Accessories

■ MOUNTING BRACKETS

These mounting brackets are useful for maintaining proper alignment between the motor shaft and the load.

Material : Die cast aluminum

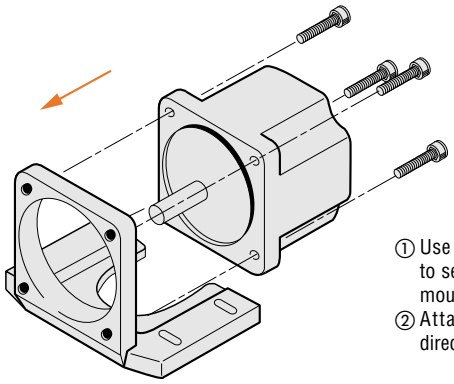
Mounting Bracket Models	Motor Models			
	αSTEP	5-Phase Stepping Motors	2-Phase Stepping Motors	Low-Speed Synchronous Motors
PAL0P	**ASC46AK**	**UPK54□W**	—	—
PAL0PA	—	**UPK54□, RFK54□ CSK54□**	**UMK24□, UMK24□M CSK24□, CSK24□M PK24□, PK24□M**	**SMK014K-AA**
PAL2P-5A	**AS66A□ ASC66AK**	**UPK56□W2, UPK56□JW UPK56□, UFK56□W RFK56□, CSK56□**	—	—
PAL2P-2	—	—	**UMK26□, UMK26□M CSK26□, CSK26□M PK26□, PK26□M**	**SMK237A-A**
PAL4P-5A	**AS98A□**	**UPK59□W, UPK59□JW UPK59□, UFK59□W CSK59□**	—	—
PAL4P-2	—	—	**UMK29□, PK29□**	**SMK5100A-AA SMK5160A-AA**

The mounting bracket base is built with holes large enough to allow for horizontal alignment adjustments. (Adjustable range: Approximately 0.24inch (6mm))

Note : These mounting brackets are for stepping motors and low-speed synchronous motors only. They cannot be used with compact AC motors or stepping motors with gearheads.

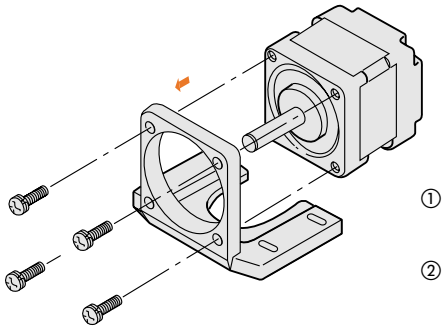
● Mounting

PAL2P-□, PAL4P-□



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

PAL0P, PAL0PA

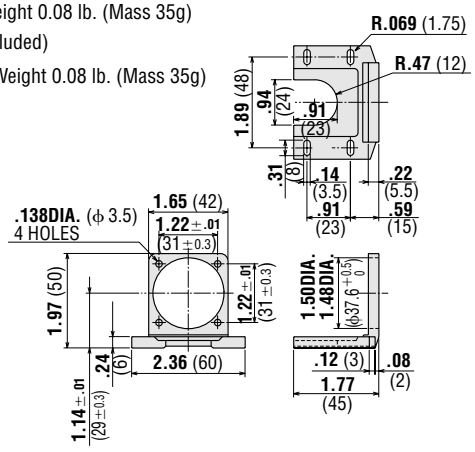


① Use the screws provided to secure the motor to the mounting bracket.
② Attach motor from the direction shown by arrow.

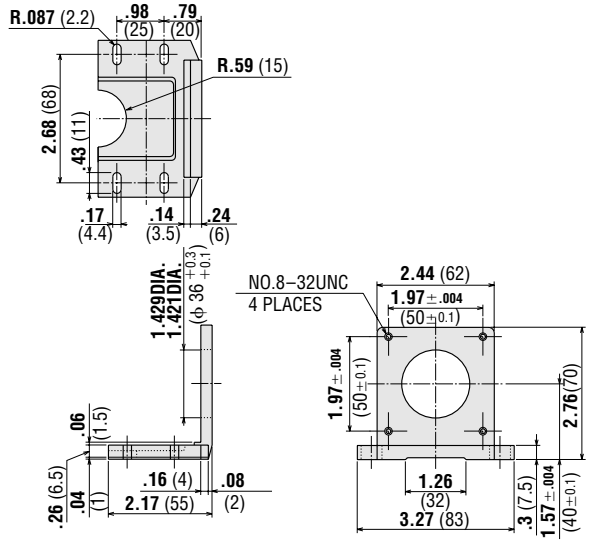
● Dimensions scale 1/4, unit = inch (mm)

PALOP Weight 0.08 lb. (Mass 35g)
(4 screws included)

