

# Micro Clamp Cylinder

**Compact** | **Lightweight** | **High Clamping Force** | **High Holding Force**

## Compact Width 20 mm

(Base type, Tandem type)

## Lightweight 250 g

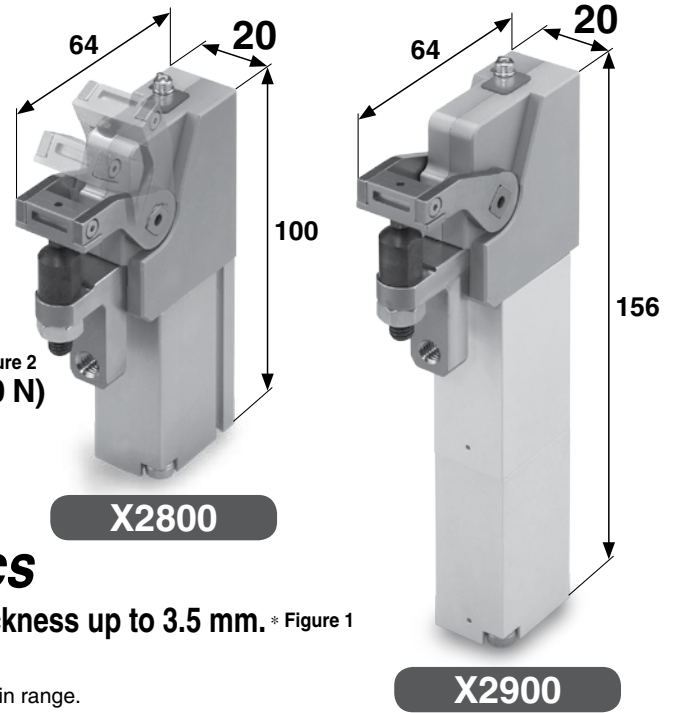
(Base type)

## Max. clamping force 45 lbf (200N)

(Tandem type) \* Operating pressure: 87 psi [0.6 MPa]

## Maximum holding force 67 lbf (300 N)

(Base type, Tandem type) \* When operating pressure of 29 to 87 psi [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, 87 psi [0.6 MPa])

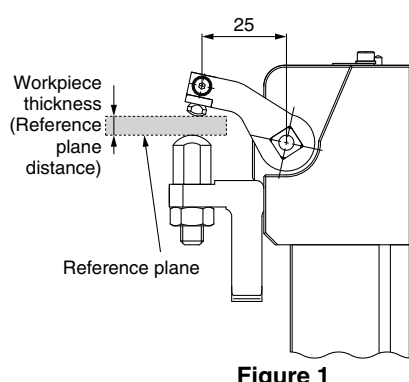
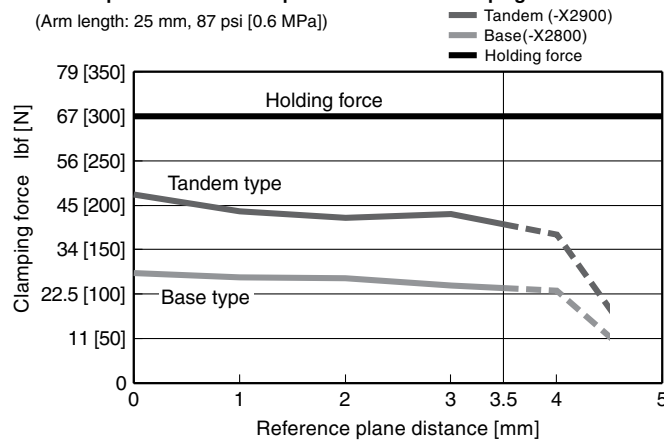


