

RoHS RoHS-Compliant

Closed Loop Stepping Motor and Driver Package

α STEP AS Series ASC Series



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The α STEP is an innovative stepping motor unit that adopts a closed-loop control to eliminate misstep. In the α STEP, the user friendliness of a stepping motor is combined with a range of new functions for improved reliability of your equipment.

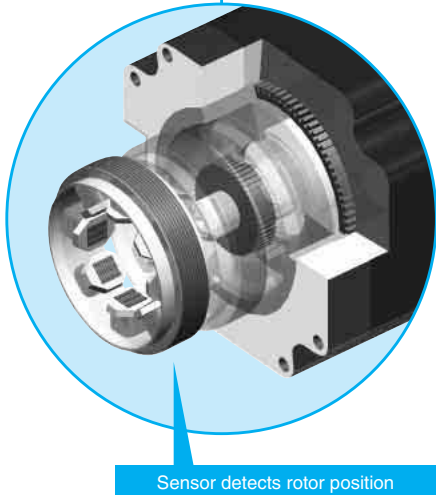
Features

● Thanks to Closed Loop Control, There is No Loss of Synchronism

α STEP does not lose synchronism even when subjected to abrupt load fluctuation or acceleration.

A newly developed rotor position detection sensor constantly monitors the motor movement. If synchronism is about to be lost, closed loop control is used, so there is no need to worry about loss of steps. When the successive overload is given, α STEP outputs the alarm signal. The reliability of α STEP is as high as that of a servo motor.

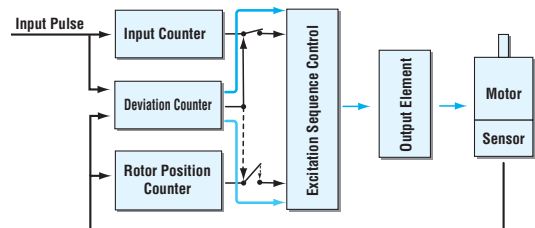
α STEP is designed as a "package" consisting of a motor and a driver.



Sensor detects rotor position



α STEP Control Diagram



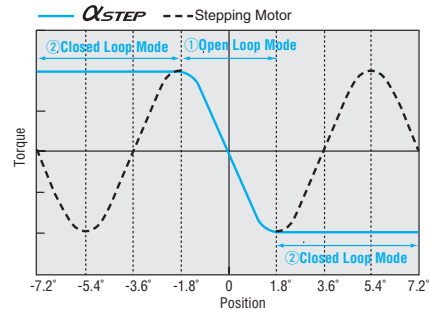
Normal (Positioning Deviation is less than $\pm 1.8^\circ$)

Motor runs in open loop mode like a stepping motor.

If Motor Missteps (Positioning Deviation is $\pm 1.8^\circ$ or more)

Control switches to closed loop mode to prevent loss of synchronism.

α STEP Angle-Torque Characteristics



① If the positioning deviation is less than $\pm 1.8^\circ$, the motor runs in open loop mode like a stepping motor.

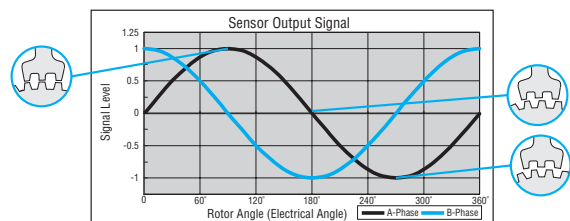
② If the positioning deviation is $\pm 1.8^\circ$ or more, the motor runs in closed loop mode and the position is corrected by exciting the motor windings to generate maximum torque based on the rotor position.

The Newly Developed Sensor to Detect Rotor's Position

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

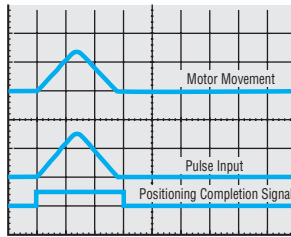
Features

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



● High Response

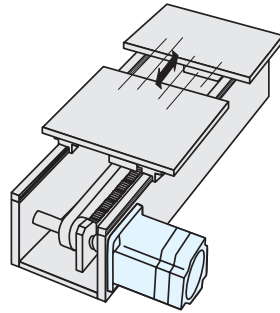
Like conventional stepping motors, α STEP operates in synchronism with command pulses. This makes possible short stroke positioning in a short time.



Measurement Condition:
Feed 1/5 rotation
Load inertia 250×10^{-7} kg·m² (J)

● No Gain Tuning

Gain tuning for servo motors is critical, troublesome and time-consuming. Since the α STEP operates like a stepping motor, there are no gain tuning requirements. Low rigidity applications, such as a belt and pulley system, are ideal for α STEP.

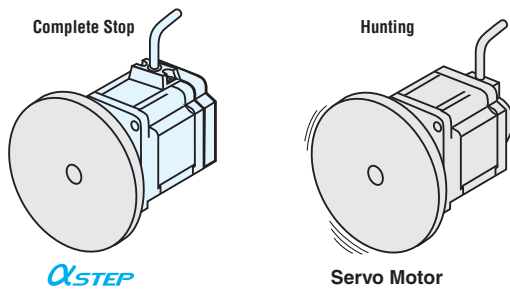


● The α STEP Complies with International Safety Standards

The AS Series is recognized with the UL/CSA standards and conforms to EN standard. [The AS46 (the motor frame size of 42 mm) is recognized with the UL standard and conforms to EN standard.] The CE marking certifies compliance with the EMC and Low Voltage Directives.

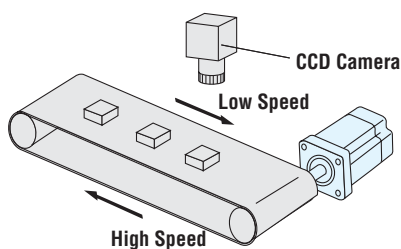
● No Hunting

Since α STEP is a stepping motor, it has no hunting problem. Therefore, when it stops, its position is completely stable and does not fluctuate. α STEP is ideal for applications in which vibration would be a problem.



● Low Vibration at Low Speed

The driver employs advanced technology that produces smoothness comparable to a microstepping driver. Its vibration level is incredibly low, even when operating in the low speed range. When frequent changes from low to high (or vice versa) speed operations are required, the use of the Resolution Select Function solves the problem. α STEP provides resolution as low as 0.036° per step without any damping mechanism or other mechanical device.



α STEP is well-suited to applications where smooth movement or stability is required, such as where a camera is used to monitor the quality of a product.

● Motor/Driver Connection with a Single Cable

α STEP requires only one cable for connection between the motor and the driver. Wiring is much simpler with compared with conventional servo motors requiring two cables, one for motor and the other for encoder. The cable can be extended to a maximum of 20 m (10 m for flexible extension cable), so the motor and the driver can be installed in locations far apart.

● A Full Lineup Including Geared Types and IP65 Rated Motor Type

The geared types enable driving of large inertial loads and positioning at higher accuracy, while the IP65 rated motor type provides ingress protection against dust and water. The α STEP offers a wide range of models meeting the needs of various applications.



Standard Type IP65 Rated Motor

*A dedicated motor cable for IP65 rated motor (sold separately) is needed to connect the IP65 rated motor and driver.

● Improved Motor

- Protective Earth Terminal
(Excluding motors with a frame size of 42 mm)



- Twice the Motor Life (compared with a conventional model)
The life of a motor is affected by its bearing. The α STEP achieves approx. twice the life of a conventional motor by adopting a modified bearing. (Available only with the standard type and standard electromagnetic-brake type with a frame size of 60 or 85 mm.)

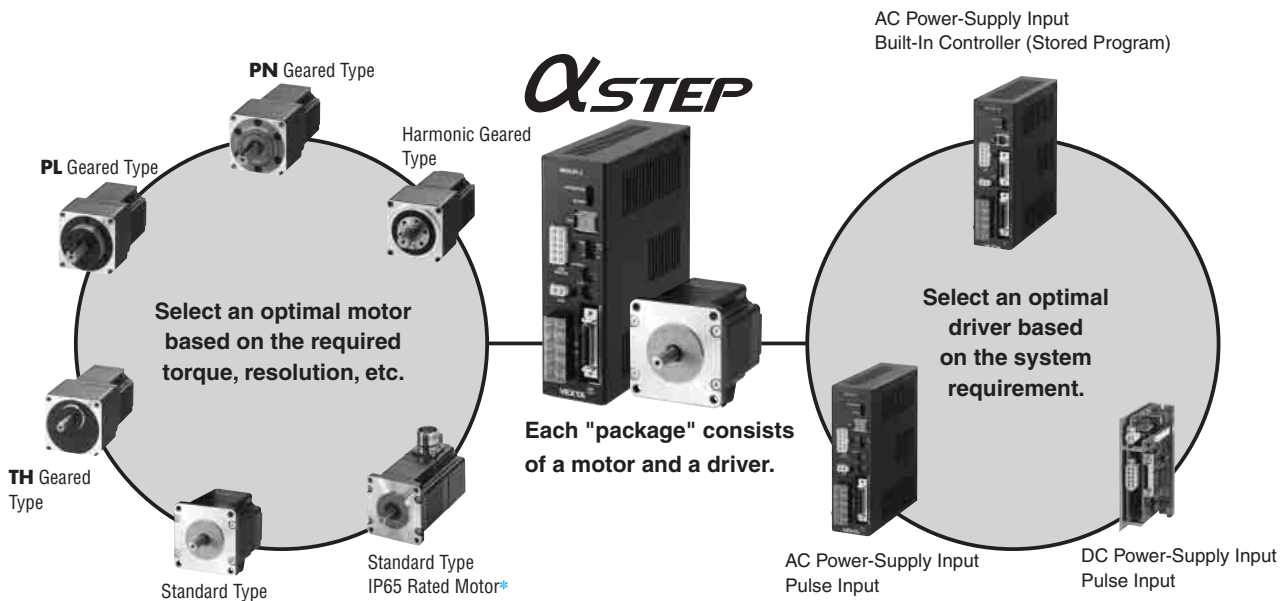
● (RoHS) RoHS-Compliant

The α STEP conforms to the RoHS Directive that prohibits the use of six chemical substances including lead and cadmium.

RoHS (Restriction of Hazardous Substances) Directive:
Directive on restriction of the use of certain hazardous substances in electrical and electronic equipment (2002/95/EC). The RoHS Directive prohibits the use of six chemical substances in electrical and electronic products sold in the EU member states. The six controlled substances are: lead, hexavalent chromium, cadmium, mercury and two specific brominated flame-retardants (PBB and PBDE).

A Full Lineup of α STEP Series

You are sure to find a unit that perfectly matches the needs of your specific application.



Motors equipped with an electromagnetic brake are also available.
(An electromagnetic brake is not available on certain types.)

*A dedicated IP65 motor cable (sold separately) is needed to connect the IP65 rated motor and driver.





Characteristics Comparison for Motors and Geared Motors


Motor Type	Geared Type	Features	Permissible Torque	Backlash	Basic Resolution	Output Shaft Speed	
			Maximum Torque [N·m]	[min]	[deg/step]	[r/min]	
Standard		Basic model of α STEP motor and driver system	Maximum Holding Torque 4	—	0.36	4000	
			Maximum Holding Torque 4	—	0.36	4000	
Low backlash	TH Geared (Parallel Shaft) 	A wide variety of low gear ratio, high-speed operation Gear ratio: 1:3.6, 1:7.2, 1:10, 1:20, 1:30	12	45	0.012	500	
	PL Geared (Planetary) 		37	35	0.0072	360	
Non-backlash	PN Geared (Planetary) 	High speed (low gear ratio), high positioning precision High permissible/maximum torque Wide variety of gear ratios for selecting the desired step angle. (resolution) Centered output shaft Gear ratio: 1:5, 1:7.2, 1:10, 1:25, 1:36, 1:50	Permissible Torque 37	Maximum Torque 60	3	0.0072	600
	Harmonic Geared (Harmonic Drive) 		Permissible Torque 37	Maximum Torque 55	0	0.0036	70

Note:



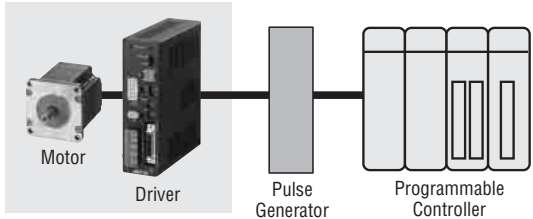

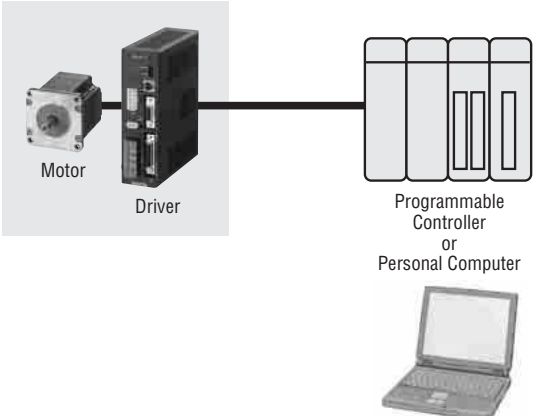
● The values shown above must be used as reference. These values vary depending on the frame size and gear ratio.

● Each series offers various motor frame sizes in accordance with the motor type and power supply voltage, as shown below. (□42: indicates a motor frame size of 42 mm.)

	Power Supply Voltage	Standard Type	Standard Type IP65 Rated Motor	TH Geared Type	PL Geared Type	PN Geared Type	Harmonic Geared Type
AC Input AS Series 	Single-Phase 100-115 VAC	□42 □60 □85	□60 □85	□42 □60 □90	□42 □60 □90	□42 □60 □90	□42 □60 □90
Pulse Input Package 		Single-Phase 200-230 VAC	□60 □85	□60 □85	□60 □90	□60 □90	□60 □90
Built-In Controller (Stored Program) Package 	Three-Phase 200-230 VAC	□60 □85	□60 □85	□60 □90	□60 □90	□60 □90	□60 □90
DC Input ASC Series Pulse Input Package 	24 VDC	□28 □42 □60	—	□28 □42 □60	—	□28 □42 □60	□28 □42 □60

- : A pulse input package and a built-in controller (stored program) package are available.
White background: A pulse input package is available.
- All the packages can be available motor with electromagnetic brake. (Except for the standard type IP65 rated motor and **ASC** Series with a motor frame size of 28 mm.)

Two Types of Drivers

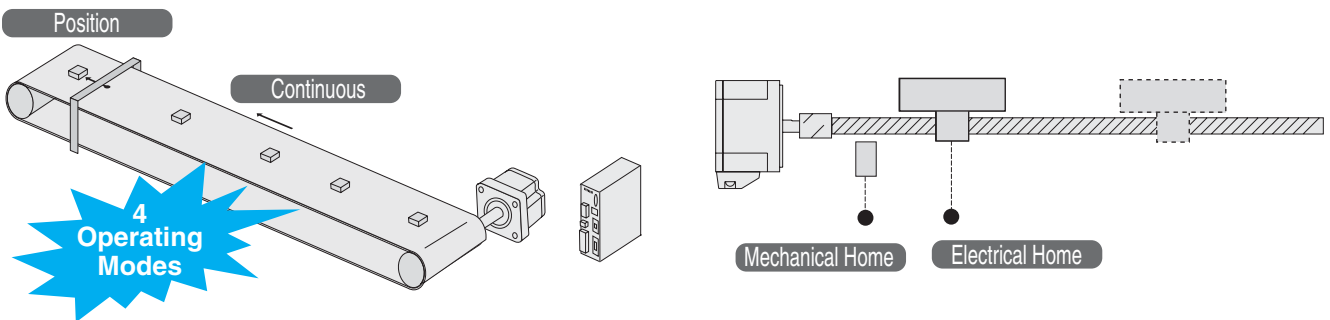
	AC Input	DC Input
Pulse Input Various motor controls can be performed using a pulse generator provided by the user.  		
Built-In Controller (Stored Program) The built-in pulse generation function allows the motor to be driven via a directly connected programmable controller. Since no separate pulse generator is required, the drivers of this type save space, simplify wiring, and also allow the number of axes to be increased with ease. 		

■ Features of Built-In Controller (Stored Program) Package

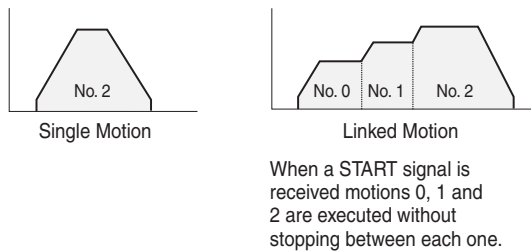
The built-in controller (stored program) driver has an integrated controller which ensures a simple, efficient solution for stepping motor applications. Intelligent, integrated, and ideal for technology's increasing demand on motion control, the built-in controller (stored program) is computer-programmable via an RS-232C connection.



● Operating Modes

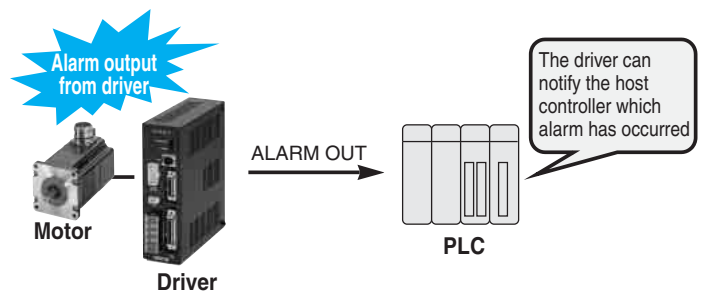


● Linked Motion Capability

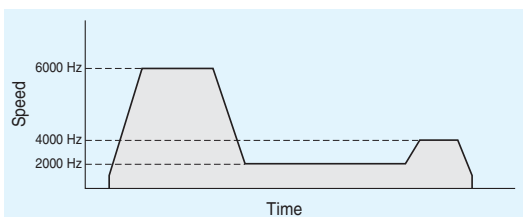


● Alarm Functions

The driver can flash LEDs to indicate which alarm has occurred.

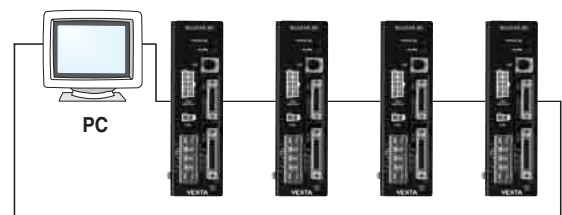


● Speed Change on the Fly



The running speed of the motor can be changed while the motor is in motion.

● Daisy Chain



Up to 36 units can be daisy chained via customer supplied cable.

● Position Control

- Incremental mode (relative distance specification)/Absolute mode (absolute position specification)
- Linked operation (a maximum of four motion profiles may be linked)
- Data range (in pulses): -8 388 608 to +8 388 607
- Operating speed: 10 Hz to 500 kHz (set in 1 Hz increments)

● Four Operation Modes

1. Positioning
2. Mechanical home seeking (+LS, -LS, HOME)LS)
3. Continuous
4. Electrical home seeking

● General Inputs/Outputs

- 8 Programmable Inputs
- 8 Programmable Outputs

● Daisy Chain Capability

- Up to 36 units can be daisy chained with unique device ID's

● Communication

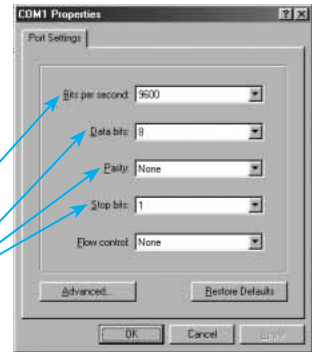
- ASCII based commands
- Conforms to RS-232C communication specifications
- Start-stop asynchronous transmission method
- Transmission speed: 9600 bps
- Data length: 8 bits, 1 stop bit, no parity
- Protocol: TTY (CR+LF)
- Modular 4-pin connector

● Program Memory

- Maximum number of programs: 14 (including STARTUP)
- Maximum lines per program: 64
- Commands per line: 1
- Program variables: 26 (A to Z)

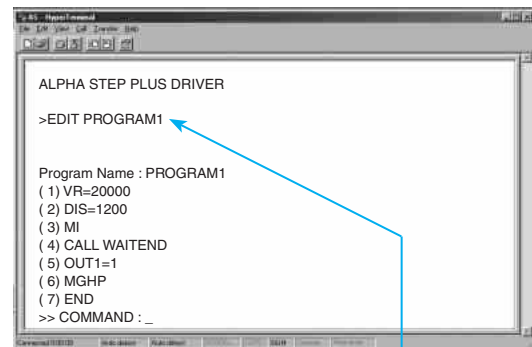
● Built-In Functions

- Selectable motor-resolution
- Sensor logic
- Display values
- Run and stop current values
- Over-travel limits
- Incremental moves
- Speed-filter set value
- Software over-travel
- I/O status
- Motor rotation direction
- Alarm history
- Emergency stop
- Syntax checking



Using Windows HyperTerminal®, programming the built-in controller (stored program) driver is a simple task.

Example: "PROGRAM1"



PROGRAM1 Definition

- Operating Speed: 20000 Hz
- Move Distance: 1200 pulses
- Call a subroutine that waits for the motor to stop before moving on to the next command
- Turn On Output #1
- Seek the Mechanical Home Position in the Positive Direction
- End of Program

■ Safety Standard and CE Marking

Model	Standards	Certification Body	File No.	CE Marking
Motor	UL 1004 UL 2111 CSA C22.2 No.100 ^{*1} CSA C22.2 No.77 ^{*1}	UL	E64199	Low Voltage Directives EMC Directives
	EN 60950-1 EN 60034-1 EN 60034-5 IEC 60664-1	Conform to EN Standards		
Driver	UL 508C ^{*2} CSA C22.2 No.14	UL	E171462	Low Voltage Directives EMC Directives
	EN 60950-1 ^{*3} EN 50178	Conform to EN Standards		

● When the system is approved under various safety standards, the model names on the motor and driver nameplates are the approved model names.

List of Motor and Driver Combinations → Pages 48 and 49

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

*1 Except for AS46 (Motor Frame size 42 mm)

*2 Maximum Ambient Temperature for UL

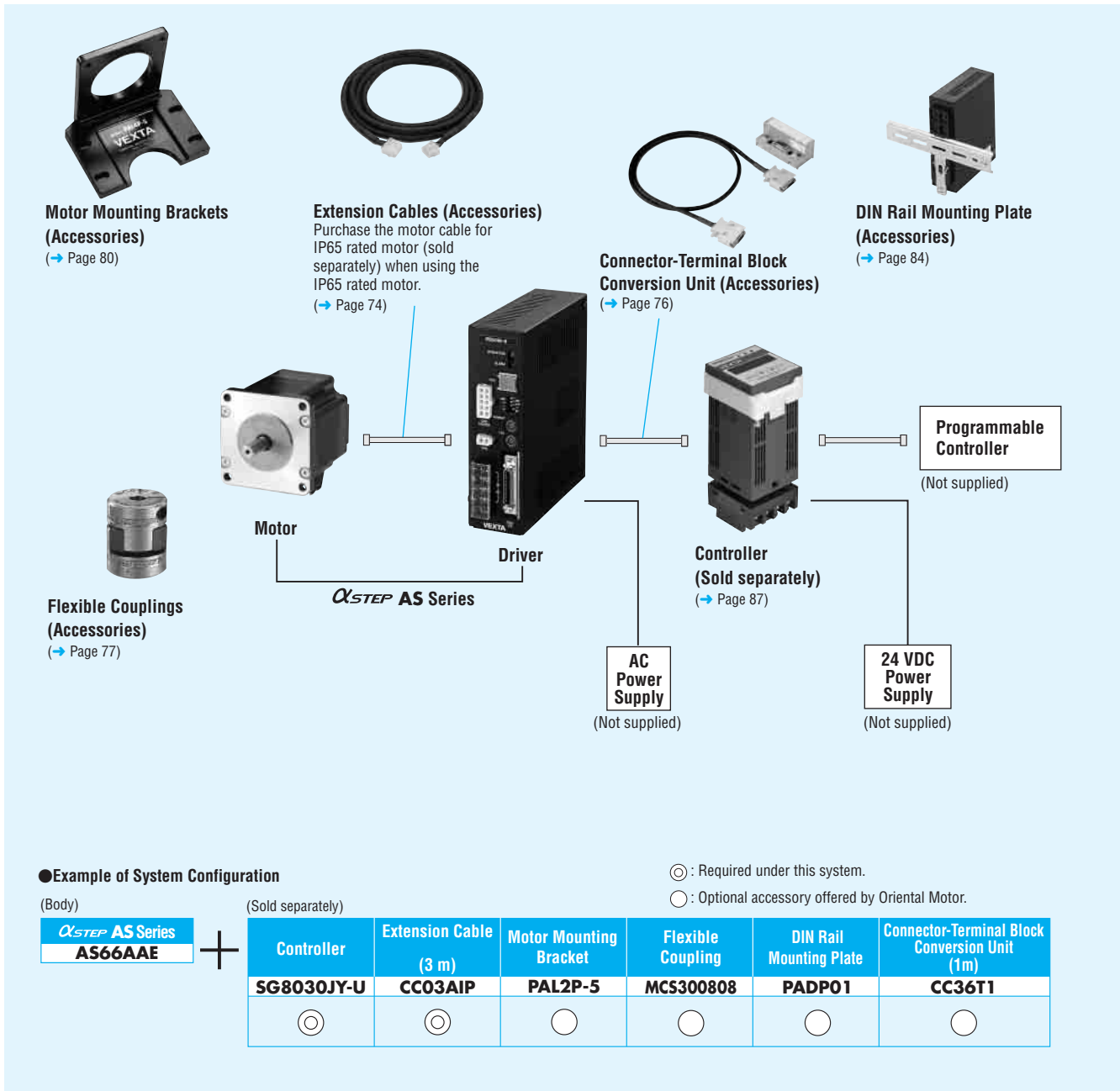
Pulse Input: +50°C, Built-In Controller (Stored Program): +40°C

*3 EN 60950-1 (Certified Pulse Input only)

System Configuration

Pulse Input Package

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



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

Extension Cables

Pulse Input Package

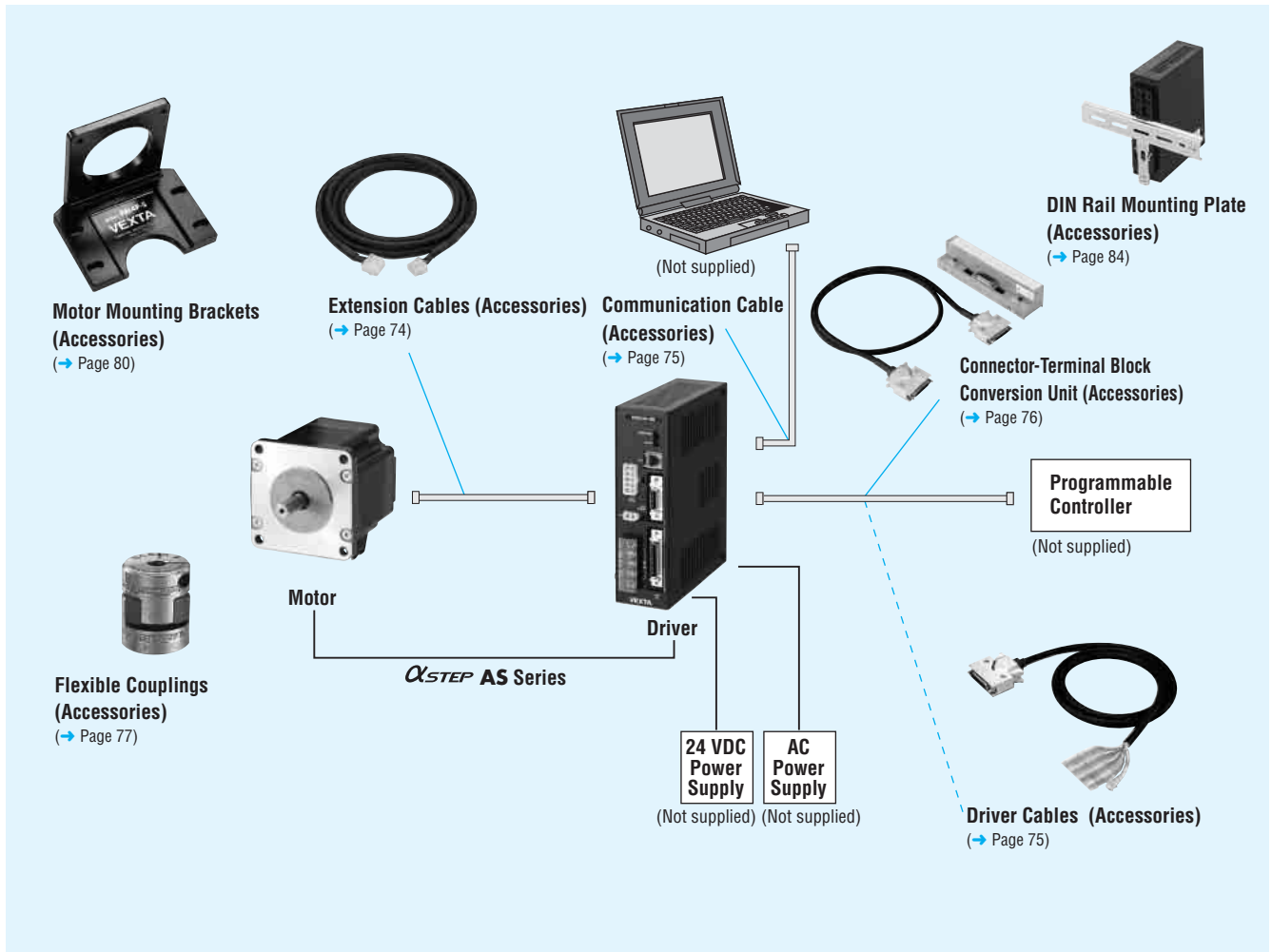
Extension cables are not included with **αSTEP** products. When using the **αSTEP** stepping motor and driver more than 0.4 m apart from each other, use an extension cable (sold separately).

Electromagnetic brake motor models (except motor frame size 42 mm) must use an extension cable for electromagnetic brake motor (sold separately). For electromagnetic brake motor with motor frame size \square 42 mm, use an extension cable for standard motor. → Page 74

Motor Cable for IP65 Rated Motor

Always use the motor cable for IP65 rated motor (sold separately) for connection between the IP65 rated motor and the driver. → Page 74

● **Built-In Controller (Stored Program) Package**



● **Example of System Configuration**

(Body)

AS66AAEP

(Sold separately)

Extension Cable (3 m)	Motor Mounting Bracket	Flexible Coupling	DIN Rail Mounting Plate	Connector-Terminal Block Conversion Unit	
CC03AIP	PAL2P-5	MCS300808	PADP01	CC20T1	CC36T1
◎	○	○	○	○	○

◎ : Required under this system.

○ : Optional accessory offered by Oriental Motor.

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

■ **Extension Cables**

● **Built-In Controller (Stored Program) Package**

Extension cables are not included with *AS* products. When using the *AS* stepping motor and driver more than 0.4 m apart from each other, use an extension cable (sold separately).

● Electromagnetic brake motor models (except motor frame size 42 mm) must use an extension cable for electromagnetic brake motor (sold separately). For electromagnetic brake motor with motor frame size □42 mm, use an extension cable for standard motor. → Page 74

■ **Motor Cable for IP65 Rated Motor**

Always use the motor cable for IP65 rated motor (sold separately) for connection between the IP65 rated motor and the driver. → Page 74

Product Number Code

Standard Type

AS 6 6 A A E P

① ② ③ ④ ⑤ ⑥ ⑦

Standard Type IP65 Rated Motor

AS 6 6 A A T P

① ② ③ ④ ⑤ ⑥ ⑦

Geared Type

AS 6 6 A C E P - N 50

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

AS 4 6 A A P 2 - H 100

① ② ③ ④ ⑤ ⑦ ⑩ ⑧ ⑨

①	Series AS: AS Series
②	Motor Frame Size 4: 42 mm 6: 60 mm 9: 85 mm
③	Motor Case Length
④	Motor Type A: Standard (Single Shaft) M: Electromagnetic Brake Type
⑤	Power Supply Voltage A: Single-Phase 100-115 VAC C: Single-Phase 200-230 VAC S: Three-Phase 200-230 VAC
⑥	Motor Classification
⑦	Driver Type P: Built-In Controller (Stored Program) Package Blank: Pulse Input Package

①	Series AS: AS Series
②	Motor Frame Size 6: 60 mm 9: 85 mm
③	Motor Case Length
④	Motor Shaft Type A: Single Shaft
⑤	Power Supply Voltage A: Single-Phase 100-115 VAC C: Single-Phase 200-230 VAC S: Three-Phase 200-230 VAC
⑥	Motor Classification
⑦	Driver Type P: Built-In Controller (Stored Program) Package Blank: Pulse Input Package

①	Series AS: AS Series
②	Motor Frame Size 4: 42 mm 6: 60 mm 9: 90 mm
③	Motor Case Length
④	Motor Type A: Standard (Single Shaft) M: Electromagnetic Brake Type
⑤	Power Supply Voltage A: Single-Phase 100-115 VAC C: Single-Phase 200-230 VAC S: Three-Phase 200-230 VAC
⑥	Motor Classification
⑦	Driver Type P: Built-In Controller (Stored Program) Package Blank: Pulse Input Package
⑧	Gearhead Type T: TH Geared Type P: PL Geared Type N: PN Geared Type H: Harmonic Geared Type
⑨	Gear Ratio
⑩	Reference Number

Product Line

The product names below are all for single shaft types, but there are also double shaft models available for all products except for those with electromagnetic brakes or IP65 rated motor. Contact the nearest Oriental Motor office for further information on the double shaft models.

Pulse Input Package

Standard Type

Power Supply Voltage	Model (Single Shaft)
Single-Phase 100-115 VAC	AS46AA
	AS66AAE <small>NEW</small>
	AS69AAE <small>NEW</small>
	AS98AAE <small>NEW</small>
	AS911AAE <small>NEW</small>
Single-Phase 200-230 VAC	AS66ACE <small>NEW</small>
	AS69ACE <small>NEW</small>
	AS98ACE <small>NEW</small>
	AS911ACE <small>NEW</small>
	AS66ASE <small>NEW</small>
Three-Phase 200-230 VAC	AS69ASE <small>NEW</small>
	AS98ASE <small>NEW</small>
	AS911ASE <small>NEW</small>

Standard Type with Electromagnetic Brake

Power Supply Voltage	Model (Single Shaft)
Single-Phase 100-115 VAC	AS46MA
	AS66MAE <small>NEW</small>
	AS69MAE <small>NEW</small>
	AS98MAE <small>NEW</small>
	AS66MCE <small>NEW</small>
Single-Phase 200-230 VAC	AS69MCE <small>NEW</small>
	AS98MCE <small>NEW</small>
	AS66MSE <small>NEW</small>
Three-Phase 200-230 VAC	AS69MSE <small>NEW</small>
	AS98MSE <small>NEW</small>

Standard Type IP65 Rated Motor

Always use the motor cable for IP65 rated motor (sold separately) for connection between the IP65 rated motor and the driver.

Motor Cable for IP65 Rated Motor → Page 74

Power Supply Voltage	Model (Single Shaft)
Single-Phase 100-115 VAC	AS66AAT <small>NEW</small>
	AS69AAT <small>NEW</small>
	AS98AAT <small>NEW</small>
	AS911AAT <small>NEW</small>
Single-Phase 200-230 VAC	AS66ACT <small>NEW</small>
	AS69ACT <small>NEW</small>
	AS98ACT <small>NEW</small>
	AS911ACT <small>NEW</small>
Three-Phase 200-230 VAC	AS66AST <small>NEW</small>
	AS69AST <small>NEW</small>
	AS98AST <small>NEW</small>
	AS911AST <small>NEW</small>

◇TH Geared Type

Power Supply Voltage	Model (Single Shaft)	
Single-Phase 100-115 VAC	AS46AA-T3.6	
	AS46AA-T7.2	
	AS46AA-T10	
	AS46AA-T20	
	AS46AA-T30	
	AS66AAE-T3.6	
	AS66AAE-T7.2	
	AS66AAE-T10	
	AS66AAE-T20	
	AS66AAE-T30	
	AS98AAE-T3.6	
	AS98AAE-T7.2	
	AS98AAE-T10	
	AS98AAE-T20	
	AS98AAE-T30	
Single-Phase 200-230 VAC	AS66ACE-T3.6	
	AS66ACE-T7.2	
	AS66ACE-T10	
	AS66ACE-T20	
	AS66ACE-T30	
	AS98ACE-T3.6	
	AS98ACE-T7.2	
	AS98ACE-T10	
	AS98ACE-T20	
	AS98ACE-T30	
	Three-Phase 200-230 VAC	AS66ASE-T3.6
		AS66ASE-T7.2
		AS66ASE-T10
		AS66ASE-T20
		AS66ASE-T30
AS98ASE-T3.6		
AS98ASE-T7.2		
AS98ASE-T10		
AS98ASE-T20		
AS98ASE-T30		

◇PL Geared Type

Power Supply Voltage	Model (Single Shaft)	
Single-Phase 100-115 VAC	AS46AA-P7.2	
	AS46AA-P10	
	AS46AA-P36	
	AS46AA-P50	
	AS66AAE-P5	
	AS66AAE-P7.2	
	AS66AAE-P10	
	AS66AAE-P25	
	AS66AAE-P36	
	AS66AAE-P50	
	AS98AAE-P5	
	AS98AAE-P7.2	
	AS98AAE-P10	
	AS98AAE-P25	
	AS98AAE-P36	
AS98AAE-P50		
Single-Phase 200-230 VAC	AS66ACE-P5	
	AS66ACE-P7.2	
	AS66ACE-P10	
	AS66ACE-P25	
	AS66ACE-P36	
	AS66ACE-P50	
	AS98ACE-P5	
	AS98ACE-P7.2	
	AS98ACE-P10	
	AS98ACE-P25	
	AS98ACE-P36	
	AS98ACE-P50	
	Three-Phase 200-230 VAC	AS66ASE-P5
		AS66ASE-P7.2
		AS66ASE-P10
AS66ASE-P25		
AS66ASE-P36		
AS66ASE-P50		
AS98ASE-P5		
AS98ASE-P7.2		
AS98ASE-P10		
AS98ASE-P25		
AS98ASE-P36		
AS98ASE-P50		

◇TH Geared Type with Electromagnetic Brake





































Power Supply Voltage	Model (Single Shaft)	
Single-Phase 100-115 VAC	AS46MA-T3.6	
	AS46MA-T7.2	
	AS46MA-T10	
	AS46MA-T20	
	AS46MA-T30	
	AS66MAE-T3.6	
	AS66MAE-T7.2	
	AS66MAE-T10	
	AS66MAE-T20	
	AS66MAE-T30	
	AS98MAE-T3.6	
	AS98MAE-T7.2	
	AS98MAE-T10	
	AS98MAE-T20	
	AS98MAE-T30	
Single-Phase 200-230 VAC	AS66MCE-T3.6	
	AS66MCE-T7.2	
	AS66MCE-T10	
	AS66MCE-T20	
	AS66MCE-T30	
	AS98MCE-T3.6	
	AS98MCE-T7.2	
	AS98MCE-T10	
	AS98MCE-T20	
	AS98MCE-T30	
	Three-Phase 200-230 VAC	AS66MSE-T3.6
		AS66MSE-T7.2
		AS66MSE-T10
		AS66MSE-T20
		AS66MSE-T30
AS98MSE-T3.6		
AS98MSE-T7.2		
AS98MSE-T10		
AS98MSE-T20		
AS98MSE-T30		

◇PL Geared Type with Electromagnetic Brake





































Power Supply Voltage	Model (Single Shaft)	
Single-Phase 100-115 VAC	AS46MA-P7.2	
	AS46MA-P10	
	AS46MA-P36	
	AS46MA-P50	
	AS66MAE-P5	
	AS66MAE-P7.2	
	AS66MAE-P10	
	AS66MAE-P25	
	AS66MAE-P36	
	AS66MAE-P50	
	AS98MAE-P5	
	AS98MAE-P7.2	
	AS98MAE-P10	
	AS98MAE-P25	
	AS98MAE-P36	
AS98MAE-P50		
Single-Phase 200-230 VAC	AS66MCE-P5	
	AS66MCE-P7.2	
	AS66MCE-P10	
	AS66MCE-P25	
	AS66MCE-P36	
	AS66MCE-P50	
	AS98MCE-P5	
	AS98MCE-P7.2	
	AS98MCE-P10	
	AS98MCE-P25	
	AS98MCE-P36	
	AS98MCE-P50	
	Three-Phase 200-230 VAC	AS66MSE-P5
		AS66MSE-P7.2
		AS66MSE-P10
AS66MSE-P25		
AS66MSE-P36		
AS66MSE-P50		
AS98MSE-P5		
AS98MSE-P7.2		
AS98MSE-P10		
AS98MSE-P25		
AS98MSE-P36		
AS98MSE-P50		

Features	AC Input AS Series
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◇PN Geared Type

Power Supply Voltage	Model (Single Shaft)	
Single-Phase 100-115 VAC	AS46AA-N7.2	
	AS46AA-N10	
	AS66AAE-N5 	
	AS66AAE-N7.2 	
	AS66AAE-N10 	
	AS66AAE-N25 	
	AS66AAE-N36 	
	AS66AAE-N50 	
	AS98AAE-N5 	
	AS98AAE-N7.2 	
	AS98AAE-N10 	
	AS98AAE-N25 	
	AS98AAE-N36 	
	AS98AAE-N50 	
Single-Phase 200-230 VAC	AS66ACE-N5 	
	AS66ACE-N7.2 	
	AS66ACE-N10 	
	AS66ACE-N25 	
	AS66ACE-N36 	
	AS66ACE-N50 	
	AS98ACE-N5 	
	AS98ACE-N7.2 	
	AS98ACE-N10 	
	AS98ACE-N25 	
	AS98ACE-N36 	
	AS98ACE-N50 	
	Three-Phase 200-230 VAC	AS66ASE-N5 
		AS66ASE-N7.2 
AS66ASE-N10 		
AS66ASE-N25 		
AS66ASE-N36 		
AS66ASE-N50 		
AS98ASE-N5 		
AS98ASE-N7.2 		
AS98ASE-N10 		
AS98ASE-N25 		
AS98ASE-N36 		
AS98ASE-N50 		













◇PN Geared Type with Electromagnetic Brake

Power Supply Voltage	Model (Single Shaft)	
Single-Phase 100-115 VAC	AS46MA-N7.2	
	AS46MA-N10	
	AS66MAE-N5 	
	AS66MAE-N7.2 	
	AS66MAE-N10 	
	AS66MAE-N25 	
	AS66MAE-N36 	
	AS66MAE-N50 	
	AS98MAE-N5 	
	AS98MAE-N7.2 	
	AS98MAE-N10 	
	AS98MAE-N25 	
	AS98MAE-N36 	
	AS98MAE-N50 	
Single-Phase 200-230 VAC	AS66MCE-N5 	
	AS66MCE-N7.2 	
	AS66MCE-N10 	
	AS66MCE-N25 	
	AS66MCE-N36 	
	AS66MCE-N50 	
	AS98MCE-N5 	
	AS98MCE-N7.2 	
	AS98MCE-N10 	
	AS98MCE-N25 	
	AS98MCE-N36 	
	AS98MCE-N50 	
	Three-Phase 200-230 VAC	AS66MSE-N5 
		AS66MSE-N7.2 
AS66MSE-N10 		
AS66MSE-N25 		
AS66MSE-N36 		
AS66MSE-N50 		
AS98MSE-N5 		
AS98MSE-N7.2 		
AS98MSE-N10 		
AS98MSE-N25 		
AS98MSE-N36 		
AS98MSE-N50 		

◇Harmonic Geared Type













Power Supply Voltage	Model (Single Shaft)
Single-Phase 100-115 VAC	AS46AA2-H50
	AS46AA2-H100
	AS66AAE-H50 
	AS66AAE-H100 
	AS98AAE-H50 
Single-Phase 200-230 VAC	AS66ACE-H50 
	AS66ACE-H100 
	AS98ACE-H50 
Three-Phase 200-230 VAC	AS98ACE-H100 
	AS66ASE-H50 
	AS66ASE-H100 
	AS98ASE-H50 
Three-Phase 200-230 VAC	AS98ASE-H100 

◇Harmonic Geared Type with Electromagnetic Brake

Power Supply Voltage	Model (Single Shaft)
Single-Phase 100-115 VAC	AS46MA2-H50
	AS46MA2-H100
	AS66MAE-H50 
	AS66MAE-H100 
	AS98MAE-H50 
Single-Phase 200-230 VAC	AS98MAE-H100 
	AS66MCE-H50 
	AS66MCE-H100 
Three-Phase 200-230 VAC	AS98MCE-H50 
	AS98MCE-H100 
	AS66MSE-H50 
	AS66MSE-H100 
Three-Phase 200-230 VAC	AS98MSE-H50 
	AS98MSE-H100 

● Built-In Controller (Stored Program) Package













◇ Standard Type

Power Supply Voltage	Model (Single Shaft)
Single-Phase 100-115 VAC	AS46AAP
	AS66AAEP 
	AS69AAEP 
	AS98AAEP 
	AS911AAEP 
Single-Phase 200-230 VAC	AS66ACEP 
	AS69ACEP 
	AS98ACEP 
	AS911ACEP 
	AS66ASEP 
Three-Phase 200-230 VAC	AS69ASEP 
	AS98ASEP 
	AS911ASEP 































◇ Standard Type IP65 Rated Motor

Always use the motor cable for IP65 rated motor (sold separately) for connection between the IP65 rated motor and the driver.