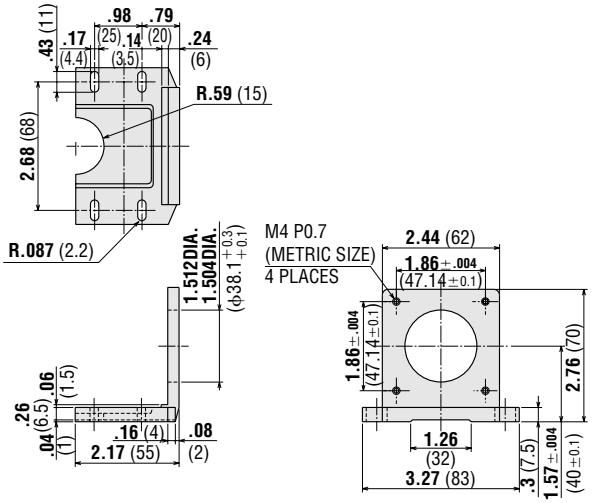
PALOPA Weight 0.08 lb. (Mass 35g)



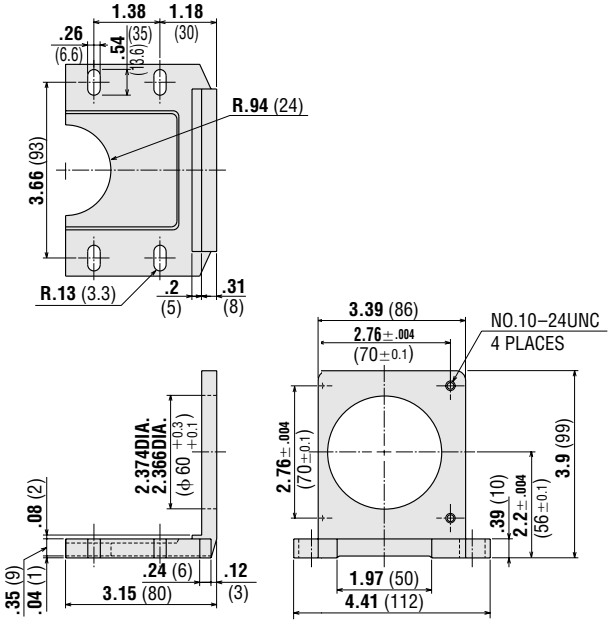
PAL2P-5A Weight 0.25 lb. (Mass 110g)
(4 screws included)



PAL2P-2 Weight 0.25 lb. (Mass 110g)
(4 screws included)

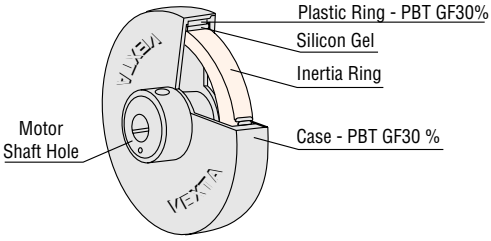


PAL4P-5A Weight 0.56 lb. (Mass 250g)
(4 screws included)



PAL4P-2 Weight 0.56 lb. (Mass 250g)
(4 screws included)

CLEAN DAMPERS



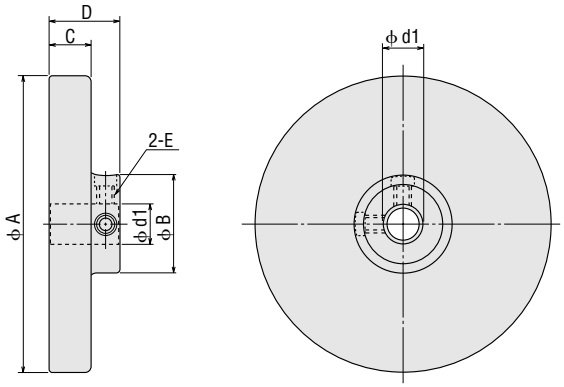
The clean damper, a viscous inertial damper is made of silicon gel encased in an airtight plastic package. Viscous inertia dampers are ideal for absorbing oscillation energy and shortening settling time.

Unlike magnetic dampers that produce dust particles from friction, the clean damper's gel creates a viscous resistance to absorb the oscillation energy. Because the magnetic dust is eliminated, the clean damper is perfect for clean environments.

The clean damper is constructed of a heat-resistant material [-4˚F ~ +176˚F (-20˚C~+80˚C)] allowing long-life operation in most environments.

