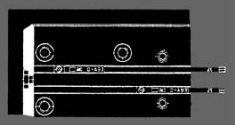
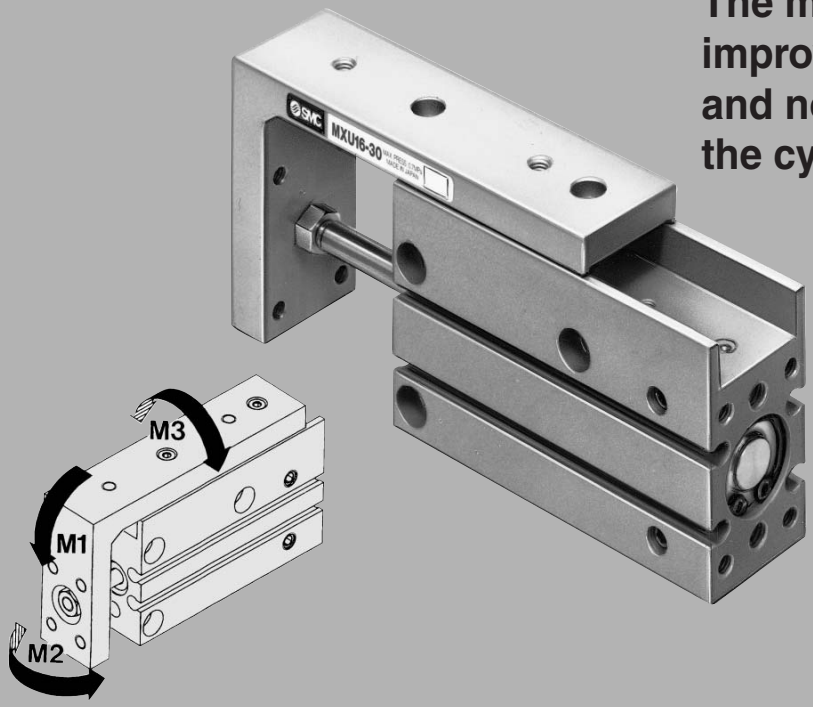
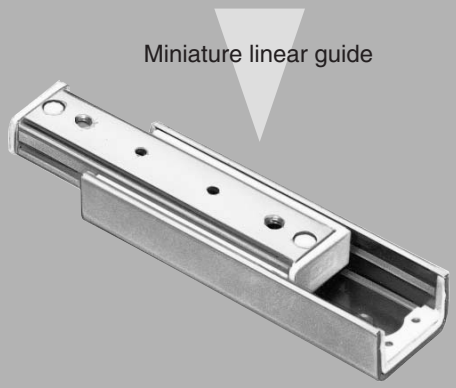


Compact Slide
Series MXU
ø6, ø10, ø16

Integration of the miniature linear guide and the worktable

The miniature linear guide improves the linear movement and non-rotating accuracy of the cylinder with a worktable.





Displacement accuracy against moments

■ Table edge displacement

M1 (Pitch moment): **0.02 mm or less**

M2 (Yaw moment): **0.01 mm or less**

■ Table turning angle

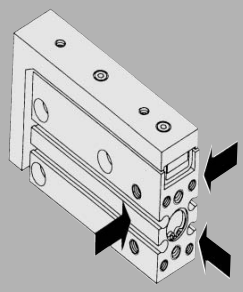
M3 (Roll moment): **0.25° or less**

Traveling parallelism (No load)

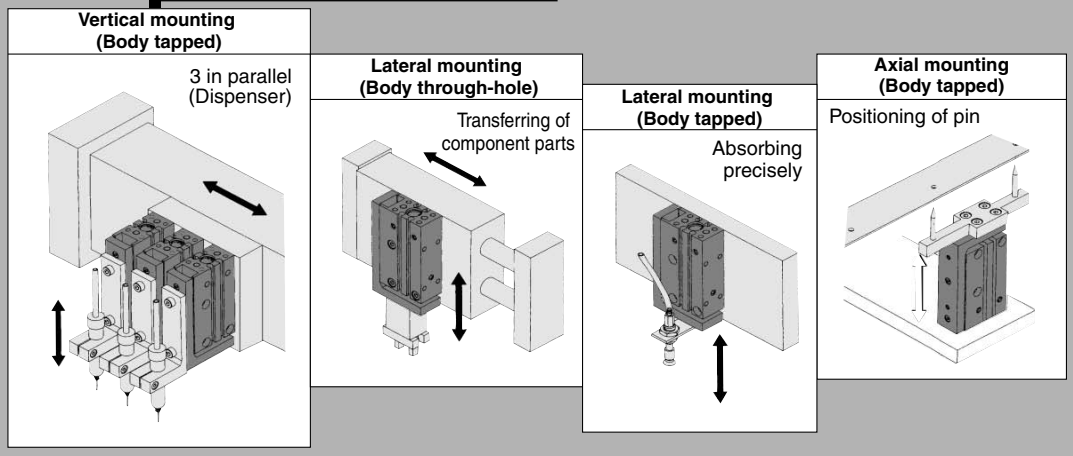
0.05 mm or less

Auto switch can be mounted.

Piping is possible from 3 directions.



