Micro Clamp Cylinder

CKZM16-*X2800* (Base Type)
-*X2900* (Tandem Type)

RoHS

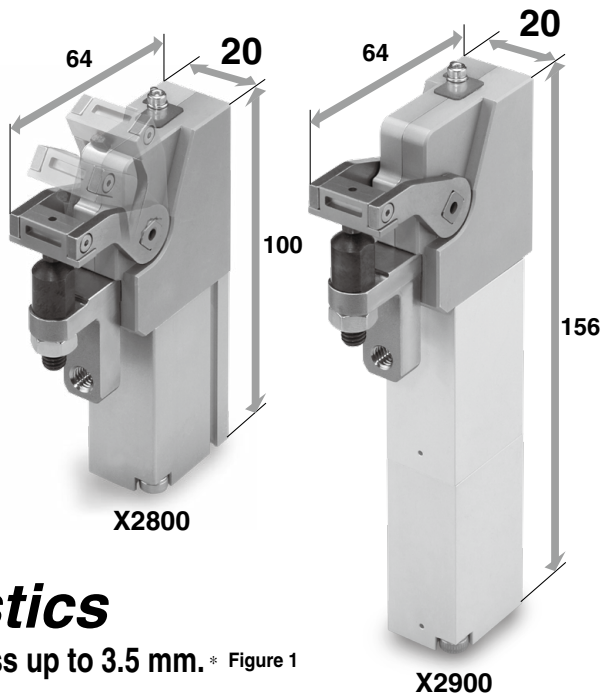
Lightweight | **Compact** | **High clamping force** | **High holding force**

Lightweight Weight : **250 g** (Base type)

Compact Width : **20 mm**
(Base type, Tandem type)

Max. clamping force : 200 N
(Tandem type)
∗ Operating pressure: 0.6 MPa

Max. holding force : 300 N ∗ Figure 2
(Base type, Tandem type)
∗ When operating pressure of 0.2 to 0.6 MPa is applied

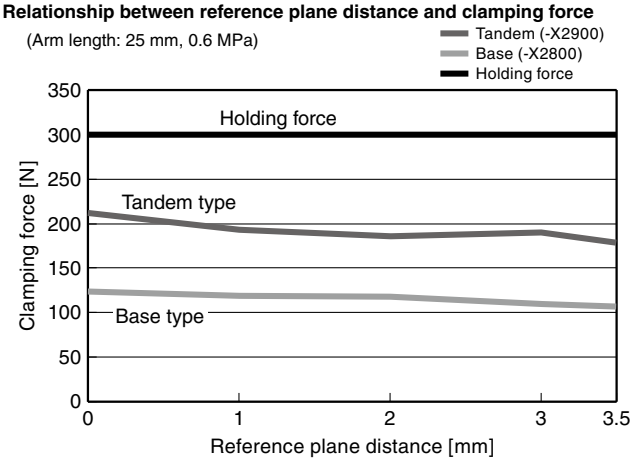


Flat clamping characteristics

Outputs constant clamping force for workpiece thickness up to 3.5 mm. ∗ Figure 1

· Easy adjustment of clamping position during assembly
· When thickness of workpiece differs, adjustment is not required if within range.

Relationship between reference plane distance and clamping force
(Arm length: 25 mm, 0.6 MPa)



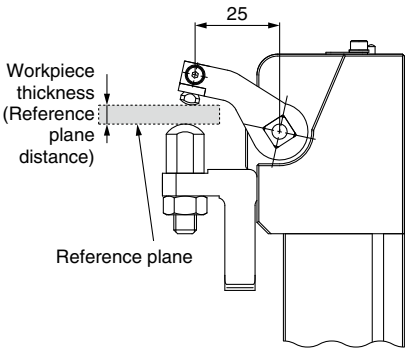
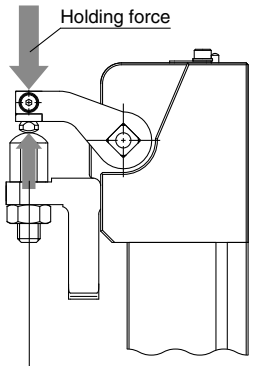


