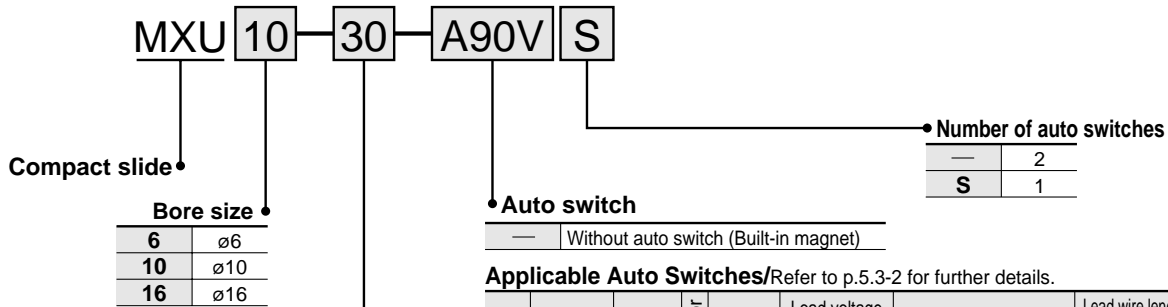


Compact Slide Series **MXU**

How to Order



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



Applicable Auto Switches/Refer to p.5.3-2 for further details.

Style	Special function	Electrical entry	Indicator	Wiring (output)	Load voltage		Auto switch model		Lead wire length*			Applicable load	
					DC	AC	Perpendicular	In-line	0.5 (—)	3 (L)	5 (Z)	IC circuit	Relay PLC
Reed switch	—	Grommet	No	2 wire	24V	5V 12V 100V or less	A90V	A90	●	●	—	IC circuit	Relay PLC
							A93V	A93	●	●	—	—	—
Reed switch	—	Grommet	Yes	3 wire (NPN)	—	5V	A96V	A96	●	●	—	IC circuit	—
							—	—	—	—	—	—	—
Solid state switch	Diagnostic indication (2 color indicator)	Grommet	Yes	3 wire (NPN)	24V	12V	F9NV	F9N	●	●	—	Relay PLC	—
				3 wire (PNP)			F9PV	F9P	●	●	—		
				2 wire			F9BV	F9B	●	●	—		
				3 wire (NPN)			F9NWV	F9NW	●	●	○		
				3 wire (PNP)			F9PWV	F9PW	●	●	○		
				2 wire			F9BWV	F9BW	●	●	○		

*Symbol for lead wire length 0.5m: — e.g.) A93

3m: L e.g.) A93L

5m: Z e.g.) F9NWZ

*Solid state switches marked with "○" are manufactured upon receipt of order.

Specifications

Cylinder bore (mm)	6	10	16
Fluid	Air		
Action	Double acting		
Port size	M5 X 0.8		
Max. operating pressure	0.7MPa		
Proof pressure	1.05MPa		
Ambient and fluid temperature	Without auto switch: -10 to +70°C With auto switch: -10 to +60°C		
Operation piston speed	50 to 500mm/sec		
Lubrication	Non-lube		
Cushion	Rubber bumper at both ends		
Allowable stroke tolerance	+1.0 0		
Auto switch (option)	Reed auto switch Solid state auto switch (2 wire style, 3 wire style)		

Min. Operating Pressure

MPa

Cylinder bore (mm)	6	10	16
Min. operating pressure	0.12	0.06	0.06

Theoretical Force Table

Unit: 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 p.3.10-10 for minimum cylinder stroke for mounting auto switches.

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 Loading Weight

(g)

Model	Max. loading weight
MXU6	100
MXU10	200
MXU16	400

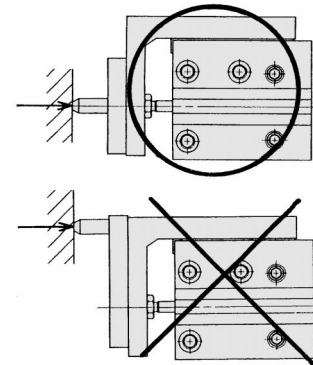
Allowable Moment

Model	Stroke	Allowable moment (Nm)			Moment center position distance compensation amount (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	

⚠ Precaution

Be sure to read before handling. Refer to p.0-39 to 0-43 for Safety Instruction and common precautions.

- ⚠ Caution**
- 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.
 - In terms of the load weight and moment, the cylinder must be operated below the maximum load weight and allowable moment.
 - 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 diagram below.)