Motor Cable for IP65 Rated Motor → Page 74

Power Supply Voltage	Model (Single Shaft)
Single-Phase 100-115 VAC	AS66AATP 
	AS69AATP 
	AS98AATP 
	AS911AATP 
Single-Phase 200-230 VAC	AS66ACTP 
	AS69ACTP 
	AS98ACTP 
	AS911ACTP 
Three-Phase 200-230 VAC	AS66ASTP 
	AS69ASTP 
	AS98ASTP 
	AS911ASTP 































◇ TH Geared Type

Power Supply Voltage	Model (Single Shaft)	
Single-Phase 100-115 VAC	AS46AAP-T3.6	
	AS46AAP-T7.2	
	AS46AAP-T10	
	AS46AAP-T20	
	AS46AAP-T30	
	AS66AAEP-T3.6 	
	AS66AAEP-T7.2 	
	AS66AAEP-T10 	
	AS66AAEP-T20 	
	AS66AAEP-T30 	
	AS98AAEP-T3.6 	
	AS98AAEP-T7.2 	
	AS98AAEP-T10 	
	AS98AAEP-T20 	
	AS98AAEP-T30 	
Single-Phase 200-230 VAC	AS66ACEP-T3.6 	
	AS66ACEP-T7.2 	
	AS66ACEP-T10 	
	AS66ACEP-T20 	
	AS66ACEP-T30 	
	AS98ACEP-T3.6 	
	AS98ACEP-T7.2 	
	AS98ACEP-T10 	
	AS98ACEP-T20 	
	AS98ACEP-T30 	
	Three-Phase 200-230 VAC	AS66ASEP-T3.6 
		AS66ASEP-T7.2 
		AS66ASEP-T10 
		AS66ASEP-T20 
		AS66ASEP-T30 
AS98ASEP-T3.6 		
AS98ASEP-T7.2 		
AS98ASEP-T10 		
AS98ASEP-T20 		
AS98ASEP-T30 		

◇ Standard Type with Electromagnetic Brake

Power Supply Voltage	Model (Single Shaft)
Single-Phase 100-115 VAC	AS46MAP
	AS66MAEP 
	AS69MAEP 
	AS98MAEP 
	AS66MCEP 
Single-Phase 200-230 VAC	AS69MCEP 
	AS98MCEP 
	AS66MSEP 
Three-Phase 200-230 VAC	AS69MSEP 
	AS98MSEP 

◇ TH Geared Type with Electromagnetic Brake

Power Supply Voltage	Model (Single Shaft)	
Single-Phase 100-115 VAC	AS46MAP-T3.6	
	AS46MAP-T7.2	
	AS46MAP-T10	
	AS46MAP-T20	
	AS46MAP-T30	
	AS66MAEP-T3.6 	
	AS66MAEP-T7.2 	
	AS66MAEP-T10 	
	AS66MAEP-T20 	
	AS66MAEP-T30 	
	AS98MAEP-T3.6 	
	AS98MAEP-T7.2 	
	AS98MAEP-T10 	
	AS98MAEP-T20 	
	AS98MAEP-T30 	
Single-Phase 200-230 VAC	AS66MCEP-T3.6 	
	AS66MCEP-T7.2 	
	AS66MCEP-T10 	
	AS66MCEP-T20 	
	AS66MCEP-T30 	
	AS98MCEP-T3.6 	
	AS98MCEP-T7.2 	
	AS98MCEP-T10 	
	AS98MCEP-T20 	
	AS98MCEP-T30 	
	Three-Phase 200-230 VAC	AS66MSEP-T3.6 
		AS66MSEP-T7.2 
		AS66MSEP-T10 
		AS66MSEP-T20 
		AS66MSEP-T30 
AS98MSEP-T3.6 		
AS98MSEP-T7.2 		
AS98MSEP-T10 		
AS98MSEP-T20 		
AS98MSEP-T30 		

◇PN Geared Type

Power Supply Voltage	Model (Single Shaft)	
Single-Phase 100-115 VAC	AS46AAP-N7.2	
	AS46AAP-N10	
	AS66AAEP-N5	
	AS66AAEP-N7.2	
	AS66AAEP-N10	
	AS66AAEP-N25	
	AS66AAEP-N36	
	AS66AAEP-N50	
	AS98AAEP-N5	
	AS98AAEP-N7.2	
	AS98AAEP-N10	
	AS98AAEP-N25	
	AS98AAEP-N36	
	AS98AAEP-N50	
Single-Phase 200-230 VAC	AS66ACEP-N5	
	AS66ACEP-N7.2	
	AS66ACEP-N10	
	AS66ACEP-N25	
	AS66ACEP-N36	
	AS66ACEP-N50	
	AS98ACEP-N5	
	AS98ACEP-N7.2	
	AS98ACEP-N10	
	AS98ACEP-N25	
	AS98ACEP-N36	
	AS98ACEP-N50	
	Three-Phase 200-230 VAC	AS66ASEP-N5
		AS66ASEP-N7.2
AS66ASEP-N10		
AS66ASEP-N25		
AS66ASEP-N36		
AS66ASEP-N50		
AS98ASEP-N5		
AS98ASEP-N7.2		
AS98ASEP-N10		
AS98ASEP-N25		
AS98ASEP-N36		
AS98ASEP-N50		

◇Harmonic Geared Type

Power Supply Voltage	Model (Single Shaft)
Single-Phase 100-115 VAC	AS46AAP2-H50
	AS46AAP2-H100
	AS66AAEP-H50
	AS66AAEP-H100
	AS98AAEP-H50
Single-Phase 200-230 VAC	AS66ACEP-H50
	AS66ACEP-H100
	AS98ACEP-H50
	AS98ACEP-H100
Three-Phase 200-230 VAC	AS66ASEP-H50
	AS66ASEP-H100
	AS98ASEP-H50
	AS98ASEP-H100

◇PN Geared Type with Electromagnetic Brake

Power Supply Voltage	Model (Single Shaft)	
Single-Phase 100-115 VAC	AS46MAP-N7.2	
	AS46MAP-N10	
	AS66MAEP-N5	
	AS66MAEP-N7.2	
	AS66MAEP-N10	
	AS66MAEP-N25	
	AS66MAEP-N36	
	AS66MAEP-N50	
	AS98MAEP-N5	
	AS98MAEP-N7.2	
	AS98MAEP-N10	
	AS98MAEP-N25	
	AS98MAEP-N36	
	AS98MAEP-N50	
Single-Phase 200-230 VAC	AS66MCEP-N5	
	AS66MCEP-N7.2	
	AS66MCEP-N10	
	AS66MCEP-N25	
	AS66MCEP-N36	
	AS66MCEP-N50	
	AS98MCEP-N5	
	AS98MCEP-N7.2	
	AS98MCEP-N10	
	AS98MCEP-N25	
	AS98MCEP-N36	
	AS98MCEP-N50	
	Three-Phase 200-230 VAC	AS66MSEP-N5
		AS66MSEP-N7.2
AS66MSEP-N10		
AS66MSEP-N25		
AS66MSEP-N36		
AS66MSEP-N50		
AS98MSEP-N5		
AS98MSEP-N7.2		
AS98MSEP-N10		
AS98MSEP-N25		
AS98MSEP-N36		
AS98MSEP-N50		

◇Harmonic Geared Type with Electromagnetic Brake

Power Supply Voltage	Model (Single Shaft)
Single-Phase 100-115 VAC	AS46MAP2-H50
	AS46MAP2-H100
	AS66MAEP-H50
	AS66MAEP-H100
	AS98MAEP-H50
Single-Phase 200-230 VAC	AS66MCEP-H50
	AS66MCEP-H100
	AS98MCEP-H50
	AS98MCEP-H100
Three-Phase 200-230 VAC	AS66MSEP-H50
	AS66MSEP-H100
	AS98MSEP-H50
	AS98MSEP-H100

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

Specifications (RoHS)

With the AS46 type, only the driver conforms to the CSA standard.

Model	Pulse Input Package	Standard	AS46AA	AS66A□E	AS69A□E	AS98A□E	AS911A□E
	Electromagnetic Brake	Standard	AS46MA	AS66M□E	AS69M□E	AS98M□E	—
Built-In Controller (Stored Program) Package	Standard	AS46AAP	AS66A□EP	AS69A□EP	AS98A□EP	AS911A□EP	—
	Electromagnetic Brake	AS46MAP	AS66M□EP	AS69M□EP	AS98M□EP	—	—
Maximum Holding Torque	N·m	0.3	1.2	2		4	—
Rotor Inertia	J: kg·m ²	68×10 ⁻⁷ [83×10 ⁻⁷]*1	405×10 ⁻⁷ [564×10 ⁻⁷]*1	802×10 ⁻⁷ [961×10 ⁻⁷]*1	1400×10 ⁻⁷ [1560×10 ⁻⁷]*1	2710×10 ⁻⁷	—
Resolution*2	Resolution Setting: 1000 P/R	0.36°/Pulse					
Power Source	Voltage-Frequency	Single-Phase 100-115 VAC	Single-Phase 100-115 VAC		Single-Phase 200-230 VAC	Single-Phase 200-230 VAC	Three-Phase 200-230 VAC
		—15%~+10% 50/60 Hz	—15%~+10% 50/60 Hz		—15%~+10% 50/60 Hz	—15%~+10% 50/60 Hz	—15%~+10% 50/60 Hz
		—	—		—	—	—
Maximum Input Current A	Single-Phase 100-115 VAC	3.3	5	6.4	6	6.5	—
	Single-Phase 200-230 VAC	—	3	3.9	3.5	4.5	—
	Three-Phase 200-230 VAC	—	1.5	2.2	1.9	2.4	—
Electromagnetic Brake*3	Type	Active when power is off					
	Power Supply Input	24 VDC±5%					
	Power Consumption W	2	6		—		
	Excitation Current A	0.08	0.25		—		
Static Friction Torque	N·m	0.15	0.6	1		—	—
	Motor	kg	0.5 [0.6]*1	0.85 [1.1]*1	1.4 [1.65]*1	1.8 [2.2]*1	3
Mass	Driver	kg	0.8				—
	Motor		1	2		3	
Dimension No.	Driver	Pulse Input	18			19	
		Built-In Controller (Stored Program)	18			19	

How to Read Specifications Table → Page 72

Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 Pulse Input Package: The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

Resolution Select Switch → Page 37

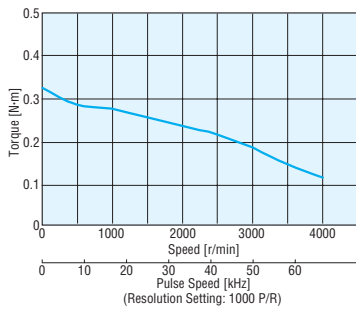
Built-In Controller (Stored Program) Package: The resolution can be set from 500 P/R to 10000 P/R by setting parameters.

*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.3 A minimum (AS46: 0.1 A minimum) power supply is required for the electromagnetic brakes.

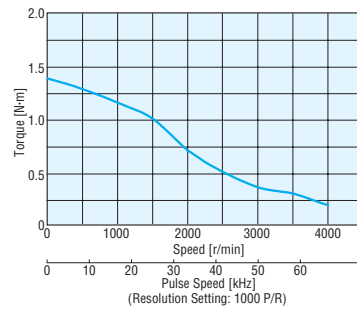
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

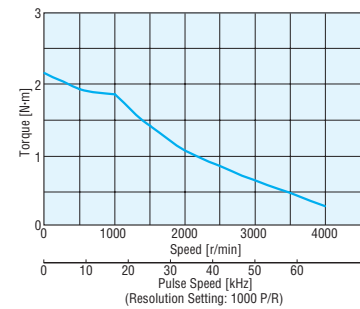
AS46□A/AS46□AP



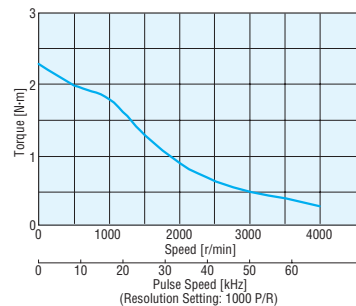
AS66□E/AS66□EP



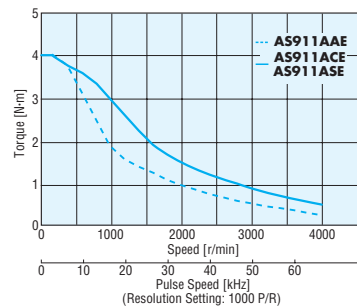
AS69□E/AS69□EP



AS98□E/AS98□EP



AS911A□E/AS911A□EP



Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.

Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

Notes:

Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]

When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

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Functions

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Controllers

AC Input AS Series

DC Input ASC Series

Standard Type IP65 Rated Motor Motor Frame Size 60 mm, 85 mm

Specifications RoHS



Model	Pulse Input Package	Standard	AS66A□T	AS69A□T	AS98A□T	AS911A□T
	Built-In Controller (Stored Program) Package	Standard	AS66A□TP	AS69A□TP	AS98A□TP	AS911A□TP
Maximum Holding Torque	N·m		1.2	2		4
Rotor Inertia	J: kg·m ²		405×10 ⁻⁷	802×10 ⁻⁷	1400×10 ⁻⁷	2710×10 ⁻⁷
Resolution*1	Resolution Setting: 1000 P/R		0.367/Pulse			
Power Source	Voltage-Frequency		Single-Phase 100-115 VAC -15%~+10% 50/60 Hz			
			Single-Phase 200-230 VAC -15%~+10% 50/60 Hz			
			Three-Phase 200-230 VAC -15%~+10% 50/60 Hz			
	Maximum Input Current A	Single-Phase 100-115 VAC	5	6.4	6	6.5
	Single-Phase 200-230 VAC	3	3.9	3.5	4.5	
	Three-Phase 200-230 VAC	1.5	2.2	1.9	2.4	
Degree of Protection			Motor: IP65*2		Driver: IP10	
Mass	Motor	kg	1	1.5	2.2	3.3
	Driver	kg				0.8
Dimension No.	Motor		4		5	
	Driver	Pulse Input			18	
		Built-In Controller (Stored Program)			19	

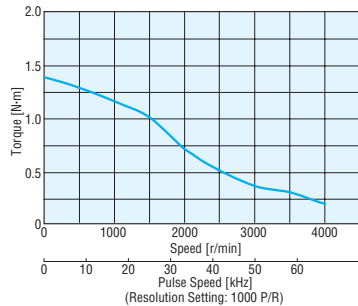
How to Read Specifications Table → Page 72

- Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.
- *1 Pulse Input Package: The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.
- Resolution Select Switch** → Page 37
- Built-In Controller (Stored Program) Package: The resolution can be set from 500 P/R to 10000 P/R by setting parameters.
- *2 Excluding the gap between the shaft and the flange.
- Always use the motor cable for IP65 rated motor (sold separately) for connection between the IP65 rated motor and the driver. → Page 74

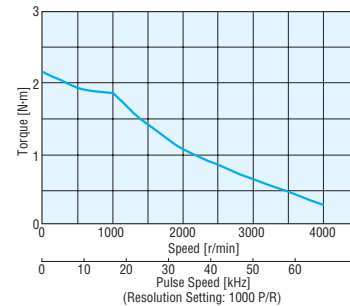
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

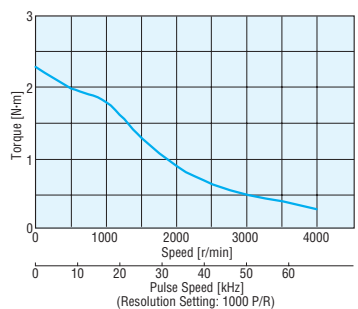
AS66A□T/AS66A□TP



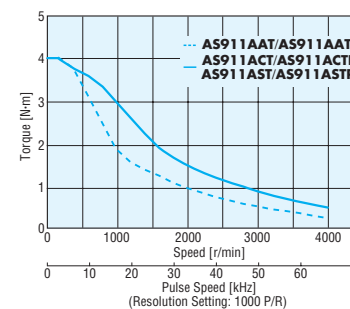
AS69A□T/AS69A□TP



AS98A□T/AS98A□TP



AS911A□T/AS911A□TP



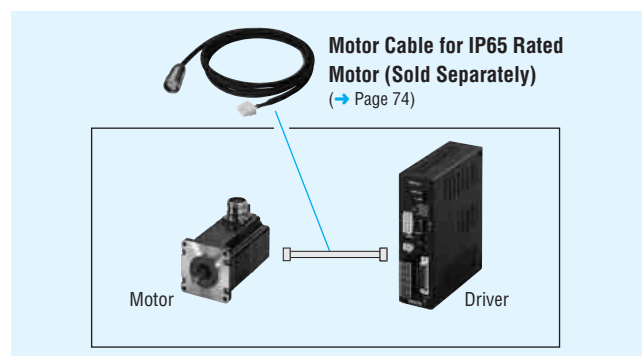
- Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

Notes:

- Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]
- When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

Requirement for Motor Cable for IP65 Rated Motor (Sold Separately)

Always use the motor cable for IP65 rated motor (sold separately) for connection between the IP65 rated motor and the driver. The IP65 rated motor cannot be driven unless the dedicated motor cable is used.



TH Geared Type Motor Frame Size 42 mm

Specifications RoHS

With the **AS46** type, only the driver conforms to the CSA standard.

Model	Pulse Input Package	Standard	AS46AA-T3.6	AS46AA-T7.2	AS46AA-T10	AS46AA-T20	AS46AA-T30
	Built-In Controller (Stored Program) Package	Standard	AS46AAP-T3.6	AS46AAP-T7.2	AS46AAP-T10	AS46AAP-T20	AS46AAP-T30
		Electromagnetic Brake	AS46MAP-T3.6	AS46MAP-T7.2	AS46MAP-T10	AS46MAP-T20	AS46MAP-T30
Maximum Holding Torque	N·m		0.35	0.7	1	1.5	
Rotor Inertia	J: kg·m ²		68×10 ⁻⁷ [83×10 ⁻⁷]*1				
Backlash	arc minute (degrees)		45 (0.75°)	25 (0.417°)	25 (0.417°)	15 (0.25°)	15 (0.25°)
Permissible Speed Range	r/min		0~500	0~250	0~180	0~90	0~60
Gear Ratio			1:3.6	1:7.2	1:10	1:20	1:30
Resolution*2	Resolution Setting: 1000 P/R		0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m		0.35	0.7	1	1.5	
Power Source	Voltage-Frequency		Single-Phase 100-115 VAC -15%~+10% 50/60 Hz				
	Maximum Input Current A	Single-Phase 100-115 VAC	3.3				
Electromagnetic Brake*3	Type		Active when power is off				
	Power Supply Input		24 VDC±5%				
	Power Consumption W		2				
	Excitation Current A		0.08				
	Static Friction Torque	N·m	0.17	0.35	0.5	0.75	
Mass	Motor	kg	0.65 [0.75]*1				
	Driver	kg	0.8				
Dimension No.	Motor		6				
	Driver	Pulse Input	18				
		Built-In Controller (Stored Program)	19				

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*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 Pulse Input Package: The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

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Built-In Controller (Stored Program) Package: The resolution can be set from 500 P/R to 10000 P/R by setting parameters.

*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.1 A minimum power supply is required for the electromagnetic brakes.

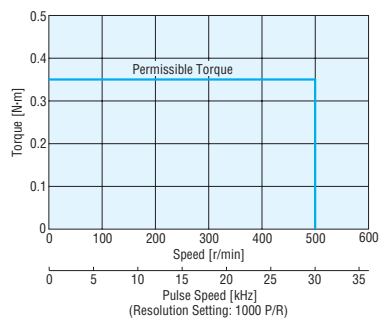
Note:

● Direction of rotation of the motor and that of the gear output shaft are the same for unit type with reduction ratio 1:3.6, 1:7.2 and 1:10. It is opposite for 1:20 and 1:30 ratio type.

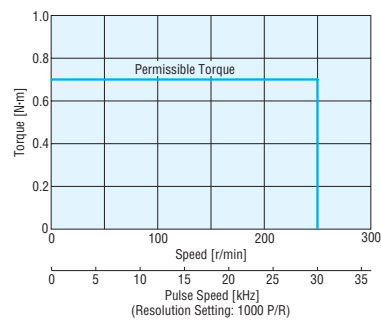
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

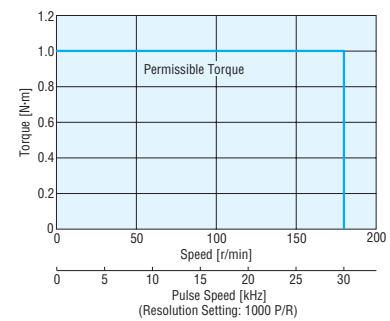
AS46□A-T3.6/AS46□AP-T3.6



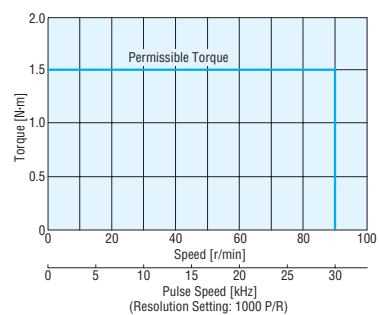
AS46□A-T7.2/AS46□AP-T7.2



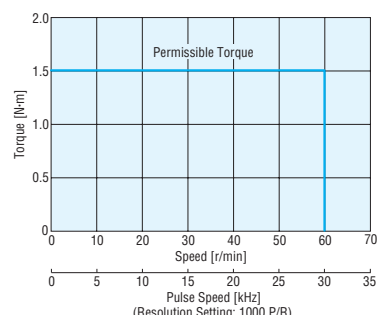
AS46□A-T10/AS46□AP-T10



AS46□A-T20/AS46□AP-T20



AS46□A-T30/AS46□AP-T30



● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.

Notes:

● Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]

● When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

TH Geared Type Motor Frame Size 60 mm

Specifications (RoHS)



Model	Pulse Input Package	Standard	AS66A□E-T3.6	AS66A□E-T7.2	AS66A□E-T10	AS66A□E-T20	AS66A□E-T30
	Electromagnetic Brake	Electromagnetic Brake	AS66M□E-T3.6	AS66M□E-T7.2	AS66M□E-T10	AS66M□E-T20	AS66M□E-T30
Model	Built-In Controller (Stored Program) Package	Standard	AS66A□EP-T3.6	AS66A□EP-T7.2	AS66A□EP-T10	AS66A□EP-T20	AS66A□EP-T30
	Electromagnetic Brake	Electromagnetic Brake	AS66M□EP-T3.6	AS66M□EP-T7.2	AS66M□EP-T10	AS66M□EP-T20	AS66M□EP-T30
Maximum Holding Torque	N·m		1.25	2.5	3	3.5	4
Rotor Inertia	J: kg·m ²		405×10 ⁻⁷ [564×10 ⁻⁷]*1				
Backlash	arc minute (degrees)		35 (0.584°)	15 (0.25°)		10 (0.167°)	
Permissible Speed Range	r/min		0~500	0~250	0~180	0~90	0~60
Gear Ratio			1:3.6	1:7.2	1:10	1:20	1:30
Resolution*2	Resolution Setting: 1000 P/R		0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m		1.25	2.5	3	3.5	4
Power Source	Voltage-Frequency		Single-Phase 100-115 VAC -15%~+10%		50/60 Hz		
			Single-Phase 200-230 VAC -15%~+10%		50/60 Hz		
			Three-Phase 200-230 VAC -15%~+10%		50/60 Hz		
Maximum Input Current A	Single-Phase 100-115 VAC		5				
	Single-Phase 200-230 VAC		3				
	Three-Phase 200-230 VAC		1.5				
Electromagnetic Brake*3	Type		Active when power is off				
	Power Supply Input		24 VDC±5%				
	Power Consumption W		6				
	Excitation Current A		0.25				
Static Friction Torque	N·m		0.62	1.25	1.5	1.75	2
	Motor	kg	1.25 [1.5]*1				
Mass	Driver	kg	0.8				
	Motor		7				
Dimension No.	Pulse Input		18				
	Built-In Controller (Stored Program)		19				

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● Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 Pulse Input Package: The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

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Built-In Controller (Stored Program) Package: The resolution can be set from 500 P/R to 10000 P/R by setting parameters.

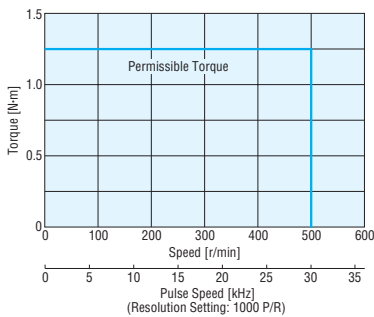
*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.3 A minimum power supply is required for the electromagnetic brakes.

Note:

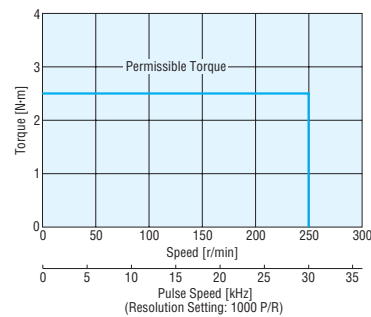
● Direction of rotation of the motor and that of the gear output shaft are the same for unit type with reduction ratio 1:3.6, 1:7.2 and 1:10. It is opposite for 1:20 and 1:30 ratio type.

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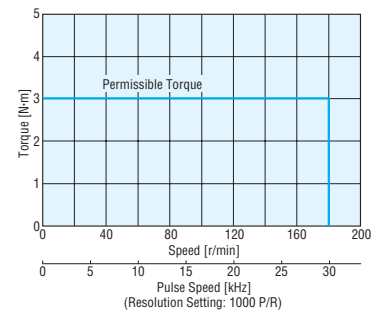
AS66□□E-T3.6/AS66□□EP-T3.6



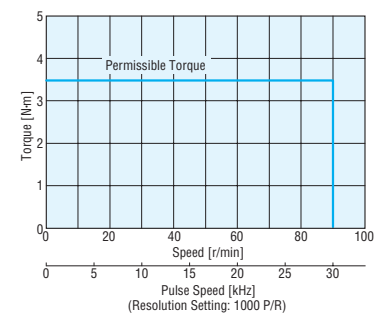
AS66□□E-T7.2/AS66□□EP-T7.2



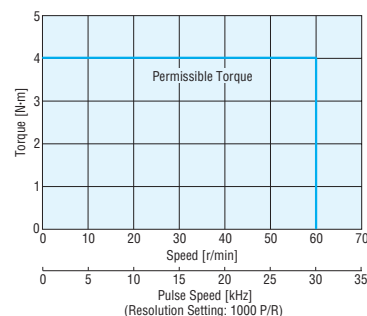
AS66□□E-T10/AS66□□EP-T10



AS66□□E-T20/AS66□□EP-T20



AS66□□E-T30/AS66□□EP-T30



● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.

● Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

Notes:

● Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]

● When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

TH Geared Type Motor Frame Size 90 mm

Specifications (RoHS)



Model	Pulse Input Package	Standard	AS98A□E-T3.6	AS98A□E-T7.2	AS98A□E-T10	AS98A□E-T20	AS98A□E-T30	
	Built-In Controller (Stored Program) Package	Electromagnetic Brake	AS98M□E-T3.6	AS98M□E-T7.2	AS98M□E-T10	AS98M□E-T20	AS98M□E-T30	
Maximum Holding Torque	N·m		4.5	9		12		
Rotor Inertia	J: kg·m ²		1400×10 ⁻⁷ [1560×10 ⁻⁷]*1					
Backlash	arc minute (degrees)		25 (0.417°)	15 (0.25°)		10 (0.167°)		
Permissible Speed Range	r/min		0~500	0~250	0~180	0~90	0~60	
Gear Ratio			1:3.6	1:7.2	1:10	1:20	1:30	
Resolution*2	Resolution Setting: 1000 P/R		0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse	
Permissible Torque	N·m		4.5	9		12		
Power Source	Voltage-Frequency		Single-Phase 100-115 VAC -15%~+10% 50/60 Hz					
			Single-Phase 200-230 VAC -15%~+10% 50/60 Hz					
			Three-Phase 200-230 VAC -15%~+10% 50/60 Hz					
Electromagnetic Brake*3	Maximum Input Current A	Single-Phase 100-115 VAC	6					
		Single-Phase 200-230 VAC	3.5					
		Three-Phase 200-230 VAC	1.9					
		Type	Active when power is off					
		Power Supply Input	24 VDC±5%					
		Power Consumption W	6					
		Excitation Current A	0.25					
Mass	Static Friction Torque	N·m	2.25	4.5		6		
	Motor	kg	3 [3.4]*1					
	Driver	kg	0.8					
Dimension No.	Motor		8					
	Driver	Pulse Input	18					
		Built-In Controller (Stored Program)	19					

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● Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 Pulse Input Package: The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

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Built-In Controller (Stored Program) Package: The resolution can be set from 500 P/R to 10000 P/R by setting parameters.

*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.3 A minimum power supply is required for the electromagnetic brakes.

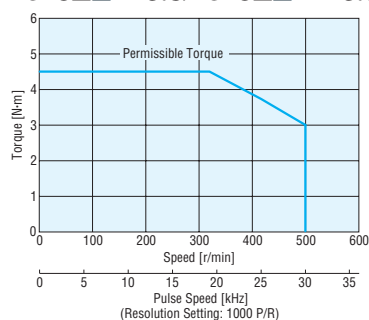
Note:

● Direction of rotation of the motor and that of the gear output shaft are the same for unit type with reduction ratio 1:3.6, 1:7.2 and 1:10. It is opposite for 1:20 and 1:30 ratio type.

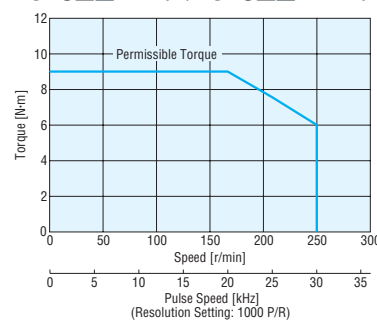
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

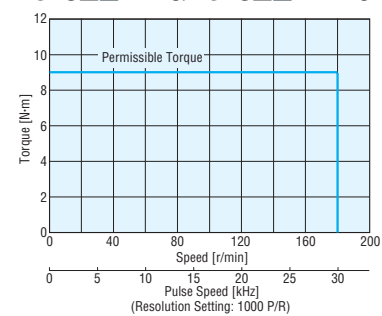
AS98□E-T3.6/AS98□EP-T3.6



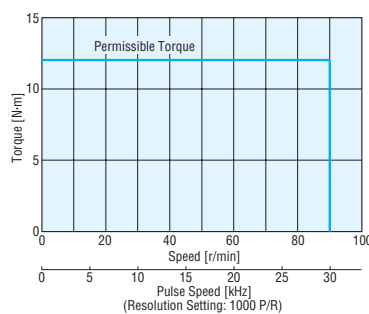
AS98□E-T7.2/AS98□EP-T7.2



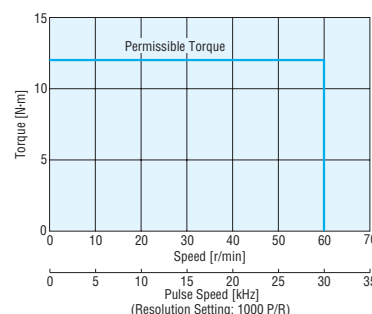
AS98□E-T10/AS98□EP-T10



AS98□E-T20/AS98□EP-T20



AS98□E-T30/AS98□EP-T30



● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.

● Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

Notes:

● Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]

● When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

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PL Geared Type Motor Frame Size 42 mm

Specifications (RoHS)



With the AS46 type, only the driver conforms to the CSA standard.

Model	Pulse Input Package	Standard Electromagnetic Brake	AS46AA-P7.2	AS46AA-P10	AS46AA-P36	AS46AA-P50
			AS46MA-P7.2	AS46MA-P10	AS46MA-P36	AS46MA-P50
Maximum Holding Torque		N·m	1.5		3	
Rotor Inertia		J: kg·m ²	68×10 ⁻⁷ [83×10 ⁻⁷]*1			
Backlash		arc minute (degrees)	35 (0.58°)			
Permissible Speed Range		r/min	0~250	0~180	0~50	0~36
Gear Ratio			1:7.2	1:10	1:36	1:50
Resolution*2	Resolution Setting: 1000 P/R		0.05°/Pulse	0.036°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque		N·m	1.5		3	
Power Source	Voltage-Frequency		Single-Phase 100-115 VAC -15%~+10% 50/60 Hz			
	Maximum Input Current A	Single-Phase 100-115 VAC	3.3			
	Type		Active when power is off			
Electromagnetic Brake*3	Power Supply Input		24 VDC±5%			
	Power Consumption W		2			
	Excitation Current A		0.08			
	Static Friction Torque	N·m	0.75		1.5	
Mass	Motor	kg	0.66 [0.76]*1		0.78 [0.88]*1	
	Driver	kg	0.8			
Dimension No.	Motor		9			
	Driver	Pulse Input	18			

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*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 Pulse Input Package: The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

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*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.1 A minimum power supply is required for the electromagnetic brakes.

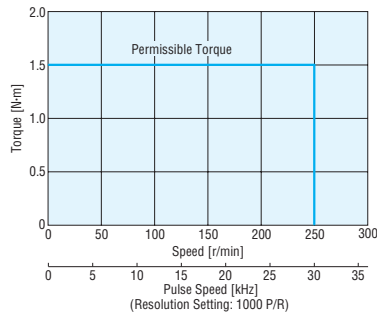
Note:

● Direction of rotation of the motor shaft and that of the gear output shaft are the same.

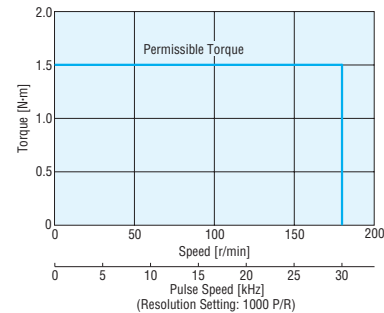
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

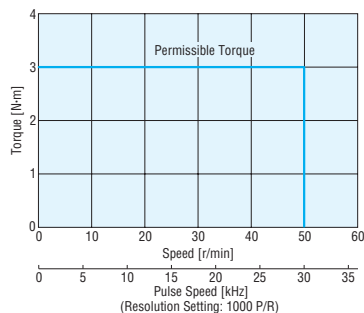
AS46□A-P7.2



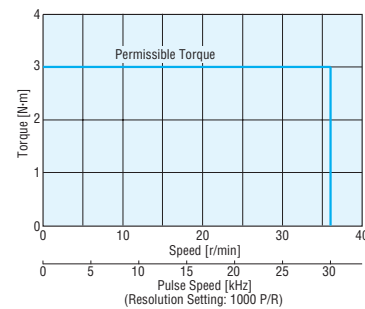
AS46□A-P10



AS46□A-P36



AS46□A-P50



● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.

Notes:

● Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]

● When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

PL Geared Type Motor Frame Size 60 mm

Specifications (RoHS)



Model	Pulse Input Package	Standard Electromagnetic Brake	AS66A□E-P5 AS66M□E-P5	AS66A□E-P7.2 AS66M□E-P7.2	AS66A□E-P10 AS66M□E-P10	AS66A□E-P25 AS66M□E-P25	AS66A□E-P36 AS66M□E-P36	AS66A□E-P50 AS66M□E-P50
Maximum Holding Torque		N·m	3.5	4	5		8	
Rotor Inertia		J: kg·m ²	405×10 ⁻⁷ [564×10 ⁻⁷]*1					
Backlash		arc minute (degrees)	20 (0.33°)					
Permissible Speed Range		r/min	0~360	0~250	0~180	0~72	0~50	0~36
Gear Ratio			1:5	1:7.2	1:10	1:25	1:36	1:50
Resolution*2	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	
Power Source	Voltage-Frequency		Single-Phase 100-115 VAC -15%~+10% 50/60 Hz					
			Single-Phase 200-230 VAC -15%~+10% 50/60 Hz					
			Three-Phase 200-230 VAC -15%~+10% 50/60 Hz					
Maximum Input Current A	Single-Phase 100-115 VAC		5					
	Single-Phase 200-230 VAC		3					
	Three-Phase 200-230 VAC		1.5					
Electromagnetic Brake*3	Type		Active when power is off					
	Power Supply Input		24 VDC±5%					
	Power Consumption W		6					
	Excitation Current A		0.25					
Static Friction Torque		N·m	1.75	2	2.5		4	
		kg	1.25 [1.5]*1			1.55 [1.8]*1		
Mass	Motor	kg	1.25 [1.5]*1					
	Driver	kg	0.8					
Dimension No.	Motor		10					
	Driver		18					

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● Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 Pulse Input Package: The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

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*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.3 A minimum power supply is required for the electromagnetic brakes.

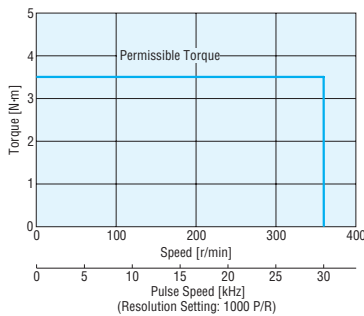
Note:

● Direction of rotation of the motor shaft and that of the gear output shaft are the same.

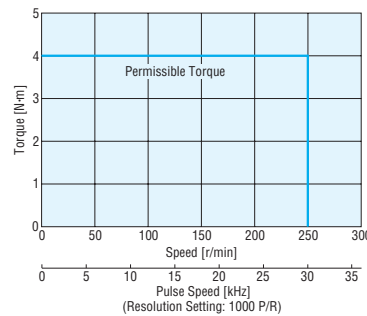
Speed – Torque Characteristics

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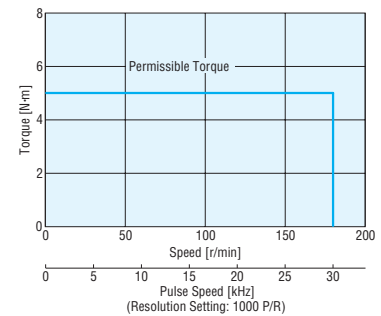
AS66□E-P5



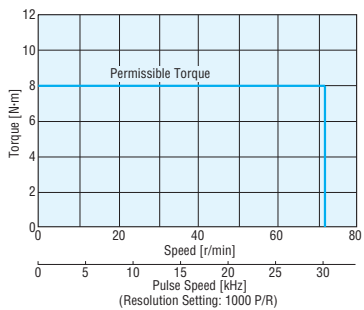
AS66□E-P7.2



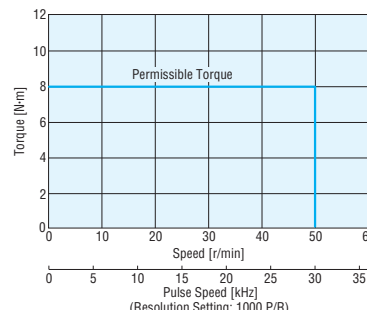
AS66□E-P10



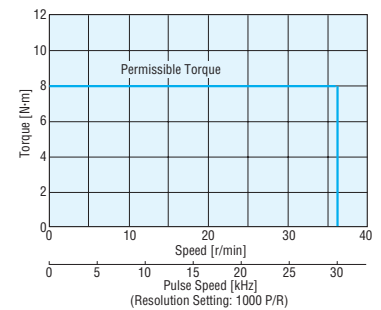
AS66□E-P25



AS66□E-P36



AS66□E-P50



● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.

● Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

Notes:

● Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]

● When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

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DC Input ASC Series

PL Geared Type Motor Frame Size 90 mm

Specifications (RoHS)



Model	Pulse Input Package	Standard Electromagnetic Brake	AS98A□E-P5	AS98A□E-P7.2	AS98A□E-P10	AS98A□E-P25	AS98A□E-P36	AS98A□E-P50
			AS98M□E-P5	AS98M□E-P7.2	AS98M□E-P10	AS98M□E-P25	AS98M□E-P36	AS98M□E-P50
Maximum Holding Torque		N·m	9	12.9	18		37	
Rotor Inertia		J: kg·m ²	1400×10 ⁻⁷ [1560×10 ⁻⁷]*1					
Backlash		arc minute (degrees)	15 (0.25°)					
Permissible Speed Range		r/min	0~360	0~250	0~180	0~72	0~50	0~36
Gear Ratio			1:5	1:7.2	1:10	1:25	1:36	1:50
Resolution*2	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	9	12.9	18		37	
Power Source	Voltage-Frequency		Single-Phase 100-115 VAC		-15%~+10%	50/60 Hz		
			Single-Phase 200-230 VAC		-15%~+10%	50/60 Hz		
			Three-Phase 200-230 VAC		-15%~+10%	50/60 Hz		
Maximum Input Current A	Type	Single-Phase 100-115 VAC	6					
		Single-Phase 200-230 VAC	3.5					
		Three-Phase 200-230 VAC	1.9					
Electromagnetic Brake*3	Power Supply Input	Type	Active when power is off					
		Power Consumption W	24 VDC±5%					
		Power Consumption W	6					
		Excitation Current A	0.25					
Static Friction Torque	N·m		4.5	6.45	9		18.5	
Mass	Motor	kg	3.2 [3.6]*1			4 [4.4]*1		
	Driver	kg				0.8		
Dimension No.	Motor		11					
	Driver		18					

How to Read Specifications Table → Page 72

● Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 Pulse Input Package: The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

Resolution Select Switch → Page 37

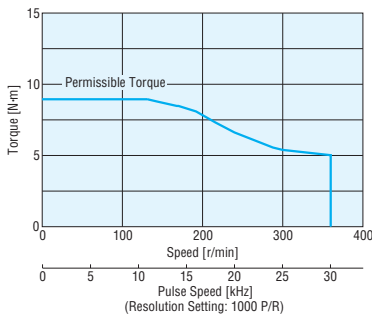
*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.3 A minimum power supply is required for the electromagnetic brakes.

Note:

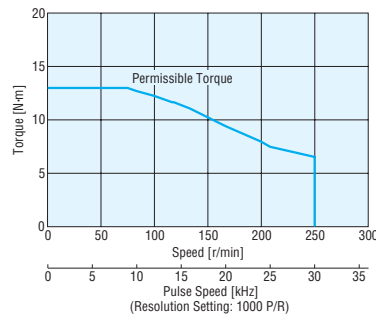
● Direction of rotation of the motor shaft and that of the gear output shaft are the same.

Speed – Torque Characteristics How to Read Speed-Torque Characteristics → Page 72

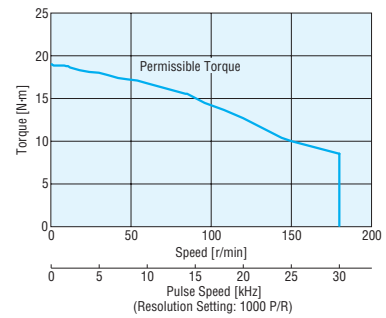
AS98□□E-P5



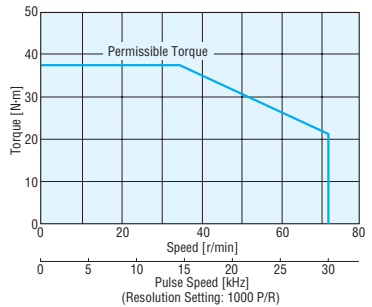
AS98□□E-P7.2



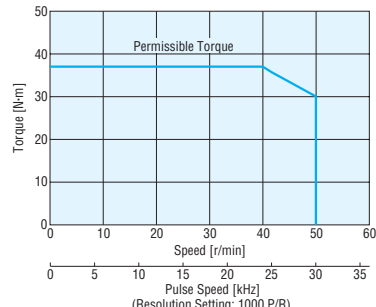
AS98□□E-P10



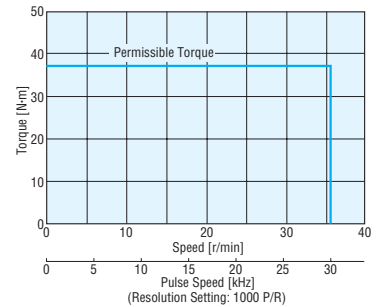
AS98□□E-P25



AS98□□E-P36



AS98□□E-P50



● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.

● Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

Notes:

● Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]

● When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

PN Geared Type Motor Frame Size 42 mm

Specifications RoHS

With the **AS46** type, only the driver conforms to the CSA standard.

Model	Pulse Input Package	Standard	AS46AA-N7.2	AS46AA-N10
	Built-In Controller (Stored Program) Package	Electromagnetic Brake	AS46MA-N7.2	AS46MA-N10
		Standard	AS46AAP-N7.2	AS46AAP-N10
		Electromagnetic Brake	AS46MAP-N7.2	AS46MAP-N10
Maximum Holding Torque		N·m	1.5	
Rotor Inertia		J: kg·m ²	68×10 ⁻⁷ [83×10 ⁻⁷]*1	
Backlash		arc minute (degrees)	2 (0.034°)	
Angle Error		arc minute (degrees)	6 (0.1°)	
Permissible Speed Range		r/min	0~416	0~300
Gear Ratio			1:7.2	1:10
Resolution*2	Resolution Setting: 1000 P/R		0.05°/Pulse	0.036°/Pulse
Permissible Torque		N·m	1.5	
Maximum Torque*3		N·m	2	
Power Source	Voltage-Frequency		Single-Phase 100-115 VAC -15%~+10% 50/60 Hz	
	Maximum Input Current A	Single-Phase 100-115 VAC	3.3	
		Type	Active when power is off	
Electromagnetic Brake*4		Power Supply Input	24 VDC±5%	
		Power Consumption W	2	
		Excitation Current A	0.08	
		Static Friction Torque	N·m	0.75
Mass	Motor	kg	0.71 [0.81]*1	
	Driver	kg	0.8	
Dimension No.	Motor		12	
	Driver	Pulse Input	18	
		Built-In Controller (Stored Program)	19	

How to Read Specifications Table → Page 72

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 Pulse Input Package: The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

Resolution Select Switch → Page 37

Built-In Controller (Stored Program) Package: The resolution can be set from 500 P/R to 10000 P/R by setting parameters.

*3 The value of Maximum Torque is for gear. For output torque for geared motor, refer to the Speed - Torque Characteristics.

*4 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.1 A minimum power supply is required for the electromagnetic brakes.

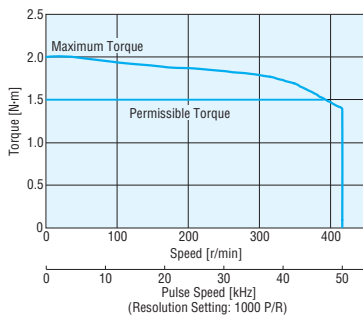
Note:

● Direction of rotation of the motor shaft and that of the gear output shaft are the same.

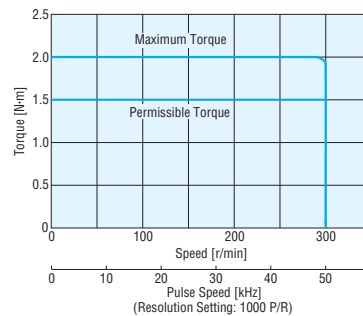
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

AS46 A-N7.2/AS46 AP-N7.2



AS46 A-N10/AS46 AP-N10



● Enter **A** (standard) or **M** (electromagnetic brake) in the box () within the model name.

Notes:

● Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]

● When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

Features

Line-up

Functions

System Configuration

Product Line

Specifications and Characteristics

Dimensions

Connection and Operation

List of Motor and Driver Combinations

How to Read Specifications and Characteristics

Accessories

Before Using a Stepping Motor

Controllers

AC Input AS Series

DC Input ASC Series

PN Geared Type Motor Frame Size 60 mm

Specifications (RoHS)



Model	Pulse Input Package	Standard	AS66A□E-N5	AS66A□E-N7.2	AS66A□E-N10	AS66A□E-N25	AS66A□E-N36	AS66A□E-N50
	Built-In Controller (Stored Program) Package	Standard	AS66M□EP-N5	AS66M□EP-N7.2	AS66M□EP-N10	AS66M□EP-N25	AS66M□EP-N36	AS66M□EP-N50
		Electromagnetic Brake	AS66M□EP-N5	AS66M□EP-N7.2	AS66M□EP-N10	AS66M□EP-N25	AS66M□EP-N36	AS66M□EP-N50
Maximum Holding Torque	N·m		3.5	4	5		8	
Rotor Inertia	J: kg·m ²				405×10 ⁻⁷	[564×10 ⁻⁷]*1		
Backlash	arc minute (degrees)		2 (0.034°)			3 (0.05°)		
Angle Error	arc minute (degrees)		5 (0.084°)					
Permissible Speed Range	r/min		0~600	0~416	0~300	0~120	0~83	0~60
Gear Ratio			1:5	1:7.2	1:10	1:25	1:36	1:50
Resolution*2	Resolution Setting: 1000 P/R		0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque	N·m		3.5	4	5		8	
Maximum Torque*3	N·m		7	9	11	16	20	
Power Source	Voltage-Frequency		Single-Phase 100-115 VAC		-15%~+10%		50/60 Hz	
			Single-Phase 200-230 VAC		-15%~+10%		50/60 Hz	
			Three-Phase 200-230 VAC		-15%~+10%		50/60 Hz	
Electromagnetic Brake*4	Maximum Input Current A	Single-Phase 100-115 VAC	5					
		Single-Phase 200-230 VAC	3					
		Three-Phase 200-230 VAC	1.5					
Electromagnetic Brake*4	Type	Active when power is off						
	Power Supply Input	24 VDC±5%						
	Power Consumption W	6						
	Excitation Current A	0.25						
Mass	Static Friction Torque	N·m	1.75	2	2.5		4	
	Motor	kg	1.5 [1.75]*1			1.7 [1.95]*1		
Dimension No.	Driver	kg	0.8					
	Motor		13					
Dimension No.	Pulse Input		18					
	Built-In Controller (Stored Program)		19					

How to Read Specifications Table → Page 72

● Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 Pulse Input Package: The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

Resolution Select Switch → Page 37

Built-In Controller (Stored Program) Package: The resolution can be set from 500 P/R to 10000 P/R by setting parameters.