Figure 1

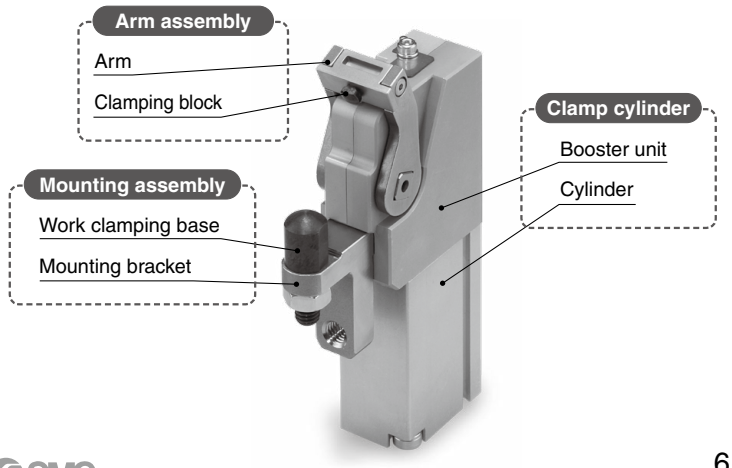


External force in unclamping direction
(Welding reaction force, inertial force during transfer, etc.)

Figure 2

Reduction of design assembly labor by unitization

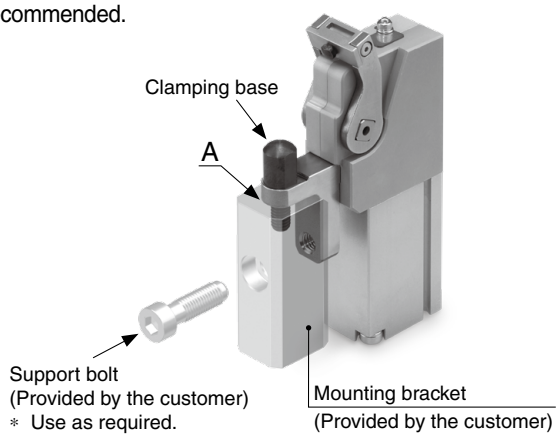
Arm assembly | **Mounting assembly**
added to clamp cylinder



Easy mounting *2 types of mounting possible*

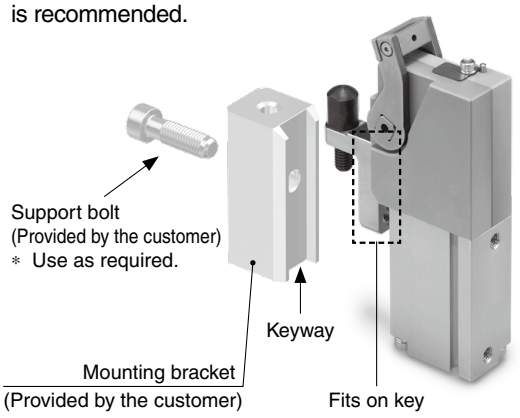
● Basic mounting

Press the mounting bracket against surface A, and fix it with the work clamping base. Using a bolt to support the mounting bracket is recommended.



● Non-rotating mounting

The work clamping base can be used as a parallel key to prevent rotation. Using a bolt to support the mounting bracket is recommended.



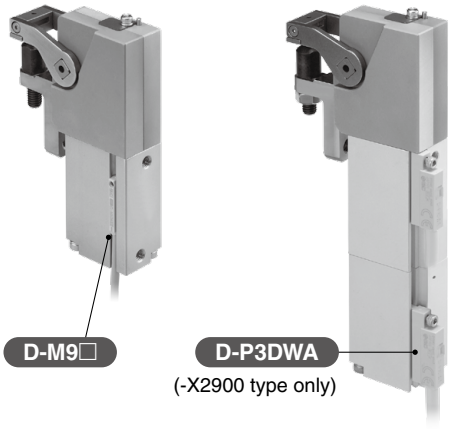
Dust-resistant construction

Fully closed structure prevents dust from entering easily.

