

Stepping Motors

2-Phase Stepping Motors

5-Phase Stepping Motors

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RoHS RoHS-Compliant
5-Phase Stepping Motors
PK Series

Additional Information
Technical reference → Page F-1

5-phase **PK** Series products are the high-torque and low-vibration stepping motors with resolution of 500 per rotation (0.72°/step). Ten motor lead wires are provided so that they can be used for all types of driving system. The dedicated driver is required separately to operate the motor.

RoHS RoHS-Compliant

The 5-phase **PK** Series conforms to the RoHS Directive that prohibits the use of six chemical substances including lead and cadmium.

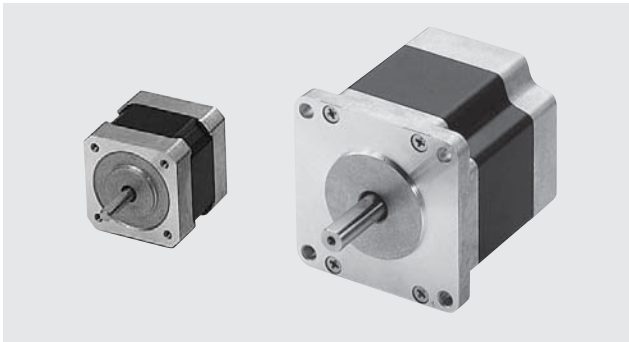
Details of RoHS Directive → Page G-23

Product Number Code

PK 5 6 6 - B E

① ② ③ ④ ⑤ ⑥

①	Series	PK: PK Series			
②	5: 5-Phase				
③	Motor Frame Size	4: 42 mm	6: 60 mm	9: 85 mm	
④	Motor Case Length				
⑤	Shaft Type	A: Single Shaft B: Double Shaft			
⑥	Reference Code				

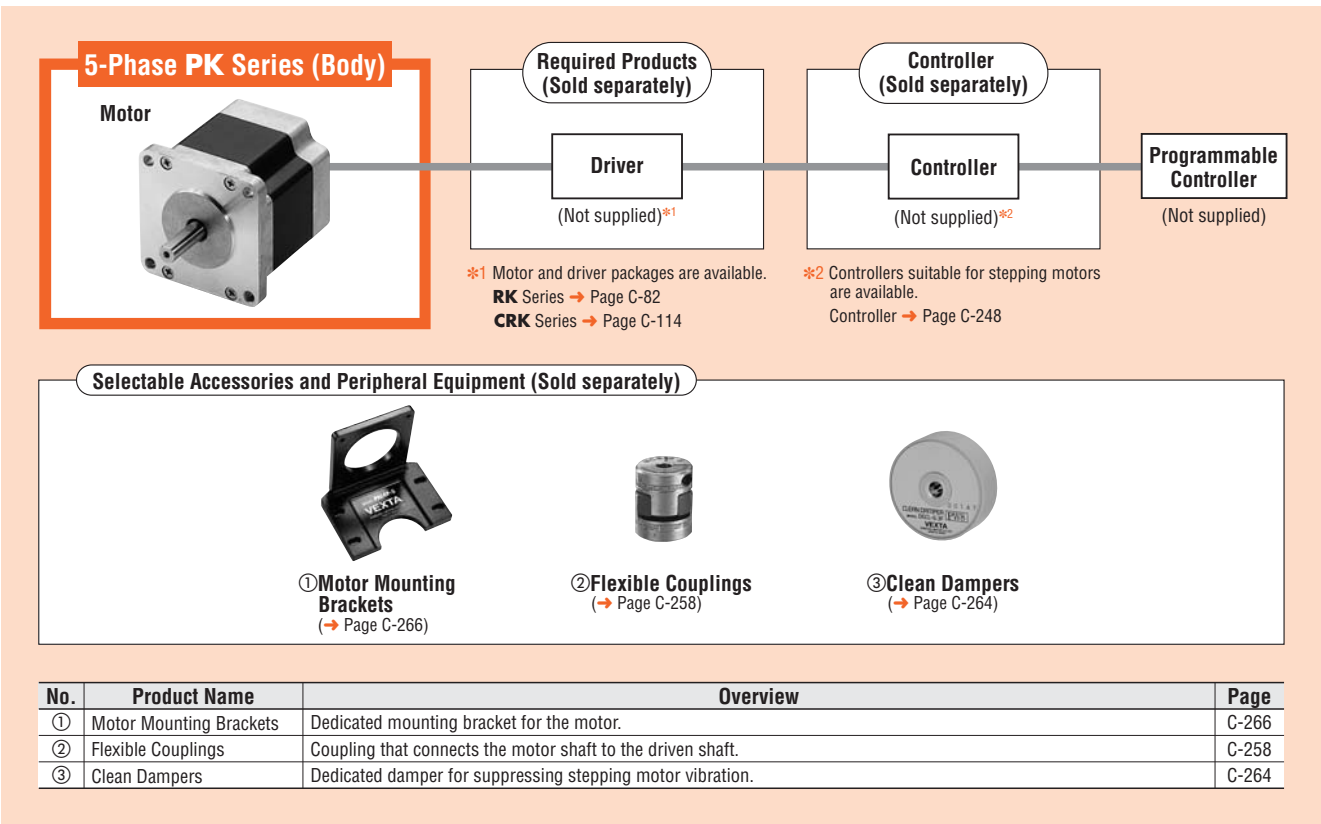


Product Line

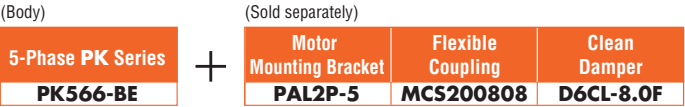
Model (Single Shaft)	Model (Double Shaft)
PK543-A PK544-A PK545-A	PK543-B PK544-B PK545-B
PK564-AE PK566-AE PK569-AE	PK564-BE PK566-BE PK569-BE
PK596-AE PK599-AE PK5913-AE	PK596-BE PK599-BE PK5913-BE

The following items are included in each product.
Motor, Operating Manual

System Configuration



Example of System Configuration



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

Specifications (RoHS)

Frame Size mm	Model		Maximum Holding Torque N·m	Rotor Inertia J: kg·m ²	Current per Phase A/Phase	Resistance per Phase Ω/Phase	Basic Step Angle	Mass kg	Corresponding Motor and Driver Package/Page with Speed – Torque Characteristics	Dimension No.
	Single Shaft	Double Shaft								
□42	PK543-A	PK543-B	0.13	35×10^{-7}	0.75	1.7	0.72°	0.21	CRK543 □P C-123	[1]
	PK544-A	PK544-B	0.18	54×10^{-7}		2.2		0.27	CRK544 □P C-123	
	PK545-A	PK545-B	0.24	68×10^{-7}		2.3		0.35	CRK545 □P C-123	
□60	PK564-AE	PK564-BE	0.42	175×10^{-7}	1.4	3.4		0.6	—	[2]
	PK566-AE	PK566-BE	0.83	280×10^{-7}		1.7		0.8	—	
	PK569-AE	PK569-BE	1.66	560×10^{-7}		1.5		1.3	RK569 □CE C-89 CRK569 □P C-123	
□85	PK596-AE	PK596-BE	2.1	1400×10^{-7}	2.8	0.75		1.7	RK596 □CE C-89	[3]
	PK599-AE	PK599-BE	4.1	2700×10^{-7}		0.75		2.8	RK599 □CE C-89	
	PK5913-AE	PK5913-BE	6.3	4000×10^{-7}		0.75		3.8	—	

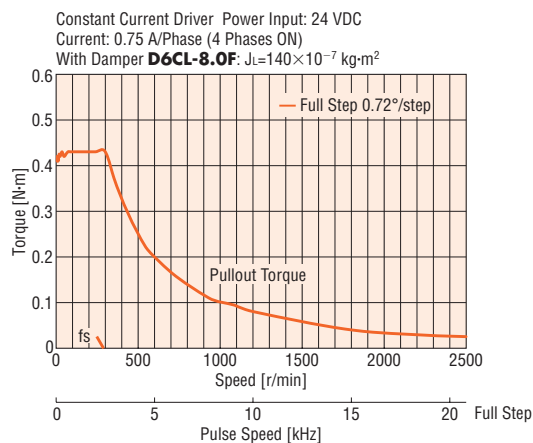
How to read specifications table → Page C-10

- For the speed – torque characteristics of the motors in the table above, see the characteristics of the corresponding motor and driver package. If there is no corresponding model, refer to the following characteristics.
- Enter the shaft type **A** or **B** in the box (□) within the model name.