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

Expression of Calculation of Allowable Fp, Fy, Fr

Pitch moment	Yaw moment	Roll moment
$F_p = \frac{M_1 \times 1000}{L_p + C_p + (St/2)} \text{ (N)}$	$F_y = \frac{M_2 \times 1000}{L_y + C_y + (St/2)} \text{ (N)}$	$F_r = \frac{M_3 \times 1000}{L_r + C_r} \text{ (N)}$
<p>Lp: Distance between table and loading point (mm) Cp: Moment center position distance compensation amount (mm) St: Stroke (mm)</p>	<p>Ly: Distance between table and loading point (mm) Cy: Moment center position distance compensation amount (mm) St: Stroke (mm)</p>	<p>Lr: Distance between table and loading point (mm) Cr: Moment center position distance compensation amount (mm)</p>

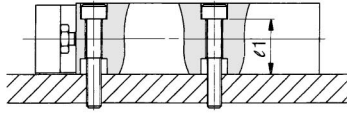
- CL
- MLGC
- CNA
- CB
- CV/MVG
- CXW
- CXS
- CXT
- MX
- MXU**
- MXS
- MXQ
- MXF
- MXW
- MXP
- MG
- MGP
- MGQ
- MGG
- MGC
- MGF
- CY1
- MY1

Series MXU

Compact Slide Mounting

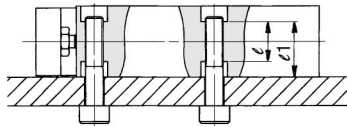
The compact slide can be mounted in four directions. Select the best direction according to the machine and work to be used.

Lateral mounting (Body through hole)



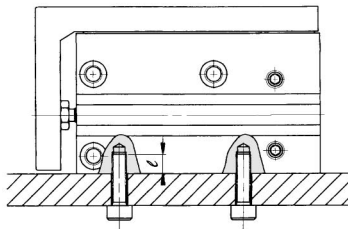
Model	Bolt	Max. torque Nm	ℓ1
MXU6	M3 X 0.5	1.1	12.7
MXU10	M4 X 0.7	2.5	15.6
MXU16	M4 X 0.7	2.5	20.6

Lateral mounting (Body tapped)



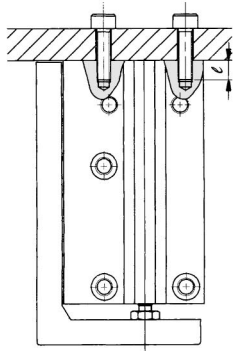
Model	Bolt	Max. torque Nm	ℓ1	ℓ
MXU6	M4 X 0.7	2.5	12.7	9.4
MXU10	M5 X 0.8	5.1	15.6	11.2
MXU16	M5 X 0.8	5.1	20.6	16.2

Vertical mounting (Body tapped)



Model	Bolt	Max. torque Nm	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)

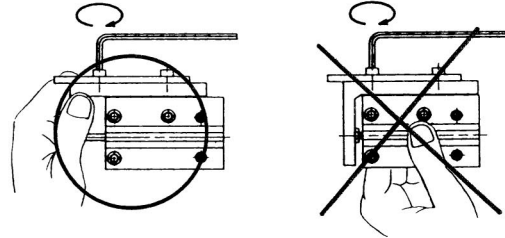


Model	Bolt	Max. torque Nm	ℓ
MXU6	M3 X 0.5	1.1	4.8
MXU10	M4 X 0.7	2.5	6
MXU16	M4 X 0.7	2.5	6

Work Mounting

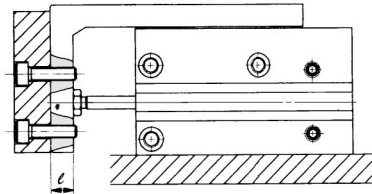
Work can be mounted on two sides of the compact slide.

- The table is supported by miniature linear guide. Be careful not to apply strong impacts or excessive moments when mounting work.
- 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.



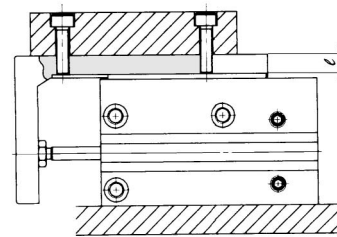
- Select the best method for connection with the load having a supporting/guiding mechanism on its outside. Alignment should be complete.
- Scratches or dents on the sliding section of the piston rod cause malfunction or air leakage.