*3 The value of Maximum Torque is for gear. For output torque for geared motor, refer to the Speed - Torque Characteristics.

*4 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.3 A minimum power supply is required for the electromagnetic brakes.

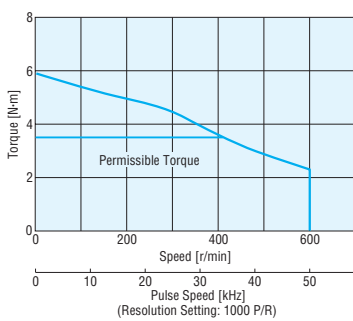
Note:

● Direction of rotation of the motor shaft and that of the gear output shaft are the same.

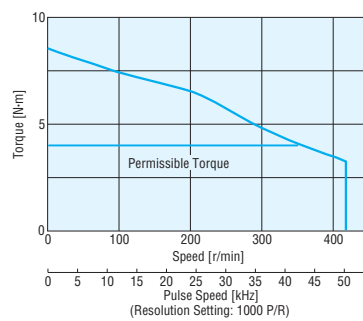
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

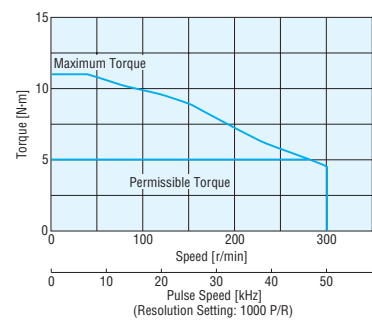
AS66□□E-N5/AS66□□EP-N5



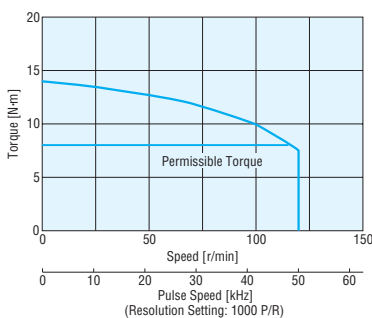
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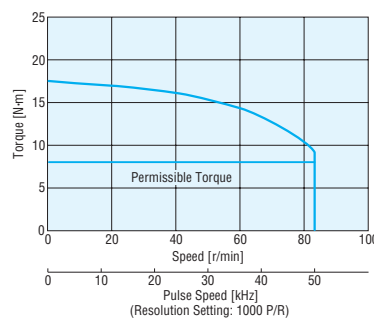
AS66□□E-N10/AS66□□EP-N10



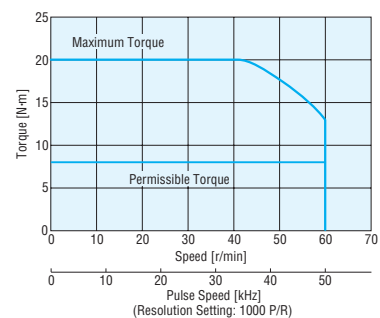
AS66□□E-N25/AS66□□EP-N25



AS66□□E-N36/AS66□□EP-N36



AS66□□E-N50/AS66□□EP-N50



● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.

● Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

Notes:

● Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]

● When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

PN Geared Type Motor Frame Size 90 mm

Specifications RoHS



Model	Pulse Input Package	Standard	AS98A□E-N5	AS98A□E-N7.2	AS98A□E-N10	AS98A□E-N25	AS98A□E-N36	AS98A□E-N50
	Built-In Controller (Stored Program) Package	Standard	AS98M□EP-N5	AS98M□EP-N7.2	AS98M□EP-N10	AS98M□EP-N25	AS98M□EP-N36	AS98M□EP-N50
		Electromagnetic Brake						
Maximum Holding Torque	N·m		10	14	20		37	
Rotor Inertia	J: kg·m ²		1400×10 ⁻⁷ [1560×10 ⁻⁷]*1					
Backlash	arc minute (degrees)		2 (0.034°)			3 (0.05°)		
Angle Error	arc minute (degrees)		4 (0.067°)					
Permissible Speed Range	r/min		0~600	0~416	0~300	0~120	0~83	0~60
Gear Ratio			1:5	1:7.2	1:10	1:25	1:36	1:50
Resolution*2	Resolution Setting: 1000 P/R		0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque	N·m		10	14	20		37	
Maximum Torque*3	N·m		28	35		56		60
Power Source	Voltage-Frequency		Single-Phase 100-115 VAC -15%~+10% 50/60 Hz					
			Single-Phase 200-230 VAC -15%~+10% 50/60 Hz					
			Three-Phase 200-230 VAC -15%~+10% 50/60 Hz					
Electromagnetic Brake*4	Maximum Input Current A	Single-Phase 100-115 VAC	6					
		Single-Phase 200-230 VAC	3.5					
		Three-Phase 200-230 VAC	1.9					
	Type		Active when power is off					
	Power Supply Input		24 VDC±5%					
	Power Consumption W		6					
	Excitation Current A		0.25					
Mass	Static Friction Torque	N·m	4.5	6.45	9		18.5	
	Motor	kg	4 [4.4]*1			4.7 [5.1]*1		
Dimension No.	Driver	kg	0.8					
	Pulse Input		14					
	Built-In Controller (Stored Program)		18					
			19					

How to Read Specifications Table → Page 72

● Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 Pulse Input Package: The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

Resolution Select Switch → Page 37

Built-In Controller (Stored Program) Package: The resolution can be set from 500 P/R to 10000 P/R by setting parameters.

*3 The value of Maximum Torque is for gear. For output torque for geared motor, refer to the Speed - Torque Characteristics.

*4 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.3 A minimum power supply is required for the electromagnetic brakes.

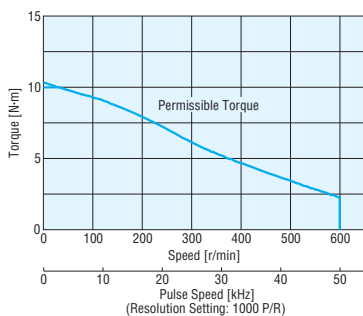
Note:

● Direction of rotation of the motor shaft and that of the gear output shaft are the same.

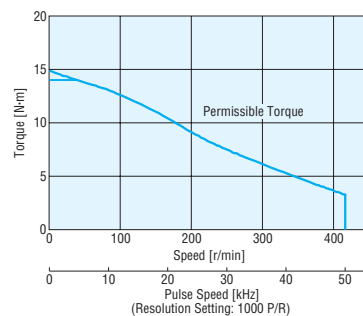
Speed - Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

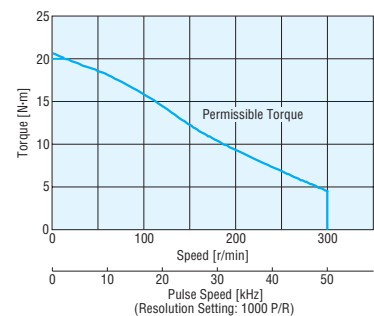
AS98□E-N5/AS98□EP-N5



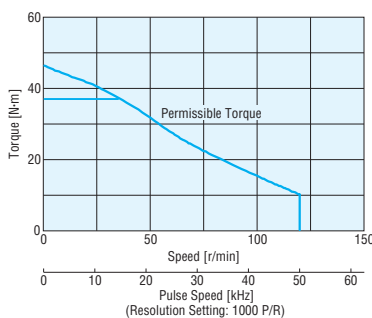
AS98□E-N7.2/AS98□EP-N7.2



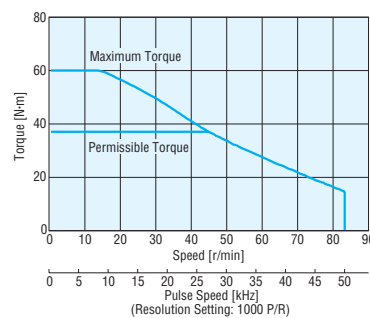
AS98□E-N10/AS98□EP-N10



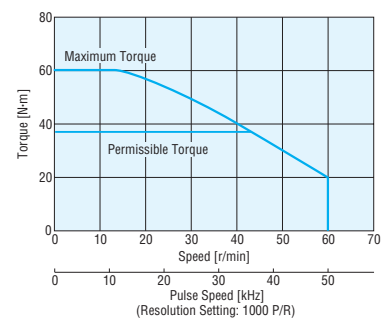
AS98□E-N25/AS98□EP-N25



AS98□E-N36/AS98□EP-N36



AS98□E-N50/AS98□EP-N50



● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.

● Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

Notes:

● Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]

● When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

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

Specifications (RoHS)



With the AS46 type, only the driver conforms to the CSA standard.

Model	Pulse Input Package	Standard	AS46AA2-H50	AS46AA2-H100	AS66A□E-H50	AS66A□E-H100	AS98A□E-H50	AS98A□E-H100
	Built-In Controller (Stored Program) Package	Standard	AS46AAP2-H50	AS46AAP2-H100	AS66A□EP-H50	AS66A□EP-H100	AS98A□EP-H50	AS98A□EP-H100
		Electromagnetic Brake	AS46MAP2-H50	AS46MAP2-H100	AS66M□EP-H50	AS66M□EP-H100	AS98M□EP-H50	AS98M□EP-H100
Maximum Holding Torque	N·m		3.5	5	5.5	8	25	37
Rotor Inertia	J: kg·m ²		85×10 ⁻⁷	100×10 ⁻⁷ *1	440×10 ⁻⁷	599×10 ⁻⁷ *1	1600×10 ⁻⁷	1759×10 ⁻⁷ *1
Permissible Speed Range	r/min		0~70	0~35	0~70	0~35	0~70	0~35
Gear Ratio			1:50	1:100	1:50	1:100	1:50	1:100
Resolution*2	Resolution Setting: 1000 P/R		0.0072°/Pulse	0.0036°/Pulse	0.0072°/Pulse	0.0036°/Pulse	0.0072°/Pulse	0.0036°/Pulse
Permissible Torque	N·m		3.5	5	5.5	8	25	37
Maximum Torque	N·m		8.3	11	18	28	35	55
Lost Motion (Load Torque)	arc minute		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 Source	Voltage-Frequency		Single-Phase 100-115 VAC -15%~+10% 50/60 Hz		Single-Phase 100-115 VAC -15%~+10% 50/60 Hz		Single-Phase 200-230 VAC -15%~+10% 50/60 Hz	
					Three-Phase 200-230 VAC -15%~+10% 50/60 Hz			
	Maximum Input Current A	Single-Phase 100-115 VAC	3.3		5		6	
		Single-Phase 200-230 VAC	-		3		3.5	
		Three-Phase 200-230 VAC	-		1.5		1.9	
Electromagnetic Brake*3	Type		Active when power is off					
	Power Supply Input		2			6		
	Power Consumption W		0.08			0.25		
	Excitation Current A		1.75			2.5		
Mass	Static Friction Torque	N·m	1.75	2.5	2.75	4	12.5	18.5
	Motor	kg	0.7 [0.8]*1		1.4 [1.65]*1		3.9 [4.3]*1	
	Driver	kg	0.8					
Dimension No.	Motor		15		16		17	
	Driver	Pulse Input			18			
		Built-In Controller (Stored Program)			19			

How to Read Specifications Table → Page 72

● Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 Pulse Input Package: The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

Resolution Select Switch → Page 37

Built-In Controller (Stored Program) Package: The resolution can be set from 500 P/R to 10000 P/R by setting parameters.

*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.3 A minimum (AS46: 0.1 A minimum) power supply is required for the electromagnetic brakes.

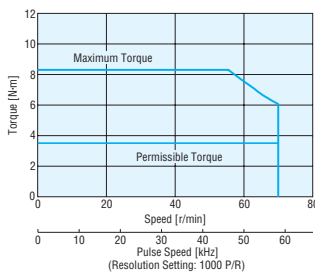
Note:

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

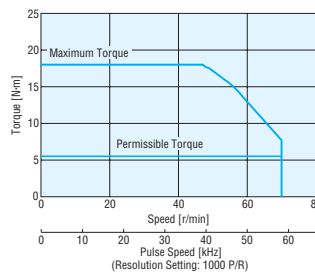
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

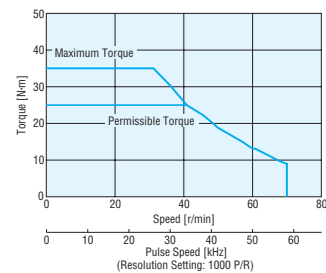
AS46□A2-H50/AS46□AP2-H50



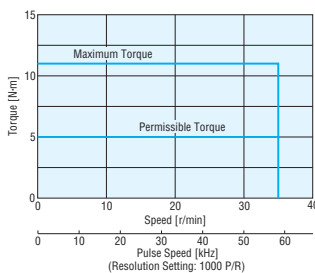
AS66□□E-H50/AS66□□EP-H50



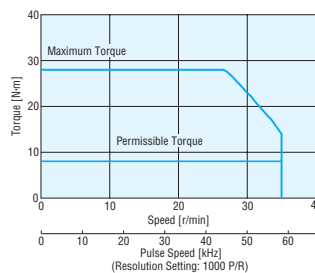
AS98□□E-H50/AS98□□EP-H50



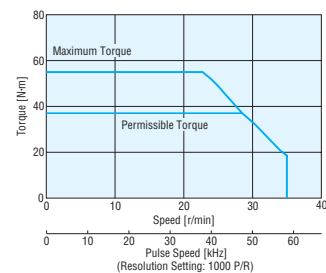
AS46□A2-H100/AS46□AP2-H100



AS66□□E-H100/AS66□□EP-H100



AS98□□E-H100/AS98□□EP-H100



● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.

● Enter the power supply voltage **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC) in the box (□) within the model name.

Notes:

● Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]

● In order to prevent fatigue of the gear grease in the harmonic gear, keep the temperature of the gear case under 70°C.

● When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

Driver Specifications

	Pulse Input Package	Built-In Controller (Stored Program) Package
Speed and Positioning Control Command	Pulse input	Stored program
Maximum Input Pulse Frequency	250 kHz (When the pulse duty is 50%)	—
Protective Functions	Overheat, Overload, Overvoltage, Speed error, Overcurrent, Overspeed, EEPROM data error, Sensor error, System error	Stack overflow, Memory read error, Program reference error, Compilation error, Operation result overflow, Parameter out-of-range error, Divide by zero, General I/O definition error, PC command execution error, Overheat protection, Overload protection, Overspeed error, Overvoltage protection, Excessive position deviation, Overcurrent protection, Emergency stop, Incorrect limit-sensor logic, Reverse limit-sensor connection, Mechanical home seeking error, Overtravel, Software overtravel, Emergency stop, Invalid operation data, Resolver sensor error, Initial rotor revolution error, NVRAM error, System error
Input Signals	Photocoupler input, Input resistance: 220 Ω, Input current: 7-20 mA Pulse (CW pulse) signal [Negative logic pulse input], Rotation direction (CCW pulse) signal [Negative logic pulse input], All windings off, Alarm clear, Resolution setting	Photocoupler input, Control input: 24 VDC, Input resistance 4.7 kΩ (X0-X7, START, E-STOP, HOME LS, +LS, -LS, SENSOR)
Output Signals	Photocoupler output, Open-collector output External use condition: 30 VDC maximum, 15 mA maximum (Positioning completion signal, Alarm signal) Transistor, Open-collector output External use condition: 30 VDC maximum, 15 mA maximum (Timing signal, Feedback pulse ASG · BSG signal) Line driver output: Equivalent of 26C31 (Timing signal, Feedback pulse ASG · BSG signal)	Photocoupler, Open-collector output External use condition: 30 VDC maximum, 4~8 mA (Y0-Y7, ALM) Line driver output: Equivalent of 26C31 (ASG · BSG Signal)
User Program	—	Maximum number of programs: 14 programs (Including STARTUP program) Maximum lines per program: 64 lines Maximum commands per 1 line: 1 command (Single state) Maximum program variables: 26 variables (A-Z)
Positioning Control	—	Incremental (relative distance specification) mode/Absolute (absolute position specification) mode One-shot operation/Linked operation (A maximum of 4 profiles can be linked) Maximum operating ranges Steps: -8 388 608~+8 388 607 (1 each) Operating speed: 10 Hz~500 000 Hz (500 kHz) Acceleration/Deceleration rate*: 10~50000 msec
Operating Method	—	Positioning operation (Indexing) Continuous operation (Scan) Linked profile Return to electrical home position (Return) Return to mechanical home position (Home operation)
Mechanical Home Detection Operation	—	Home seeking operation is performed from the entire range using mechanical position detection signals (+LS, -LS, HOME LS)
Other Functions	—	Speed-filter value setting function Current setting function Electric gear function Setting function for direction of motor rotation Emergency stop function Over-travel function Software over-travel function Alarm trace-back function Daisy-chain connections
Terminal Emulation	—	Connection standard: RS-232C conformity Transfer system: Asynchronous communication, NRZ (Non return to zero), Full duplex Data length: 8 bits, 1 stop bit, No parity Transmit speed: 9600 bps Connector specification: Modular (4 wires, 4 pins) Pin arrangement: RS232 Compatible Protocol: TTY (CR+LF)

* The rates of acceleration and deceleration can be set separately.

General Specifications

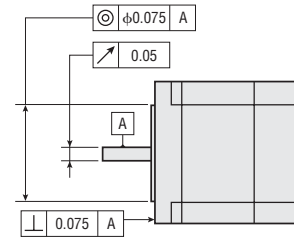
This is the value after rated operation at normal temperature and normal humidity.

Specifications		Motor	Driver
Motor Insulation Class		Class B (130°C)[UL/CSA: Recognized as class A (105°C)]	—
Insulation Resistance		100 MΩ minimum when measured by a 500 VDC megger between the following places · Frame-Windings · Frame-Electromagnetic brake windings	100 MΩ minimum when measured by a 500 VDC megger between the following places · Frame-Power supply input terminal · I/O-Power supply input terminal
Dielectric Strength		Sufficient to withstand the following for one minute: · Frame-Windings 1.5 kV (1.0 kV for AS46) 50 Hz or 60 Hz · Frame-Electromagnetic brake windings 1.0 kV 50 Hz or 60 Hz	Sufficient to withstand the following for one minute: · Frame-Power supply input terminal 1.5 kV 50 Hz or 60 Hz · I/O-Power supply input terminal 2.3 kV (3.0 kV for 200-230 VAC) 50 Hz or 60 Hz: Pulse input package 1.8 kV 50 Hz or 60 Hz: Built-in controller (stored program) package
Operating Environment (In Operation)	Ambient Temperature	0°C~+50°C (nonfreezing): Standard Type TH · PL · PN Geared Type	0°C~+50°C (nonfreezing): Pulse input package 0°C~+40°C (nonfreezing): Built-in controller (stored program) package
	Ambient Humidity	85% or less (noncondensing)	
	Atmosphere	No corrosive gases, dust, water or oil (Standard IP65 rated motor: No corrosive gases.)	
Static Angle Error		±5 arc minutes (0.084°)	—
Shaft Runout		0.05 T.I.R.(mm)*	—
Concentricity		0.075 T.I.R.(mm)*	—
Perpendicularity		0.075 T.I.R.(mm)*	—

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

Note:

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



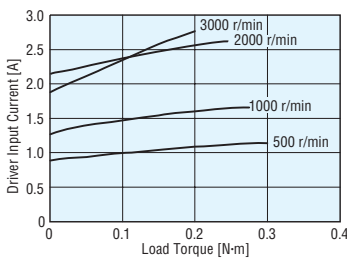
Load Torque – Driver Input Current Characteristics

This is the relationship between the load torque and driver input current at each speed when the motor is 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 axis.

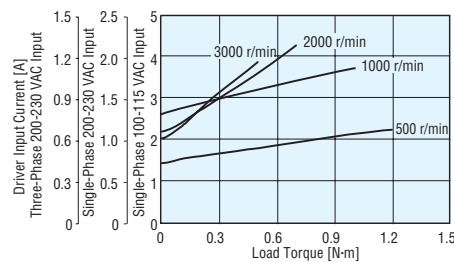
$$\text{Motor shaft speed} = \text{Gear output shaft speed} \times \text{Gear ratio} \text{ [r/min]}$$

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

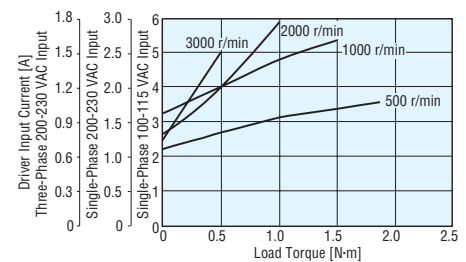
AS46



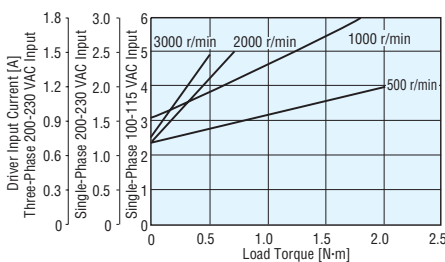
AS66



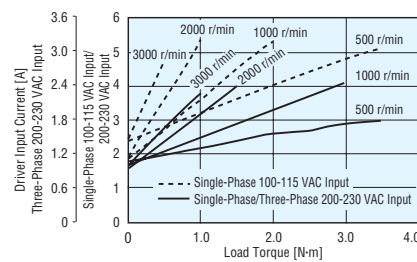
AS69



AS98



AS911



Permissible Overhung Load and Permissible Thrust Load

Unit = N

Type	Model	Gear Ratio	Overhung Load Distance from Shaft End (mm)					Thrust Load
			0	5	10	15	20	
Standard Type Standard Type IP65 Rated Motor	AS46□A AS46□AP	-	20	25	34	52	-	The permissible thrust load shall be no greater than the motor mass.
	AS66□E AS66A□T AS66□EP AS66A□TP AS69□E AS69A□T AS69□EP AS69A□TP		63	75	95	130	190	
	AS98□E AS98A□T AS98□EP AS98A□TP AS911A□E AS911A□T AS911A□EP AS911A□TP		260	290	340	390	480	
TH Geared Type	AS46□A-T□ AS46□AP-T□	3.6, 7.2, 10, 20, 30	10	14	20	30	-	15
	AS66□E-T□ AS66□EP-T□		70	80	100	120	150	40
	AS98□E-T□ AS98□EP-T□		220	250	300	350	400	100
PL Geared Type	AS46□A-P□	7.2, 10	73	84	100	123	-	50
		36, 50	109	127	150	184	-	50
	AS66□E-P5	-	200	220	250	280	320	100
	AS66□E-P□	7.2, 10	250	270	300	340	390	
		25, 36, 50	330	360	400	450	520	300
	AS98□E-P□	5, 7.2, 10	480	540	600	680	790	
	AS98□E-P25	-	850	940	1050	1190	1380	
AS98□E-P36	930		1030	1150	1310	1520		
AS98□E-P50		1050	1160	1300	1480	1710		
PN Geared Type	AS46□A-N□ AS46□AP-N□	7.2, 10	100	120	150	190	-	100
	AS66□E-N5 AS66□EP-N5	-	200	220	250	280	320	
	AS66□E-N□ AS66□EP-N□	7.2, 10	250	270	300	340	390	
		25, 36, 50	330	360	400	450	520	300
	AS98□E-N5 AS98□EP-N5	-	480	520	550	580	620	
	AS98□E-N□ AS98□EP-N□	7.2, 10	480	540	600	680	790	
	AS98□E-N25 AS98□EP-N25	-	850	940	1050	1110	1190	
	AS98□E-N36 AS98□EP-N36		930	1030	1150	1220	1300	
	AS98□E-N50 AS98□EP-N50		1050	1160	1300	1380	1490	
Harmonic Geared Type	AS46□A2-H□ AS46□AP2-H□	50, 100	180	220	270	360	510	220
	AS66□E-H□ AS66□EP-H□		320	370	440	550	720	450
	AS98□E-H□ AS98□EP-H□		1090	1150	1230	1310	1410	1300

- Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.
- Enter the power supply voltage **A**, **C** or **S** in the box (□) within the model name.
- Enter the gear ratio in the box (□) within the model name.

Features
Line-up
Functions
System Configuration
Product Line
Specifications and Characteristics
Dimensions
Connection and Operation
List of Motor and Driver Combinations
How to Read Specifications and Characteristics
Accessories
Before Using a Stepping Motor
Controllers

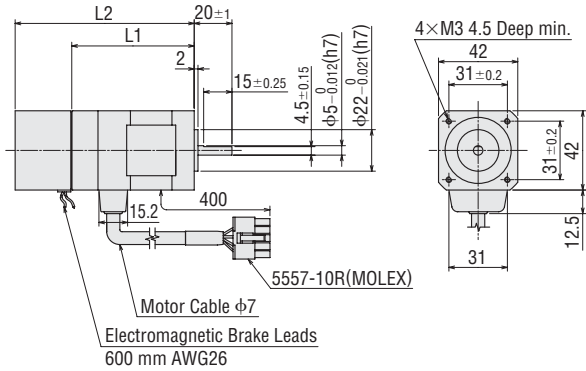
■ Dimensions (Unit = mm)

● Motor

◇ Standard Type

1 □42 mm

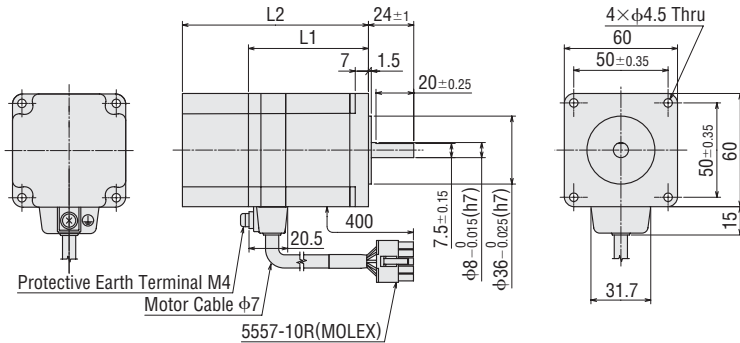
Model	Motor Model	L1	L2	Mass (kg)
AS46AA AS46AAP	ASM46AA	64.9	—	0.5
AS46MA AS46MAP	ASM46MA	—	94.9	0.6



2 □60 mm

Model	Motor Model	L1	L2	Mass (kg)
AS66A□E AS66A□EP	ASM66A□E	63.6	—	0.85
AS66M□E AS66M□EP	ASM66M□E	—	98.6	1.1
AS69A□E AS69A□EP	ASM69A□E	94.6	—	1.4
AS69M□E AS69M□EP	ASM69M□E	—	129.6	1.65

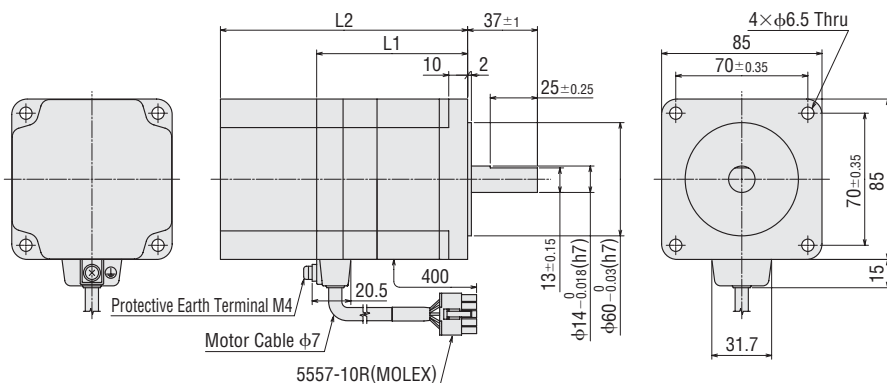
● Enter the power supply voltage **A**, **C** or **S** in the box (□) within the model name.



3 □85 mm

Model	Motor Model	L1	L2	Mass (kg)
AS98A□E AS98A□EP	ASM98A□E	80	—	1.8
AS98M□E AS98M□EP	ASM98M□E	—	131	2.2
AS911A□E AS911A□EP	ASM911A□E	110	—	3

● Enter the power supply voltage **A**, **C** or **S** in the box (□) within the model name.

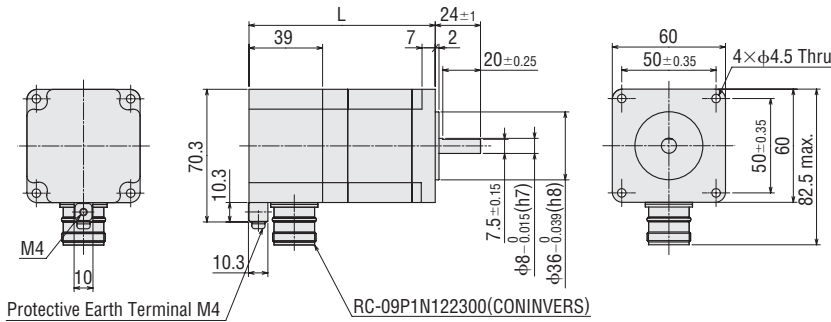


◇ Standard Type IP65 Rated Motor

4 □ 60 mm

Model	Motor Model	L	Mass (kg)
AS66A□T AS66A□TP	ASM66A□T	98.7	1
AS69A□T AS69A□TP	ASM69A□T	129.7	1.5

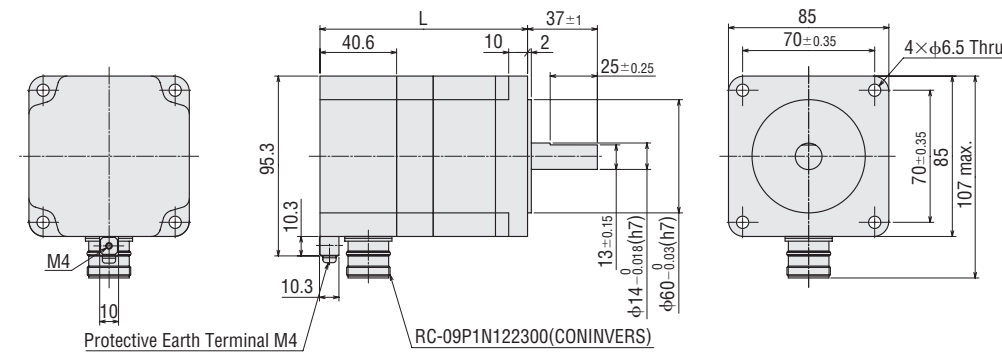
- Enter the power supply voltage **A**, **C** or **S** in the box (□) within the model name.
- Always use the motor cable for IP65 rated motor (sold separately) for connection between the IP65 rated motor and the driver.



5 □ 85 mm

Model	Motor Model	L	Mass (kg)
AS98A□T AS98A□TP	ASM98A□T	110	2.2
AS911A□T AS911A□TP	ASM911A□T	140	3.3

- Enter the power supply voltage **A**, **C** or **S** in the box (□) within the model name.
- Always use the motor cable for IP65 rated motor (sold separately) for connection between the IP65 rated motor and the driver.



● Requirement for motor cable for IP65 rated motor (sold separately)

Always use the motor cable for IP65 rated motor (sold separately) for connection between the IP65 rated motor and the driver. The IP65 rated motor cannot be driven unless the dedicated motor cable is used.

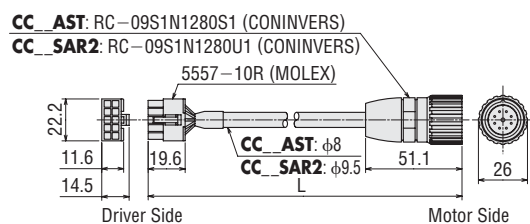
◇ Motor Cables for IP65 Rated Motor

Model	Length L (m)
CC01AST	1
CC02AST	2
CC03AST	3
CC05AST	5
CC07AST	7
CC10AST	10
CC15AST	15
CC20AST	20

◇ Flexible Motor Cables for IP65 Rated Motor

Model	Length L (m)
CC01SAR2	1
CC02SAR2	2
CC03SAR2	3
CC05SAR2	5
CC07SAR2	7
CC10SAR2	10

Motor Cables/Flexible Motor Cables for IP65 Rated Motor

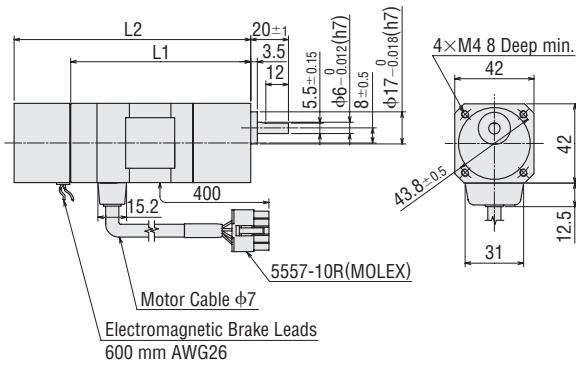


◆ TH Geared Type

6 □ 42 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
AS46AA-T AS46AAP-T	ASM46AA-T	3.6, 7.2, 10, 20, 30	95.4	—	0.65
AS46MA-T AS46MAP-T	ASM46MA-T		—	125.4	0.75

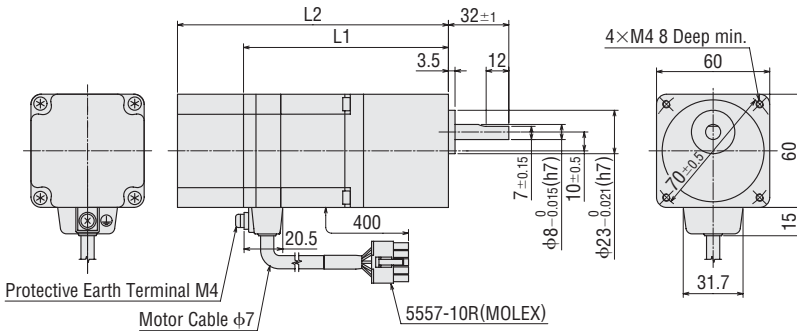
● Enter the gear ratio in the box (□) within the model name.



7 □ 60 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
AS66A □E-T AS66A □EP-T	ASM66A□E-T	3.6, 7.2, 10, 20, 30	108.6	—	1.25
AS66M □E-T AS66M □EP-T	ASM66M□E-T		—	143.6	1.5

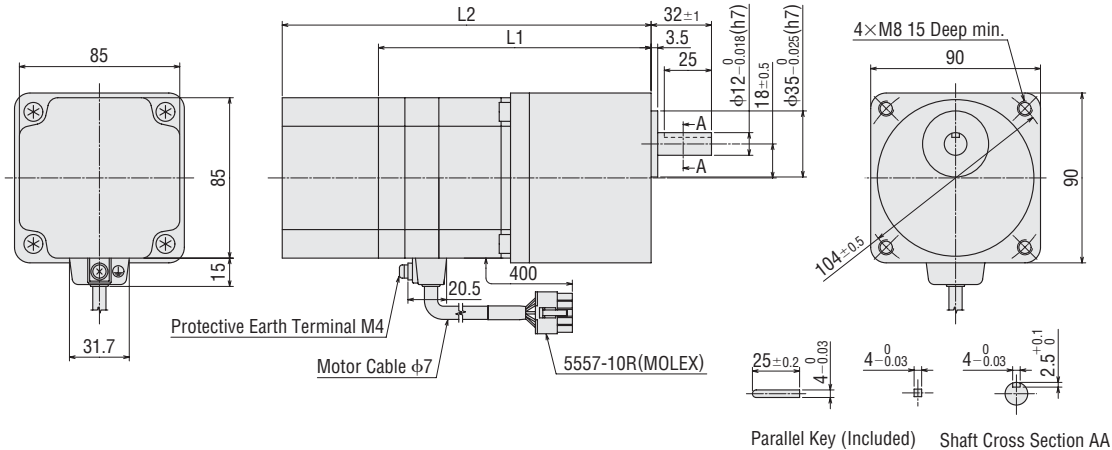
● Enter the power supply voltage **A, C** or **S** in the box (□) within the model name.
Enter the gear ratio in the box (□) within the model name.



8 □ 90 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
AS98A □E-T AS98A □EP-T	ASM98A□E-T	3.6, 7.2, 10, 20, 30	144.5	—	3
AS98M □E-T AS98M □EP-T	ASM98M□E-T		—	195.5	3.4

● Enter the power supply voltage **A, C** or **S** in the box (□) within the model name.
Enter the gear ratio in the box (□) within the model name.



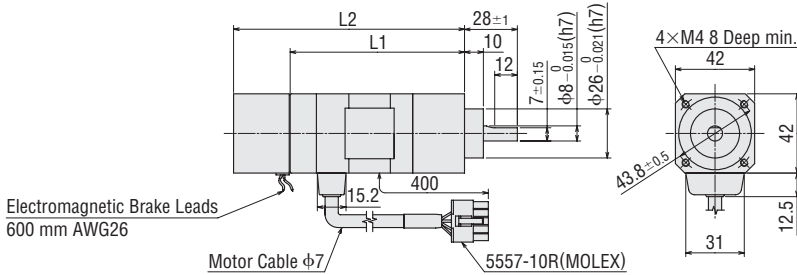
Parallel Key (Included) Shaft Cross Section AA

◇ PL Geared Type

9 □ 42 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
AS46AA-P □	ASM46AA-P □	7.2, 10	92.4	—	0.66
		36, 50	115.9	—	0.78
AS46MA-P □	ASM46MA-P □	7.2, 10	—	122.4	0.76
		36, 50	—	145.9	0.88

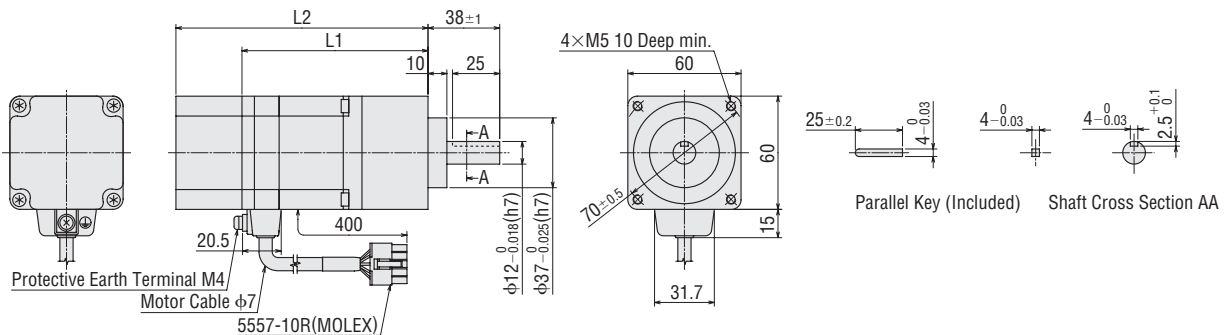
● Enter the gear ratio in the box (□) within the model name.



10 □ 60 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
AS66A □ E-P □	ASM66A □ E-P □	5, 7.2, 10	98.6	—	1.25
		25, 36, 50	123.6	—	1.55
AS66M □ E-P □	ASM66M □ E-P □	5, 7.2, 10	—	133.6	1.5
		25, 36, 50	—	158.6	1.8

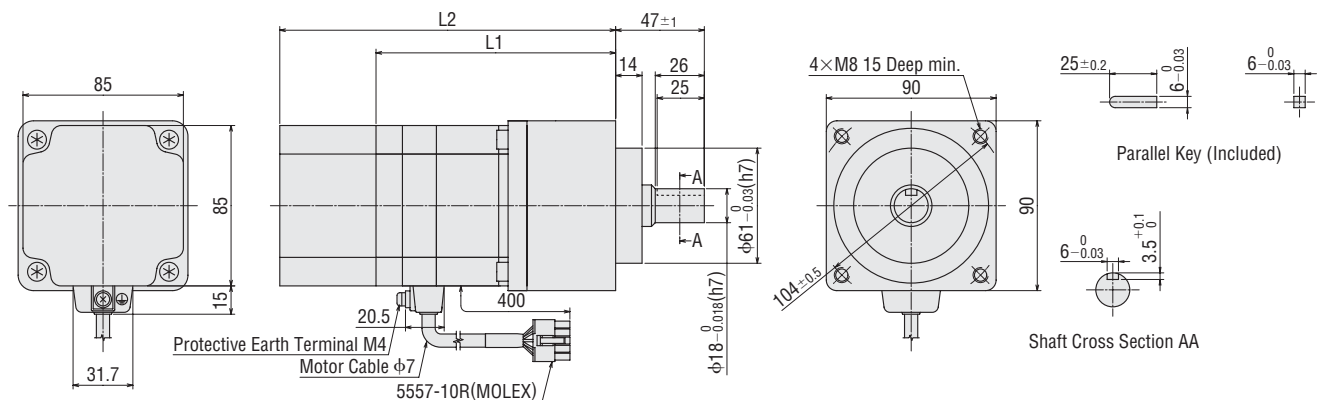
● Enter the power supply voltage **A, C** or **S** in the box (□) within the model name.
Enter the gear ratio in the box (□) within the model name.



11 □ 90 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
AS98A □ E-P □	ASM98A □ E-P □	5, 7.2, 10	127	—	3.2
		25, 36, 50	163	—	4
AS98M □ E-P □	ASM98M □ E-P □	5, 7.2, 10	—	178	3.6
		25, 36, 50	—	214	4.4

● Enter the power supply voltage **A, C** or **S** in the box (□) within the model name.
Enter the gear ratio in the box (□) within the model name.

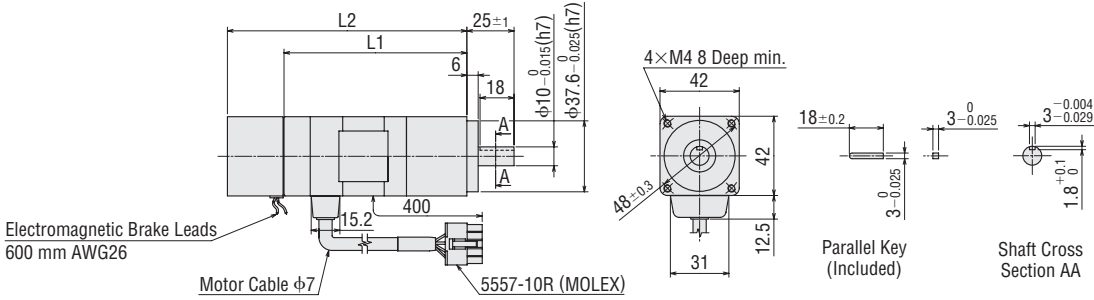


◆ PN Geared Type

12 □ 42 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
AS46AA-N □ AS46AAP-N □	ASM46AA-N □	7.2, 10	96.9	—	0.71
AS46MA-N □ AS46MAP-N □	ASM46MA-N □		—	126.9	0.81

● Enter the gear ratio in the box (□) within the model name.

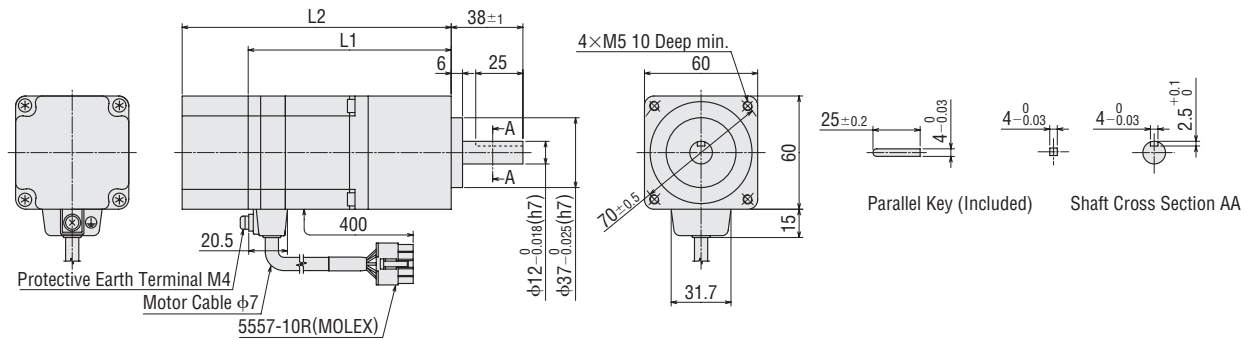


13 □ 60 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
AS66A □ E-N □ AS66A □ EP-N □	ASM66A □ E-N □	5, 7.2, 10	107.6	—	1.5
		25, 36, 50	123.6	—	1.7
AS66M □ E-N □ AS66M □ EP-N □	ASM66M □ E-N □	5, 7.2, 10	—	142.6	1.75
		25, 36, 50	—	158.6	1.95

● Enter the power supply voltage **A, C** or **S** in the box (□) within the model name.

Enter the gear ratio in the box (□) within the model name.

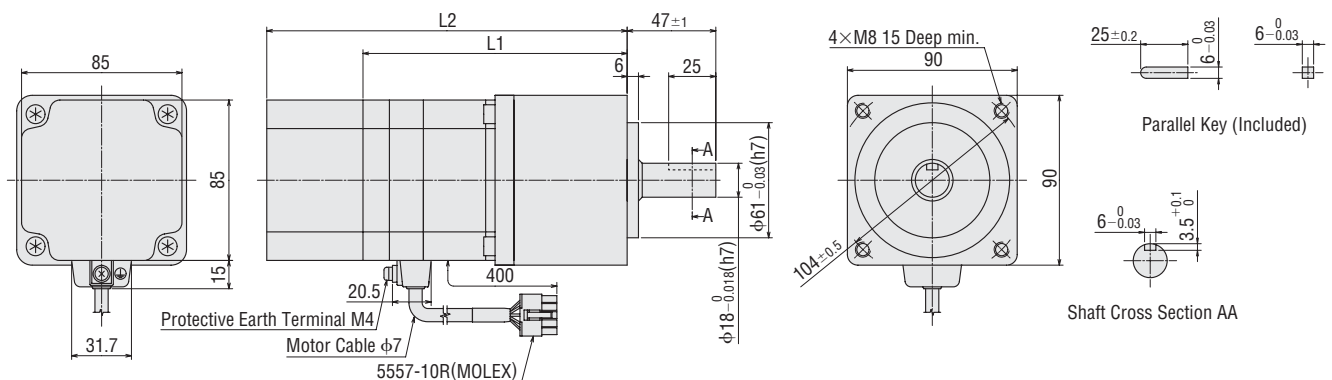


14 □ 90 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
AS98A □ E-N □ AS98A □ EP-N □	ASM98A □ E-N □	5, 7.2, 10	140	—	4
		25, 36, 50	163	—	4.7
AS98M □ E-N □ AS98M □ EP-N □	ASM98M □ E-N □	5, 7.2, 10	—	191	4.4
		25, 36, 50	—	214	5.1

● Enter the power supply voltage **A, C** or **S** in the box (□) within the model name.

Enter the gear ratio in the box (□) within the model name.

