK-T30□
	With Electromagnetic Brake	ARM66SMK-T3.6□	ARM66SMK-T7.2□	ARM66SMK-T10□	ARM66SMK-T20□	ARM66SMK-T30□
Driver Product Name	Built-in Controller	ARD-KD				
	Pulse Input	ARD-K				
Maximum Holding Torque	N·m	1.25	2.5	3	3.5	4
Rotor Inertia	J: kg·m^2	380×10^{-7} [500×10^{-7}]*1				
Gear Ratio		3.6	7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	1.25	2.5	3	3.5	4
Holding Torque at Motor Standstill	Power ON N·m	1.1	2.2	3	3.5	4
	Electromagnetic Brake N·m	1.1	2.2	3	3.5	4
Speed Range	r/min	0 to 500	0 to 250	0 to 180	0 to 90	0 to 60
Backlash	arcmin	35 (0.59°)	15 (0.25°)		10 (0.17°)	
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)*2/48 VDC ±5%*3				
	Input Current A	3.1 (3.8)*2				
Electromagnetic Brake*4	Power Supply Input	24 VDC ±5%*5 0.25 A				

● Either **R** (rightward direction), **U** (upward direction), or **L** (leftward direction) indicating the cable outlet direction is entered where the box □ is located within the product name.
For the cable leading downward, there will be no "□" within the product name.

*1 The values in brackets [ ] include the inertia of electromagnetic brake.

*2 The values in parentheses ( ) represent the specifications of built-in controller type driver.

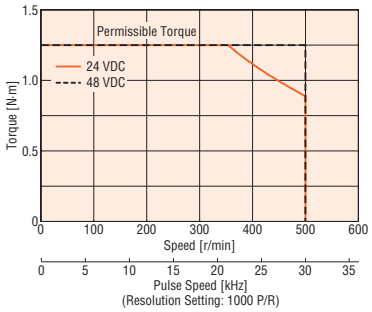
*3 When the motor is operated with 48 VDC input, as a reference, keep the load inertia 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.

*4 For pulse input type driver, a separate power supply for electromagnetic brake is required.

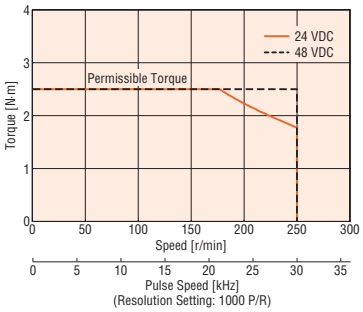
*5 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

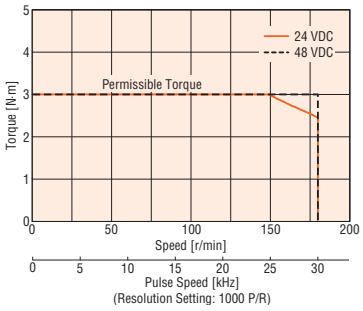
ARM66 Gear Ratio **3.6**



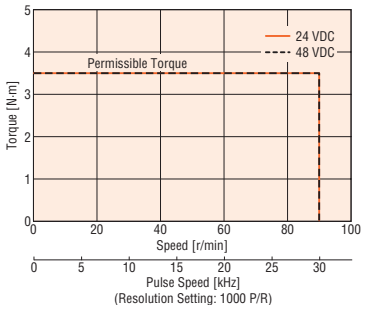
ARM66 Gear Ratio **7.2**



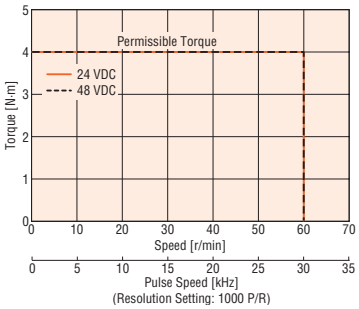
ARM66 Gear Ratio **10**



ARM66 Gear Ratio **20**



ARM66 Gear Ratio **30**



Note

● Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
(When conforming to the UL Standards, the temperature of the motor case must be kept at 75°C or less, since the motor is recognized as heat-resistant class A.)

TH Geared Type Frame Size 90 mm

Specifications

Motor Product Name	Single Shaft	ARM98SAK-T3.6□	ARM98SAK-T7.2□	ARM98SAK-T10□	ARM98SAK-T20□	ARM98SAK-T30□
	With Electromagnetic Brake	ARM98SMK-T3.6□	ARM98SMK-T7.2□	ARM98SMK-T10□	ARM98SMK-T20□	ARM98SMK-T30□
Driver Product Name	Built-in Controller	ARD-KD				
	Pulse Input	ARD-K				
Maximum Holding Torque	N·m	4.5	9		12	
Rotor Inertia	J: kg·m^2	1100×10^{-7} [1220×10^{-7}]*1				
Gear Ratio		3.6	7.2	10	20	30
Resolution	Resolution Setting: 1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	4.5	9		12	
Holding Torque at Motor Standstill	Power ON N·m	3.6	7.2	9	12	
	Electromagnetic Brake N·m	3.6	7.2	9	12	
Speed Range	r/min	0 to 500	0 to 250	0 to 180	0 to 90	0 to 60
Backlash	arcmin	25 (0.42°)	15 (0.25°)		10 (0.17°)	
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)*2/48 VDC ±5%*3				
	Input Current A	2.5 (3.1)*2				
Electromagnetic Brake*4	Power Supply Input	24 VDC ±5%*5 0.25 A				

● Either **R** (rightward direction), **U** (upward direction), or **L** (leftward direction) indicating the cable outlet direction is entered where the box □ is located within the product name.
For the cable leading downward, there will be no "□" within the product name.

*1 The values in brackets [ ] include the inertia of electromagnetic brake.

*2 The values in parentheses ( ) represent the specifications of built-in controller type driver.

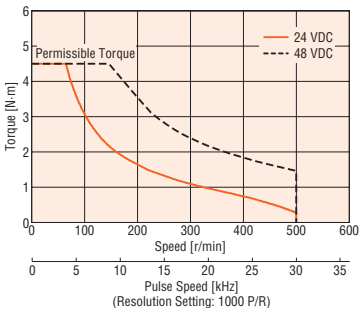
*3 When the motor is operated with 48 VDC input, as a reference, keep the load inertia 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.

*4 For pulse input type driver, a separate power supply for electromagnetic brake is required.

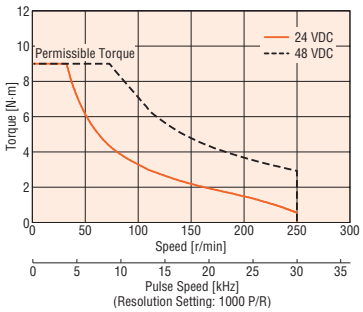
*5 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

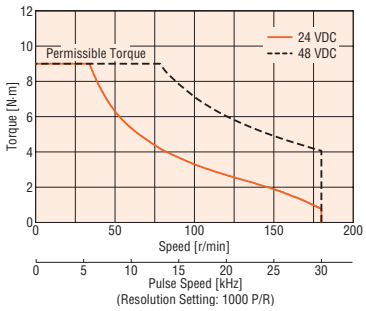
ARM98 Gear Ratio **3.6**



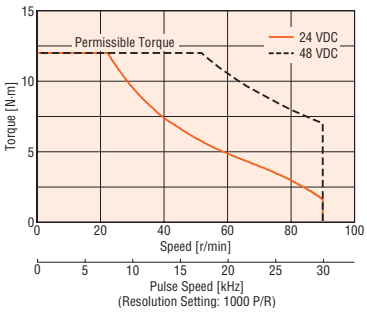
ARM98 Gear Ratio **7.2**



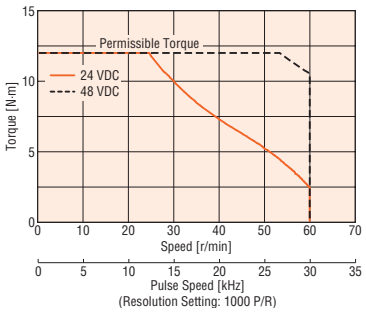
ARM98 Gear Ratio **10**



ARM98 Gear Ratio **20**



ARM98 Gear Ratio **30**



Note

● Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.

● Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
(When conforming to the UL Standards, the temperature of the motor case must be kept at 75°C or less, since the motor is recognized as heat-resistant class A.)

PS Geared Type Frame Size 28 mm

Specifications

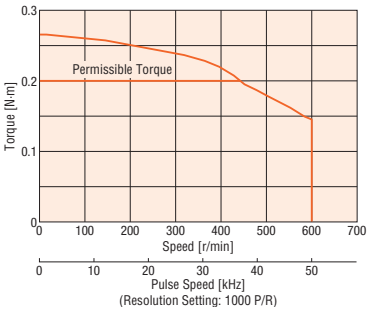
Motor Product Name	Single Shaft	ARM24SAK-PS5	ARM24SAK-PS7	ARM24SAK-PS10
Driver Product Name	Built-in Controller	ARD-KD		
	Pulse Input	ARD-K		
Maximum Holding Torque	N·m	0.2	0.3	0.5
Rotor Inertia	J: kg·m^2	11×10^{-7}		
Gear Ratio		5	7.2	10
Resolution	Resolution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse
Permissible Torque	N·m	0.2	0.3	0.5
Maximum Instantaneous Torque✻	N·m	✻	✻	–
Holding Torque at Motor Standstill	N·m	0.13	0.19	0.27
Speed Range	r/min	0 to 600	0 to 416	0 to 300
Backlash	arcmin	35 (0.59°)		
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)✻1		
	Input Current A	0.9 (1.3)✻1		

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

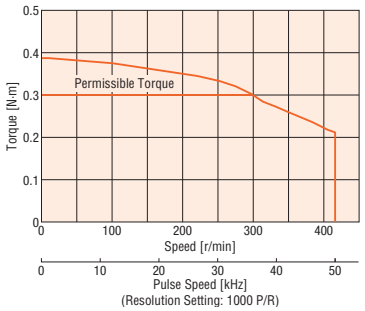
✻1 The values in parentheses ( ) represent the specifications of built-in controller type driver.

Speed - Torque Characteristics (Reference values)

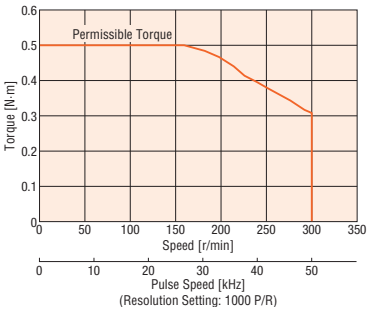
ARM24 Gear Ratio **5**



ARM24 Gear Ratio **7.2**



ARM24 Gear Ratio **10**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.

PS Geared Type Frame Size 42 mm

Specifications

Motor Product Name	Single Shaft	ARM46SAK-PS5	ARM46SAK-PS7	ARM46SAK-PS10	ARM46SAK-PS25	ARM46SAK-PS36	ARM46SAK-PS50
	With Electromagnetic Brake	ARM46SMK-PS5	ARM46SMK-PS7	ARM46SMK-PS10	ARM46SMK-PS25	ARM46SMK-PS36	ARM46SMK-PS50
Driver Product Name	Built-in Controller	ARD-KD					
	Pulse Input	ARD-K					
Maximum Holding Torque	N·m	1	1.5		2.5	3	
Rotor Inertia	J: kg·m^2	58×10^{-7} [73×10^{-7}]*1					
Gear Ratio		5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque	N·m	1	1.5		2.5	3	
Maximum Instantaneous Torque*	N·m	*	2		6	*	6
Holding Torque at Motor Standstill	Power ON N·m	0.75	1	1.5	2.5	3	
	Electromagnetic Brake N·m	0.75	1	1.5	2.5	3	
Speed Range	r/min	0 to 600	0 to 416	0 to 300	0 to 120	0 to 83	0 to 60
Backlash	arcmin	15 (0.25°)					
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)*2/48 VDC ±5%					
	Input Current A	1.4 (1.8)*2					
Electromagnetic Brake*3	Power Supply Input	24 VDC ±5%*4 0.08 A					

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

*1 The values in brackets [ ] include the inertia of electromagnetic brake.

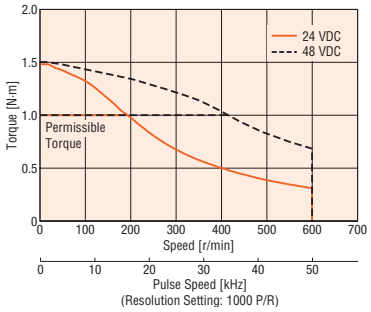
*2 The values in parentheses ( ) represent the specifications of built-in controller type driver.

*3 For pulse input type driver, a separate power supply for electromagnetic brake is required.

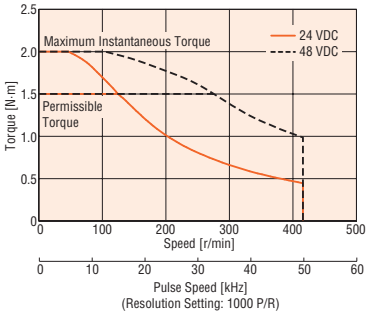
*4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

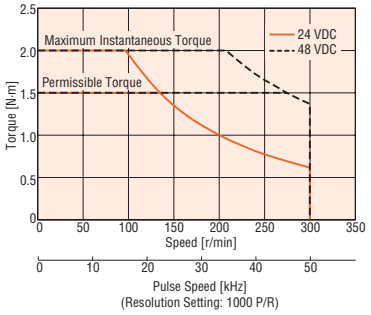
ARM46 Gear Ratio **5**



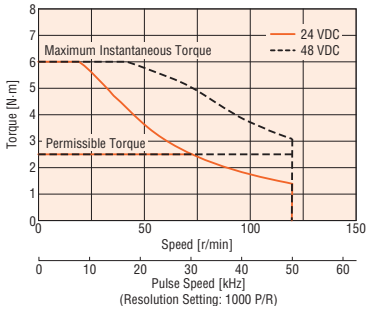
ARM46 Gear Ratio **7.2**



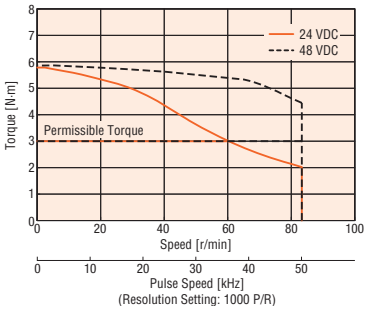
ARM46 Gear Ratio **10**



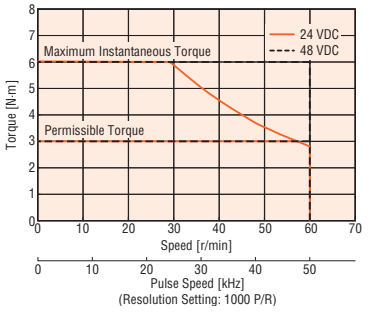
ARM46 Gear Ratio **25**



ARM46 Gear Ratio **36**



ARM46 Gear Ratio **50**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
  (When conforming to the UL Standards, the temperature of the motor case must be kept at 75°C or less, since the motor is recognized as heat-resistant class A.)

PS Geared Type Frame Size 60 mm

Specifications

Motor Product Name	Single Shaft	ARM66SAK-PS5	ARM66SAK-PS7	ARM66SAK-PS10	ARM66SAK-PS25	ARM66SAK-PS36	ARM66SAK-PS50
	With Electromagnetic Brake	ARM66SMK-PS5	ARM66SMK-PS7	ARM66SMK-PS10	ARM66SMK-PS25	ARM66SMK-PS36	ARM66SMK-PS50
Driver Product Name	Built-in Controller	ARD-KD					
	Pulse Input	ARD-K					
Maximum Holding Torque	N·m	3.5	4	5	8		
Rotor Inertia	J: kg·m^2	380×10^{-7} [500×10^{-7}]*1					
Gear Ratio		5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque	N·m	3.5	4	5	8		
Maximum Instantaneous Torque*	N·m	*	*	*	*	20	
Holding Torque at Motor Standstill	Power ON N·m	2.5	3.6	5	7.6	8	
	Electromagnetic Brake N·m	2.5	3.6	5	7.6	8	
Speed Range	r/min	0 to 600	0 to 416	0 to 300	0 to 120	0 to 83	0 to 60
Backlash	arcmin	7 (0.12°)			9 (0.15°)		
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)*2/48 VDC ±5%*3					
	Input Current A	3.1 (3.8)*2					
Electromagnetic Brake*4	Power Supply Input	24 VDC ±5%*5 0.25 A					

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

*1 The values in brackets [ ] include the inertia of electromagnetic brake.

*2 The values in parentheses ( ) represent the specifications of built-in controller type driver.

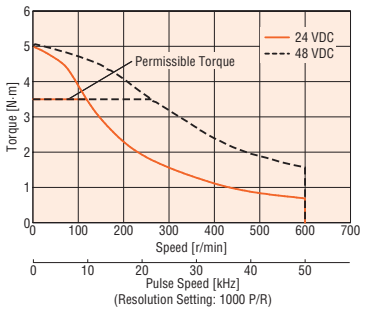
*3 When the motor is operated with 48 VDC input, as a reference, keep the load inertia 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.

*4 For pulse input type driver, a separate power supply for electromagnetic brake is required.

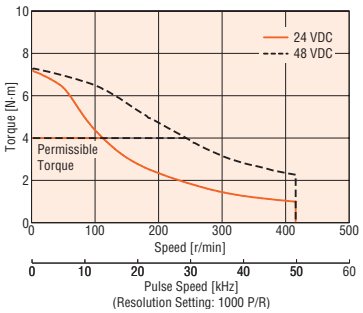
*5 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

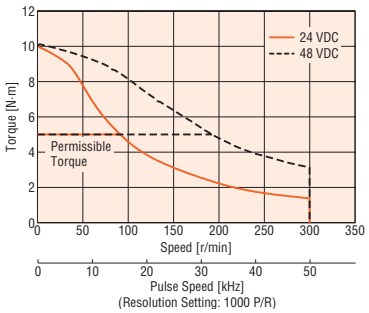
ARM66 Gear Ratio **5**



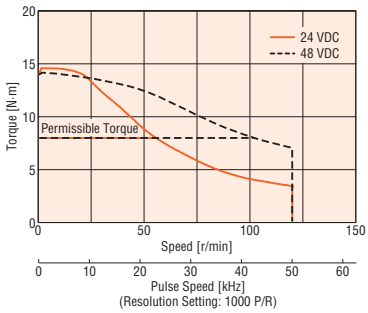
ARM66 Gear Ratio **7.2**



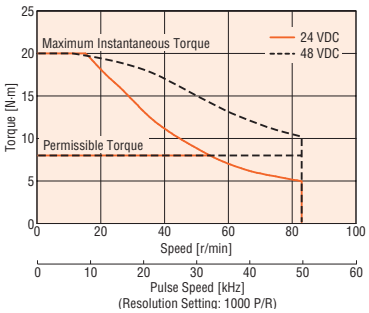
ARM66 Gear Ratio **10**



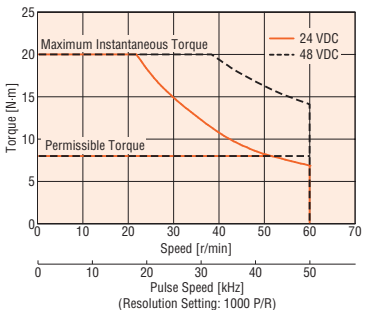
ARM66 Gear Ratio **25**



ARM66 Gear Ratio **36**



ARM66 Gear Ratio **50**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less. (When conforming to the UL Standards, the temperature of the motor case must be kept at 75°C or less, since the motor is recognized as heat-resistant class A.)

PS Geared Type Frame Size 90 mm

Specifications

Motor Product Name	Single Shaft	ARM98SAK-PS5	ARM98SAK-PS7	ARM98SAK-PS10	ARM98SAK-PS25	ARM98SAK-PS36	ARM98SAK-PS50
	With Electromagnetic Brake	ARM98SMK-PS5	ARM98SMK-PS7	ARM98SMK-PS10	ARM98SMK-PS25	ARM98SMK-PS36	ARM98SMK-PS50
Driver Product Name	Built-in Controller	ARD-KD					
	Pulse Input	ARD-K					
Maximum Holding Torque	N·m	10	14	20	37		
Rotor Inertia	J: kg·m^2	1100×10^{-7} [1220×10^{-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	10	14	20	37		
Maximum Instantaneous Torque*	N·m	*	*	*	*	60	
Holding Torque at Motor Standstill	Power ON N·m	5	7.2	10	25	36	37
	Electromagnetic Brake N·m	5	7.2	10	25	36	37
Speed Range	r/min	0 to 400	0 to 277	0 to 200	0 to 80	0 to 55	0 to 40
Backlash	arcmin	7 (0.12°)			9 (0.15°)		
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)*2/48 VDC ±5%*3					
	Input Current A	2.5 (3.1)*2					
Electromagnetic Brake*4	Power Supply Input	24 VDC ±5%*5 0.25 A					

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

*1 The values in brackets [ ] include the inertia of electromagnetic brake.

*2 The values in parentheses ( ) represent the specifications of built-in controller type driver.

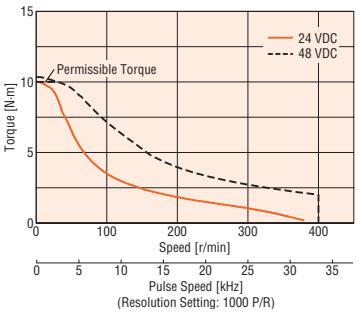
*3 When the motor is operated with 48 VDC input, as a reference, keep the load inertia 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.

*4 For pulse input type driver, a separate power supply for electromagnetic brake is required.

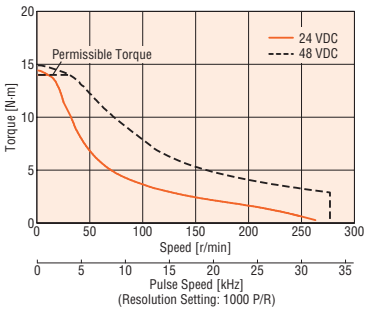
*5 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

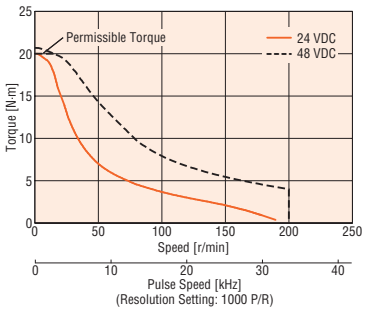
ARM98 Gear Ratio **5**



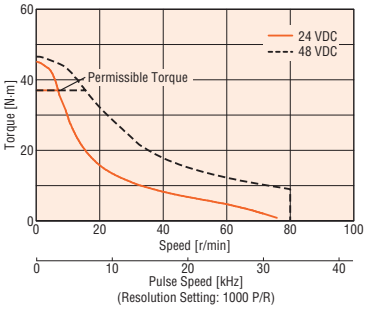
ARM98 Gear Ratio **7.2**



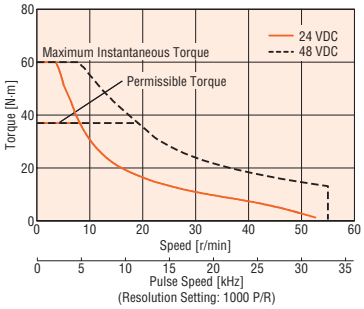
ARM98 Gear Ratio **10**



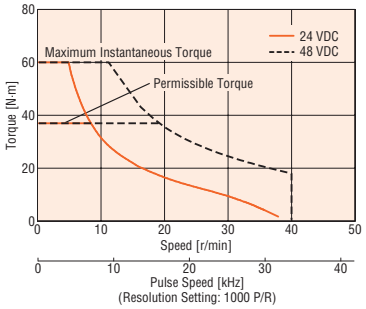
ARM98 Gear Ratio **25**



ARM98 Gear Ratio **36**



ARM98 Gear Ratio **50**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
  (When conforming to the UL Standards, the temperature of the motor case must be kept at 75°C or less, since the motor is recognized as heat-resistant class A.)

PN Geared Type Frame Size 28 mm

Specifications

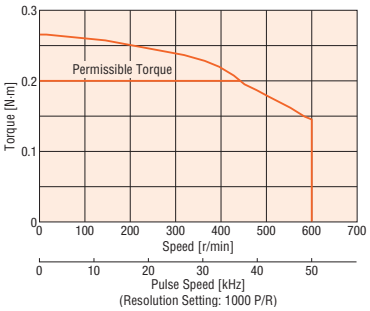
Motor Product Name	Single Shaft	ARM24SAK-N5	ARM24SAK-N7.2	ARM24SAK-N10
Driver Product Name	Built-in Controller	ARD-KD		
	Pulse Input	ARD-K		
Maximum Holding Torque	N·m	0.2	0.3	0.5
Rotor Inertia	J: kg·m^2	11×10^{-7}		
Gear Ratio		5	7.2	10
Resolution	Resolution Setting: 1000 P/R	0.072º/Pulse	0.05º/Pulse	0.036º/Pulse
Permissible Torque	N·m	0.2	0.3	0.5
Maximum Instantaneous Torque*	N·m	*	*	–
Holding Torque at Motor Standstill	N·m	0.13	0.19	0.27
Speed Range	r/min	0 to 600	0 to 416	0 to 300
Backlash	arcmin	3 (0.05º)		
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)*1		
	Input Current A	0.9 (1.3)*1		

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

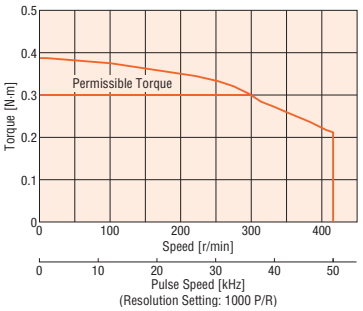
*1 The values in parentheses ( ) represent the specifications of built-in controller type driver.

Speed - Torque Characteristics (Reference values)

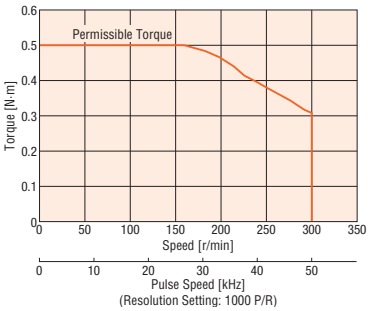
ARM24 Gear Ratio **5**



ARM24 Gear Ratio **7.2**



ARM24 Gear Ratio **10**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100ºC or less.