Front face mounting



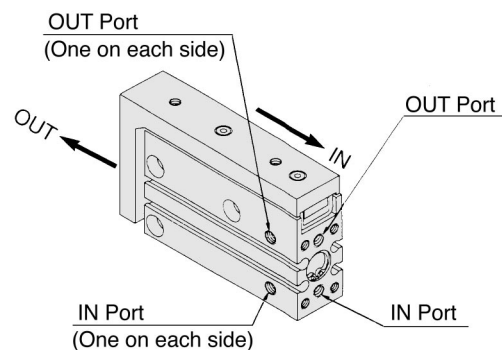
Model	Bolt	Max. torque Nm	ℓ
MXU6	M3 X 0.5	1.1	5
MXU10	M4 X 0.7	2.5	7
MXU16	M4 X 0.7	2.5	9.5

Top face mounting

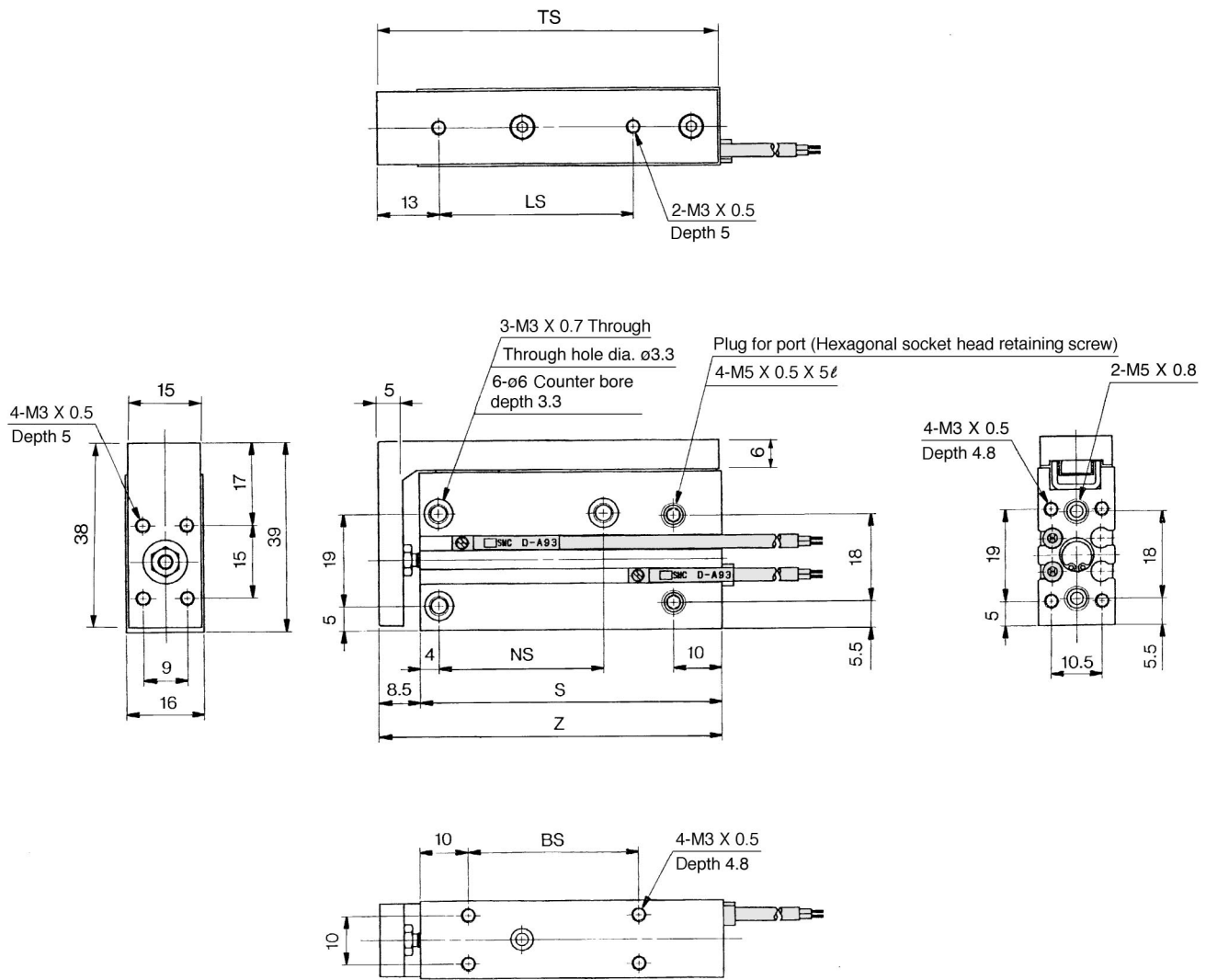


Model	Bolt	Max. torque Nm	ℓ
MXU6	M3 X 0.5	1.1	5
MXU10	M4 X 0.7	2.5	6
MXU16	M4 X 0.7	2.5	6

Operational Direction for Each Pressure Port



Dimensions MXU **6** (ø6)