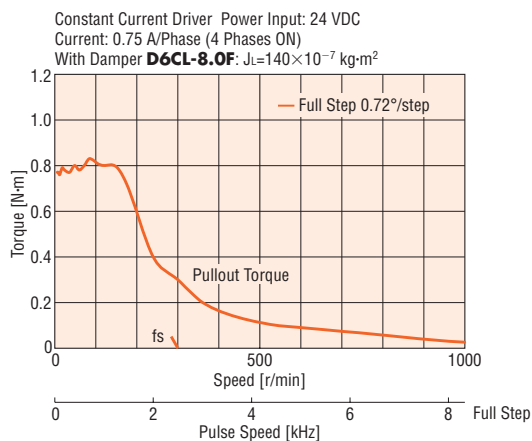
Speed – Torque Characteristics

How to read speed – torque characteristics → Page C-10

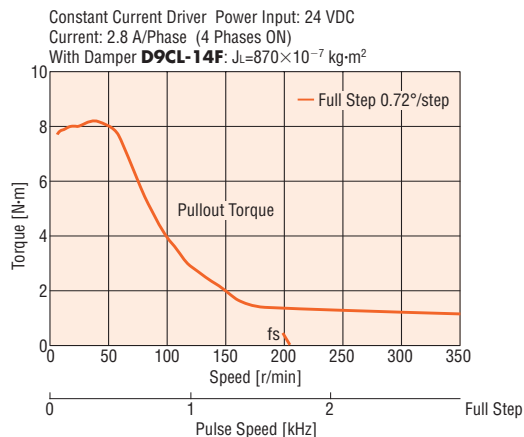
PK564-AE/PK564-BE



PK566-AE/PK566-BE



PK5913-AE/PK5913-BE



Note:

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

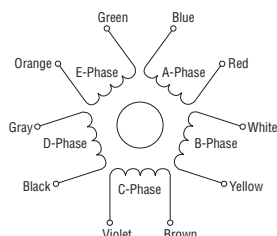
Permissible Overhung Load and Permissible Thrust Load

Unit = N

Model	Permissible Overhung Load Distance from Shaft End (mm)					Permissible Thrust Load
	0	5	10	15	20	
PK54 □-□	20	25	34	52	—	The permissible thrust load shall be no greater than the motor mass.
PK56 □-□ E	63	75	95	130	190	
PK59 □-□ E	260	290	340	390	480	

- Enter the shaft type **A** or **B** in the box (□) within the model name.
Enter the motor case length in the box (□) within the model name.

Inner Connection Diagram for Motor



General Specifications

Specifications		Motor
Insulation Class		Class B (130°C)
Insulation Resistance		100 MΩ or more when 500 VDC megger is applied between the windings and the case under normal ambient temperature and humidity.
Dielectric Strength		Sufficient to withstand 1.0 kV at 50 Hz or 60 Hz applied between the windings and the case for 1 minute under normal ambient temperature and humidity. (0.5 kV for PK54 □)
Operating Environment (In operation)	Ambient Temperature	-10~+50°C (non-freezing)
	Ambient Humidity	85% or less (non-condensing)
	Atmosphere	No corrosive gases, dust, water or oil
Temperature Rise		Temperature rise of the windings are 80°C or less measured by the resistance change method. (at rated current, at standstill, five phases energized)
Stop Position Accuracy*1		±3 arc minutes (±0.05°)
Shaft Runout		0.05 T.I.R. (mm)*4
Radial Play*2		0.025 mm max. of 5 N
Axial Play*3		0.075 mm max. of 10 N
Concentricity		0.075 T.I.R. (mm)*4
Perpendicularity		0.075 T.I.R. (mm)*4

*1 This value is for full step under no load. (The value changes with the size of the load.)

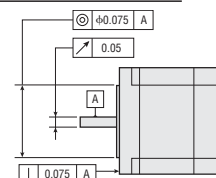
*2 Radial Play: Displacement in shaft position in the radial direction, when a 5 N load is applied in the vertical direction to the tip of the motor's shaft.

*3 Axial Play: Displacement in shaft position in the axial direction, when a 10 N load is applied to the motor's shaft in the axial direction.

*4 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.



Stepping Motors

Accessories

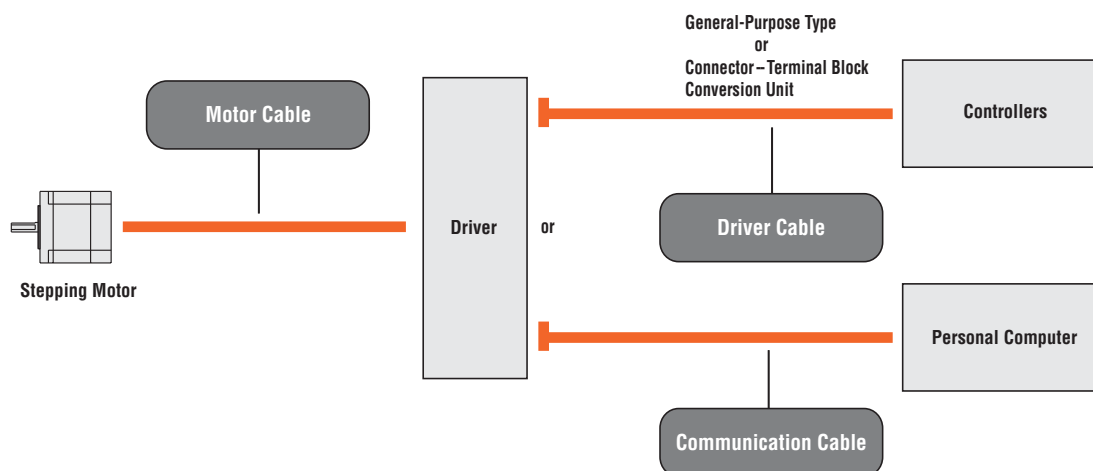
Accessories

	<u>Page</u>
Cables	C-252
Flexible Couplings	C-258
Clean Dampers	C-264
Motor Mounting Brackets	C-266
DIN Rail Mounting Plate	C-270

Cables

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

Type of Cables



Motor Cables

These cables are available to extend the distance between the motor and the driver for **αSTEP** and **RK** Series, or connect a high-torque type motor to a driver.

Cable Name	Page	Applicable Product
Extension Cables Extension Cables for Electromagnetic Brake Motor	C-253 [1]	αSTEP
Flexible Extension Cables Flexible Extension Cables for Electromagnetic Brake Motor	C-253 [2]	
Motor Cables for IP65 Rated Motor Flexible Motor Cables for IP65 Rated Motor	C-254 [3]	
Extension Cables	C-254 [4]	RK Series
Motor Cable	C-254 [5]	RK Series 2-Phase PK Series
Motor Lead Wire/Connector Assembly*	C-255 [6]	CRK Series CMK Series 2-Phase PK Series
Motor Connector Set*	C-255 [7]	CRK Series CMK Series 2-Phase PK Series

* Only for connector-coupled motors

Communication Cable

This cable is used to connect personal computer and the **αSTEP AS** Series built-in controller (stored program) package through an RS-232C connection.

Cable Name	Page	Applicable Product
Communication Cable	C-257 [4]	αSTEP AS Series Built-In Controller (Stored Program) Package

Driver Cables

Use these cables to connect the driver of the **αSTEP** or **RK** Series to a controller.

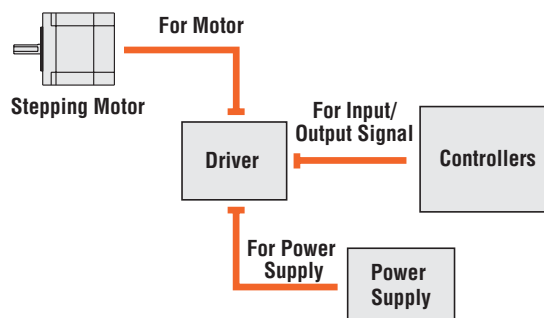
Choose the general-purpose type to be combined with a connector appropriate for the specific controller used, or the connector-terminal block conversion unit that permits connection between the driver and host controller using a terminal block.

Cable Name	Page	Applicable Product
Driver Cables General-Purpose Type	C-256 [1]	αSTEP RK Series
Connector-Terminal Block Conversion Unit	C-256 [2]	αSTEP RK Series

Lead wire set is available for connection between DC input driver and motor, controller, and power supply. As driver side of the cable is crimped with connector, easy connection is possible.

Cable Name	Page	Applicable Product
Driver Lead Wire Set	C-257 [3]	CRK Series CMK Series

The driver lead wire set includes three lead wire/connector assemblies (for motor, input/output signal and power supply).



Motor Cables

1 Extension Cables (RoHS) Extension Cables for Electromagnetic Brake Motor (RoHS) (For α STEP)



These cables are used to connect α STEP motors and drivers.

Product Line

Extension Cables

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

Extension Cables for Electromagnetic Brake Motor

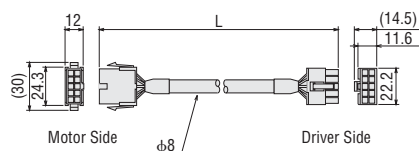
Model	Length L (m)
CC01AIPM	1
CC02AIPM	2
CC03AIPM	3
CC05AIPM	5
CC07AIPM	7
CC10AIPM	10
CC15AIPM	15
CC20AIPM	20

Notes:

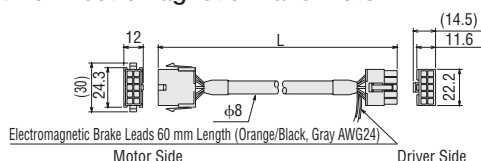
- Electromagnetic brake models must use an extension cable for an electromagnetic brake motor. But for electromagnetic brake motor with motor frame size $\square 42$ mm, use an extension cable for standard motor.
- ASC Series cannot use extension cables of 15 m and 20 m.