PN Geared Type Frame Size 42 mm

Specifications

Motor Product Name	Single Shaft	ARM46SAK-N5	ARM46SAK-N7.2	ARM46SAK-N10
	With Electromagnetic Brake	ARM46SMK-N5	ARM46SMK-N7.2	ARM46SMK-N10
Driver Product Name	Built-in Controller	ARD-KD		
	Pulse Input	ARD-K		
Maximum Holding Torque	N·m	1.35	1.5	
Rotor Inertia	J: kg·m^2	58×10^{-7} [73×10^{-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 Instantaneous Torque*	N·m	*	2	
Holding Torque at Motor Standstill	Power ON N·m	0.75	1	1.5
	Electromagnetic Brake N·m	0.75	1	1.5
Speed Range	r/min	0 to 600	0 to 416	0 to 300
Backlash	arcmin	2 (0.034°)		
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)*2/48 VDC ±5%		
	Input Current A	1.4 (1.8)*2		
Electromagnetic Brake*3	Power Supply Input	24 VDC ±5%*4 0.08 A		

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

*1 The values in brackets [ ] include the inertia of electromagnetic brake.

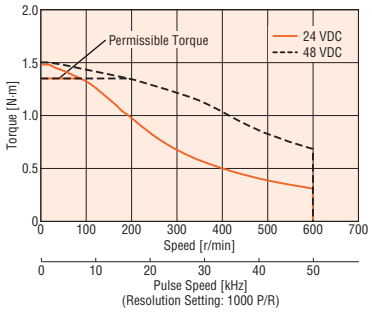
*2 The values in parentheses ( ) represent the specifications of built-in controller type driver.

*3 For pulse input type driver, a separate power supply for electromagnetic brake is required.

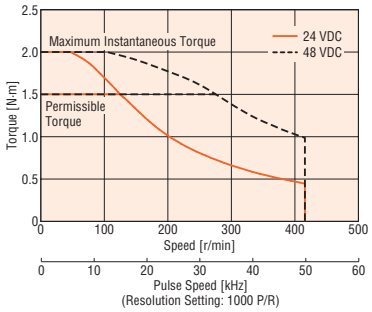
*4 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

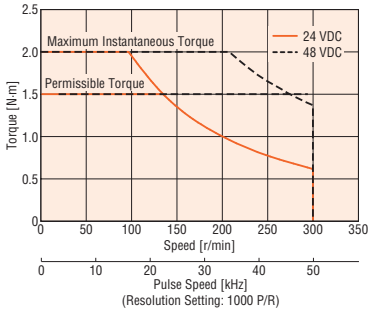
ARM46 Gear Ratio **5**



ARM46 Gear Ratio **7.2**



ARM46 Gear Ratio **10**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
  (When conforming to the UL Standards, the temperature of the motor case must be kept at 75°C or less, since the motor is recognized as heat-resistant class A.)

PN Geared Type Frame Size 60 mm

Specifications

Motor Product Name	Single Shaft	ARM66SAK-N5	ARM66SAK-N7.2	ARM66SAK-N10	ARM66SAK-N25	ARM66SAK-N36	ARM66SAK-N50
	With Electromagnetic Brake	ARM66SMK-N5	ARM66SMK-N7.2	ARM66SMK-N10	ARM66SMK-N25	ARM66SMK-N36	ARM66SMK-N50
Driver Product Name	Built-in Controller	ARD-KD					
	Pulse Input	ARD-K					
Maximum Holding Torque	N·m	3.5	4	5	8		
Rotor Inertia	J: kg·m^2	380×10^{-7} [500×10^{-7}]✻1					
Gear Ratio		5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R	0.072º/Pulse	0.05º/Pulse	0.036º/Pulse	0.0144º/Pulse	0.01º/Pulse	0.0072º/Pulse
Permissible Torque	N·m	3.5	4	5	8		
Maximum Instantaneous Torque✻	N·m	✻	✻	✻	✻	20	
Holding Torque at Motor Standstill	Power ON N·m	2.5	3.6	5	7.6	8	
	Electromagnetic Brake N·m	2.5	3.6	5	7.6	8	
Speed Range	r/min	0 to 600	0 to 416	0 to 300	0 to 120	0 to 83	0 to 60
Backlash	arcmin	2 (0.034º)			3 (0.05º)		
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)✻2/48 VDC ±5%✻3					
	Input Current A	3.1 (3.8)✻2					
Electromagnetic Brake✻4	Power Supply Input	24 VDC ±5%✻5 0.25 A					

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

✻1 The values in brackets [ ] include the inertia of electromagnetic brake.

✻2 The values in parentheses ( ) represent the specifications of built-in controller type driver.

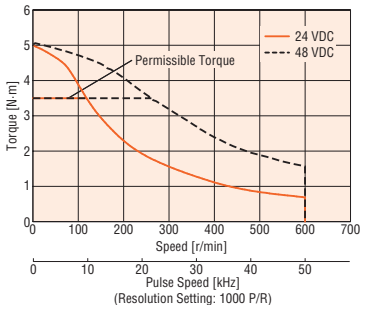
✻3 When the motor is operated with 48 VDC input, as a reference, keep the load inertia 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.

✻4 For pulse input type driver, a separate power supply for electromagnetic brake is required.

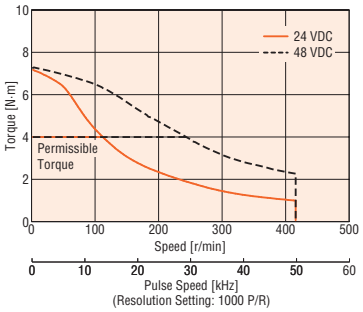
✻5 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

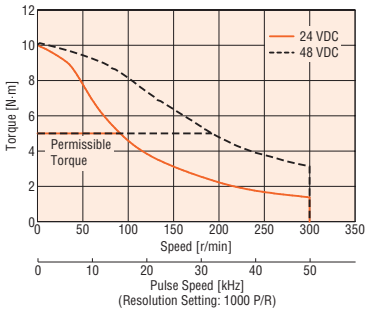
ARM66 Gear Ratio **5**



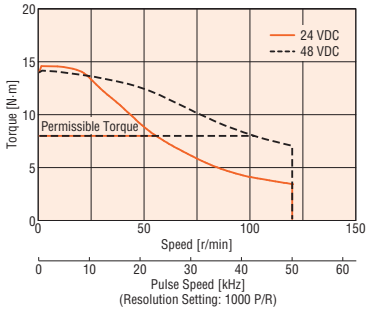
ARM66 Gear Ratio **7.2**



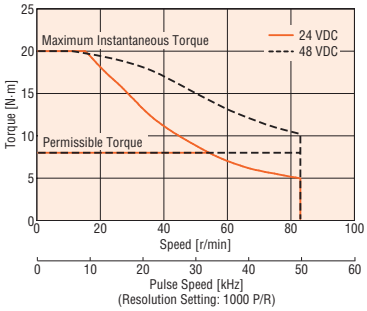
ARM66 Gear Ratio **10**



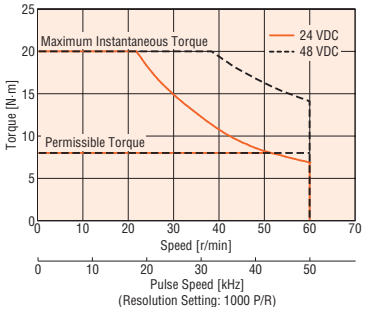
ARM66 Gear Ratio **25**



ARM66 Gear Ratio **36**



ARM66 Gear Ratio **50**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100ºC or less. (When conforming to the UL Standards, the temperature of the motor case must be kept at 75ºC or less, since the motor is recognized as heat-resistant class A.)

PN Geared Type Frame Size 90 mm

Specifications

Motor Product Name	Single Shaft	ARM98SAK-N5	ARM98SAK-N7.2	ARM98SAK-N10	ARM98SAK-N25	ARM98SAK-N36	ARM98SAK-N50
	With Electromagnetic Brake	ARM98SMK-N5	ARM98SMK-N7.2	ARM98SMK-N10	ARM98SMK-N25	ARM98SMK-N36	ARM98SMK-N50
Driver Product Name	Built-in Controller	ARD-KD					
	Pulse Input	ARD-K					
Maximum Holding Torque	N·m	10	14	20	37		
Rotor Inertia	J: kg·m^2	1100×10^{-7} [1220×10^{-7}]*1					
Gear Ratio		5	7.2	10	25	36	50
Resolution	Resolution Setting: 1000 P/R	0.072º/Pulse	0.05º/Pulse	0.036º/Pulse	0.0144º/Pulse	0.01º/Pulse	0.0072º/Pulse
Permissible Torque	N·m	10	14	20	37		
Maximum Instantaneous Torque*	N·m	*	*	*	*	60	
Holding Torque at Motor Standstill	Power ON N·m	5	7.2	10	25	36	37
	Electromagnetic Brake N·m	5	7.2	10	25	36	37
Speed Range	r/min	0 to 400	0 to 277	0 to 200	0 to 80	0 to 55	0 to 40
Backlash	arcmin	2 (0.034º)			3 (0.05º)		
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)*2/48 VDC ±5%*3					
	Input Current A	2.5 (3.1)*2					
Electromagnetic Brake*4	Power Supply Input	24 VDC ±5%*5 0.25 A					

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

*1 The values in brackets [ ] include the inertia of electromagnetic brake.

*2 The values in parentheses ( ) represent the specifications of built-in controller type driver.

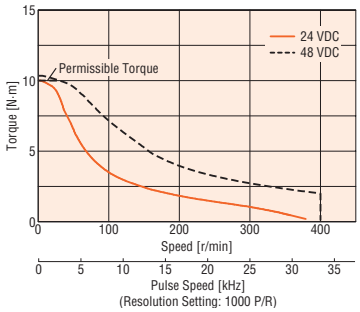
*3 When the motor is operated with 48 VDC input, as a reference, keep the load inertia 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.

*4 For pulse input type driver, a separate power supply for electromagnetic brake is required.

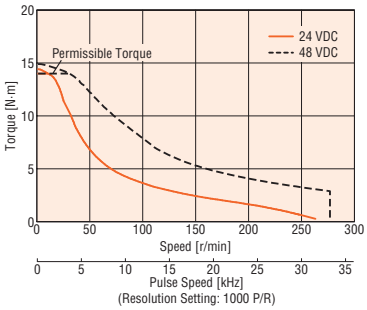
*5 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Speed - Torque Characteristics (Reference values)

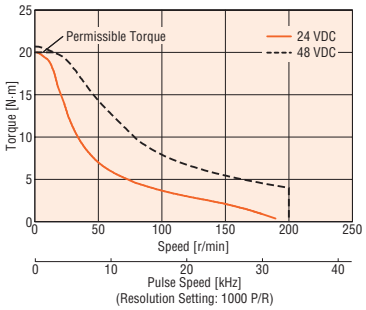
ARM98 Gear Ratio **5**



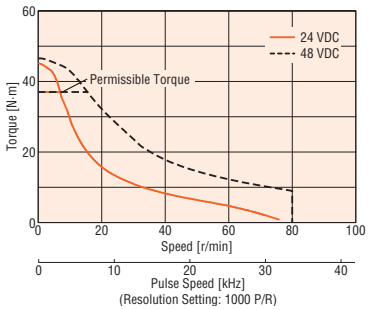
ARM98 Gear Ratio **7.2**



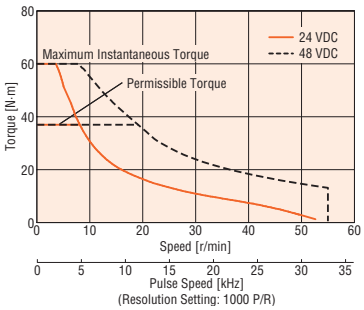
ARM98 Gear Ratio **10**



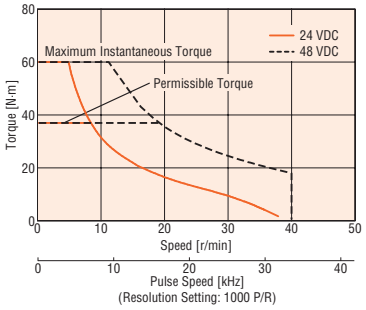
ARM98 Gear Ratio **25**



ARM98 Gear Ratio **36**



ARM98 Gear Ratio **50**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100ºC or less.
  (When conforming to the UL Standards, the temperature of the motor case must be kept at 75ºC or less, since the motor is recognized as heat-resistant class A.)

Harmonic Geared Type Frame Size 30 mm, 42 mm

Specifications

Motor Product Name	Single Shaft	ARM24SAK-H50	ARM24SAK-H100	ARM46SAK-H50	ARM46SAK-H100
	With Electromagnetic Brake	ARM24SMK-H50	ARM24SMK-H100	ARM46SMK-H50	ARM46SMK-H100
Driver Product Name	Built-in Controller	ARD-KD			
	Pulse Input	ARD-K			
Maximum Holding Torque	N·m	1.8	2.4	3.5	5
Rotor Inertia	J: kg·m^2	14×10^{-7} [19×10^{-7}]*2		75×10^{-7} [90×10^{-7}]*2	
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 Instantaneous Torque*	N·m	*	*	8.3	11
Holding Torque at Motor Standstill	Power ON N·m	1.3	2.4	3.5	5
	Electromagnetic Brake N·m	1.3	2.4	3.5	5
Speed Range	r/min	0 to 70	0 to 35	0 to 70	0 to 35
Lost Motion (Load Torque)	arcmin	1.5 max. (±0.09 N·m)	1.5 max. (±0.12 N·m)	1.5 max. (±0.16 N·m)	1.5 max. (±0.2 N·m)
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)*3		24 VDC ±10% (24 VDC ±5%)*3/48 VDC ±5%	
	Input Current A	0.9 (1.3)*3		1.4 (1.8)*3	
Electromagnetic Brake*4	Power Supply Input	24 VDC ±5%*5 0.05 A		24 VDC ±5%*5 0.08 A	

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

*1 **ARM24** is excluded.

*2 The values in brackets [ ] include the inertia of electromagnetic brake.

*3 The values in parentheses ( ) represent the specifications of built-in controller type driver.

*4 For pulse input type driver, a separate power supply for electromagnetic brake is required.

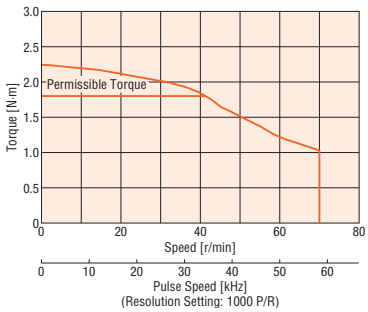
*5 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

Note

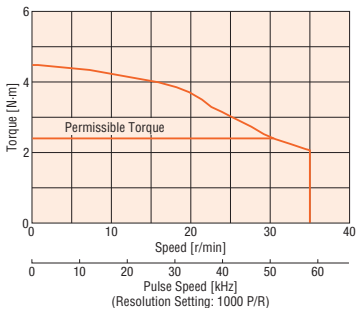
- The rotor inertia represents the inertia of the harmonic gear converted to motor shaft values.

Speed - Torque Characteristics (Reference values)

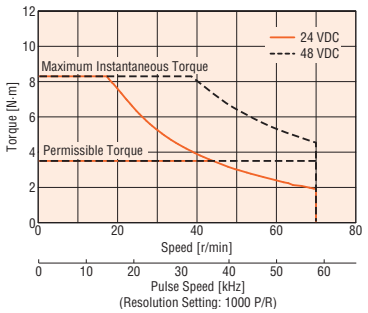
ARM24 Gear Ratio **50**



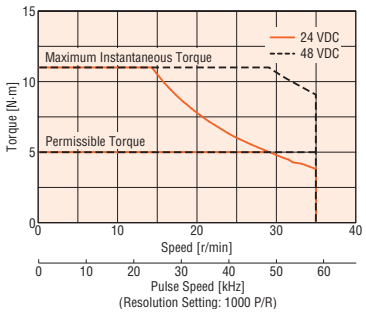
ARM24 Gear Ratio **100**



ARM46 Gear Ratio **50**



ARM46 Gear Ratio **100**



Note

- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
  (When conforming to the UL Standards, the temperature of the motor case must be kept at 75°C or less, since the motor is recognized as heat-resistant class A.)

Harmonic Geared Type Frame Size 60 mm, 90 mm

Specifications

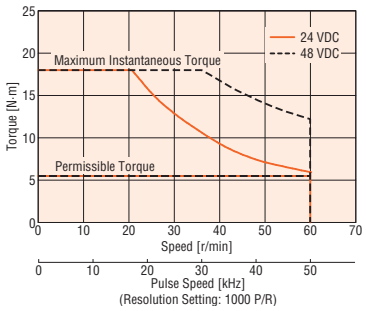
Motor Product Name	Single Shaft	ARM66SAK-H50	ARM66SAK-H100	ARM98SAK-H50	ARM98SAK-H100
	With Electromagnetic Brake	ARM66SMK-H50	ARM66SMK-H100	ARM98SMK-H50	ARM98SMK-H100
Driver Product Name	Built-in Controller	ARD-KD			
	Pulse Input	ARD-K			
Maximum Holding Torque	N·m	5.5	8	25	37
Rotor Inertia	J: kg·m^2	415×10^{-7} [535×10^{-7}]*1		1300×10^{-7} [1420×10^{-7}]*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 Instantaneous Torque	N·m	18	28	35	55
Holding Torque at Motor Standstill	Power ON N·m	5.5	8	25	37
	Electromagnetic Brake N·m	5.5	8	25	37
Speed Range	r/min	0 to 60	0 to 30	0 to 40	0 to 20
Lost Motion (Load Torque)	arcmin	0.7 max. (±0.28 N·m)	0.7 max. (±0.39 N·m)	1.5 max. (±1.2 N·m)	
Power Supply Input	Voltage	24 VDC ±10% (24 VDC ±5%)*2/48 VDC ±5%*3			
	Input Current A	3.1 (3.8)*2		2.5 (3.1)*2	
Electromagnetic Brake*4	Power Supply Input	24 VDC ±5%*5 0.25 A			

*1 The values in brackets [ ] include the inertia of electromagnetic brake.
*2 The values in parentheses ( ) represent the specifications of built-in controller type driver.
*3 When the motor is operated with 48 VDC input, as a reference, keep the load inertia 10 times the rotor inertial ratio or less and twice the safety factor or more when calculating the acceleration torque.
*4 For pulse input type driver, a separate power supply for electromagnetic brake is required.
*5 For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 to 30 m using a cable.

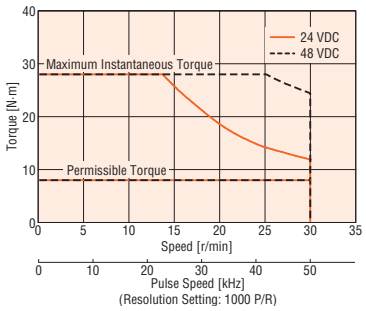
Note
- The rotor inertia represents the inertia of the harmonic gear converted to motor shaft values.

Speed - Torque Characteristics (Reference values)

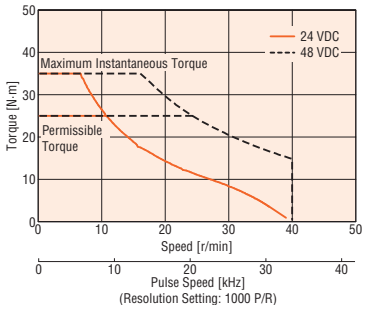
ARM66 Gear Ratio **50**



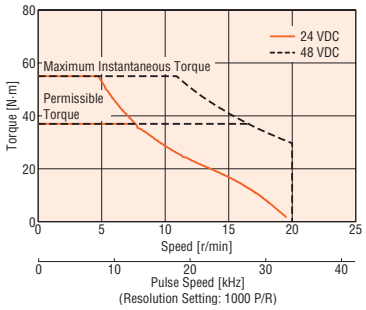
ARM66 Gear Ratio **100**



ARM98 Gear Ratio **50**



ARM98 Gear Ratio **100**



Note
- Data for the speed - torque characteristics is based on Oriental Motor's internal measurement conditions. If the conditions are changed, the characteristics may also change as a result.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. Be sure to keep the motor case temperature at 100°C or less.
  (When conforming to the UL Standards, the temperature of the motor case must be kept at 75°C or less, since the motor is recognized as heat-resistant class A.)

Driver Specifications

		Built-in Controller Type	Pulse Input Type
Maximum Input Pulse Frequency		–	Line driver output by programmable controller: 500 kHz (When the pulse duty is 50%) Open-collector output by programmable controller: 250 kHz (When the pulse duty is 50%)*1 Negative Logic Pulse Input (Initial value)
Positioning Data Points		64 points	–
Positioning Operation	Single-Motion Operation	○	–
	Linked	○	–
	Linked 2	○	–
	Sequential Operation	○	–
	Direct	○	–
	Push-Motion	○	○*2
Continuous Operation		○	–
JOG Operation		○	–
Return-to-Home Operation		○	–
Test Operation		○	○*2
Absolute-Position Backup System		○	–
Support Software **MEXE02**		○	○
Control Module **OPX-2A**		○	○

*1 The value when the I/O signal cable **CC36D1E** (sold separately) is used. I/O signal cable ➜ Page 126

*2 This operation is set by an extended function (**MEXE02** or **OPX-2A**)

RS-485 Communication Specification

Protocol	Modbus RTU Mode
Electrical Characteristics	EIA-485 based, Straight Cable Use a shielded twisted pair cable (TIA/EIA-568B CAT5e or higher is recommended) and keep the total wiring distance including extension to 50 m or less.*
Communication Mode	Half duplex, asynchronous communication (data: 8 bits, stop bit: 1 bit or 2 bits, parity: none, even, or odd)
Transmission Rate	Select either from 9600 bps, 19200 bps, 38400 bps, 57600 bps, or 115200 bps.
Connection Units	Up to 31 drivers can be connected to a single programmable controller (master device).

*If the motor cable or power supply cable generates an undesirable amount of noise depending on the wiring or configuration, shield the cable or install a ferrite core.

General Specifications

		Motor	Driver	
			Built-in Controller Type	Pulse Input Type
Thermal Class		130 (B) [UL Recognized 105 (A)*1]	–	
Insulation Resistance		100 MΩ or more when 500 VDC megger is applied between the following places: ・Case - Motor and Sensor Windings ・Case - Electromagnetic Brake Windings	100 MΩ or more when 500 VDC megger is applied between the following places: ・FG Terminal - Power Supply Input Terminal	–
Dielectric Strength		Sufficient to withstand the followings for 1 minute: ・Case - Motor and Sensor Windings 1.0 kVAC*2 50 Hz/60 Hz ・Case - Electromagnetic Brake Windings 1.0 kVAC*3 50 Hz/60 Hz	Sufficient to withstand the followings for 1 minute: ・FG Terminal - Power Supply Input Terminal 500 VAC 50 Hz/60 Hz	–
Operating Environment (In operation)	Ambient Temperature	−10 to +50ºC (Non-freezing)*4: Standard Type, **TH**, **PS**, and **PN** Geared Type 0 to +40ºC (Non-freezing)*4: Harmonic Geared Type	0 to +50ºC (Non-freezing)	
	Ambient Humidity	85% or less (Non-condensing)		
	Surrounding Atmosphere	No corrosive gas or dust. No water or oil.		
Degree of Protection		IP20	IP10	IP20
Stop Position Accuracy		**ARM14**, **ARM15**: ±5 arcmin (±0.083º) **ARM24**, **ARM26**, **ARM46**: ±4 arcmin (±0.067º) **ARM66**, **ARM69**, **ARM98**: ±3 arcmin (±0.05º)		
Shaft Runout		0.05 T.I.R. (mm)*5	–	
Concentricity of Installing Pilot to the Shaft		0.075 T.I.R. (mm)*5	–	
Perpendicularity of Installation Surface to the Shaft		0.075 T.I.R. (mm)*5	–	

*1 **ARM14**, **ARM15**, **ARM24**, and **ARM26** are excluded.

*2 **ARM14**, **ARM15**, **ARM24**, and **ARM26** are 0.5 kVAC.

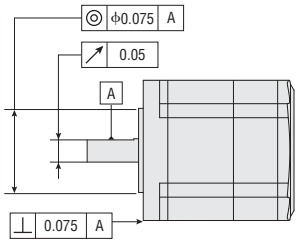
*3 **ARM24**, and **ARM26** are 0.5 kVAC

*4 When installing a motor to a heat sink of a capacity at least equivalent to an aluminum plate, 100×100 mm, thickness 6 mm.

*5 T.I.R. (Total Indicator Reading): The total dial gauge reading when the measurement section is rotated once around the reference axis center.

Note

● Disconnect the motor and driver when taking an insulation resistance measurement or performing a dielectric voltage withstand test.



Electromagnetic Brake Specifications

Product Name		ARM24	ARM26	ARM46	ARM66	ARM69	ARM98
Brake Type		Power Off Activated Type					
Power Supply Voltage		24 VDC ±5%*					
Power Supply Current	A	0.05		0.08	0.25		
Brake Operating Time	ms	20					
Brake Releasing Time	ms	50		30			
Time Rating		Continuous					

*For the electromagnetic brake type products, 24 VDC ±4% specification applies if the wiring between the motor and driver is extended to a distance from 20 m to 30 m using a cable.

●The product names are listed such that the applicable product names can be determined.

Load Torque - Driver Input Current Characteristics

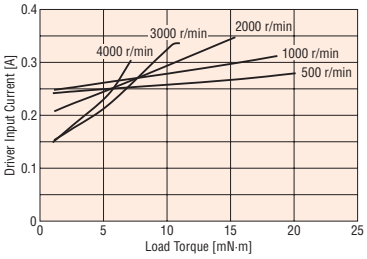
This is the relationship between the load torque and driver input current at each speed when the motor is operated. From these characteristics, the current capacity required when used for multiple axes can be estimated. For geared motors, convert to torque and speed at the motor shaft.