Model	Inertia oz-in^2 (kg·m^2)	Weight (Mass) lb.	(g)	Compatible Motors (Double Shaft Type)
D4CL-5.0	0.22 (40×10^{-7})	0.07	30	**UPK54□M, UPK54□, PMU3□, RFK54□, CSK54□, PMC3□, UMK24□, UMK24□M, CSK24□, CSK24□M, PK24□, PK24□M UPK543W-T, PMU33-MG, CSK543-TG, PMC33-MG, CSK243-SG,PK243-SG**
D6CL-6.3	1.01 (185×10^{-7})	0.22	98	**UMK26□, UMK26□M, CSK26□, CSK26□M, PK26□, PK26□M CSK264-SG, PK264-SG**
D6CL-8.0	1.01 (185×10^{-7})	0.25	110	**UPK56□W2, UPK56□JW, UPK56□, RFK56□, CSK56□, PK56□ UPK564W-T, UPK564JW-T, UPK56□W-N, UPK56□JW-N, CSK564-TG**
D9CL-12.7	4.76 (870×10^{-7})	0.24	105	**UPK59□, CSK59□, UMK29□, PK29□, PK296-SG**
D9CL-14	4.76 (870×10^{-7})	0.24	105	**UPK59□W2, UPK59□JW2 UPK596W-T, UPK596JW-T**

Dimensions unit = inch (mm)



Model	d1	A	B	C	D	E
D4CL-5.0	$0.1969^{+.0007}_{0}$ ($5^{+0.018}_{0}$)	1.42DIA. ±.02 (ϕ36 ±0.5)	0.51DIA. ±.02 (ϕ13 ±0.5)	0.35 ±.01 (9 ±0.3)	0.59 ±.02 (15 ±0.5)	M3 2 Places
D6CL-6.3	$0.25^{+.0007}_{0}$ ($6.35^{+0.022}_{0}$)	1.75DIA. ±.02 (ϕ44.5 ±0.5)	0.79DIA. ±.02 (ϕ20 ±0.5)	0.59 ±.01 (15 ±0.3)	0.87 ±.02 (22 ±0.5)	M4 2 Places
D6CL-8.0	$0.315^{+.0009}_{0}$ ($8^{+0.022}_{0}$)					
D9CL-12.7	$0.5^{+.001}_{0}$ ($12.7^{+0.027}_{0}$)	3.13DIA. ±.02 (ϕ79.5 ±0.5)	1.02DIA. ±.02 (ϕ26 ±0.5)	0.43 ±.01 (11 ±0.3)	0.75 ±.02 (19 ±0.5)	M4 2 Places
D9CL-14	$0.5512^{+.001}_{0}$ ($14^{+0.027}_{0}$)					

Note:
The clean damper rotates at the same speed as the motor shaft.
Do not touch the damper while it rotates and keep objects a safe distance away.

FLEXIBLE COUPLINGS

● **MC** Motor Couplings

Selecting an MC Coupling

Once you have decided on a motor and the shaft diameter of the equipment to be connected, determine the proper flexible coupling to use. Oriental Motors flexible couplings are available in external diameter sizes that provide the strength required for the motor torque.
All motor shaft diameters of stepping motor units are available with the exception of geared models.
There are three broad categories for the shaft diameter on the equipment to be connected based on the motor shaft diameter (except for some clamp types).

Features

- No backlash.
- Plate springs formed of slits reliably absorb eccentricity, declination and end play.
- Torsional rigidity is high, responsiveness excellent.
- Characteristics are the same in forward and reverse.
- Maintenance free (excellent resistance to oil and chemicals).
- Aluminum alloy construction.
- Standardized shaft hole sizes even for motor shafts and connecting equipment shafts of different diameters.

Product Number Code

MC 25 F 04 F 04 C

- **MC** Couplings
- Outer Diameter of Coupling
- Shaft Hole Size Blank : Metric Size, **F**: Inch Size
- Inner Diameter
- Shaft Hole Size Blank : Metric Size, **F**: Inch Size
- Inner Diameter
- Connection Method **C**: Clamp Type

Examples **MC 25 08 F 04 C**

- Internal Diameter
- Internal Diameter

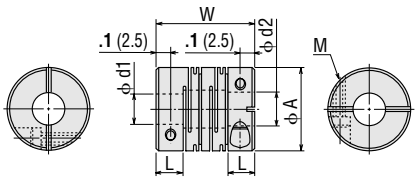
① When the motor is **UPK566AW2** [outer diameter of shaft: 0.315inch (8mm) and the shaft diameter of the equipment to be connected to the motor is 0.25inch (6.35mm)] use **MC2508F04C**.

②When the motor is **UPK5913AHA** [outer diameter of shaft: 0.5inch (12.7mm)] and the shaft diameter of the equipment to be connected to the motor is 0.5inch (12.7mm)] use **MC50F08F08C**.