Universal mounting



Compact Slide
Series MXU
ø6, ø10, ø16

How to Order

MXU | **10** | **30** | **F9BW** | **S**

Compact slide

Bore size

6	6 mm
10	10 mm
16	16 mm

Stroke

5	5 mm
10	10 mm
15	15 mm
20	20 mm
25	25 mm
30	30 mm

Auto switch

Nil	Without auto switch (Built-in magnet)

∗ For the applicable auto switch model, refer to the table below.
∗ Auto switches are shipped together, (but not assembled).

Number of auto switches

Nil	2 pcs.
S	1 pc.

Applicable Auto Switch/Refer to page 8-30-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage			Auto switch model		Lead wire length (m) ∗			Pre-wire connector	Applicable load	
					DC		AC	Perpendicular	In-line	0.5 (Nil)	3 (L)	5 (Z)			
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	—	Relay, PLC
Solid state 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 indication)			3-wire (NPN)		5 V, 12 V		**F9NWV**	**F9NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	

∗ Lead wire length symbols: 0.5 m····· Nil (Example) A93
3 m····· L (Example) A93L
5 m····· Z (Example) F9NWZ

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

• Since there are other applicable auto switches than listed, refer to page 8-3-11 for details.
• For details about auto switches with pre-wire connector, refer to page 8-30-52.

Made to Order Specifications
(For details, refer to page 8-31-1.)

Symbol	Specifications
-XB13	Low speed cylinder (5 to 50 mm/s)

Specifications

Bore size (mm)	**6**	**10**	**16**
Fluid	Air		
Action	Double acting		
Piping port size	M5 x 0.8		
Maximum operating pressure	0.7 MPa		
Proof pressure	1.05 MPa		
Ambient & fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)		
Piston speed	50 to 500 mm/s		
Lubrication	Non-lube		
Cushion	Rubber bumper on both ends		
Stroke length tolerance	+1.0 0		
Auto switch (Option)	Reed switch Solid state switch (2-wire, 3-wire)		

Minimum Operating Pressure (MPa)

Bore size (mm)	**6**	**10**	**16**
Min. operating pressure (MPa)	0.12	0.06	0.06

Theoretical Output (N)

Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
6	IN	6	11	15
	OUT	8	14	20
10	IN	20	33	46
	OUT	24	39	55
16	IN	52	86	121
	OUT	60	101	141

Standard Stroke

Bore size (mm)	Standard stroke (mm)
6, 10, 16	5, 10, 15, 20, 25, 30

∗ Refer to “Minimum Stroke for Auto Switch Mounting” on page 8-3-10.

Weight (g)

Model	Cylinder stroke (mm)					
	5	10	15	20	25	30
MXU6	66	72	81	88	97	103
MXU10	115	124	138	147	166	174
MXU16	216	215	251	250	285	300

Maximum Load Weight (g)

Model	Maximum load weight
MXU6	100
MXU10	200
MXU16	400

Series MXU

Allowable Moment

Model	Stroke	Allowable moment (N·m)			Correction value of moment center position distance (mm)	
		M1	M2	M3	Cp, Cy	Cr
MXU6	5	0.046	0.040	0.049	28.3	7.5
	10	0.046	0.040	0.049	28.3	
	15	0.061	0.053	0.062	31.5	
	20	0.061	0.053	0.062	34	
	25	0.076	0.066	0.074	38.5	
	30	0.076	0.066	0.074	41	
MXU10	5	0.047	0.041	0.109	28.5	9.5
	10	0.047	0.041	0.109	31	
	15	0.080	0.069	0.169	36	
	20	0.080	0.069	0.169	38.5	
	25	0.103	0.089	0.212	44	
	30	0.103	0.089	0.212	46	
MXU16	5	0.115	0.099	0.296	37.5	12
	10	0.115	0.099	0.296	37.5	
	15	0.153	0.132	0.380	46	
	20	0.153	0.132	0.380	46	
	25	0.190	0.165	0.464	50	
	30	0.190	0.165	0.464	52.5	

⚠Precautions

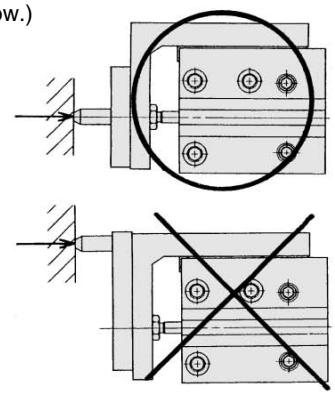
Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 8-34-3 to 8-34-6.

⚠Caution

1. Do not place your fingers in the clearance between the table and the cylinder tube.
Your fingers could get caught between the table and the cylinder tube when the piston rod retracts.
Because the cylinder outputs a great force, it could lead to injury if precautions are not taken to prevent your fingers from getting caught.