Motor Shaft Speed = Gear Output Shaft Speed × Gear Ratio [r/min]

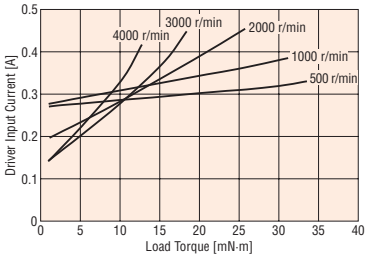
$$\text{Motor Shaft Torque} = \frac{\text{Gear Output Shaft Torque}}{\text{Gear Ratio}} \text{ [N·m]}$$

●24 VDC

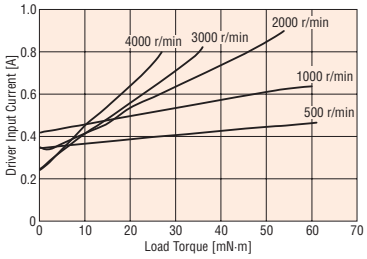
ARM14



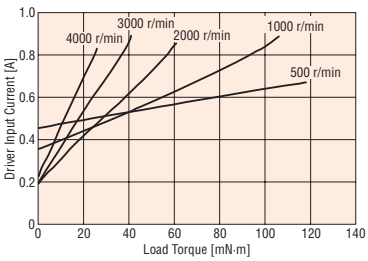
ARM15



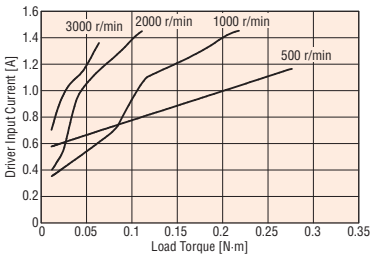
ARM24



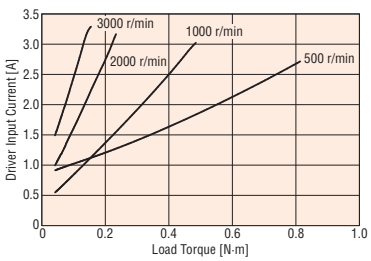
ARM26



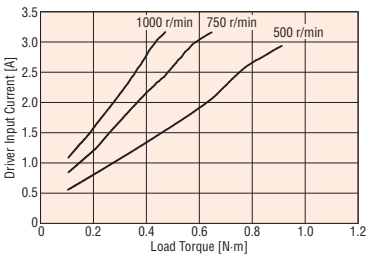
ARM46



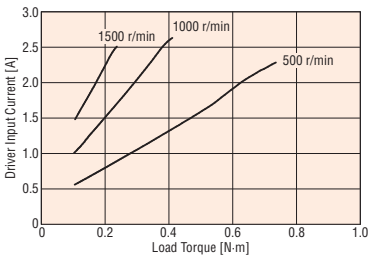
ARM66



ARM69

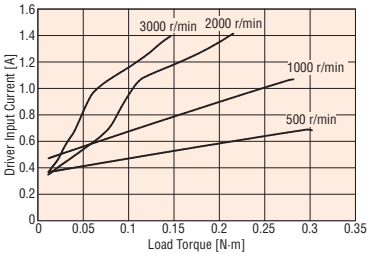


ARM98

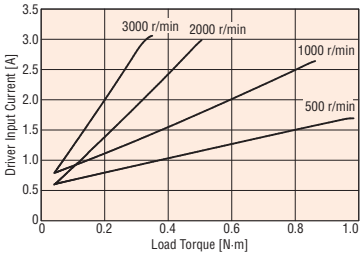


48 VDC

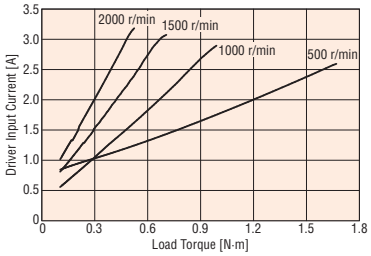
ARM46



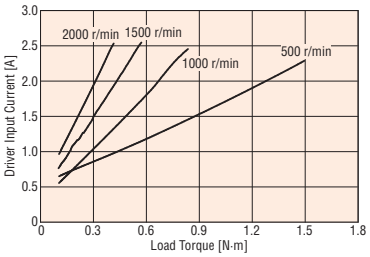
ARM66



ARM69



ARM98



Permissible Radial Load and Permissible Axial Load, Permissible Moment Load

➜ Page 116, Page 117

Rotational Direction

➜ Page 117

Dimensions (Unit: mm)

Motor

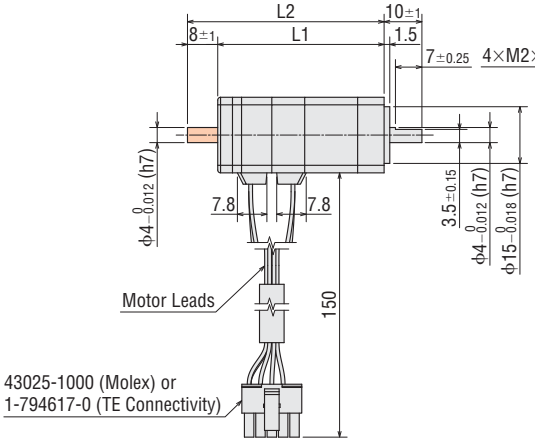
◇Standard Type

Frame Size 20 mm

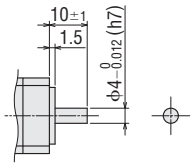
2D & 3D CAD

Shaft Type	Product Name	L1	L2	Mass kg	2D CAD
Shaft Flat on One Side	**ARM14SAK**	44	—	0.07	B1130
	ARM14SBK		52		
Round Shaft	**ARM14SA0K**		—		B1396A
	ARM14SB0K		52		B1396B
Shaft Flat on One Side	**ARM15SAK**	54	—	0.09	B1131
	ARM15SBK		62		
Round Shaft	**ARM15SA0K**		—		B1397A
	ARM15SB0K		62		B1397B

Shaft Flat on One Side



Round Shaft

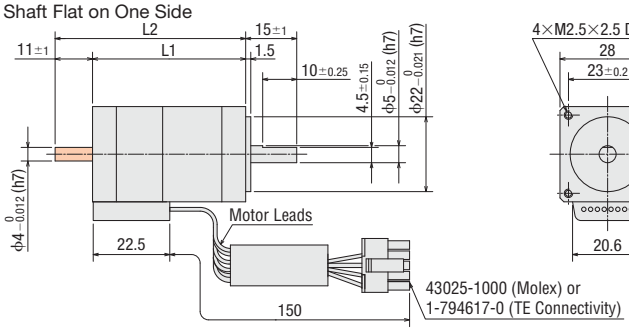


Frame Size 28 mm

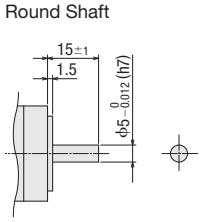
2D & 3D CAD

Shaft Type	Product Name	L1	L2	Mass kg	2D CAD
Shaft Flat on One Side	**ARM24SAK**	45	—	0.15	B705
	ARM24SBK		56		
Round Shaft	**ARM24SA0K**		—		B1398A
	ARM24SB0K		56		B1398B
Shaft Flat on One Side	**ARM26SAK**	65	—	0.22	B706
	ARM26SBK		76		
Round Shaft	**ARM26SA0K**		—		B1400A
	ARM26SB0K		76		B1400B

Shaft Flat on One Side



Round Shaft



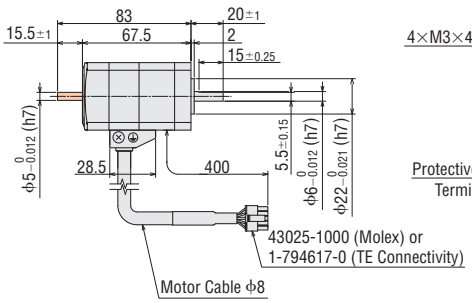
● These dimensions are for double shaft motors. For single shaft motors, ignore the shaded areas.

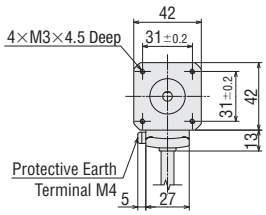
Frame Size 42 mm

2D & 3D CAD

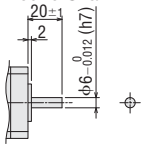
Shaft Type	Product Name	Mass kg	2D CAD
Shaft Flat on One Side	**ARM46SAK**	0.44	B718
	ARM46SBK		
Round Shaft	**ARM46SA0K**		B1402A
	ARM46SB0K		B1402B

Shaft Flat on One Side





Round Shaft

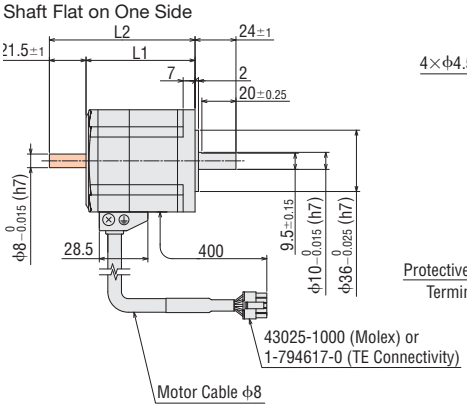


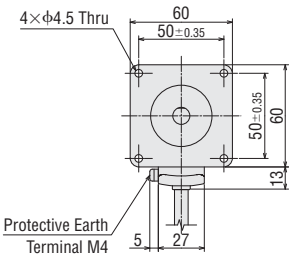
Frame Size 60 mm

2D & 3D CAD

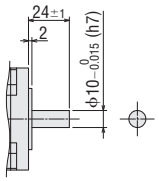
Shaft Type	Product Name	L1	L2	Mass kg	2D CAD
Shaft Flat on One Side	**ARM66SAK**	64	—	0.87	B719
	ARM66SBK		85.5		
Round Shaft	**ARM66SA0K**		—		B1404A
	ARM66SB0K		85.5		B1404B
Shaft Flat on One Side	**ARM69SAK**	89.5	—	1.37	B720
	ARM69SBK		111		
Round Shaft	**ARM69SA0K**		—		B1406A
	ARM69SB0K		111		B1406B

Shaft Flat on One Side





Round Shaft



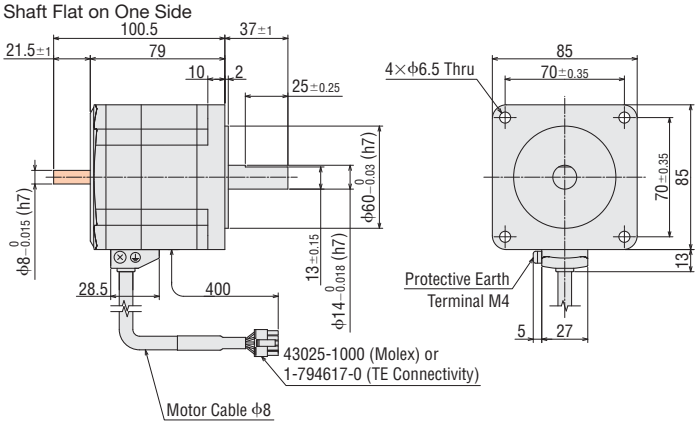
● These dimensions are for double shaft motors. For single shaft motors, ignore the shaded areas.

Frame Size 85 mm

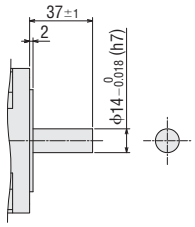
2D & 3D CAD

Shaft Type	Product Name	Mass kg	2D CAD
Shaft Flat on One Side	**ARM98SAK**	1.85	B721
	ARM98SBK		
Round Shaft	**ARM98SA0K**		B1408A
	ARM98SB0K		B1408B

Shaft Flat on One Side



Round Shaft



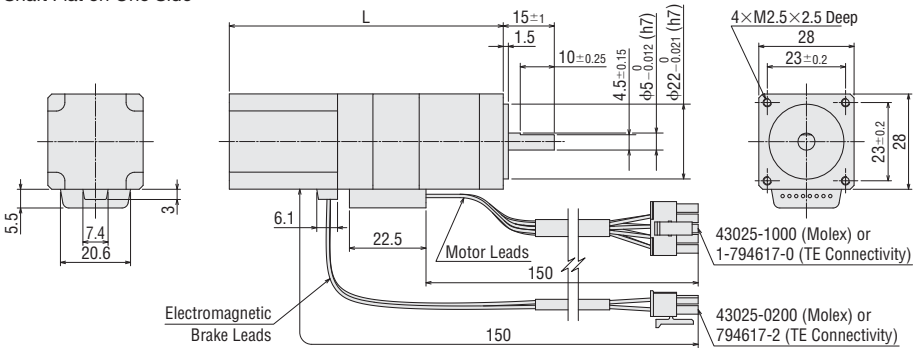
◇Standard Type with Electromagnetic Brake

Frame Size 28 mm

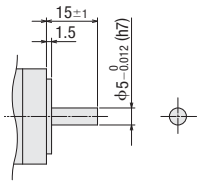
2D & 3D CAD

Shaft Type	Product Name	L	Mass kg	2D CAD
Shaft Flat on One Side	**ARM24SMK**	80.5	0.21	B1172
Round Shaft	**ARM24SM0K**			B1399
Shaft Flat on One Side	**ARM26SMK**	100	0.28	B1173
Round Shaft	**ARM26SM0K**			B1401

Shaft Flat on One Side



Round Shaft

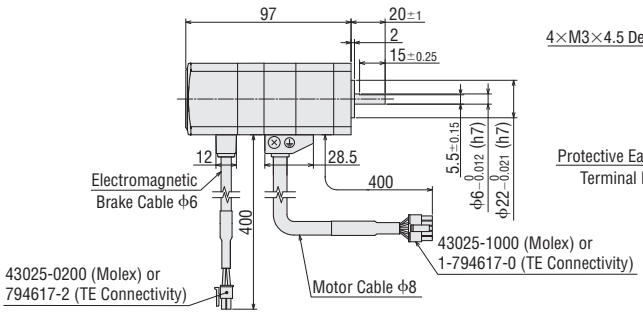


Frame Size 42 mm

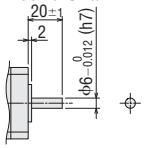
2D & 3D CAD

Shaft Type	Product Name	Mass kg	2D CAD
Shaft Flat on One Side	**ARM46SMK**	0.57	B722
Round Shaft	**ARM46SM0K**		B1403

Shaft Flat on One Side



Round Shaft



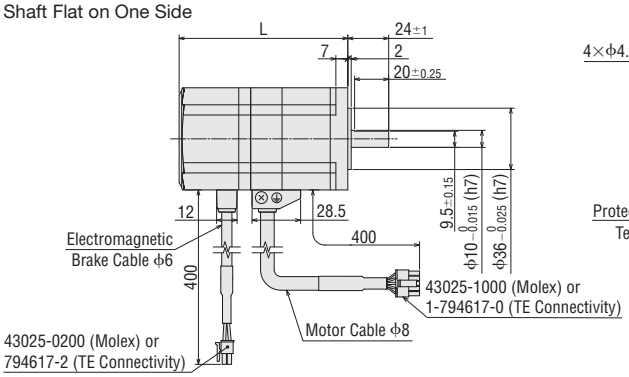
● The dimensions of standard type frame size 85 mm is for double shaft motor. For single shaft motor, ignore the shaded ▭ area.

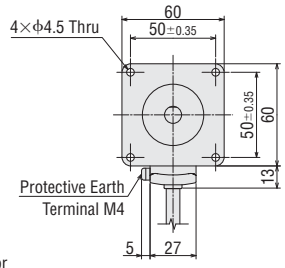
Frame Size 60 mm

2D & 3D CAD

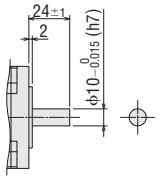
Shaft Type	Product Name	L	Mass kg	2D CAD
Shaft Flat on One Side	**ARM66SMK**	99	1.13	B723
Round Shaft	**ARM66SM0K**			B1405
Shaft Flat on One Side	**ARM69SMK**	124.5	1.63	B724
Round Shaft	**ARM69SM0K**			B1407

Shaft Flat on One Side





Round Shaft

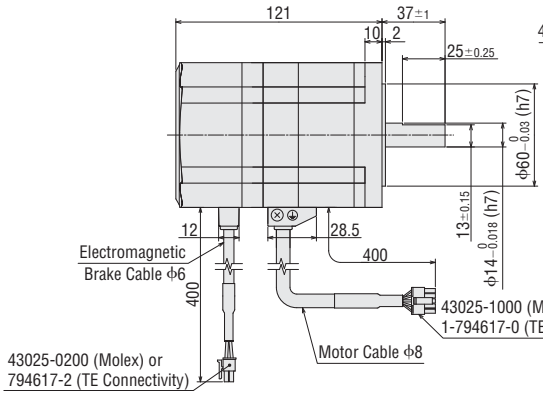


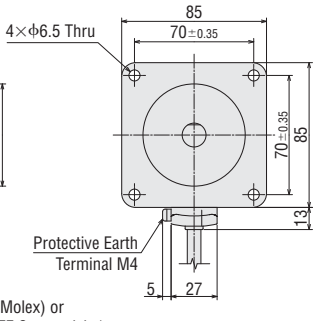
Frame Size 85 mm

2D & 3D CAD

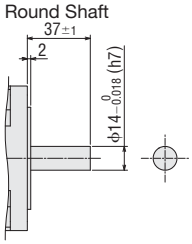
Shaft Type	Product Name	Mass kg	2D CAD
Shaft Flat on One Side	**ARM98SMK**	2.3	B725
Round Shaft	**ARM98SM0K**		B1409

Shaft Flat on One Side





Round Shaft

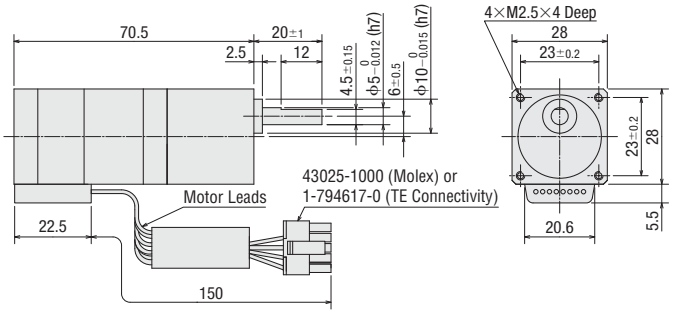


◇TH Geared Type

Frame Size 28 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM24SAK-T□	**7.2**, **10**, **20**, **30**	0.21	B707

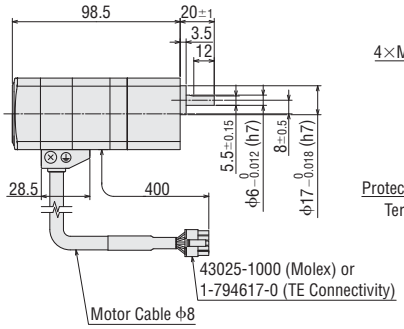


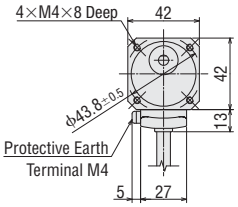
●A number indicating the gear ratio is specified where the box ■ is located within the product name.

Frame Size 42 mm

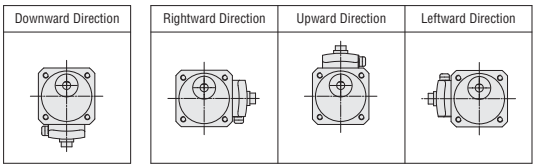
2D & 3D CAD

Cable Outlet Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward Direction	**ARM46SAK-T□**	**3.6, 7.2, 10, 20, 30**	0.59	B726
Rightward Direction	**ARM46SAK-T□R**			B1410
Upward Direction	**ARM46SAK-T□U**			B1411
Leftward Direction	**ARM46SAK-T□L**			B1412





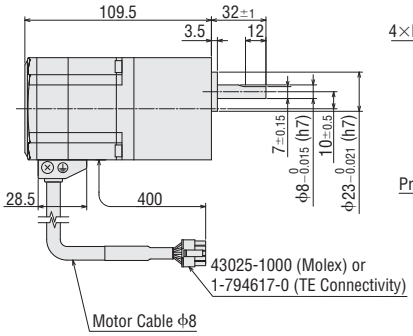
Cable Drawing Direction

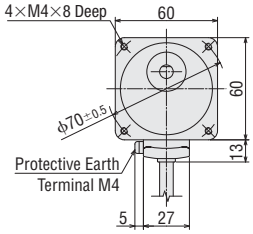


Frame Size 60 mm

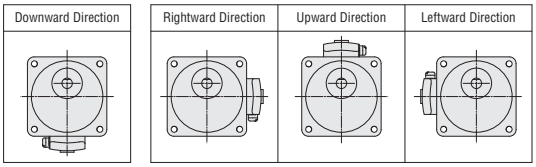
2D & 3D CAD

Cable Outlet Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward Direction	**ARM66SAK-T□**	**3.6, 7.2, 10, 20, 30**	1.27	B727
Rightward Direction	**ARM66SAK-T□R**			B1416
Upward Direction	**ARM66SAK-T□U**			B1417
Leftward Direction	**ARM66SAK-T□L**			B1418





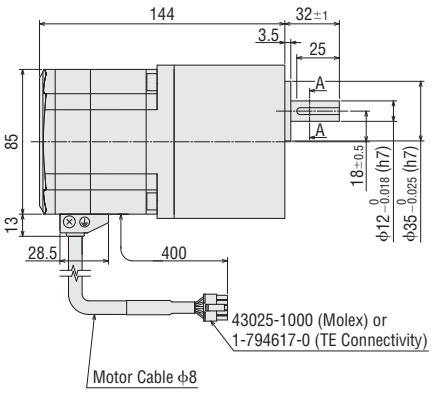
Cable Drawing Direction

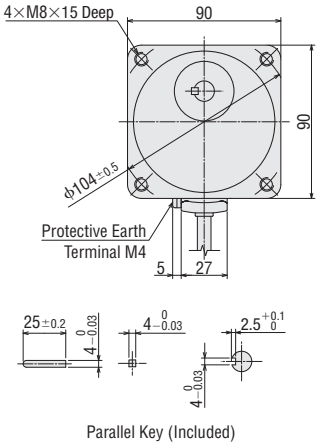


Frame Size 90 mm

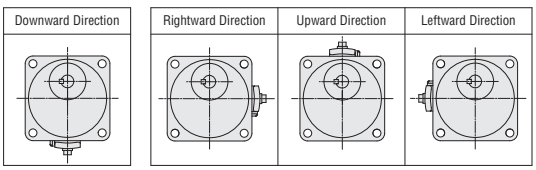
2D & 3D CAD

Cable Outlet Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward Direction	**ARM98SAK-T□**	**3.6, 7.2, 10, 20, 30**	3	B728
Rightward Direction	**ARM98SAK-T□R**			B1422
Upward Direction	**ARM98SAK-T□U**			B1423
Leftward Direction	**ARM98SAK-T□L**			B1424





Cable Drawing Direction



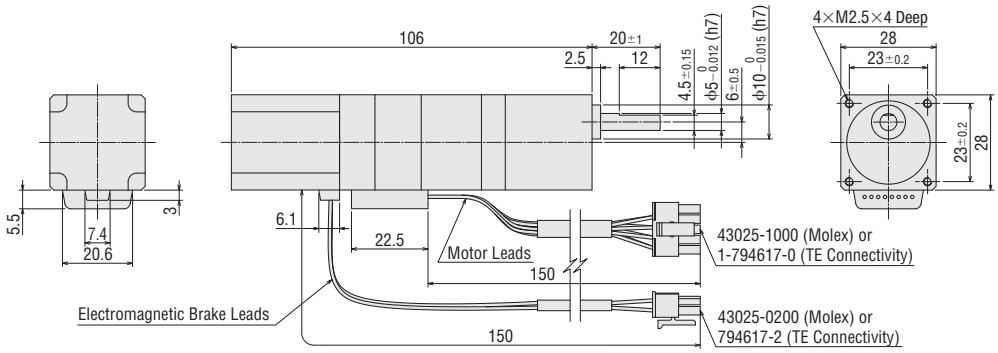
● A number indicating the gear ratio is specified where the box ■ is located within the product name.

◇**TH** Geared Type with Electromagnetic Brake

Frame Size 28 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM24SMK-T□	**7.2**, **10**, **20**, **30**	0.27	B1174

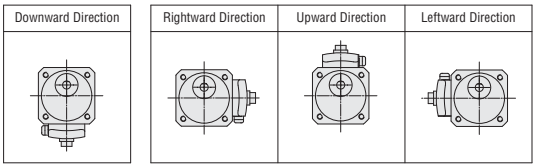


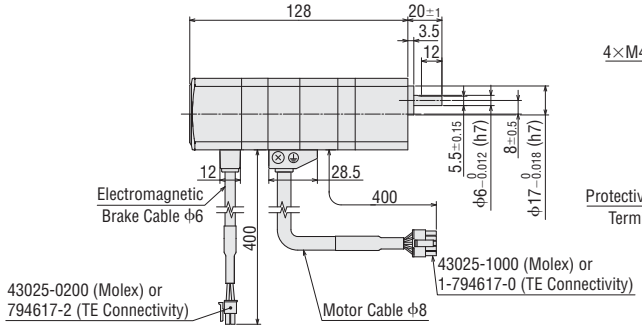
Frame Size 42 mm

2D & 3D CAD

Cable Outlet Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward Direction	**ARM46SMK-T□**	**3.6**, **7.2**, **10**, **20**, **30**	0.72	B729
Rightward Direction	**ARM46SMK-T□R**			B1413
Upward Direction	**ARM46SMK-T□U**			B1414
Leftward Direction	**ARM46SMK-T□L**			B1415

●Cable Drawing Direction



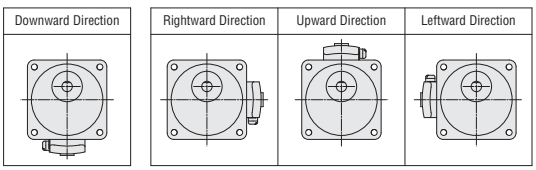


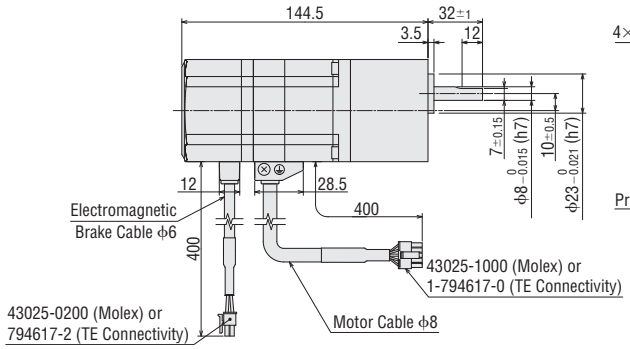
Frame Size 60 mm

2D & 3D CAD

Cable Outlet Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward Direction	**ARM66SMK-T□**	**3.6**, **7.2**, **10**, **20**, **30**	1.53	B730
Rightward Direction	**ARM66SMK-T□R**			B1419
Upward Direction	**ARM66SMK-T□U**			B1420
Leftward Direction	**ARM66SMK-T□L**			B1421

●Cable Drawing Direction





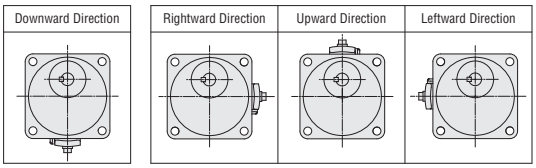
●A number indicating the gear ratio is specified where the box □ is located within the product name.