Figure 1

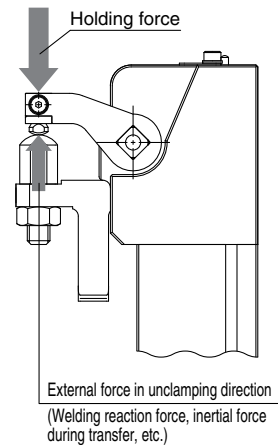
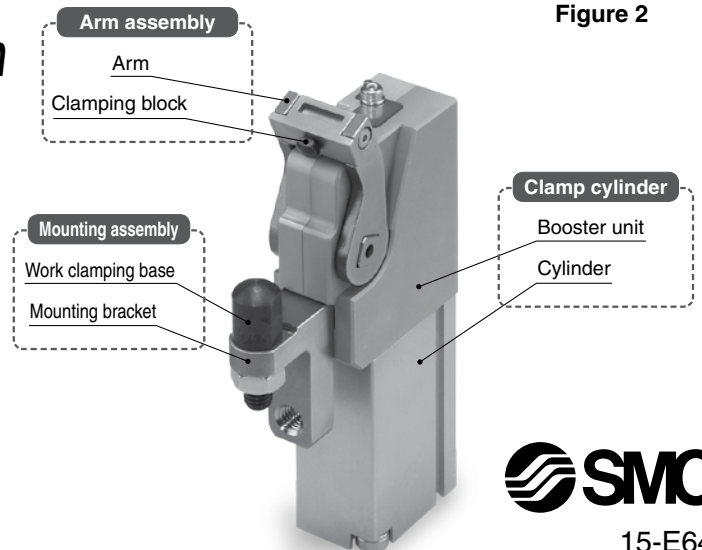


Figure 2

## Reduction of *design assembly labor by unitization*

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



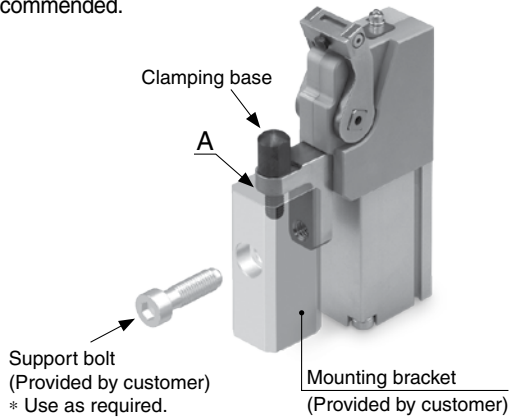
**CKZM16** -X2800 (Base type)  
-X2900 (Tandem type)



## Easy mounting *2 types of mounting possible*

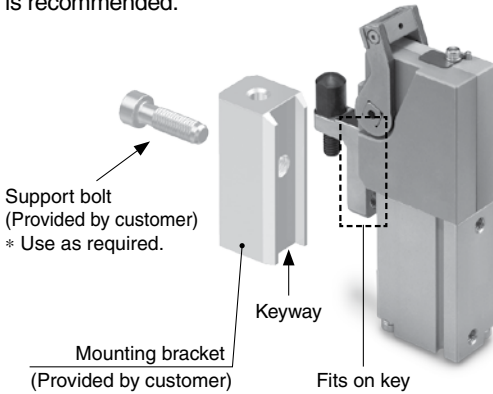
### Basic mounting

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.



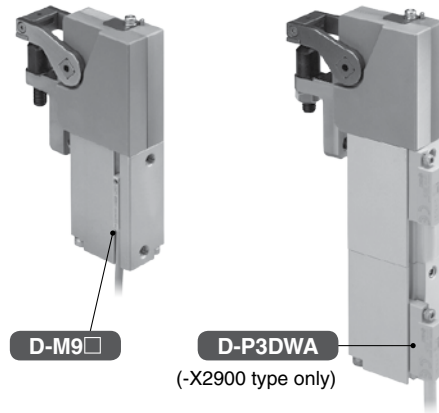
## Dust resistant construction

Fully closed structure prevents dust from entering easily.

## Auto switch mountable

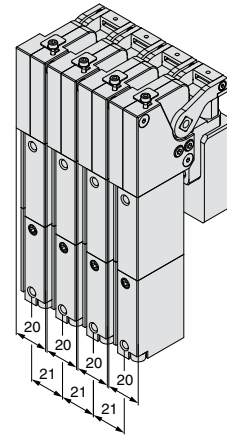
Magnetic field resistant auto switch **D-P3DWA**