Auto switch mountable

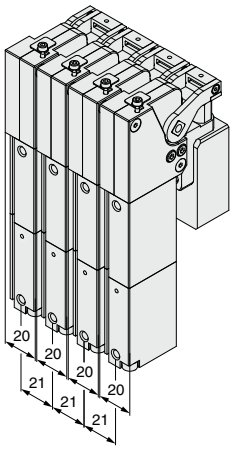
Magnetic field-resistant auto switch **D-P3DWA□**

Compact auto switch **D-M9□** **D-A9□**



Short pitch (21 mm) mounting is possible.

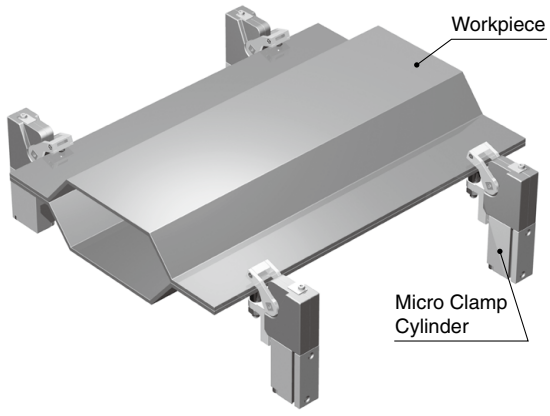
(D-A9□)



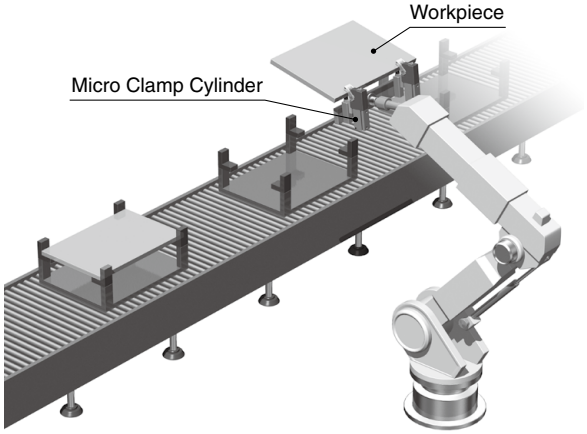
Application examples

● Clamping of workpiece

Clamps edges of panels which do not require a long arm



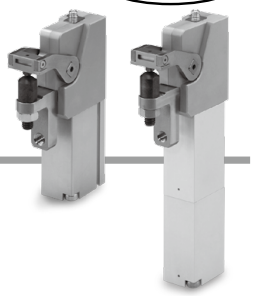
● Gripper handling workpiece



Micro Clamp Cylinder

CKZM16-X2800 -X2900

RoHS



How to Order

CKZM16 – 68 – M9BW ☐ – X2800

Arm opening angle [°]

Auto switch

Nil	Without auto switch

∗ For applicable auto switch models, refer to the table below.

Number of auto switches

Nil	2
S	1
n	n

Type

X2800	Base type
X2900	Tandem type

Auto Switch Models: Refer to the **Web Catalog** for further information on auto switches.

Compact Auto Switches (-X2800 and -X2900 types)

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length [m] 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	●	○	—	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	●	○	—	○	—	
	Diagnostic indication (2-color indicator)			3-wire (NPN)		5 V, 12 V		**M9NWV**	**M9NW**	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)				**M9PWV**	**M9PW**	●	●	●	○	—	○		
				2-wire		12 V		**M9BWV**	**M9BW**	●	●	●	○	—	○	—	
	Water resistant (2-color indicator)			3-wire (NPN)		5 V, 12 V		**M9NAV**	**M9NA**	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)				**M9PAV**	**M9PA**	○	○	●	○	—	○		
				2-wire		12 V		**M9BAV**	**M9BA**	○	○	●	○	—	○	—	
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	●	●	●	—	○	IC circuit	—
			Yes	2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	●	●	—	○∗1	—	Relay, PLC
			No			5 V,12 V	100 V or less	**A90V**	**A90**	●	●	●	●	—	○∗1	IC circuit	

∗1 The load voltage used is 24 VDC.

∗ Water-resistant type auto switches can be mounted on the above models, but SMC cannot guarantee water resistance.

∗ Lead wire length symbols: 0.5 m ····· Nil (Example) M9NWV
1 m ····· M (Example) M9NWVM
3 m ····· L (Example) M9NWVL
5 m ····· Z (Example) M9NWVZ

∗ Auto switches marked with "○" are produced upon receipt of order.