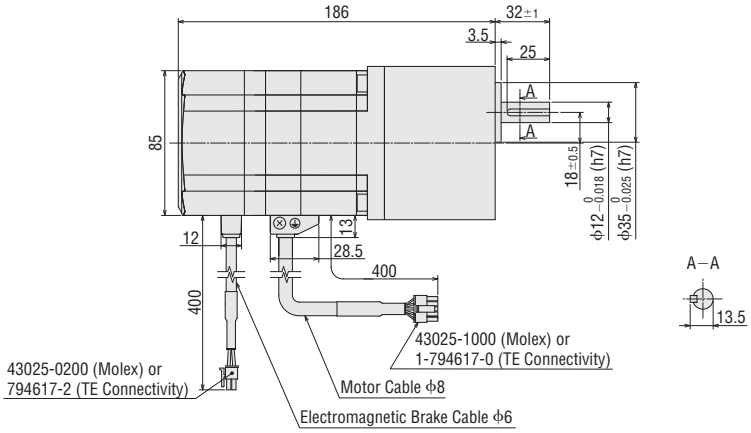
Frame Size 90 mm

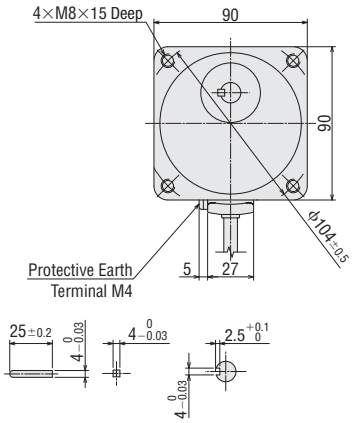
2D & 3D CAD

Cable Outlet Direction	Product Name	Gear Ratio	Mass kg	2D CAD
Downward Direction	**ARM98SMK-T□**	**3.6**, **7.2**, **10**, **20**, **30**	3.5	B731
Rightward Direction	**ARM98SMK-T□R**			B1425
Upward Direction	**ARM98SMK-T□U**			B1426
Leftward Direction	**ARM98SMK-T□L**			B1427

●Cable Drawing Direction







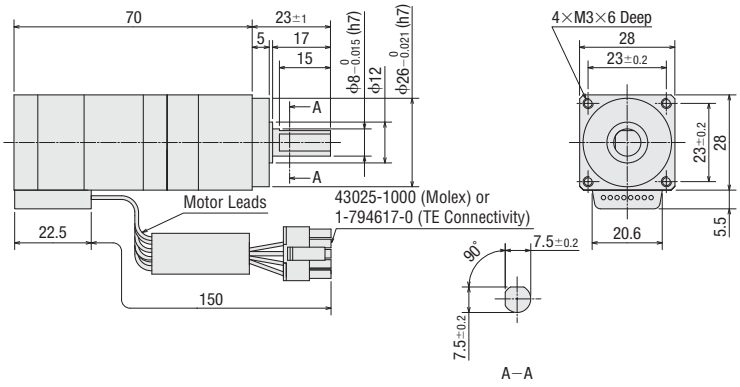
Parallel Key (Included)

◇**PS** Geared Type

Frame Size 28 mm

2D & 3D CAD

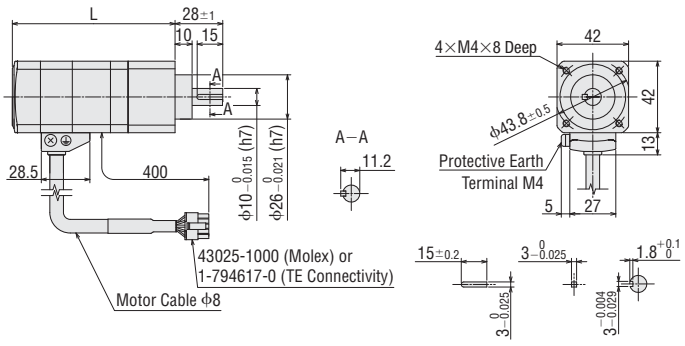
Product Name	Gear Ratio	Mass kg	2D CAD
ARM24SAK-PS□	**5**, **7.2**, **10**	0.25	B708



Frame Size 42 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM46SAK-PS□	**5**, **7.2**, **10**	95.5	0.64	B742
	25, **36**, **50**	119	0.79	B743



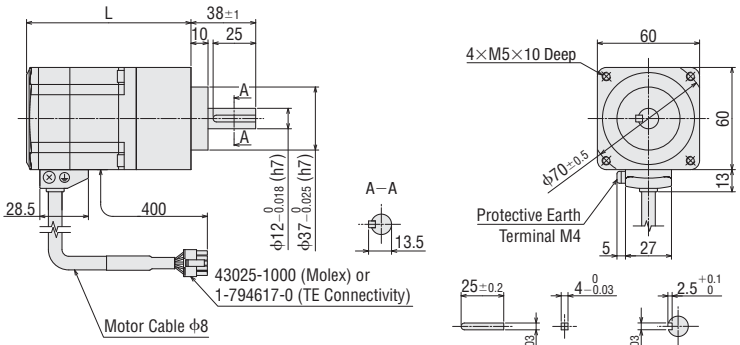
Parallel Key (Included)

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

Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM66SAK-PS□	**5**, **7.2**, **10**	96.5	1.27	B744
	25, **36**, **50**	116.5	1.57	B745

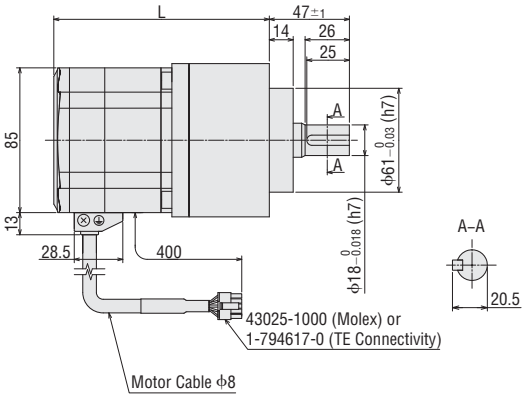


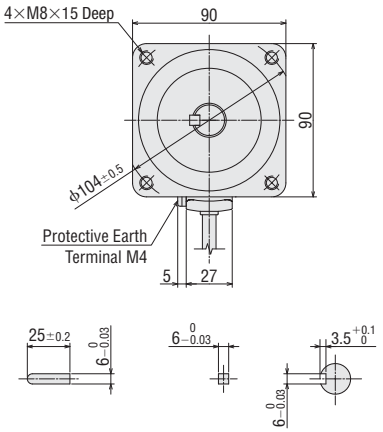
Parallel Key (Included)

Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM98SAK-PS□	**5**, **7.2**, **10**	126.5	3.2	B746
	25, **36**, **50**	154	4	B747





Parallel Key (Included)

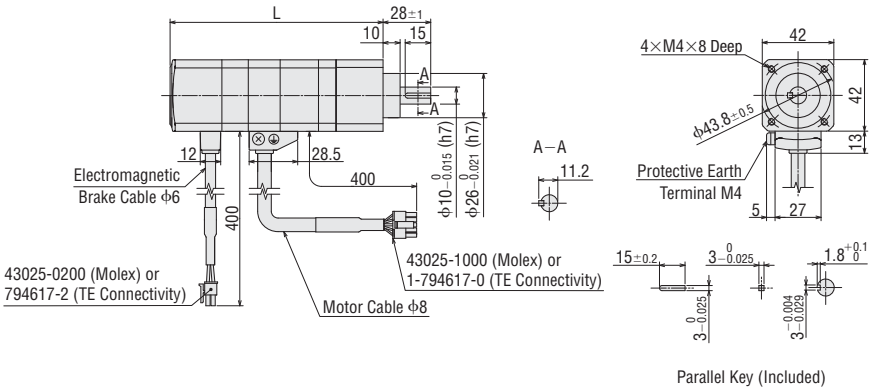
● A number indicating the gear ratio is specified where the box ■ is located within the product name.

◇**PS** Geared Type with Electromagnetic Brake

Frame Size 42 mm

2D & 3D CAD

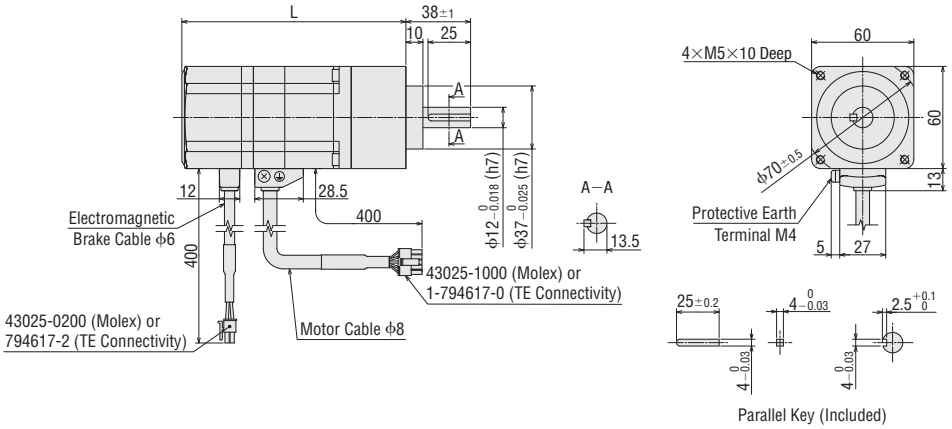
Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM46SMK-PS■	**5**, **7.2**, **10**	125	0.77	B748
	25, **36**, **50**	148.5	0.92	B749



Frame Size 60 mm

2D & 3D CAD

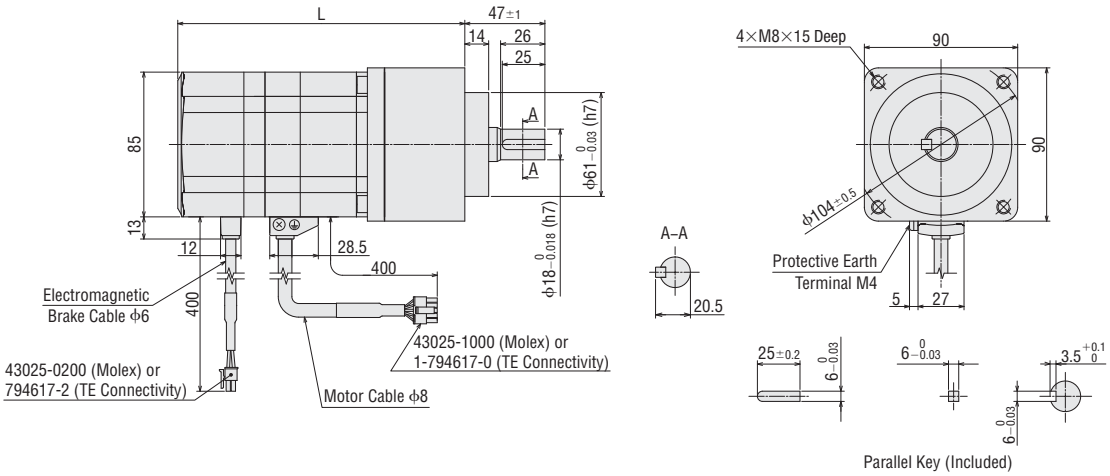
Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM66SMK-PS■	**5**, **7.2**, **10**	131.5	1.53	B750
	25, **36**, **50**	151.5	1.83	B751



Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM98SMK-PS■	**5**, **7.2**, **10**	168.5	3.7	B752
	25, **36**, **50**	196	4.5	B753



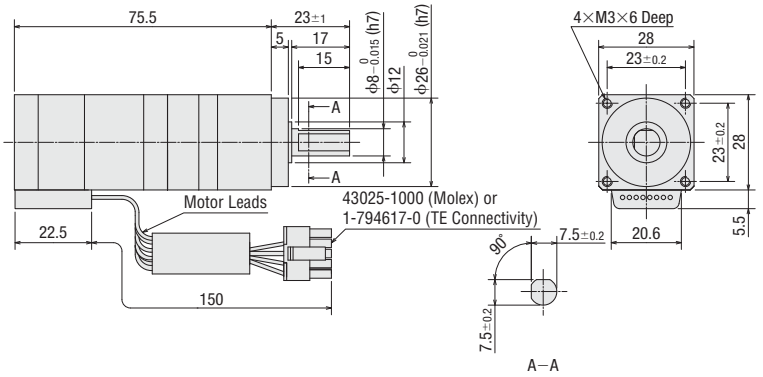
●A number indicating the gear ratio is specified where the box ■ is located within the product name.

◇**PN** Geared Type

Frame Size 28 mm

2D & 3D CAD

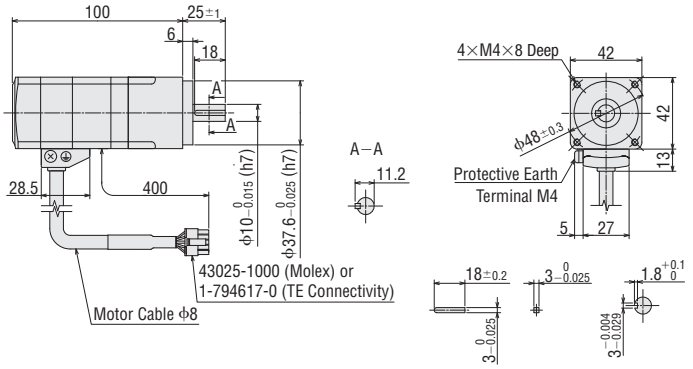
Product Name	Gear Ratio	Mass kg	2D CAD
ARM24SAK-N■	**5**, **7.2**, **10**	0.28	B709



Frame Size 42 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM46SAK-N■	**5**, **7.2**, **10**	0.7	B732

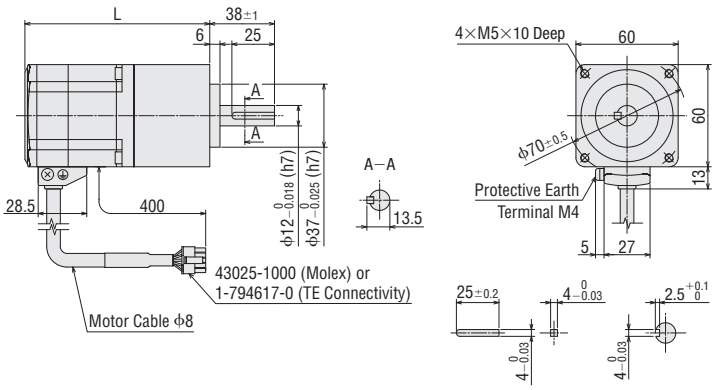


Parallel Key (Included)

Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM66SAK-N■	**5**, **7.2**, **10**	108.5	1.47	B733
	25, **36**, **50**	124.5	1.7	B734



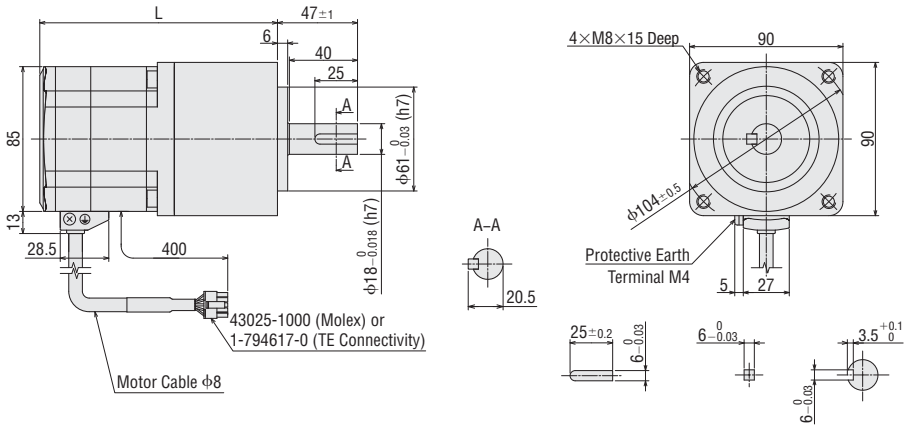
Parallel Key (Included)

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

Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM98SAK-N□	**5**, **7.2**, **10**	139.5	3.7	B735
	25, **36**, **50**	162.5	4.4	B736



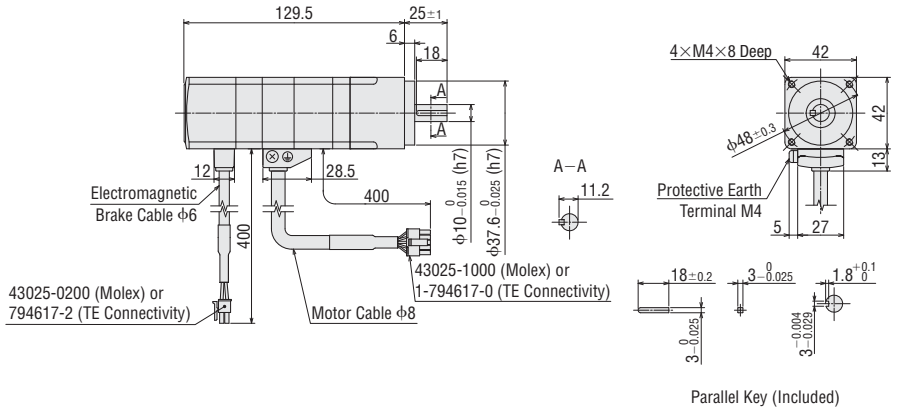
Parallel Key (Included)

◇**PN** Geared Type with Electromagnetic Brake

Frame Size 42 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM46SMK-N□	**5**, **7.2**, **10**	0.83	B737

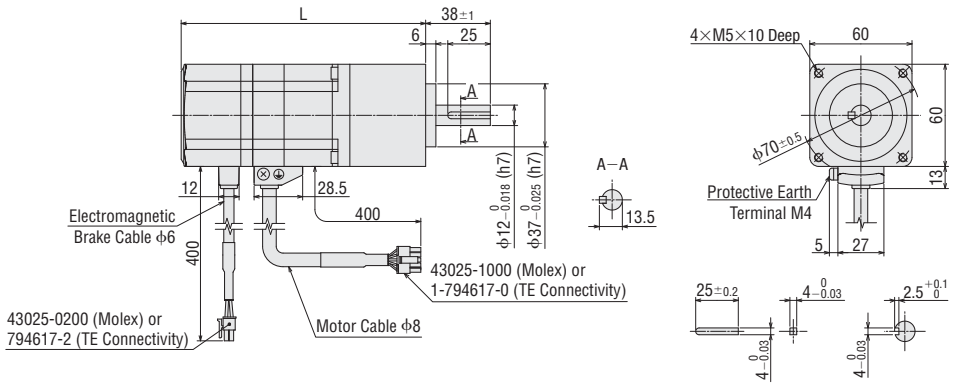


Parallel Key (Included)

Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM66SMK-N□	**5**, **7.2**, **10**	143.5	1.73	B738
	25, **36**, **50**	159.5	1.96	B739



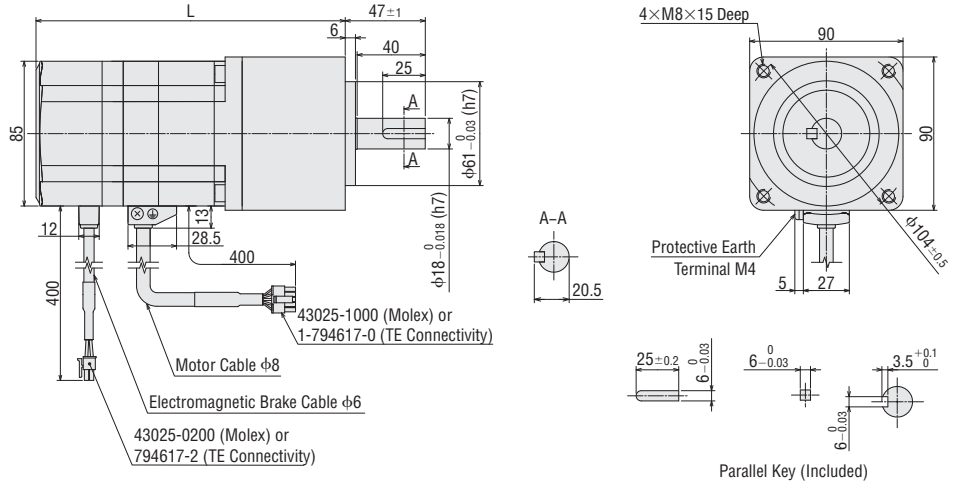
Parallel Key (Included)

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

Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	L	Mass kg	2D CAD
ARM98SMK-N□	**5**, **7.2**, **10**	181.5	4.2	B740
	25, **36**, **50**	204.5	4.9	B741

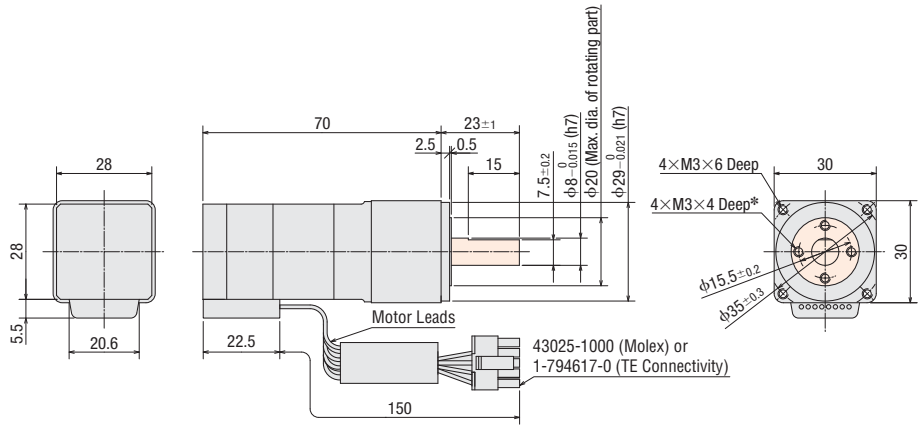


◇Harmonic Geared Type

Frame Size 30 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM24SAK-H□	**50**, **100**	0.24	B710



*The position of the output shaft relative to the screw holes on the rotating part cannot be specified. Adjust the position via the size of the screw holes on the load installation surface.

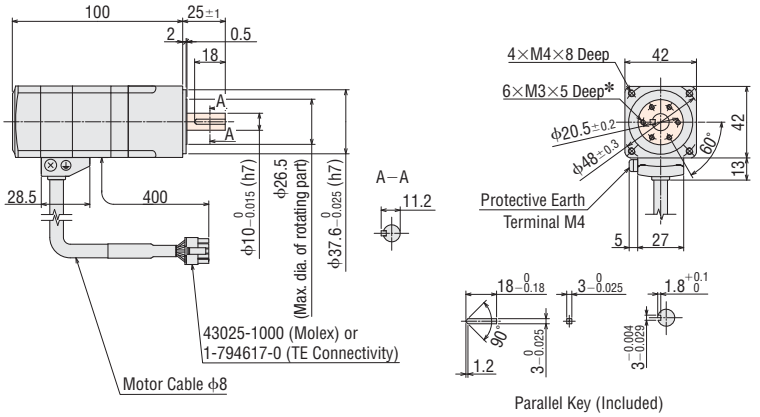
● The ▭ shaded areas are rotating parts.

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

Frame Size 42 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM46SAK-H□	**50, 100**	0.65	B754



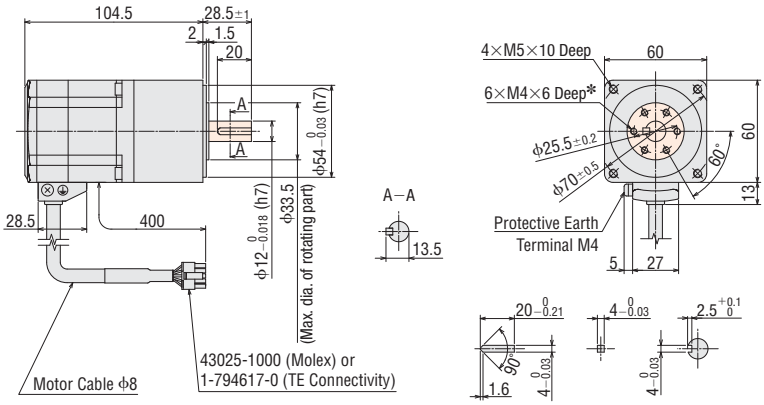
Parallel Key (Included)

*The position of the output shaft relative to the screw holes on the rotating part cannot be specified. Adjust the position via the size of the screw holes on the load installation surface.

Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM66SAK-H□	**50, 100**	1.38	B755



Parallel Key (Included)

*The position of the output shaft relative to the screw holes on the rotating part cannot be specified. Adjust the position via the size of the screw holes on the load installation surface.

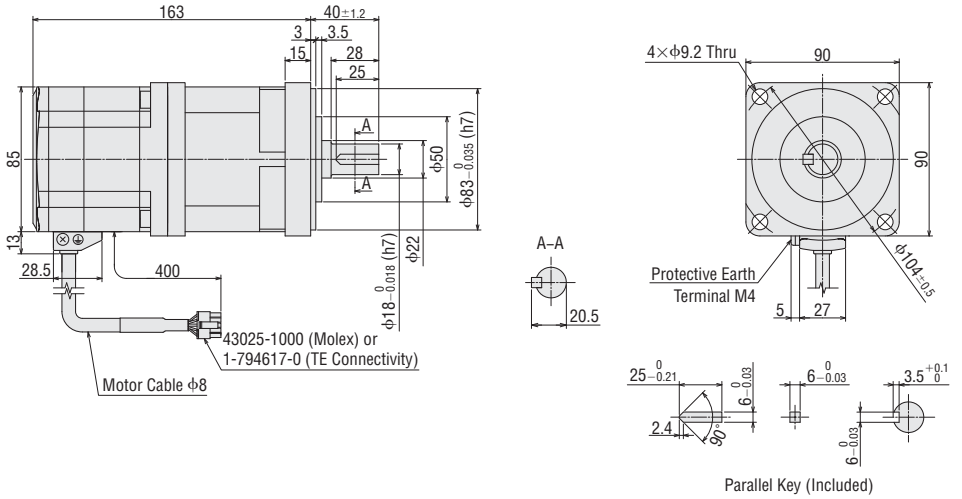
● The ▭ shaded areas are rotating parts.