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



## Short pitch (21 mm) mounting is possible.

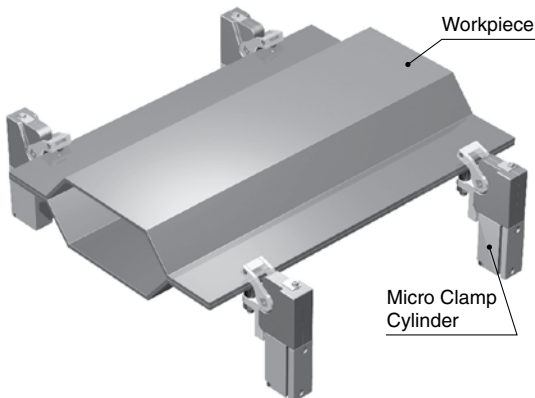
(D-A9)



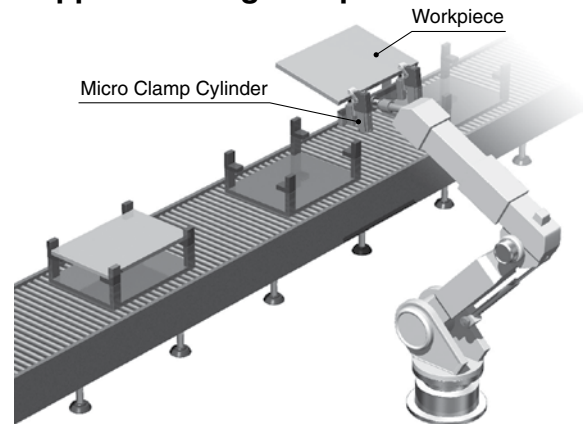
## Application examples

### • Clamping of workpiece

Clamps edges of panels which do not require a long arm.



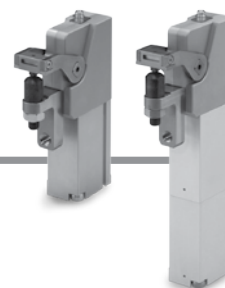
### • Gripper handling workpiece



# Micro Clamp Cylinder

## CKZM16 -X2800

## CKZM16 -X2900



### How to Order

CKZM16 - 68 - M9BW - X2800

Arm opening angle  
[°]

Auto switch type

Nil Without auto switch

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

Type

X2800	Base type
X2900	Tandem type

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

**Auto Switch Model**/Refer to the **WEB catalog** or Best Pneumatics No. 3 for further information on auto switches.

**Compact auto switch (-X2800 and -X2900 types only)**

Type	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage		Auto switch model		Lead wire length [m]					Pre-wired connector	Applicable load			
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC		
Solid state auto switch	Diagnostic indication (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC		
				3-wire (PNP)			M9PV	M9P	●	●	●	○	—	○				
				2-wire			M9BV	M9B	●	●	●	○	—	○				
				3-wire (NPN)			M9NWV	M9NW	●	●	●	○	—	○				
	Water resistant (2-color indication)			3-wire (PNP)	M9PWV	M9PW	●	●	●	○	—	○	IC circuit	Relay, PLC				
				2-wire	M9BWW	M9BW	●	●	●	○	—	○						
				3-wire (NPN)	M9NAV	M9NA	○	○	●	○	—	○						
				3-wire (PNP)	M9PAV	M9PA	○	○	●	○	—	○						
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	—	A96V	A96	●	—	●	—	—	○	IC circuit	—		
				2-wire			A93V*2	A93	●	—	●	—	—	—	—	—	Relay, PLC	
			No	2-wire	24 V	5 V, 12 V	100 V or less	A90V	A90	●	—	●	—	—	—	—	IC circuit	Relay, PLC

\*1 Water resistant type auto switches can be mounted on the above models, but in such a case SMC cannot guarantee water resistance.

\*2 1 m type lead wire is only applicable to D-A93.

\* 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

\* Solid state auto switches marked with "○" are produced upon receipt of order.

\* For details about auto switches with pre-wired connector, refer to the **WEB catalog** or Best Pneumatics No. 2.