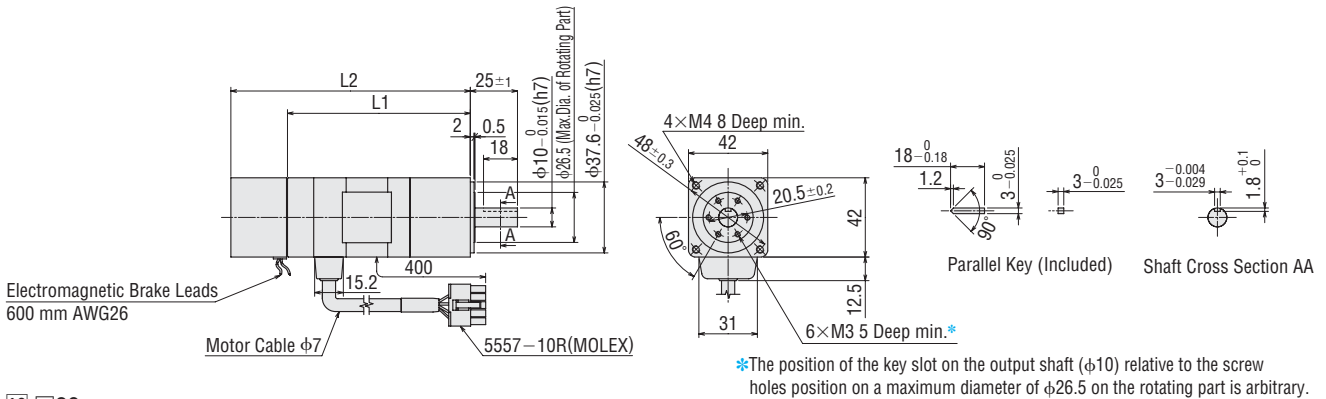


◇ Harmonic Geared Type

15 □ 42 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
AS46AA2-H □ AS46AAP2-H □	ASM46AA2-H □	50, 100	96.9	—	0.7
AS46MA2-H □ AS46MAP2-H □	ASM46MA2-H □		—	126.9	0.8

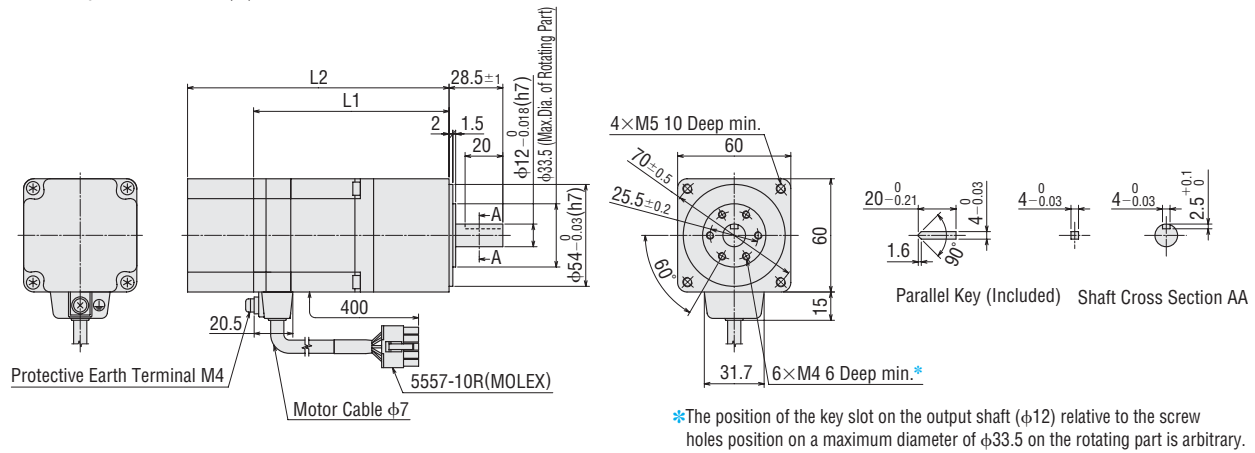
● Enter the gear ratio in the box (□) within the model name.



16 □ 60 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
AS66A □ E-H □ AS66A □ EP-H □	ASM66A □ E-H □	50, 100	103.6	—	1.4
AS66M □ E-H □ AS66M □ EP-H □	ASM66M □ E-H □		—	138.6	1.65

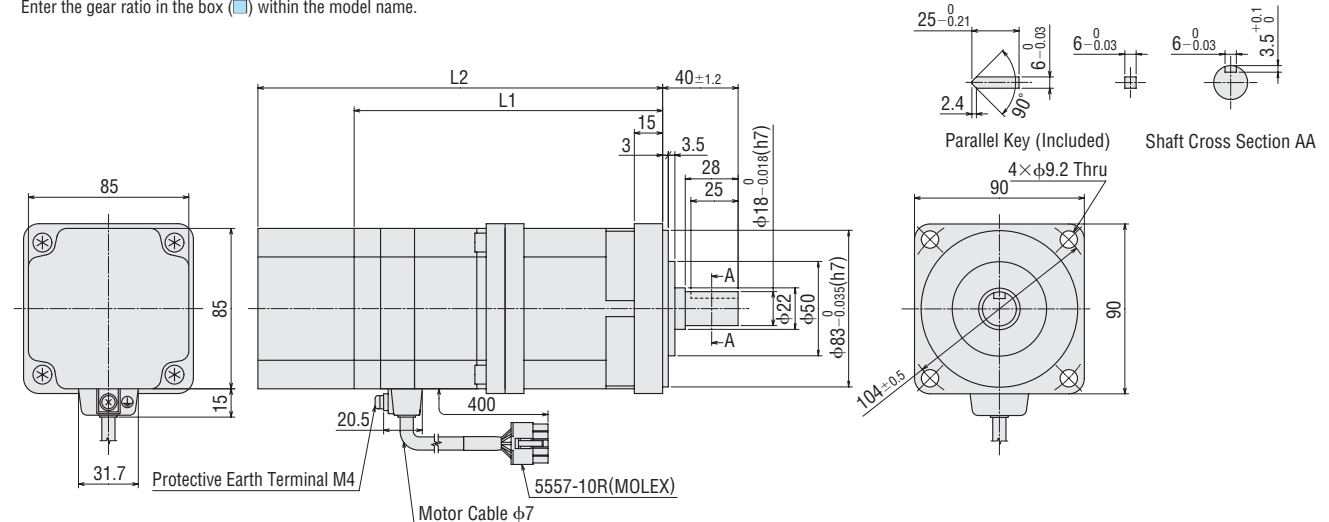
● Enter the power supply voltage **A**, **C** or **S** in the box (□) within the model name.
Enter the gear ratio in the box (□) within the model name.



17 □ 90 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
AS98A □ E-H □ AS98A □ EP-H □	ASM98A □ E-H □	50, 100	163.5	—	3.9
AS98M □ E-H □ AS98M □ EP-H □	ASM98M □ E-H □		—	214.5	4.3

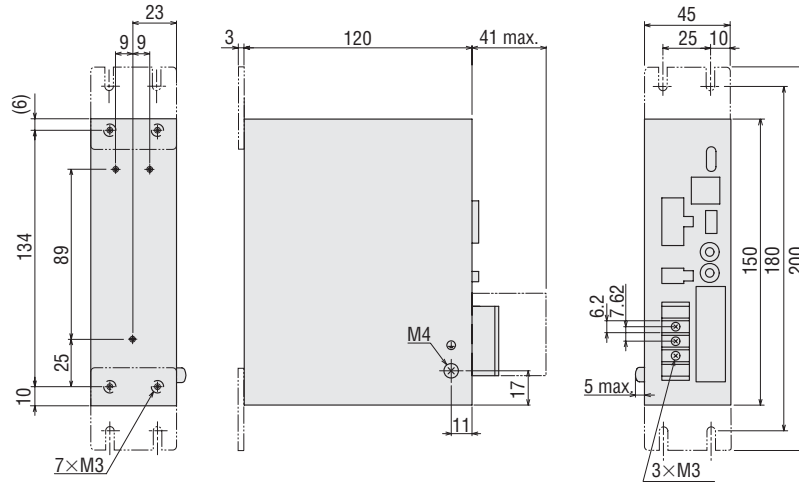
● Enter the power supply voltage **A**, **C** or **S** in the box (□) within the model name.
Enter the gear ratio in the box (□) within the model name.



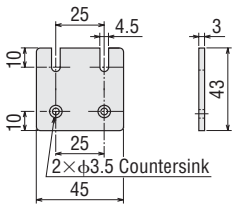
● **Driver**

18 Pulse Input Package (Common to All Types)

Mass: 0.8 kg



● Mounting Bracket
(2 pieces, included)



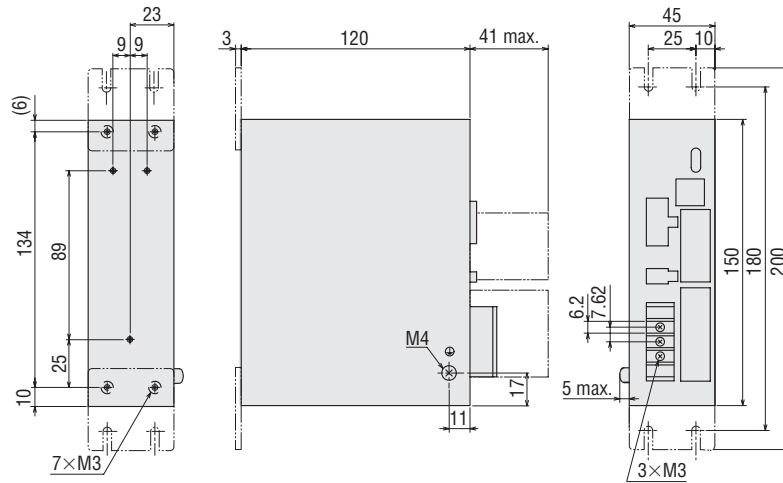
Control I/O Connector

Cover Assembly: 54331-1361 (MOLEX)

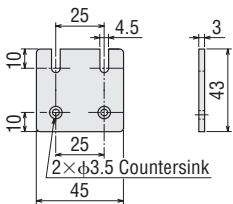
Connector: 54306-3619 (MOLEX)

19 Built-In Controller (Stored Program) Package (Common to All Types)

Mass: 0.8 kg



● Mounting Bracket
(2 pieces, included)



Control I/O Connector

Cover Assembly: 54331-1361 (MOLEX)

Connector: 54306-3619 (MOLEX)

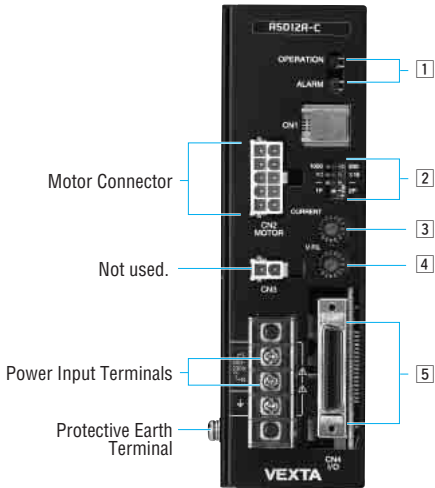
Sensor Input Connector

Cover Assembly: 54331-1201 (MOLEX)

Connector: 54306-2019 (MOLEX)

Connection and Operation (Pulse Input Package)

Names and Functions of Driver Parts



1 Signal Monitor Display

◇LED Indicators

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

◇Alarm

Blink Count	Function	When Activated
1	Overheat	The temperature of the driver's internal heat sink rises to approximately 85°C.
2	Overload	The motor is operated continuously over 5 seconds under a load exceeding the maximum torque.
3	Overvoltage	The primary voltage of the driver's inverter exceeds the permissible value.
4	Speed error	The motor cannot accurately follow at the indicated pulse speed.
5	Overcurrent	An excessive current has flowed to the driver's inverter.
6	Overspeed	The motor shaft velocity exceeds 5000 r/min. (Except geared type)
7	EEPROM data error	The EEPROM has a fault.
8	Sensor error	The power source turns on when the motor cable is not connected to the driver.
Lights (No blinking)	System error	The driver has fatal error.

2 Function Switches

Indication	Switch Name	Function
1000/500 ×1/×10	Resolution select switch	This function is for selecting the motor resolution. For each geared type, the resolution of gear output shaft is 1/gear ratio. "1000" "×1" →1000 Pulses (0.36°/step) (Factory setting) "1000" "×10" →10000 Pulses (0.036°/step) "500" "×1" →500 Pulses (0.72°/step) "500" "×10" →5000 Pulses (0.072°/step)
1P/2P	Pulse input mode switch	The settings of this switch are compatible with the following two types of pulse input modes: "1P" for the 1-pulse input mode (Factory setting), "2P" for the 2-pulse input mode.

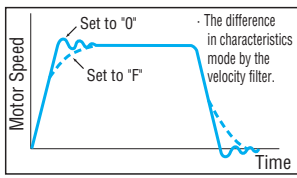
Notes:

- Always turn the power off before switching resolution or pulse input, and turn it ON again after you have made the change.
- If the Resolution Select Switch is set to "×10," it cannot control the resolution selected by the input terminals. It will always be "×10."

3 Current Adjustment Switch

Indication	Switch Name	Function
CURRENT	Current adjustment switch	The motor running current can be lowered to suppress temperature rise in the motor and driver, or lower operating current in order to allow a margin for motor torque.

4 Velocity Filter Adjustment Switch

Indication	Switch Name	Function
V.FIL	Velocity filter adjustment switch	This switch is used to make adjustments when a smooth start-stop or smooth motion at low speed is required. 

5 Input/Output Signals (36 pins)

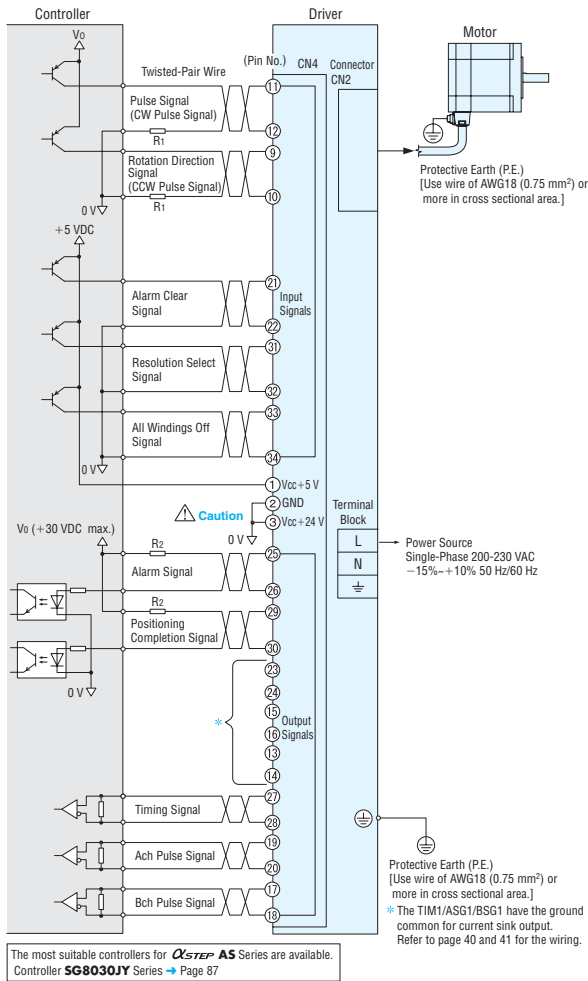
Indication	Input/Output	Pin. No	Signal	Name of Signal
External power input		1	Vcc+5V	Power supply for signal control
		2	GND	
		3	Vcc+24V	
Input signal		9	DIR. (CCW)	Rotation direction (CCW pulse)*
		10	DIR. (CCW)	
		11	PLS (CW)	Pulse (CW pulse)*
		12	PLS (CW)	
Output signal		13	BSG1	B-phase pulse output (Open-collector)
		14	GND	
		15	ASG1	A-phase pulse output (Open-collector)
		16	GND	
		17	BSG2	B-phase pulse output (Line driver)
		18	BSG2	
		19	ASG2	A-phase pulse output (Line driver)
		20	ASG2	
Input signal		21	ACL	Alarm clear
		22	ACL	
Output signal		23	TIM.1	Timing (Open-collector)
		24	GND	
		25	ALARM	Alarm
		26	ALARM	
		27	TIM.2	Timing (Line driver)
		28	TIM.2	
		29	END	Positioning completion
30	END			
Input signal		31	×10	Resolution select
		32	×10	
		33	C.OFF	All windings off
		34	C.OFF	

Description of Input/Output Signals → Page 39

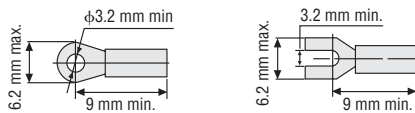
*Signal name in parentheses represents the setting in 2-pulse input mode.

The factory setting is the 1-pulse input mode.

Connection Diagrams



Recommended Crimp Terminals



● Crimp terminals are not provided with the package. They must be furnished separately.

Connecting the Electromagnetic Brake to Power Supply

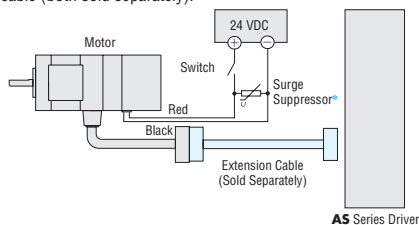
Connect the electromagnetic brake to the power supply using a cable with a conductor cross-sectional area of at least AWG24 (0.2 mm²). The power supply input to the electromagnetic brake is 24 VDC ±5% 0.3 A minimum (**AS46**: 0.1 A minimum) and therefore must be independent of the driver's power supply for signal control.

Notes:

- Applying a voltage that exceeds the specifications will cause the electromagnetic brake to generate a great amount of heat, resulting in motor temperature rises and possible damage to the motor. Conversely, if voltage is too low, the electromagnetic brake may not release.
- To protect the switch contacts and prevent noise, always connect the surge suppressor (Included).
(*The surge suppressor is included with electromagnetic brake motors.)
- To prevent noise, use a dedicated power supply for electromagnetic brake.
- Correct polarity (+ and -) must be ensured when connecting the electromagnetic brake lead wire of **AS Series** to the DC power supply. If polarity is incorrect, the electromagnetic brake will not operate.
- When using as a CE certified part, use a dedicated DC power supply for electromagnetic brake.

(1) AS46

The electromagnetic brake wire is linked to the connector on the motor (600 mm). When connecting with the DC power supply, connect the red spiral lead wire to +24 V, and the black lead wire to the ground (GND). Use the extension cable or the flexible extension cable (both sold separately).



Input Signal Connection

● Pulse Signal and Rotation Direction Signal

Signals can be connected directly when 5 VDC is supplied. If the signals are used at a voltage exceeding 5 VDC, be sure to provide an external resistor to prevent the current exceeding 20 mA from flowing. Internal components will be damaged if a voltage exceeding 5 VDC is supplied directly without using an external resistor.

Example) If the voltage is 24 VDC, connect a resistor (R₁) of 1.5 to 2.2 kΩ and 0.5 W or more.

- All Windings OFF Signal, Resolution Select Signal and Alarm Clear Signal Keep the input signal voltage of 5 VDC. Applying a voltage exceed 5 VDC will damage the internal elements.

Output Signal Connection

- Use output signals at 30 VDC or less and 15 mA or less. If these specifications are exceeded, the elements may be damaged. Check the specification of the connected equipment.

Notes on Wiring

- Use a multi-core, twisted-pair shielded wire AWG28 (0.08 mm²) or thicker for the control input/output signal line (CN4), 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.
- When it is necessary to have a connection more than 0.4 m between motor and driver, the optional extension cable or flexible extension cable must be used. Electromagnetic brake motor models (except motor frame size 42 mm) must use an electromagnetic brake extension cable or flexible extension cable (sold separately). The frame size 42 mm models can use a standard extension cable even for electromagnetic brake motor models. Always use the motor cable for IP65 rated motor (sold separately) for connection between the IP65 rated motor and the driver.
- Use the following cable for the power line:
Single-phase 100-115 VAC, Single-phase 200-230 VAC: 3-core cable with a conductor cross-sectional area of at least AWG18 (0.75 mm²).
Three-phase 200-230 VAC: 4-core cable with a conductor cross-sectional area of at least AWG18 (0.75 mm²).
- Provide a minimum distance of 300 mm between the control I/O signal line and power lines (AC lines, motor lines and other large-current circuits). Do not run the control I/O signal line in the same duct as power lines or bundle it with power lines.
- To ground the driver, lead the ground conductor from the protective ground terminal (M4) and connect the ground conductor to provide single-point grounding.

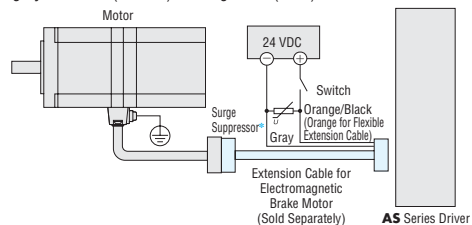
⚠ Caution

- Connect the power supply for timing signal and pulse signal output to 5 VDC. Vcc+24 V (③ pin of CN4) should be grounded.

Description of Output Signals → Page 40

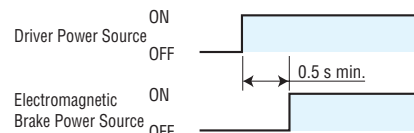
(2) AS66, AS69, AS98

The electromagnetic brake wire is linked to the connector on the driver connection side of extension cable for electromagnetic brake motor (sold separately). Be sure to use the accessory (sold separately) extension cable or flexible extension cable. Connect the orange/black spiral lead wire (orange for flexible extension cable)(60 mm) to +24 V, and the gray lead wire (60 mm) to the ground (GND).



Timing Chart for Electromagnetic Brake Operation

To release the electromagnetic brake, wait at least 0.5 seconds after turning on the driver power source. The load may fall down due to a loss of holding torque.



Description of Input/Output Signals

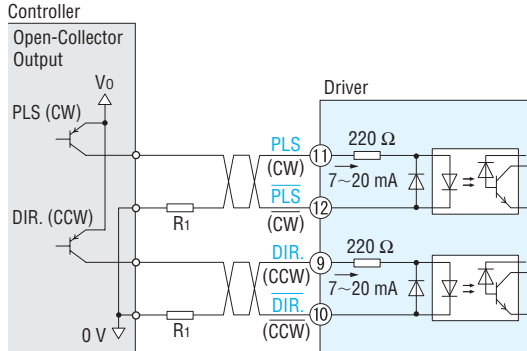
Indication of Input/Output Signal "ON"/"OFF"

Input (output) "ON" indicates that the current is sent into the photocoupler (transistor) inside the driver. Input (output) "OFF" indicates that the current is not sent into the photocoupler (transistor) inside the driver. The input/output remains "OFF" if nothing is connected.

Photocoupler OFF ON

PLS (CW) and DIR. (CCW) Input Signal

Input Circuit and Sample Connection

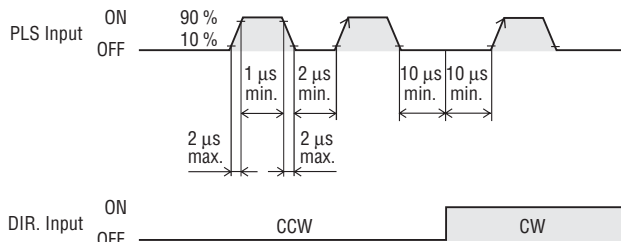


The colored characters indicate signals under the 1-pulse input mode, while the black characters indicate signals under the 2-pulse input mode.

Note:

The external resistor is not needed when V_o is 5 VDC. When the voltage exceeds 5 VDC, connect the external resistor R_1 to keep input current at 20 mA or less. When a voltage exceed 5 VDC is applied without the external resistor, the elements may get damaged.

Pulse Waveform Characteristics



For pulse signals, use input pulse waveforms like those shown in the figure above.

Pulse Input Mode

<1-Pulse Input Mode>

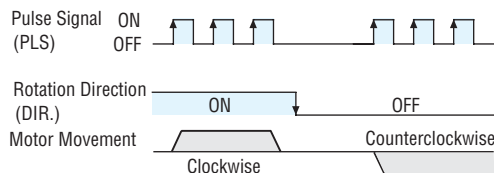
The 1-pulse input mode uses Pulse (PLS) and Rotation Direction (DIR.) signals. CW is selected by inputting DIR. signal at low level (with the input photocoupler ON), CCW by inputting at high level (with input photocoupler OFF).

Note:

The factory setting is 1-pulse input.

[Rotation Direction Signals] Photocoupler "ON": Clockwise
Photocoupler "OFF": Counterclockwise

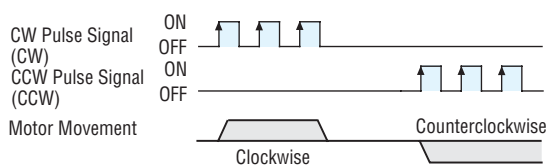
1-Pulse Input Mode



<2-Pulse Input Mode>

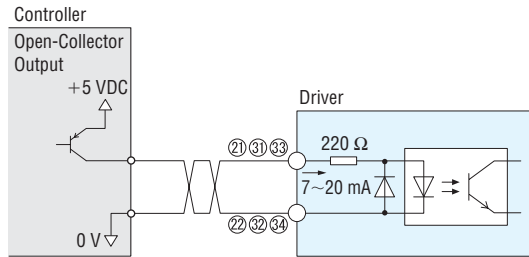
The 2-pulse input mode is used for "CW" and "CCW" pulses. When "CW" pulses are input, the motor's output shaft rotates clockwise when the motor is viewed facing the shaft; when "CCW" pulses are input, the shaft rotates counterclockwise.

2-Pulse Input Mode



All Windings OFF (C.OFF) Input Signal Resolution Select ($\times 10$) Input Signal Alarm Clear (ACL) Input Signal

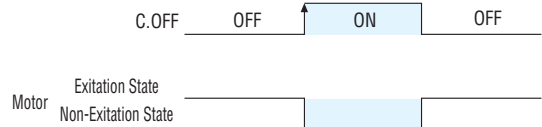
Input Circuit and Sample Connection



All Windings OFF (C.OFF) Input Signal

Pin No. 33, 34

This controller power source offers 5 VDC. Inputting the All Windings Off (C.OFF) signal puts the motor in a non-excitation (free) state. It is used when turning the motor shaft externally or when positioning manually. This signal clears the deviation counter.



Resolution Select ($\times 10$) Input Signal

Pin No. 31, 32

This controller power source offers 5 VDC. Inputting this signal when 1000 P/R or 500 P/R is selected as resolution via the function switch will increase the resolution ten-times to 10000 P/R or 5000 P/R.

Note:

While the resolution select switch is set to 10000 P/R or 5000 P/R, input of this signal will not change the resolution.

Alarm Clear (ACL) Input Signal

Pin No. 21, 22

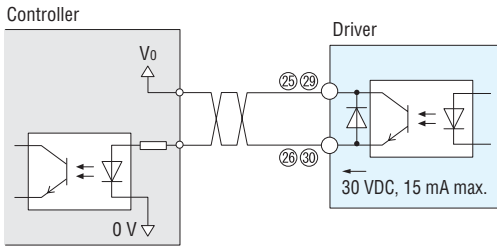
This controller power source offers 5 VDC. This signal is used for canceling the alarm without turning off power to the driver when a protection circuit has been activated.

Note:

The following alarm cannot be cleared. To cancel the alarm, first resolve the cause and check for safety, and then turn power on again.
· Overcurrent · EEPROM data error · System error

Position Completion (END) Output Signal Alarm (ALARM) Output Signal

◇ Output Circuit and Sample Connection

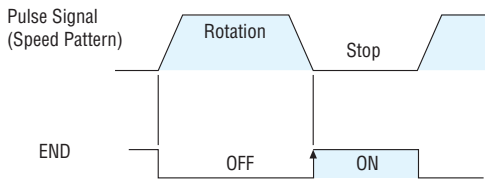


◇ Position Completion (END) Output Signal

Pin No. 29, 30

Circuit for use with 30 VDC, 15 mA maximum.

This signal is output at the photocoupler ON state when positioning is completed. This signal is output when the rotor position is less than $\pm 1.8^\circ$ from the command position, approximately 2 ms after the pulse input stops.



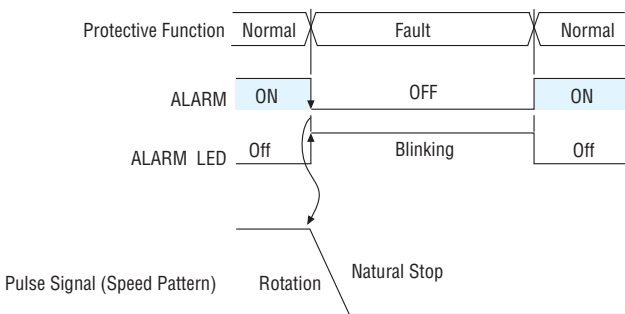
Note:

- The END signal flashes during operation with a pulse input frequency of 500 Hz or less.

◇ Alarm (ALARM) Output Signal

Pin No. 25, 26

Circuits for use with 30 VDC, 15 mA maximum. The photocoupler turns OFF when one of the driver's protection circuits has been activated. When an abnormality such as an overload or over current is detected, the alarm signal will output, the ALARM indicator blinks, and the motor stops (non-excitation state). To cancel the alarm, first resolve the cause and check for safety, and then input an Alarm Clear (ACL) signal or reset power. Once power has been turned off, wait at least 10 seconds before turning it on again.



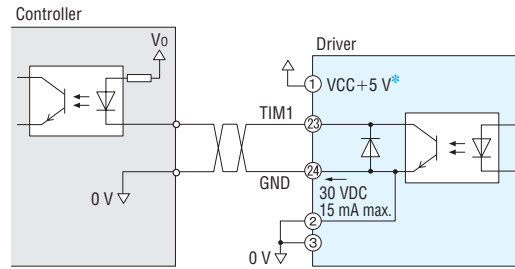
Notes:

- The alarm output uses positive logic (Normally Closed), all other outputs use negative logic (Normally Open).
- The ALARM indicator lights (not blinks) when system error protective function has been activated.

Excitation Timing Signal (TIM.) Output Signal

◇ Output Circuit and Sample Connection

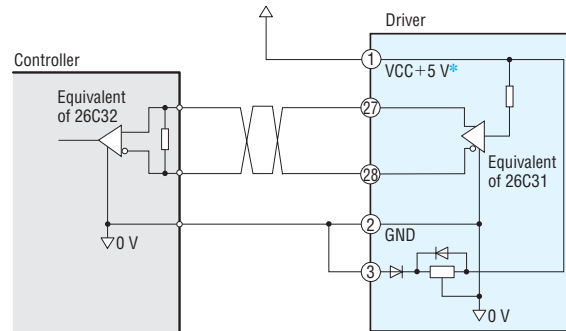
Open-Collector Output



*Power supply for timing output should be connected to 5 VDC.

Circuits for use with 30 VDC, 15 mA maximum.

Line Driver Output

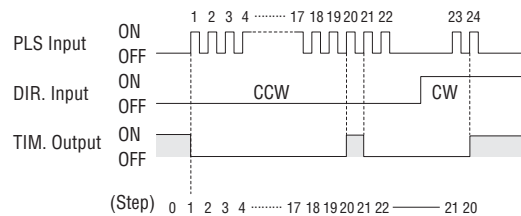


*Power supply for timing output should be connected to 5 VDC.

◇ Excitation Timing Signal (TIM.) Output Signal

Pin No. 23, 24, 27, 28

When the Excitation Timing signal is output, the transistor turns ON (For the line driver output which is TIM.2, the output signal is ON). This signal can be used to detect the home position with greater precision. This signal is output 50 times per motor shaft revolution.



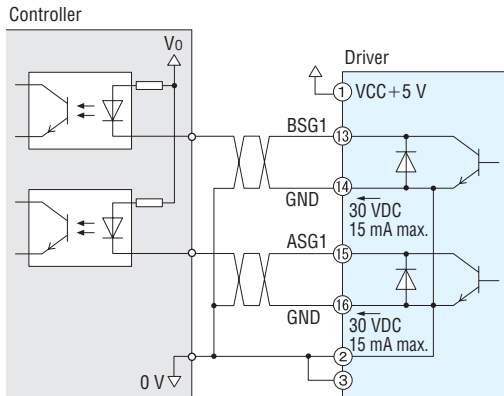
Notes:

- A precise timing signal cannot be obtained when the speed of the pulse input frequency is over 500 Hz.
- When the Timing Signal Output is used, 5 VDC power supply is necessary.

Quadrature (ASG1/BSG1, ASG2/BSG2) Output Signal

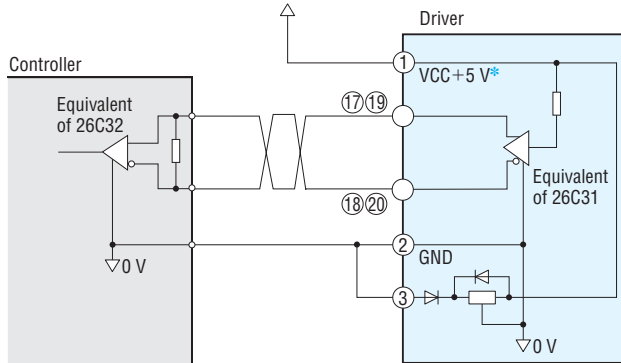
◇ Output Circuit and Sample Connection

Open-Collector Output



Circuit for use with 30 VDC, 15 mA maximum.

Line Driver Output



* Power supply for quadrature output should be connected to 5 VDC.

◇ Quadrature (ASG1/BSG1, ASG2/BSG2) Output Signal Pin No. 13~20

A counter or similar device can be connected to monitor the position of the motor.

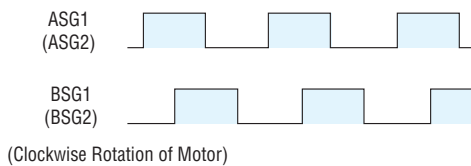
The pulse resolution is the same as the motor resolution at the time of power-on.

[Example: Resolution select switch (1000 P/R) → Output pulse number for each motor revolution (1000).] The phase difference between A and B is 90° electrical.

Notes:

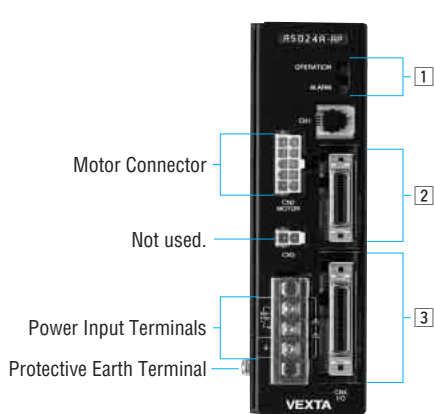
- The pulse output accuracy is, regardless of resolution, within $\pm 0.36^\circ$ (repetition accuracy: within $\pm 0.09^\circ$).
- When the "quadrature" signal output is used, 5 VDC power supply is necessary. These signals are only for position verification when the motor has stopped. There is a 1 ms (maximum) time lag between real rotor motion and the output signals.

◇ Pulse Waveform Characteristics



Connection and Operation [Built-In Controller (Stored Program) Package]

Names and Functions of Driver Parts



1 Signal Monitor Display

◇LED Indicators

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

◇Alarm

Blink Count	Protective Function	When Activated	Alarm Code Output	Operation	Reset
1	Stack overflow	Too many nested LOOP, ENDL, CALL, etc.	90h (Decimal: 144)	The program stops. The motor performs stop operation set by MSTOPACT.	* Possible
	Memory read error	The data stored in the memory is damaged.	91h (Decimal: 145)		
	Program reference error	The called program does not exist.	94h (Decimal: 148)		
	Compilation error	The executed program is not executable.	95h (Decimal: 149)		
	Operation result overflow	The operation result exceeds the range of -8 388 608 to +8 388 607.	98h (Decimal: 152)		
	Parameter out-of-range error	The parameter exceeds its setting range.	99h (Decimal: 153)		
	Divide by zero	Divide by zero was executed.	9Ah (Decimal: 154)		
	General I/O definition error	The signal assignment method for general I/O ports was not correct.	9Ch (Decimal: 156)		
	PC command execution error	A PC command was executed while the motor was operating or not energized.	9Dh (Decimal: 157)		
2	Overheat protection	The temperature of the heat sink in the driver has reached approx. 85°C.	21h (Decimal: 33)	The motor loses its holding torque.	* Possible
	Overload protection	A load exceeding the maximum torque was applied to the motor for the duration set by the OLTIME command.	30h (Decimal: 48)		
	Overspeed error	The speed of the motor's output shaft has exceeded 5000 r/min.	31h (Decimal: 49)		
3	Overvoltage protection	The driver's primary inverter voltage has exceeded the limit of tolerance.	22h (Decimal: 34)	The motor loses its holding torque.	* Possible
4	Excessive position deviation	The position of the motor's output shaft has deviated from the position specified by the operation command, by at least the number of revolutions set by the OVERFLOW command.	10h (Decimal: 16)	The motor loses its holding torque.	* Possible
5	Overcurrent protection	An excessive current has flowed into the power element of the driver's inverter section.	20h (Decimal: 32)	The motor loses its holding torque.	* Impossible
6	Emergency stop	An E-STOP signal has been input.	68h (Decimal: 104)	The program stops. The motor loses its holding torque (ESTOPACT = 0).	* Possible
7	Incorrect limit-sensor logic	Both the +LS and -LS are ON simultaneously.	60h (Decimal: 96)	The motor stops immediately.	* Possible
	Reverse limit-sensor connection	The +LS and -LS are connected in reverse.	61h (Decimal: 97)		
	Mechanical home seeking error	Mechanical home seeking could not be executed correctly.	62h (Decimal: 98)		
	Overtravel	The motor has exceeded its hardware limit.	66h (Decimal: 102)	The program stops. The motor stops immediately (ESTOPACT= 1).	
	Software overtravel	The motor has exceeded its software limit.	67h (Decimal: 103)	Decelerates to a stop.	
	Emergency stop	An E-STOP signal has been input.	68h (Decimal: 104)	The motor stops immediately.	
	Invalid operation data	An inoperable operation pattern has been started.	70h (Decimal: 112)	Motion is stopped.	
8	Resolver sensor error	The motor cable has not been connected or a motor's error has occurred in a sensor.	42h (Decimal: 66)	The motor loses its holding torque.	* Impossible
	Initial rotor revolution error	The driver's power was turned on while the motor's output shaft was turning by external force.	43h (Decimal: 67)		
9	NVRAM error	Motor control parameters has been damaged.	41h (Decimal: 65)	The motor loses its holding torque.	* Impossible
Stays ON.	System error	Driver failure has occurred.	F0h (Decimal: 240)	The motor loses its holding torque.	* Impossible

*Possible - The Alarm can be cleared with the ALMCLR command or an ACL input.

Impossible - The AC power must be cycled to clear these alarms.

2 Limit Sensor Input Communication Signals (CN5) (20 pins)

Connector	Pin No.	Input/Output	Signal	Signal Name
CN5	1	Input	COM1	Common terminal for input signals
	2		COM2	Common terminal for input signals
	3	—	—	No Connection
	4	—	—	No Connection
	5	Output	TX	RS-232C Transmit
	6	—	—	No Connection
	7	Input	RX	RS-232C Receive
	8	—	—	No Connection
	9	—	—	No Connection
	10	Input	N24	External power supply terminal (GND)
	11	Input	COM1	Common terminal for input signals
	12		COM2	Common terminal for input signals
	13		+LS	+LS limit sensor
	14		-LS	-LS limit sensor
	15		HOMELS	HOME sensor
	16		SENSOR	Sensor
	17		—	No connection
	18		—	No connection
	19		COM1	Common terminal for input signals
	20		COM2	Common terminal for input signals

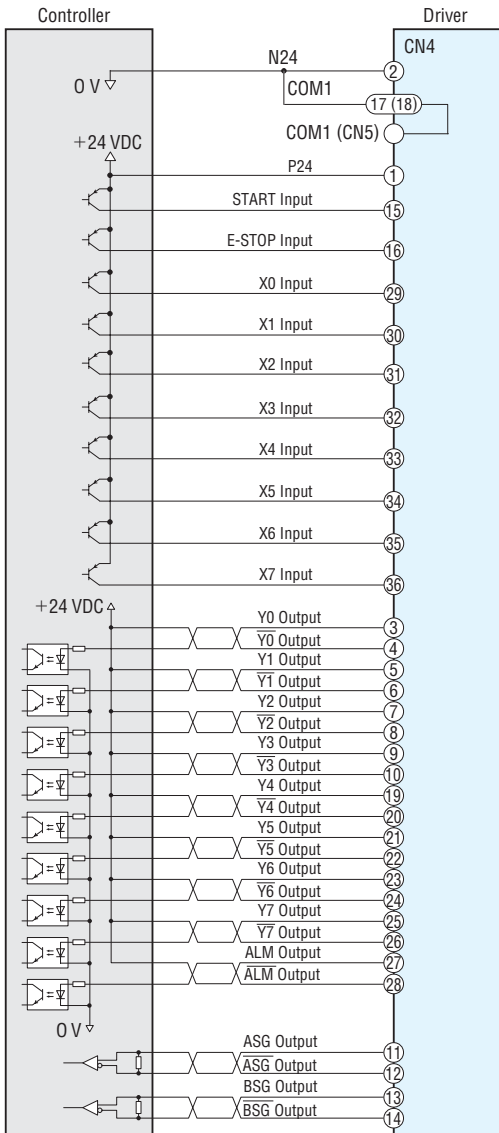
3 I/O Signals (CN4) (36 pins)

Connector	Pin No.	Input/Output	Signal	Signal Name	
CN4	1	Input	P24	Power source for RS-232C, ASG and BSG (24 VDC)	
	2		N24	Power source for RS-232C, ASG and BSG (GND)	
	3	Output	Y0	General output*1 (Y0 to Y3)	
	4		$\bar{Y}0$		
	5		Y1		
	6		$\bar{Y}1$		
	7		Y2		
	8		$\bar{Y}2$		
	9		Y3		
	10		$\bar{Y}3$		
	11		ASG		Phase A pulse output (Line driver output)
	12		\bar{ASG}		
	13	BSG	Phase B pulse output (Line driver output)		
	14	\bar{BSG}			
	15	Input	START	START	
	16		E-STOP	Emergency stop	
	17		COM1	Common terminal for input signal	
	18	Output	Y4	General output*1 (Y4 to Y7)	
	19		$\bar{Y}4$		
	20		Y5		
	21		$\bar{Y}5$		
	22		Y6		
	23		$\bar{Y}6$		
	24		Y7		
	25		$\bar{Y}7$		
	26		ALM		Alarm
	27		ALM		
	28	Input	X0	General input*2 (X0 to X7)	
	29		X1		
	30		X2		
	31		X3		
	32		X4		
	33		X5		
	34		X6		
	35		X7		
	36				

*1 The following signals can be assigned arbitrarily via program settings. Additionally, the output logic of each signal can be switched. END output, RUN output, MOVE output, HOME-P output, TIM output, MBC output

*2 The following signals can be assigned arbitrarily via program settings. Additionally, the input logic of each signal can be switched. ACL input, PAUSE input, MSTOP input, RESTART input

Connection Diagrams



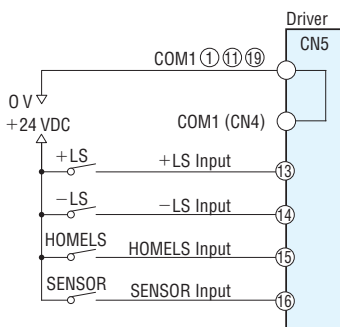
X0 to X7: General Input*1

Y0 to Y7: General Output*2

*1 The following signals can be assigned arbitrarily via program settings. Additionally, the output logic of each signal can be switched. END output, RUN output, MOVE output, HOME-P output, TIM output, MBC output

*2 The following signals can be assigned arbitrarily via program settings. Additionally, the input logic of each signal can be switched. ACL input, PAUSE input, MSTOP input, RESTART input

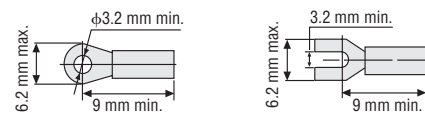
Limit Sensor (CN5)



Notes on Wiring

- Use input signals at 24 VDC \pm 10%.
- Use output signals at 30 VDC or below and at 4 to 8 mA.
- Use a shielded cable with a wire of a size ranging between AWG24 (0.2 mm²) and AWG22 (0.3 mm²) for the driver signal cable (I/O signals, limit sensors signals), and keep it as short as possible.
- Keep the control input/output signal line at least 300 mm away from power lines (e.g. lines carrying large current, such as AC lines and motor lines). Also, do not run these lines through the same ducts or pipes as power lines.
- Always use the optional cable for IP65 rated motor (sold separately) for connection between the IP65 rated motor and the driver.
- Use the following cable for the power line:
Single-phase 200 to 230 VAC: 3-core cable (Conductor cross-sectional area: 0.75 mm² or more)
Provide a minimum distance of 300 mm between the control I/O signal line and power lines (AC lines, motor lines and other large-current circuits).
- Do not guide the control I/O signal line in the same duct as power lines or bundle it with power lines.
- The power cable and control I/O signal cable are not supplied with the package and must be provided separately by the user.
To ground the driver, lead the ground conductor from the protective ground terminal (M4) and connect the ground conductor to a cable of AWG18 (0.75 mm²) or larger to provide single-point grounding.

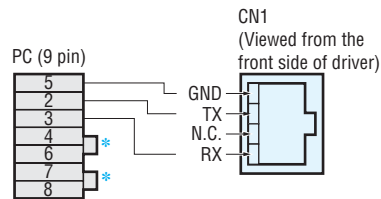
Recommended Crimp Terminals



- Crimp terminals are not provided with the package. They must be furnished separately.

Connecting the Driver with a Personal Computer (CN1)

- Pin Assignments and Connecting



- * Short pins 4 and 6 together, as well as pins 7 and 8 together.

Communication Specifications

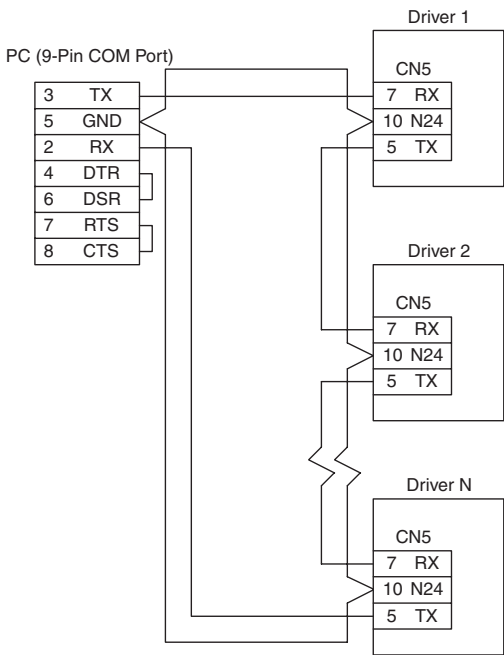
Item	Description
Electrical characteristics	In conformance with RS-232C.
Transmission method	Start-stop asynchronous method, NRZ (non-return to Zero), full-duplex
Data length	8 bits, 1 stop bit, no parity
Transmission speed	9600 bps
Protocol	TTY (CR + LF)
Connector specification	Modular (4 lines, 4 pins)

Notes:

- Confirm that 24 VDC is supplied to the driver's external power supply input terminals (P24 and N24).
- Use the RS-232C signal lines over the shortest possible distance. It is recommended that the signal lines be shielded to protect them from noise interference.
- The maximum distance between drivers when using a daisy chain connection should be 15 m.

● Description of Daisy-Chain Connections

Use the RS-232C communication pins (TX, RX and N24) of the sensor connector (CN5) when connecting two or more drivers via a daisy chain (up to 36 drivers).



◇ TX, RX

These communication terminals are used when implementing daisy-chain connections.

Notes:

- Confirm that each driver is supplied 24 VDC $\pm 10\%$ (P24 and N24) of CN4 from outside for communication.
- Wire the RS-232C signal lines over the shortest possible distance. It is recommended that the signal lines be shielded to protect them from noise interference.
- The maximum distance between drivers when using a daisy-chain connection should be 15 m.
- Do not use the RS-232C communication port (CN1).