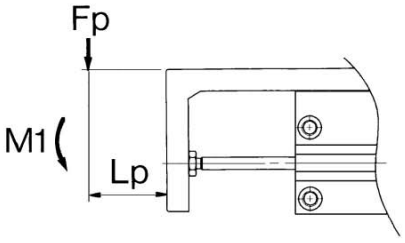
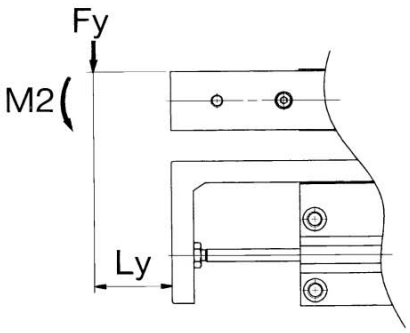
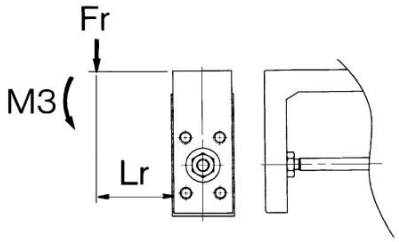
2. In terms of the load weight and moment, the cylinder must be operated below the maximum load weight and allowable moment.

3. If the output of the compact slide is applied directly to the table, make sure it is applied along the rod axial line. (Refer to the figure below.)



4. Make sure to connect a speed controller and adjust it to a speed of 500 mm/s or less to operate the cylinder.

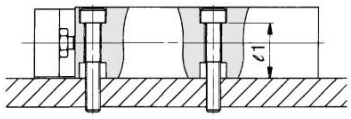
Expression of Calculation of Allowable Fp, Fy, Fr

Pitch moment	Yaw moment	Roll moment
		
Fp = Lp x Cp x (St/12) (N)	Fy = Ly x Cy x (St/12) (N)	Fy = Lr x Cy (N)
Lp: Distance between table and loading point (mm) Cp: Correction value of moment center position distance (mm) St: Stroke (mm)	Ly: Distance between table and loading point (mm) Cy: Correction value of moment center position distance (mm) St: Stroke (mm)	Lr: Distance between table and loading point (mm) Cr: Correction value of moment center position distance (mm)

Mounting of Compact Slide

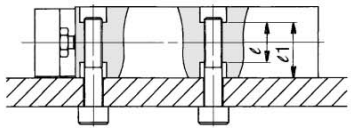
The compact slide can be mounted in four directions. Select the best direction according to the machine and work to be used.

Lateral Mounting (Body through-hole)



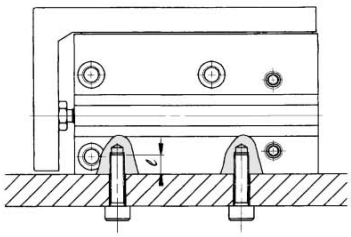
Model	Bolt	Maximum tightening torque (N·m)	ℓ1
MXU6	M3 x 0.5	1.1	12.7
MXU10	M4 x 0.7	2.5	15.6
MXU16	M4 x 0.7	2.5	20.6

Lateral Mounting (Body tapped)



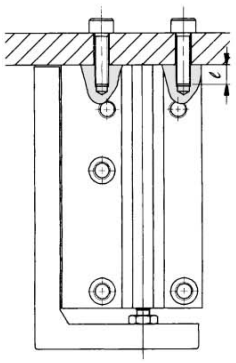
Model	Bolt	Maximum tightening torque (N·m)	ℓ1	ℓ
MXU6	M4 x 0.7	2.5	12.7	9.4
MXU10	M5 x 0.8	5.1	15.6	11.2
MXU16	M5 x 0.8	5.1	20.6	16.2

Vertical Mounting (Body tapped)



Model	Bolt	Maximum tightening torque (N·m)	ℓ
MXU6	M3 x 0.5	1.1	4.8
MXU10	M4 x 0.7	2.5	6
MXU16	M4 x 0.7	2.5	6

Axial Mounting (Body tapped)

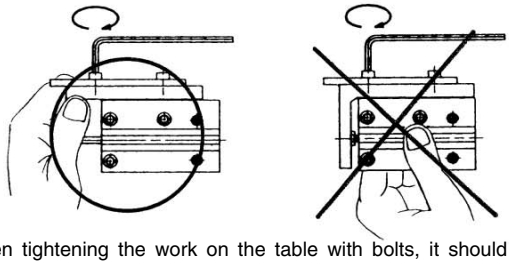


Model	Bolt	Maximum tightening torque (N·m)	ℓ
MXU6	M3 x 0.5	1.1	4.8
MXU10	M4 x 0.7	2.5	6
MXU16	M4 x 0.7	2.5	6

Mounting of Workpiece

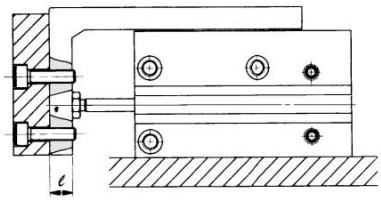
Workpieces can be mounted on 2 surfaces of the compact slide.

- The table is supported by miniature linear guide. Be careful not to apply strong impacts or excessive moments when mounting work.
- Hold the table when fastening workpieces to it with bolts, etc. If the body is held while tightening bolts, etc., the guide section will be subjected to a large moment, and there may be a loss of precision.



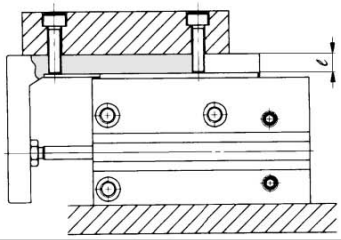
- When tightening the work on the table with bolts, it should be done while holding the table. If holding the body, it may cause more than allowable moment to the guide, leading to decrease in accuracy.
- For connection with a load having an external support/guide mechanism, select an appropriate connection method and perform careful alignment.
- Use caution, as scratches or nicks, etc. on the sliding parts of the piston rod can cause malfunction and air leakage.