∗ For details on auto switches with pre-wired connectors, refer to the **Web Catalog**.

Magnetic Field-Resistant Auto Switches (-X2900 type only)

Type	Auto switch model	Applicable magnetic field	Electrical entry	Indicator light	Wiring (Pin no. in use)	Load voltage	Lead wire length	Applicable load
Solid state auto switch	**D-P3DWASC**	AC magnetic field (Single-phase AC welding magnetic field)	Pre-wired connector	2-color indicator	2-wire (3 – 4)	24 VDC	0.3 m	Relay, PLC
	D-P3DWASE				2-wire (1 – 4)			
	D-P3DWA		Grommet		2-wire		0.5 m	
	D-P3DWAL						3 m	
	D-P3DWAZ						5 m	

Specifications

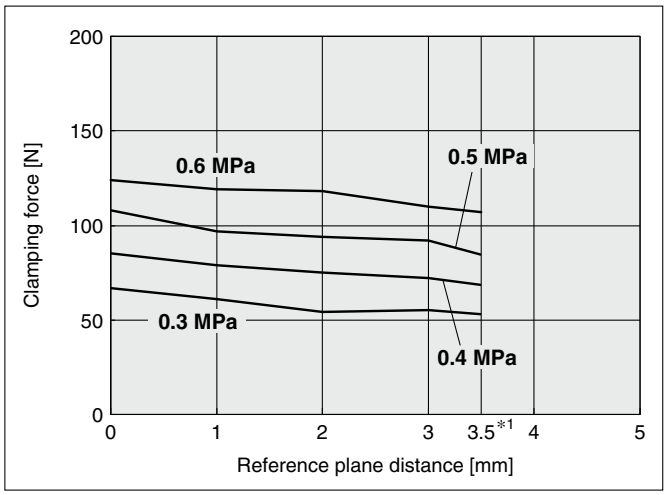
Type	Base type (-X2800)	Tandem type (-X2900)
Operating pressure	0.2 to 0.6 MPa	
Appropriate workpiece thickness range	3.5 mm or less	
Maximum holding force∗1	300 N	
Cylinder bore size	16 mm	
Cylinder stroke	27 mm	25 mm x 2
Arm length	25 mm	
Arm opening angle	68 degrees	
Clamping force	Refer to page 9.	
Appropriate workpiece insert length	8 mm (Refer to page 10.)	8 mm (Refer to page 11.)
Weight	250 g	330 g

∗1 The maximum holding force is 300 N when a pressure of 0.2 to 0.6 MPa is supplied. The clamping state is not maintained while operating air is exhausted.

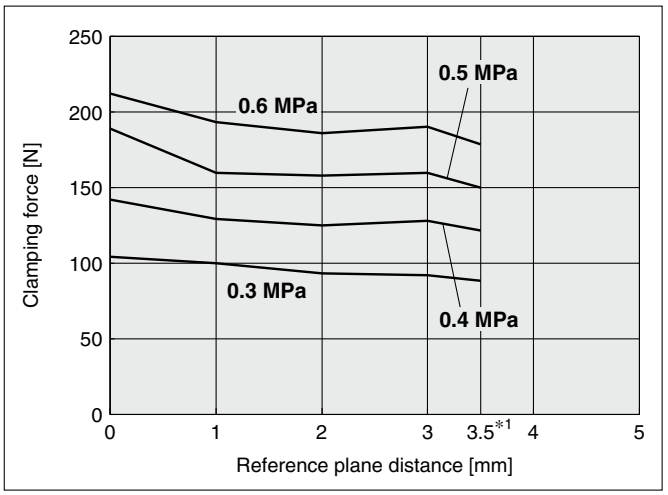
Clamping Force Characteristics (Reference Plane Distance and Clamping Force)