**Magnetic field resistant auto switch (-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 indication	2-wire (3 - 4)	24 VDC	0.3 m	Relay, PLC
	D-P3DWASE				2-wire (1 - 4)			
	D-P3DWA		2-wire					
	D-P3DWAL							
	D-P3DWAZ							
			Grommet			0.5 m		
						3 m		
						5 m		

## Specifications

Type	Base type (-X2800)	Tandem type (-X2900)
Operating pressure	29 to 87 psi [0.2 to 0.6 MPa]	
Appropriate workpiece thickness range	3.5 mm or less	
Maximum holding force <sup>Note)</sup>	67 lbf [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 3	
Appropriate workpiece insert length	8 mm (Refer to page 4)	8 mm (Refer to page 5)
Weight	250 g	330 g

Note) The maximum holding force is 67 lbf [300 N] when a pressure of 29 to 87 psi [0.2 to 0.6 MPa] is supplied.

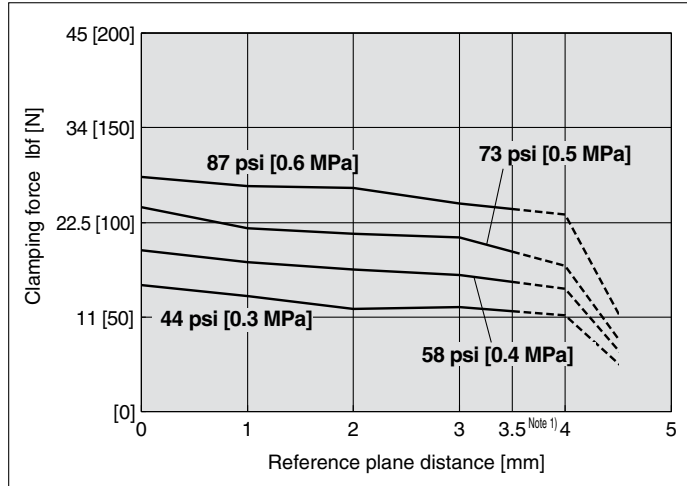
The clamping state is not maintained while operating air is exhausted.



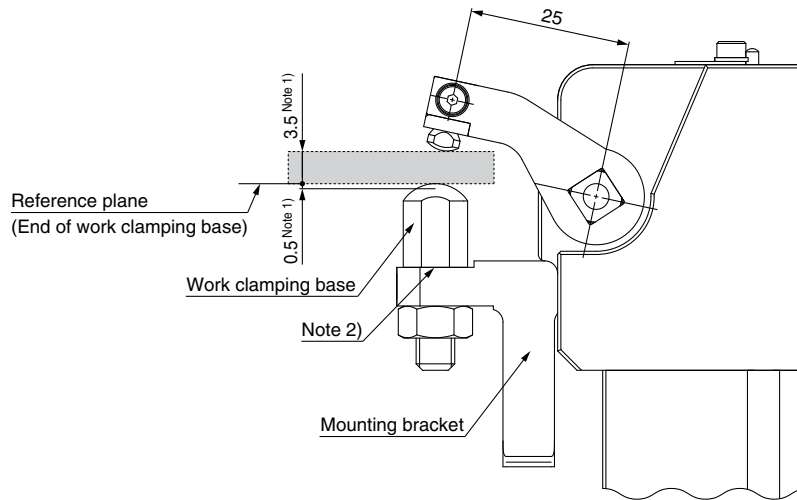
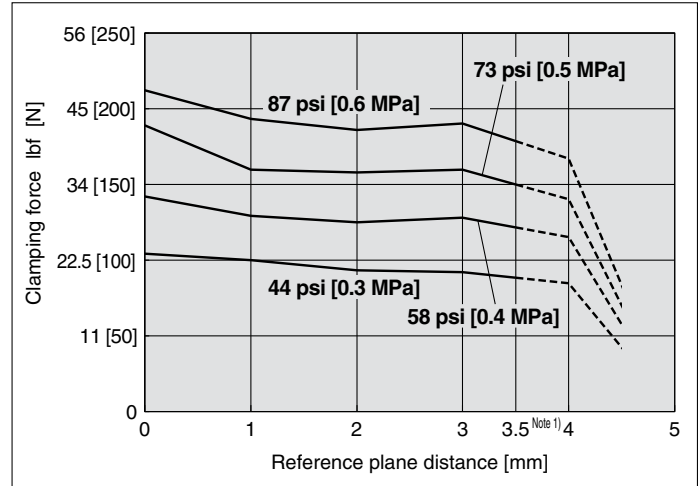
## Clamping Force Characteristics (Reference Plane Distance and Clamping Force)