Front Mounting



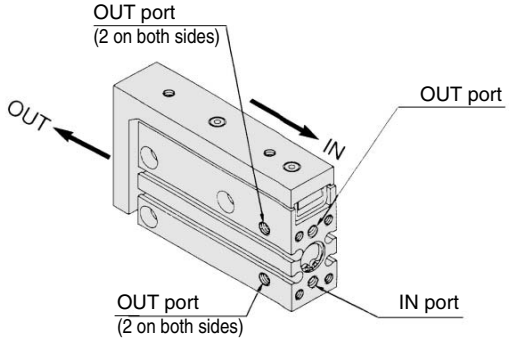
Model	Bolt	Maximum tightening torque (N·m)	ℓ
MXU6	M3 x 0.5	1.1	5
MXU10	M4 x 0.7	2.5	7
MXU16	M4 x 0.7	2.5	9.5

Top Mounting

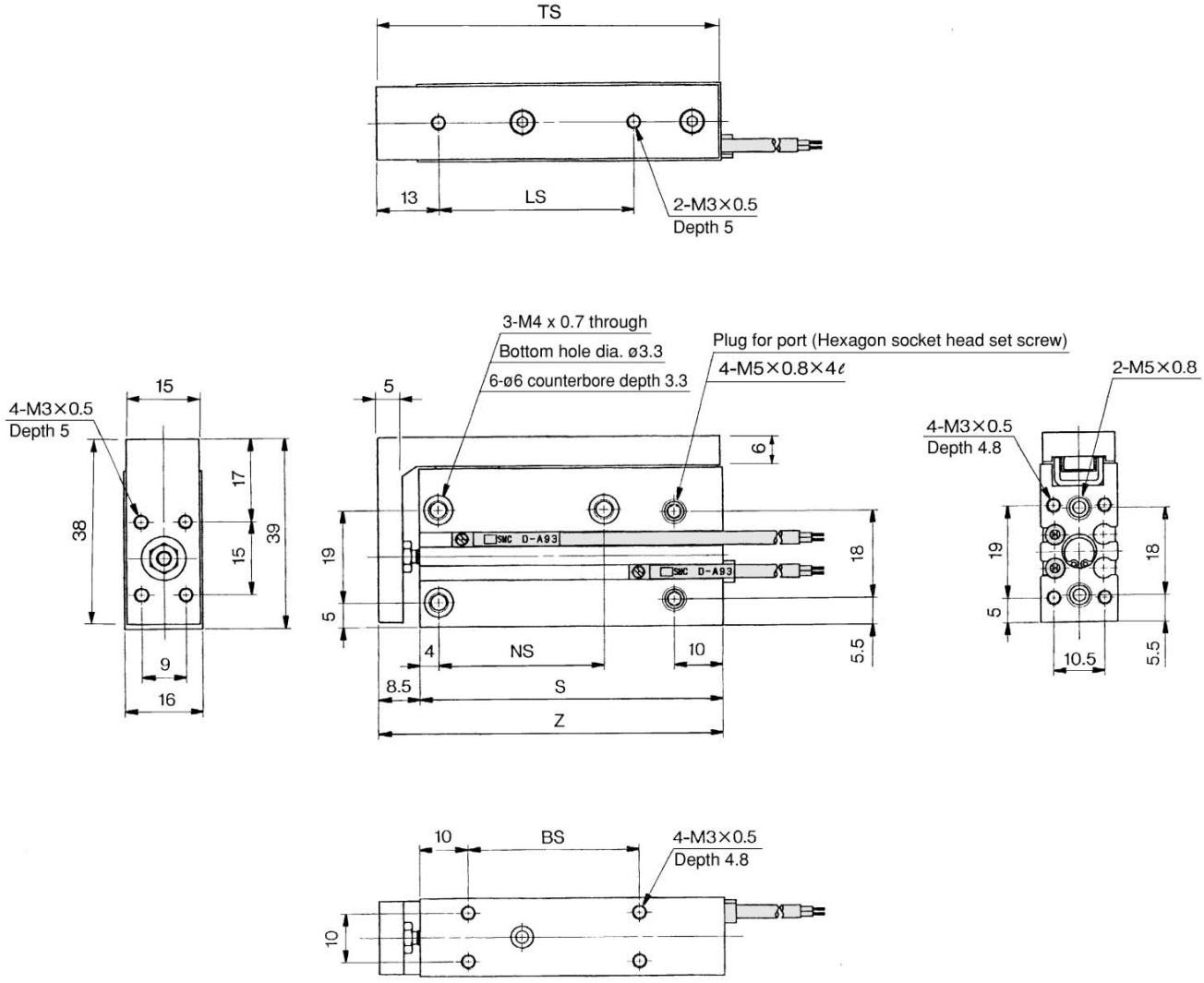


Model	Bolt	Maximum tightening torque (N·m)	ℓ
MXU6	M3 x 0.5	1.1	5
MXU10	M4 x 0.7	2.5	6
MXU16	M4 x 0.7	2.5	6