■ Connecting the Electromagnetic Brake to Power Supply

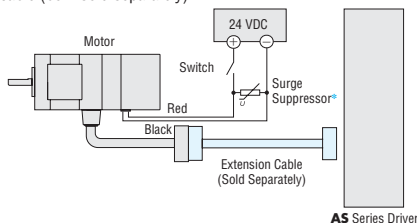
Connect the electromagnetic brake to the power supply using a cable with a conductor cross-sectional area of at least AWG24 (0.2 mm²). The power supply input to the electromagnetic brake is 24 VDC $\pm 5\%$ 0.3 A minimum (**AS46**: 0.1 A minimum) and therefore must be independent of the driver's power supply for signal control.

Notes:

- Applying a voltage that exceeds the specifications will cause the electromagnetic brake to generate a great amount of heat, resulting in motor temperature rises and possible damage to the motor. Conversely, if voltage is too low, the electromagnetic brake may not release.
- To protect the switch contacts and prevent noise, always connect the surge suppressor (Included).*
- (*The surge suppressor is included with electromagnetic brake motors.)
- To prevent noise, use a dedicated power supply for electromagnetic brake.
- Correct polarity (+ and -) must be ensured when connecting the electromagnetic brake lead wire of **AS** Series to the DC power supply. If polarity is incorrect, the electromagnetic brake will not operate.
- When using as a CE certified part, use a dedicated DC power supply for electromagnetic brake.

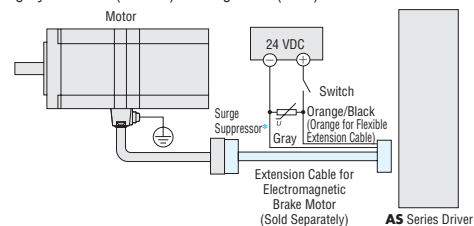
(1) AS46

The electromagnetic brake wire is linked to the connector on the motor (600 mm). When connecting with the DC power supply, connect the red spiral lead wire to +24 V, and the black lead wire to the ground (GND). Use the extension cable or the flexible extension cable (both sold separately).



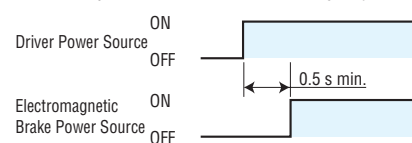
(2) AS66, AS69, AS98

The electromagnetic brake wire is linked to the connector on the driver connection side of extension cable for electromagnetic brake motor (sold separately). Be sure to use the accessory (sold separately) extension cable or flexible extension cable. Connect the orange/black spiral lead wire (orange for flexible extension cable)(60 mm) to +24 V, and the gray lead wire (60 mm) to the ground (GND).



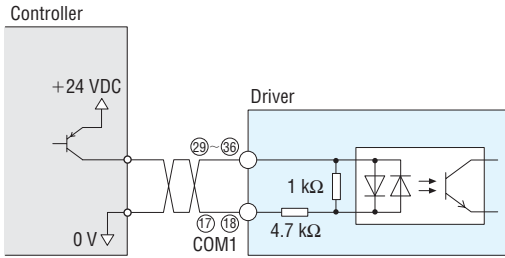
Timing Chart for Electromagnetic Brake Operation

To release the electromagnetic brake, wait at least 0.5 seconds after turning on the driver power source. The load may fall down due to a loss of holding torque.



● Description of Input Signals (CN4)

◇ Input Circuit and Sample Connection



Note:

- Use input signals at $24\text{ VDC} \pm 10\%$.

◇ P24 Input, N24 Input

These inputs are for the external power supply required for the RS-232C communication, ASG and BSG outputs. Make sure to use a power supply of at least $24\text{ VDC} \pm 10\%$, 0.05 A.

If the same power supply is going to be used for the RS-232C, ASG, BSG and other external I/O, make sure to use a power supply of at least $24\text{ VDC} \pm 10\%$, 0.2 A.

◇ START Input

This signal starts the program named "STARTUP."
OFF→ON edge to start "STARTUP" program.

◇ E-STOP Input

This signal is used to forcibly stop the operation.
Set the stopping method using the ESTOPACT command.
Additionally, the input logic can be changed using the ESTOPLV command. (The factory setting of this command is normally open.)
OFF→ON edge to stop operation.

◇ COM1 Input

This is an external power-source terminal for input signals.
This signal is internally connected to terminals COM1 of CN5.

◇ X0 to X7 Inputs

The X0 through X7 inputs can be used as input ports for general signals. The status of each port can be read using an IN command or INx command.

The general signals assignable to the X0 through X7 inputs are listed below. Use a corresponding command to assign signal.

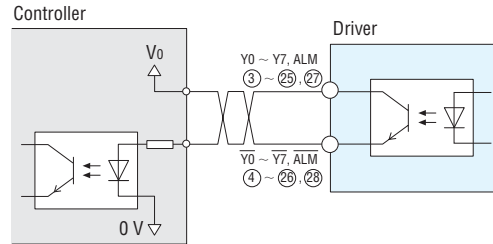
- ACL input INACL command
- PAUSE input..... INPAUSE command
- MSTOP input..... INMSTOP command
- RESTART input... INRESTART command

◇ ACL Input

This signal is used to reset the alarm that has been generated by the driver's protective function.
Input an ACL signal once after removing the cause that has triggered the protective function.

● Description of Output Signals (CN4)

◇ Output Circuit and Sample Connection



Note:

- Use output signals at 30 VDC or below and at 4 to 8 mA.

◇ Y0 to Y7 Output

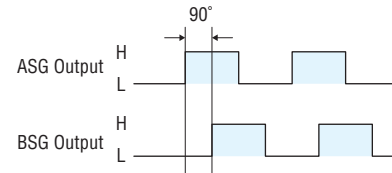
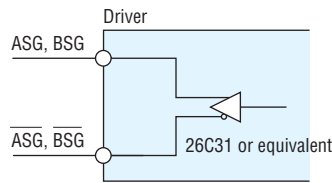
The Y0 through Y7 outputs can be used as output ports for general signals. The status of each port can be read using an OUT command or OUTx command.

The general signals assignable to the Y0 through Y7 outputs are listed below. Use the corresponding command to assign each signal.

- END output OUTEND command
- RUN output OUTRUN command
- MOVE output..... OUTMOVE command
- HOME-P output..... OUTHOMEP command
- TIM output..... OUTTIM command
- MBC output..... OUTMBC command

◇ ASG Output, BSG Output

- Line driver output (26C31 or equivalent)



To monitor the motor position, connect these signals to a counter, etc.

The pulse resolution is the same as the motor resolution at the time of power-on.

The ASG output and BSG output have a phase difference of 90 degrees electrical.

Pulse output is subject to a maximum delay of 1 ms relative to the motor's motion. Use the ASG output and BSG output to check the stopping position.

◇ ALM Output

This signal is output when an alarm is generated by the driver's protective function.

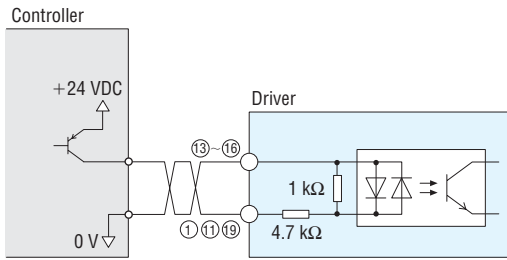
The reason for triggering of the protective function can be identified through the blink count of the alarm LED, or ALM command.

To reset the ALM output, remove the cause of the alarm and then perform one of the following procedures after ensuring safety:

- Assign INACL then turn the ACL input to ON.
- Enter an ALMCLR command.
- Turn off the AC power, wait at least 10 seconds, then turn it back on.

● Description of Limit Sensors (CN5)

◇ Input Circuit and Sample Connection



Note:

- Use input signals at 24 VDC \pm 10%.

◇ COM1 Input

This is a power-source input terminal for limit-sensor signals. The power-source voltage must be 24 VDC \pm 10%.

This signal is internally connected to terminals COM1 of CN4.

◇ COM2 Input

This is a power-source input terminal for limit-sensor signals.

Use it when sharing the input signal power source among two or more drivers.

◇ +LS Input, -LS Input

These signals are input from +LS and -LS.

The input logic can be changed using the OTLV command. (The factory setting of this command is normally open.) Input logic for the +LS input and -LS input cannot be set separately.

Continuous Operation and Positioning Operation

When a +LS or -LS is detected, the driver's protective function (over travel) is activated. As a result, the ALM output is turned OFF and the motor stops.

Set the stopping method using the OTACT command.

To pull out of +LS or -LS, cancel the protective function by inputting an ACL signal once or by using the ALMCLR command.

Then perform mechanical home seeking routine or operate the motor in the direction opposite that of the limit sensor during continuous operation.

Mechanical Home Seeking Routine

When a +LS or -LS is detected, the motor operates in the direction opposite that of the detected limit.

◇ HOMELS Input

This signal is input from HOMELS.

Connect the HOMELS when mechanical home seeking is performed in 3-sensor mode.

When mechanical home seeking is performed in 3-sensor mode, the HOMELS becomes the mechanical home. The input logic can be changed using the HOMELV command. (The factory setting of this command is normally open.)

◇ SENSOR Input

This signal is input from SENSOR.

The input logic can be changed using the SENSORLV command. (The factory setting of this command is normally open.)

Mechanical Home Seeking Routine

This input is used when detecting the mechanical home at a specific point on the motor's output shaft or load shaft using a slotted disc, etc. The accuracy of mechanical home hunting increases if this input is used in conjunction with the TIM. signal.

Continuous Operation

The motor can be stopped forcibly upon the detection of SENSOR. Set the stopping method using the SENSORACT command.

Note:

- If the SENSOR input is used in mechanical home hunting, it cannot be used during continuous operation.

List of Motor and Driver Combinations

Model names for motor and driver combinations are shown below.

Power Supply Voltage	Type	Pulse Input Package			Built-In Controller (Stored Program) Package			
		Package Model	Motor Model	Driver Model	Package Model	Motor Model	Driver Model	
Single-Phase 100-115 VAC Input	Standard Type	AS46 □ A	ASM46□A	ASD13A-A	AS46 □ AP	ASM46□A	ASD13A-AP	
		AS66 □ AE	ASM66□AE	ASD24A-A	AS66 □ AEP	ASM66□AE	ASD24A-AP	
		AS69 □ AE	ASM69□AE	ASD30D-A	AS69 □ AEP	ASM69□AE	ASD30D-AP	
		AS98 □ AE	ASM98□AE	ASD30A-A	AS98 □ AEP	ASM98□AE	ASD30A-AP	
	Standard Type IP65 Rated Motor	AS911AAE	ASM911AAE	ASD30E-A	AS911AAEP	ASM911AAE	ASD30E-AP	
		AS66AAT	ASM66AAT	ASD24A-A	AS66AATP	ASM66AAT	ASD24A-AP	
		AS69AAT	ASM69AAT	ASD30D-A	AS69AATP	ASM69AAT	ASD30D-AP	
		AS98AAT	ASM98AAT	ASD30A-A	AS98AATP	ASM98AAT	ASD30A-AP	
	TH Geared Type	AS911AAT	ASM911AAT	ASD30E-A	AS911AATP	ASM911AAT	ASD30E-AP	
		AS46 □ A-T3.6	ASM46□A-T3.6	ASD13B-A	AS46 □ AP-T3.6	ASM46□A-T3.6	ASD13B-AP	
		AS46 □ A-T7.2	ASM46□A-T7.2		AS46 □ AP-T7.2	ASM46□A-T7.2		
		AS46 □ A-T10	ASM46□A-T10	ASD13C-A	AS46 □ AP-T10	ASM46□A-T10	ASD13C-AP	
		AS46 □ A-T20	ASM46□A-T20		AS46 □ AP-T20	ASM46□A-T20		
		AS46 □ A-T30	ASM46□A-T30	ASD24B-A	AS46 □ AP-T30	ASM46□A-T30	ASD24B-AP	
		AS66 □ AE-T3.6	ASM66□AE-T3.6		AS66 □ AEP-T3.6	ASM66□AE-T3.6		
		AS66 □ AE-T7.2	ASM66□AE-T7.2		AS66 □ AEP-T7.2	ASM66□AE-T7.2		
		AS66 □ AE-T10	ASM66□AE-T10		AS66 □ AEP-T10	ASM66□AE-T10		
		AS66 □ AE-T20	ASM66□AE-T20	ASD24C-A	AS66 □ AEP-T20	ASM66□AE-T20	ASD24C-AP	
		AS66 □ AE-T30	ASM66□AE-T30		AS66 □ AEP-T30	ASM66□AE-T30		
		AS98 □ AE-T3.6	ASM98□AE-T3.6	ASD30A-A	AS98 □ AEP-T3.6	ASM98□AE-T3.6	ASD30A-AP	
		AS98 □ AE-T7.2	ASM98□AE-T7.2		AS98 □ AEP-T7.2	ASM98□AE-T7.2		
		AS98 □ AE-T10	ASM98□AE-T10		AS98 □ AEP-T10	ASM98□AE-T10		
		AS98 □ AE-T20	ASM98□AE-T20		AS98 □ AEP-T20	ASM98□AE-T20		
		AS98 □ AE-T30	ASM98□AE-T30	ASD30C-A	AS98 □ AEP-T30	ASM98□AE-T30	ASD30C-AP	
	PL Geared Type	AS46 □ A-P7.2	ASM46□A-P7.2	ASD13A-A	—	—	—	
		AS46 □ A-P10	ASM46□A-P10	ASD13B-A	—	—	—	
		AS46 □ A-P36	ASM46□A-P36	ASD13C-A	—	—	—	
		AS46 □ A-P50	ASM46□A-P50	—	—	—	—	
		AS66 □ AE-P5	ASM66□AE-P5	—	—	—	—	
		AS66 □ AE-P7.2	ASM66□AE-P7.2	ASD24A-A	—	—	—	
		AS66 □ AE-P10	ASM66□AE-P10	—	—	—	—	
		AS66 □ AE-P25	ASM66□AE-P25	ASD24B-A	—	—	—	
		AS66 □ AE-P36	ASM66□AE-P36	ASD24C-A	—	—	—	
		AS66 □ AE-P50	ASM66□AE-P50	—	—	—	—	
		AS98 □ AE-P5	ASM98□AE-P5	—	—	—	—	
		AS98 □ AE-P7.2	ASM98□AE-P7.2	ASD30A-A	—	—	—	
		AS98 □ AE-P10	ASM98□AE-P10		—	—	—	
		AS98 □ AE-P25	ASM98□AE-P25	—	—	—	—	
	AS98 □ AE-P36	ASM98□AE-P36	ASD30B-A	—	—	—		
	AS98 □ AE-P50	ASM98□AE-P50	—	—	—	—		
	PN Geared Type	AS46 □ A-N7.2	ASM46□A-N7.2	ASD13A-A	AS46 □ AP-N7.2	ASM46□A-N7.2	ASD13A-AP	
		AS46 □ A-N10	ASM46□A-N10	—	AS46 □ AP-N10	ASM46□A-N10	—	
		AS66 □ AE-N5	ASM66□AE-N5	ASD24A-A	AS66 □ AEP-N5	ASM66□AE-N5	ASD24A-AP	
		AS66 □ AE-N7.2	ASM66□AE-N7.2		AS66 □ AEP-N7.2	ASM66□AE-N7.2		
		AS66 □ AE-N10	ASM66□AE-N10	ASD24B-A	AS66 □ AEP-N10	ASM66□AE-N10	ASD24B-AP	
		AS66 □ AE-N25	ASM66□AE-N25		AS66 □ AEP-N25	ASM66□AE-N25		
		AS66 □ AE-N36	ASM66□AE-N36	ASD24C-A	AS66 □ AEP-N36	ASM66□AE-N36	ASD24C-AP	
		AS66 □ AE-N50	ASM66□AE-N50		AS66 □ AEP-N50	ASM66□AE-N50		
		AS98 □ AE-N5	ASM98□AE-N5	ASD30A-A	AS98 □ AEP-N5	ASM98□AE-N5	ASD30A-AP	
		AS98 □ AE-N7.2	ASM98□AE-N7.2		AS98 □ AEP-N7.2	ASM98□AE-N7.2		
		AS98 □ AE-N10	ASM98□AE-N10		AS98 □ AEP-N10	ASM98□AE-N10		
		AS98 □ AE-N25	ASM98□AE-N25		AS98 □ AEP-N25	ASM98□AE-N25		
	AS98 □ AE-N36	ASM98□AE-N36	ASD30B-A	AS98 □ AEP-N36	ASM98□AE-N36	ASD30B-AP		
	AS98 □ AE-N50	ASM98□AE-N50		AS98 □ AEP-N50	ASM98□AE-N50			
	Harmonic Geared Type	AS46 □ A2-H50	ASM46□A2-H50	ASD13A-A	AS46 □ AP2-H50	ASM46□A2-H50	ASD13A-AP	
		AS46 □ A2-H100	ASM46□A2-H100	—	AS46 □ AP2-H100	ASM46□A2-H100	—	
		AS66 □ AE-H50	ASM66□AE-H50	ASD24B-A	AS66 □ AEP-H50	ASM66□AE-H50	ASD24B-AP	
		AS66 □ AE-H100	ASM66□AE-H100	ASD24C-A	AS66 □ AEP-H100	ASM66□AE-H100	ASD24C-AP	
		AS98 □ AE-H50	ASM98□AE-H50	ASD30B-A	AS98 □ AEP-H50	ASM98□AE-H50	ASD30B-AP	
	AS98 □ AE-H100	ASM98□AE-H100	AS98 □ AEP-H100		ASM98□AE-H100			
	Single-Phase 200-230 VAC Input	Standard Type	AS66 □ CE	ASM66□CE	ASD12A-C	AS66 □ CEP	ASM66□CE	ASD12A-CP
			AS69 □ CE	ASM69□CE	ASD16D-C	AS69 □ CEP	ASM69□CE	ASD16D-CP
			AS98 □ CE	ASM98□CE	ASD16A-C	AS98 □ CEP	ASM98□CE	ASD16A-CP
			AS911ACE	ASM911ACE	ASD20A-C	AS911ACEP	ASM911ACE	ASD20A-CP
		Standard Type IP65 Rated Motor	AS66ACT	ASM66ACT	ASD12A-C	AS66ACTP	ASM66ACT	ASD12A-CP
			AS69ACT	ASM69ACT	ASD16D-C	AS69ACTP	ASM69ACT	ASD16D-CP
			AS98ACT	ASM98ACT	ASD16A-C	AS98ACTP	ASM98ACT	ASD16A-CP
			AS911ACT	ASM911ACT	ASD20A-C	AS911ACTP	ASM911ACT	ASD20A-CP
		TH Geared Type	AS66 □ CE-T3.6	ASM66□CE-T3.6	ASD12B-C	AS66 □ CEP-T3.6	ASM66□CE-T3.6	ASD12B-CP
			AS66 □ CE-T7.2	ASM66□CE-T7.2		AS66 □ CEP-T7.2	ASM66□CE-T7.2	
			AS66 □ CE-T10	ASM66□CE-T10	ASD12C-C	AS66 □ CEP-T10	ASM66□CE-T10	ASD12C-CP
			AS66 □ CE-T20	ASM66□CE-T20		AS66 □ CEP-T20	ASM66□CE-T20	
		AS66 □ CE-T30	ASM66□CE-T30	—	AS66 □ CEP-T30	ASM66□CE-T30	—	

● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.

Power Supply Voltage	Type	Pulse Input Package			Built-In Controller (Stored Program) Package		
		Package Model	Motor Model	Driver Model	Package Model	Motor Model	Driver Model
Single-Phase 200-230 VAC Input	TH Geared Type	AS98 □ CE-T3.6	ASM98□CE-T3.6	ASD16A-C	AS98 □ CEP-T3.6	ASM98□CE-T3.6	ASD16A-CP
		AS98 □ CE-T7.2	ASM98□CE-T7.2		AS98 □ CEP-T7.2	ASM98□CE-T7.2	
		AS98 □ CE-T10	ASM98□CE-T10		AS98 □ CEP-T10	ASM98□CE-T10	
		AS98 □ CE-T20	ASM98□CE-T20	ASD16C-C	AS98 □ CEP-T20	ASM98□CE-T20	ASD16C-CP
		AS98 □ CE-T30	ASM98□CE-T30		AS98 □ CEP-T30	ASM98□CE-T30	
	PL Geared Type	AS66 □ CE-P5	ASM66□CE-P5	ASD12A-C	—	—	—
		AS66 □ CE-P7.2	ASM66□CE-P7.2		—	—	—
		AS66 □ CE-P10	ASM66□CE-P10		—	—	—
		AS66 □ CE-P25	ASM66□CE-P25	ASD12B-C	—	—	—
		AS66 □ CE-P36	ASM66□CE-P36	ASD12C-C	—	—	—
		AS66 □ CE-P50	ASM66□CE-P50		—	—	—
		AS98 □ CE-P5	ASM98□CE-P5	ASD16A-C	—	—	—
		AS98 □ CE-P7.2	ASM98□CE-P7.2		—	—	—
		AS98 □ CE-P10	ASM98□CE-P10		—	—	—
		AS98 □ CE-P25	ASM98□CE-P25		—	—	—
		AS98 □ CE-P36	ASM98□CE-P36	ASD16B-C	—	—	—
		AS98 □ CE-P50	ASM98□CE-P50		—	—	—
		PN Geared Type	AS66 □ CE-N5	ASM66□CE-N5	ASD12A-C	AS66 □ CEP-N5	ASM66□CE-N5
	AS66 □ CE-N7.2		ASM66□CE-N7.2	AS66 □ CEP-N7.2		ASM66□CE-N7.2	
	AS66 □ CE-N10		ASM66□CE-N10	AS66 □ CEP-N10		ASM66□CE-N10	
	AS66 □ CE-N25		ASM66□CE-N25	ASD12B-C	AS66 □ CEP-N25	ASM66□CE-N25	ASD12B-CP
	AS66 □ CE-N36		ASM66□CE-N36	ASD12C-C	AS66 □ CEP-N36	ASM66□CE-N36	ASD12C-CP
	AS66 □ CE-N50		ASM66□CE-N50		AS66 □ CEP-N50	ASM66□CE-N50	
	AS98 □ CE-N5		ASM98□CE-N5	ASD16A-C	AS98 □ CEP-N5	ASM98□CE-N5	ASD16A-CP
	AS98 □ CE-N7.2		ASM98□CE-N7.2		AS98 □ CEP-N7.2	ASM98□CE-N7.2	
	AS98 □ CE-N10		ASM98□CE-N10		AS98 □ CEP-N10	ASM98□CE-N10	
	AS98 □ CE-N25		ASM98□CE-N25		AS98 □ CEP-N25	ASM98□CE-N25	
	AS98 □ CE-N36		ASM98□CE-N36		AS98 □ CEP-N36	ASM98□CE-N36	
	AS98 □ CE-N50	ASM98□CE-N50	ASD16B-C	AS98 □ CEP-N50	ASM98□CE-N50	ASD16B-CP	
	Harmonic Geared Type	AS66 □ CE-H50	ASM66□CE-H50	ASD12B-C	AS66 □ CEP-H50	ASM66□CE-H50	ASD12B-CP
		AS66 □ CE-H100	ASM66□CE-H100	ASD12C-C	AS66 □ CEP-H100	ASM66□CE-H100	ASD12C-CP
		AS98 □ CE-H50	ASM98□CE-H50	ASD16B-C	AS98 □ CEP-H50	ASM98□CE-H50	ASD16B-CP
		AS98 □ CE-H100	ASM98□CE-H100		AS98 □ CEP-H100	ASM98□CE-H100	
	Standard Type	AS66 □ SE	ASM66□CE	ASD12A-S	AS66 □ SEP	ASM66□CE	ASD12A-SP
		AS69 □ SE	ASM69□CE	ASD16D-S	AS69 □ SEP	ASM69□CE	ASD16D-SP
		AS98 □ SE	ASM98□CE	ASD16A-S	AS98 □ SEP	ASM98□CE	ASD16A-SP
		AS911 □ ASE	ASM911ACE	ASD20A-S	AS911 □ ASEP	ASM911ACE	ASD20A-SP
	Standard Type IP65 Rated Motor	AS66 □ AST	ASM66ACT	ASD12A-S	AS66 □ ASTP	ASM66ACT	ASD12A-SP
		AS69 □ AST	ASM69ACT	ASD16D-S	AS69 □ ASTP	ASM69ACT	ASD16D-SP
		AS98 □ AST	ASM98ACT	ASD16A-S	AS98 □ ASTP	ASM98ACT	ASD16A-SP
AS911 □ AST		ASM911ACT	ASD20A-S	AS911 □ ASTP	ASM911ACT	ASD20A-SP	
TH Geared Type	AS66 □ SE-T3.6	ASM66□CE-T3.6	ASD12B-S	AS66 □ SEP-T3.6	ASM66□CE-T3.6	ASD12B-SP	
	AS66 □ SE-T7.2	ASM66□CE-T7.2		AS66 □ SEP-T7.2	ASM66□CE-T7.2		
	AS66 □ SE-T10	ASM66□CE-T10		AS66 □ SEP-T10	ASM66□CE-T10		
	AS66 □ SE-T20	ASM66□CE-T20	ASD12C-S	AS66 □ SEP-T20	ASM66□CE-T20	ASD12C-SP	
	AS66 □ SE-T30	ASM66□CE-T30		AS66 □ SEP-T30	ASM66□CE-T30		
	AS98 □ SE-T3.6	ASM98□CE-T3.6	ASD16A-S	AS98 □ SEP-T3.6	ASM98□CE-T3.6	ASD16A-SP	
	AS98 □ SE-T7.2	ASM98□CE-T7.2		AS98 □ SEP-T7.2	ASM98□CE-T7.2		
	AS98 □ SE-T10	ASM98□CE-T10		AS98 □ SEP-T10	ASM98□CE-T10		
	AS98 □ SE-T20	ASM98□CE-T20	ASD16C-S	AS98 □ SEP-T20	ASM98□CE-T20	ASD16C-SP	
AS98 □ SE-T30	ASM98□CE-T30	AS98 □ SEP-T30		ASM98□CE-T30			
PL Geared Type	AS66 □ SE-P5	ASM66□CE-P5	ASD12A-S	—	—	—	
	AS66 □ SE-P7.2	ASM66□CE-P7.2		—	—	—	
	AS66 □ SE-P10	ASM66□CE-P10		—	—	—	
	AS66 □ SE-P25	ASM66□CE-P25	ASD12B-S	—	—	—	
	AS66 □ SE-P36	ASM66□CE-P36	ASD12C-S	—	—	—	
	AS66 □ SE-P50	ASM66□CE-P50		—	—	—	
	AS98 □ SE-P5	ASM98□CE-P5	ASD16A-S	—	—	—	
	AS98 □ SE-P7.2	ASM98□CE-P7.2		—	—	—	
	AS98 □ SE-P10	ASM98□CE-P10		—	—	—	
	AS98 □ SE-P25	ASM98□CE-P25		—	—	—	
	AS98 □ SE-P36	ASM98□CE-P36	ASD16B-S	—	—	—	
AS98 □ SE-P50	ASM98□CE-P50	—		—	—		
PN Geared Type	AS66 □ SE-N5	ASM66□CE-N5	ASD12A-S	AS66 □ SEP-N5	ASM66□CE-N5	ASD12A-SP	
	AS66 □ SE-N7.2	ASM66□CE-N7.2		AS66 □ SEP-N7.2	ASM66□CE-N7.2		
	AS66 □ SE-N10	ASM66□CE-N10		AS66 □ SEP-N10	ASM66□CE-N10		
	AS66 □ SE-N25	ASM66□CE-N25	ASD12B-S	AS66 □ SEP-N25	ASM66□CE-N25	ASD12B-SP	
	AS66 □ SE-N36	ASM66□CE-N36	ASD12C-S	AS66 □ SEP-N36	ASM66□CE-N36	ASD12C-SP	
	AS66 □ SE-N50	ASM66□CE-N50		AS66 □ SEP-N50	ASM66□CE-N50		
	AS98 □ SE-N5	ASM98□CE-N5	ASD16A-S	AS98 □ SEP-N5	ASM98□CE-N5	ASD16A-SP	
	AS98 □ SE-N7.2	ASM98□CE-N7.2		AS98 □ SEP-N7.2	ASM98□CE-N7.2		
	AS98 □ SE-N10	ASM98□CE-N10		AS98 □ SEP-N10	ASM98□CE-N10		
	AS98 □ SE-N25	ASM98□CE-N25		AS98 □ SEP-N25	ASM98□CE-N25		
	AS98 □ SE-N36	ASM98□CE-N36		AS98 □ SEP-N36	ASM98□CE-N36		
AS98 □ SE-N50	ASM98□CE-N50	ASD16B-S	AS98 □ SEP-N50	ASM98□CE-N50	ASD16B-SP		
Harmonic Geared Type	AS66 □ SE-H50	ASM66□CE-H50	ASD12B-S	AS66 □ SEP-H50	ASM66□CE-H50	ASD12B-SP	
	AS66 □ SE-H100	ASM66□CE-H100	ASD12C-S	AS66 □ SEP-H100	ASM66□CE-H100	ASD12C-SP	
	AS98 □ SE-H50	ASM98□CE-H50	ASD16B-S	AS98 □ SEP-H50	ASM98□CE-H50	ASD16B-SP	
	AS98 □ SE-H100	ASM98□CE-H100		AS98 □ SEP-H100	ASM98□CE-H100		

● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.

Features
Line-up
Functions
System Configuration
Product Line
Specifications and Characteristics
Dimensions
Connection and Operation
List of Motor and Driver Combinations
How to Read Specifications and Characteristics
Accessories
Before Using a Stepping Motor
Controllers

RoHS RoHS-Compliant

Closed Loop Stepping Motor and Driver Package

α STEP ASC Series

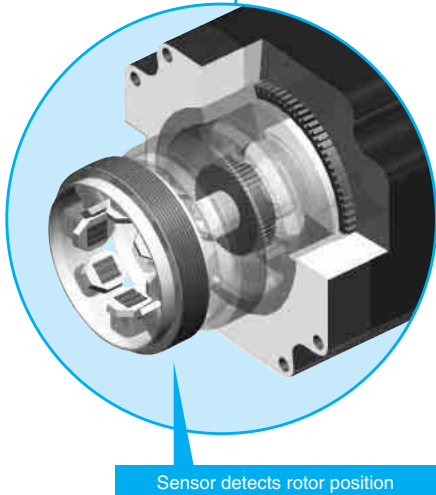
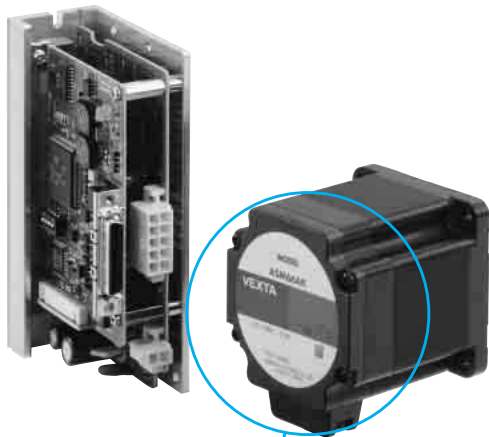
The α STEP is an innovative stepping motor unit that adopts a closed-loop control to eliminate misstep. In the α STEP, the user friendliness of a stepping motor is combined with a range of new functions for improved reliability of your equipment.

Features

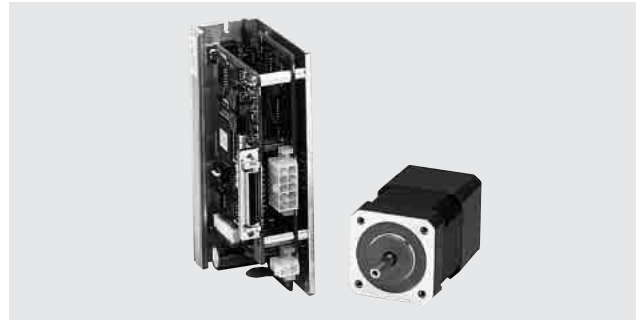
● Thanks to Closed Loop Control, There is No Loss of Synchronism
 α STEP does not lose synchronism even when subjected to abrupt load fluctuation or acceleration.

A newly developed rotor position detection sensor constantly monitors the motor movement. If synchronism is about to be lost, closed loop control is used, so there is no need to worry about loss of steps. When the successive overload is given, α STEP outputs the alarm signal. The reliability of α STEP is as high as that of a servo motor.

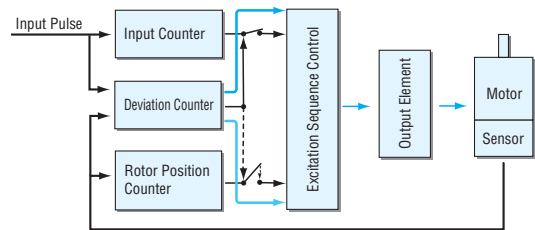
α STEP is designed as a "package" consisting of a motor and a driver.



Sensor detects rotor position



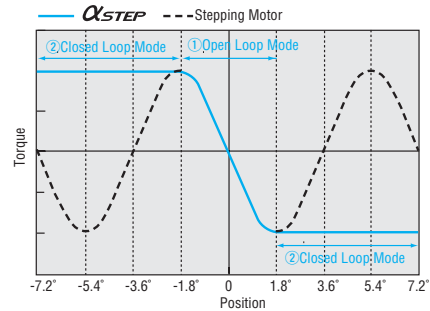
α STEP Control Diagram



Normal (Positioning Deviation is less than $\pm 1.8^\circ$)
 Motor runs in open loop mode like a stepping motor.

If Motor Missteps (Positioning Deviation is $\pm 1.8^\circ$ or more)
 Control switches to closed loop mode to prevent loss of synchronism.

α STEP Angle-Torque Characteristics



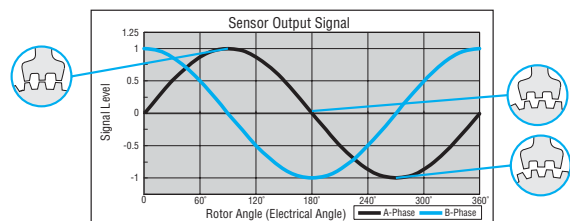
- ① If the positioning deviation is less than $\pm 1.8^\circ$ the motor runs in open loop mode like a stepping motor.
- ② If the positioning deviation is $\pm 1.8^\circ$ or more, the motor runs in closed loop mode and the position is corrected by exciting the motor windings to generate maximum torque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

The Newly Developed Sensor to Detect Rotor's Position

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

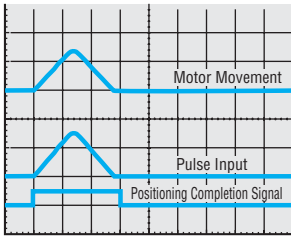
Features

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



● High Response

Like conventional stepping motors, α STEP operates in synchronism with command pulses. This makes possible short stroke positioning in a short time.

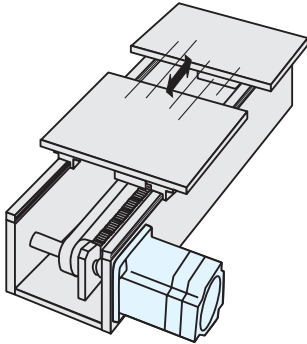


Measurement Condition: Feed 1/5 rotation

Load inertia 250×10^{-7} kg·m² (J)

● No Gain Tuning

Gain tuning for servo motors is critical, troublesome and time-consuming. Since the α STEP operates like a stepping motor, there are no gain tuning requirements. Low rigidity applications, such as a belt and pulley system, are ideal for α STEP.



● The α STEP Complies with International Safety Standards

The **ASC** Series is recognized with the UL/CSA standards and conforms to EN standard. The CE marking certifies compliance with the EMC Directives.

■ Safety Standards and CE Marking

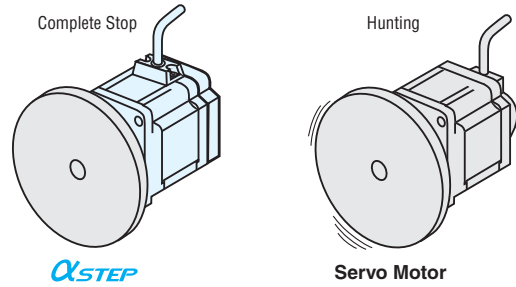
Model	Standards	Certification Body	Standards File No.	CE Marking
Motor	UL 60950 CSA C22.2 No.60950	UL	E208200	EMC Directives
Driver	UL 508C CSA C22.2 No.14	UL	E171462	
	UL 1950 CSA C22.2 No.950	UL	E208200	

● When the system is approved under various safety standards, the model names in the motor and driver nameplates are the approved model names.
List of Motor and Driver Combinations → Page 71

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

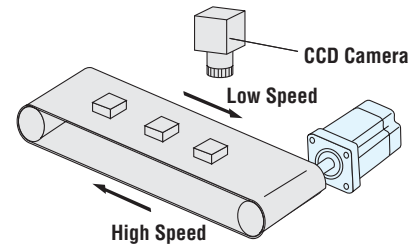
● No Hunting

Since α STEP is a stepping motor, it has no hunting problem. Therefore, when it stops, its position is completely stable and does not fluctuate. α STEP is ideal for applications in which vibration would be a problem.



● Low Vibration at Low Speed

The driver employs advanced technology that produces smoothness comparable to a microstepping driver. Its vibration level is incredibly low, even when operating in the low speed range. When frequent changes from low to high (or vice versa) speed operations are required, the use of the Resolution Select Function solves the problem. α STEP provides resolution as low as 0.036° per step without any damping mechanism or other mechanical device.



α STEP is well-suited to applications where smooth movement or stability is required, such as where a camera is used to monitor the quality of a product.

● Motor/Driver Connection with a Single Cable

α STEP requires only one cable for connection between the motor and the driver. Wiring is much simpler compared with conventional servo motors requiring two cables, one for motor and the other for encoder. The cable can be extended to a maximum of 10 m (including flexible extension cable), so the motor and the driver can be installed in locations far apart.

● (RoHS) RoHS-Compliant

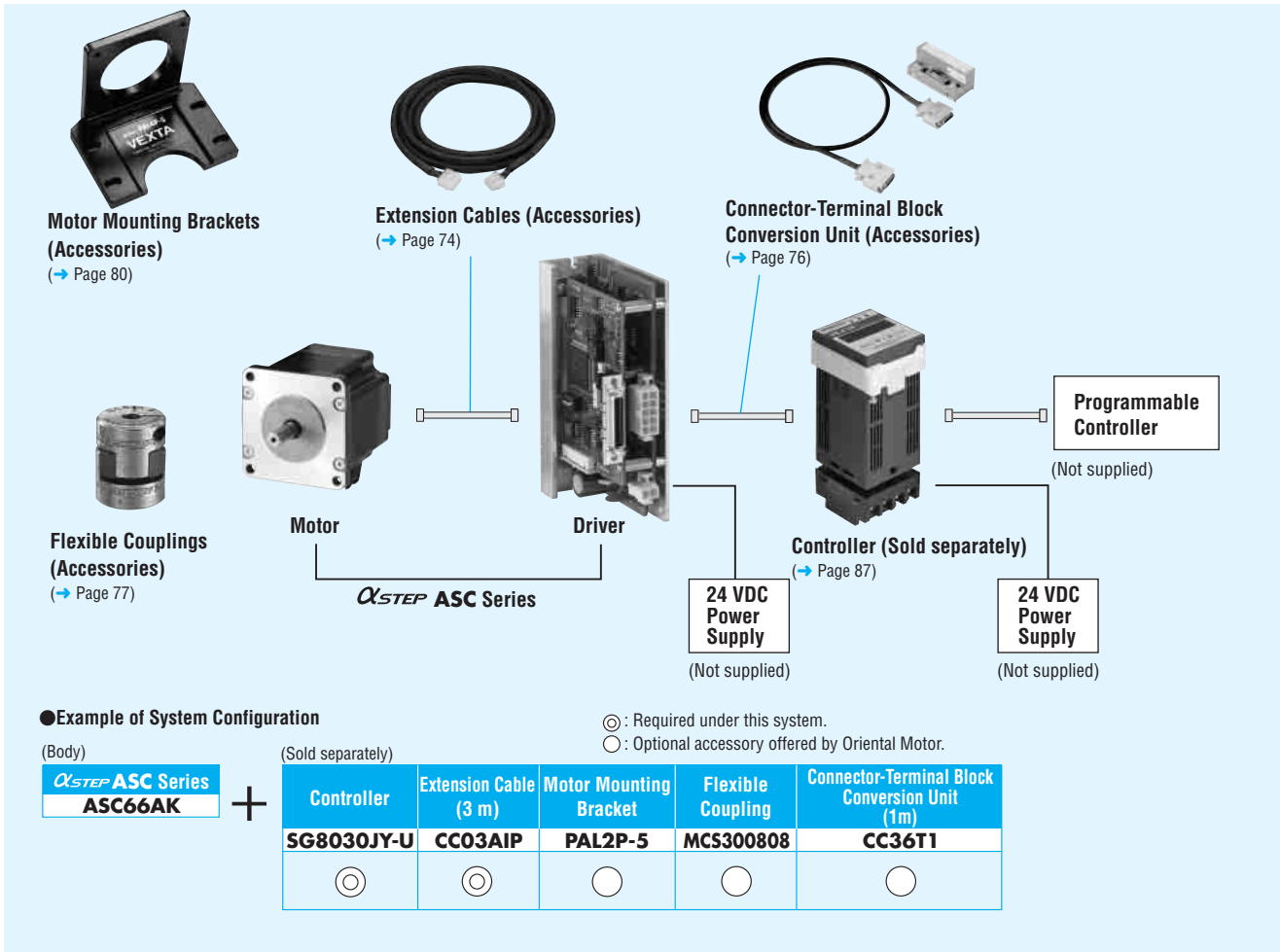
The α STEP conforms to the RoHS Directive that prohibits the use of six chemical substances including lead and cadmium.

RoHS (Restriction of Hazardous Substances) Directive:

Directive on restriction of the use of certain hazardous substances in electrical and electronic equipment (2002/95/EC). The RoHS Directive prohibits the use of six chemical substances in electrical and electronic products sold in the EU member states. The six controlled substances are: lead, hexavalent chromium, cadmium, mercury and two specific brominated flame-retardants (PBB and PBDE).

System Configuration

An example of a system configuration with the **SG8030JY** Series controller.



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

Extension Cables

Extension cables are not included with **alphaSTEP** products. When using the **alphaSTEP** stepping motor and driver more than 0.4 m apart from each other, use an extension cable (sold separately).

● Electromagnetic brake motor models (except motor frame size 42 mm) must use an extension cable for electromagnetic brake motor (sold separately). For electromagnetic brake motor with motor frame size □42 mm, use an extension cable for standard motor. → Page 74

Product Number Code

ASC 6 6 A K - T 3.6

① ② ③ ④ ⑤ ⑥ ⑦

①	Series ASC : ASC Series
②	Motor Frame Size 3 : 28 mm 4 : 42 mm 6 : 60 mm
③	Motor Case Length
④	Electromagnetic Brake A : Standard (Single Shaft) M : Electromagnetic Brake Type
⑤	Power Supply Voltage K : 24 VDC
⑥	Gearhead Type Blank : Standard Type T : TH Geared Type N : PN Geared Type H : Harmonic Geared Type
⑦	Gear Ratio

Product Line

The product names below are all for single shaft types, but there are also double shaft models available for all products except for those with electromagnetic brakes. Contact the nearest Oriental Motor office for further information on the double shaft models.

◇ Standard Type

Power Supply Voltage	Model (Single Shaft)
24 VDC	ASC34AK
	ASC36AK
	ASC46AK
	ASC66AK

◇ TH Geared Type

Power Supply Voltage	Model (Single Shaft)
24 VDC	ASC34AK-T7.2
	ASC34AK-T10
	ASC34AK-T20
	ASC34AK-T30
	ASC46AK-T3.6
	ASC46AK-T7.2
	ASC46AK-T10
	ASC46AK-T20
	ASC46AK-T30
	ASC66AK-T3.6
	ASC66AK-T7.2
	ASC66AK-T10
	ASC66AK-T20
	ASC66AK-T30

◇ PN Geared Type

Power Supply Voltage	Model (Single Shaft)
24 VDC	ASC34AK-N5
	ASC34AK-N7.2
	ASC34AK-N10
	ASC46AK-N7.2
	ASC46AK-N10
	ASC66AK-N5
	ASC66AK-N7.2
	ASC66AK-N10
	ASC66AK-N25
	ASC66AK-N36
	ASC66AK-N50

◇ Harmonic Geared Type

Power Supply Voltage	Model (Single Shaft)
24 VDC	ASC34AK-H50
	ASC34AK-H100
	ASC46AK-H50
	ASC46AK-H100
	ASC66AK-H50
	ASC66AK-H100

◇ Standard Type with Electromagnetic Brake

Power Supply Voltage	Model (Single Shaft)
24 VDC	ASC46MK ASC66MK

◇ TH Geared Type with Electromagnetic Brake

Power Supply Voltage	Model (Single Shaft)
24 VDC	ASC46MK-T3.6
	ASC46MK-T7.2
	ASC46MK-T10
	ASC46MK-T20
	ASC46MK-T30
	ASC66MK-T3.6
	ASC66MK-T7.2
	ASC66MK-T10
	ASC66MK-T20
	ASC66MK-T30

◇ PN Geared Type with Electromagnetic Brake

Power Supply Voltage	Model (Single Shaft)
24 VDC	ASC46MK-N7.2
	ASC46MK-N10
	ASC66MK-N5
	ASC66MK-N7.2
	ASC66MK-N10
	ASC66MK-N25
	ASC66MK-N36
	ASC66MK-N50

◇ Harmonic Geared Type with Electromagnetic Brake

Power Supply Voltage	Model (Single Shaft)
24 VDC	ASC46MK-H50
	ASC46MK-H100
	ASC66MK-H50
	ASC66MK-H100

Standard Type Motor Frame Size 28 mm, 42 mm, 60 mm

Specifications



Model	Standard	ASC34AK	ASC36AK	ASC46AK	ASC66AK
	Electromagnetic Brake	—	—	ASC46MK	ASC66MK
Maximum Holding Torque	N·m	0.055	0.12	0.3	1
Rotor Inertia	J: kg·m ²	11×10 ⁻⁷	27×10 ⁻⁷	68×10 ⁻⁷ [83×10 ⁻⁷]*1	405×10 ⁻⁷ [564×10 ⁻⁷]*1
Resolution*2	Resolution Setting: 1000 P/R	0.367/Pulse			
Power Source	Voltage	24 VDC±10%			
	Maximum Input Current A	1	1.1	1.7	3.7
	Type	—	—	Active when power is off	
Electromagnetic Brake*3	Power Supply Input	—	—	24 VDC±5%	
	Power Consumption W	—	—	2	6
	Excitation Current A	—	—	0.08	0.25
	Static Friction Torque N·m	—	—	0.15	0.6
Mass	Motor kg	0.15	0.22	0.5 [0.6]*1	0.85 [1.1]*1
	Driver kg	0.25			
Dimension No.	Motor	[1]		[2]	[3]
	Driver	[13]			

How to Read Specifications Table → Page 72

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

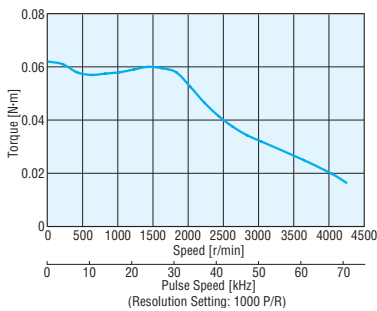
Resolution Select Switch → Page 68

*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.3 A minimum (ASC46: 0.1 A minimum) power supply is required for the electromagnetic brakes.