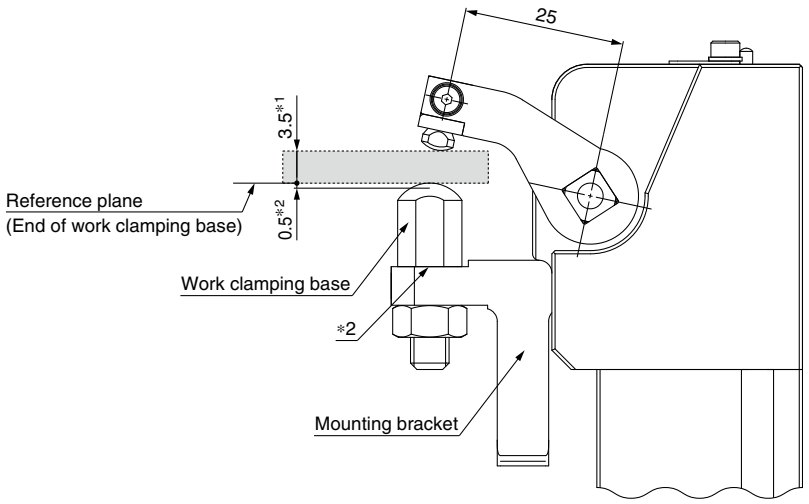
Arm length: 25 mm

Base type (-X2800)



Tandem type (-X2900)