Operating Direction with Different Pressure Ports



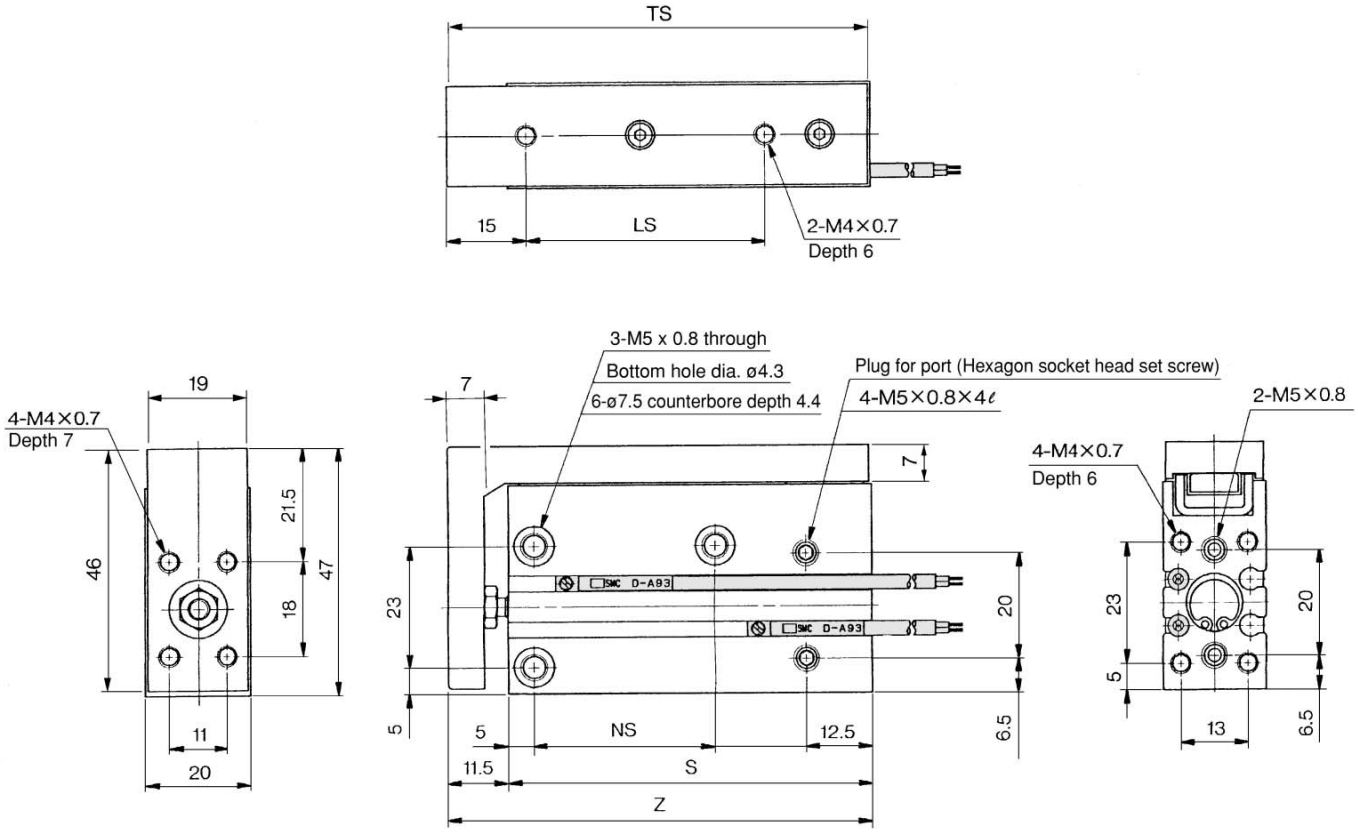
Dimensions: MXU6



(mm)

Stroke (mm)	BS	LS	NS	S	Z	TS
5	10	20	14	37.5	46	45.5
10	15	20	14	42.5	51	50.5
15	20	25	24	47.5	56	55.5
20	25	30	24	52.5	61	60.5
25	30	40	34	57.5	66	65.5
30	35	40	34	62.5	71	70.5