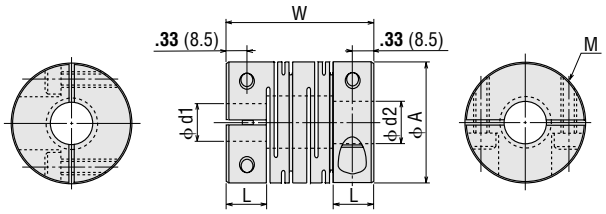
Type	Shaft Diameter inch (mm)	αSTEP	5-Phase Stepping Motors	2-Phase Stepping Motors	Low-Speed Synchronous Motor	Connecting Equipment Diameter inch (mm)					
						0.1875 (4.763)	0.25 (6.35)	0.3125 (7.938)	0.375 (9.525)	0.5 (12.7)	0.625 (15.875)
MC12	0.1968 DIA. (ϕ5)	—	**UPK543, RFK543, CSK543, PMU3□ UPK544, RFK544, CSK544, PMC3□**	**UMK243, CSK243, PK243 UMK243M, CSK243M, PK243M**	—	○					
MC16	0.1968 DIA. (ϕ5)	**AS46A□ ASC46AK**	**UPK545, RFK545, CSK545**	**UMK244, CSK244, PK244 UMK244M, CSK244M, PK244M**	**SMK014**		○				
MC20	0.1968 DIA. (ϕ5)	—	—	**UMK245, CSK245, PK245 UMK245M, CSK245M, PK245M**	—	○	○	○			
	0.315 DIA. (ϕ8)	—	**UPK564, UFK564, RFK564, CSK564**	—	—	○	○	○			
MC25	0.25 DIA. (ϕ6.35)	—	—	**UMK264, CSK264, PK264 UMK264M, CSK264M, PK264M UMK266, CSK266, PK266 UMK266M, CSK266M, PK266M**	**SMK237**		○	○	○		
	0.315 DIA. (ϕ8)	—	**UPK566, UFK566, RFK566, CSK566**	—	—		○	○	○		
MC32	0.25 DIA. (ϕ6.35)	—	—	**UMK268, CSK268, PK268 UMK268M, CSK268M, PK268M**	—		○	○	○		
	0.315 DIA. (ϕ8)	**AS66A□ ASC66AK**	**UPK569, UFK569, RFK569, CSK569**	—	—		○	○	○		
MC40	0.5 DIA. (ϕ12.7)	—	—	**UMK296, PK296 UMK299, PK299**	—				○	○	○
	0.5512 DIA. (ϕ14)	**AS98A□**	**UPK596, UFK596, CSK596 UPK599, UFK599, CSK599**	—	**SMK5100 SMK5160**				○	○	○
MC50	0.5 DIA. (ϕ12.7)	—	—	**UMK2913, PK2913**	—					○	○
	0.5512 DIA. (ϕ14)	—	**UPK5913, UFK5913, CSK5913**	—	—					○	○

Dimensions unit = inch (mm)