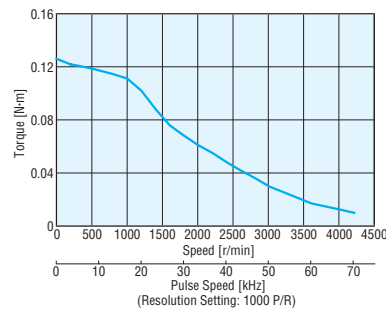
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

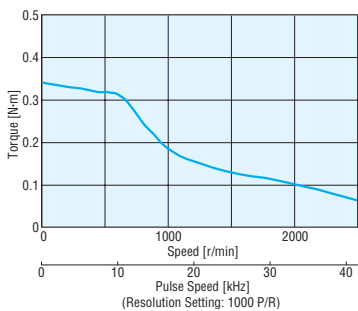
ASC34AK



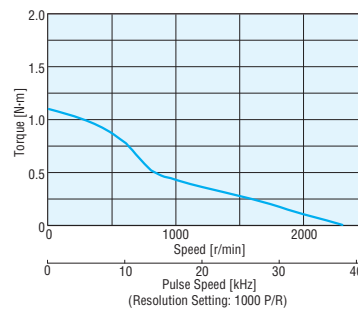
ASC36AK



ASC46AK/ASC46MK



ASC66AK/ASC66MK



Notes:

- Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]
- When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

TH Geared Type Motor Frame Size 28 mm

Specifications RoHS



Model	Standard	ASC34AK-T7.2	ASC34AK-T10	ASC34AK-T20	ASC34AK-T30
Maximum Holding Torque	N·m	0.2	0.3	0.4	0.5
Rotor Inertia	J: kg·m ²	11×10^{-7}			
Backlash	arc minute (degrees)	60 (1°)			
Permissible Speed Range	r/min	0~416	0~300	0~150	0~100
Gear Ratio		1:7.2	1:10	1:20	1:30
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
Power Source	Voltage	24 VDC ± 10%			
	Maximum Input Current A	1			
Mass	Motor	kg			
	Driver	kg			
Dimension No.	Motor	4			
	Driver	13			

How to Read Specifications Table → Page 72

*The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

Resolution Select Switch → Page 68

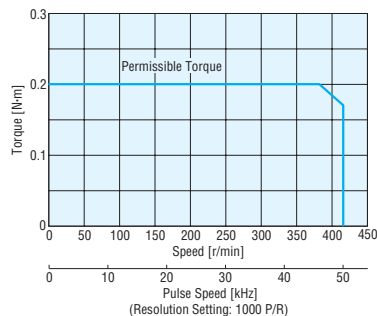
Note:

● Direction of rotation of the motor and that of the gear output shaft are the same for unit type with reduction ratio 1:20 and 1:30. It is opposite for 1:7.2 and 1:10 ratio type.

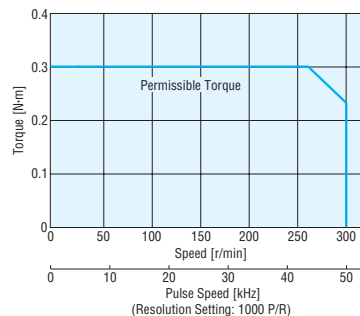
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

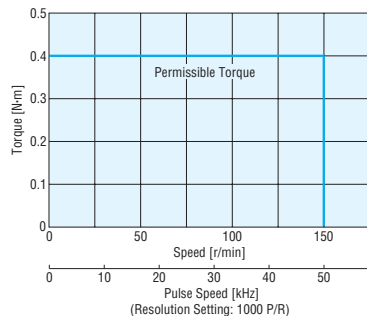
ASC34AK-T7.2



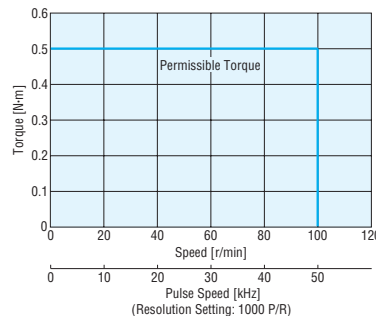
ASC34AK-T10



ASC34AK-T20



ASC34AK-T30



Notes:

● Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]

● When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

TH Geared Type Motor Frame Size 42 mm

Specifications RoHS



Model	Standard	ASC46AK-T3.6	ASC46AK-T7.2	ASC46AK-T10	ASC46AK-T20	ASC46AK-T30
	Electromagnetic Brake	ASC46MK-T3.6	ASC46MK-T7.2	ASC46MK-T10	ASC46MK-T20	ASC46MK-T30
Maximum Holding Torque	N·m	0.35	0.7	1	1.5	
Rotor Inertia	J: kg·m ²	68×10 ⁻⁷ [83×10 ⁻⁷]*1				
Backlash	arc minute (degrees)	45 (0.75°)	25 (0.417°)		15 (0.25°)	
Permissible Speed Range	r/min	0~500	0~250	0~180	0~90	0~60
Gear Ratio		1:3.6	1:7.2	1:10	1:20	1:30
Resolution*2	Resolution Setting: 1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	0.35	0.7	1	1.5	
Power Source	Voltage	24 VDC±10%				
	Maximum Input Current A	1.7				
Electromagnetic Brake*3	Type	Active when power is off				
	Power Supply Input	24 VDC±5%				
	Power Consumption W	2				
	Excitation Current A	0.08				
Mass	Static Friction Torque	N·m	0.17	0.35	0.5	0.75
	Motor	kg	0.65 [0.75]*1			
Dimension No.	Driver	kg	0.25			
	Motor		5			
	Driver		13			

How to Read Specifications Table → Page 72

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

Resolution Select Switch → Page 68

*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.1 A minimum power supply is required for the electromagnetic brakes.

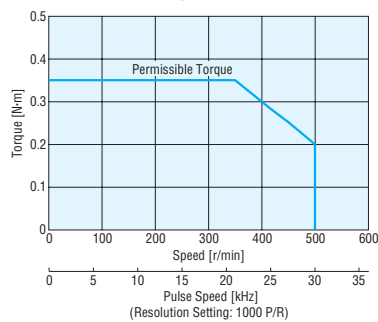
Note:

● Direction of rotation of the motor and that of the gear output shaft are the same for unit type with reduction ratio 1:3.6, 1:7.2 and 1:10. It is opposite for 1:20 and 1:30 ratio type.

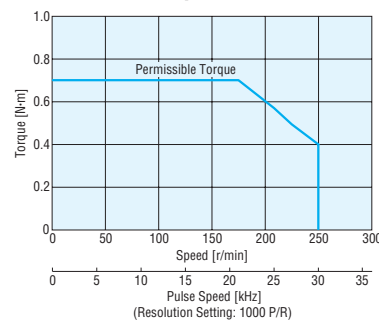
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

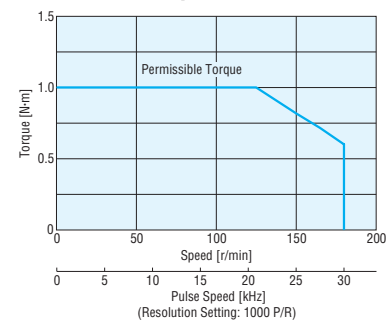
ASC46AK-T3.6/ASC46MK-T3.6



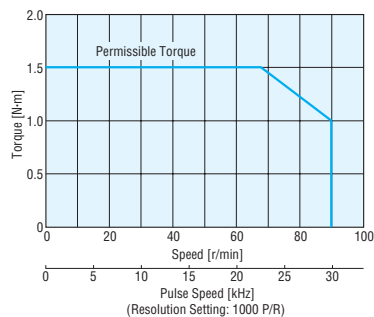
ASC46AK-T7.2/ASC46MK-T7.2



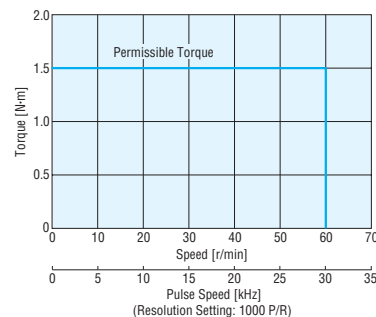
ASC46AK-T10/ASC46MK-T10



ASC46AK-T20/ASC46MK-T20



ASC46AK-T30/ASC46MK-T30



Notes:

● Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]

● When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

TH Geared Type Motor Frame Size 60 mm

Specifications RoHS



Model	Standard	ASC66AK-T3.6	ASC66AK-T7.2	ASC66AK-T10	ASC66AK-T20	ASC66AK-T30
	Electromagnetic Brake	ASC66MK-T3.6	ASC66MK-T7.2	ASC66MK-T10	ASC66MK-T20	ASC66MK-T30
Maximum Holding Torque	N·m	1.25	2.5	3	3.5	4
Rotor Inertia	J: kg·m ²	405×10 ⁻⁷ [564×10 ⁻⁷]*1				
Backlash	arc minute (degrees)	35 (0.584°)	15 (0.25°)		10 (0.167°)	
Permissible Speed Range	r/min	0~500	0~250	0~180	0~90	0~60
Gear Ratio		1:3.6	1:7.2	1:10	1:20	1:30
Resolution*2	Resolution Setting: 1000 P/R	0.1°/Pulse	0.05°/Pulse	0.036°/Pulse	0.018°/Pulse	0.012°/Pulse
Permissible Torque	N·m	1.25	2.5	3	3.5	4
Power Source	Voltage	24 VDC±10%				
	Maximum Input Current A	3.7				
Electromagnetic Brake*3	Type	Active when power is off				
	Power Supply Input	24 VDC±5%				
	Power Consumption W	6				
	Excitation Current A	0.25				
Mass	Static Friction Torque N·m	0.62	1.25	1.5	1.75	2
	Motor kg	1.25 [1.5]*1				
Dimension No.	Driver kg	0.25				
	Motor	[6]				
	Driver	[13]				

How to Read Specifications Table → Page 72

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

Resolution Select Switch → Page 68

*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.3 A minimum power supply is required for the electromagnetic brakes.

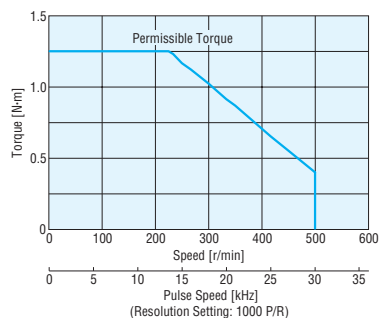
Note:

● Direction of rotation of the motor and that of the gear output shaft are the same for unit type with reduction ratio 1:3.6, 1:7.2 and 1:10. It is opposite for 1:20 and 1:30 ratio type.

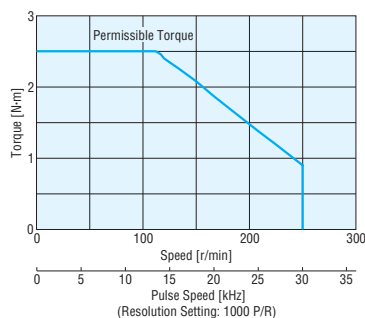
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

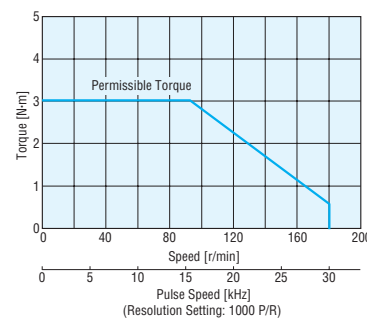
ASC66AK-T3.6/ASC66MK-T3.6



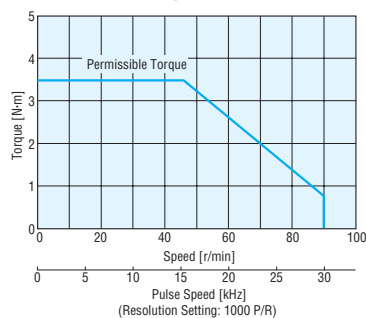
ASC66AK-T7.2/ASC66MK-T7.2



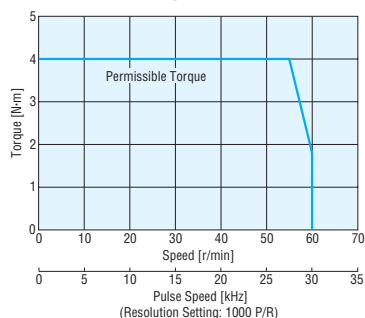
ASC66AK-T10/ASC66MK-T10



ASC66AK-T20/ASC66MK-T20



ASC66AK-T30/ASC66MK-T30



Notes:

● Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]

● When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

PN Geared Type Motor Frame Size 28 mm

Specifications RoHS



Model	Standard	ASC34AK-N5	ASC34AK-N7.2	ASC34AK-N10
Maximum Holding Torque	N·m	0.2	0.3	0.5
Rotor Inertia	J: kg·m ²	11×10 ⁻⁷		
Backlash	arc minute (degrees)	3 (0.05°)		
Angle Error	arc minute (degrees)	6 (0.1°)		
Permissible Speed Range	r/min	0~600	0~416	0~300
Gear Ratio		1:5	1:7.2	1:10
Resolution*1	Resolution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse
Permissible Torque	N·m	0.2	0.3	0.5
Maximum Torque*2	N·m	0.5		
Power Source	Voltage	24 VDC ± 10%		
	Maximum Input Current A	1		
Mass	Motor	kg	0.28	
	Driver	kg	0.25	
Dimension No.	Motor		7	
	Driver		13	

How to Read Specifications Table → Page 72

*1 The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

Resolution Select Switch → Page 68

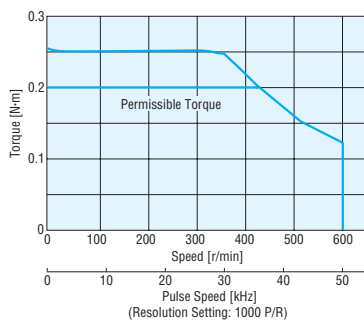
*2 The value of Maximum Torque is for gear. For output torque for geared motor, refer to the Speed - Torque Characteristics.

Note:

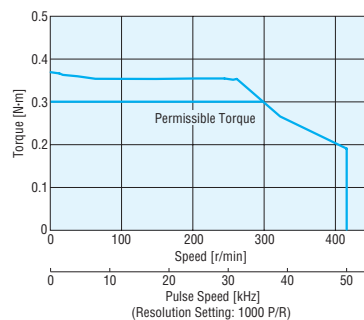
- Direction of rotation of the motor shaft and that of the gear output shaft are the same.

Speed – Torque Characteristics How to Read Speed-Torque Characteristics → Page 72

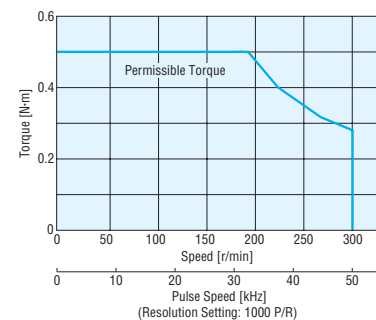
ASC34AK-N5



ASC34AK-N7.2



ASC34AK-N10



Notes:

- Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]
- When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

PN Geared Type Motor Frame Size 42 mm

Specifications RoHS



Model	Standard		ASC46AK-N7.2	ASC46AK-N10
	Electromagnetic Brake		ASC46MK-N7.2	ASC46MK-N10
Maximum Holding Torque	N·m		1.5	
Rotor Inertia	J: kg·m ²		68×10 ⁻⁷ [83×10 ⁻⁷]*1	
Backlash	arc minute (degrees)		2 (0.034°)	
Angle Error	arc minute (degrees)		6 (0.1°)	
Permissible Speed Range	r/min		0~333	0~240
Gear Ratio			1:7.2	1:10
Resolution*2	Resolution Setting: 1000 P/R		0.05°/Pulse	0.036°/Pulse
Permissible Torque	N·m		1.5	
Maximum Torque*3	N·m		2	
Power Source	Voltage		24 VDC±10%	
	Maximum Input Current A		1.7	
Electromagnetic Brake*4	Type		Active when power is off	
	Power Supply Input		24 VDC±5%	
	Power Consumption W		2	
	Excitation Current A		0.08	
Mass	Static Friction Torque	N·m	0.75	
	Motor	kg	0.71 [0.81]*1	
Dimension No.	Driver	kg	0.25	
	Motor		8	
	Driver		13	

How to Read Specifications Table → Page 72

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

Resolution Select Switch → Page 68

*3 The value of Maximum Torque is for gear. For output torque for geared motor, refer to the Speed - Torque Characteristics.

*4 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.1 A minimum power supply is required for the electromagnetic brakes.

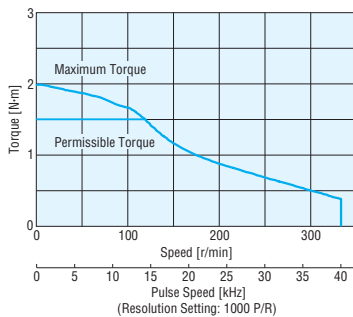
Note:

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

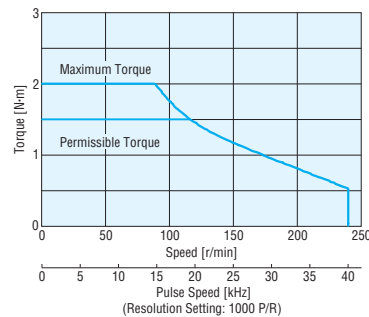
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

ASC46AK-N7.2/ASC46MK-N7.2



ASC46AK-N10/ASC46MK-N10



Notes:

- Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]
- When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

PN Geared Type Motor Frame Size 60 mm

Specifications RoHS



Model	Standard Electromagnetic Brake	ASC66AK-N5	ASC66AK-N7.2	ASC66AK-N10	ASC66AK-N25	ASC66AK-N36	ASC66AK-N50
		ASC66MK-N5	ASC66MK-N7.2	ASC66MK-N10	ASC66MK-N25	ASC66MK-N36	ASC66MK-N50
Maximum Holding Torque	N·m	3.5	4	5	8		
Rotor Inertia	J: kg·m ²	405×10 ⁻⁷ [564×10 ⁻⁷]*1					
Backlash	arc minute (degrees)	2 (0.034°)			3 (0.05°)		
Angle Error	arc minute (degrees)	5 (0.084°)					
Permissible Speed Range	r/min	0~360	0~250	0~180	0~72	0~50	0~36
Gear Ratio		1:5	1:7.2	1:10	1:25	1:36	1:50
Resolution*2	Resolution Setting: 1000 P/R	0.072°/Pulse	0.05°/Pulse	0.036°/Pulse	0.0144°/Pulse	0.01°/Pulse	0.0072°/Pulse
Permissible Torque	N·m	3.5	4	5	8		
Maximum Torque*3	N·m	7	9	11	16	20	
Power Source	Voltage	24 VDC ± 10%					
	Maximum Input Current A	3.7					
Electromagnetic Brake*4	Type	Active when power is off					
	Power Supply Input	24 VDC ± 5%					
	Power Consumption W	6					
	Excitation Current A	0.25					
Mass	Static Friction Torque N·m	1.75	2	2.5	4		
	Motor kg	1.5 [1.75]*1			1.7 [1.95]*1		
Dimension No.	Driver kg	0.25					
	Motor	9					
	Driver	13					

How to Read Specifications Table → Page 72

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

Resolution Select Switch → Page 68

*3 The value of Maximum Torque is for gear. For output torque for geared motor, refer to the Speed - Torque Characteristics.

*4 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC ± 5%, 0.3 A minimum power supply is required for the electromagnetic brakes.

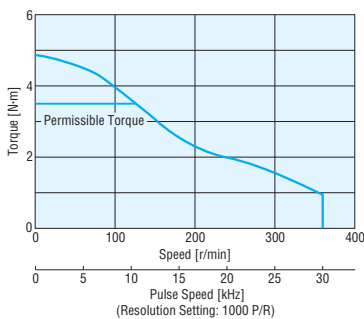
Note:

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

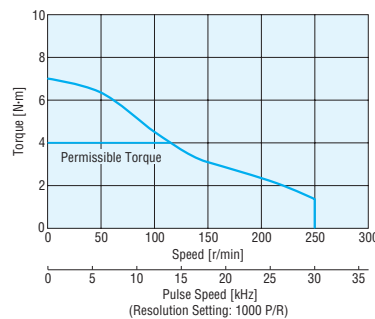
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

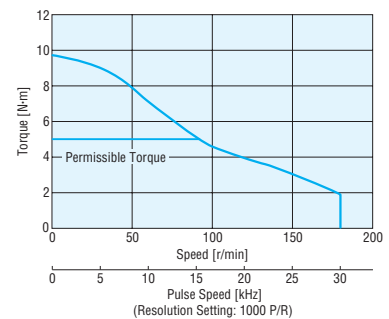
ASC66AK-N5/ASC66MK-N5



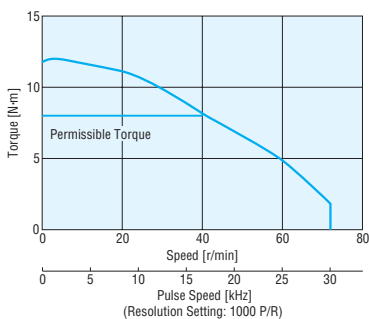
ASC66AK-N7.2/ASC66MK-N7.2



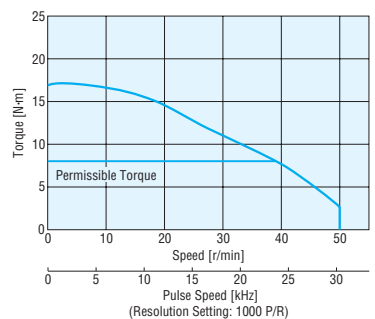
ASC66AK-N10/ASC66MK-N10



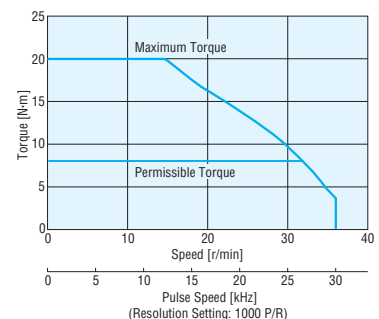
ASC66AK-N25/ASC66MK-N25



ASC66AK-N36/ASC66MK-N36



ASC66AK-N50/ASC66MK-N50



Notes:

- Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]
- When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

Harmonic Geared Type Motor Frame Size 28 mm, 42 mm, 60 mm

Specifications RoHS



Model	Standard	ASC34AK-H50	ASC34AK-H100	ASC46AK-H50	ASC46AK-H100	ASC66AK-H50	ASC66AK-H100
	Electromagnetic Brake	—	—	ASC46MK-H50	ASC46MK-H100	ASC66MK-H50	ASC66MK-H100
Maximum Holding Torque	N·m	1.5	2	3.5	5	5.5	8
Rotor Inertia	J: kg·m ²	14×10 ⁻⁷		85×10 ⁻⁷ [100×10 ⁻⁷]*1		440×10 ⁻⁷ [599×10 ⁻⁷]*1	
Permissible Speed Range	r/min	0~70	0~35	0~48	0~24	0~36	0~18
Gear Ratio		1:50	1:100	1:50	1:100	1:50	1:100
Resolution*2	Resolution Setting: 1000 P/R	0.0072°/Pulse	0.0036°/Pulse	0.0072°/Pulse	0.0036°/Pulse	0.0072°/Pulse	0.0036°/Pulse
Permissible Torque	N·m	1.5	2	3.5	5	5.5	8
Maximum Torque	N·m	2	2.8	8.3	11	18	28
Lost Motion (Load Torque)	arc minute	3 max. (±0.06 N·m)	3 max. (±0.08 N·m)	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)
Power Source	Voltage	24 VDC ±10%					
	Maximum Input Current A	1		1.7		3.7	
Electromagnetic Brake*3	Type	—					
	Power Supply Input	Active when power is off					
	Power Consumption W	24 VDC ±5%					
	Excitation Current A	—		0.08		0.25	
Mass	Static Friction Torque N·m	—		1.75	2.5	2.75	4
	Motor kg	0.25		0.7 [0.8]*1		1.4 [1.65]*1	
Dimension No.	Driver kg	—		0.25		—	
	Motor	10		11		12	
	Driver	—		13		—	

How to Read Specifications Table → Page 72

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

Resolution Select Switch → Page 68

*3 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC ±5%, 0.3 A minimum (**ASC46**: 0.1 A minimum) power supply is required for the electromagnetic brakes.

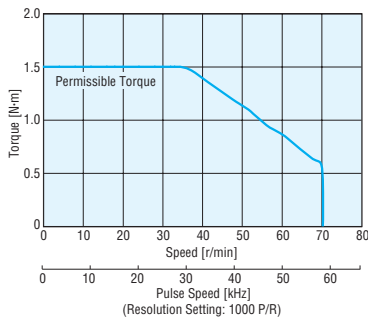
Note:

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

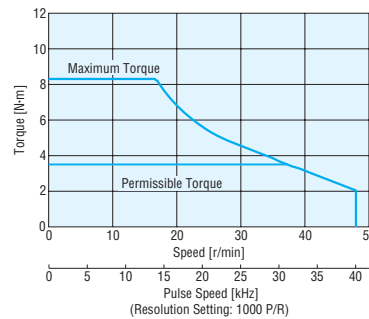
Speed – Torque Characteristics

How to Read Speed-Torque Characteristics → Page 72

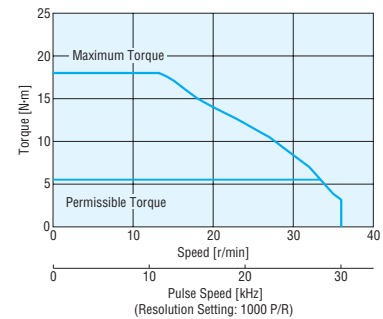
ASC34AK-H50



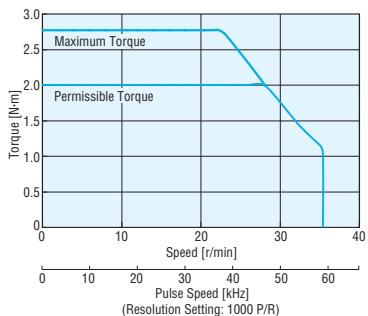
ASC46AK-H50/ASC46MK-H50



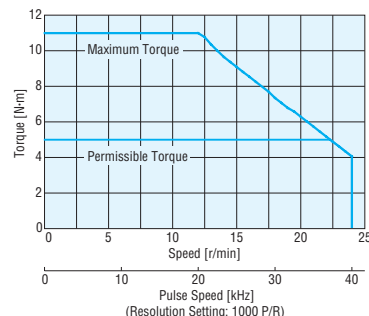
ASC66AK-H50/ASC66MK-H50



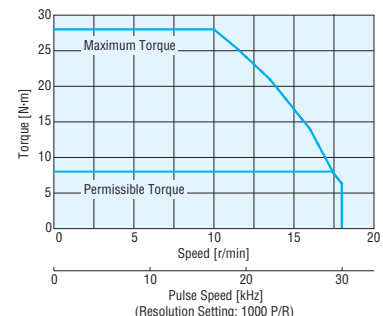
ASC34AK-H100



ASC46AK-H100/ASC46MK-H100



ASC66AK-H100/ASC66MK-H100



Notes:

- Pay attention to heat dissipation from motor and driver. In particular, remember that the motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. [Under 75°C is required to comply with UL or CSA standards.]
- In order to prevent fatigue of the gear grease in the harmonic gear, keep the temperature of the gear case under 70°C.
- When using the motor with the dedicated driver, the driver's automatic current cutback at motor standstill function reduces maximum holding torque by approximately 50%.

Driver Specifications

Speed and Positioning Control Command	Pulse input
Maximum Input Pulse Frequency	250 kHz (When the pulse duty is 50%)
Protective Functions	When the protective functions are activated, an alarm signal is output and the motor stops automatically. Overload, Overvoltage, Speed error, Overspeed, EEPROM data error, Sensor error, System error
Input Signals	Photocoupler input Input resistance: 220 Ω Input current: 7~20 mA [Pulse signal/Rotation direction signal (Negative logic pulse input), CW pulse signal/CCW pulse signal (Negative logic pulse input), All windings off, Alarm clear, Resolution setting]
Output Signals	Photocoupler, Open-collector output, External use condition: 30 VDC maximum, 15 mA maximum (Positioning completion signal, Alarm signal, Timing signal) Transistor, Open-collector output, External use condition: 30 VDC maximum, 15 mA maximum (Feedback pulse ASG-BSG signal)

General Specifications

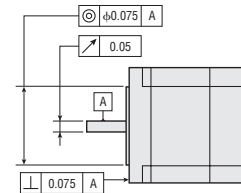
This is the value after rated operation at normal temperature and normal humidity.

Specifications	Motor	Driver
Motor Insulation Class	Class B (130°C)[UL/CSA: Recognized as class A (105°C)]	—
Insulation Resistance	100 MΩ minimum when measured by a 500 VDC megger between the following places · Frame-Windings · Frame-Electromagnetic brake windings	100 MΩ minimum when measured by a 500 VDC megger between the following places · Heat sink-Power supply input terminal
Dielectric Strength	Sufficient to withstand the following for one minute: · Frame-Windings 0.5 kV 50 Hz or 60 Hz · Frame-Electromagnetic brake windings 1.0 kV 50 Hz or 60 Hz	Sufficient to withstand the following for one minute: · Heat sink-Power supply input terminal 0.5 kV 50 Hz or 60 Hz
Operating Environment (In Operation)	Ambient Temperature	0°C~+50°C (nonfreezing): Standard Type TH·PN Geared Type 0°C~+40°C (nonfreezing): Harmonic Geared Type
	Ambient Humidity	85% or less (noncondensing)
	Atmosphere	No corrosive gases, dust, water or oil.
Static Angle Error	±5 arc minutes (0.084°)	—
Shaft Runout	0.05 T.I.R.(mm)*	—
Concentricity	0.075 T.I.R.(mm)*	—
Perpendicularity	0.075 T.I.R.(mm)*	—

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

Note:

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



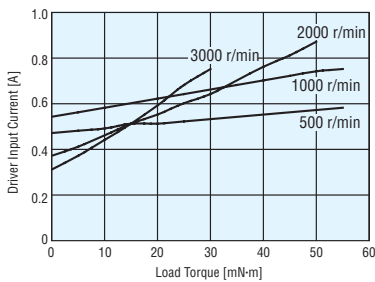
Load Torque – Driver Input Current Characteristics

This is the relationship between the load torque and driver input current at each speed when the motor is 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 axis.

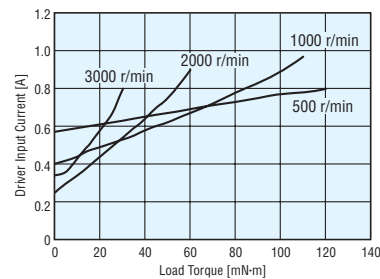
Motor shaft speed = Gear output shaft speed × Gear ratio [r/min]

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

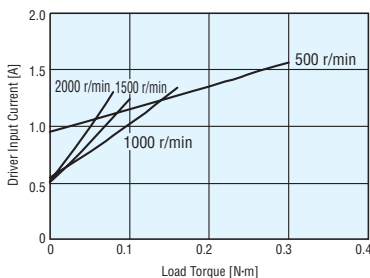
ASC34



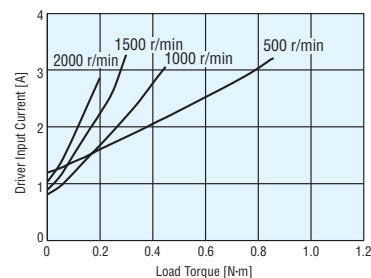
ASC36



ASC46



ASC66



Permissible Overhung Load and Permissible Thrust Load

Unit = N

Type	Model	Gear Ratio	Overhung Load Distance from Shaft End (mm)					Thrust Load
			0	5	10	15	20	
Standard Type	ASC34AK ASC36AK	-	25	34	52	-	-	The permissible thrust load shall be no greater than the motor mass.
	ASC46□K		20	25	34	52	-	
	ASC66□K		63	75	95	130	190	
TH Geared Type	ASC34AK-T□	7.2, 10, 20, 30	15	17	20	23	-	10
	ASC46□K-T□	3.6, 7.2, 10, 20, 30	10	14	20	30	-	15
	ASC66□K-T□		70	80	100	120	150	40
PN Geared Type	ASC34AK-N□	5, 7.2, 10	45	60	80	100	-	20
	ASC46□K-N□	7.2, 10	100	120	150	190	-	100
	ASC66□K-N5		-	200	220	250	280	
	ASC66□K-N□	7.2, 10	250	270	300	340	390	
ASC66□K-N□	25, 36, 50	330	360	400	450	520		
Harmonic Geared Type	ASC34AK-H□	50, 100	140	160	200	240	-	220
	ASC46□K-H□		180	220	270	360	510	
	ASC66□K-H□		320	370	440	550	720	

● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.
Enter the gear ratio in the box (□) within the model name.

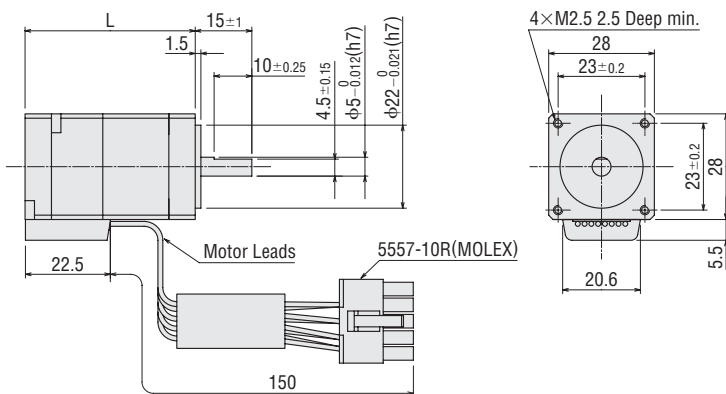
Dimensions (Unit = mm)

● Motor

◇ Standard Type

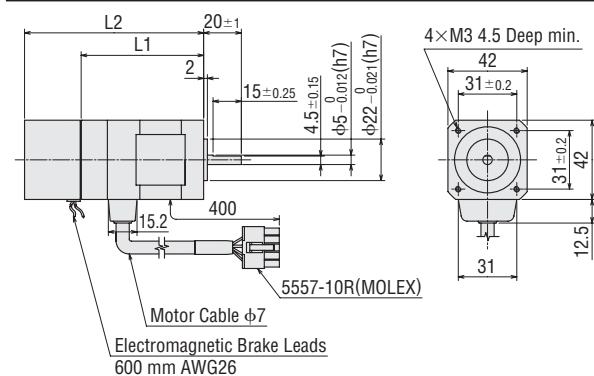
1 □ 28 mm

Model	Motor Model	L	Mass (kg)
ASC34AK	ASM34AK	45	0.15
ASC36AK	ASM36AK	65	0.22



2 □ 42 mm

Model	Motor Model	L1	L2	Mass (kg)
ASC46AK	ASM46AK	64.9	-	0.5
ASC46MK	ASM46MK	-	94.9	0.6

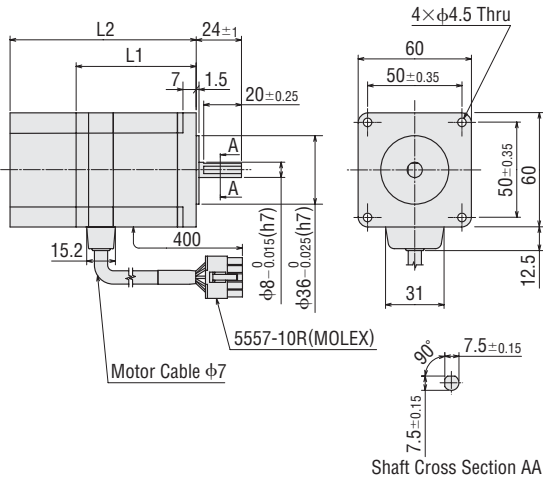


Features
Line-up
Functions
System Configuration
Product Line
Specifications and Characteristics
DC Input ASC Series
Dimensions
Connection and Operation
List of Motor and Driver Combinations
How to Read Specifications and Characteristics
Accessories
Before Using a Stepping Motor
Controllers

◇ Standard Type

3 □ 60 mm

Model	Motor Model	L1	L2	Mass (kg)
ASC66AK	ASM66AK	63.6	—	0.85
ASC66MK	ASM66MK	—	98.6	1.1

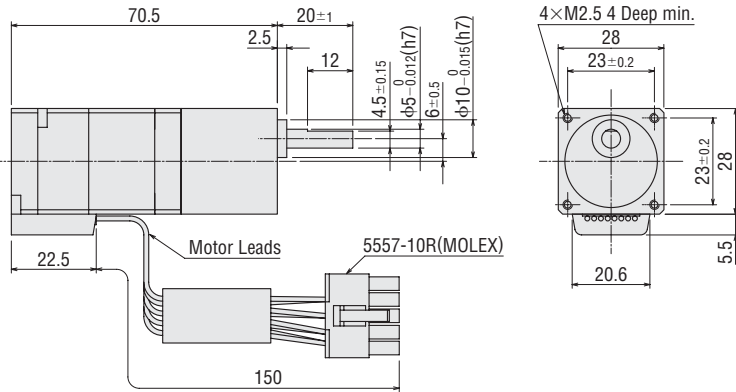


◇ TH Geared Type

4 □ 28 mm

Model	Motor Model	Gear Ratio	Mass (kg)
ASC34AK-T □	ASM34AK-T □	7.2, 10, 20, 30	0.21

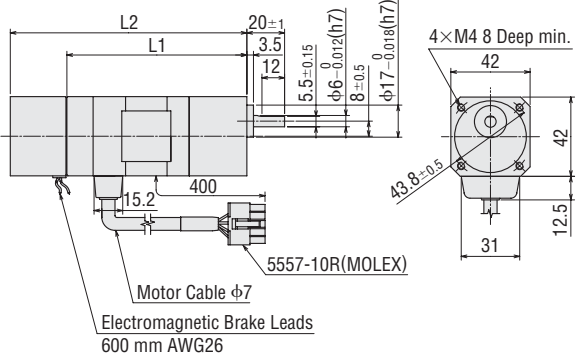
● Enter the gear ratio in the box (□) within the model name.



5 □ 42 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
ASC46AK-T □	ASM46AK-T □	3.6, 7.2, 10, 20, 30	95.4	—	0.65
ASC46MK-T □	ASM46MK-T □		—	125.4	0.75

● Enter the gear ratio in the box (□) within the model name.

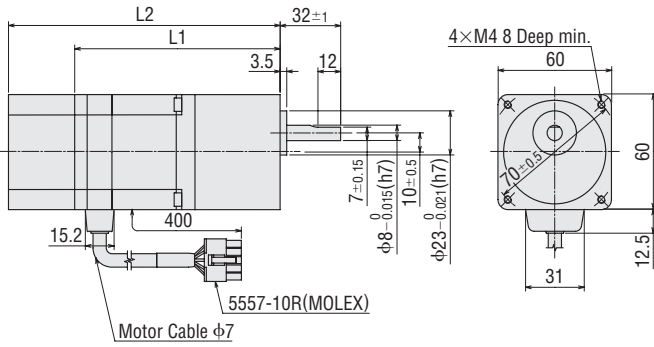


◇TH Geared Type

6 □ 60 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
ASC66AK-T□	ASM66AK-T□	3.6, 7.2, 10, 20, 30	108.6	—	1.25
ASC66MK-T□	ASM66MK-T□		—	143.6	1.5

● Enter the gear ratio in the box (□) within the model name.

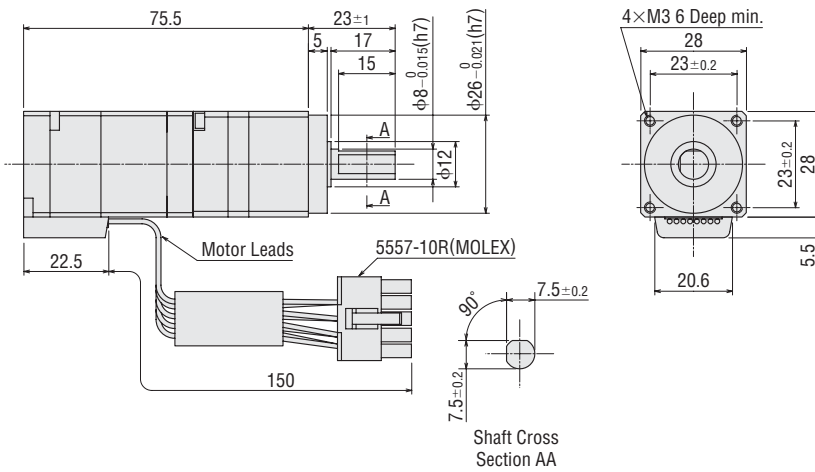


◇PN Geared Type

7 □ 28 mm

Model	Motor Model	Gear Ratio	Mass (kg)
ASC34AK-N□	ASM34AK-N□	5, 7.2, 10	0.28

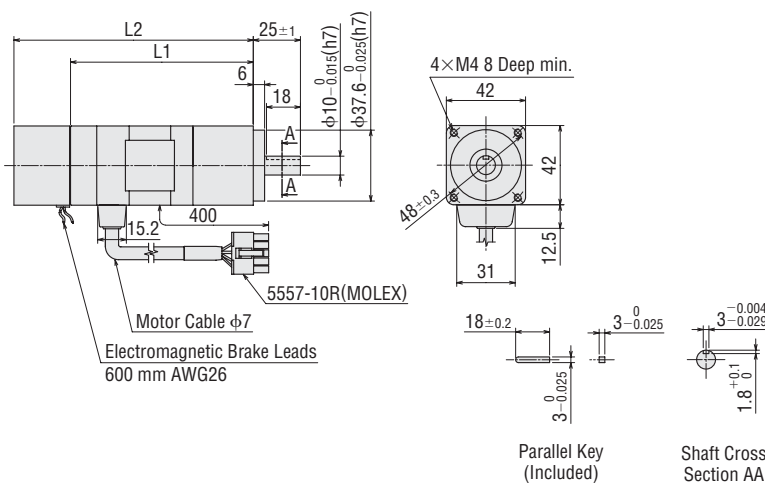
● Enter the gear ratio in the box (□) within the model name.



8 □ 42 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
ASC46AK-N□	ASM46AK-N□	7.2, 10	96.9	—	0.71
ASC46MK-N□	ASM46MK-N□		—	126.9	0.81

● Enter the gear ratio in the box (□) within the model name.

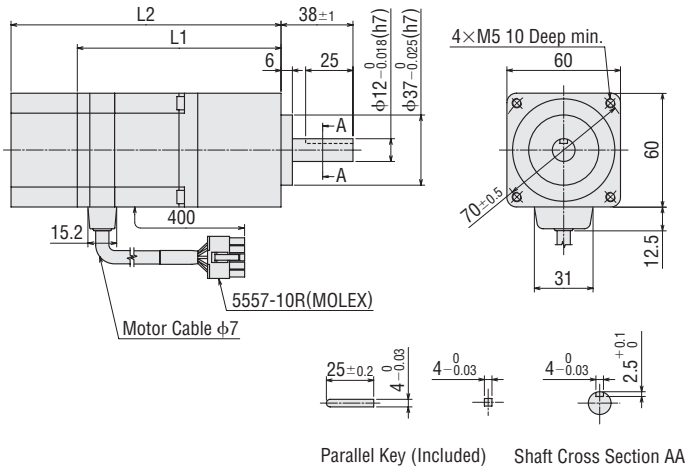


◇PN Geared Type

9 □ 60 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
ASC66AK-N □	ASM66AK-N □	5, 7.2, 10	107.6	—	1.5
		25, 36, 50	123.6	—	1.7
ASC66MK-N □	ASM66MK-N □	5, 7.2, 10	—	142.6	1.75
		25, 36, 50	—	158.6	1.95

● Enter the gear ratio in the box (□) within the model name.

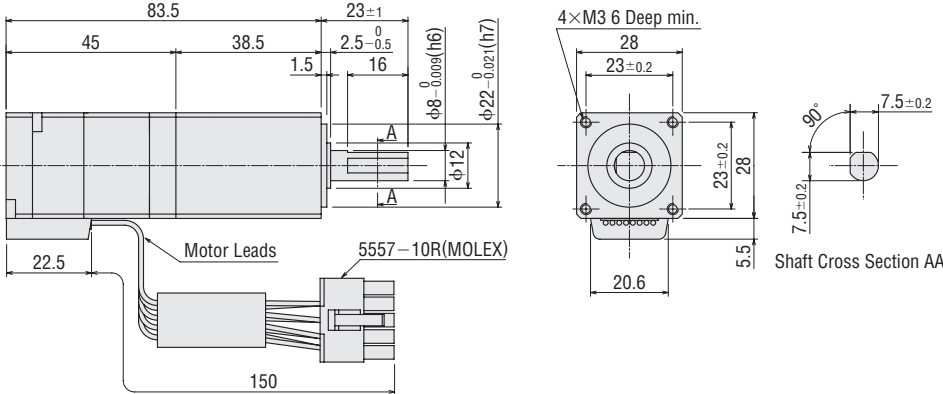


◇Harmonic Geared Type

10 □ 28 mm

Model	Motor Model	Gear Ratio	Mass (kg)
ASC34AK-H □	ASM34AK-H □	50, 100	0.25

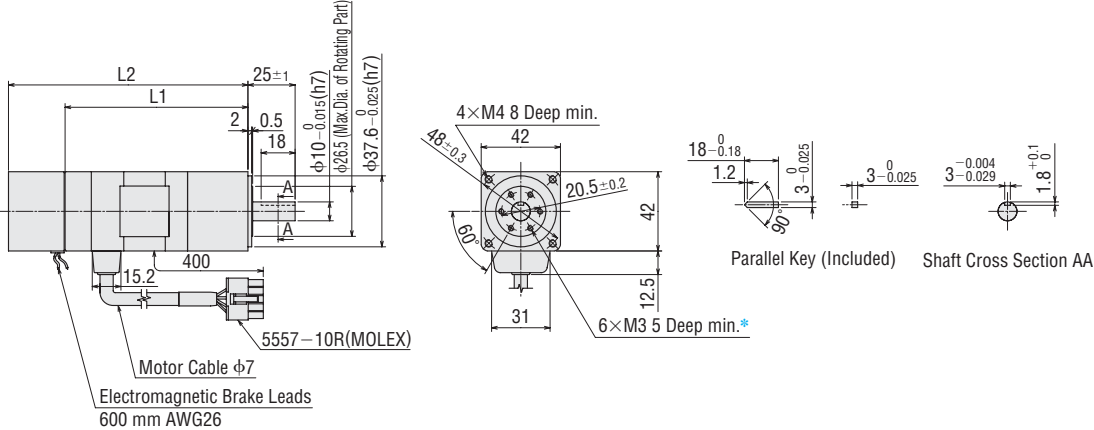
● Enter the gear ratio in the box (□) within the model name.



11 □ 42 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
ASC46AK-H □	ASM46AK-H □	50, 100	96.9	—	0.7
ASC46MK-H □	ASM46MK-H □		—	126.9	0.8

● Enter the gear ratio in the box (□) within the model name.