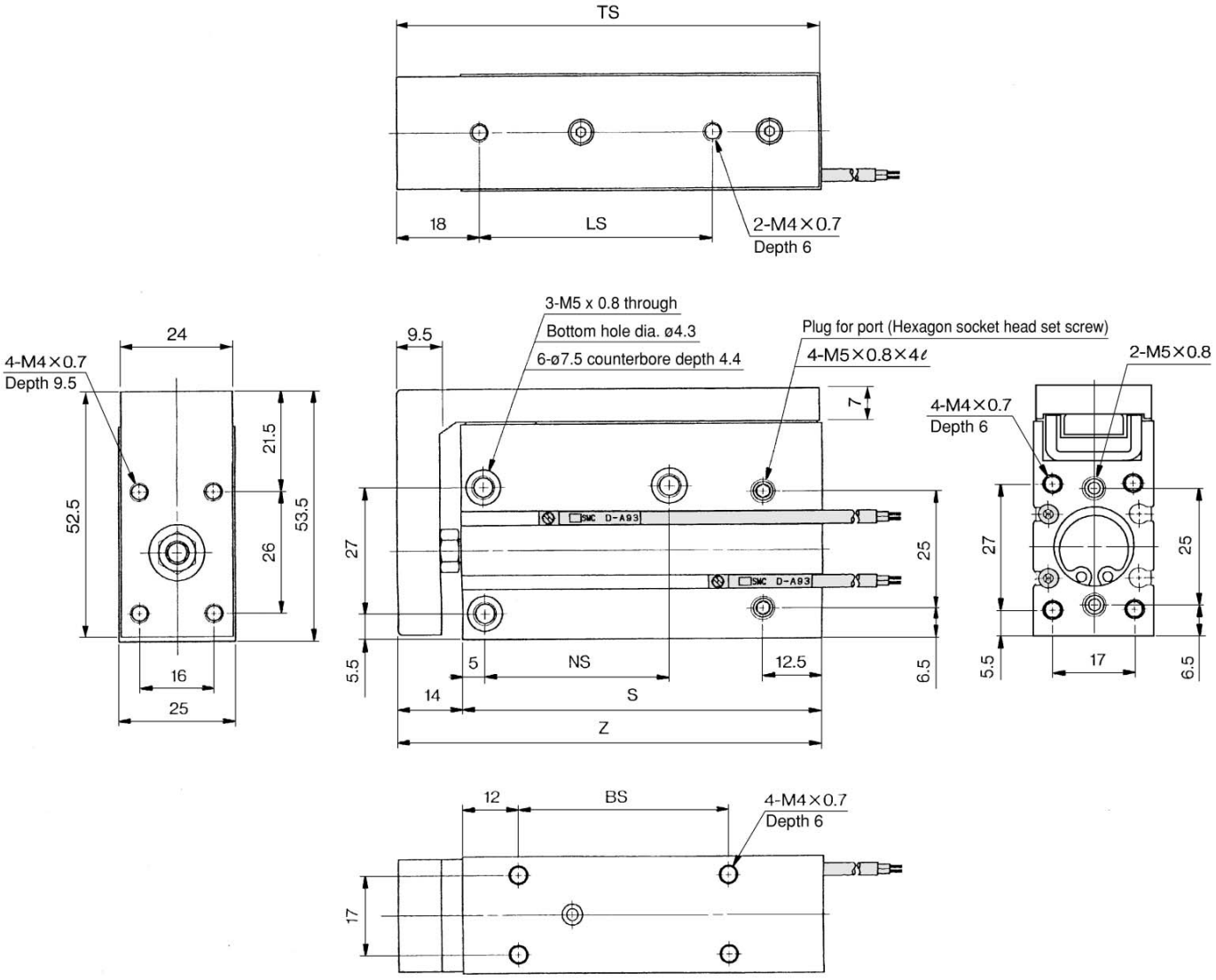
Dimensions: MXU10



(mm)

Stroke (mm)	BS	LS	NS	S	Z	TS
5	10	14	14	41.5	53	52.5
10	14	19	14	46.5	58	57.5
15	18	25	24	51.5	63	62.5
20	24	30	24	56.5	68	67.5
25	32	40	34	64.5	76	75.5
30	35	45	34	68.5	80	79.5

Dimensions: MXU16

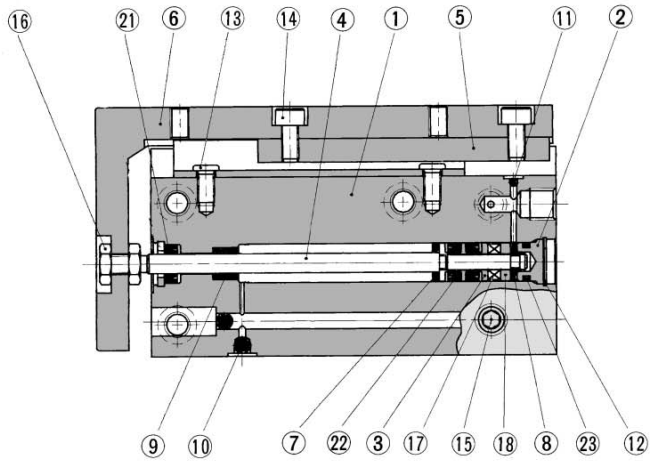


(mm)

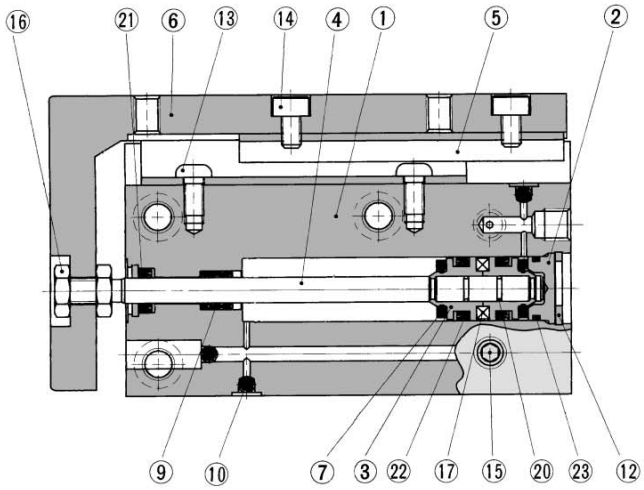
Stroke (mm)	BS	LS	NS	S	Z	TS
5	20	24	24	52	66	65.5
10	20	24	24	52	66	65.5
15	30	35	34	62	76	75.5
20	30	35	34	62	76	75.5
25	40	45	40	72	86	85.5
30	45	50	40	77	91	90.5