Arm length: 25 mm

Base type (-X2800)



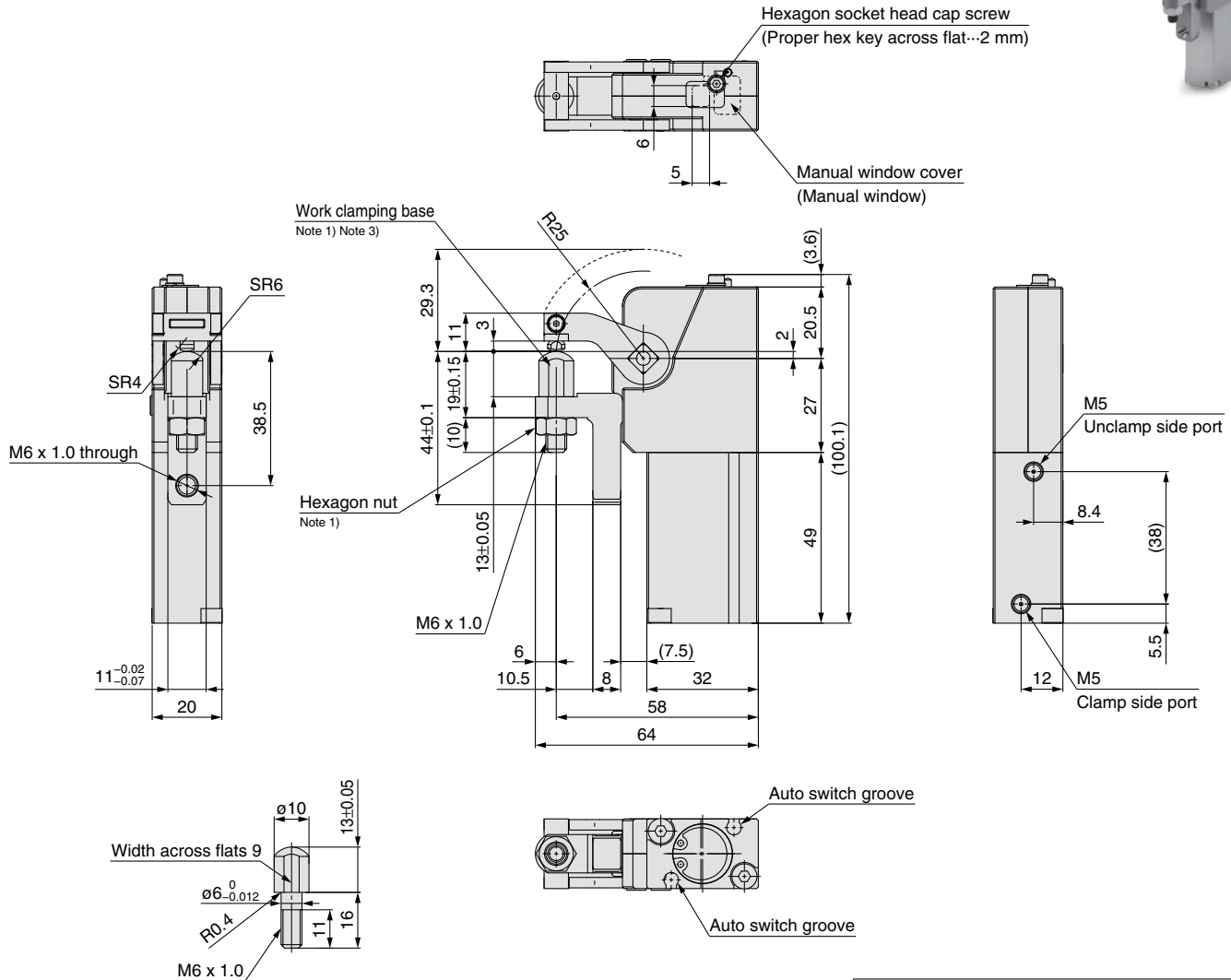
Tandem type (-X2900)