Dimensions (Unit = mm)

For Standard Motor



For Electromagnetic Brake Motor



2 Flexible Extension Cables (RoHS) Flexible Extension Cables for Electromagnetic Brake Motor (RoHS) (For α STEP)



These flexible extension cables are used between α STEP motors and drivers. We recommend this cable when the motor is installed on a moving section and the cable is bent and flexed.

Product Line

Flexible Extension Cables

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

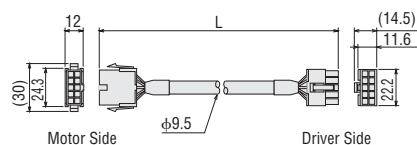
Model	Length L (m)
CC01SARM2	1
CC02SARM2	2
CC03SARM2	3
CC05SARM2	5
CC07SARM2	7
CC10SARM2	10

Note:

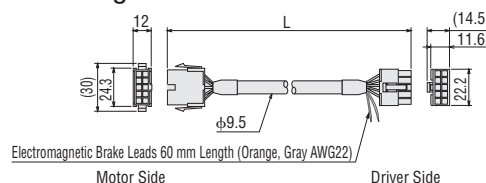
- For electromagnetic brake motor with motor frame size $\square 42$ mm, use a flexible extension cable for standard motor.

Dimensions (Unit = mm)

For Standard Motor

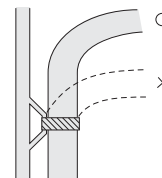
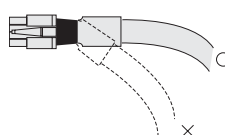


For Electromagnetic Brake Motor

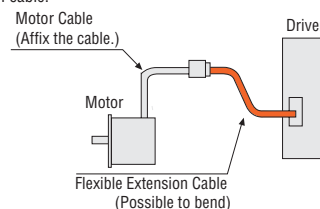


Notes on Use of a Flexible Extension Cable

- Do not allow the cable to bend at the cable connector.
- Keep the bending radius to 60 mm or more.



- The motor cable is not a flexible cable. If the motor cable is to be bent, bend it at the flexible extension cable.



3 Motor Cables for IP65 Rated Motor (RoHS) Flexible Motor Cables for IP65 Rated Motor (RoHS) (For α STEP)



These motor cables must be used for connection between the α STEP AS Series IP65 rated motor and the driver.

Any IP65 rated motor cannot be driven without these cables. One end of the cable connects to the metal connector on the motor, while the other end connects to the driver.

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

Product Line

Motor Cables for IP65 Rated Motor

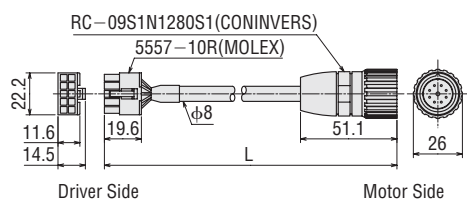
Model	Length L (m)
CC01AST	1
CC02AST	2
CC03AST	3
CC05AST	5
CC07AST	7
CC10AST	10
CC15AST	15
CC20AST	20

Flexible Motor Cables for IP65 Rated Motor

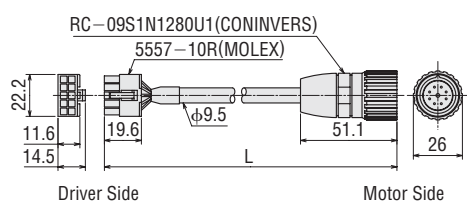
Model	Length L (m)
CC01SAR2	1
CC02SAR2	2
CC03SAR2	3
CC05SAR2	5
CC07SAR2	7
CC10SAR2	10

Dimensions (Unit = mm)

Motor Cables for IP65 Rated Motor



Flexible Motor Cables for IP65 Rated Motor



4 Extension Cables (RoHS) (For RK Series)



These extension cables are used between RK Series motors and dedicated drivers (except for electromagnetic brake type). They come in three lengths: 5 m, 10 m and 20 m.

Product Line

Model	Length (m)	Conductors
CC05PK5	5	5
CC10PK5	10	
CC20PK5	20	

- Conductor configuration: 5
- Conductor size: AWG22 (0.3 mm²)
- Finished outer diameter: φ7.2 mm
- Cable rating: 105°C
- Outer casing: Oil-resistant, heat-resistant, non-migrating vinyl

Note:

- These extension cables are only for the RK Series. Do not use them on other stepping motor and driver packages (such as CRK Series or CMK Series).

5 Motor Cable (RoHS) (For IP65 Rated Motor of RK Series and 2-Phase PK Series)

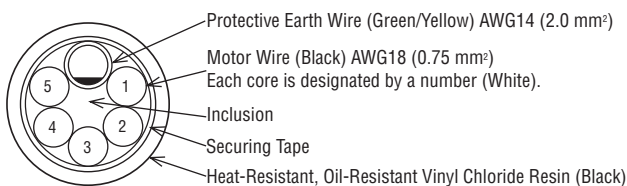


A cable for connection between the IP65 rated motor and driver (with protective earth wire)

Product Line

Model	Length (m)	Conductors
CC03PKT	3	6

- Conductor configuration: 6
- Conductor size: Motor wire AWG18 (0.75 mm²), protective earth wire AWG14 (2.0 mm²)
- Finished outer diameter: φ12 mm
- Cable rating: 105°C 600 V
- Outer casing: Heat-resistant, oil-resistant vinyl chloride resin
- Applicable standards: UL 758 (AWM) VW-1, UL Style 2586



6 Motor Lead Wire/Connector Assembly (RoHS)



These lead wires with connectors are available for connection with the connector-coupled motor, eliminating the need for assembling a connector. (A motor lead wire/connector assembly of 0.6 m is included with the connector-coupled motor packages.)

Product Line

Model	Applicable Product	Applicable Motor Model	Length (m)
LC5N06A	CRK513P□P	PK513P□	0.6
	CRK513P□P-H□	PK513P□-H□S	
	CRK52□P□P	PK52□P□	
LC5N10A	CRK52□PM□P	PK52□PM□	1
	CRK523P□P-T□	PK523P□-T□	
	CRK523P□P-N□	PK523P□-N□	
LC5N06B	CRK54□P□P	PK54□P□	0.6
LC5N10B	CRK54□PM□P	PK54□PM□	1
LC5N06C	CRK56□PM□P	PK56□PM□	0.6
LC5N10C			1
LC2U06A	CMK22□P□P	PK22□P□	0.6
LC2U10A	CMK223□P-SG□	PK223P□-SG□	1
LC2U06B	CMK23□P□P	PK23□P□	0.6
LC2U10B	CMK24□P□P	PK24□P□	1

- Enter the motor case length in the box (□) within the model name.
- Enter **A** (single shaft) or **B** (double shaft) in the box (□) within the model name.
- Enter the gear ratio in the box (□) within the model name.

7 Motor Connector Set (RoHS)



A set of connector housings and contacts for use with connector-coupled motors.

Each package contains enough housings and contacts for 30 motors.

This photograph shows **CS5N30B**.

Product Line

Model	Applicable Product	Applicable Motor Model
CS5N30A	CRK513P□P	PK513P□
	CRK513P□P-H□	PK513P□-H□S
	CRK52□P□P	PK52□P□
	CRK52□PM□P	PK52□PM□
	CRK523P□P-T□	PK523P□-T□
CS5N30B	CRK523P□P-N□	PK523P□-N□
	CRK54□P□P	PK54□P□
CS5N30C	CRK54□PM□P	PK54□PM□
CS2U30A	CRK56□PM□P	PK56□PM□
	CMK22□P□P	PK22□P□
CS2U30B	CMK223□P-SG□	PK223P□-SG□
	CMK23□P□P	PK23□P□
	CMK24□P□P	PK24□P□

- Enter the motor case length in the box (□) within the model name.
- Enter **A** (single shaft) or **B** (double shaft) in the box (□) within the model name.
- Enter the gear ratio in the box (□) within the model name.

Specifications

Model	Connector Housing	Contact	Applicable Crimp Tool	Manufacturer	Applicable Cable
CS5N30A	51065-0500	50212-8100	57176-5000	MOLEX	AWG30~24 (0.05~0.2 mm ²) Outer Sheath Diameter: ϕ 1.4 mm max. Strip Length: 1.3~1.8 mm
CS5N30B	51103-0500	50351-8100	57295-5000		AWG28~22 (0.08~0.3 mm ²) Outer Sheath Diameter: ϕ 1.15~1.8 mm Strip Length: 2.3~2.8 mm
CS5N30C	51144-0500	50539-8100	57189-5000		AWG24~18 (0.2~0.75 mm ²) Outer Sheath Diameter: ϕ 1.4~3 mm Strip Length: 3~3.5 mm
CS2U30A	51065-0600	50212-8100	57176-5000		AWG30~24 (0.05~0.2 mm ²) Outer Sheath Diameter: ϕ 1.4 mm max. Strip Length: 1.3~1.8 mm
CS2U30B	51103-0600	50351-8100	57295-5000		AWG28~22 (0.08~0.3 mm ²) Outer Sheath Diameter: ϕ 1.15~1.8 mm Strip Length: 2.3~2.8 mm

Note:

- The crimp tool is not provided with the package. It must be purchased separately.