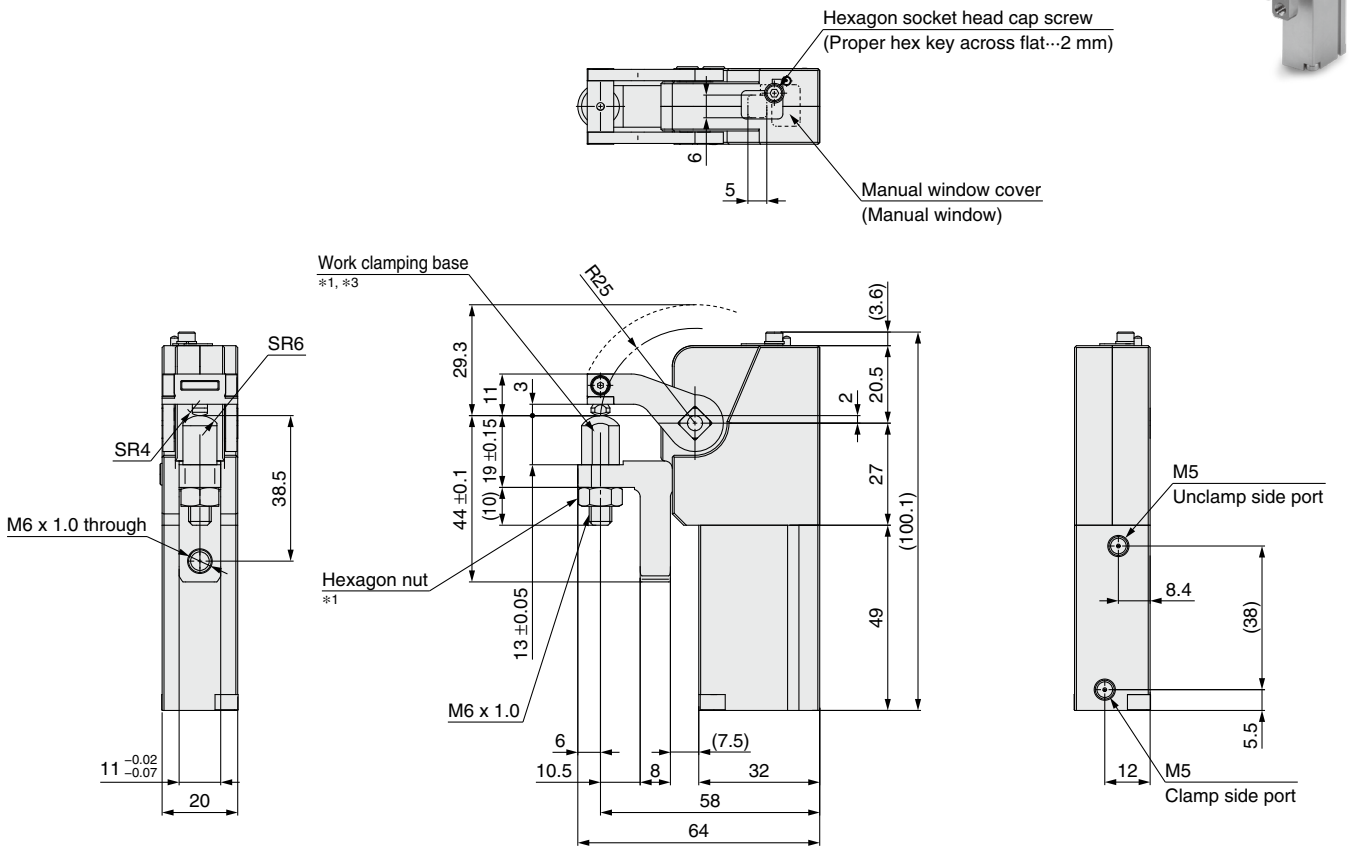


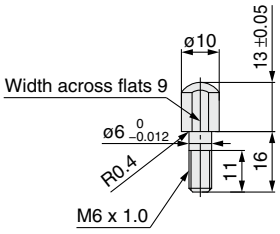


*1 The clamping operating range is 3.5 mm upward from the reference plane, and 0.5 mm downward from the reference plane when the work clamping base is removed.

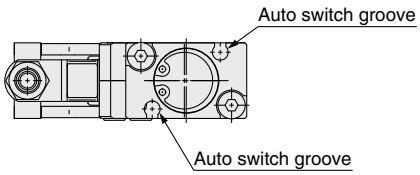
*2 When the height is changed by inserting a shim between the work clamping base and the mounting bracket, the “clamping force characteristics/reference plane distance” becomes narrower only for the height changed.

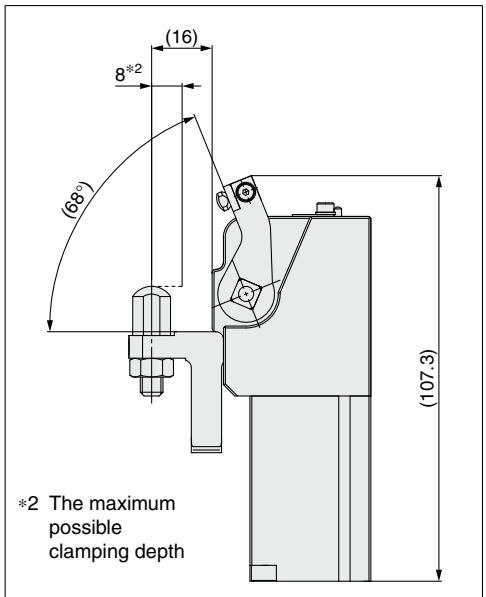
Dimensions: Base Type (-X2800)





Work clamping base
(*3)

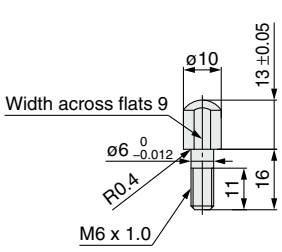




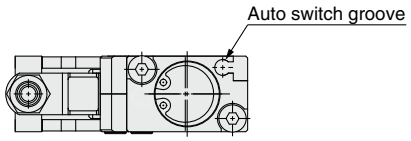
Unclamp
(Arm opening angle: 68 degrees)

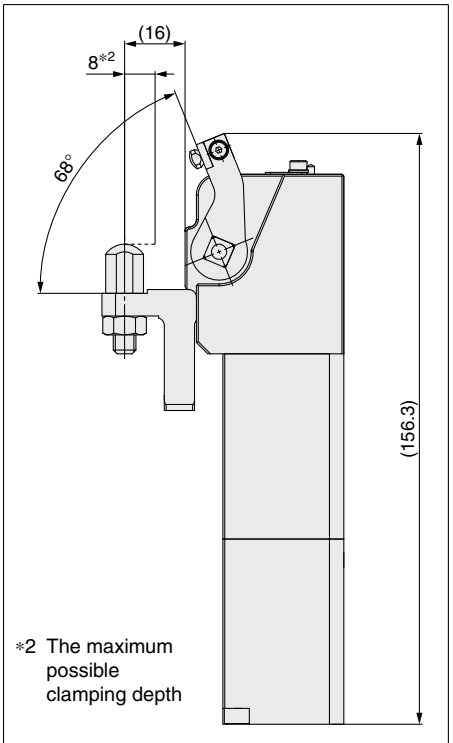
*1 The hexagon nut is installed to prevent detachment of the work clamping base before the shipment.
Remove the hexagon nut when the product is installed to the equipment.
*3 If the clamping base is used to clamp the workpiece, the torque range is 5.2 to 6.7 [N·m].