MC12-C, MC16-C, MC20-C, MC25-C,MC32-C



MC40-C, MC50-C



Specifications

Model	Dimensions						Rated Torque oz-in (N·m)	Weight (Mass) oz (g)	Inertia oz-in^2 (kg·m^2)	Static Torsion Spring Constant lb-in/rad (N·m/rad)	Permissible Eccentricity in (mm)	Permissible Declination degrees	Permissible End Play in (mm)
	Outer Diameter ϕA in (mm)	Length W in (mm)	Shaft Hole Diameter d1 in (mm)	Shaft Hole Diameter d2 in (mm)	L in (mm)	Screw Used M							
MC1205F03C	0.472 (12)	0.728 (18.5)	0.1882DIA. (ϕ4.781) 0.1875DIA. (ϕ4.763)	0.1976DIA. (ϕ5.018) 0.1969DIA. (ϕ5.000)	0.197 (5)	M2	27.8 (0.2)	0.16 (4.5)	0.005 (1×10^{-7})	277 (32)	0.0039 (0.1)	2	±0.012 (±0.3)
MC1605F03C	0.63 (16)	0.906 (23)	0.1882DIA. (ϕ4.781) 0.1875DIA. (ϕ4.763)	0.2509DIA. (ϕ6.372) 0.2500DIA. (ϕ6.350)	0.256 (6.5)	M2.5	41.7 (0.3)	0.32 (9)	0.022 (4×10^{-7})	390 (45)	0.0039 (0.1)	2	±0.016 (±0.4)
MC1605F04C			0.1976DIA. (ϕ5.018) 0.1969DIA. (ϕ5.000)										
MC2005F03C **MC2005F04C** **MC2005F05C**	0.787 (20)	1.02 (26)	0.1882DIA. (ϕ4.781) 0.1875DIA. (ϕ4.763)	0.1976DIA. (ϕ5.018) 0.1969DIA. (ϕ5.000) 0.2509DIA. (ϕ6.372) 0.2500DIA. (ϕ6.350)	0.295 (7.5)	M2.5	69.4 (0.5)	0.63 (18)	0.06 (11×10^{-7})	737 (85)	0.0039 (0.1)	2	±0.016 (±0.4)
MC2008F04C **MC2008F05C**			0.3134DIA. (ϕ7.960) 0.3125DIA. (ϕ7.938)	0.3158DIA. (ϕ8.022) 0.3150DIA. (ϕ8.000)									
MC25F04F04C **MC25F04F05C** **MC25F04F06C** **MC2508F04C** **MC2508F05C** **MC2508F06C**	0.984 (25)	1.22 (31)	0.2509DIA. (ϕ6.372) 0.2500DIA. (ϕ6.350)	0.2509DIA. (ϕ6.372) 0.2500DIA. (ϕ6.350) 0.3134DIA. (ϕ7.960) 0.3125DIA. (ϕ7.938)	0.335 (8.5)	M3	138 (1)	1.16 (33)	0.175 (32×10^{-7})	1996 (230)	0.0059 (0.15)	2	±0.016 (±0.4)
			0.3158DIA. (ϕ8.022) 0.3150DIA. (ϕ8.000)	0.3759DIA. (ϕ9.547) 0.3750DIA. (ϕ9.525)									
MC32F04F04C **MC32F04F05C** **MC32F04F06C** **MC3208F04C** **MC3208F05C** **MC3208F06C**	1.26 (32)	1.61 (41)	0.2509DIA. (ϕ6.372) 0.2500DIA. (ϕ6.350)	0.2509DIA. (ϕ6.372) 0.2500DIA. (ϕ6.350) 0.3134DIA. (ϕ7.960) 0.3125DIA. (ϕ7.938)	0.472 (12)	M4	277 (2)	2.65 (75)	0.656 (120×10^{-7})	3124 (360)	0.0059 (0.15)	2	±0.02 (±0.5)
			0.3158DIA. (ϕ8.022) 0.3150DIA. (ϕ8.000)	0.3759DIA. (ϕ9.547) 0.3750DIA. (ϕ9.525)									
MC40F08F06C **MC40F08F08C** **MC40F08F10C** **MC4014F06C** **MC4014F08C** **MC4014F10C**	1.57 (40)	2.2 (56)	0.5011DIA. (ϕ12.727) 0.5000DIA. (ϕ12.700)	0.3759DIA. (ϕ9.547) 0.3750DIA. (ϕ9.525) 0.5011DIA. (ϕ12.727) 0.5000DIA. (ϕ12.700)	0.614 (15.59)	M5	694 (5)	6 (170)	2.187 (400×10^{-7})	6596 (760)	0.0079 (0.2)	2	±0.02 (±0.5)
			0.5522DIA. (ϕ14.027) 0.5512DIA. (ϕ14.000)	0.6261DIA. (ϕ15.902) 0.6250DIA. (ϕ15.875)									
MC50F08F08C **MC50F08F10C** **MC5014F08C** **MC5014F10C**	1.97 (50)	2.8 (71)	0.5011DIA. (ϕ12.727) 0.5000DIA. (ϕ12.700)	0.5011DIA. (ϕ12.727) 0.5000DIA. (ϕ12.700)	0.709 (18)	M6	1388 (10)	11.3 (320)	6.56 (1200×10^{-7})	26038 (3000)	0.0079 (0.2)	2	±0.02 (±0.5)
			0.5522DIA. (ϕ14.027) 0.5512DIA. (ϕ14.000)	0.6261DIA. (ϕ15.902) 0.6250DIA. (ϕ15.875)									

FLEXIBLE COUPLINGS

● **MCL** Geared Motor Couplings

Selecting an MCL Coupling

Once you have decided on a motor and the shaft diameter of the equipment to be connected to it, determine the proper flexible coupling to use. Oriental Motors flexible couplings are available external diameter in sizes that provide the strength required for the motor torque.

These flexible couplings are clamp types and connect geared stepping motors to other shafts. Select the coupling to match the motor.

Features

- Couplings come with shaft holes and have standardized combinations of different diameter shaft holes.
- Characteristics are the same for clockwise and counterclockwise rotation.
- Oil-resistant and electrically insulated couplings are available.
- Aluminum alloy construction.
- The shaft being driven is not damaged, since shafts are joined by clamping.
- Easy installation due to separating hub and sleeve design.

Product Number Code

MCL 40 F 06 F 08

- 08 — Inner Diameter d2
- F — F: Inch Size
- 06 — Inner Diameter d1
- F — Shaft Hole Size: Blank : Metric Size, F: Inch Size
- 40 — Outer Diameter of Coupling
- MCL — **MCL** Couplings

Examples **MCL 30 F 05 F 06**

- 05 — Internal Diameter d1
- 06 — Internal Diameter d2

When the motor is **CSK264ATA-SG3.6** [outer diameter of shaft: 0.3125 inch (7.938mm)] and the axis diameter of the equipment to be connected to the motor is 0.375inch (9.525mm), use **MCL30F05F06**.