Driver Cables

1 General-Purpose Type (RoHS)



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

Notes:

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

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- Install a connector that matches the controller you are using to the other end of the cable.

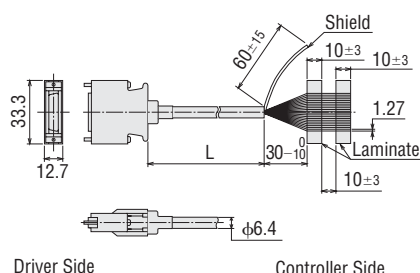
Product Line

Model	Length L (m)	Applicable Connector
CC20D1-1	1	AS Series Built-In Controller (Stored Program) Package CN5 (20 Pins), RK Series CN1 (20 Pins)
CC20D2-1	2	
CC36D1-1	1	AS Series Pulse Input Package CN4 (36 Pins), AS Series Built-In Controller (Stored Program) Package CN4 (36 Pins), ASC Series CN3 (36 Pins)
CC36D2-1	2	

Dimensions (Unit = mm)

CC20D1-1, CC20D2-1

Conductor: AWG28 (0.08 mm²)

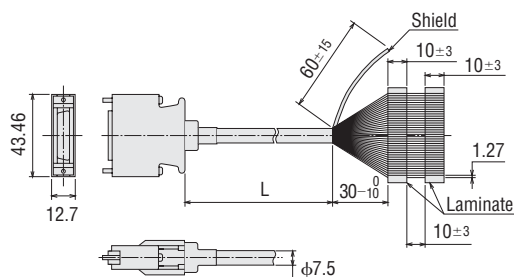


Driver Side

Controller Side

CC36D1-1, CC36D2-1

Conductor: AWG28 (0.08 mm²)



Driver Side

Controller Side

2 Connector – Terminal Block Conversion Unit (RoHS)

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



CC20T1



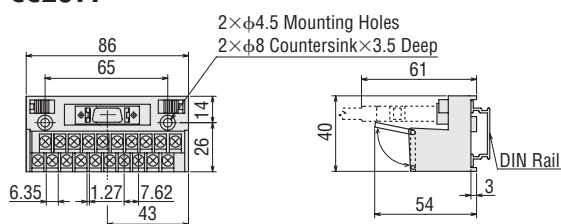
CC36T1

Product Line

Model	Length (m)	Applicable Connector
CC20T1	1	AS Series Built-In Controller (Stored Program) Package CN5 (20 Pins), RK Series CN1 (20 Pins)
CC36T1		AS Series Pulse Input Package CN4 (36 Pins), AS Series Built-In Controller (Stored Program) Package CN4 (36 Pins), ASC Series CN3 (36 Pins)

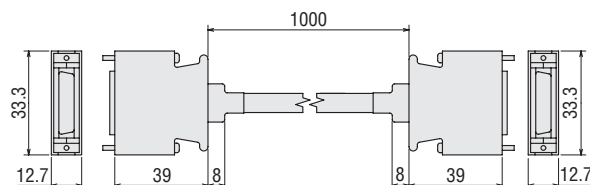
Dimensions (Unit = mm)

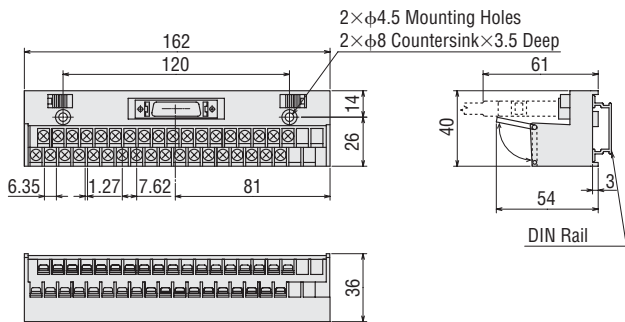
CC20T1



Terminal Block Pin No.

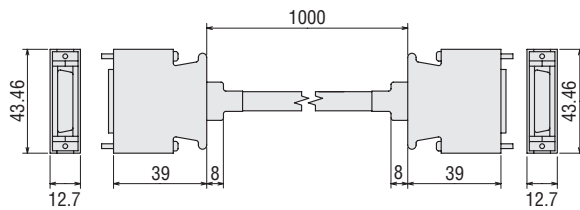
11	12	13	14	15	16	17	18	19	20
1	2	3	4	5	6	7	8	9	10



CC36T1

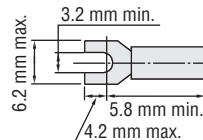
Terminal Block Pin No.

19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		



● Recommended Crimp Terminals

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

**3 Driver Lead Wire Set (RoHS)**

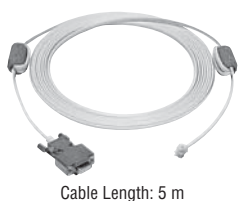
As an accessory for DC input drivers, lead wires with a connector are available. Crimping is not necessary, and the connection with the motor, power supply, input/output signal is also easy. The driver lead wire set includes three lead wire/connector assemblies (for motor, power supply and input/output signal).

Product Line

Model	Applicable Product	Applicable Driver	Length (m)
LCS04SD5	CRK Series	CRD5103P CRD5107P CRD5114P	0.6
LCS01CMK2	CMK Series	CMD2109P CMD2112P CMD2120P	

4 Communication Cable FC04W5 (RoHS)

This cable is used to connect personal computer and the **αSTEP AS** Series built-in controller (stored program) driver through an RS-232C connection.



Cable Length: 5 m

Flexible Couplings (RoHS)

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.



Product Line

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

● Enter the inner diameter of coupling in the box (□) within the model name.

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.

Technical reference → Page F-46

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

Product Number Code

MCS 30 08 12

① ② ③ ④

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

Coupling Selection Table



Model		Gear Ratio	Motor Shaft Diameter (mm)	Type	Driven Shaft Diameter (mm)												
AS	ASC				$\phi 4$	$\phi 5$	$\phi 6$	$\phi 6.35$	$\phi 8$	$\phi 10$	$\phi 12$	$\phi 14$	$\phi 15$	$\phi 16$	$\phi 18$	$\phi 20$	$\phi 25$
—	ASC34AK ASC36AK ASC46 □ K	—	$\phi 5$	MCS14	●	●	●										
—	ASC34AK-T □	7.2, 10, 20, 30	$\phi 6$	MCS20		●	●	●	●	●							
—	ASC46 □ K-T □	3.6, 7.2, 10	$\phi 8$			●	●	●	●	●							
—	ASC34AK-N □	5, 7.2, 10	$\phi 6$			●	●	●	●	●							
—	ASC46 □ K-T □	20, 30	$\phi 6$				●	●	●	●							
AS66 □ CE AS66ACT AS66 □ CEP AS66ACTP AS69 □ CE AS69ACT AS69 □ CEP AS69ACTP	ASC66 □ K	—	$\phi 8$	MCS30			●	●	●	●	●						
AS66 □ CE-T □ AS66 □ CEP-T □	ASC66 □ K-T □	3.6, 7.2	$\phi 10$				●	●	●	●	●						
—	ASC34AK-H □	50, 100	$\phi 14$							●	●	●		●			
—	ASC46 □ K-N □	7.2, 10	$\phi 14$				●	●	●	●	●						
AS98 □ CE AS98ACT AS98 □ CEP AS98ACTP AS911ACE AS911ACT AS911ACEP AS911ACTP	—	—	$\phi 8$	MCS40					●	●	●		●				
AS66 □ CE-T □ AS66 □ CEP-T □	ASC66 □ K-H □	10, 20, 30	$\phi 10$						●	●	●		●				
—	—	5, 7.2	$\phi 12$						●	●	●		●				
AS66 □ CE-P □	—	5, 7.2	$\phi 12$						●	●	●		●				
AS66 □ CE-N □ AS66 □ CEP-N □	ASC66 □ K-N □	5, 7.2	$\phi 12$	MCS55													
AS98 □ CE-T □ AS98 □ CEP-T □	—	3.6, 7.2, 10, 20, 30	$\phi 12$														
AS66 □ CE-P □	—	10, 25, 36, 50	$\phi 12$														
AS66 □ CE-N □ AS66 □ CEP-N □	ASC66 □ K-N □	10, 25, 36, 50	$\phi 12$								●	●	●	●			
AS66 □ CE-H □ AS66 □ CEP-H □	ASC66 □ K-H □	50, 100	$\phi 12$														

● 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.

Model		Gear Ratio	Motor Shaft Diameter (mm)	Type	Driven Shaft Diameter (mm)												
AS	ASC				φ4	φ5	φ6	φ6.35	φ8	φ10	φ12	φ14	φ15	φ16	φ18	φ20	φ25
AS98□CE-P■	—	5, 7.2, 10, 25, 36, 50	φ18	MCS65													
AS98□CE-N■ AS98□CEP-N■	—	5, 7.2, 10, 25, 36, 50												●	●	●	●
AS98□CE-H■ AS98□CEP-H■	—	50, 100															

● 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.