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

Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM98SAK-H□	**50, 100**	3.9	B756

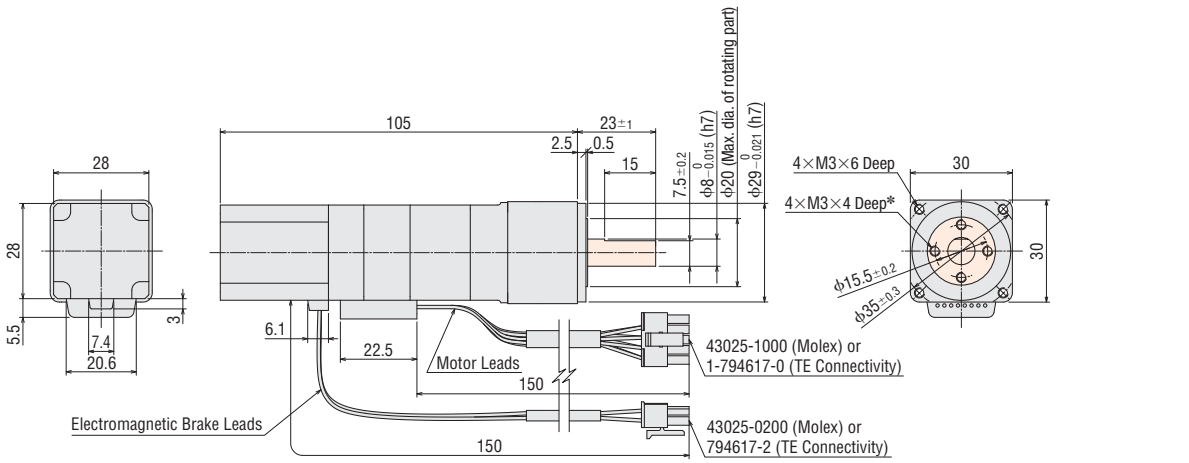


◇Harmonic Geared Type with Electromagnetic Brake

Frame Size 30 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM24SMK-H□	**50, 100**	0.3	B1175



*The position of the output shaft relative to the screw holes on the rotating part cannot be specified. Adjust the position via the size of the screw holes on the load installation surface.

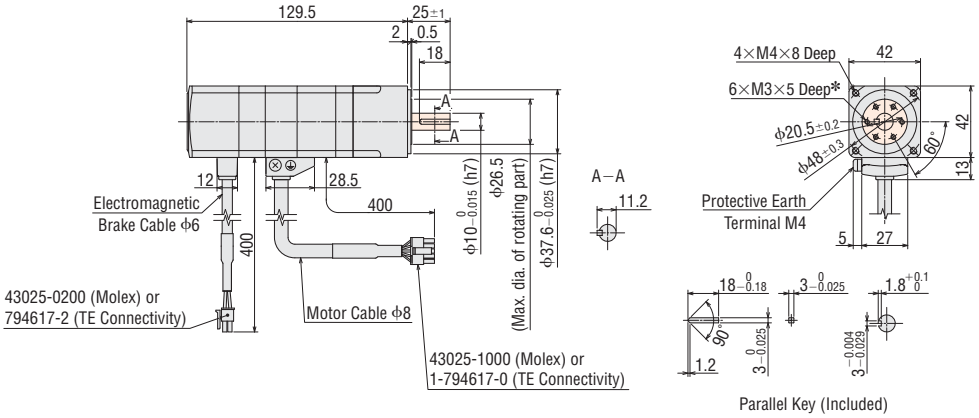
● The ▭ shaded areas are rotating parts.

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

Frame Size 42 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM46SMK-H□	**50, 100**	0.78	B757

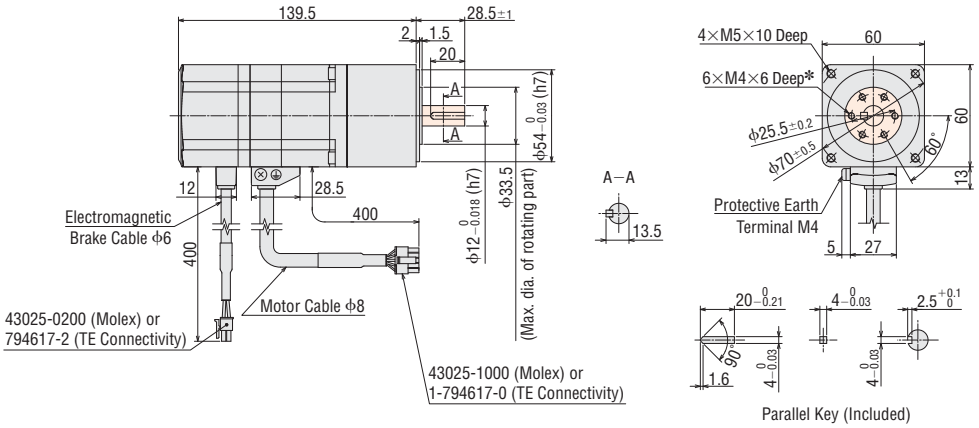


*The position of the output shaft relative to the screw holes on the rotating part cannot be specified. Adjust the position via the size of the screw holes on the load installation surface.

Frame Size 60 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM66SMK-H□	**50, 100**	1.64	B758



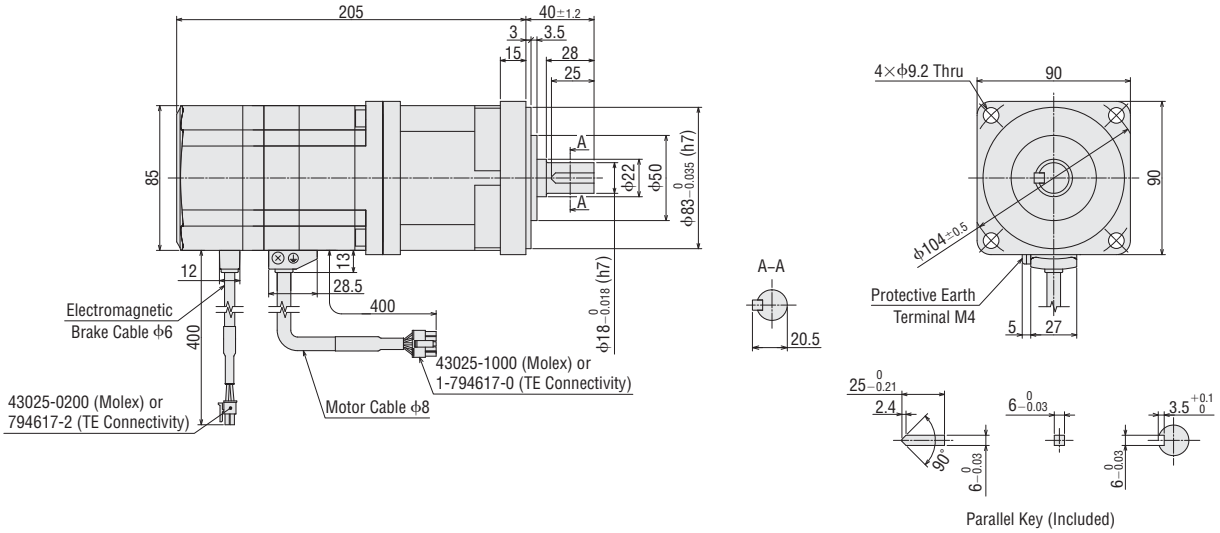
*The position of the output shaft relative to the screw holes on the rotating part cannot be specified. Adjust the position via the size of the screw holes on the load installation surface.

- The shaded areas are rotating parts.
- A number indicating the gear ratio is specified where the box □ is located within the product name.

Frame Size 90 mm

2D & 3D CAD

Product Name	Gear Ratio	Mass kg	2D CAD
ARM98SMK-H□	**50, 100**	4.4	B759



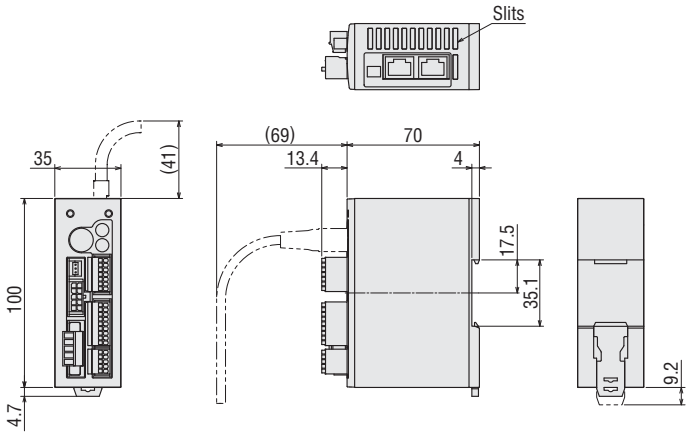
● A number indicating the gear ratio is specified where the box ■ is located within the product name.

Driver

◇Built-in Controller Type

Product Name: **ARD-KD**

Mass: 0.17 kg 2D CAD B711 3D CAD



Included

Power Supply Input Terminal Connector (CN1)
- Connector: MC1,5/5-STF-3,5 (Phoenix Contact)

Sensor Signal Connector (CN5)
- Connector: FK-MC0,5/5-ST-2,5 (Phoenix Contact)

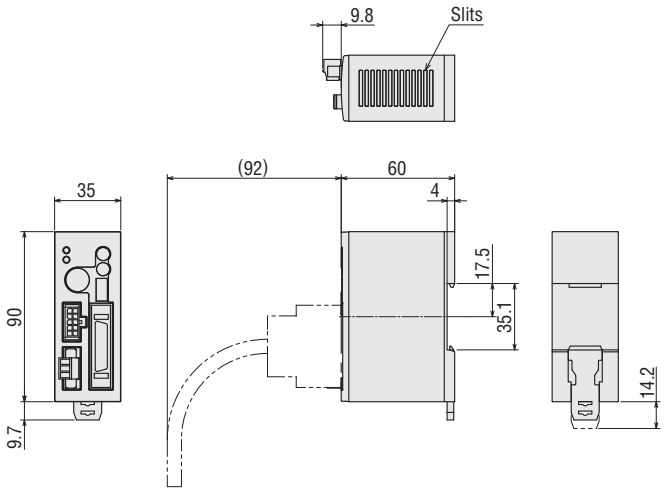
Input Signal Connector (CN8)
- Connector: FK-MC0,5/9-ST-2,5 (Phoenix Contact)

Output Signal Connector (CN9)
- Connector: FK-MC0,5/7-ST-2,5 (Phoenix Contact)

◇Pulse Input Type

Product Name: **ARD-K**

Mass: 0.17 kg 2D CAD B546 3D CAD



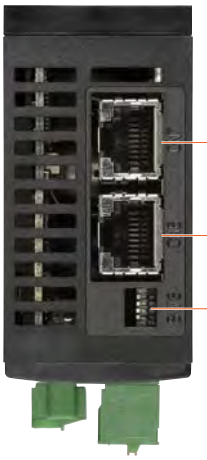
Included

Control I/O Connector (CN5)
- Cover Assembly: 10336-52A0-008 (3M Japan Limited)
- Connector: 10136-3000PE (3M Japan Limited)

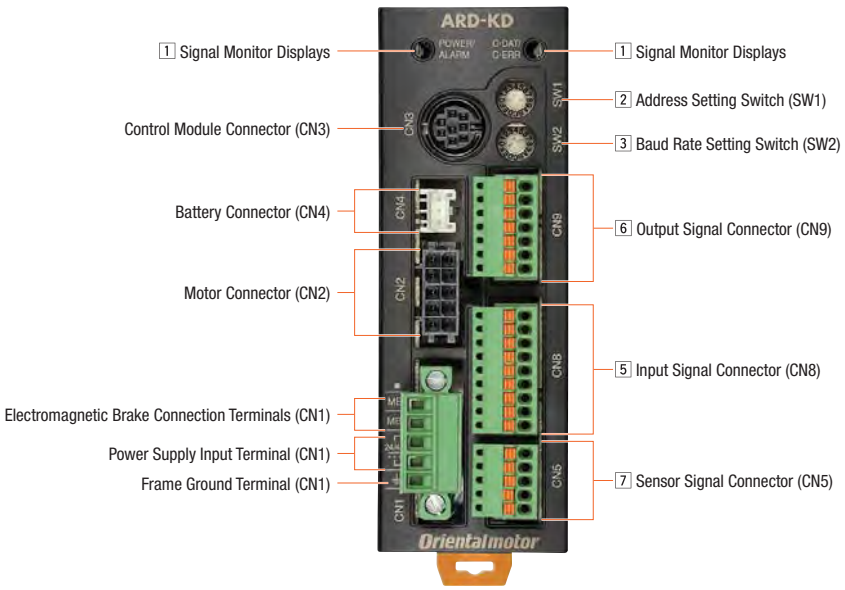
Connector for Power Supply Input/Frame Ground Terminal (CN1)
- Connector: MC1.5/3-STF-3.5 (Phoenix Contact)

Connection and Operation (Built-in controller type)

Names and Functions of Driver Parts



[Driver Top]



1 Signal Monitor Displays

◇LED Indicators

Indication	Color	Function	Description
POWER	Green	Power Supply Indication	This LED is lit while the power supply is input.
ALARM	Red	Alarm Indication	This LED blinks if an alarm (protective function) generates.
C-DAT	Green	Communication Indication	This LED is lit when communication data is being received or sent.
C-ERR	Red	Communication Error Indication	This LED is lit when a communication data error occurs.

2 Address Setting Switch (SW1)

Indication	Function
SW1	Sets when using the driver via RS-485 communication. Sets the address number (Factory setting: 0).

3 Baud Rate Setting Switch (SW2)

Indication	Function
SW2	Sets when using the driver via RS-485 communication. Sets the transmission rate of RS-485 communication. (Factory setting: 7)

◇RS-485 Baud Rate Setting

No.	Transmission Rate (bps)
0	9600
1	19200
2	38400
3	57600
4	115200
5～6	Not used
7	625000 (Network Converter)
8～F	Not used

4 Function Setting Switch (SW3)

Indication	No.	Function
SW3	1	Sets the address number using this switch and the address setting switch (SW1). (Factory setting: OFF)
	2	Sets the protocol of RS-485 communication. (Factory setting: OFF)
	3	Not used
	4	Sets the termination resistor (120 Ω) of RS-485 communication. (Factory setting: OFF) OFF: Termination resistor is not used ON: Termination resistor is used

◇RS-485 Communication Protocol Setting

No. \ Connection	Network Converter	Modbus RTU Mode
2	OFF	ON

5 Input Signal Connector (CN8)

Indication	Pin No.	Signal Name	Description	
CN8	1	IN0	HOME	This signal is used to perform return-to-home operation.
	2	IN1	START	This signal is used to perform positioning operation.
	3	IN2	M0	This signal is used to select the operation data number using 3 bits.
	4	IN3	M1	
	5	IN4	M2	
	6	IN5	FREE	This signal is used to put the motor into a non-excitation state and release the electromagnetic brake.
	7	IN6	STOP	This signal is used to stop the motor.
	8	IN7	ALM-RST	This signal is used to reset the alarm.
	9	IN-COM1	Input signals common	

● Assignable functions can be set using parameters. Initial values are shown above. For details, see the User Manual.

The following input signals can be assigned to input terminals IN0 to IN7.

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

6 Output Signal Connector (CN9)

Indication	Pin No.	Signal Name	Description	
CN9	1	OUT0	HOME-P	This signal is output when the motor is in the home position.
	2	OUT1	END	This signal is output when the positioning operation is completed.
	3	OUT2	AREA1	This signal is output when the motor is within the range of area 1.
	4	OUT3	READY	This signal is output when the driver is ready for operation.
	5	OUT4	WNG	The warning status for the driver is output.
	6	OUT5	ALM	The alarm status for the driver is output (normally closed).
	7	OUT-COM	Output signals common	

● Assignable functions can be set using parameters. Initial values are shown above. For details, see the User Manual.

The following output signals can be assigned to output terminals OUT0 to OUT5.

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

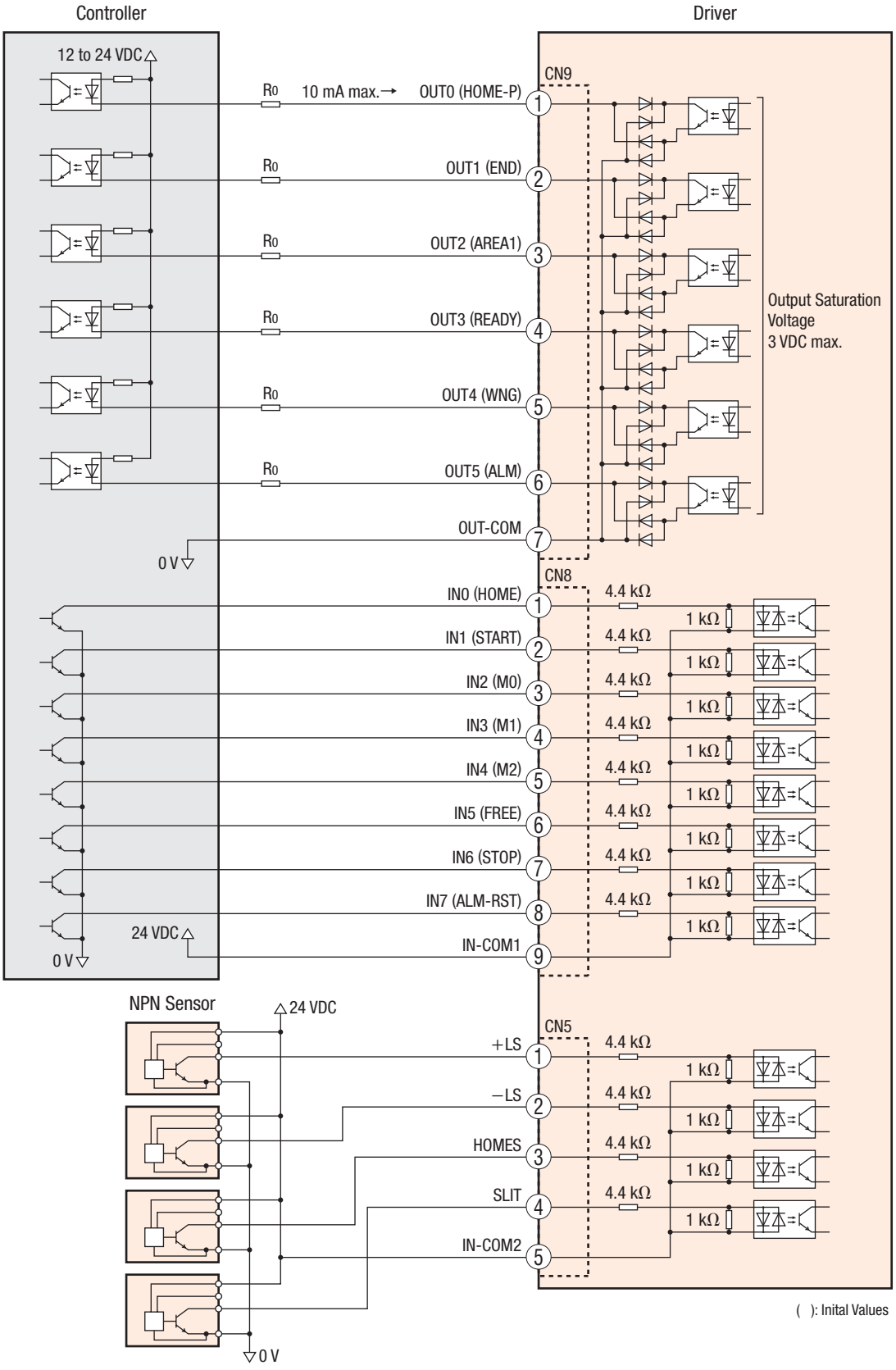
7 Sensor Signal Input (CN5)

Indication	Pin No.	Signal Name	Description
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	Common for Sensors

Connection Diagram

◇Connecting to a Host Controller

•Connecting to a Current Sink Output Circuit

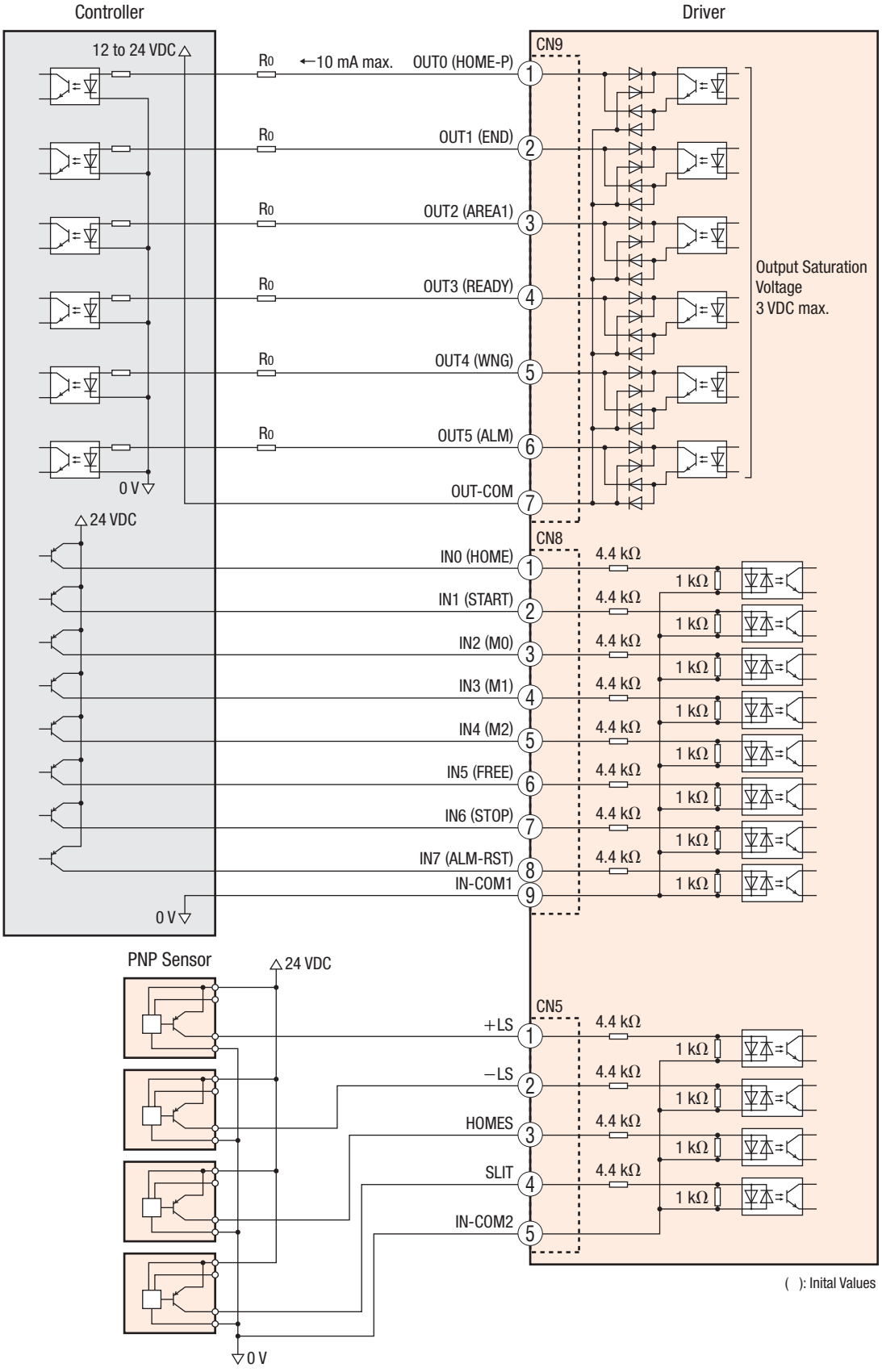


Note

- Use 24 VDC for the input signals.
- Use output signal at 12 to 24 VDC 10 mA or less. When the current value exceeds 10 mA, connect an external resistor R_0 to reduce the current to 10 mA or less.
- The maximum saturation voltage for the output signals is 3 VDC.
- Provide a distance of 200 mm or more between the signal lines and power lines (power supply lines, motor lines).
  Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

◇Connecting to a Host Controller

•Connecting to a Current Source Output Circuit

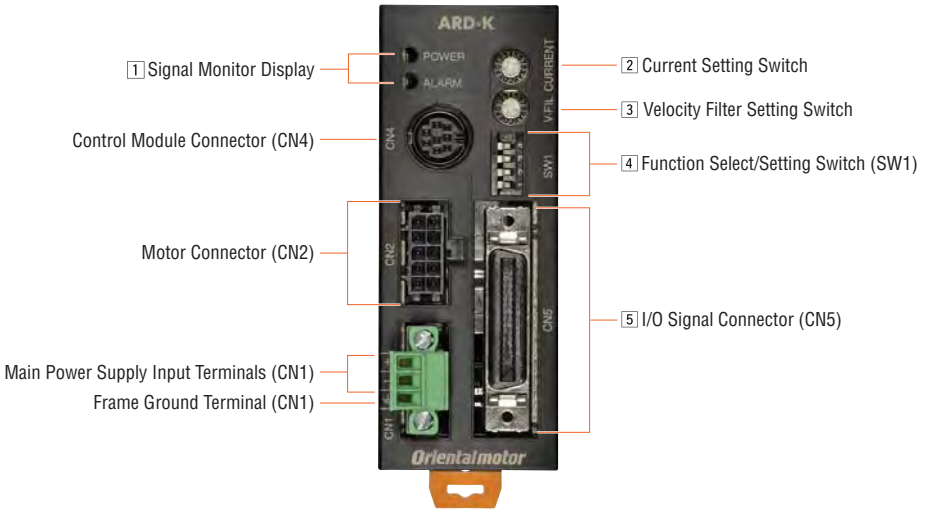


Note

- Use 24 VDC for the input signals.
- Use output signal at 12 to 24 VDC 10 mA or less. When the current value exceeds 10 mA, connect an external resistor R_0 to reduce the current to 10 mA or less.
- The maximum saturation voltage for the output signals is 3 VDC.
- Provide a distance of 200 mm or more between the signal lines and power lines (power supply lines, motor lines).
  Do not run the signal lines in the same piping as power lines or bundle them with power lines.
- If noise generated by the motor cable or power supply cable causes a problem with the specific wiring or layout, shield the cable or use ferrite cores.

Connection and Operation (Pulse input type)

Names and Functions of Driver Parts



1 Signal Monitor Displays

◇LED Indicators

Indication	Color	Function	Description
POWER	Green	Power Supply Indication	This LED is lit while the power supply is input.
ALARM	Red	Alarm Indication	This LED blinks if an alarm (protective function) generates.