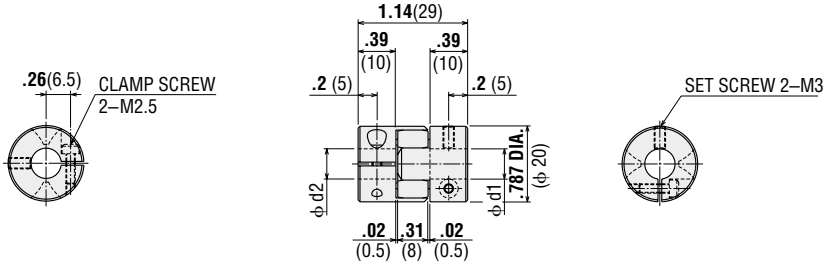
Type	Shaft Diameter inch (mm)	5-Phase Stepping Motors	2-Phase Stepping Motors	Low-Speed Synchronous Motor	Connecting Equipment Diameter inch (mm)					
					0.1875 (4.763)	0.25 (6.35)	0.3125 (7.938)	0.375 (9.525)	0.5 (12.7)	0.625 (15.875)
MCL20	0.1968 DIA. (ϕ5)	**PMU33-MG□** **PMC33-MG□**	**CSK243-SG□** **PK243-SG□**	—	○	○	○			
MCL30	0.25 DIA. (ϕ6.35)	—	—	**SMK216-GN / 2GN□KA**			○			
	0.3125 DIA. (ϕ7.938)	—	**CSK264-SG□** **PK264-SG□**	—				○	○	
MCL40	0.5 DIA. (ϕ12.7)	—	**PK296-SG□**	**SMK550-GN / 5GN□KA**				○	○	○

Specifications

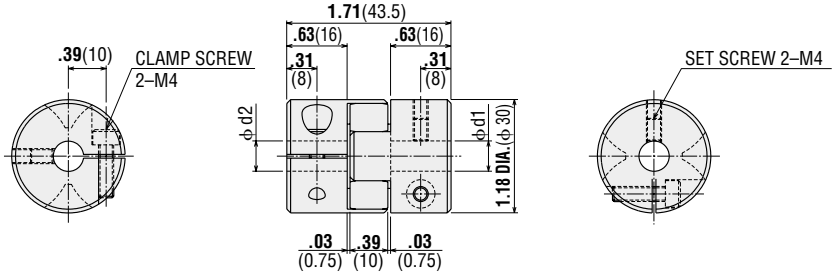
Model	Dimensions				Normal Torque	Weight (Mass)	Inertia	Permissible Eccentricity	Permissible Declination	Permissible End Play
	Outer Diameter inch (mm)	Length inch (mm)	Axis Hole Diameter d1 inch (mm)	Axis Hole Diameter d2 inch (mm)	lb-in (N·m)	lb. (g)	oz-in^2 (kgm^2)	inch (mm)	degrees	inch (mm)
MCL2005F03	0.787 (20)	1.14 (29)	0.197 (5)	0.188 (4.763)	43.4 (5.0)	0.04 (19)	0.005 (1.0×10^{-6})	0.006 (0.15)	1°	$+0.032\ 0$ $\left(\begin{smallmatrix}+0.8\\0\end{smallmatrix}\right)$
MCL2005F04			0.197 (5)	0.25 (6.35)						
MCL2005F05			0.197 (5)	0.3125 (7.938)						
MCL30F04F05	1.18 (30)	1.71 (43.5)	0.25 (6.35)	0.3125 (7.938)	108 (12.5)	0.15 (66)	0.045 (8.3×10^{-6})	0.008 (0.2)	1°	$+0.039\ 0$ $\left(\begin{smallmatrix}+1.0\\0\end{smallmatrix}\right)$
MCL30F05F05			0.3125 (7.938)	0.3125 (7.938)						
MCL30F05F06			0.3125 (7.938)	0.375 (9.525)						
MCL40F06F08	1.57 (40)	2.52 (64)	0.375 (9.525)	0.5 (12.7)	217 (25.0)	0.33 (150)	0.02 (3.6×10^{-5})	0.008 (0.2)	1°	$+0.047\ 0$ $\left(\begin{smallmatrix}+1.2\\0\end{smallmatrix}\right)$
MCL40F08F08			0.5 (12.7)	0.5 (12.7)						
MCL40F08F10			0.5 (12.7)	0.625 (15.875)						

Dimensions scale 1/2, unit = inch (mm)