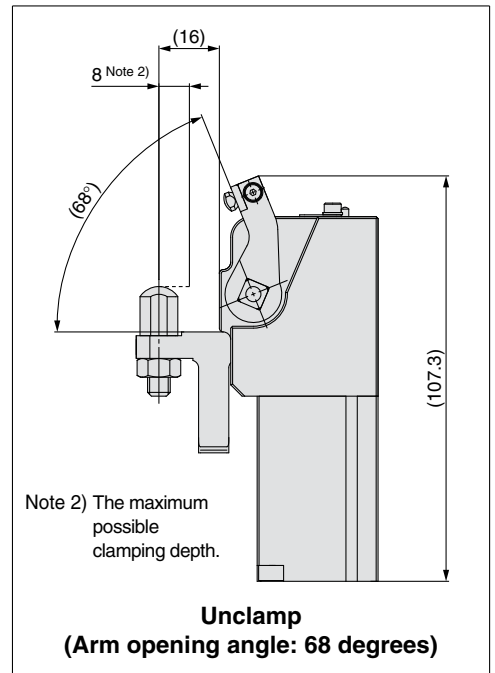
Note 1) The clamping operating range is 3 . 5 mm upward from the reference plane, and 0 . 5 mm downward from the reference plane when the work clamping base is removed.

Note 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)**



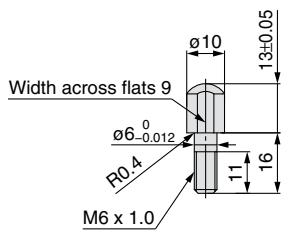
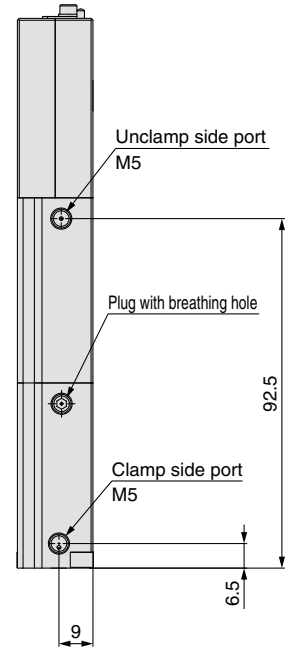
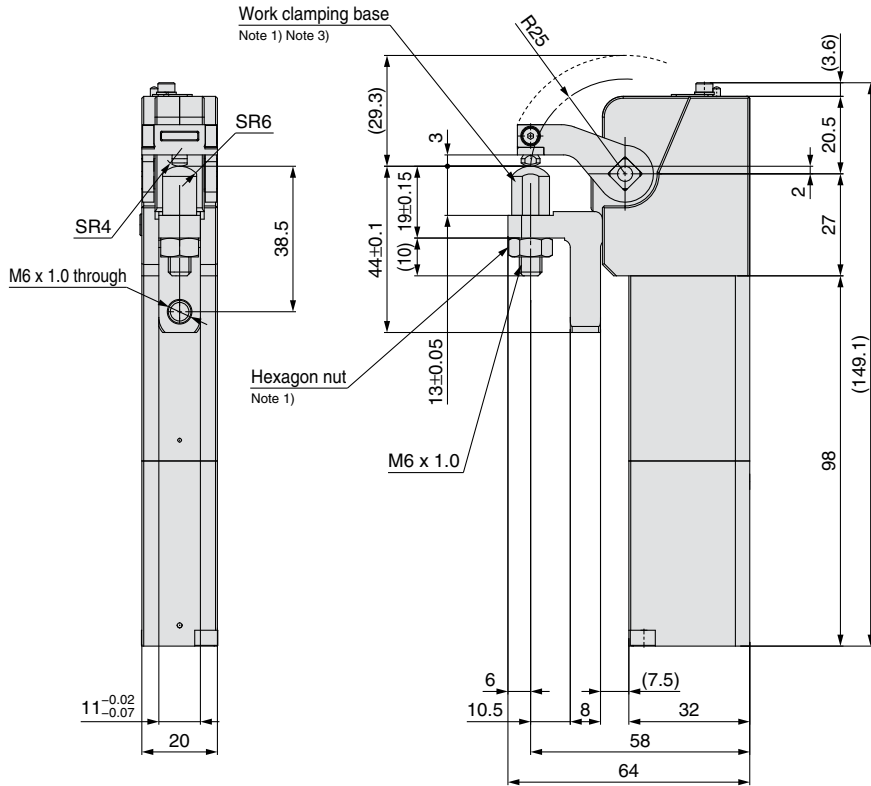
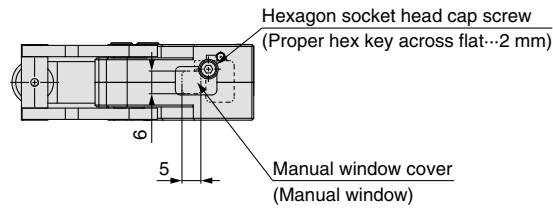
**Work clamping base**  
(Note 3)