● 5-Phase Packages

Model		Gear Ratio	Motor Shaft Diameter (mm)	Type	Driven Shaft Diameter (mm)											
RK	CRK				φ4	φ5	φ6	φ6.35	φ8	φ10	φ12	φ14	φ15	φ16	φ18	φ20
—	CRK513P□P	—	φ4	MCS14	●	●	●									
—	CRK513P□P-H■	50, 100	φ5													
—	CRK523PM□P CRK524PM□P CRK525PM□P CRK544PM□P CRK546PM□P CRK523P□P CRK525P□P CRK544P□P CRK546P□P CRK543□P CRK544□P CRK545□P	—			●	●	●									
	CRK523P□P-T■	7.2, 10, 20, 30														
	CRK543□P-T3.6	3.6			●	●	●									
	CRK543□P-T■	7.2, 10				●	●	●	●							
	RK564□CE RK566□CE RK564ACT RK566ACT RK564AMCE RK566AMCE	CRK564□P CRK566□P	—	φ8		●	●	●	●							
		CRK523P□P-N■	5, 7.2, 10													
		CRK545□P-P5	5													
		—	CRK544□P-N■	5, 7.2	φ10			●	●	●	●					
—	CRK543□P-T■	20, 30	φ6			●	●	●	●							
RK569□CE RK569ACT RK569AMCE	CRK564PM□P CRK566PM□P CRK569□P	—	φ8	MCS30												
	RK564□CE-T■	CRK564□P-T■			3.6, 7.2			●	●	●	●	●				
	—	CRK543□P-P25			25											
—	CRK545□P-P■	7.2, 10														
—	CRK569PM□P	—	φ10				●	●	●	●	●					
—	CRK544□P-N10	10														
RK596□CE RK596ACT RK596AMCE	—	—	φ14					●	●	●		●				
—	CRK543□P-P■	36, 50	φ8	MCS40				●	●	●		●				
RK564□CE-T■	CRK564□P-T■	10, 20, 30							●	●	●		●			
—	CRK543□P-H■	50, 100			φ10					●	●	●		●		
RK566□CE-P■	CRK566□P-P■	5, 7.2	φ12						●	●	●		●			
RK566□CE-N■	CRK566□P-N■															
RK596□CE-T■	—	3.6, 7.2, 10, 20, 30	φ12	MCS55												
RK564□CE-P■	CRK564□P-P■	25, 36, 50									●	●	●	●		
RK566□CE-P10	CRK566□P-P10	10														
RK564□CE-N■	CRK564□P-N■	25, 36, 50														
RK566□CE-N10	CRK566□P-N10	10														
RK564□CE-H■	CRK564□P-H■	50, 100														
RK599□CE RK5913□CE RK599ACT RK5913ACT RK599AMCE RK5913AMCE	—	—	φ14							●	●	●	●			
RK599□CE-P5 RK599□CE-N5	—	5	φ18									●	●	●	●	
RK596□CE-P■	—	25, 36, 50	φ18	MCS65												
RK599□CE-P■		7.2, 10														
RK596□CE-N■		25, 36, 50										●	●	●	●	
RK599□CE-N■		7.2, 10														
RK596□CE-H■		50, 100														

● Enter **A** (single shaft) or **B** (double shaft) in the box (□) within the model name.
Enter the gear ratio in the box (■) within the model name.

● 5-Phase Stepping Motors

5-Phase Stepping Motors PK	Gear Ratio	Motor Shaft Diameter (mm)	Type	Driven Shaft Diameter (mm)									
				φ4	φ5	φ6	φ6.35	φ8	φ10	φ12	φ14	φ15	φ16
PK543-□, PK544-□, PK545-□	—	φ5	MCS14	●	●	●							
PK564-□E, PK566-□E	—	φ8	MCS20		●	●	●	●	●				
PK569-□E	—	φ8	MCS30			●	●	●	●	●			
PK596-□E	—	φ14							●	●	●		●
PK599-□E, PK5913-□E	—	φ14	MCS55							●	●	●	●

● Enter **A** (single shaft) or **B** (double shaft) in the box (□) within the model name.

● 2-Phase Packages, 2-Phase Stepping Motors

Model		2-Phase Stepping Motors PK	Gear Ratio	Motor Shaft Diameter (mm)	Type	Driven Shaft Diameter (mm)										
CMK	CSK					φ4	φ5	φ6	φ6.35	φ8	φ10	φ12	φ14	φ15	φ16	
CMK22□P□P CMK23□P□P CMK244P□P CMK24□M□P CMK24□□P	CSK24□-□T CSK24□M□T	PK22□P□ PK23□P□ PK24□-01□ PK24□-02□ PK24□-03□ PK24□M-01□ PK24□M-02□ PK24□M-03□	—	φ5	MCS14	●	●	●								
CMK223□P-SG■		—	PK223P□-SG■			7.2, 9, 10, 18, 36										
CMK243□P-SG■		—	—			3.6, 7.2, 9, 10, 18, 36, 50, 100										
—		CSK243□T-SG■	PK243□1-SG■			3.6, 7.2, 9, 10, 18, 36										
CMK246P□P	—	PK24□P□	—	φ5	MCS20		●	●	●	●						
CMK264M□P CMK266M□P CMK256□P CMK264□P CMK266□P	CSK264-□T CSK266-□T CSK264M□T CSK266M□T	PK256-02□ PK264-01□ PK264-02□ PK264-03□ PK264-E2.0□ PK266-01□ PK266-02□ PK266-03□ PK266-E2.0□ PK264M-01□ PK264M-02□ PK264M-03□ PK264M-E2.0□ PK266M-01□ PK266M-02□ PK266M-03□ PK266M-E2.0□ PK264DAT PK266DAT	—	φ6.35			●	●	●	●	●					
		—	—	PK264JD□ PK264J□		—	φ8		●	●	●	●	●			
		CMK264□P-SG■	CSK264□T-SG■	PK264□E-SG■		3.6, 7.2										
		CMK268M□P CMK258□P CMK268□P	CSK268-□T CSK268M□T	PK258-02□ PK268-01□ PK268-02□ PK268-03□ PK268-E2.0□ PK268M-01□ PK268M-02□ PK268M-03□ PK268M-E2.0□ PK268DAT	—	φ6.35	MCS30			●	●	●	●			
—	—			PK266JD□ PK266J□ PK267JD□ PK267J□	—	φ8										
CMK264□P-SG■	—			—	9, 10, 18, 36, 50, 100					●	●	●	●	●		
—	CSK264□T-SG■	PK264□E-SG■	9, 10, 18, 36		MCS40					●	●	●		●		
—	—	PK269JD□ PK269J□	—	φ8						●	●	●		●		
—	—	PK296□E-SG■	3.6, 7.2, 9	φ12						●	●	●		●		
—	—	PK296□E-SG■	10, 18, 36	φ12							●	●	●	●		
—	—	PK299-E4.5□ PK2913-E4.0□ PK299EAT PK2913EAT	—	φ14	MCS55							●	●	●	●	

● Enter **A** (single shaft) or **B** (double shaft) in the box (□) within the model name.

Enter the motor case length in the box (□) within the model name.