Dimensions: Tandem Type (-X2900)



Work clamping base
(*3)





Unclamp
(Arm opening angle: 68 degrees)

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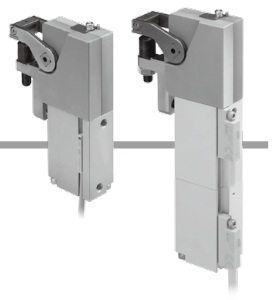
Remove the hexagon nut when the product is installed to the equipment.
*3 If the clamping base is used to clamp the workpiece, the torque range is 5.2 to 6.7 [N·m].

CKZM16-X2800 -X2900
Auto Switch Mounting

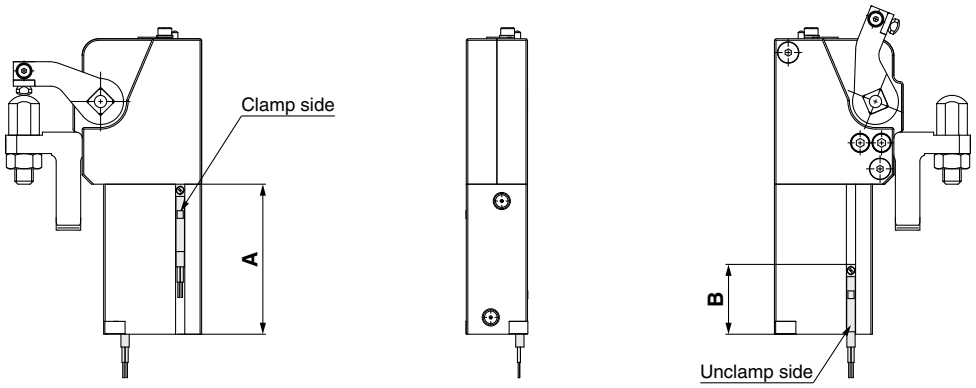


Auto Switch Proper Mounting Position (Detection at Stroke End) and Mounting Height

Auto switch mounting position is the most sensitive position for when the arm positions are clamping and unclamping.
The clamp side switch position is when the workpiece thickness 0 mm.

Base type (-X2800)

D-M9□
D-A9□



⚠Caution

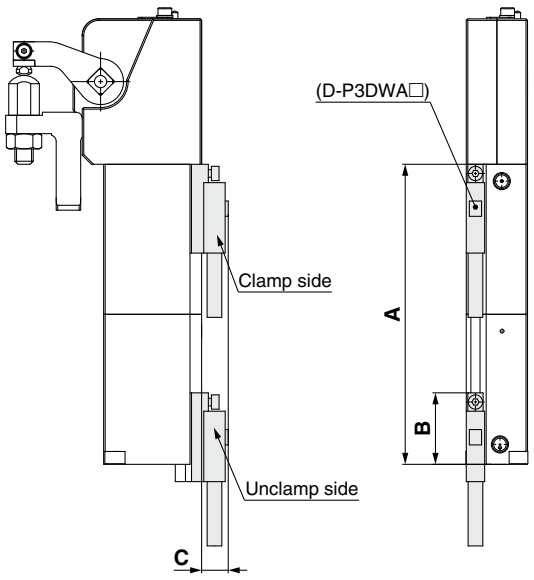
· The auto switch mounting position on the clamp side changes with the workpiece thickness. It cannot be mounted in a position which detects the overall workpiece thickness of 0 to 3.5 mm.
· 2 switches cannot be installed in one switch groove.

[mm]

Auto switch model	A	B
D-M9□	45	18.8
D-A9□	49	22.8

Tandem type (-X2900)

D-P3DWA□
D-M9□
D-A9□



[mm]

Auto switch model	A	B	C
D-P3DWA□	98	23.3	8.7
D-M9□	94	18.8	—
D-A9□	98	22.8	—

⚠Caution

· The auto switch mounting position on the clamp side changes with the workpiece thickness. It cannot be mounted in a position which detects the overall workpiece thickness of 0 to 3.5 mm.