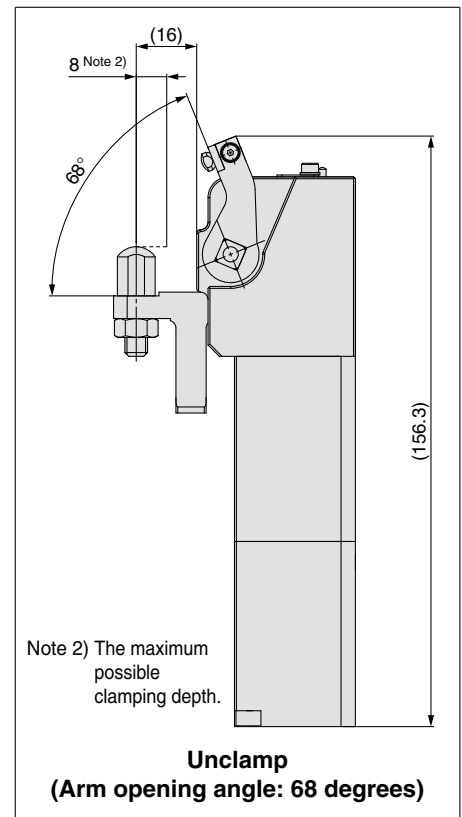
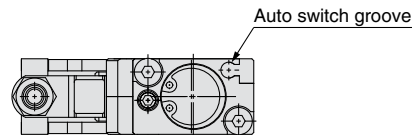
Note 1) The hexagon nut is installed to prevent detachment of the work clamping base before the shipment.  
Remove the hexagon nut when the product is installed to the equipment.  
Note 3) If the clamping base is used to clamp the workpiece, the torque range is 3.8 to 4.9 lbf ft [5.2 to 6.7 N·m].

# CKZM16-X2800 -X2900

## Dimensions/Tandem Type (-X2900)



**Work clamping base**  
(Note 3)



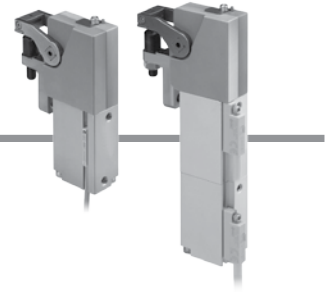
Note 1) The hexagon nut is installed to prevent detachment of the work clamping base before the shipment.

Remove the hexagon nut when the product is installed to the equipment.

Note 3) If the clamping base is used to clamp the workpiece, the torque range is 3.8 to 4.9 lbf-ft [5.2 to 6.7 N·m]

**CKZM16**-X2800  
-X2900

# Auto Switch Mounting



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

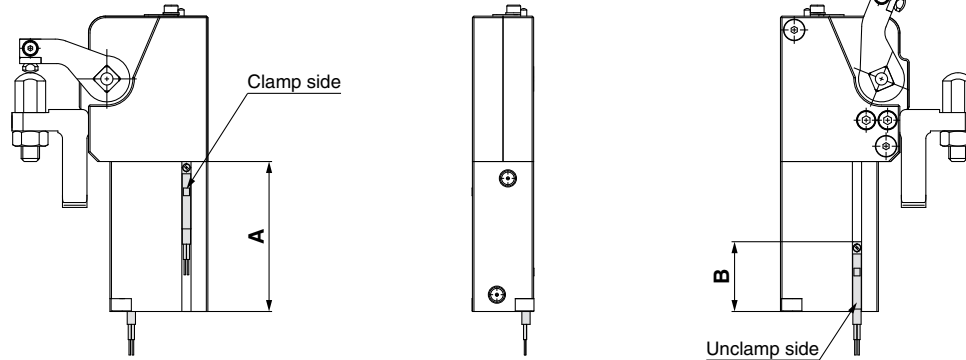
Auto switch mounting position is the most sensitive position for when the arm positions are clamping and unclamping.