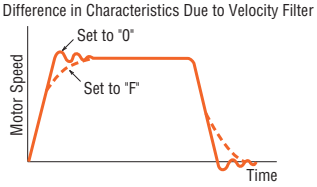
◇Alarms

No. of ALARM LED Blinks	Function	Condition
2	Overheat Protection	When the temperature inside the driver exceeds 85°C
	Overload	When the accumulated value for the time that the load torque exceeds the maximum torque exceeds the overload detection time (Initial value: 5 seconds)
	Overspeed	When the motor output shaft speed exceeds 4500 r/min
	Command Pulse Error	When an error has occurred for the command pulse value
3	Overvoltage Protection	When the primary voltage of the driver's inverter exceeds the upper limit value
	Undervoltage	When the primary voltage of the driver's inverter has fallen below the lower limit
4	Overflow during All Windings On	When the positioning deviation has exceeded the overflow rotation amount (Initial value: 3 rotations)
	Overflow during All Windings Off	When all winding on was performed even though the positioning deviation during all windings off was above the permissible value (Initial value: 100 rotations minimum)
7	Operating Data Error	When a return-to-electrical home operation was performed when an operating data error warning occurred
	Electronic Gear Setting Error	When the resolution set by the electronic gear is outside the range of the specifications
8	Sensor Error during Operation	When an abnormality has occurred in a sensor while the motor is rotating
	Sensor Error during Initialization	When the main power supply was turned on before the motor cable was connected to the driver
	Initial Rotor Rotation Error	When the main power supply was turned on while the motor was rotating
	Motor Combination Error	When a motor that cannot be combined with the driver was connected
9	EEPROM Error	When 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. Factory setting: F

3 Velocity Filter Setting Switch

Indication	Switch Name	Function
V-FIL	Velocity Filter Setting Switch	Adjust the responsiveness of the motor. Adjust to suppress the vibration of the motor or make starting and stopping smoother. The minimum value of the velocity filter is "0" and the maximum value is "F". Factory Setting: 1 

4 Function Select/Setting Switch (SW1)

Indication	Switch Name	Function
4 3	Resolution Select Switches "D0/D1" "CS0/CS1"	These two switches are used to set the resolution per revolution 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) "4:ON" "3:OFF" → 500 pulse (0.72°/step) "4:ON" "3:ON" → 5000 pulse (0.072°/step)
2	Control Mode Select Switch "NORM/CCM"	This switch toggles the driver between the normal mode and current control mode. In the current control mode, noise and vibration can be reduced although the motor synchronicity may reduce. "OFF": Normal mode [Factory setting] "ON": Current control mode
1	Pulse Input Mode Switch "2P/1P"	This switch is used to toggle between the 1-pulse input mode and 2-pulse input mode according to the pulse output mode of the controller. "OFF": 2-pulse input mode 「ON」: 1-pulse input mode [Factory setting]

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

Indication	I/O	Pin No.	Signal		Signal Name	
			Positioning Operation	Push-Motion Operation*1	Positioning Operation	Push-Motion Operation*1
CN5	–	1	–		–	
	出力	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 Completion 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	
	Input	22	IN−COM		Input Signal Common	
		23	C−ON*2		Current ON Input*2	
		24	CLR/ALM−RST		Deviation Counter Clear Input/Alarm Reset Input	
		25	CCM		Current Control Mode ON Input	
		26	CS	T−MODE*1	Resolution Selection Input	Push-Motion Operation ON*1
		27	–	M0*1	–	Push-Current Setting Selection Input*1
		28	RETURN	M1*1	Return to Electrical Home Operation	
		29	P−RESET	M2*1	Position Reset Input	
		30	FREE		Excitation OFF	
		31	CW+/PLS+		Pulse Input/CW Pulse Input (+5 VDC/Line driver)	
		32	CW−/PLS−			
		33	CW+24/PLS+24V		Pulse Input/CW Pulse Input (+24 VDC)	
		34	CCW+24/DIR+24V		Direction Input/CCW Pulse Input (+24 VDC)	
		35	CCW+/DIR+		Direction Input/CCW Pulse Input (+5 VDC/Line Driver)	
		36	CCW−/DIR−			

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

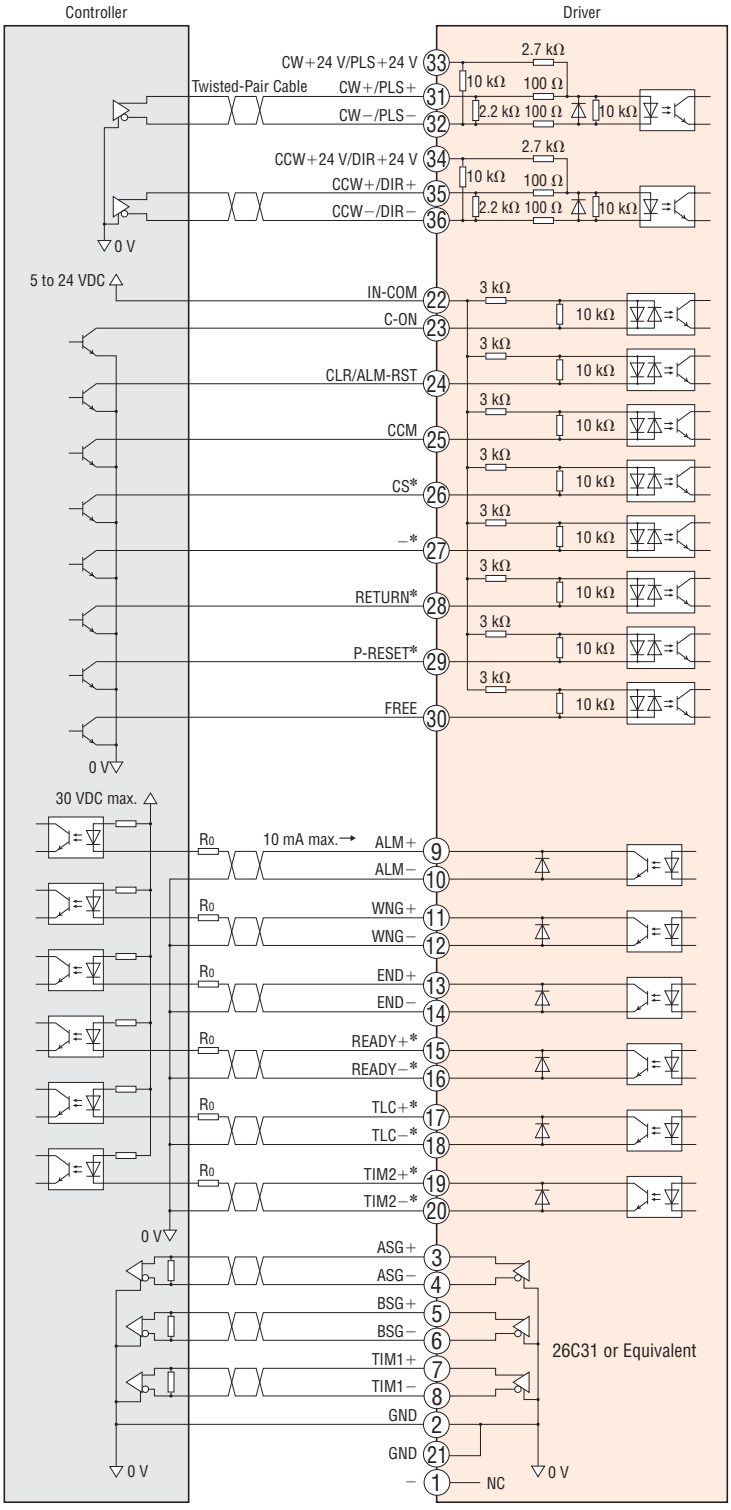
*2 The factory setting of the C-ON input is normally open. Be sure to turn the C-ON input ON when operating the motor. Set the C-ON input to normally closed with a control module **OPX-2A** (sold separately) or a support software **MEXE02** when the C-ON input is not used.

●Connection Diagram

◇Connecting to a Host Controller

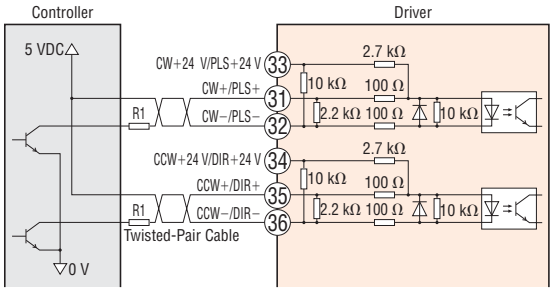
•Connecting to a Current Sink Output Circuit

When the pulse input is the line driver



*Inital values.

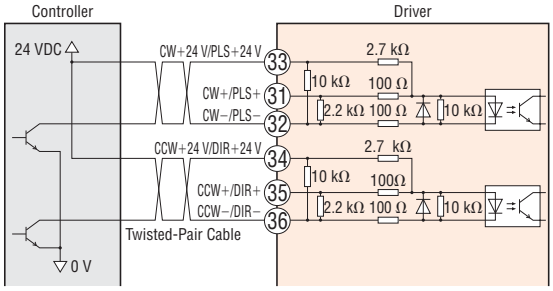
When the pulse input is open collector (input voltage 5 VDC)



Note

- When a 12 VDC is applied, be sure to connect an external resistor R1 (1 kΩ, 0.25 W or more) so that current exceeding 20 mA does not flow to the circuit.

When the pulse input is open collector (input voltage 24 VDC)



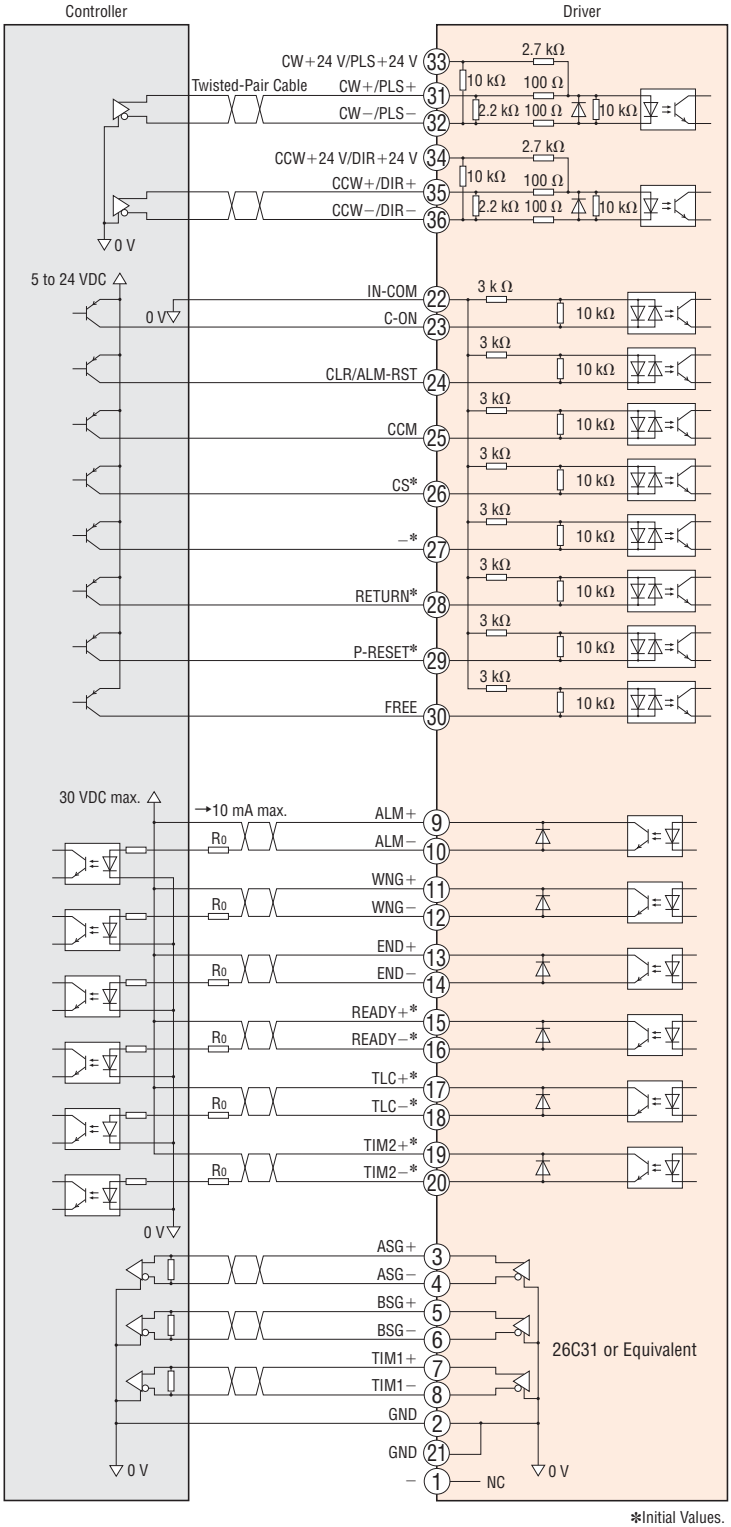
Note

- Use output signals at 30 VDC or less. If the current exceeds 10 mA, connect an external resistor Ro.
- Connect a terminating resistor of 100 Ω or more between the input of the line receiver terminals.
- Use a multi-core, twisted-pair shielded wire of AWG28 to 26 (0.08 to 0.14mm^2) 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).

◇Connecting to a Host Controller

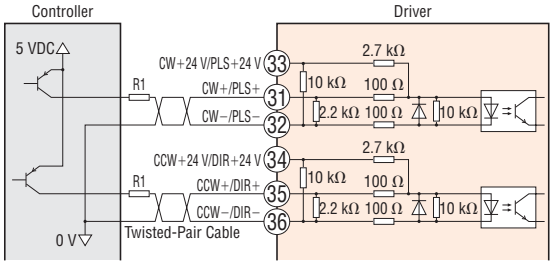
•Connecting to a Current Source Output Circuit

When the pulse input is the line driver



*Initial Values.

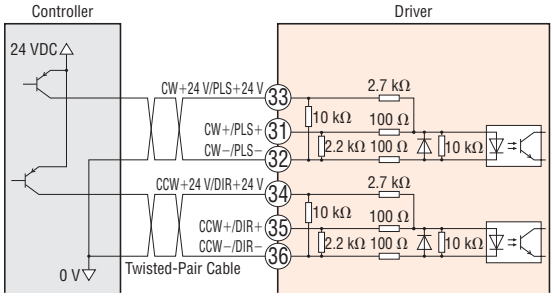
When the pulse input is open collector (input voltage 5 VDC)



Note

- When a 12 VDC is applied, be sure to connect an external resistor R1 (1 kΩ, 0.25 W or more) so that current exceeding 20 mA does not flow to the circuit.

When the pulse input is open collector (input voltage 24 VDC)



Note

- Use output signals at 30 VDC or less. If the current exceeds 10 mA, connect an external resistor Ro.
- Connect a terminating resistor of 100 Ω or more between the input of the line receiver terminals.
- Use a multi-core, twisted-pair shielded wire of AWG28 to 26 (0.08 to 0.14mm^2) 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).

Common Specifications

Permissible Radial Load and Permissible Axial Load

Unit: N

Type	Motor Frame Size	Product Name	Gear Ratio	Permissible Radial Load					Permissible Axial Load
				Distance from Shaft End [mm]					
				0	5	10	15	20	
Standard Type	20 mm	**ARM14**, **ARM15**	–	12	15	–	–	–	3
	28 mm	**ARM24**, **ARM26**		25	34	52	–	–	5
	42 mm	**ARM46**		35	44	58	85	–	15
	60 mm	**ARM66**, **ARM69**		90	100	130	180	270	30
	85 mm	**ARM98**, **ARM911**		260	290	340	390	480	60
TH Geared Type	28 mm	**ARM24**	**7.2**, **10**, **20**, **30**	15	17	20	23	–	10
	42 mm	**ARM46**	**3.6**, **7.2**, **10**, **20**, **30**	10	14	20	30	–	15
	60 mm	**ARM66**		70	80	100	120	150	40
	90 mm	**ARM98**		220	250	300	350	400	100
FC Geared Type	42 mm	**ARM46**	**7.2**, **10**, **20**, **30**	180	200	220	250	–	100
	60 mm	**ARM66**		270	290	310	330	350	200
PS Geared Type	28 mm	**ARM24**	**5**, **7.2**, **10**	45	60	80	100	–	40
	42 mm	**ARM46**	**5**	70	80	95	120	–	100
			7.2	80	90	110	140	–	
			10	85	100	120	150	–	
			25	120	140	170	210	–	
			36	130	160	190	240	–	
			50	150	170	210	260	–	
	60 mm	**ARM66**	**5**	170	200	230	270	320	200
			7.2	200	220	260	310	370	
			10	220	250	290	350	410	
			25	300	340	400	470	560	
			36	340	380	450	530	630	
			50	380	430	500	600	700	
	90 mm	**ARM98**	**5**	380	420	470	540	630	600
			7.2	430	470	530	610	710	
			10	480	530	590	680	790	
			25	650	720	810	920	1070	
			36	730	810	910	1040	1210	
			50	820	910	1020	1160	1350	
PN Geared Type	28 mm	**ARM24**	**5**, **7.2**, **10**	45	60	80	100	–	40
	42 mm	**ARM46**	**5**	80	95	120	160	–	100
			7.2	90	110	130	180	–	
			10	100	120	150	200	–	
	60 mm	**ARM66**	**5**	240	260	280	300	330	200
			7.2	270	290	310	340	370	
			10	300	320	350	380	410	
			25	410	440	470	520	560	
			36	360	410	480	570	640	
			50	360	410	480	570	700	
	90 mm	**ARM98**	**5**	370	390	410	430	460	600
			7.2	410	440	460	490	520	
			10	460	490	520	550	580	
			25	630	660	700	740	790	
			36	710	750	790	840	900	
			50	790	840	890	940	1000	
Harmonic Geared Type	30 mm	**ARM24**	**50**, **100**	100	135	175	250	–	140
	42 mm	**ARM46**		180	220	270	360	510	220
	60 mm	**ARM66**		320	370	440	550	720	450
	90 mm	**ARM98**		1090	1150	1230	1310	1410	1300

- The **PS** geared type and **PN** geared type geared type have a full lifespan of 20,000 hours when either the permissible radial load or the permissible axial load is applied. For the life of the gearhead, please contact the nearest Oriental Motor sales office, or visit the Oriental Motor website.

Note

- With a double shaft product, the output shaft located on the opposite side of the motor output shaft is used to install a slit disk or similar device. Do not apply load torque, radial load, and axial load.

Permissible Moment Load

If an eccentric load is applied to the output flange-installation surface, a load moment affects the bearing.
Please use the following formula to check that the axial load and load moment are within the specified values.

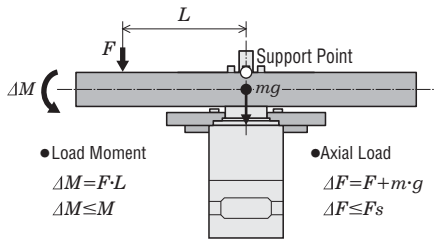
Harmonic Geared Type

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

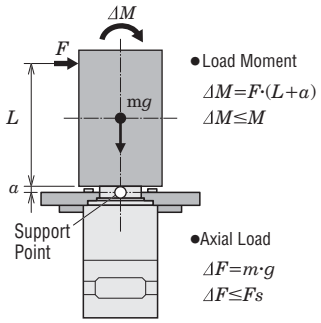
The permissible moment load can be calculated with the following formula.

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

Example 1: When external force F (N) is applied at distance L (m) horizontally from the center of the output flange



Example 2: When external force F (N) is applied at distance L (m) perpendicular to the flange-installation surface

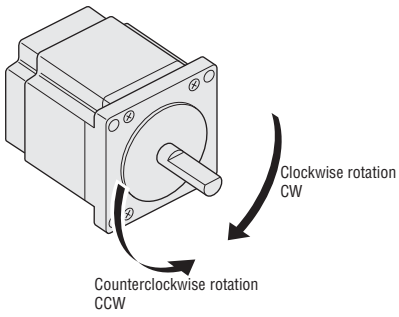


Rotational Direction

This indicates the rotation direction when viewed from the output shaft side of the motor.
The rotation direction of the output gear shaft relative to the standard type motor output shaft varies depending on the gear type and gear ratio.
Please check the following table.

Type	Gear Ratio	Rotation direction when viewed from the output shaft side of the motor
TH Geared Type	**3.6**, **7.2**, **10**	Same Direction
	20, **30**	Reverse Direction
FC Geared Type **PS** Geared Type **PN** Geared Type	All Gear Ratios	Same Direction
Harmonic Geared Type	All Gear Ratios	Reverse Direction

Standard Type Motor



Hybrid Control System α_{STEP}

AR Series Vacuum Type Pulse Input Type

Capable of Withstanding 10^{-5}Pa

The vacuum type **AR** Series has significantly reduced heat generation by the motor through higher efficiency.
Positioning operation in a vacuum environment is possible, while still retaining the high reliability provided by closed loop control.
The product line includes both DC input and AC input models.

Features

Vacuum Environment-Compatible (10^{-5}Pa)

This product can be used in a vacuum environment of 10^{-5}Pa. In addition to make positioning operations possible within vacuum environment equipment, by not using a rotation feed through or bellows device, equipment can be made more compact.

High Reliability with Closed Loop Control

In addition to the ability to monitor rotation speed and rotations for the motor inside the vacuum vessel (chamber), an output function for all alarm types is also built in.

High Efficiency Technology Reduces Heat Generation

High torque operation is possible even in a vacuum environment with poor heat radiation, thanks to the high efficiency motor and driver.

Current Control Mode

This is a current control mode based on the load. Consider this for situations in which even greater heat generation reductions and a decrease in magnetic noise are needed. (This is effective with smaller loads.)

CE Marking

The DC input product line has a CE Marking affixed under the EMC Directive.

Product Line

AC Input

Power Supply Input [VAC]	Frame Size [mm]	Resolution (Resolution setting: 1000 P/R) [°/pulse]	Max. Holding Torque (At atmospheric pressure) [N·m]
Single-Phase 100-115	42	0.36	0.25
Single-Phase 200-230	60		1～1.8
Three-Phase 200-230	85		1.8～3

DC Input

Power Supply Input [VDC]	Frame Size [mm]	Resolution (Resolution setting: 1000 P/R) [°/pulse]	Max. Holding Torque (At atmospheric pressure) [N·m]
24	28	0.36	0.044～0.096
24/48	42		0.25
	60		0.8～1.8
	85		1.8

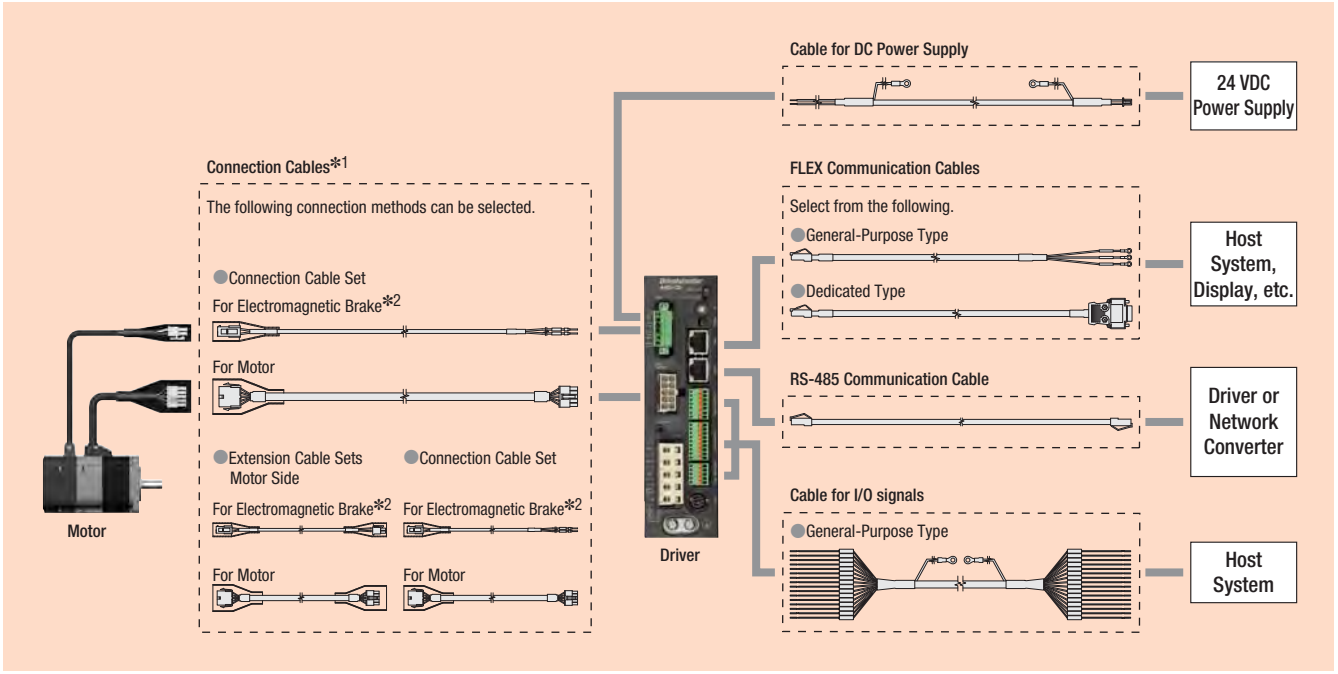
The following items are included with each product.
Motor, Driver, I/O Signal Connector, Main Power Supply Input Terminal Connector, 24 VDC Power Supply/Regeneration Resistor Thermal Input*, Connector Wiring Lever*, Operating Manual
*AC input only.

For details regarding the Vacuum Type, please contact the nearest Oriental Motor sales office.