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

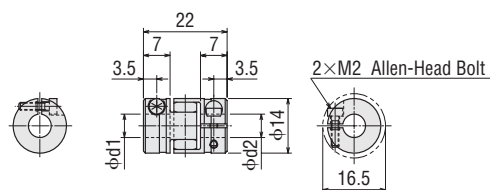
Specifications

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 mm	Length mm	Axis Hole Diameter d1 H7 mm	Axis Hole Diameter d2 H7 mm	Key Slot Tolerance b/t mm							
MCS140404 MCS140405 MCS140406 MCS140505 MCS140506 MCS140606	14	22	4 4 4 5 5 6	4 5 6 5 6 6	—	2.0	6.7	0.184×10 ⁻⁶	22.9	0.06	0.9	+0.6 0
MCS200505 MCS200506 MCS2005F04 MCS200508 MCS200606 MCS2006F04 MCS200608 MCS200610 MCS20F04F04 MCS20F0408 MCS20F0410 MCS200808 MCS200810 MCS201010	20	30	5 5 5 5 6 6 6 6 6.35 6.35 6.35 8 8 10	5 6 6.35 8 6 6.35 8 10 6.35 8 10 8 10 10	—	5.0	19.8	1.059×10 ⁻⁶	51.6	0.08	0.9	+0.8 0
MCS300606 MCS3006F04 MCS300608 MCS300610 MCS30F04F04 MCS30F0408 MCS30F0410 MCS300808 MCS300810 MCS300812 MCS301010 MCS301012 MCS301014 MCS301212 MCS301214 MCS301414 MCS301416	30	35	6 6 6 6 6.35 6.35 6.35 8 8 8 10 10 10 10 12 12 14 14	6 6.35 8 10 6.35 8 10 10 12 12 14 14 14 14 14 14 16	—	12.5	44.6	6.057×10 ⁻⁶	171.9	0.09	0.9	+1.0 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 10 12 15 12 12 15	φ8 b: 2±0.0125 t: 1 ^{+0.1} ₀ φ10 b: 3±0.0125 t: 1.4 ^{+0.1} ₀ φ12 b: 4±0.015 t: 1.8 ^{+0.1} ₀	17.0	139	42.29×10 ⁻⁶	859.5	0.06	0.9	+1.2 0
MCS551212 MCS551214 MCS551215 MCS551216 MCS551414 MCS551415 MCS551416 MCS551518 MCS551618 MCS551818 MCS551820	55	78	12 12 12 12 14 14 14 15 16 18 18 18	12 14 15 16 14 15 16 18 18 18 18 20	φ14 b: 5±0.015 t: 2.3 ^{+0.1} ₀ φ15 b: 5±0.015 t: 2.3 ^{+0.1} ₀ φ16 b: 5±0.015 t: 2.3 ^{+0.1} ₀ φ18 b: 6±0.015 t: 2.8 ^{+0.1} ₀ φ20 b: 6±0.015 t: 2.8 ^{+0.1} ₀	60.0	282	109.1×10 ⁻⁶	2063	0.10	0.9	+1.4 0
MCS651618 MCS651818 MCS651820 MCS651825	65	90	16 18 18 18	18 18 20 25	φ25 b: 8±0.018 t: 3.3 ^{+0.2} ₀	160.0	535	417.1×10 ⁻⁶	3438	0.11	0.9	+1.5 0

Dimensions (Unit = mm)

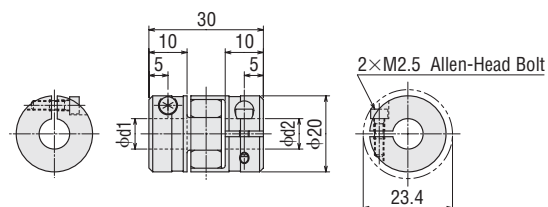
MCS14

Mass: 6.7 g



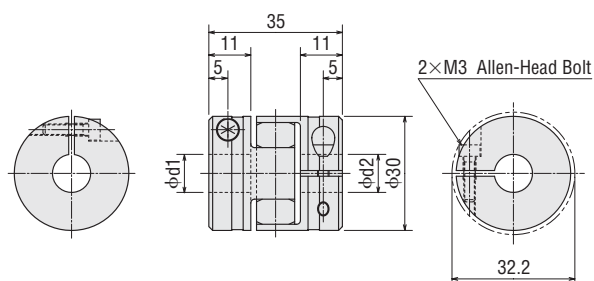
MCS20

Mass: 19.8 g



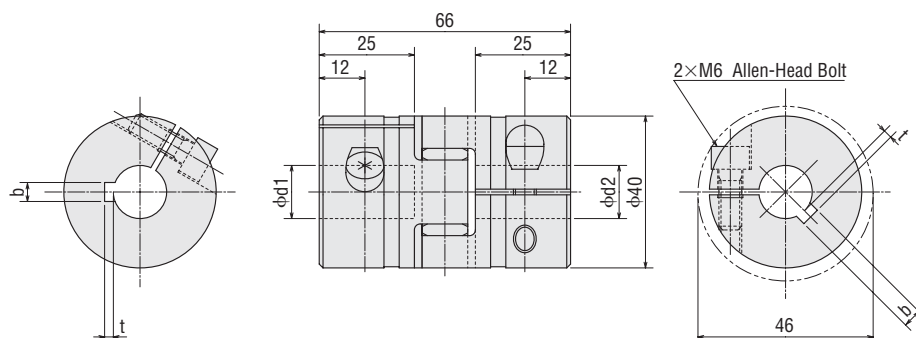
MCS30

Mass: 44.6 g



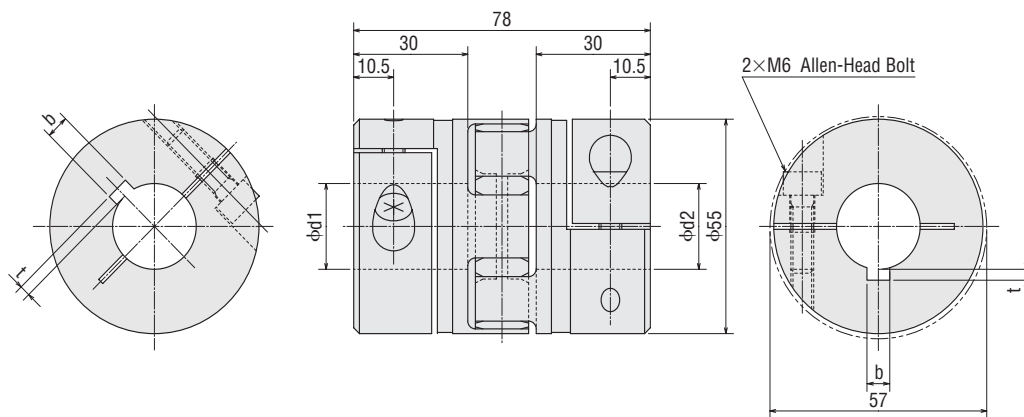
MCS40

Mass: 139 g

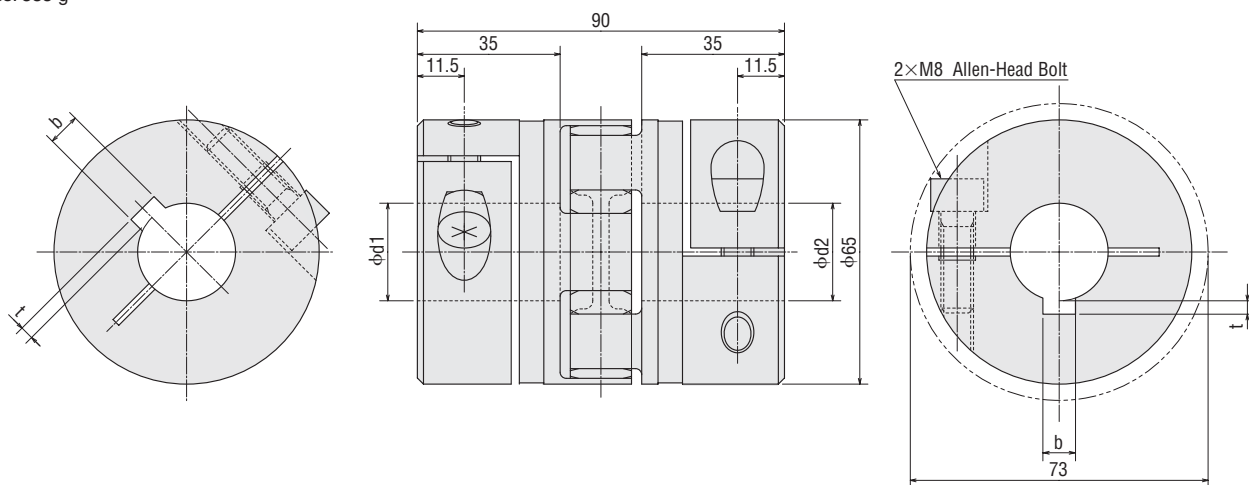


MCS55

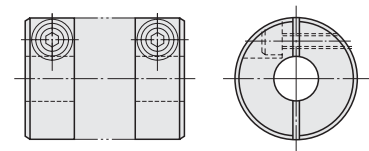
Mass: 282 g

**MCS65**

Mass: 535 g

**Mounting to a Shaft****Clamp Type**

Clamp couplings use the tightening 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.



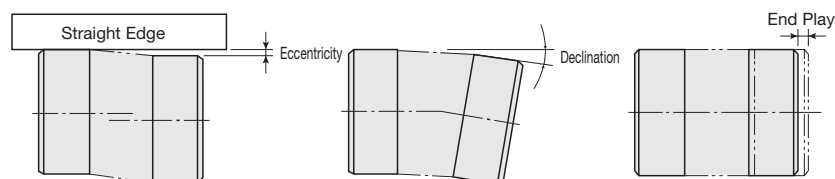
The following table shows the screw tightening torque. We recommend use of a torque wrench to fasten the coupling.

Type		MCS14	MCS20	MCS30	MCS40	MCS55	MCS65
Tightening Torque	N·m	0.37	0.76	1.34	10.5	10.5	25.0

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 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, apply an adhesive to the coupling set screw to prevent it from loosening.

Clean Dampers (RoHS)

Mechanical dampers suppress stepping motor vibration and improve high-speed performance. An inertia body and silicon gel are hermetically sealed in a plastic case.

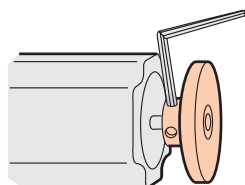
Features

- Excellent vibration absorption
The doughnut-shaped internal inertia body and silicon gel absorb vibration. This feature enables a stable damping effect.
- Since there is no frictional dust as in conventional magnetic dampers, it can be used in environments where higher degrees of cleanness is needed.
- High reliability
- It holds up well in harsh environments and changes little with age because the silicon gel and plastic case used are heat resistant.
- Machine part is sealed hermetically in a plastic case. This ensures safety and doesn't generate noise.
- This clean damper is an accessory for double shaft types. It can be used with various geared motors of double shaft type.