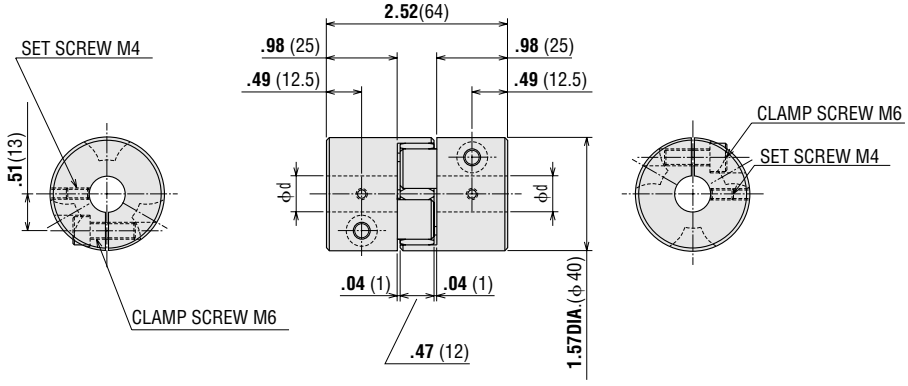
MCL20



MCL30

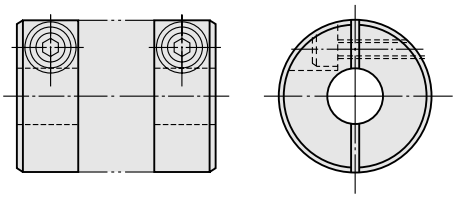


MCL40



■ Mounting to a Shaft

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.

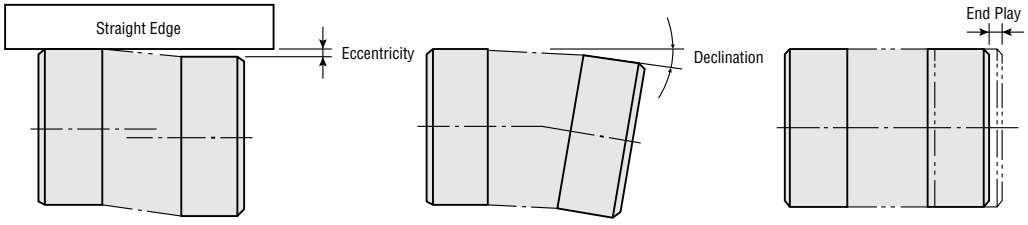


		MC12-C	MC16-C MC20-C MCL20	MC25-C	MC32-C MCL30	MC40-C	MC50-C	MCL40
Tightening Torque	oz-in (N•m)	69.4 (0.5)	138 (1)	208 (1.5)	347 (2.5)	555 (4)	1110 (8)	1666 (12)

■ 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.



Note :

- 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 with an adhesive to prevent the coupling screw from loosening or substitute a coupling one size larger.

■ EXTENSION CABLES

●Extension Cable for Stepping Motor

These extension cables are used between **UPK・W** , **UPK** and **UFK・W** series motors and dedicated drivers. They come in three lengths: 16.4 feet (5 m), 32.8 feet (10 m), and 65.6 feet (20 m).

Model	Length feet (m)	Conductors
CC05PK5	16.4 (5)	5
CC10PK5	32.8 (10)	
CC20PK5	65.6 (20)	

- Conductor size: AWG22
- Finished outer diameter: 0.28 inch DIA. (ϕ 7.2mm)
- Cable rating: 221˚F (105°C)
- Outer casing: oil-resistant, heat-resistant, non-migrating vinyl

Note:
These extension cables are only for the **UPK・W** , **UPK** and **UFK・W** series. Do not use them on other stepping motor units.

●Extension Cable for α_{STEP}

These are the dedicated α_{STEP} extension cables. In addition to the standard extension cable, there is also a cable that can withstand repeated movement.
Six lengths are available for each type.

- **Extension Cable**

This extension cable is convenient when using the α_{STEP} stepping motor and driver more than 1.31 feet (0.4 m) apart from each other.

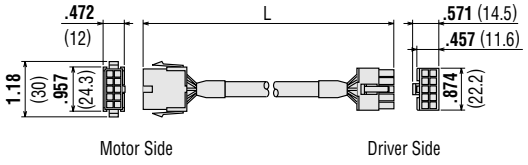
- **Movable Cable**

This extension cable has a measured value for refraction resistance about 40 times that for ordinary extension cables. We recommend this cable when the motor is installed on a moving section and the cable is repeatedly bent and extended.