Cables

Cable System Configuration (For AC Input)

Built-in Controller Type Driver

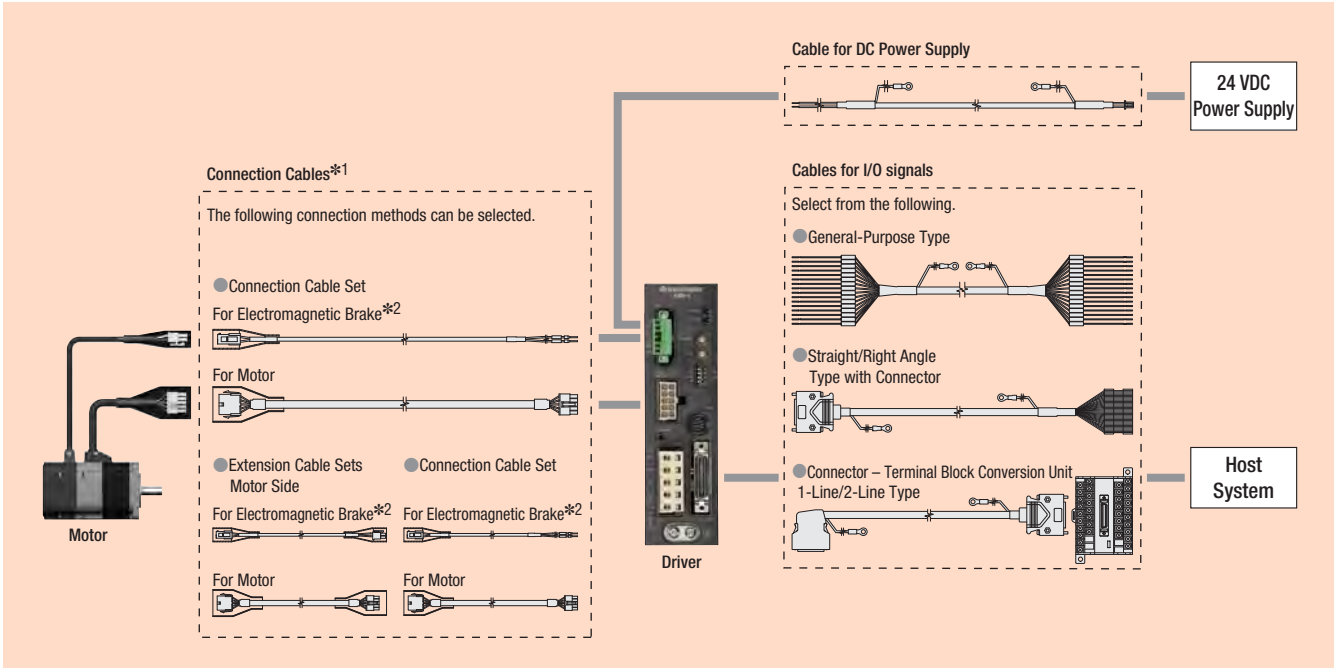


*1 Flexible connection cable sets and flexible extension cable sets with excellent flexibility are also available.
*2 Required for motors with electromagnetic brakes.

Note

- A maximum of three cables can be used to connect the motor and the driver.
- Maximum wiring distance between motor and driver is 30 m.

Pulse Input Type Driver



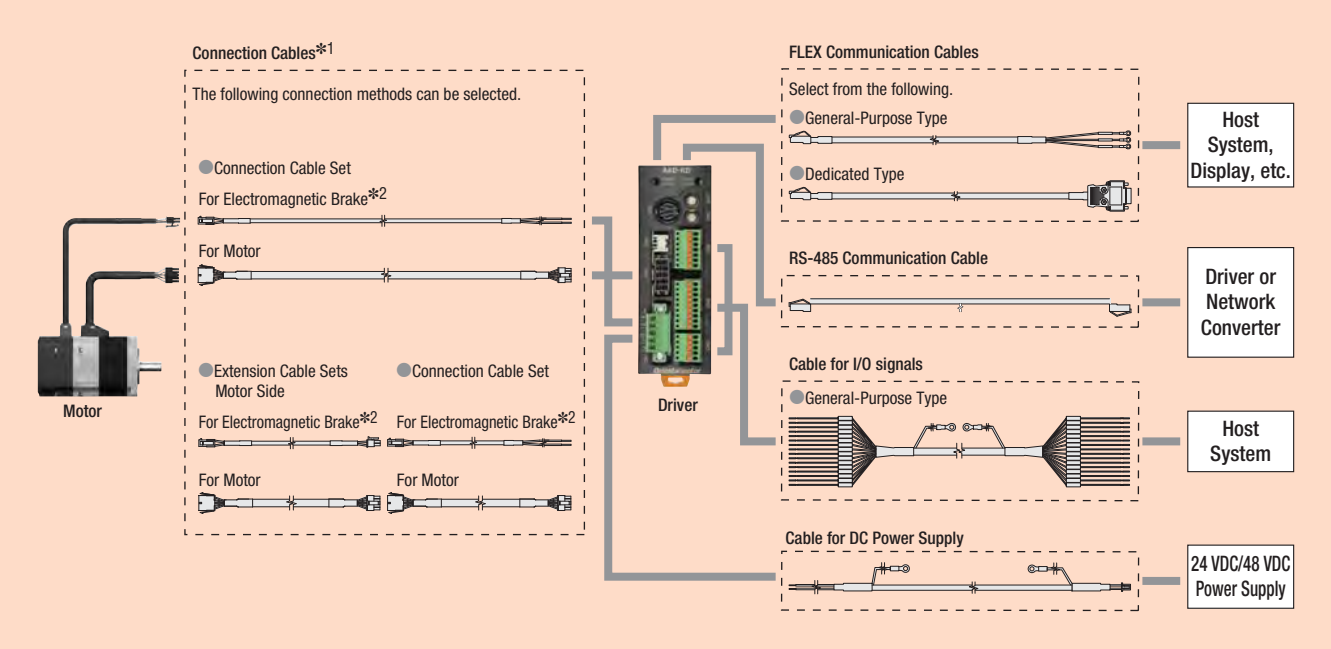
*1 Flexible connection cable sets and flexible extension cable sets with excellent flexibility are also available.
*2 Required for motors with electromagnetic brakes.

Note

- A maximum of three cables can be used to connect the motor and the driver.
- Maximum wiring distance between motor and driver is 30 m.

Cable System Configuration (For DC Input)

Built-in Controller Type Driver

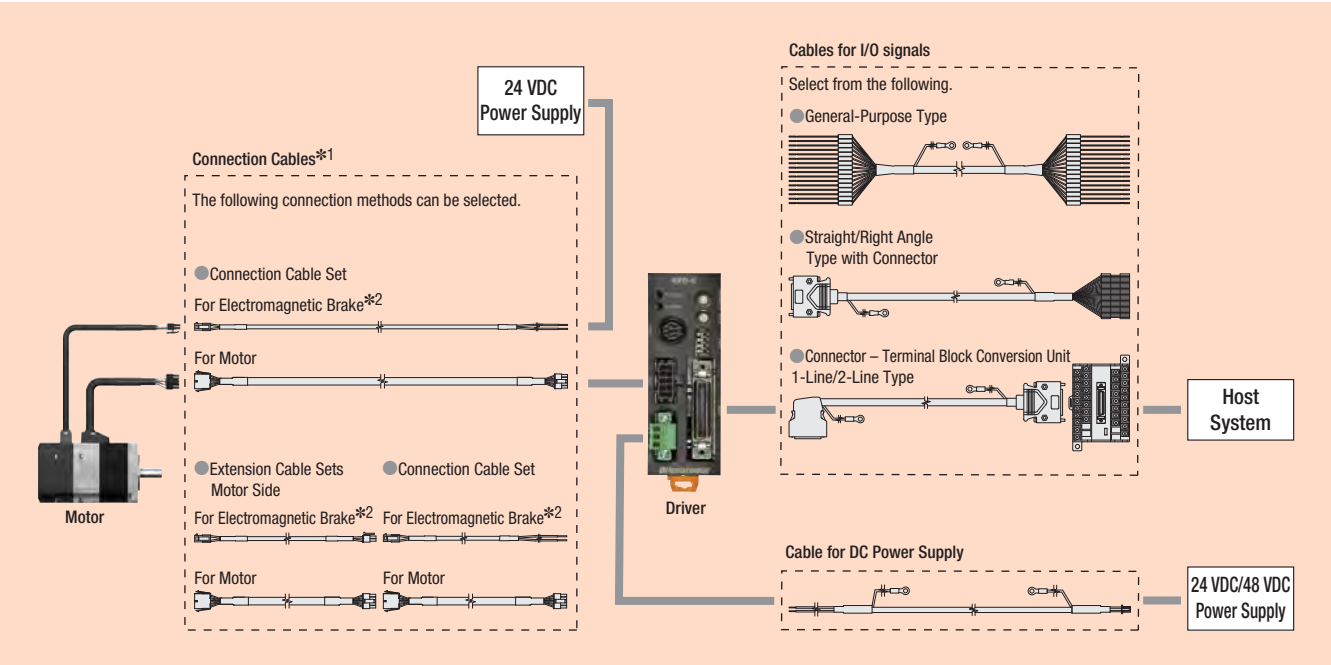


*1 Flexible connection cable sets and flexible extension cable sets with excellent flexibility are also available.
*2 Required for motors with electromagnetic brakes.

Note

- A maximum of three cables can be used to connect the motor and the driver.
- Maximum wiring distance between motor and driver is 30 m.

Pulse Input Type Driver

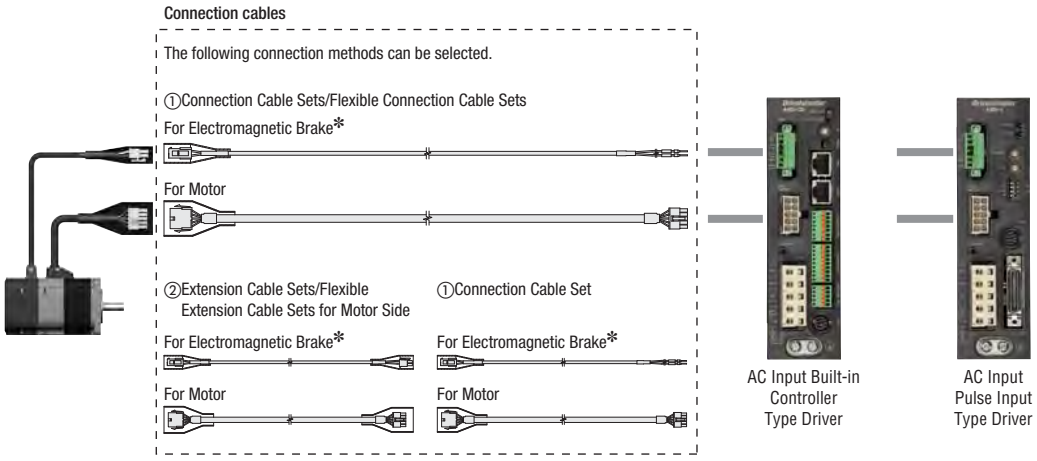


*1 Flexible connection cable sets and flexible extension cable sets with excellent flexibility are also available.
*2 Required for motors with electromagnetic brakes.

Note

- A maximum of three cables can be used to connect the motor and the driver.
- Maximum wiring distance between motor and driver is 30 m.

Connection Cables (For AC Input)



*Required for motors with electromagnetic brakes.

Note

- A maximum of three cables can be used to connect the motor and the driver.
- Maximum wiring distance between motor and driver is 30 m.

① Connection Cable Sets/Flexible Connection Cable Sets

This cable set is used to connect the motor and the driver. Use the flexible connection cable set in applications where the cable is bent and flexed repeatedly.

· Cable for Motor

· Cables for Motor and for Electromagnetic Brake Combined as sets shown below.

Product Line

◇Connection Cable Sets

•For Motor

Length L (m)	Product Name
0.5	**CC005VAF**
1	**CC010VAF**
1.5	**CC015VAF**
2	**CC020VAF**
2.5	**CC025VAF**
3	**CC030VAF**
4	**CC040VAF**
5	**CC050VAF**
7	**CC070VAF**
10	**CC100VAF**
15	**CC150VAF**
20	**CC200VAF**
30	**CC300VAF**

•Cables for Motor and for Electromagnetic Brake

Length L (m)	Product Name
0.5	**CC005VAFB**
1	**CC010VAFB**
1.5	**CC015VAFB**
2	**CC020VAFB**
2.5	**CC025VAFB**
3	**CC030VAFB**
4	**CC040VAFB**
5	**CC050VAFB**
7	**CC070VAFB**
10	**CC100VAFB**
15	**CC150VAFB**
20	**CC200VAFB**
30	**CC300VAFB**

◇Flexible Connection Cable Sets

•For Motor

Length L (m)	Product Name
0.5	**CC005VAR**
1	**CC010VAR**
1.5	**CC015VAR**
2	**CC020VAR**
2.5	**CC025VAR**
3	**CC030VAR**
4	**CC040VAR**
5	**CC050VAR**
7	**CC070VAR**
10	**CC100VAR**
15	**CC150VAR**
20	**CC200VAR**
30	**CC300VAR**

Note when wiring flexible cables ➜ Page 130

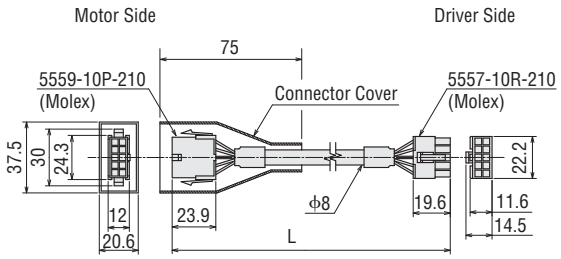
•Cables for Motor and for Electromagnetic Brake

Length L (m)	Product Name
0.5	**CC005VARB**
1	**CC010VARB**
1.5	**CC015VARB**
2	**CC020VARB**
2.5	**CC025VARB**
3	**CC030VARB**
4	**CC040VARB**
5	**CC050VARB**
7	**CC070VARB**
10	**CC100VARB**
15	**CC150VARB**
20	**CC200VARB**
30	**CC300VARB**

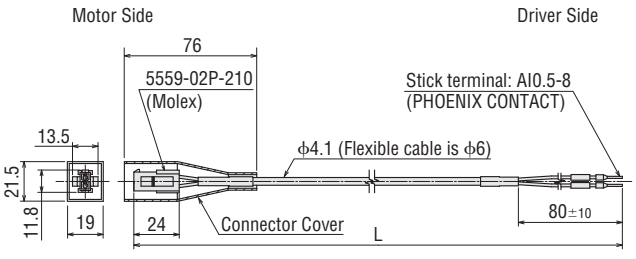
Note when wiring flexible cables ➜ Page 130

Dimensions (Unit: mm)

◇Cable for Motor



◇Cable for Electromagnetic Brake



②Extension Cable Sets/Flexible Extension Cable Sets for Motor Side

This is a cable to extend the connection cable set. This can directly connect between the connection cable and the motor. When extending cables, keep the overall cable length at 30 m or less. Use the flexible extension cable in applications where the cable is bent and flexed repeatedly.

· Cable for Motor

· Cables for Motor and for Electromagnetic Brake Combined as sets shown below.

Product Line

◇Extension Cable Sets

•For Motor

Length L (m)	Product Name
0.5	**CC005VAFT**
1	**CC010VAFT**
1.5	**CC015VAFT**
2	**CC020VAFT**
2.5	**CC025VAFT**
3	**CC030VAFT**
4	**CC040VAFT**
5	**CC050VAFT**
7	**CC070VAFT**
10	**CC100VAFT**
15	**CC150VAFT**
20	**CC200VAFT**

•Cables for Motor and for Electromagnetic Brake

Length L (m)	Product Name
0.5	**CC005VAFBT**
1	**CC010VAFBT**
1.5	**CC015VAFBT**
2	**CC020VAFBT**
2.5	**CC025VAFBT**
3	**CC030VAFBT**
4	**CC040VAFBT**
5	**CC050VAFBT**
7	**CC070VAFBT**
10	**CC100VAFBT**
15	**CC150VAFBT**
20	**CC200VAFBT**

◇Flexible Extension Cable Sets

•For Motor

Length L (m)	Product Name
0.5	**CC005VART**
1	**CC010VART**
1.5	**CC015VART**
2	**CC020VART**
2.5	**CC025VART**
3	**CC030VART**
4	**CC040VART**
5	**CC050VART**
7	**CC070VART**
10	**CC100VART**
15	**CC150VART**
20	**CC200VART**

Note when wiring flexible cables ➜ Page 130

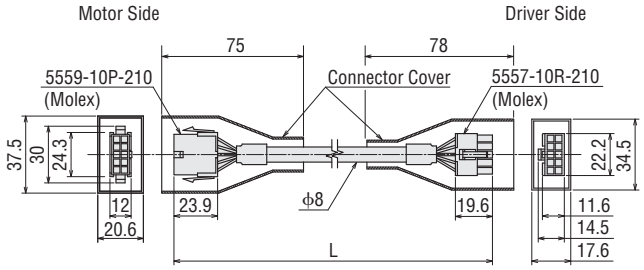
•Cables for Motor and for Electromagnetic Brake

Length L (m)	Product Name
0.5	**CC005VARBT**
1	**CC010VARBT**
1.5	**CC015VARBT**
2	**CC020VARBT**
2.5	**CC025VARBT**
3	**CC030VARBT**
4	**CC040VARBT**
5	**CC050VARBT**
7	**CC070VARBT**
10	**CC100VARBT**
15	**CC150VARBT**
20	**CC200VARBT**

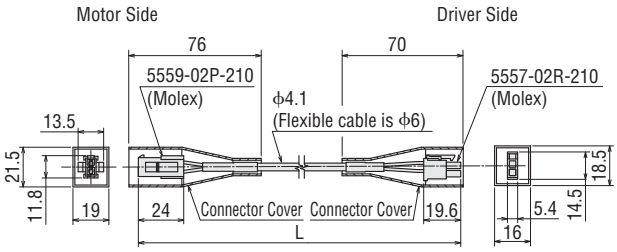
Note when wiring flexible cables ➜ Page 130

Dimensions (Unit: mm)

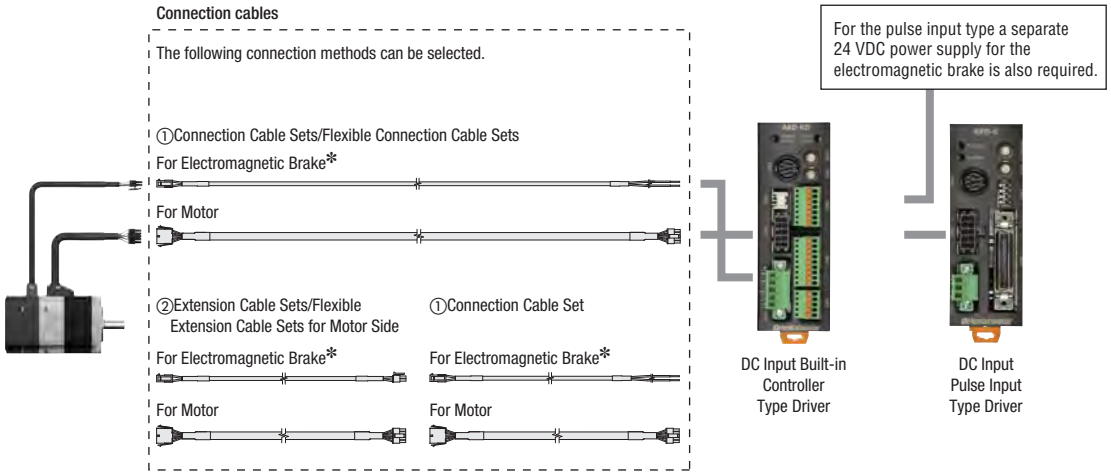
◇Cable for Motor



◇Cable for Electromagnetic Brake



Connection Cables (For DC Input)



*Required for motors with electromagnetic brakes.

Note

- A maximum of three cables can be used to connect the motor and the driver.
- Maximum wiring distance between motor and driver is 30 m.

① Connection Cable Sets/Flexible Connection Cable Sets

This cable set is used to connect the motor and the driver. Use the flexible connection cable set in applications where the cable is bent and flexed repeatedly.

· Cable for Motor

· Cables for Motor and for Electromagnetic Brake Combined as sets shown below.

Product Line

◇Connection Cable Sets

•For Motor

Length L (m)	Product Name
0.5	**CC005VA2F2**
1	**CC010VA2F2**
1.5	**CC015VA2F2**
2	**CC020VA2F2**
2.5	**CC025VA2F2**
3	**CC030VA2F2**
4	**CC040VA2F2**
5	**CC050VA2F2**
7	**CC070VA2F2**
10	**CC100VA2F2**
15	**CC150VA2F2**
20	**CC200VA2F2**
30	**CC300VA2F2**

•Cables for Motor and for Electromagnetic Brake

Length L (m)	Product Name
0.5	**CC005VA2FB2**
1	**CC010VA2FB2**
1.5	**CC015VA2FB2**
2	**CC020VA2FB2**
2.5	**CC025VA2FB2**
3	**CC030VA2FB2**
4	**CC040VA2FB2**
5	**CC050VA2FB2**
7	**CC070VA2FB2**
10	**CC100VA2FB2**
15	**CC150VA2FB2**
20	**CC200VA2FB2**
30	**CC300VA2FB2**

◇Flexible Connection Cable Sets

•For Motor

Length L (m)	Product Name
0.5	**CC005VA2R2**
1	**CC010VA2R2**
1.5	**CC015VA2R2**
2	**CC020VA2R2**
2.5	**CC025VA2R2**
3	**CC030VA2R2**
4	**CC040VA2R2**
5	**CC050VA2R2**
7	**CC070VA2R2**
10	**CC100VA2R2**
15	**CC150VA2R2**
20	**CC200VA2R2**
30	**CC300VA2R2**

Note when wiring flexible cables ➜ Page 130

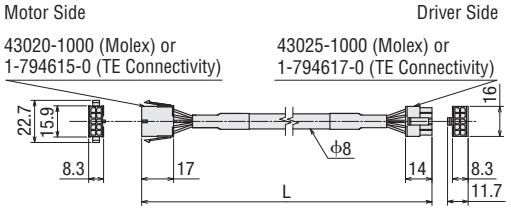
•Cables for Motor and for Electromagnetic Brake

Length L (m)	Product Name
0.5	**CC005VA2RB2**
1	**CC010VA2RB2**
1.5	**CC015VA2RB2**
2	**CC020VA2RB2**
2.5	**CC025VA2RB2**
3	**CC030VA2RB2**
4	**CC040VA2RB2**
5	**CC050VA2RB2**
7	**CC070VA2RB2**
10	**CC100VA2RB2**
15	**CC150VA2RB2**
20	**CC200VA2RB2**
30	**CC300VA2RB2**

Note when wiring flexible cables ➜ Page 130

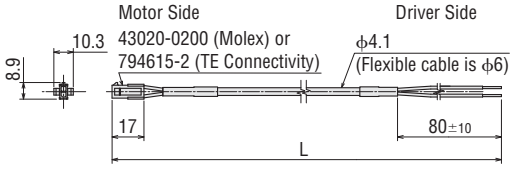
Dimensions (Unit: mm)

◇Cable for Motor



Connector dimension indicates dimensions for TE Connectivity product.

◇Cable for Electromagnetic Brake



Connector dimension indicates dimensions for TE Connectivity product.

②Extension Cable Sets/Flexible Extension Cable Sets for Motor Side

This is a cable to extend the connection cable set. This can directly connect between the connection cable and the motor. When extending cables, keep the overall cable length at 30 m or less. Use the flexible extension cable in applications where the cable is bent and flexed repeatedly.

· Cable for Motor

· Cables for Motor and for Electromagnetic Brake
Combined as sets shown below.

Product Line

◇Extension Cable Sets

•For Motor

Length L (m)	Product Name
0.5	**CC005VA2F2**
1	**CC010VA2F2**
1.5	**CC015VA2F2**
2	**CC020VA2F2**
2.5	**CC025VA2F2**
3	**CC030VA2F2**
4	**CC040VA2F2**
5	**CC050VA2F2**
7	**CC070VA2F2**
10	**CC100VA2F2**
15	**CC150VA2F2**
20	**CC200VA2F2**

•Cables for Motor and for Electromagnetic Brake

Length L (m)	Product Name
0.5	**CC005VA2FBT2**
1	**CC010VA2FBT2**
1.5	**CC015VA2FBT2**
2	**CC020VA2FBT2**
2.5	**CC025VA2FBT2**
3	**CC030VA2FBT2**
4	**CC040VA2FBT2**
5	**CC050VA2FBT2**
7	**CC070VA2FBT2**
10	**CC100VA2FBT2**
15	**CC150VA2FBT2**
20	**CC200VA2FBT2**

◇Flexible Extension Cable Sets

•For Motor

Length L (m)	Product Name
0.5	**CC005VA2R2**
1	**CC010VA2R2**
1.5	**CC015VA2R2**
2	**CC020VA2R2**
2.5	**CC025VA2R2**
3	**CC030VA2R2**
4	**CC040VA2R2**
5	**CC050VA2R2**
7	**CC070VA2R2**
10	**CC100VA2R2**
15	**CC150VA2R2**
20	**CC200VA2R2**

Note when wiring flexible cables ➜ Page 130

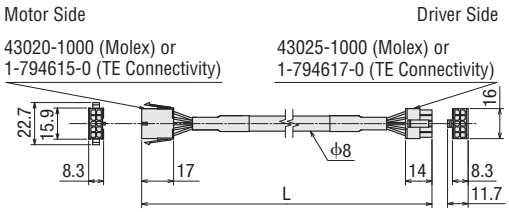
•Cables for Motor and for Electromagnetic Brake

Length L (m)	Product Name
0.5	**CC005VA2RBT2**
1	**CC010VA2RBT2**
1.5	**CC015VA2RBT2**
2	**CC020VA2RBT2**
2.5	**CC025VA2RBT2**
3	**CC030VA2RBT2**
4	**CC040VA2RBT2**
5	**CC050VA2RBT2**
7	**CC070VA2RBT2**
10	**CC100VA2RBT2**
15	**CC150VA2RBT2**
20	**CC200VA2RBT2**

Note when wiring flexible cables ➜ Page 130

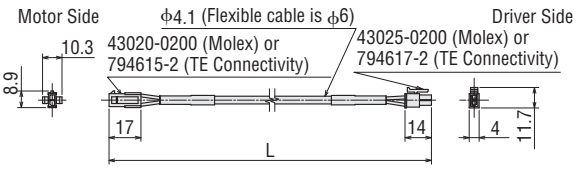
Dimensions (Unit: mm)

◇Cable for Motor



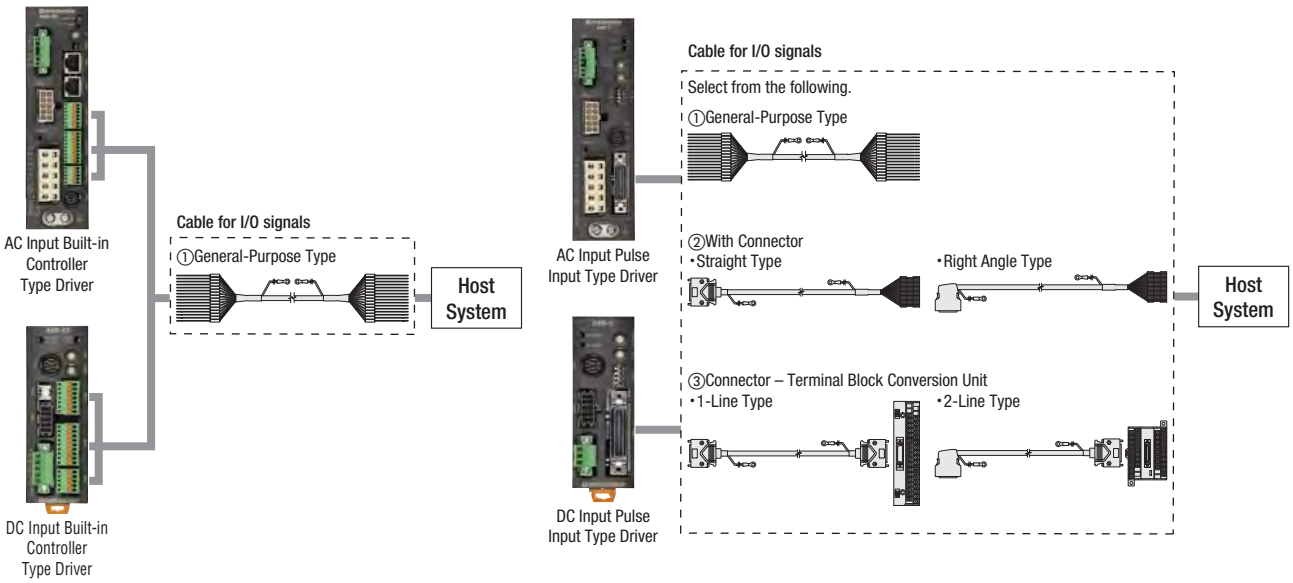
Connector dimension indicates dimensions for TE Connectivity product.