Construction

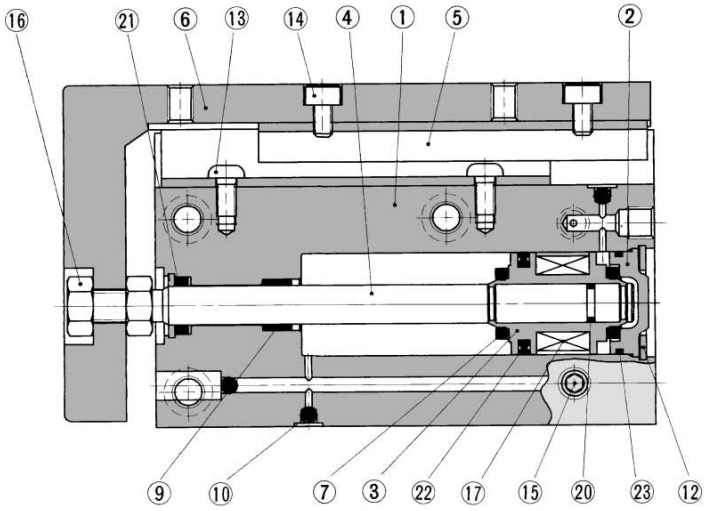
MXU6 (ø6)



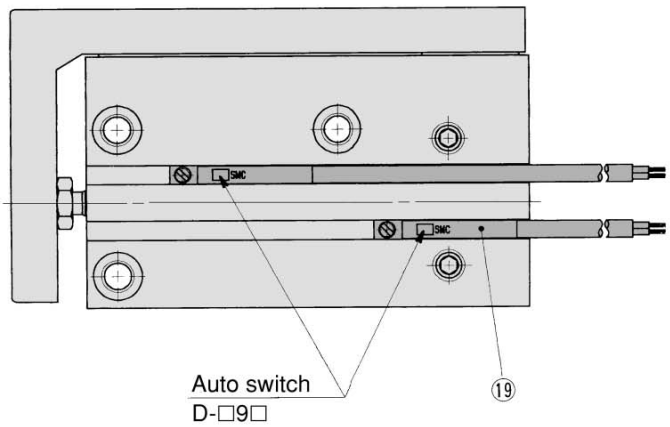
MXU10 (ø10)



MXU16 (ø16)



With auto switch



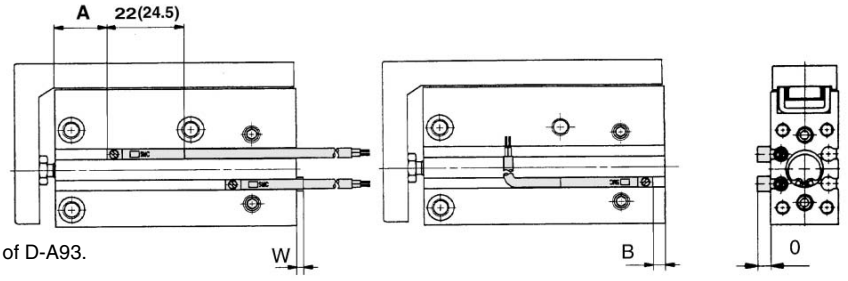
Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Head cover	Brass	ø6, ø10 Electroless nickel plated
		Aluminum alloy	ø16 Clear chromated
③	Piston	Brass	ø6, ø10
		Aluminum alloy	ø16
④	Piston rod	Stainless steel	
⑤	Miniature linear guide	—	
⑥	Table	Aluminum alloy	Hard anodized
⑦	Bumper A	Urethane	
⑧	Bumper B	Urethane	
⑨	Bushing	Oil-impregnated sintered alloy	Oil impregnated
⑩	Steel ball A	High carbon chrome bearing steel	
⑪	Steel ball B	High carbon chrome bearing steel	
⑫	Type C snap ring for hole	Carbon tool steel	Phosphate coated
⑬	Round head Phillips screw	Carbon steel	

No.	Description	Material	Note
⑭	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
⑮	Hexagon socket head plug	Chromium molybdenum steel	Nickel plated
⑯	Rod end nut	Carbon steel	Nickel plated
⑰	Magnet	Magnetic material	ø6, ø10 Nickel plated
		Synthetic rubber	ø16
⑱	Magnet holder	Brass	
⑲	Auto switch	—	D-□9□
⑳	Piston gasket	NBR	
㉑	Rod seal	NBR	
㉒	Piston seal	NBR	
㉓	Gasket	NBR	

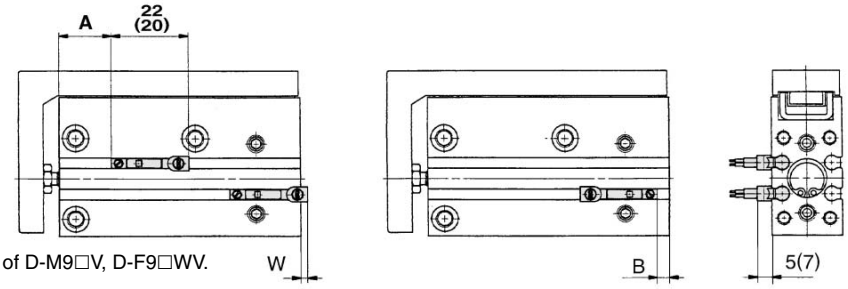
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

D-A9□
D-M9□
D-F9□W



( ): Denotes the values of D-A93.