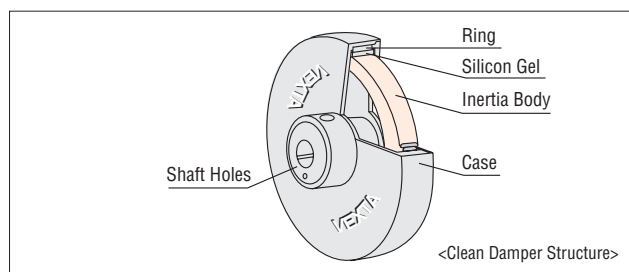
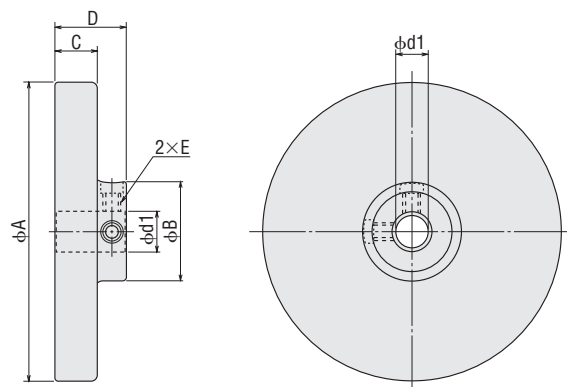
Product Line

Model
D4CL-5.0F
D6CL-6.3F
D6CL-8.0F
D9CL-14F

Installation of the Clean Damper



Dimensions (Unit = mm)



Point the mounting screws of the clean damper toward the motor case, fasten to the shaft and tighten the damper's mounting screws (two places) with an allen wrench to secure it to the shaft.

Model	D4CL-5.0F	D6CL-6.3F	D6CL-8.0F	D9CL-14F
Tightening Torque	N·m	0.4	1.5	

Notes:

- There are mounting screws with hexagonal holes in two damper locations, so tighten them both before running the motor.
- The damper rotates at the same speed as the motor shaft, so do not touch it while the motor is running.

Model	φd1	φA	φB	C	D	E
D4CL-5.0F	5 ^{+0.018} / ₀	φ36±0.5	φ13±0.5	9±0.3	15±0.5	M3
D6CL-6.3F	6.35 ^{+0.022} / ₀	φ44.5±0.5	φ20±0.5	15±0.3	22±0.5	M4
D6CL-8.0F	8 ^{+0.022} / ₀					
D9CL-14F	14 ^{+0.027} / ₀	φ79.5±0.5	φ26±0.5	11±0.3	19±0.5	M4

Clean Damper Selection Table

Model	Inertia kg·m ²	Mass g	Applicable Product		
			RK	5-Phase Stepping Motors	2-Phase Stepping Motors
D4CL-5.0F	34×10^{-7}	24	—	CRK52□PBP CRK52□PMBP CRK523PBP-T ■ CRK523PBP-N ■ CRK54□BP CRK54□PBP CRK54□PMBP CRK543BP-T ■ CRK54□BP-P ■ CRK544BP-N ■ CRK543BP-H ■ PK54□-B	CMK22□PBP CMK23□PBP CMK24□PBP CMK24□MBP CMK24□BP CMK223BP-SG ■ CMK243BP-SG ■ CSK243BT-SG ■ CSK24□-BT CSK24□MBT PK22□PB PK23□PB PK223PB-SG ■ PK243B1-SG ■ PK24□PB PK24□-01B PK24□-02B PK24□-03B PK24□M-01B PK24□M-02B PK24□M-03B
D6CL-6.3F	140×10^{-7}	62	—	—	CMK26□MBP CMK25□BP CMK26□BP CMK264BP-SG ■ CSK26□-BT CSK26□MBT CSK264BT-SG ■ PK25□-02B PK26□-01B PK26□-02B PK26□-03B PK26□-E2.0B PK26□M-01B PK26□M-02B PK26□M-03B PK26□M-E2.0B PK264BE-SG ■
D6CL-8.0F	140×10^{-7}	61	RK56□BCE RK564BCE-T ■ RK56□BCE-P ■ RK56□BCE-N ■ RK564BCE-H ■	CRK56□BP CRK56□PMBP CRK564BP-T ■ CRK56□BP-P ■ CRK56□BP-N ■ CRK564BP-H ■ PK56□-BE	PK26□JB PK26□JDB
D9CL-14F	870×10^{-7}	105	RK59□BCE RK596BCE-T ■ RK59□BCE-P ■ RK59□BCE-N ■ RK596BCE-H ■	PK59□-BE	PK29□-E4.5B PK2913-E4.0B PK296BE-SG ■

Ambient Temperature: -20 to +80°C

● Enter the motor case length in the box (□) within the model name.

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

Motor Mounting Brackets

RoHS

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



Product Line

Standard Type, High-Torque Type, High-Speed Type, High-Resolution Type

Material: Aluminum alloy

Model	Applicable Product				
	<i>αSTEP</i>	RK	CRK	5-Phase Stepping Motors	2-Phase Stepping Motors
PALOP	ASC46□K	—	CRK54□□P CRK54□P□P CRK54□PM□P	PK54□-□	CMK24□P□P CMK24□M□P CMK24□□P CSK24□-□T CSK24□M□T PK24□P□ PK24□-01□ PK24□-02□ PK24□-03□ PK24□M-01□ PK24□M-02□ PK24□M-03□
PAL2P-5	AS66□CE AS66ACT AS66□CEP AS66ACTP ASC66□K AS69□CE AS69ACT AS69□CEP AS69ACTP	RK56□□CE RK56□AMCE RK56□ACT	CRK56□□P CRK56□PM□P	PK56□-□E	—
PAL2P-2	—	—	—	—	CMK26□MP□ CMK26□□P CSK26□-□T CSK26□M□T PK26□J□ PK26□JD□ PK26□-01□ PK26□-02□ PK26□-03□ PK26□M-01□ PK26□M-02□ PK26□M-03□ PK26□DAT PK26□-E2.0□ PK26□M-E2.0□
PAL4P-5	AS98□CE AS98ACT AS98□CEP AS98ACTP AS911ACE AS911ACT AS911ACEP AS911ACTP	RK59□□CE RK59□AMCE RK59□ACT	—	PK59□-□E	—
PAL4P-2	—	—	—	—	PK29□EAT PK29□-E4.5□ PK2913-E4.0□

● Enter **A** (single shaft), **B** (double shaft) or **M** (electromagnetic brake) in the box (□) within the model name.

Enter the motor case length 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 alloy

Model	Applicable Product			
	α STEP	RK	CRK	2-Phase Stepping Motors
SOL0A	—	—	—	CMK243 □P-SG■ CSK243 □T-SG■ PK243 □1-SG■
SOL0B	ASC46 □K-T■	—	CRK543 □P-T■ CRK545 □P-P■ CRK543 □P-P■	—
SOL2A	AS66 □CE-T■ AS66 □CEP-T■ ASC66 □K-T■	RK564 □CE-T■	CRK564 □P-T■	CMK264 □P-SG■ CSK264 □T-SG■ PK264 □E-SG■
SOL2B	AS66 □CE-P■	RK566 □CE-P■ RK564 □CE-P■	CRK566 □P-P■ CRK564 □P-P■	—
SOL5A	—	—	—	PK296 □E-SG■
SOL5B	AS98 □CE-T■ AS98 □CEP-T■ AS98 □CE-P■	RK596 □CE-T■ RK599 □CE-P■ RK596 □CE-P■	—	—

● Enter **A** (single shaft), **B** (double shaft) or **M** (electromagnetic brake) in the box (□) within the model name.

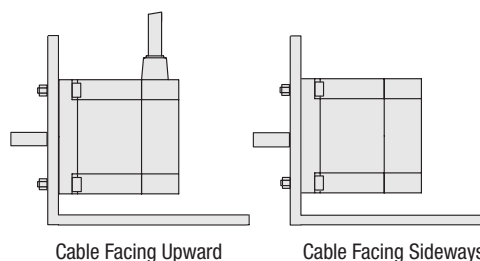
Enter the gear ratio in the box (■) within the model name.

● Install **SOL2A** and **SOL2B** using the supplied screws.

No screws are supplied for installing **SOL0A**, **SOL0B**, **SOL5A** and **SOL5B**. Appropriate screws must be purchased separately.