Specific Product Precautions

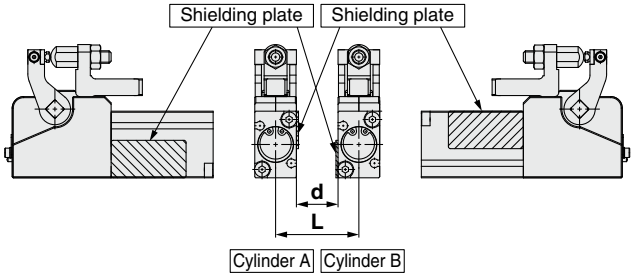
Be sure to read this before handling the products. Refer to page 179 for safety instructions. For actuator and auto switch precautions, refer to the "Handling Precautions for SMC Products" on the SMC website: https://www.smcworld.com

Caution on Handling Auto Switch

⚠Warning

1. If multiple cylinders are operated adjacent to each other, the magnets that are enclosed in the adjacent cylinders could affect the operation of the auto switches, causing the switches to malfunction. Therefore, make sure that the mounting pitch of the cylinders is at least that indicated in the table below.

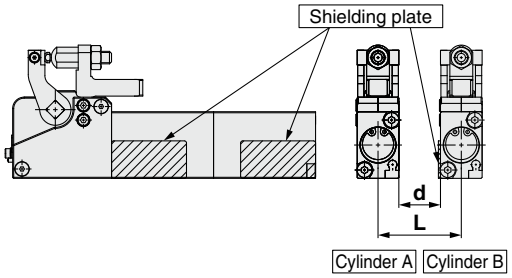
Base type (-X2800)



Cylinder Minimum Mounting Pitch [mm]

Auto switch model	L		(d)	
	With shielding plate	Without shielding plate	With shielding plate	Without shielding plate
D-M9□	25	35	5	15
D-A9□	21	21	1	1

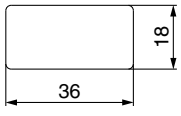
Tandem type (-X2900)



Cylinder Minimum Mounting Pitch [mm]

Auto switch model	L		(d)	
	With shielding plate	Without shielding plate	With shielding plate	Without shielding plate
D-M9□	25	30	5	10
D-A9□	21	28	1	8
D-P3DWA□	21	35	1	15

If cylinders are used with a mounting pitch less than that shown above, they must be shielded with iron plates or the separately sold magnetic shielding plate (part no.: MU-S025). Please contact SMC for further information.



Material: Ferrite stainless steel
Thickness: 0.3 mm
Since the back side is treated with adhesive, it is possible to attach to the cylinder.

How to use

In order not to influence the auto switch mounted on cylinder B adjacent to the magnetic force of cylinder A, use a shielding plate to block the magnetic force.

Caution on Handling Auto Switch

⚠Warning

2. The magnetic field-resistant auto switch (D-P3DWA□) cannot be used in environments with DC magnetic fields.

Even under AC magnetic fields, if a magnetic body structure is placed very close to the cylinder, it will be affected by magnetization. Use the auto switch at a sufficient distance.

How to manually unclamp while the operating air is exhausted

⚠Caution

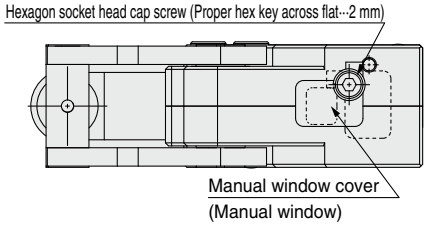
1. Absolutely do not release the lock until the safety is ensured.

2. Loosen the hexagon socket head cap screw for "manual window cover." And rotate the window.

3. Insert a long stick-like object into the "manual window" and push the joint inside down.

4. Confirm "manual window" is completely covered with the "manual window cover." Then tighten the hexagon socket head cap screw.

∗ Tightening torque: 0.36 to 0.45 N·m



Note for Loads on End of Arm Assembly (Moving Part)

⚠Warning

1. Do not attach any load onto the end of the arm assembly (moving part).