◇Cable for Electromagnetic Brake



Connector dimension indicates dimensions for TE Connectivity product.

Cable for I/O signals



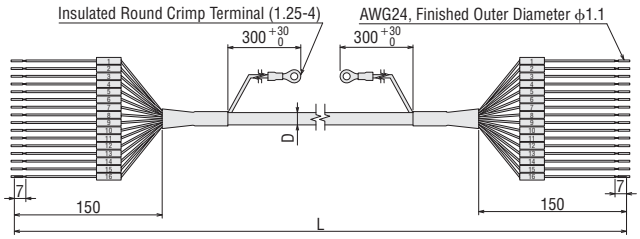
①General-Purpose Type

- Shielded type cable
- Unbundled leads on both ends
- Ground wire with round terminal for easy grounding of shield
- Number of lead wire cores can be selected in accordance with functions used

Product Line

Product Name	Length L (m)	Number of Lead Wire Cores	Outer Diameter (mm)	AWG
CC06D005B-1	0.5	6	ϕ5.4	24
CC06D010B-1	1			
CC06D015B-1	1.5			
CC06D020B-1	2			
CC10D005B-1	0.5	10	ϕ6.7	
CC10D010B-1	1			
CC10D015B-1	1.5			
CC10D020B-1	2			
CC12D005B-1	0.5	12	ϕ7.5	
CC12D010B-1	1			
CC12D015B-1	1.5			
CC12D020B-1	2			
CC16D005B-1	0.5	16	ϕ7.5	
CC16D010B-1	1			
CC16D015B-1	1.5			
CC16D020B-1	2			

Dimensions (Unit: mm)



The figure depicts 16 core wires.

②With Connector

- Shielded type cable
- These shielded cables have a half-pitch connector for easy connection to the driver
- At one end, the laminated lead wires are arranged with 1.27 mm pitch, which are convenient for crimp connectors
- Easy grounding with ground wires at both ends of the cable


Straight Type　　Right Angle Type

Note

Note that as the length of the pulse signal line between the driver and host system (controller) increases, the maximum transmission frequency decreases.

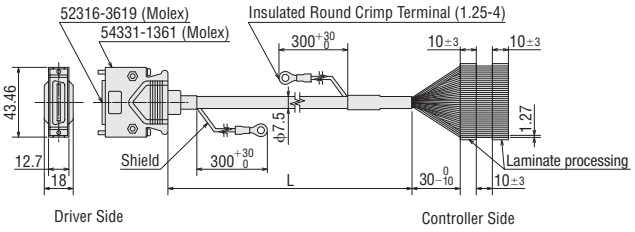
Straight Type

Product Line

Product Name	Applicable Drivers	Length L (m)
CC36D1E	For pulse input CN5 (36 pins)	1
CC36D2E		2

Dimensions (Unit: mm)

Conductor: AWG28 (0.08 mm^2)



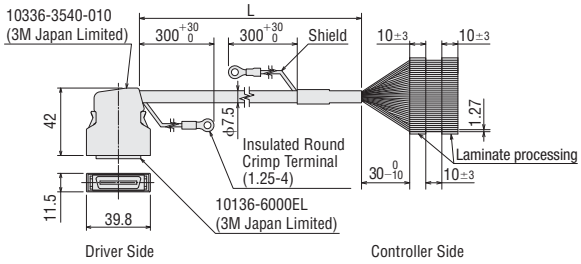
Right Angle Type

Product Line

Product Name	Applicable Drivers	Length L (m)
CC36D1AE	For pulse input CN5 (36 pins)	1
CC36D2AE		2

Dimensions (Unit: mm)

Conductor: AWG28 (0.08 mm^2)



③Connector – Terminal Block Conversion Unit

These are conversion units that can connect a driver to a programmable controller or a sensor using a terminal block.

- Uses shielded cable with ground wires at both ends of the cable for easy grounding
- Includes a signal name plate for easy, one-glance identification of driver signal names
- DIN rail installable
- Applicable Terminals
  1-Line Type: Fork terminal
  2-Line Type: Fork terminal, round terminal
  2-line type features screw-on type terminal which prevents dropouts even when screws are loosened
- 2-line type features a right angle connector on the driver side to help save space in the power board

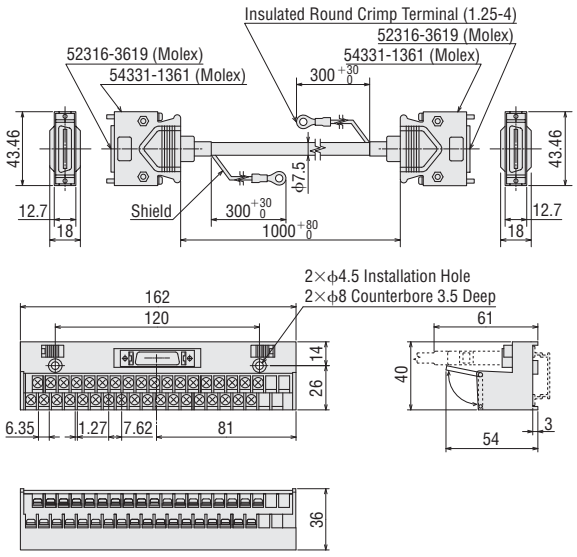
1-Line Type

Product Line

Product Line	Product Name	Applicable Drivers	Length L (m)
36 Poles	**CC36T10E**	Pulse Input For CN5 (36 pins)	1

Dimensions (Unit: mm)

2D CAD B991



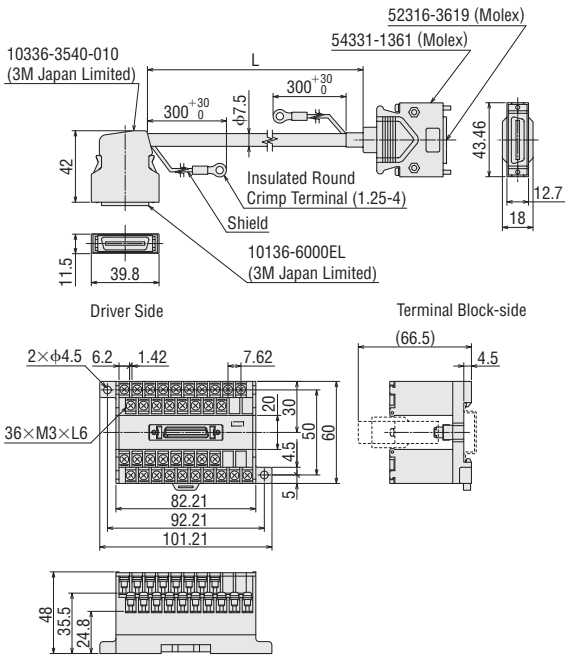
2-Line Type

Product Line

Product Line	Product Name	Applicable Drivers	Length L (m)
36 Poles	**CC36WT05AE**	For pulse input CN5 (36 pins)	0.5
	CC36WT10AE		1

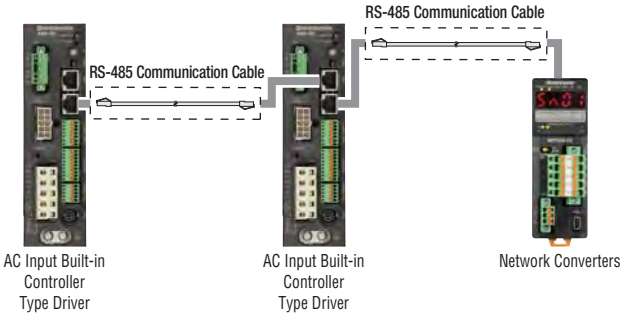
Dimensions (Unit: mm)

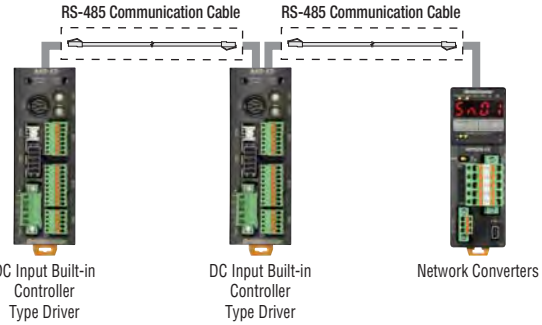
2D CAD B994



RS-485 Communication Cables

This cable is used to connect two built-in controller type drivers to each other or to connect a built-in controller type driver to a network converter.

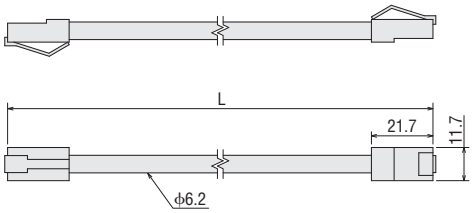




Product Line

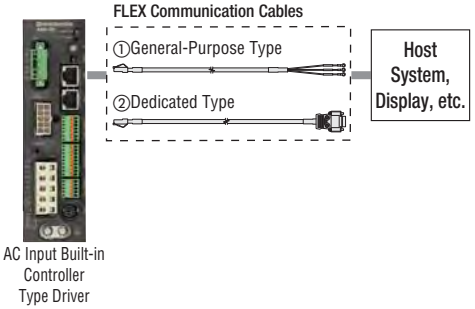
Product Name	Applicable Drivers	Length L (m)
CC001-RS4	DC Input Driver	0.1
CC002-RS4	AC Input Driver DC Input Driver	0.25

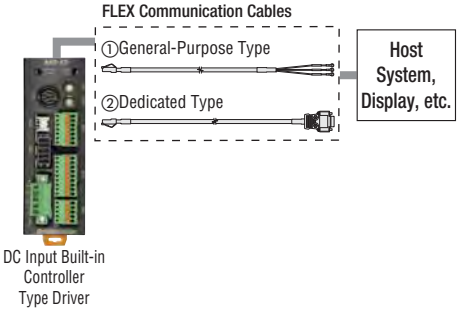
Dimensions (Unit: mm)



FLEX Communication Cable

This cable is convenient for connecting FLEX-compatible products to various equipment that is Modbus-controlled by RS-485.
Also available are general purpose type cables with unbundled leads at one end of the cable and dedicated type cables which can connect directly to HMI (Human Machine Interface).





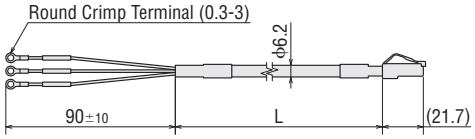
①General-Purpose Type

Product Line

Product Line	Product Name	Length L (m)
General-Purpose Type*	**CC02FLT**	2
	CC05FLT	5

*A terminating resistor is included.

Dimensions (Unit: mm)



②Dedicated Type

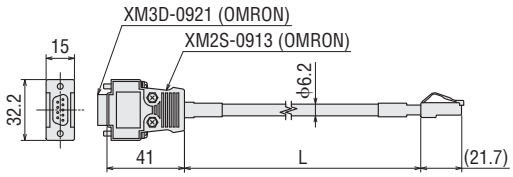
Product Line

Product Line	Product Name	Length L (m)
Dedicated Type Schneider Electric Holdings Ltd. GP3000 Series for COM1 LT3300 Series GP4000 Series COM1, COM2 and RS-485	**CC02FLT2**	2
	CC05FLT2	5
Dedicated Type Schneider Electric Holdings Ltd. GP3000 Series for COM2*1	**CC02FLT3**	2
	CC05FLT3	5
Dedicated Type Hakko Electronics Co., Ltd. V8 Series*2 for MJ1 and MJ2	**CC02FLT4**	2
	CC05FLT4	5
Dedicated Type Schneider Electric Holdings Ltd. For LT4000M Series	**CC02FLT5**	2
	CC05FLT5	5

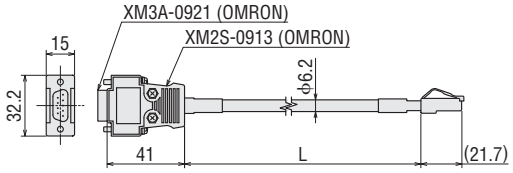
●A terminating resistor is built-in.
*1 When the product for COM2 is used, the online adapter CA4-ADPONL-01, an accessory from Schneider Electric Holdings Ltd, is required.
*2 Excluding V808iCH and V808CH

Dimensions (Unit: mm)

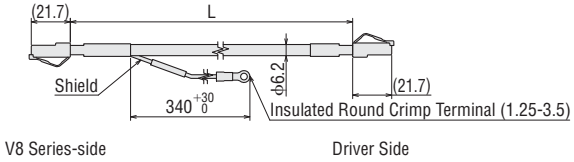
CC02FLT2, CC05FLT2



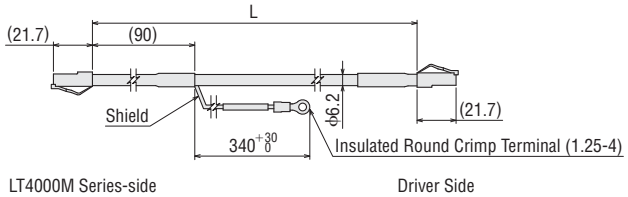
CC02FLT3, CC05FLT3



CC02FLT4, CC05FLT4

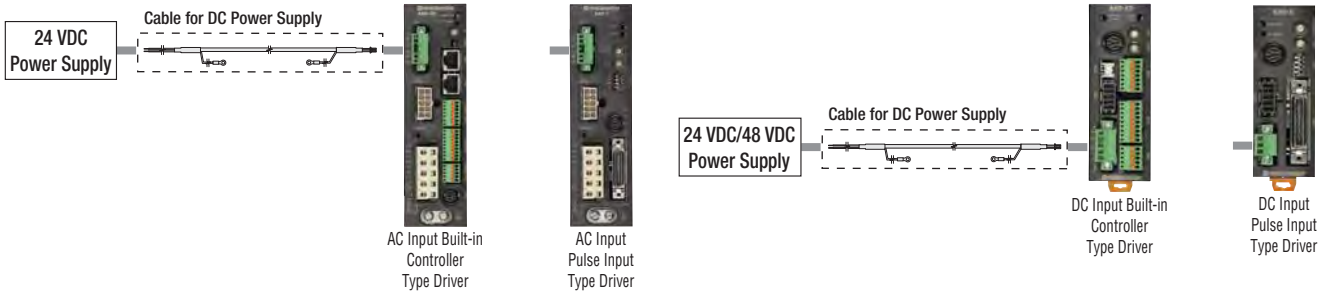


CC02FLT5, CC05FLT5



Cables for DC Power Supply

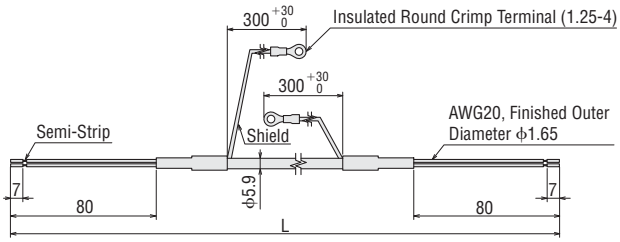
These cables are used to connect the driver and the DC power supply.



Product Line

Product Name	Length L (m)
CC02D005-3	0.5
CC02D010-3	1
CC02D015-3	1.5
CC02D020-3	2
CC02D050-3	5

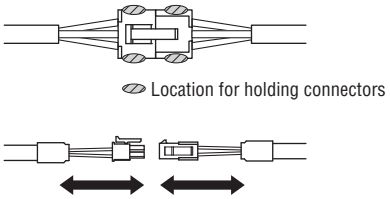
Dimensions (Unit: mm)



Note on Use of Cables

Notes when Connecting Connectors

When mating connectors together, always hold the connectors.
Mating the connectors while holding the cable may result in poor connection.



◇When Inserting Connectors

Hold the connector body and insert in a straight line.
If the connector is at an angle when inserted, this may result in damage to the terminals or poor connection.

◇When Disconnecting

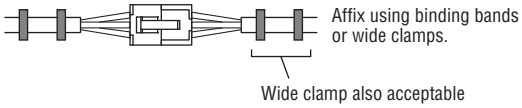
Release the connector's lock, and pull out in a straight line.
If the cable is held during disconnection, this may result in damage to the connector.

Note when Wiring Flexible Cables

Do not allow the cable to bend at the connector. This applies stress to the cable and terminal, and may result in poor contact or disconnection.

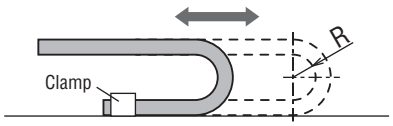
◇Cable Fixing Method

Fix the connector in 2 places so that it will not move.



◇Cable Length and Bending Radius

Select a cable of sufficient length that there is no pulling even when the cable moves.
The bending radius (R), should be at least 6 times the cable diameter.



◇Cable Interference

If wiring inside a cable holder, ensure that the cables do not interfere with each other. This applies stress to the cable, and may result in premature disconnection. Carefully check the notes regarding cable holders before using.

◇Cable Twisting

Run cables in a manner that avoids torsion or twisting of cables.
If the cables are bent while twisted, this may result in premature disconnection.
After wiring the cables, use the text printed on the cable surface to check that the cables are not twisted.

Accessories

For details, check the Oriental Motor website or contact the Oriental Motor Customer Support Center. **http://www.orientalmotor.com.sg**

Support Software Communication Cable/Support Software **MEXE02**

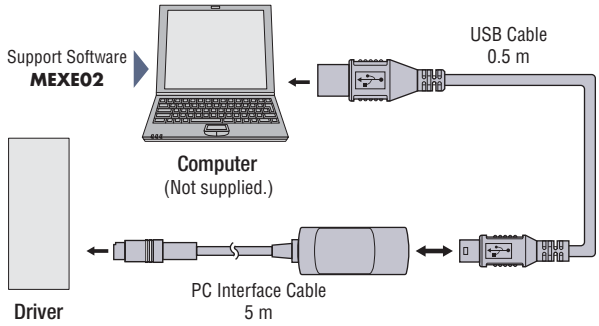
Support Software Communication Cable

This communication cable is required for connecting to the computer on which the support software **MEXE02** is installed.
A 5 m PC interface cable and 0.5 m USB cable are included.

Product Line

Product Name
CC05IF-USB

Computer and Driver Connection



Support Software **MEXE02**

In addition to setting and editing the operating data and various parameters with a computer, you can perform teaching and monitor I/O and operating speed waveform with Support Software.
The support software can be downloaded from the Oriental Motor website.
The support software can also be provided on physical media.
A physical copy can be ordered from the Oriental Motor website or by contacting the nearest sales office.
http://www.orientalmotor.com.sg

Operating Environment

Operating System*1	For the following operating systems, only the 32-bit (x86) version and 64-bit (x64) version are supported. · Microsoft Windows 10 · Microsoft Windows 8.1 · Microsoft Windows 8 · Microsoft Windows 7 Service Pack 1 · Microsoft Windows Vista Service Pack 2*2 · Microsoft Windows XP Service Pack 3*3
CPU*4	Intel Core processor 2 GHz or faster (OS must be supported)
Display	High resolution video adapter and monitor with a min. resolution of XGA (1024×768)
Memory*4	32 bit (x86) Edition: 1 GB or more 64 bit (x64) Edition: 2 GB or more
Hard Disk*5	At least 60MB of free disk space
Serial Interface	One USB1.1 port

∗1 Microsoft Windows 2000 is not supported.
∗2 If the root certificate is not the latest version, the **MEXE02** software may fail to install.
∗3 Runs with Service Pack 2 on Microsoft Windows XP x64 Edition.
∗4 The system requirements for the OS must be met.
∗5 **MEXE02** requires Microsoft .NET Framework 4 Client Profile. It will be automatically installed if it is not already installed, so 1.5 GB of free space for the 64-bit (x64) version and 600 MB of free space for the 32-bit (x86) version may be required.

Note
· The required memory and hard disk space may vary depending on the system environment.
· A drive that supports the media is required when installing with media.

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

Control Module **OPX-2A**

This enables you to perform operations such as setting the driver's internal parameters and setting or changing the data.
It can also be used for operations such as speed and I/O monitoring and teaching.

Product Line

Product Name
OPX-2A

Specifications

Indication	LED
Cable Length	5 m
Operating Ambient Temperature	0～+40ºC (Non-freezing)

Flexible Couplings

Coupling Types		MCS
Product External View		
Coupling Type		Jaw
Overview		This 3 piece coupling is made with a polyurethane elastic body press fit into an aluminum alloy hub and allows for no initial backlash. The elastic body effectively absorbs inertial load speed fluctuations that occur easily during starts or stops/ It is suitable for applications with high permissible torque and positioning using a geared motor.
Characteristics*2	No backlash	○
	Torque	◎
	Torsional Rigidity	△
	Permissible Misalignment	○
	Vibration Absorption	○
Connection Method		Clamping
Materials	Body	Aluminum Alloy
	Vibration Absorber/Buffer Material	Polyurethane

*1 Manufactured by NBK Nabeya Bi-tech Co. Ltd.
*2 Characteristics symbol legend shown below.
◎: Excellent ○: Good △: Inferior

MCS Coupling (For Geared Type Motor)

This three-piece coupling is composed of an aluminum alloy hub and a resin spider.

Product Line

Product Name
MCS14□
MCS20□
MCS30□
MCS40□
MCS55□
MCS65□

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

Motor Mounting Bracket

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

Product Line

For Standard Type

Material: Aluminum Alloy (SPCC)*
Surface Treatment: Painted (Electroless nickel plating)*

Product Name	Motor Frame Size	Applicable Product
PFB28A	28 mm	**ARM24**, **ARM26**
PAF0P	42 mm	**ARM46**
PAL0P	42 mm	**ARM46**
PAL2P-5	60 mm	**ARM66**, **ARM69**
PAL4P-5	85 mm	**ARM98**, **ARM911**

*The parentheses ( ) indicate the specifications for the **PFB28A**.
● These installation brackets can be perfectly fitted to the pilot of the stepper motors. (Except for the **PAL0P**)
● The motor installation screws are included.

For **TH** Geared Type

Material: Aluminum Alloy
Surface Treatment: Painted

Product Name	Motor Frame Size	Applicable Product
SOL0B	42 mm	**ARM46-T**
SOL2A	60 mm	**ARM66-T**
SOL5B	90 mm	**ARM98-T**

● **SOL2A** includes motor installation screws.

For **PS** and **PN** Geared Type

Material: SS400
Surface Treatment: Electroless nickel plating

Product Name	List Price	Motor Frame Size	Applicable Product
PFA28G	SGD69	28 mm	**ARM24-PS**, **ARM24-N**
PFA42F	SGD75	42 mm	**ARM46-PS**
PFA42H	SGD75	42 mm	**ARM46-N**
PLA60G	SGD158	60 mm	**ARM66-PS**, **ARM66-N**
PLA90G	SGD188	90 mm	**ARM98-PS**, **ARM98-N**

● The motor installation screws are included.

For Harmonic Geared Type

Material: SS400
Surface Treatment: Electroless nickel plating

Product Name	List Price	Motor Frame Size	Applicable Product
PFA42H	SGD75	42 mm	**ARM46-H**
PLA60H	SGD158	60 mm	**ARM66-H**
PLA90H	SGD188	90 mm	**ARM98-H**

● The motor installation screws are included.

Mounting Brackets for Circuit Products

Material: SPCC
Surface Treatment: Electroless nickel plating

Product Name	Applicable Product	Overview · Features
MADP06	AC Input Driver*	Use this mounting bracket when attaching the driver to a DIN rail.
MAFP02	DC Input Driver	Use this mounting bracket when attaching a DIN-mount driver to a wall surface using screws.

*At an ambient temperature of 40ºC or less

MADP06

<Application Example>

MAFP02

<Application Example>

Connector Cover

This is a resin cover for protecting and securing the connected connector part of the cable.

- Protection level equivalent to IP20
- Can be installed after connecting the motors and drivers
- Constructed to secure cables and protect lead wires
- Can be attached to the equipment using two mounting holes (ϕ4.5)

<Application Example>

Product Line

Material: Nylon

Product Name
MAC-D

Excluding **ARM14**, **ARM15**, **ARM24**, **ARM26**

Regeneration Resistor

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

Product Line

Product Name	Applicable Product
RGB100	AC Input Driver

Specifications

Product Name	**RGB100**
Continuous Regenerative Power	50 W
Resistance Value	150 Ω
Thermal Protector Operating Temperature	Activation: 150 ±7ºC Close: 145 ±12ºC (Normally closed)
Thermal Protector Electrical Rating	120 VAC 4 A 30 VDC 4 A (Min. current 5 mA)

Install the regeneration resistor in a place that has the same heat radiation capability as the heat sink (material: aluminum 350×350 mm, 3 mm thick).

Battery

This battery is for constructing an absolute system on types with built-in positioning function.
Position information can be stored during power blackouts or if the driver's power supply is switched OFF.

Product Line

Product Name	Applicable Product
BAT01B	Built-in Controller Type Driver (AC Input/DC Input)

Network Converters

Network converters convert host communication protocol to Oriental Motor's original RS-485 communication protocol. Use a network converter to control Oriental Motor's RS-485 compatible products within the host communication environment.

NETC01-CC

NETC02-CC

NETC01-M2

NETC01-M3

NETC01-ECT

Product Line

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