Extension Cable Model Name	Movable Cable Model Name	Length feet (m)
CC01AIP	**CC01SAR**	3.28 (1)
CC02AIP	**CC02SAR**	6.56 (2)
CC03AIP	**CC03SAR**	9.84 (3)
CC05AIP	**CC05SAR**	16.4 (5)
CC07AIP	**CC07SAR**	23 (7)
CC10AIP	**CC10SAR**	32.8 (10)

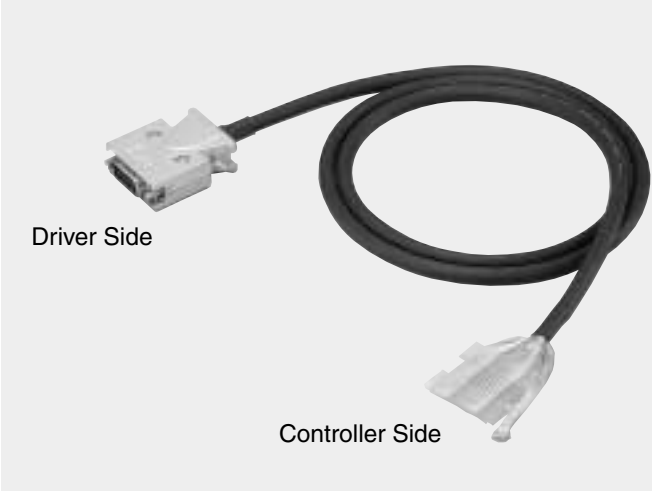
- **Dimensions** scale 1/4, unit = inch (mm)

Common to extension cable and movable cable.



DRIVER CABLES

● Driver Cable for **UPK·W** and **UFK·W** series



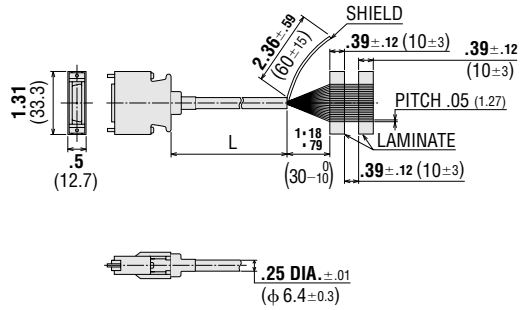
● Driver Cable for α_{STEP}

This cable is convenient for connecting **UPK · W, UFK · W** series and α_{STEP} drivers to controllers. One end of the cable is a half-pitch connector that snaps into the driver.
Install a connector that matches the controller you are using to the other end of the cable.

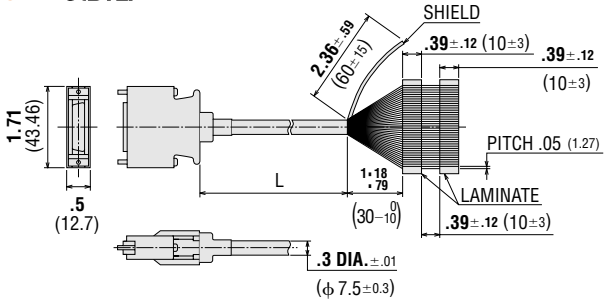
Model	Length L feet (m)	Applicable Unit Model
CC20D1-1	3.28 (1)	**UPK · W , UFK · W**
CC20D2-1	6.56 (2)	
CC36D1-1	3.28 (1)	α_{STEP}
CC36D2-1	6.56 (2)	

Dimensions scale 1/4, unit = inch (mm)

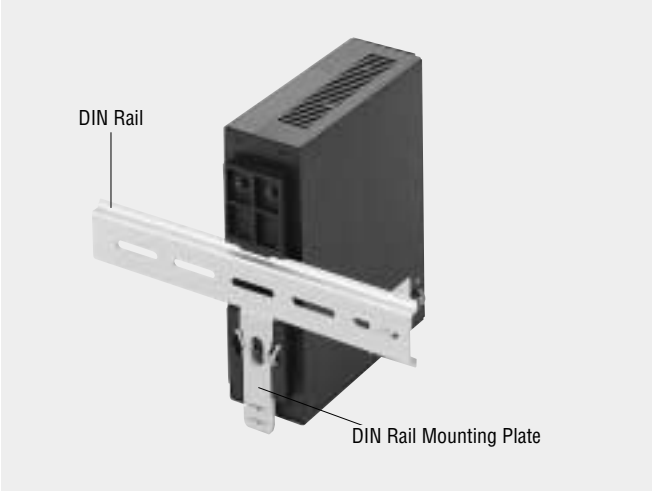
● For **UPK · W , UFK · W** series



● For α_{STEP}



DIN RAIL MOUNTING PLATE



This installation plate is convenient for installing the α_{STEP} **AS** series driver on DIN rails with ease.
The required installation screws come with this installation plate.

Model : **PADP01**

Dimensions scale 1/4, unit = inch (mm)