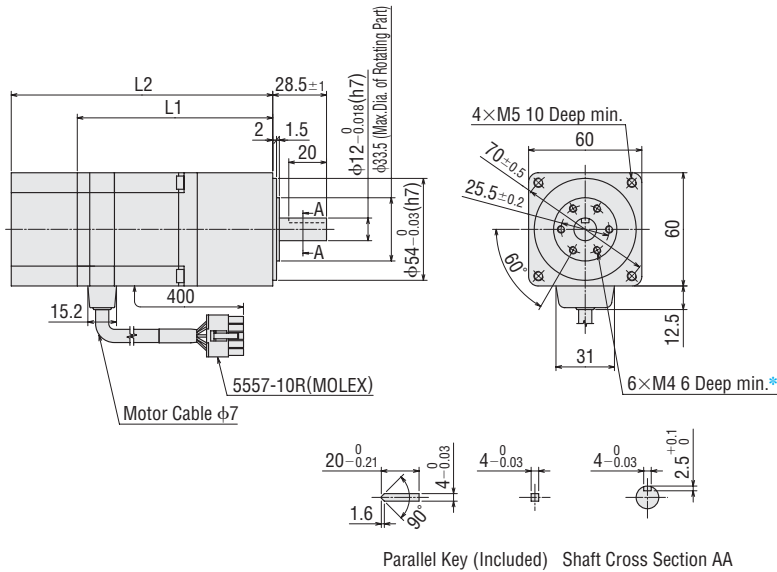
*The position of the key slot on the output shaft (φ10) relative to the screw holes position on a maximum diameter of φ26.5 on the rotating part is arbitrary.

◇ Harmonic Geared Type

12 □ 60 mm

Model	Motor Model	Gear Ratio	L1	L2	Mass (kg)
ASC66AK-H□	ASM66AK-H□	50, 100	103.6	—	1.4
ASC66MK-H□	ASM66MK-H□		—	138.6	1.65

● Enter the gear ratio in the box (□) within the model name.



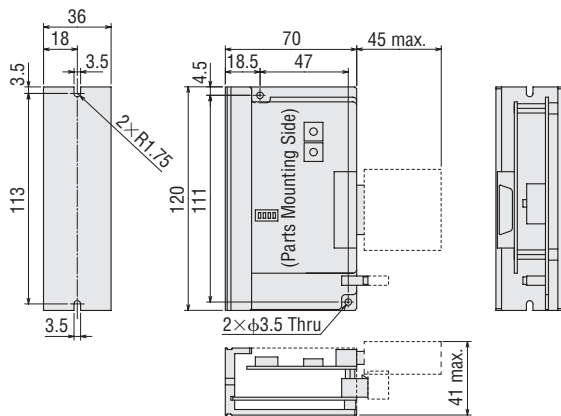
Parallel Key (Included) Shaft Cross Section AA

*The position of the key slot on the output shaft (φ12) relative to the screw holes position on a maximum diameter of φ33.5 on the rotating part is arbitrary.

● Driver

13 Common to All Types

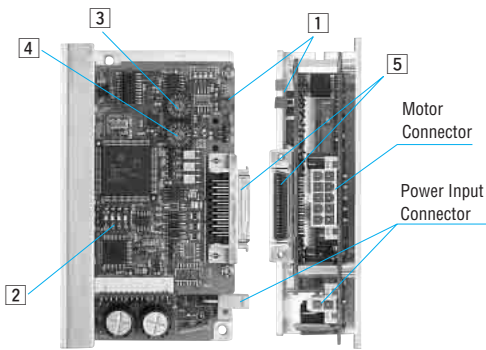
Mass: 0.25 kg



- I/O Connector (Included)
Cover Assembly: 54331-1361 (MOLEX)
Connector: 54306-3619 (MOLEX)
- Power Input Connector (Included)
Connector: 5557-02R (MOLEX)
Crimp Terminal: 5556TL (MOLEX)

Connection and Operation

Names and Functions of Driver Parts



1 Signal Monitor Display

◇ LED Indicators

Indication	Color	Function	When Activated
LED1	Green	Power supply indication	Lights when power is on.
LED2	Red	Alarm indication	Blinks when protective functions are activated.

◇ Alarm

Blink Count	Function	When Activated
2	Overload	The motor is operated continuously over 5 seconds under a load exceeding the maximum torque.
3	Overvoltage	The primary voltage of the driver's inverter exceeds the permissible value.
4	Speed error	The motor cannot accurately follow at the indicated pulse speed.
6	Overspeed	The motor shaft velocity exceeds 5000 r/min. (Except geared type)
7	EEPROM data error	The EEPROM has a fault.
8	Sensor error	The power source turns on when the motor cable is not connected to the driver.
Lights (No blinking)	System error	The driver has fatal error.

2 Function Switches

Indication	Switch Name	Function
1000/500 ×1/×10	Resolution select switch	This function is for selecting the motor resolution. For each geared type, the resolution of gear output shaft is 1/gear ratio. "1000" "×1" →1000 Pulses (0.36°/step) (Factory setting) "1000" "×10" →10000 Pulses (0.036°/step) "500" "×1" →500 Pulses (0.72°/step) "500" "×10" →5000 Pulses (0.072°/step)
1P/2P	Pulse input mode switch	The settings of this switch are compatible with the following two types of pulse input modes: "1P" for the 1-pulse input mode (Factory setting), "2P" for the 2-pulse input mode.

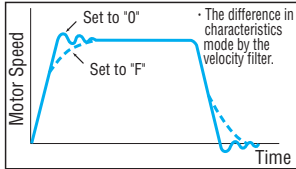
Notes:

- Always turn the power off before switching resolution or pulse input, and turn it ON again after you have made the change.
- If the Resolution Select Switch is set to "×10," it cannot control the resolution selected by the input terminals. It will always be "×10."

3 Current Adjustment Switch

Indication	Switch Name	Function
CURRENT	Current adjustment switch	The motor running current can be lowered to suppress temperature rise in the motor and driver, or lower operating current in order to allow a margin for motor torque.

4 Velocity Filter Adjustment Switch

Indication	Switch Name	Function
V.FIL	Velocity filter adjustment switch	This switch is used to make adjustments when a smooth start-stop or smooth motion at low speed is required. 

5 Input/Output Signals (36 pins)

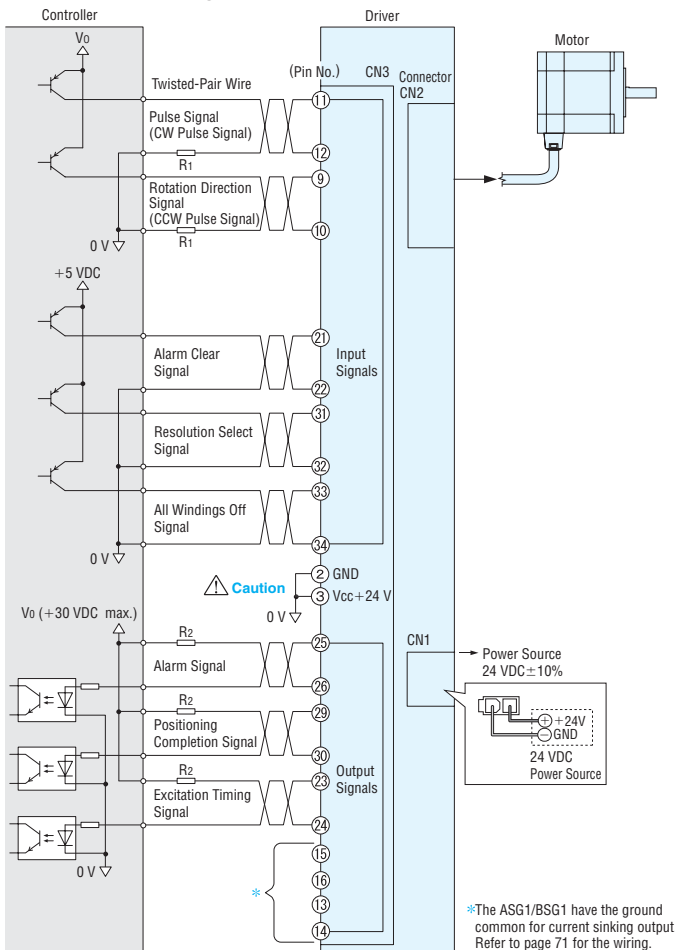
Indication	Input/Output	Pin. No	Signal	Name of Signal
External power input		2	GND	Power supply for signal control
		3	Vcc+24V	
Input signal		9	DIR. (CCW)	Rotation direction (CCW pulse)*
		10	DIR. (CW)	
		11	PLS (CW)	Pulse (CW pulse)*
		12	PLS (CW)	
Output signal		13	BSG1	B-Phase pulse output (Open-collector)
		14	GND	
		15	ASG1	A-Phase pulse output (Open-collector)
		16	GND	
Input signal	CN3	21	ACL	Alarm clear
		22	ACL	
Output signal		23	TIM.1	Timing (Open-collector)
		24	TIM.1	
		25	ALARM	Alarm
		26	ALARM	
		29	END	Positioning completion
		30	END	
Input signal		31	×10	Resolution select
		32	×10	
		33	C.OFF	All windings off
		34	C.OFF	

Description of Input/Output Signals → Page 70

*Signal name in parentheses represents the setting in 2-pulse input mode.

The factory setting is the 1-pulse input mode.

Connection Diagrams



The most suitable controllers for **Q5STEP ASC Series** are available.

Input Signal Connection

Pulse Signal and Rotation Direction Signal

Signals can be connected directly when 5 VDC is supplied. If the signals are used at a voltage exceeding 5 VDC, be sure to provide an external resistor to prevent the current exceeding 20 mA from flowing. Internal components will be damaged if a voltage exceeding 5 VDC is supplied directly without using an external resistor.
Example) If the voltage is 24 VDC, connect a resistor (R_1) of 1.5 to 2.2 k Ω and 0.5 W or more.

All Windings OFF Signal, Resolution Select Signal and Alarm Clear Signal

Keep the input signal voltage of 5 VDC. Applying a voltage exceed 5 VDC will damage the internal elements.

Output Signal Connection

Use output signals at 30 VDC or less and 15 mA or less.

If these specifications are exceeded, the elements may be damaged. Check the specification of the connected equipment.

*Check the connection on page 70 when using a 24 VDC power supply for control signals.

Notes on Wiring

- Use a multi-core, twisted-pair shielded wire AWG28 (0.08 mm²) or thicker for the control input/output signal line (CN3), 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.
- When it is necessary to have a connection more than 0.4 m between motor and driver (0.15 m or more: **ASC34** and **ASC36** types), the optional extension cable or flexible extension cable must be used. Electromagnetic brake motor models (except motor frame size 42 mm) must use an electromagnetic brake extension cable or flexible extension cable (sold separately). The frame size 42 mm models can use a standard extension cable even for electromagnetic brake motor models.
- The range of wire for the power connector (CN1) is AWG24~18 (0.2 mm²~0.75 mm²). Use wire AWG20 (0.5 mm²) or thicker for the power line.
- Keep the control input/output signal line at least 300 mm away from power lines (e.g. lines carrying large current, such as AC lines and motor lines). Also, do not run these lines through the same ducts or pipes as power lines.
- The customer must furnish the cables for power supply lines and control input/output signal lines.
- Use included connector for connection of power source.
- To install the pins, be sure to use the specified crimping tool made by MOLEX 57026-5000 (for UL 1007) or 57027-5000 (for UL 1015).

Caution

- Connect the power supply for timing signal and pulse signal output to 5 VDC. Vcc+24 V (③ pin of CN3) should be damaged.

Description of Output Signals → Page 31

Connecting the Electromagnetic Brake to Power Supply

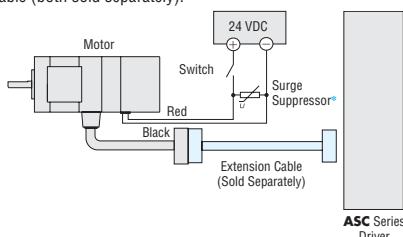
Connect the electromagnetic brake to the power supply using a cable with a conductor cross-sectional area of at least AWG24 (0.2 mm²). The power supply input to the electromagnetic brake is 24 VDC \pm 5% 0.3 A minimum (**ASC46**: 0.1 A minimum) and therefore must be independent of the driver's power supply for signal control.

Notes:

- Applying a voltage that exceeds the specifications will cause the electromagnetic brake to generate a great deal of heat, resulting in motor temperature rises and possible damage to the motor. Conversely, if voltage is too low, the electromagnetic brake may not release.
- To protect the switch contacts and prevent noise, always connect the surge suppressor (Included). (*The surge suppressor is included with electromagnetic brake motors.)
- To prevent noise, use a dedicated power supply for electromagnetic brake.
- Correct polarity (+ and -) must be ensured when connecting the electromagnetic brake lead wire of **ASC Series** to the DC power supply. If polarity is incorrect, the electromagnetic brake will not operate properly.
- When using as a CE certified part, use a dedicated DC power supply for electromagnetic brake.

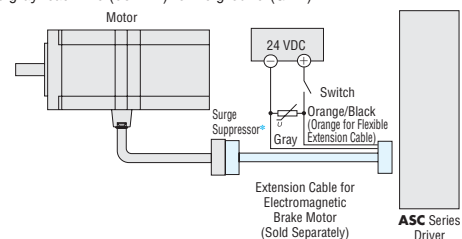
(1) ASC46

The electromagnetic brake wire is linked to the connector on the motor (600 mm). When connecting with the DC power supply, connect the red spiral lead wire to +24 V, and the black lead wire to the ground (GND). Use the extension cable or the flexible extension cable (both sold separately).



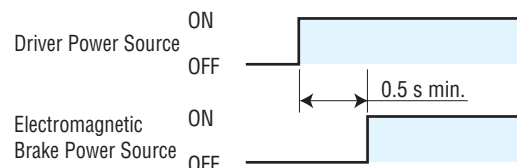
(2) ASC66

The electromagnetic brake wire is linked to the connector on the driver connection side of extension cable for electromagnetic brake motor (sold separately). Be sure to use the accessory (sold separately) extension cable or flexible extension cable. Connect the orange/black spiral lead wire (orange for flexible extension cable)(60 mm) to +24 V, and the gray lead wire (60 mm) to the ground (GND).



Timing Chart for Electromagnetic Brake Operation

To release the electromagnetic brake, wait at least 0.5 seconds after turning on the driver power source. The load may fall down due to a loss of holding torque.



● Description of Input/Output Signals

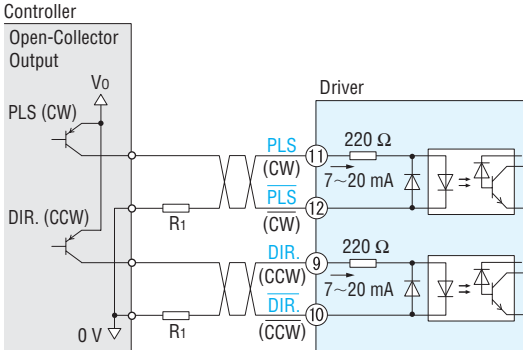
Indication of Input/Output Signal "ON""OFF"

Input (Output) "ON" indicates that the current is sent into the photocoupler (transistor) inside the driver. Input (Output) "OFF" indicates that the current is not sent into the photocoupler (transistor) inside the driver. The input/output remains "OFF" if nothing is connected.

Photocoupler OFF ON

PLS (CW) and DIR. (CCW) Input Signal

◇ Input Circuit and Sample Connection

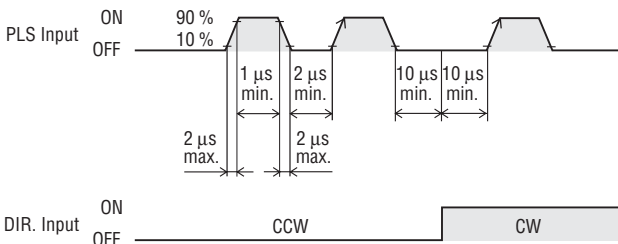


● The colored characters indicate signals under the 1-pulse input mode, while the black characters indicate signals under the 2-pulse input mode.

Note:

● The external resistor is not needed when V_o is 5 VDC. When the voltage exceeds 5 VDC, connect the external resistor R_1 to keep input current at 20 mA or less. When a voltage exceed 5 VDC is applied without the external resistor, the elements may get damaged.

◇ Pulse Waveform Characteristics



● For pulse signals, use input pulse waveforms like those shown in the figure above.

◇ Pulse Input Mode

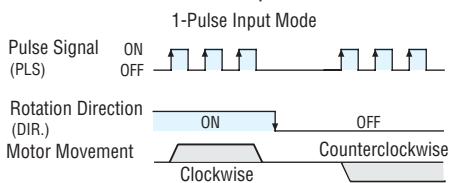
<1-Pulse Input Mode>

The 1-pulse input mode uses Pulse (PLS) and Rotation Direction (DIR.) signals. CW is selected by inputting DIR. signal at low level (with the input photocoupler ON), CCW by inputting at high level (with input photocoupler OFF).

Note:

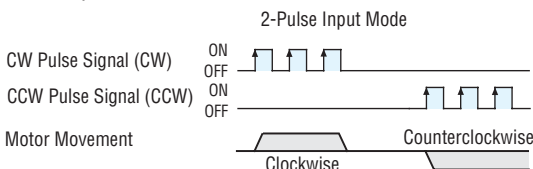
● The factory setting is 1-pulse input.

[Rotation Direction Signals] Photocoupler "ON": Clockwise
Photocoupler "OFF": Counterclockwise



<2-Pulse Input Mode>

The 2-pulse input mode is used for "CW" and "CCW" pulses. When "CW" pulses are input, the motor's output shaft rotates clockwise when the motor is viewed facing the shaft; when "CCW" pulses are input, the shaft rotates counterclockwise.



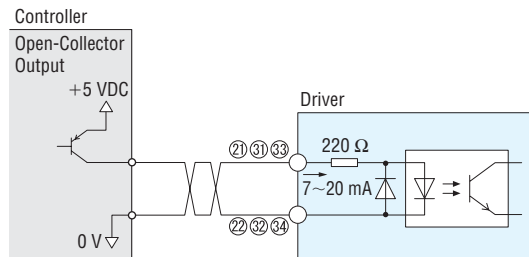
All Windings OFF (C.OFF) Input Signal

Resolution Select ($\times 10$) Input Signal

Alarm Clear (ACL) Input Signal

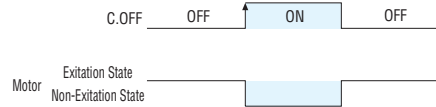
◇ Input Circuit and Sample Connection

· When using 5 VDC



◇ All Windings OFF (C.OFF) Input Signal Pin No. ③③, ③④

This controller power source offers 5 VDC. Inputting the All Windings Off (C.OFF) signal puts the motor in a non-excitation (free) state. It is used when turning the motor shaft externally or when positioning manually. This signal clears the deviation counter.



◇ Resolution Select ($\times 10$) Input Signal Pin No. ③①, ③②

This controller power source offers 5 VDC. Inputting this signal when 1000 P/R or 500 P/R is selected as resolution via the function switch will increase the resolution ten-times to 10000 P/R or 5000 P/R.

Note:

● While the resolution select switch is set to 10000 P/R or 5000 P/R, input of this signal will not change the resolution.

◇ Alarm Clear (ACL) Input Signal Pin No. ②①, ②②

This controller power source offers 5 VDC. This signal is used for canceling the alarm without turning off power to the driver when a protection circuit has been activated.

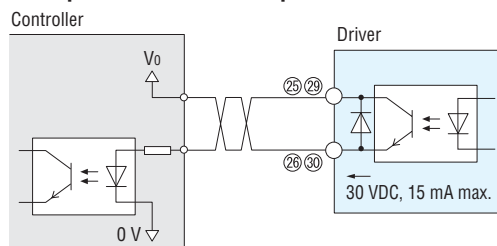
Note:

● The following alarm cannot be cleared. To cancel the alarm, first resolve the cause and check for safety, and then turn power on again.
· EEPROM data error · System error

Position Completion (END) Output Signal

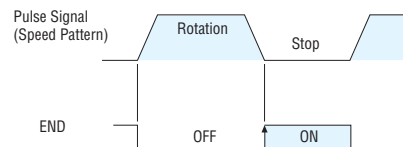
Alarm (ALARM) Output Signal

◇ Output Circuit and Sample Connection



◇ Position Completion (END) Output Signal Pin No. ②⑨, ③①

Circuit for use with 30 VDC, 15 mA maximum. This signal is output at the photocoupler ON state when positioning is completed. This signal is output when the rotor position is less than $\pm 1.8^\circ$ from the command position, approximately 2 ms after the pulse input stops.

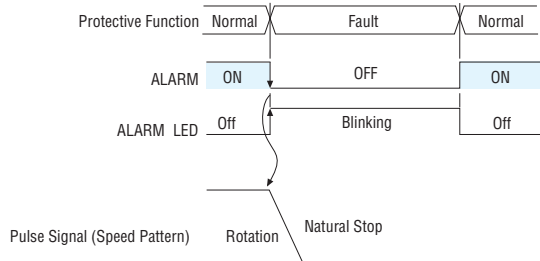


Note:

● The END signal flashes during operation with a pulse input frequency of 500 Hz or less.

◇ Alarm (ALARM) Output Signal Pin No. 25, 26

Circuits for use with 30 VDC, 15 mA maximum. The photocoupler turns OFF when one of the driver's protection circuits has been activated. When an abnormality such as an overload or over current is detected, the alarm signal will output, the ALARM indicator blinks, and the motor stops (non-excitation state). To cancel the alarm, first resolve the cause and check for safety, and then input an Alarm Clear (ACL) signal or reset power. Once power has been turned off, wait at least 5 seconds before turning it on again.

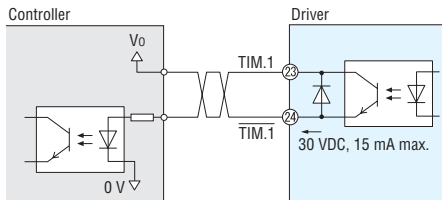


Note:

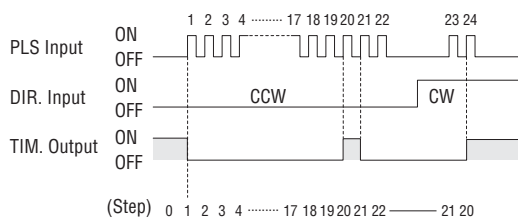
- The alarm output uses positive logic (Normally Closed), all other outputs use negative logic (Normally Open).

Excitation Timing Signal (TIM.) Output Signal

◇ Output Circuit and Sample Connection



Circuits for use with 30 VDC, 15 mA maximum. When the Excitation Timing signal is output, the transistor turns ON. This signal can be used to detect the home position with greater precision. This signal is output 50 times per motor shaft revolution.



Note:

- A precise timing signal cannot be obtained when the speed of the pulse input frequency is over 500 Hz.

List of Motor and Driver Combinations

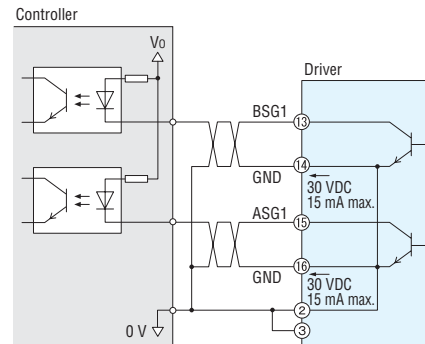
Model names for motor and driver combinations are shown below.

Type	Package Model	Motor Model	Driver Model	
Standard Type	ASC34AK	ASM34AK	ASD10A-K	
	ASC36AK	ASM36AK	ASD10B-K	
	ASC46□K	ASM46□K	ASD18A-K	
	ASC66□K	ASM66□K	ASD36A-K	
TH Geared Type	ASC34AK-T7.2	ASM34AK-T7.2	ASD10C-K	
	ASC34AK-T10	ASM34AK-T10		
	ASC34AK-T20	ASM34AK-T20		
	ASC34AK-T30	ASM34AK-T30		
	ASC46□K-T3.6	ASM46□K-T3.6		ASD18B-K
	ASC46□K-T7.2	ASM46□K-T7.2		
	ASC46□K-T10	ASM46□K-T10		
	ASC46□K-T20	ASM46□K-T20		
	ASC46□K-T30	ASM46□K-T30		
	ASC66□K-T3.6	ASM66□K-T3.6	ASD36B-K	
	ASC66□K-T7.2	ASM66□K-T7.2		
	ASC66□K-T10	ASM66□K-T10		
ASC66□K-T20	ASM66□K-T20			
ASC66□K-T30	ASM66□K-T30			

● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.

Quadrature (ASG1/BSG1) Output Signal

◇ Output Circuit and Sample Connection



Circuits for use with 30 VDC, 15 mA maximum. A counter or similar device can be connected to monitor the position of the motor. The pulse resolution is the same as the motor resolution at the time of power-on.

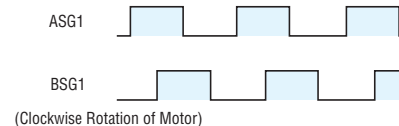
[Example: Resolution select switch (1000 P/R) → Output pulse number for each motor revolution (1000).]

The phase difference between A and B is 90° electrical.

Notes:

- The pulse output accuracy is, regardless of resolution, within $\pm 0.36^\circ$ (repetition accuracy: within $\pm 0.09^\circ$).
- These signals are only for position verification when the motor has stopped. There is a 1 ms (maximum) time lag between real rotor motion and the output signals.

● Pulse Waveform Characteristics



Type	Package Model	Motor Model	Driver Model	
PN Geared Type	ASC34AK-N5	ASM34AK-N5	ASD10A-K	
	ASC34AK-N7.2	ASM34AK-N7.2		
	ASC34AK-N10	ASM34AK-N10		
	ASC46□K-N7.2	ASM46□K-N7.2		ASD18A-K
	ASC46□K-N10	ASM46□K-N10		
	ASC66□K-N5	ASM66□K-N5	ASD36A-K	
	ASC66□K-N7.2	ASM66□K-N7.2		
	ASC66□K-N10	ASM66□K-N10		
	ASC66□K-N25	ASM66□K-N25		
	Harmonic Geared Type	ASC66□K-N36	ASM66□K-N36	ASD36B-K
ASC66□K-N50		ASM66□K-N50	ASD10C-K	
ASC34AK-H50		ASM34AK-H50		
ASC34AK-H100		ASM34AK-H100		
ASC46□K-H50		ASM46□K-H50		ASD18A-K
ASC46□K-H100		ASM46□K-H100		
Harmonic Geared Type	ASC66□K-H50	ASM66□K-H50		ASD36B-K
	ASC66□K-H100	ASM66□K-H100		

● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.

How to Read Specifications Table

Model	Pulse Input Package	Standard	AS66A□E	AS66A□E-N7.2
	Built-In Controller (Stored Program) Package	Standard	AS66A□EP	AS66A□EP-N7.2
① Maximum Holding Torque		N·m	1.2	4
② Rotor Inertia		J: kg·m ²	405×10 ⁻⁷	[564×10 ⁻⁷]*1
③ Backlash		arc minute (degrees)	—	2 (0.034°)
④ Angle Error		arc minute (degrees)	—	5 (0.084°)
⑤ Permissible Speed Range		r/min	—	0~416
⑥ Gear Ratio			—	1:7.2
⑦ Resolution*2	Resolution Setting: 1000 P/R		0.36°/Pulse	0.05°/Pulse
⑧ Permissible Torque		N·m	3.5	4
⑨ Maximum Torque*3		N·m	7	9
⑩ Power Source	Voltage-Frequency	Single-Phase 100-115 VAC	-15%~+10%	50/60 Hz
		Single-Phase 200-230 VAC	-15%~+10%	50/60 Hz
		Three-Phase 200-230 VAC	-15%~+10%	50/60 Hz
	Maximum Input Current A	Single-Phase 100-115 VAC		5
Single-Phase 200-230 VAC			3	
Three-Phase 200-230 VAC			1.5	
Electromagnetic Brake*4	Type		Active when power is off	
	Power Supply Input		24 VDC±5%	
	Power Consumption W		6	
	Excitation Current A		0.25	
⑪ Static Friction Torque		N·m	0.6	2
	Motor	kg	0.85 [1.1]*1	1.5 [1.75]*1
Mass	Driver	kg	0.8	
	Motor		②	⑪
Dimension No.	Driver	Pulse Input	⑩	
		Built-In Controller (Stored Program)	⑩	

● The square box in the model name will contain one of the following letters to indicate the power supply voltage: **A** (Single-Phase 100-115 VAC), **C** (Single-Phase 200-230 VAC) or **S** (Three-Phase 200-230 VAC).

*1 The values inside the brackets [] represent the specification for the electromagnetic brake type.

*2 Pulse Input Package: The resolution can be set to any one of 500 P/R, 1000 P/R, 5000 P/R, or 10000 P/R with the resolution select switch or resolution select switching signals.

Resolution Select Switch → Page 37

Built-In Controller (Stored Program) Package: The resolution can be set from 500 P/R to 10000 P/R by setting parameters.

*3 The value of Maximum Torque is for gear. For output torque for geared motor, refer to the Speed - Torque Characteristics.

*4 The electromagnetic brakes are for holding the position when the power is off. They cannot be used for complicated braking. Also, a separate 24 VDC±5%, 0.3 A minimum power supply is required for the electromagnetic brakes.

Note:

● Direction of rotation of the motor shaft and that of the gear output shaft are the same. (PN geared type)

① Maximum Holding Torque

The holding torque is the maximum holding power (torque) the stepping motor has when power (rated current) is being supplied but the motor is not rotating (with consideration given to the permissible strength of the gear when applicable). At motor standstill, the driver's "Automatic Current Cutback" function reduces the maximum holding torque by approximately 50%.

② Rotor Inertia

This refers to the inertia of rotor inside the motor. This is necessary when the required torque (acceleration torque) for the motor needs is calculated.

③ Backlash

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

④ Angle Error (PN Geared Type only)

Angle error is the difference between the theoretical angle of rotation of the output shaft, as calculated from the input pulse count, and actual angle of rotation.

⑤ Permissible Speed Range

This is the rotation speed that the motor can be operated at with the gear output shaft.

⑥ Gear Ratio

This is the ratio in rotation speed between the input speed from the motor and the speed of the gear output shaft. For example, the gear ratio 1:10 is that when the input speed from the motor is 10 r/min, the gear output shaft is 1 r/min.

⑦ Resolution

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

⑧ Permissible Torque

The permissible torque represents the torque value limited by the mechanical strength of the gear when operated at a constant speed. For the types excluding PN and Harmonic geared type, the total torque including acceleration/deceleration torque should not exceed this value.

⑨ Maximum Torque (PN Geared, Harmonic Geared Type only)

This is the maximum torque that can be used instantaneously (for a short time). During acceleration/ deceleration, the motor can be operated up to this value.

⑩ Power Source

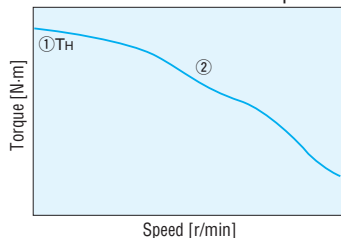
The current value of the power input is the maximum input current value. (The input current varies according to the rotation speed.)

⑪ Static Friction Torque

The electromagnetic brake specifications. This is the maximum holding torque at which the electromagnetic brake can hold the position.

How to Read Speed – Torque Characteristics

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



The speed-torque characteristics are determined by the motor and driver, so they vary greatly based upon the type of the driver used.

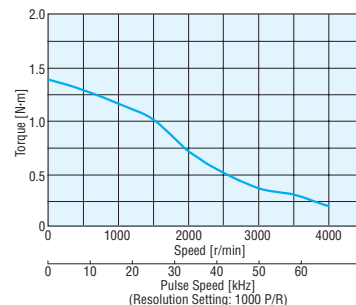
① Maximum Holding Torque

The holding torque is the maximum holding power (torque) the stepping motor has when power is being supplied but the motor shaft is not rotating (rated current). At motor standstill, the driver's "Automatic Current Cutback" function reduces the maximum holding torque by approximately 50%.

② Pullout Torque

Pullout torque is the maximum torque that can be output at a given speed. When selecting a motor, be sure the required torque falls within this curve.

The following figure shows the speed–torque characteristics of the **αSTEP AS Series AS66AAE**.



● Pay attention to heat dissipation from the motor and driver. The motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C. (Under 75°C is required to comply with UL or CSA standards.)

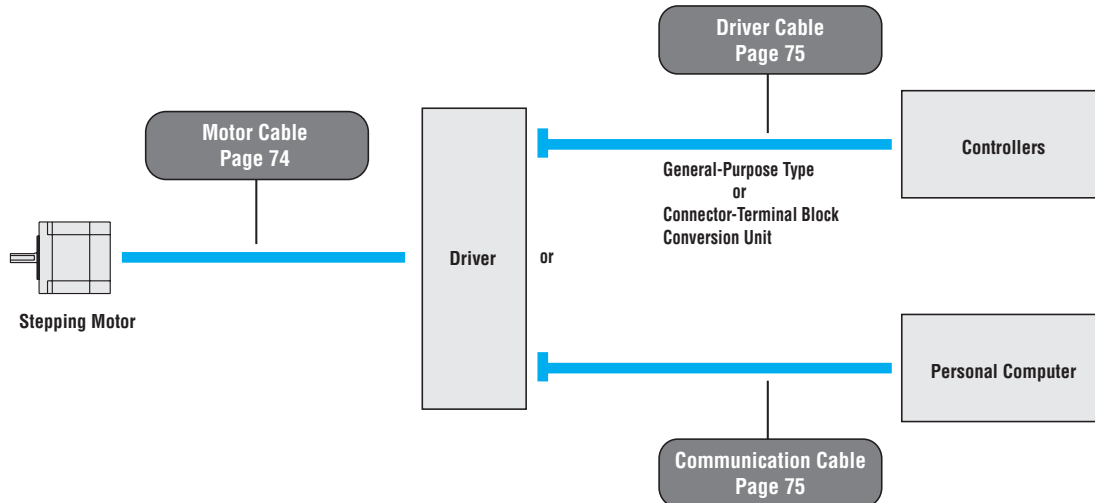
● In order to prevent fatigue of the gear grease in the harmonic gear, keep the temperature of the gear case under 70°C.

Accessories (Sold Separately)

Cables

Various cables provide convenient connection between a motor, driver and controller.

Type of Cables



Cable Selection Table

Use these cables to extend the wiring length between the *ASC* motor and driver or connect the standard IP65 rated motor and driver. Select an appropriate type of cable according to the motor frame size and additional function.

- **AS Series Pulse Input Package (Standard, TH Geared, PL Geared, PN Geared, Harmonic Geared Type)**
- **AS Series Built-In Controller (Stored Program) Package (Standard, TH Geared, PN Geared, Harmonic Geared Type)**
- **ASC Series (Standard, TH Geared, PN Geared, Harmonic Geared Type)**

Motor		Cable Name			
Motor Frame Size	Type	1 Extension Cable		2 Flexible Extension Cable	
		For Standard Motor	For Electromagnetic Brake Motor	For Standard Motor	For Electromagnetic Brake Motor
28 mm	Standard*	●	—	●	—
42 mm	Standard*	●	—	●	—
	Electromagnetic Brake*	●	—	●	—
60 mm	Standard*	●	—	●	—
	Electromagnetic Brake	—	●	—	●
85 mm (Geared Type: 90 mm)	Standard*	●	—	●	—
	Electromagnetic Brake	—	●	—	●

Notes:

- As for the products indicated by *, neither an extension cable nor flexible extension cable is required if the wiring distance between the motor and driver is 0.4 m or shorter (or 0.15 m or shorter: **ASC34** and **ASC36** types).
- Any motor with an electromagnetic brake cannot be driven without an extension cable for electromagnetic brake motor. Take note, however, for electromagnetic brake type with motor frame size □42 mm, use a standard extension cable.

AS Series Pulse Input Package (Standard Type IP65 Rated Motor)

Motor		Cable Name	
Motor Frame Size	Type	Motor Cable for IP65 Rated Motor	
		3 Extension Cable	4 Flexible Extension Cable
60 mm	Standard	●	●
85 mm	Standard	●	●

Note:

- Always use the motor cable for IP65 rated motor (sold separately) for connection between the IP65 rated motor and the driver.

Motor Cables RoHS

1 Extension Cables



These extension cables are convenient when using the *αSTEP* motor and driver more than 0.4 m apart from each other.

Product Line

For Standard Motor

Model	Length L (m)
CC01AIP	1
CC02AIP	2
CC03AIP	3
CC05AIP	5
CC07AIP	7
CC10AIP	10
CC15AIP	15
CC20AIP	20

For Electromagnetic Brake Motor

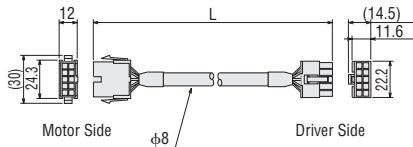
Model	Length L (m)
CC01AIPM	1
CC02AIPM	2
CC03AIPM	3
CC05AIPM	5
CC07AIPM	7
CC10AIPM	10
CC15AIPM	15
CC20AIPM	20

Notes:

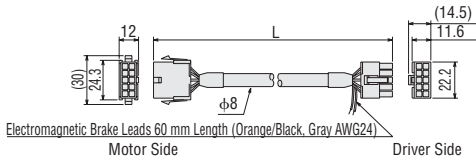
- Electromagnetic brake models must use an extension cable for an electromagnetic brake motor. But for electromagnetic brake motor with motor frame size □42 mm, use an extension cable for standard motor.
- ASC Series cannot use extension cable with 15 m, 20 m length.

Dimensions (Unit = mm)

For Standard Motor



For Electromagnetic Brake Motor



2 Flexible Extension Cables



This flexible extension cable is used between *αSTEP* motors and dedicated drivers. We recommend this cable when the motor is installed on a moving section and the cable is repeatedly bent and extended.

Product Line

For Standard Motor

Model	Length L (m)
CC01SAR	1
CC02SAR	2
CC03SAR	3
CC05SAR	5
CC07SAR	7
CC10SAR	10

For Electromagnetic Brake Motor

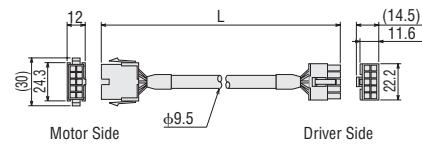
Model	Length L (m)
CC01SARM2	1
CC02SARM2	2
CC03SARM2	3
CC05SARM2	5
CC07SARM2	7
CC10SARM2	10

Note:

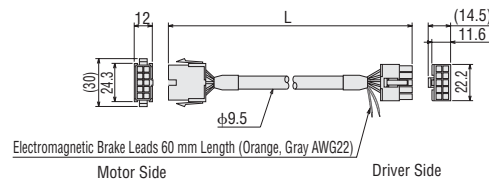
- For electromagnetic brake motor with motor frame size □42 mm, use an extension cable for standard motor.

Dimensions (Unit = mm)

For Standard Motor



For Electromagnetic Brake Motor



Motor Cable for IP65 Rated Motor RoHS



This motor cable must be used for connection between the IP65 rated motor and the driver.

Any IP65 rated motor cannot be driven without this cable.

One end of the cable connects to the metal connector on the motor, while the other end connects to the driver.

Use a flexible extension cable if the motor is installed on a moving part and its cable will be flexed repeatedly.

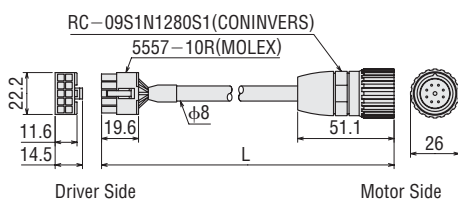
3 Extension Cables for IP65 Rated Motor

Product Line

Model	Length L (m)
CC01AST	1
CC02AST	2
CC03AST	3
CC05AST	5

Model	Length L (m)
CC07AST	7
CC10AST	10
CC15AST	15
CC20AST	20

Dimensions (Unit = mm)



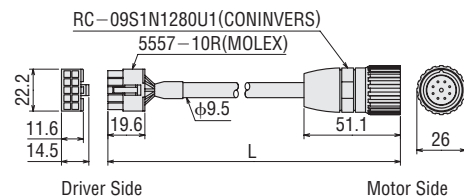
4 Flexible Extension Cables for IP65 Rated Motor

Product Line

Model	Length L (m)
CC01SAR2	1
CC02SAR2	2
CC03SAR2	3
CC05SAR2	5

Model	Length L (m)
CC07SAR2	7
CC10SAR2	10

Dimensions (Unit = mm)



Driver Cables RoHS

These shielded cables are convenient for connecting *αSTEP* Series drivers to controllers.

General-Purpose Type



This is a shielded cable equipped with, at one end of the cable, the half-pitch connector that snaps into the driver for *αSTEP* Series.

Notes:

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

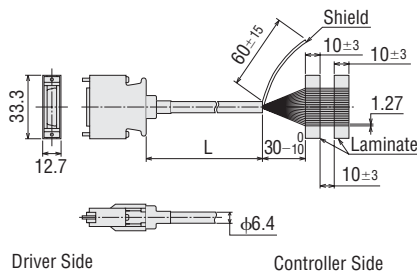
Product Line

Model	Length L (m)	Applicable Series
CC20D1-1	1	For CN5 (20 pins) of AS Series built-in controller (stored program) package driver
CC20D2-1	2	
CC36D1-1	1	For CN4 (36 pins) of AS Series pulse input package driver
CC36D2-1	2	For CN4 (36 pins) of AS Series built-in controller (stored program) package driver
		For CN3 (36 pins) of ASC Series driver

Dimensions (Unit = mm)

CC20D1-1, CC20D2-1

Conductor: AWG28 (0.08 mm²)

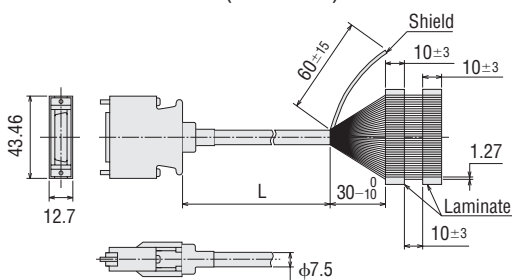


Driver Side

Controller Side

CC36D1-1, CC36D2-1

Conductor: AWG28 (0.08 mm²)



Driver Side

Controller Side

Communication Cable FC04W5 RoHS

This cable is used to connect personal computer and built-in controller (stored program) driver through an RS232 connection.



Cable Length: 5 m

Features

Line-up

Functions

System Configuration

Product Line

Specifications and Characteristics

Dimensions

Connection and Operation

List of Motor and Driver Combinations

How to Read Specifications and Characteristics

Accessories

Before Using a Stepping Motor

Controllers

AC Input AS Series

DC Input ASC Series

Connector-Terminal Block Conversion Unit RoHS NEW



A conversion unit that connects a driver to a host controller using a terminal block.

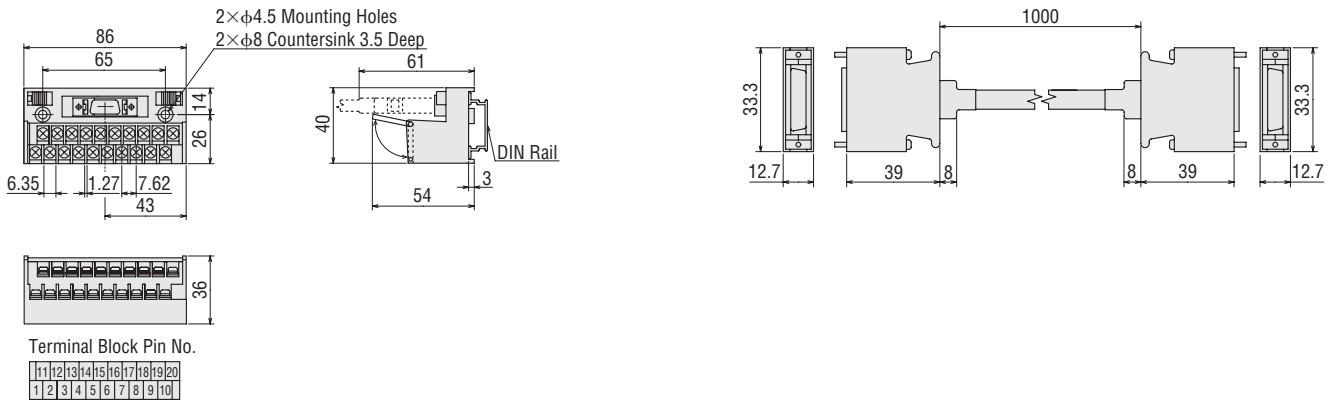
- With a signal name plate for easy, one-glance identification of driver signal names.
- DIN-rail mountable
- Cable length: 1 m

Product Line

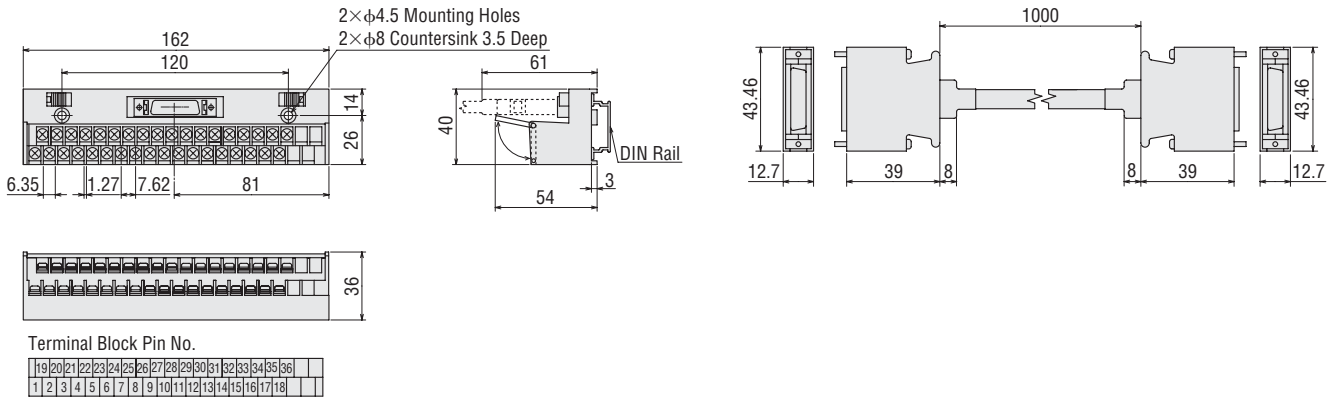
Model	Length L (m)	Applicable Series
CC20T1	1	For CN5 (20 pins) of AS Series built-in controller (stored program) package driver
CC36T1	1	For CN4 (36 pins) of AS Series pulse input package driver For CN4 (36 pins) of AS Series built-in controller (stored program) package driver For CN3 (36 pins) of ASC Series driver

Dimensions (Unit = mm)

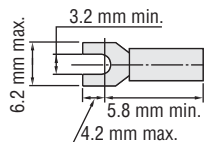
CC20T1



CC36T1



- Recommended Crimp Terminals
- Terminal screw size: M3
- Tightening torque: 1.2 N·m
- Applicable minimum lead wire: AWG22 (0.3 mm²)



Flexible Couplings



A flexible coupling ideal for your motor is available. Once you have decided on a motor and gear, you can select the recommended coupling easily. All motor shaft diameters of stepping motor packages are available (including geared motors).