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 can not be installed in one switch groove.

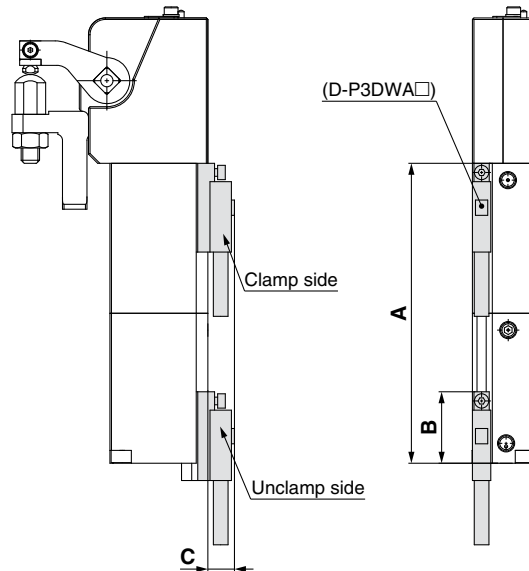
[mm]		
Auto switch model	A	B
D-M9 <input type="checkbox"/>	45	18.8
D-A9 <input type="checkbox"/>	49	22.8

### Tandem type (-X2900)

D-P3DWA

D-M9

D-A9



[mm]			
Auto switch model	A	B	C
D-P3DWA <input type="checkbox"/>	98	23.3	8.7
D-M9 <input type="checkbox"/>	94	18.8	—
D-A9 <input type="checkbox"/>	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.





# Series CKZM Specific Product Precautions

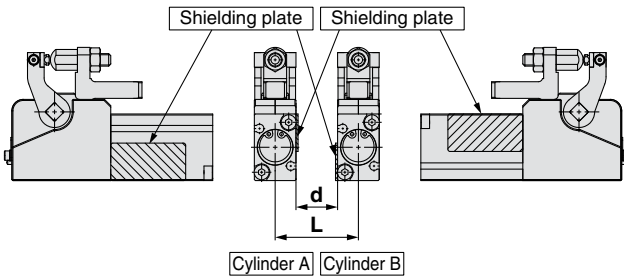
Be sure to read this before handling. For Safety Instructions, Actuator and Auto Switch Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, <http://www.smcworld.com>

## 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.

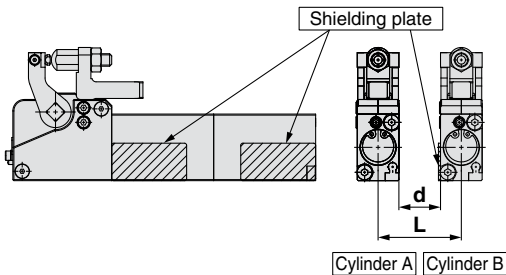
#### Base type (-X2800)



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)



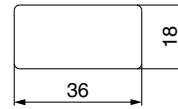
Cylinder minimum mounting pitch [mm]

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

## Caution on Handling Auto Switch

### Warning

If cylinders are used with a mounting pitch less than that shown on the left, 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 to not 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.
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.

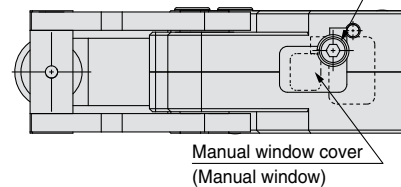
## How to manually unclamp while the operating air is exhausted.

### 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: 0.27 to 0.33 lbf-ft [0.36 to 0.45 N·m]

Hexagon socket head cap screw (Proper hex key across flat--2 mm)



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

### Warning

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

**Warning** Safety Instructions Be sure to read "Handling Precautions for SMC Products" (M-E03-3) before using.

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