D-A9□V
D-M9□V
D-F9□WV

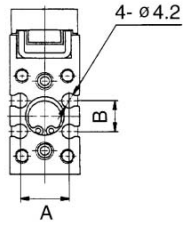


( ): Denotes the values of D-M9□V, D-F9□WV.

Bore size (mm)	Application stroke	D-A□, D-A9□V			D-M9□, D-F9□W			D-M9□V, D-F9□WV		
		A	B	W	A	B	W	A	B	W
6	5 to 30	13	0	2.5(5)	17	3.5	6.5	17	3.5	4.5
10	5 to 20	13	3.5	–1.5 (1)	17	7.5	2.5	17	7.5	0.5
	25	16			20			20		
	30	15			19			19		
16	5	23	4	–2 (0.5)	27	8	2	27	8	0
	10	18			22			22		
	15	23			27			27		
	20	18			22			22		
	25	23			27			27		
	30	23			27			27		

Note 1) Negative figures in the table W indicate an auto switch is mounted inward from the edge of the cylinder body.
Note 2) In the case of models with 5 and 10 strokes, the switch may not turn off within the operation range or two switches may turn on simultaneously. Fix switches outside 1 to 4 mm further than the values in the above table (if 1 switch is used, make sure that it turns ON and OFF properly; if 2 switches are used, make sure that both switches turn ON).
Note 3) ( ) in column W is the dimensions of D-A93.

Auto Switch Groove Position



Bore (mm)	A	B
6	10	6.9
10	14	8.8
16	19	13.9

Minimum Stroke for Auto Switch Mounting (mm)

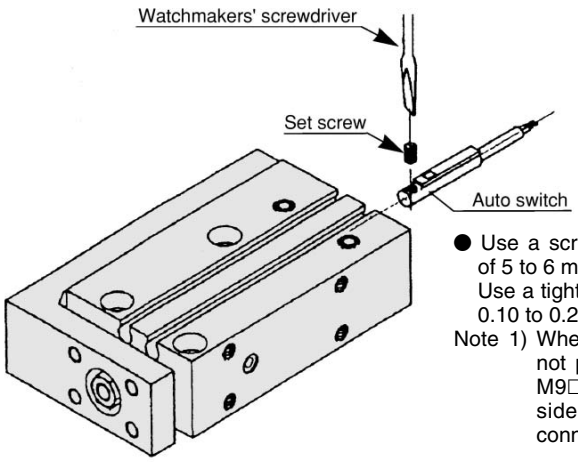
No. of auto switches mounted	Applicable auto switch model		
	D-A9□ D-A9□V	D-M9□ D-M9□V	D-F9□W D-F9□WV
1 pc.	5	5	5
2 pcs.	10	5	10

Operating Range

Auto switch model	Bore size (mm)		
	6	10	16
D-A9□/A9□V	5	6	9
D-M9□/M9□V D-F9□W/F9□WV	3 (2)	3.5 (2)	5.5 (3)

∗ Since this is a guideline including hysteresis, not meant to be guaranteed. (assuming approximately 30% dispersion.) There may be the case it will vary substantially depending on an ambient environment.
Note) Figures in parentheses are the cases for D-M9□, D-M9□V switch types.

Mounting of Auto Switch



● Use a screwdriver with a grip diameter of 5 to 6 mm to tighten the set screw. Use a tightening torque of approximately 0.10 to 0.20 N·m.

Note 1) When used with side piping, it is not possible to mount a D-A9□V, M9□V auto switch type on the side to which the piping is connected.

Caution on Installing in Close Proximity to Each Other

When compact slide cylinders equipped with D-A9□ or D-M9□ auto switches are used, the auto switches could activate unintentionally if the installed distance is less than the dimension shown in Table (1). Therefore, make sure to provide at least this much clearance. Due to unavoidable circumstances, if they must be used with less distance than the dimensions given in the table below, the cylinders must be shielded. Therefore, affix a steel plate or a magnetic shield plate (MU-S025) to the area on the cylinder that corresponds to the adjacent auto switch. (Please contact SMC for details.) The auto switch could activate unintentionally if a shield plate is not used.

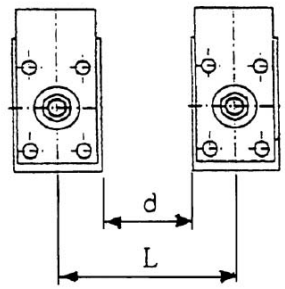


Table (1)

Bore size (mm)	d	L
MXU6	5	21
MXU10	5	25
MXU16	10	35

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted.
For detailed specifications, refer to page 8-30-1.

Type	Model	Electrical entry (Fetching direction)	Features
Reed switch	D-A90	Grommet (In-line)	Without indicator light
	D-A90V	Grommet (Perpendicular)	

∗ Normally closed (NC= b contact), solid state switch (D-F9G/F9H type) are also available. For details, refer to page 8-30-31.