Features of MCS Couplings

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

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

Coupling Selection Table

Applicable Motor		Gear Ratio	Motor Shaft Diameter (mm)	Type	Driven Shaft Diameter (mm)												
AS Series	ASC Series				φ4	φ5	φ6	φ6.35	φ8	φ10	φ12	φ14	φ15	φ16	φ18	φ20	φ25
AS46□A AS46□AP	ASC34AK ASC36AK ASC46□K	—	φ5	MCS14	●	●	●										
—	ASC34AK-T■	7.2, 10, 20, 30															
AS46□A-T■ AS46□AP-T■	ASC46□K-T■	3.6, 7.2, 10	φ6	MCS20		●	●	●	●	●							
—	ASC34AK-N■	5, 7.2, 10	φ8			●	●	●	●								
AS46□A-T■ AS46□AP-T■	ASC46□K-T■	20, 30	φ6			●	●	●	●								
AS66□E AS66A□T AS66□EP AS66A□TP AS69□E AS69A□T AS69□EP AS69A□TP	ASC66□K	—	φ8			●	●	●	●	●							
AS66□E-T■ AS66□EP-T■	ASC66□K-T■	3.6, 7.2		MCS30													
AS46□A-P■	—	7.2, 10															
—	ASC34AK-H■	50, 100															
AS46□A-N■ AS46□AP-N■	ASC46□K-N■	7.2, 10	φ10			●	●	●	●	●							
AS98□E AS98A□T AS98□EP AS98A□TP AS911A□E AS911A□T AS911A□EP AS911A□TP	—	—	φ14							●	●	●	●				
AS66□E-T■ AS66□EP-T■	ASC66□K-T■	10, 20, 30	φ8						●	●	●		●				
AS46□A-P■	—	36, 50															
AS46□A2-H■ AS46□AP2-H■	ASC46□K-H■	50, 100	φ10	MCS40					●	●	●		●				
AS66□E-P■	—	5, 7.2															
AS66□E-N■ AS66□EP-N■	ASC66□K-N■	5, 7.2	φ12						●	●	●		●				
AS98□E-T■ AS98□EP-T■	—	3.6, 7.2, 10, 20, 30															
AS66□E-P■	—	10, 25, 36, 50															
AS66□E-N■ AS66□EP-N■	ASC66□K-N■	10, 25, 36, 50	φ12	MCS55						●	●	●	●				
AS66□E-H■ AS66□EP-H■	ASC66□K-H■	50, 100															
AS98□E-P■	—	5, 7.2, 10, 25, 36, 50															
AS98□E-N■ AS98□EP-N■	—	5, 7.2, 10, 25, 36, 50	φ18	MCS65									●	●	●	●	
AS98□E-H■ AS98□EP-H■	—	50, 100															

● Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.
 Enter the power supply voltage **A**, **C** or **S** in the box (■) within the model name.
 Enter the gear ratio in the box (■) within the model name.

Product Number Code

MCS 30 08 12

①

②

③

④

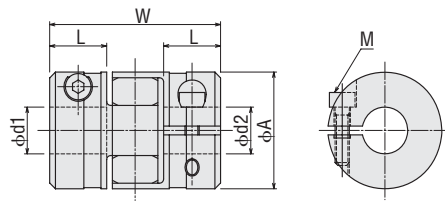
①	MCS Couplings
②	Outer Diameter of Coupling
③	Inner Diameter d1 (Smaller Side) (F04 represents $\phi 6.35$ mm)
④	Inner Diameter d2 (Larger Side) (F04 represents $\phi 6.35$ mm)

Specifications

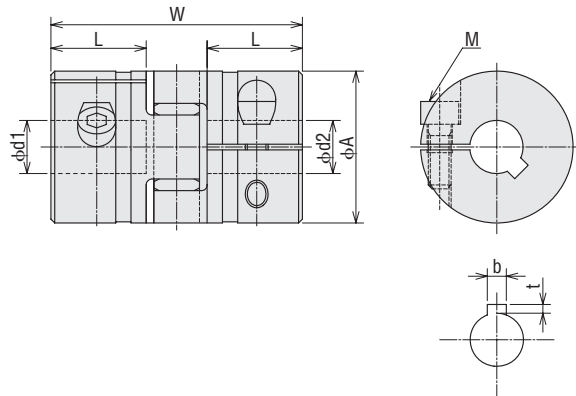
Model	Dimensions							Normal Torque N·m	Mass g	Inertia kg·m ²	Static Torsion Spring Constant N·m/rad	Permissible Eccentricity mm	Permissible Declination deg	Permissible End Play mm
	Outer Diameter ϕA mm	Length W mm	Axis Hole Diameter d1 H7 mm	Axis Hole Diameter d2 H7 mm	Key Slot Tolerance b/t mm	L mm	Screw Used M							
MCS140405 MCS140505 MCS140506 MCS140606	14	22	4 5 5 6	5 5 6 6	—	7	M2	2.0	6.7	0.184×10^{-6}	22.9	0.06	0.9	+0.6 0
MCS200506 MCS200606 MCS2006F04 MCS200608 MCS200610	20	30	5 6 6 6 6	6 6 6.35 8 10	—	10	M2.5	5.0	19.8	1.059×10^{-6}	51.6	0.08	0.9	+0.8 0
MCS300606 MCS3006F04 MCS300608 MCS300610 MCS30F0408 MCS30F0410 MCS300808 MCS300810 MCS300812 MCS301010 MCS301012 MCS301014 MCS301214 MCS301414 MCS301416	30	35	6 6 6 6 6.35 6.35 8 8 8 10 10 10 10 12 14 14 14	6 6.35 8 8 8 10 10 10 12 14 14 14 14 14 14 16	—	11	M3	12.5	44.6	6.057×10^{-6}	171.9	0.09	0.9	+1 0
MCS400808 MCS400810 MCS400812 MCS400815 MCS401010 MCS401012 MCS401015 MCS401212 MCS401215	40	66	8 8 8 8 10 10 10 12 12 12	8 10 12 15 12 12 15 12 12 15	$\phi 8$ b: 2 ± 0.0125 t: $1^{+0.1}_0$ $\phi 10$ b: 3 ± 0.0125 t: $1.4^{+0.1}_0$ $\phi 12$ b: 4 ± 0.015 t: $1.8^{+0.1}_0$ $\phi 14$ b: 5 ± 0.015 t: $2.3^{+0.1}_0$ $\phi 15$ b: 5 ± 0.015 t: $2.3^{+0.1}_0$	25	M6	17.0	139	42.29×10^{-6}	859.5	0.06	0.9	+1.2 0
MCS551212 MCS551214 MCS551215 MCS551216	55	78	12 12 12 12	12 14 15 16	$\phi 16$ b: 5 ± 0.015 t: $2.3^{+0.1}_0$ $\phi 18$ b: 6 ± 0.015 t: $2.8^{+0.1}_0$	30	M6	60.0	282	109.1×10^{-6}	2063	0.1	0.9	+1.4 0
MCS651618 MCS651818 MCS651820 MCS651825	65	90	16 18 18 18	18 18 20 25	$\phi 20$ b: 6 ± 0.015 t: $2.8^{+0.1}_0$ $\phi 25$ b: 8 ± 0.018 t: $3.3^{+0.2}_0$	35	M8	160	535	417.1×10^{-6}	3438	0.11	0.9	+1.5 0

Dimensions (Unit = mm)

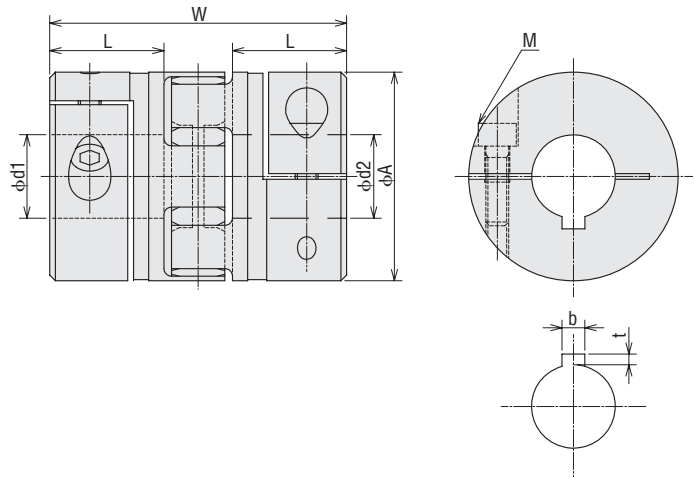
MCS14 Mass: 6.7 g
MCS20 Mass: 19.8 g
MCS30 Mass: 44.6 g



MCS40 Mass: 139 g



MCS55 Mass: 282 g
MCS65 Mass: 535 g

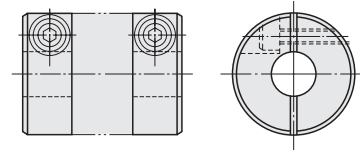


Mounting to a Shaft

Clamp Type

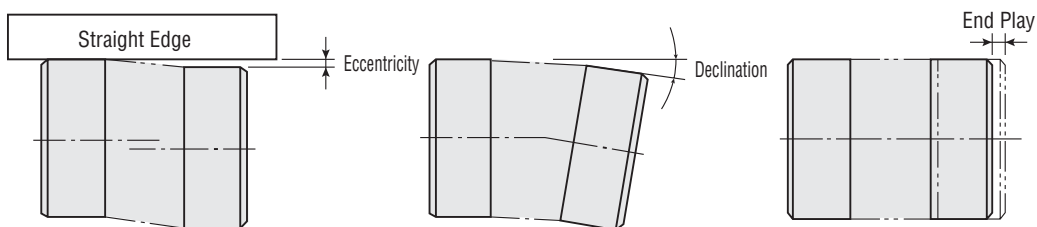
Clamp couplings use the binding force of the screw to compress the shaft hole diameter and thereby fasten the coupling to the shaft. This does not damage the shaft and is easy to mount and remove. The following table shows the screw binding torque. We recommend use of a torque wrench to fasten the coupling.

Type		MCS14	MCS20	MCS30	MCS40	MCS55	MCS65
Tightening Torque	N·m	0.37	0.76	1.34	10.5	10.5	25



Alignment Adjustment

Flexible couplings tolerate misalignment of the axis center and transfer rotational angle and torque, but produce vibration when the permissible value for misalignment is exceeded. This can dramatically shorten the coupling's service life. This requires alignment adjustment. Misalignment of the axis center includes eccentricity (parallel error of both centers), declination (angular error of both centers) and end play (shaft movement in the axial direction). To keep misalignment within the permissible value, always check and adjust the alignment. To increase the service life of the coupling, we recommend keeping misalignment to below 1/3 of the permissible value.



Notes:

- When misalignment exceeds the permissible value or excessive torque is applied, the coupling's shape will deform, and service life is shortened.
- When the coupling emits a metallic sound during operation, stop operation immediately and ensure there is no misalignment, axis interference or loose screws.
- When load changes are large, paint the coupling set screw with an adhesive to prevent the coupling screw from loosening.

Motor Mounting Brackets

Motor mounting brackets are convenient for installation and securing a stepping motor and geared stepping motor.



Product Line

Standard Type

Material: Aluminum die cast

Mounting Bracket Models	Applicable Motor
PAFOP	AS46□A AS46□AP ASC46□K
PALOP	AS46□A AS46□AP ASC46□K
PAL2P-5	AS66□□E AS66A□T AS66□□EP AS66A□TP ASC66□K AS69□□E AS69A□T AS69□□EP AS69A□TP
PAL4P-5	AS98□□E AS98A□T AS98□□EP AS98A□TP AS911A□E AS911A□T AS911A□EP AS911A□TP

- Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.
Enter the power supply voltage **A**, **C** or **S** in the box (□) within the model name.
- The mounting bracket base is built with holes large enough to allow for alignment adjustments in the horizontal direction.
- These mounting brackets can be perfectly fitted to the pilot of the stepping motors. (except for **PALOP**)

Note:

- They cannot be used with geared stepping motors.

Geared Type

Material: Aluminum die cast

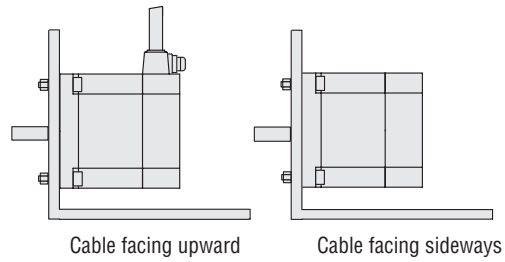


Mounting Bracket Models	Applicable Motor
SOL0B	AS46□A-T□ AS46□AP-T□ ASC46□K-T□ AS46□A-P□
SOL2A	AS66□□E-T□ AS66□□EP-T□ ASC66□K-T□
SOL2B	AS66□□E-P□
SOL5B	AS98□□E-T□ AS98□□EP-T□ AS98□□E-P□

- Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.
Enter the power supply voltage **A**, **C** or **S** in the box (□) within the model name.
Enter the gear ratio in the box (□) within the model name.
- The mounting bracket base is built with holes large enough to allow for alignment adjustments in the horizontal direction.
- Install **SOL2A** and **SOL2B** using the supplied screws.
No screws are supplied for installing **SOL0B** and **SOL5B**. Provide appropriate screws separately.

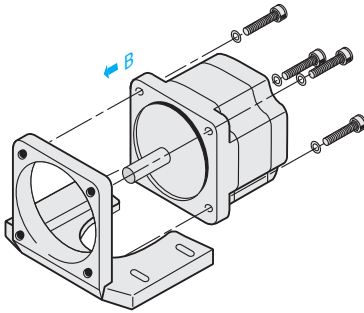
Motor Installation Direction

The motor cable comes out at right angles to the motor. Orient the motor so that the cable faces either upward or sideways.



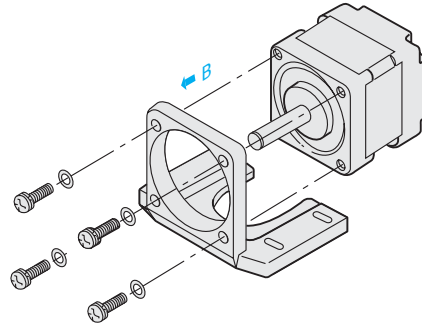
Mounting the Motor

1 PAL2P-5, PAL4P-5



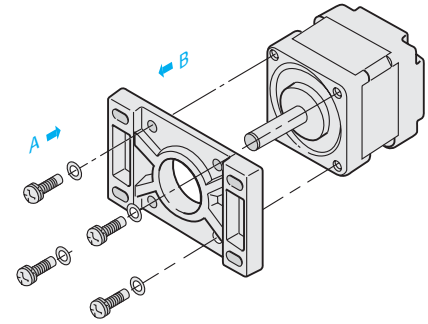
- ① Use the screws provided to secure the motor to the mounting bracket.
- ② Attach the motor from the direction shown by the arrow (B).

2 PALOP, SOLOB, SOL2A, SOL2B, SOL5B



- ① Use the screws provided to secure the motor to the mounting bracket.
- ② Attach the motor from the direction shown by the arrow (B).

3 PAFOP

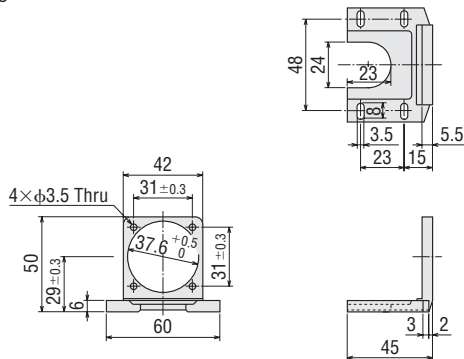


- ① Use the screws provided to secure the motor to the mounting bracket.
- ② Attach motor from the direction shown by either arrow (A) or arrow (B).

Dimensions (Unit = mm)

PALOP

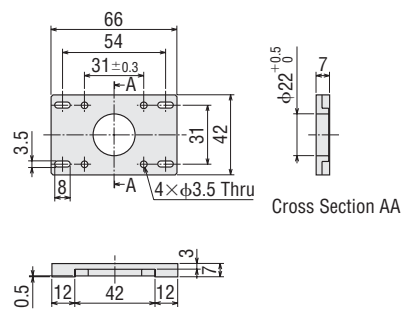
Mass: 35 g



- Screws (Included)
M3P0.5 Length 10 mm --- 4 Pieces

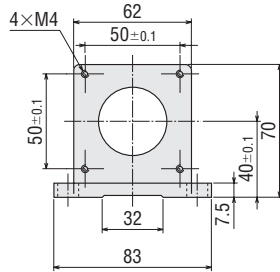
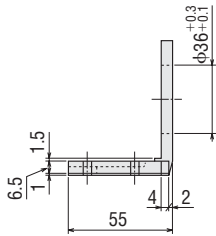
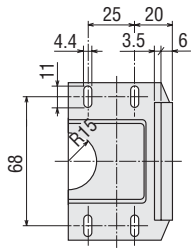
PAFOP

Mass: 30 g



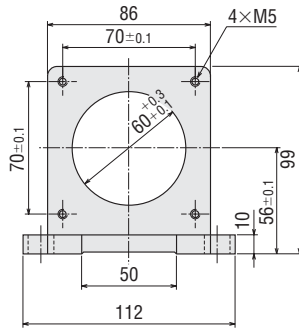
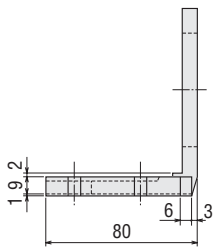
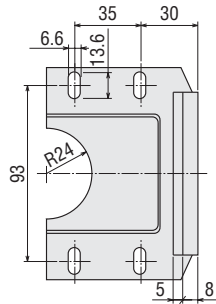
- Screws (Included)
M3P0.5 Length 7 mm --- 4 Pieces

PAL2P-5
 Mass: 110 g



- Screws (Included)
 M4P0.7 Length 12 mm --- 4 Pieces

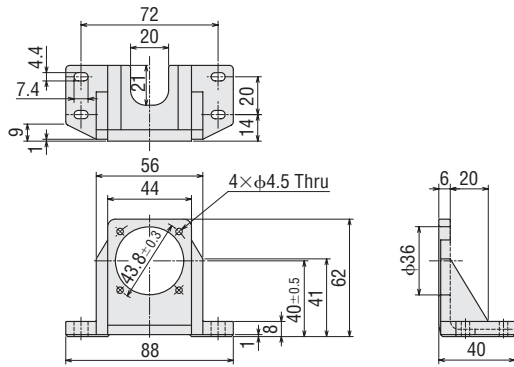
PAL4P-5
 Mass: 250 g



- Screws (Included)
 M5P0.8 Length 16 mm --- 4 Pieces

SOL0B

Mass: 85 g

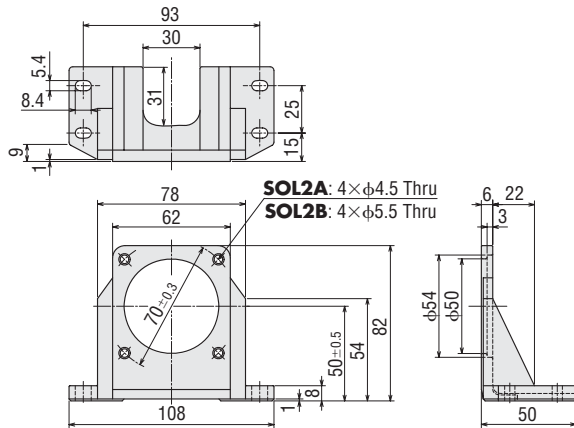


SOL2A

Mass: 120 g

SOL2B

Mass: 120 g



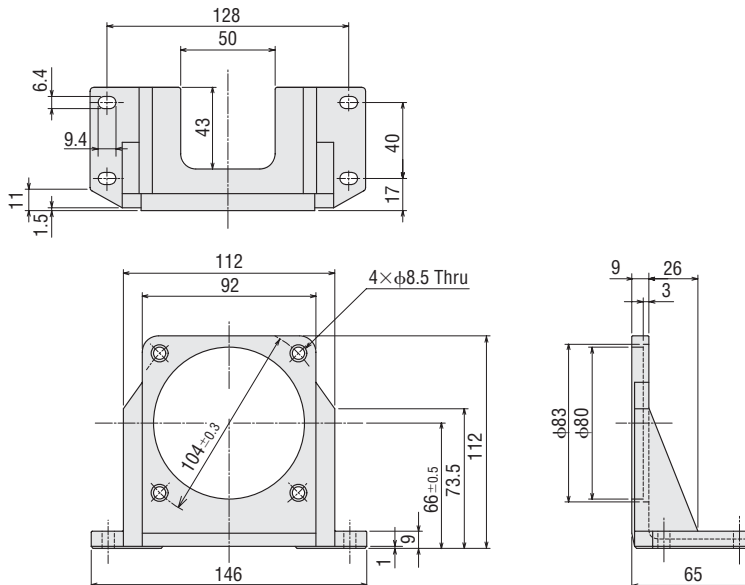
● Screws (Included)

M4P0.7 Length 12 mm -- 4 Pieces (SOL2A)

M5P0.8 Length 15 mm -- 4 Pieces (SOL2B)

SOL5B

Mass: 270 g



DIN Rail Mounting Plate RoHS

This installation plate is convenient for installing the driver of **αSTEP AS** Series on DIN rails with ease.

Product Line

Model	Applicable Product
PADP01	AS Series Driver

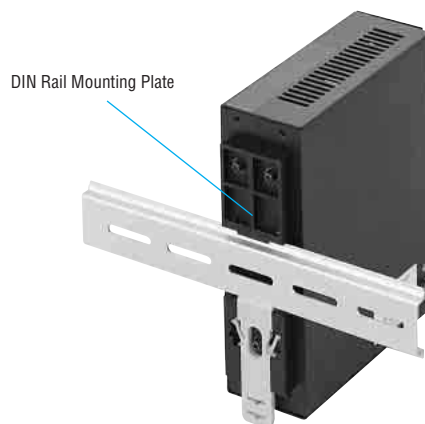
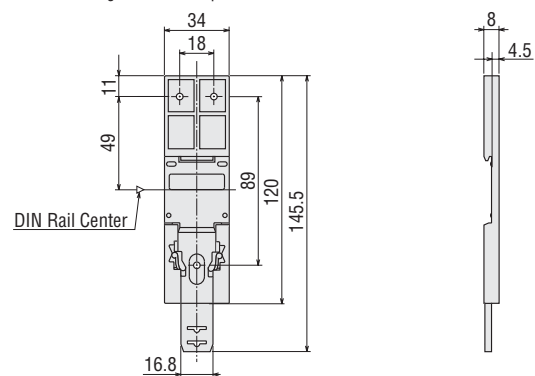
Dimensions (Unit = mm)

PADP01

Mass: 20 g

● Screws (Included)

M3P0.5 Length 8 mm ... 3 pieces

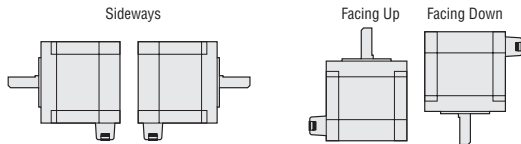


Before Using a Stepping Motor

Motor Installation

Direction of Mounting

Motors can be mounted freely in any direction as shown below. Regardless of how the motor is mounted, take care not to apply an overhung load or thrust load on the shaft. Make sure the cable does not contact the mounting surface causing undesirable force on the cable.



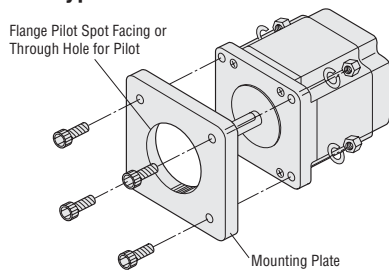
Notes:

- Do not disassemble the motors.
- Do not apply any shock to the motor.

Mounting Method

Considering heat radiation and vibration isolation as much as possible, mount the motor tightly against a metal surface.

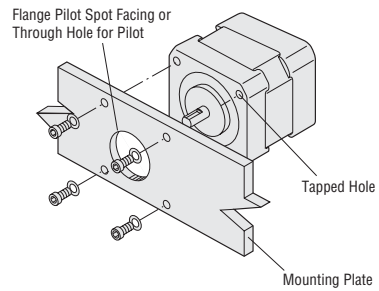
Through Hole Type



Model	Thickness of the Mounting Plate
AS66□□E AS66A□T AS66□□EP AS66A□TP ASC66□K AS69□□E AS69A□T AS69□□EP AS69A□TP	5 mm min.
AS98□□E AS98A□T AS98□□EP AS98A□TP AS911A□E AS911A□T AS911A□EP AS911A□TP	8 mm min.
AS98□□E-H AS98□□EP-H	12 mm min.

- Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.
- Enter the power supply voltage **A**, **C** or **S** in the box (□) within the model name.
- Enter the gear ratio in the box (■) within the model name.

Tapped Hole Type



Applicable Motor		Thickness of the Mounting Plate
AS Series	ASC Series	
AS46□A AS46□AP	ASC34AK ASC36AK ASC46□K ASC34AK-T ASC34AK-N ASC34AK-H	3 mm min.
AS46□A-T AS46□AP-T AS46□A-P AS46□A-N AS46□AP-N AS46□A2-H AS46□AP2-H AS66□E-T AS66□EP-T AS66□E-P	ASC46□K-T ASC46□K-N ASC46□K-H ASC66□K-T	5 mm min.
AS66□E-N AS66□EP-N AS66□E-H AS66□EP-H AS98□E-T AS98□EP-T	ASC66□K-N ASC66□K-H	8 mm min.
AS98□E-P AS98□E-N AS98□EP-N	-	12 mm min.

- Enter **A** (standard) or **M** (electromagnetic brake) in the box (□) within the model name.
- Enter the power supply voltage **A**, **C** or **S** in the box (□) within the model name.
- Enter the gear ratio in the box (■) within the model name.

Installation Conditions

Install the motor in a location that meets the following conditions, or the product may be damaged.

- Indoors (This product is designed and manufactured to be installed within another device)
- Ambient temperature: 0°C to +50°C (nonfreezing)
0°C to +40°C (nonfreezing): Harmonic geared type
- Ambient humidity: 85% or less (noncondensing)
- Not exposed to explosive, flammable, or corrosive gas
- Not exposed to direct sunlight
- Not exposed to dust
- Not exposed to water or oil (except for IP65 rated motor)
- A place where heat can escape easily
- Not exposed to continuous vibration or excessive impact

Notes:

- When installing the motor in an enclosed space such as a control box, or somewhere close to a heat-radiating object, vent holes should be used to prevent the motor from overheating.
- Do not install the motor in a location where a source of vibration will cause the motor to vibrate.

Driver Installation

AC Input Type

◇Installation Direction and Method

Drivers are designed to dissipate heat through natural convection. Install the driver vertically as shown in the photograph.

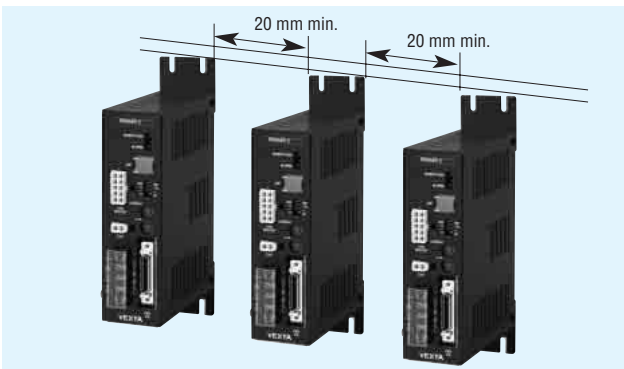


- Firmly install on a metal plate that has good heat conductivity, such as iron or aluminum 2 mm or more in thickness.
- To directly install the driver without using the screws provided, pay particular attention to the length of the screws used for the tapped holes. For **AS** Series, the use of screw that would penetrate 3 mm or more through the surface of the driver may cause damage to the driver.

◇Using Multiple Axes

When using multiple stepping motor axes, driver temperature rise will cause ambient temperatures to rise. At least 20 mm must be allowed between driver units and at least 25 mm between drivers and other equipment or structures.

Install a forced-air cooling fan if ambient temperatures exceed 50°C [40°C for built-in controller (stored data) driver].



◇Installation Conditions

Install the driver in a location that meets the following conditions, or the product may be damaged.

- Indoors (This product is designed and manufactured to be installed within another device)
- Ambient temperature:
 - 0°C to +50°C (nonfreezing): Pulse input driver
 - 0°C to +40°C (nonfreezing): Built-in controller (stored program) driver
- Ambient humidity: 85% or less (noncondensing)
- Not exposed to explosive, flammable, or corrosive gas
- Not exposed to direct sunlight
- Not exposed to dust
- Not exposed to water or oil
- A place where heat can escape easily
- Not exposed to continuous vibration or excessive impact

Notes:

- When installing the driver in an enclosed space such as a control box, or somewhere close to a heat-radiating object, vent holes should be used to prevent the driver from overheating.
- Do not install the driver in a location where a source of vibration will cause the driver to vibrate.

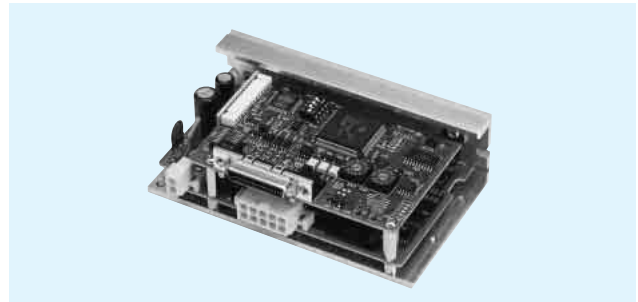
- In situations where drivers are located close to a large noise source such as high frequency welding machines or large electromagnetic switches, take steps to prevent noise interference, either by inserting noise filters or connecting the driver to a separate circuit.
- Take care that pieces of conductive material (filings, pins, pieces of wire, etc.) do not enter the drivers.

DC Input Type

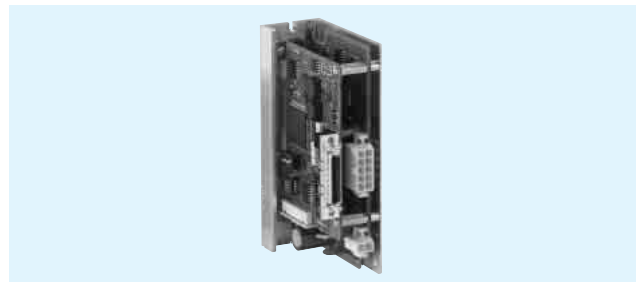
◇Installation Direction

Considering heat radiation, install the driver vertically or board side down. Install the driver in a way that the power element side faces up and the aluminum electrolytic capacitor side faces down.

●Horizontal Installation



●Vertical Installation



Note:

- The driver can generate a great deal of heat depending on the operating conditions. Make sure that the temperature of the heat sink does not exceed 80°C. (When the temperature of the heat sink exceeds 80°C, forced cooling is required.)

◇Installation Conditions

Install the driver in a location that meets the following conditions, or the product may be damaged.

- Indoors (This product is designed and manufactured to be installed within another device)
- Ambient temperature: 0°C to +40°C (nonfreezing)
- Ambient humidity: 85% or less (noncondensing)
- Not exposed to explosive, flammable, or corrosive gas
- Not exposed to direct sunlight
- Not exposed to dust
- Not exposed to water or oil
- A place where heat can escape easily
- Not exposed to continuous vibration or excessive impact

Notes:

- When installing the driver in an enclosed space such as a control box, or somewhere close to a heat-radiating object, vent holes should be used to prevent the driver from overheating.
- Do not install the driver in a location where a source of vibration will cause the driver to vibrate.
- In situations where drivers are located close to a large noise source such as high frequency welding machines or large electromagnetic switches, take steps to prevent noise interference, either by inserting noise filters or connecting the driver to a separate circuit.
- Take care that pieces of conductive material (filings, pins, pieces of wire, etc.) do not enter the drivers.

Controller for Stepping Motor

SG8030JY RoHS

With the **SG8030JY**, all operations including data setting can easily be performed using the four touch-screen buttons on the top panel. In addition, the number of signal lines is reduced to a minimum for easy connection.

Features

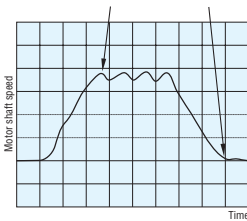
● Jerk Limiting Control Function Suppresses Motor Drive Vibrations

The "Jerk limiting control function" effectively minimizes vibrations during motor drive and stop. This is especially useful in applications such as driving a belt pulley, to ensure smooth motion of transported works.

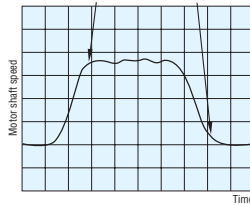
- Measurement conditions
 - Application: Belt drive
 - Operation mode: Positioning operation
 - Load: 10 kg

Motor vibrations when switching between acceleration/deceleration and constant speed cause mechanical vibrations.

Motor vibrations when switching between acceleration/deceleration and constant speed are minimized, resulting in less mechanical vibrations.



Linear controlled acceleration/deceleration pattern



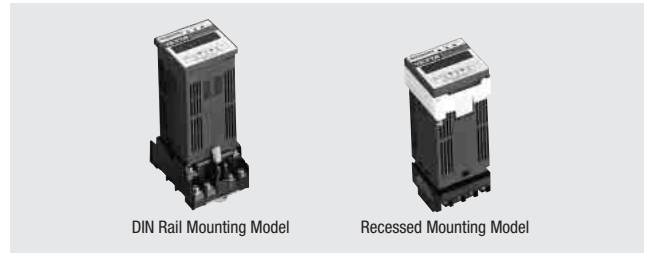
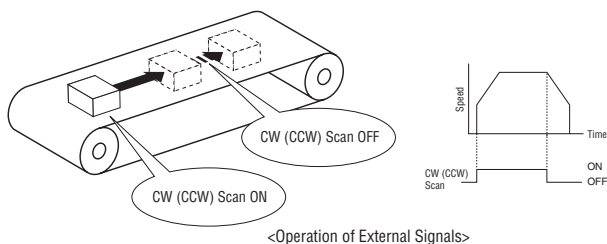
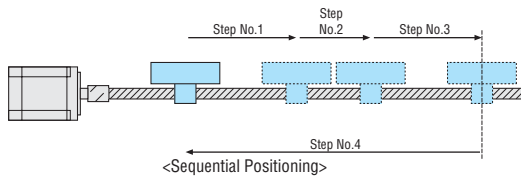
Jerk controlled acceleration/deceleration pattern

*These diagrams are simulated. Actual effect will differ depending on mechanical construction.

To achieve the same positioning time with jerk controlled acceleration/deceleration, set the acceleration/deceleration rate to 1/2 that of linear controlled acceleration/deceleration.

● Sequential Positioning Operation/External Signal Operation Possible

In "Sequential positioning operation," the start signal always causes execution from step No. 1 in a preselected sequence. In "External signal operation," when the CW scan (or CCW scan) signal input goes ON, operation starts. When the signal goes OFF, slowdown stop occurs. This is useful for moving the work manually to a desired position.



● Maximum Oscillation Frequency 200 kHz

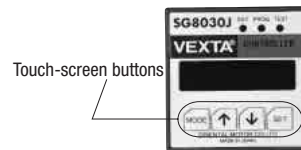
The "Maximum oscillation frequency of 200 kHz" allows motor control in micro steps.

● 1-Pulse Output/2-Pulse Output Mode Select Possible

In addition to the 1-pulse output mode, the controller can also provide 2-pulse operation mode, which makes it compatible with a wide range of motor drivers.

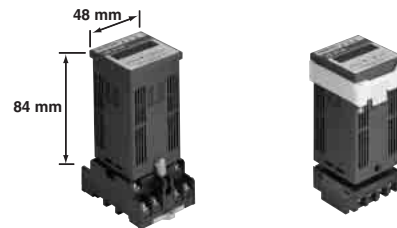
● Top Panel Single Interface for All Settings and Operation Checks

All operations including setting of various data can be performed using the four touch-screen buttons on the top panel. You can also check the status of each operation simply by checking the display on the top panel.



● 48×48 mm DIN Size and Two Mounting Configurations are Provided.

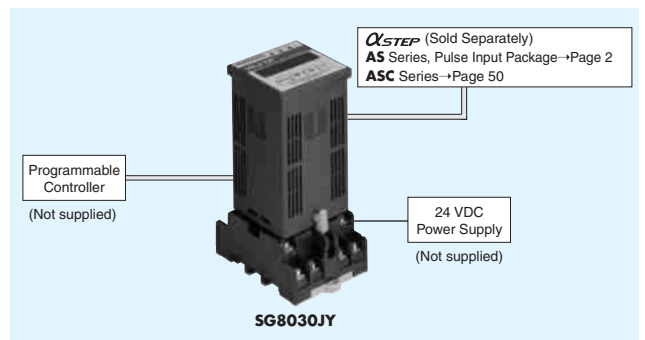
The unit is very compact, measuring only 48 (W)×48 (D)×84 (H) mm. Two mounting configurations are available, for DIN rail mounting and recessed mounting.



<DIN Rail Mounting Model> <Recessed Mounting Model>

System Configuration

● Configuration Example of Combination with α STEP Series



Product Line

Type	Model
DIN Rail Mounting Model	SG8030JY-D
Recessed Mounting Model	SG8030JY-U

Specifications

Model		SG8030JY-D SG8030JY-U
Number of Control Axes		1 axis
Number of Settings		4 steps
Positioning Data	Setting Mode	Set with touch key on front panel (stored in EEPROM)
	Setting Method	Incremental mode (point to point)
Mode		Sequential-step positioning Step-select positioning
Positioning Control	Move Distance Setting Range	Incremental 1~99999 pulses
	Starting Pulse Speed Setting Range (VS)	100 Hz~10 kHz (100 Hz units)
	Operating Pulse Speed Setting Range (VR)	100 Hz~200 kHz (100 Hz units)
	Acceleration/Deceleration Rate Setting Range (TR)	1~100 ms/kHz (28 rates: *)
Pulse Output Mode		1-pulse output/2-pulse output mode select possible
Operation Modes		Positioning operation (INDEX operation) Return to mechanical home operation (HOME operation) Continuous operation (SCAN operation) 1-Pulse operation (JOG operation: Test mode only)
Control Modes		External input mode (EXT) Program mode (PROG) Test mode (TEST)
Number of Maximum Return Pulses		—
Mechanical Home Return Function		Sensor detection of home through designation of mechanical home detection direction of rotation
Input Signals		24 VDC photocoupler input, input resistance 4.7 kΩ Current sinking input
Output Signals		PNP transistor output linked to photocoupler 24 VDC max. 25 mA max., Current sourcing output
Power Supply Voltage		24 VDC±5% current consumption 0.1 A
Ambient Temperature		0°C~+40°C (Nonfreezing)
Ambient Humidity		20%~85% (Noncondensing)

*The following 28 acceleration/deceleration rates can be selected. [unit: ms/kHz]

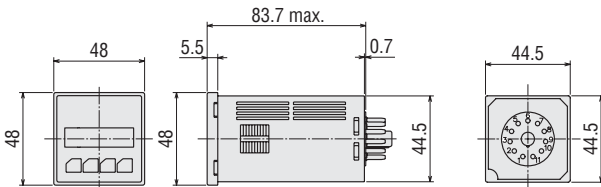
1, 2, 4, 5, 6, 8, 10, 12, 14, 15, 16, 18, 20, 22, 24, 25, 26, 28, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100

Dimensions (Unit = mm)

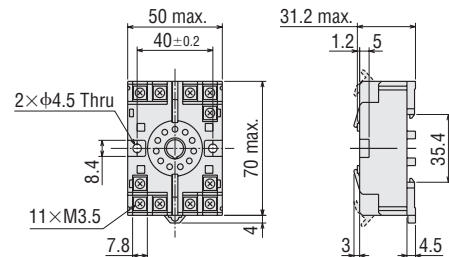
DIN Rail Mounting Model

◇SG8030JY-D

Mass: 0.17 kg



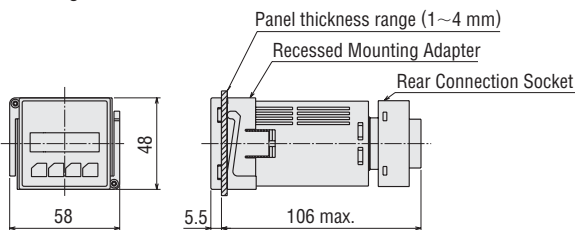
◇Flush Connection Socket (Included)



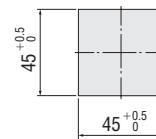
Recessed Mounting Model

◇SG8030JY-U

Mass: 0.15 kg

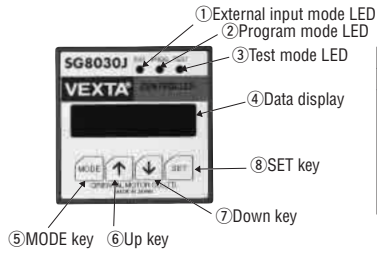


◇Panel Mounting Cut-Out Dimensions



Connection and Operation

Names and Functions of Controller Parts



①	EXT (LED): Lights up when external input is selected.
②	PROG (LED): Lights up when program mode is selected.
③	TEST (LED): Lights up when test mode is selected.
④	Data display: Shows operation and setting status.
⑤	MODE key
⑥	↑ key
⑦	↓ key
⑧	SET key

Connection Socket Signal Table

Pin No.	Signal Designation	I/O	Function
1*	Operation Mode Input	Input	S: Switching positioning/home detection operation D: Switching positioning/home detection operation and continuous operation
2	GND	Input	GND connecting terminal
3	+24V	Input	24 VDC power supply input terminal
4	BUSY	Output	Output during pulse oscillation
5	HOMELS	Input	Mechanical home detection sensor
6	Start	Input	Start signal
7	Pulse/CW Pulse	Output	1 pulse output mode: Pulse 2 pulse output mode: CW Pulse
8	Rotation Direction/CCW Pulse	Output	1 pulse output mode: Direction of rotation 2 pulse output mode: CCW Pulse
9	Emergency Stop	Input	Stop all operations (including busy output)
10*	S: CW Scan D: M0 [CW Scan]	Input	S: CW continuous operation D: M0 data select signal [CW continuous operation]
11*	S: CCW Scan D: M1 [CCW Scan]	Input	S: CCW continuous operation D: M1 data select signal [CCW continuous operation]

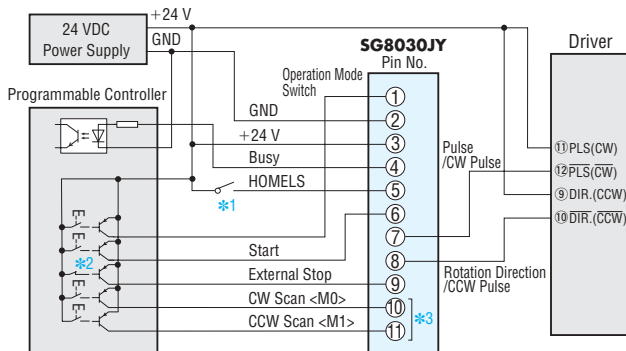
● Indications in brackets [] apply to state when mode switching signal was input.

*Only pins 1, 10, 11 differ for sequential positioning and selection positioning.

"S" in the table indicates sequential positioning and "D" indicates selection positioning.

Wiring Diagram

Connection between SG8030JY and α STEP AS Series, ASC Series



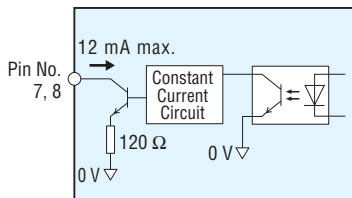
- *1 Use normal open (NO) limit control of the mechanical home sensor.
- *2 Power for the external stop input signal must always be ON during normal operation. When not using the external stop input signal, always connect to the +24 V terminal.
- *3 Designations in <> brackets are for data selection mode.

Notes:

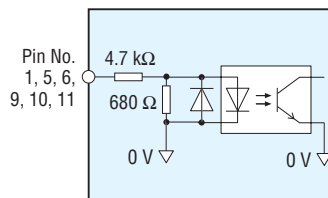
- External resistor does not need to be installed on the pulse outputs, because they contain constant current circuits.
- Note that the length of the pulse signal line increases, the maximum transmission frequency decreases.

Description of Input/Output Signal

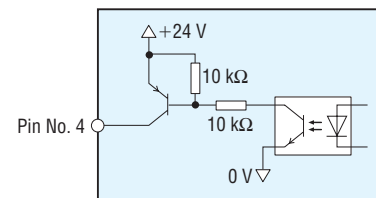
Output Signals to Driver



Input Signals from Programmable Controller and Limit Sensor



Output Signals to Programmable Controller



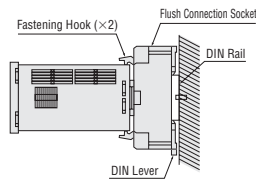
Before Using a Controller

Installation Method

SG8030JY

◇ DIN Rail Mounting Using Flush Connection Socket

1. Mount the flush connection socket to the DIN rail. (The DIN lever should face down.)
2. Insert the controller terminals firmly into the flush connection socket.
3. Engage the fastening hooks (two places) of the flush connection socket on the controller to secure the assembly.

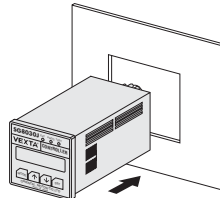


Note:

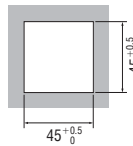
- Mount the controller only after connecting all required leads to the terminals of the flush connection socket.

◇ Panel Mounting Using Rear Connection Socket

- The **SG8030JY** can be affixed to a plate of 1 to 4 mm in thickness.
1. Push in the controller from the front side of the mounting plate.
 2. Insert the burying-type adapter from the back and push it in until the gap with the mounting plate becomes minimal.
 3. Affix with the fixing screws (two locations) of the burying-type adapter.
 4. Insert the controller terminals firmly into the rear connection socket.



Panel Mounting Cut-Out Dimensions (Unit = mm)



Installation Location

● Indoors, ambient temperature 0°C ~ +40°C (Nonfreezing)

- If the ambient temperature exceeds 40°C, use a fan to provide forced cooling. Otherwise internal heat buildup may lead to damage.
- When attaching the controller in an enclosed space such as a control box, or somewhere close to a heat-radiating object, ventilation holes should be used to prevent the controllers from overheating.

● Ambient humidity 85% maximum (Noncondensing)

● Not exposed to corrosive gases or dust

Take care that pieces of conductive material (filing, pins, pieces of wire, etc.) do not enter the controllers. Otherwise circuit damage may occur.

● Not exposed to water or oil

Exposure to liquids can lead to corrosion or short-circuits.

● Not exposed to direct sunlight

● Not in the vicinity of noise sources

In situations where controllers are located close to a large noise source such as high frequency welding machines or large electromagnetic switches, take steps to prevent noise interference, either by inserting noise filters, using shielded wires or connecting the controller to a separate circuit.

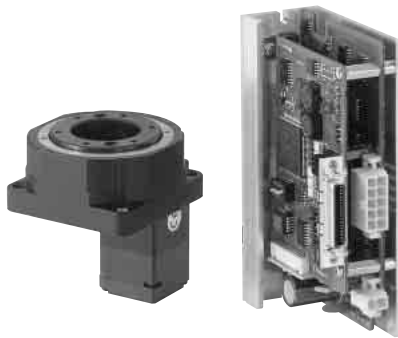
● Not in the vicinity of vibration sources

When the controller is to be installed in a location where a source of vibration will cause the controller to be damaged.

Hollow Rotary Actuator DG Series RoHS

To check the product details not featured in this catalogue, you must obtain a separate, individual catalogue for the product. To request a catalogue, contact your nearest Oriental Motor sales office.

The **DG**-Series hollow rotary actuators are constructed to achieve quick, accurate positioning based on a simple design. These actuators come in extensive variations with a choice of frame size of □60 mm or □130 mm.



Frame size □60 mm

Permissible Torque 0.9 N·m	Bearing Ball Bearing	Diameter of Hollow Section φ28 mm <small>(Rotational)</small>
Safety Standard UL US CE	24-VDC Input Driver	Actuator Weight 0.5 kg



Frame size □130 mm

Diameter of Hollow Section 12 N·m	Bearing Cross-Roller Bearing	Diameter of Hollow Section φ62 mm <small>(Rotational)</small>	High Permissible-Moment
High Permissible-Thrust Load	Safety Standard UL US CE	AC Input Driver	Actuator Weight 2.6 kg

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

Specifications are subject to change without notice.
This catalogue was published in March, 2007.

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Printed in Japan 07Q 3K 50000K