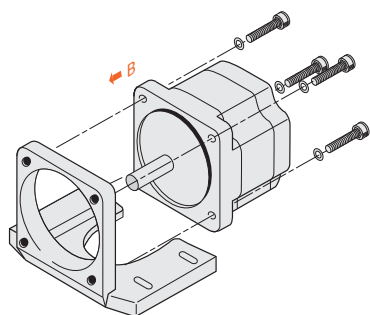
Motor Installation Direction

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



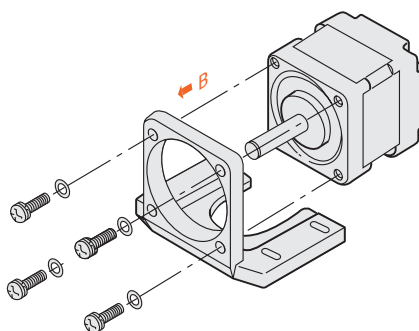
Mounting the Motor

① **PAL2P-5, PAL2P-2, PAL4P-5, PAL4P-2**



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

② **PAL0P, SOL0A, SOL0B, SOL2A, SOL2B, SOL5A, SOL5B**

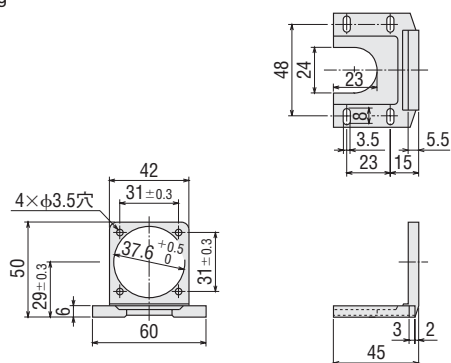


- ① Use the screws to secure the motor to the mounting bracket.
- ② Attach the motor from the direction shown by the arrow (B).

Dimensions (Unit = mm)

PALOP

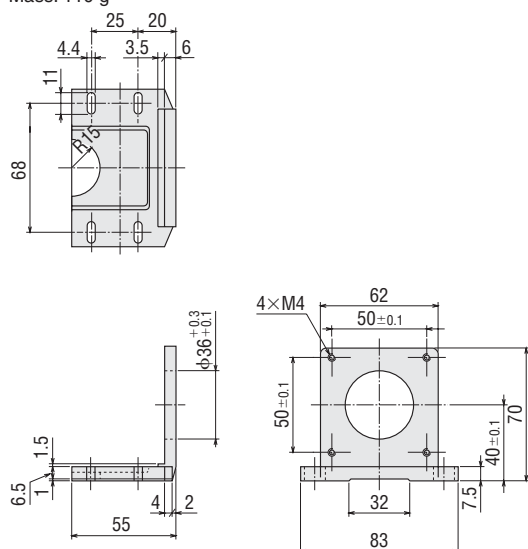
Mass: 35 g



- Screws (Included)
M3 Length 10 mm --- 4 Pieces

PAL2P-5

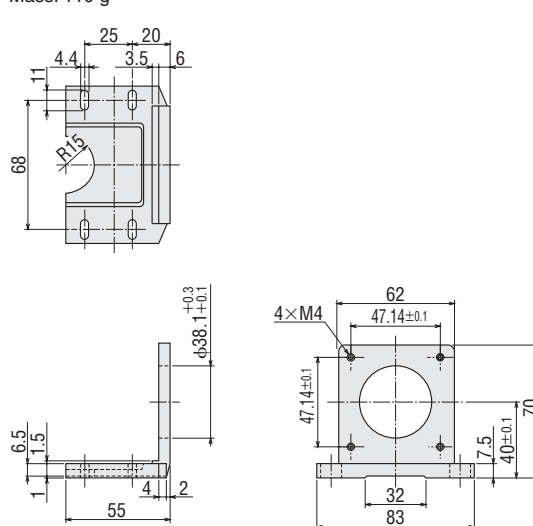
Mass: 110 g



- Screws (Included)
M4 Length 12 mm --- 4 Pieces

PAL2P-2

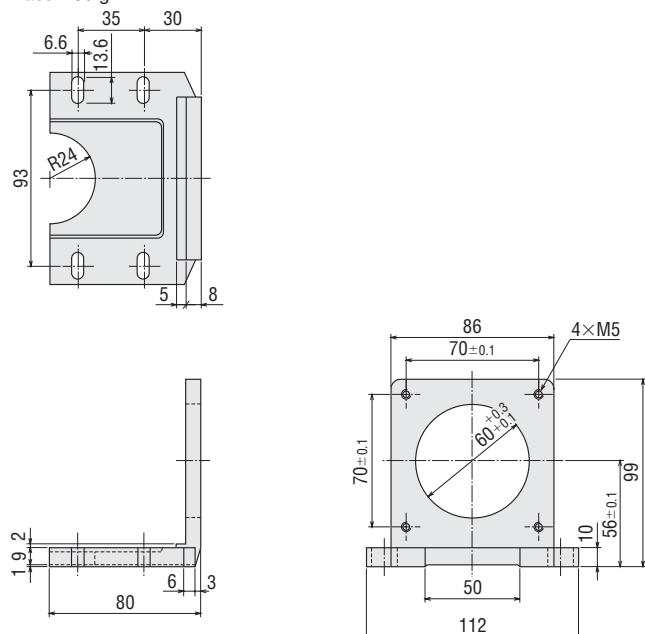
Mass: 110 g



- Screws (Included)
M4 Length 12 mm --- 4 Pieces

PAL4P-5

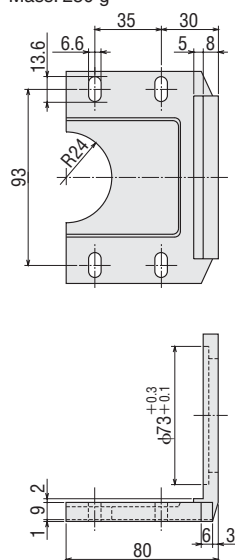
Mass: 250 g



- Screws (Included)
M5 Length 16 mm --- 4 Pieces

PAL4P-2

Mass: 250 g



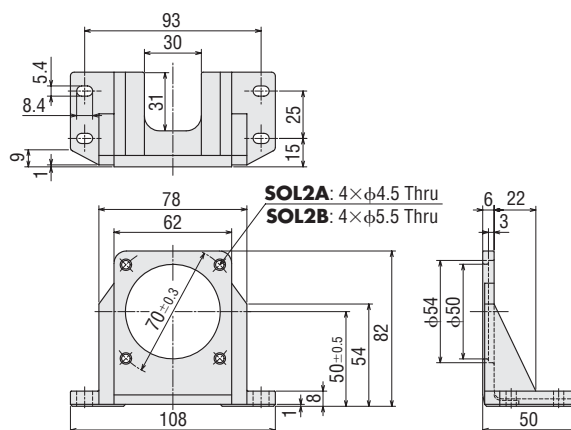
- Screws (Included)
M5 Length 16 mm ... 4 Pieces

SOL2A

Mass: 120 g

SOL2B

Mass: 120 g



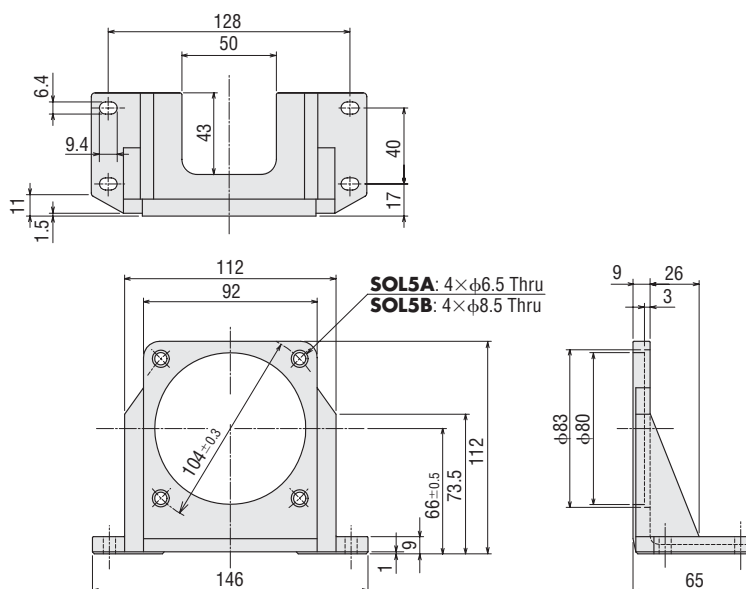
- Screws (Included)
 - M4 Length 12 mm ... 4 Pieces (**SOL2A**)
 - M5 Length 15 mm ... 4 Pieces (**SOL2B**)

SOL5A

Mass: 270 g

SOL5B

Mass: 270 g



DIN Rail Mounting Plate RoHS

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

Product Line

Model	Applicable Product
PADP01	AS Series driver

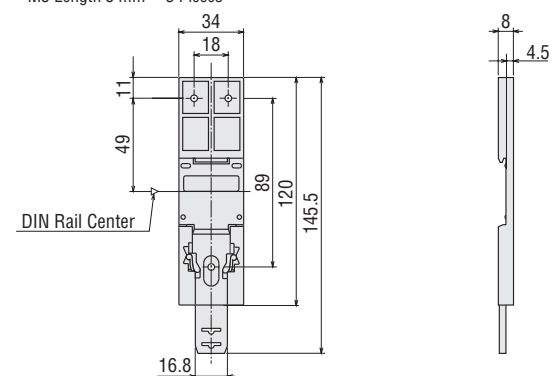
Dimensions (Unit = mm)

PADP01

Mass: 20 g

● Screws (Included)

M3 Length 8 mm ... 3 Pieces



DIN Rail Mounting Plate