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

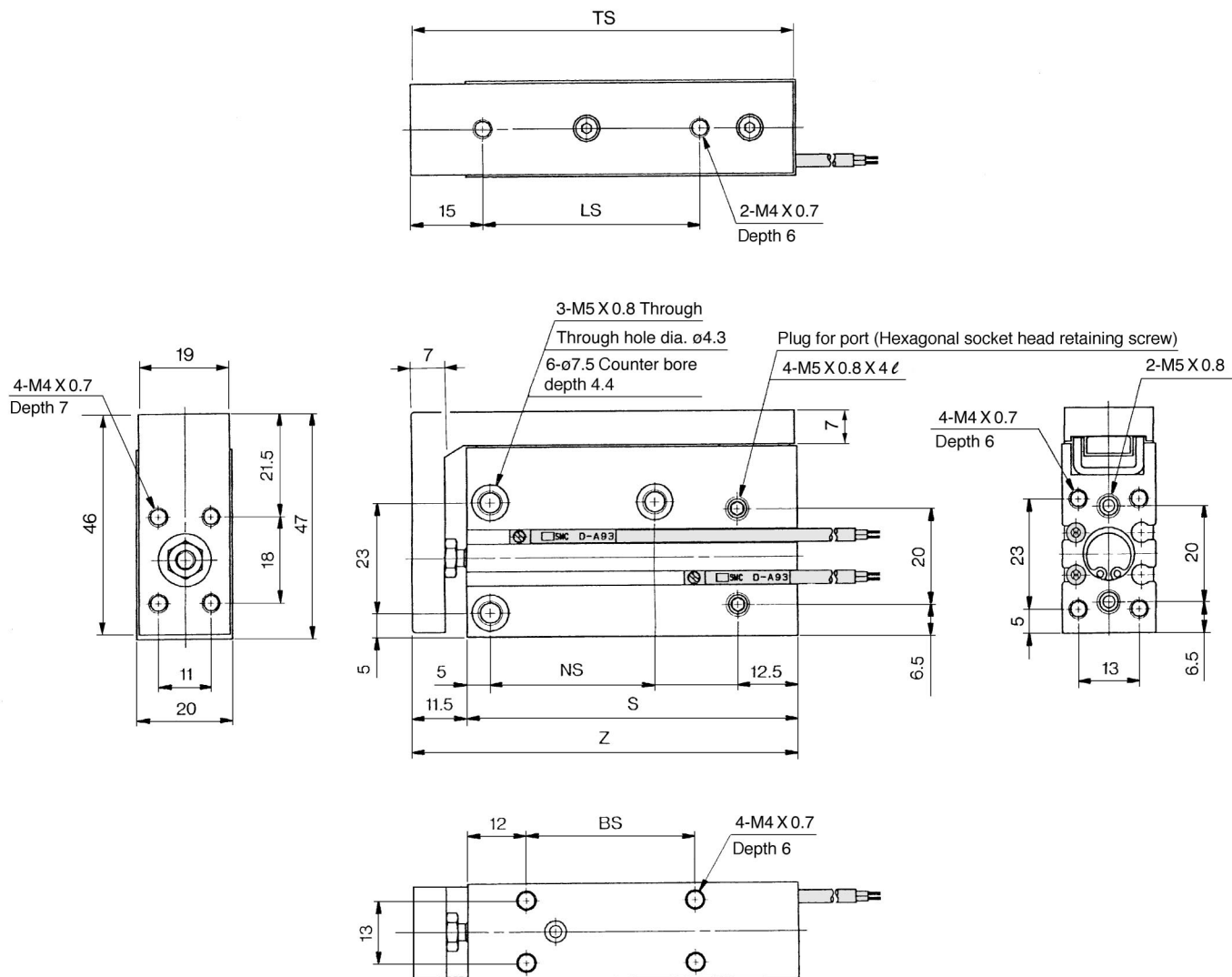
- CL
- MLGC
- CNA
- CB
- CV/MVG
- CXW
- CXS
- CXT
- MXU**
- MXS
- MXQ
- MXF
- MXW
- MXP
- MG
- MGP
- MGQ
- MGG
- MGC
- MGF
- CY1
- MY1



- MXU6-5.....SMXU6, #1 (#1+#7)
- MXU6-10.....SMXU6, #2 (#2+#7)
- MXU6-15.....SMXU6, #3 (#3+#7)
- MXU6-20.....SMXU6, #4 (#4+#7)
- MXU6-25.....SMXU6, #5 (#5+#7)
- MXU6-30.....SMXU6, #6 (#6+#7)

Series MXU

MXU 10 (ø10)

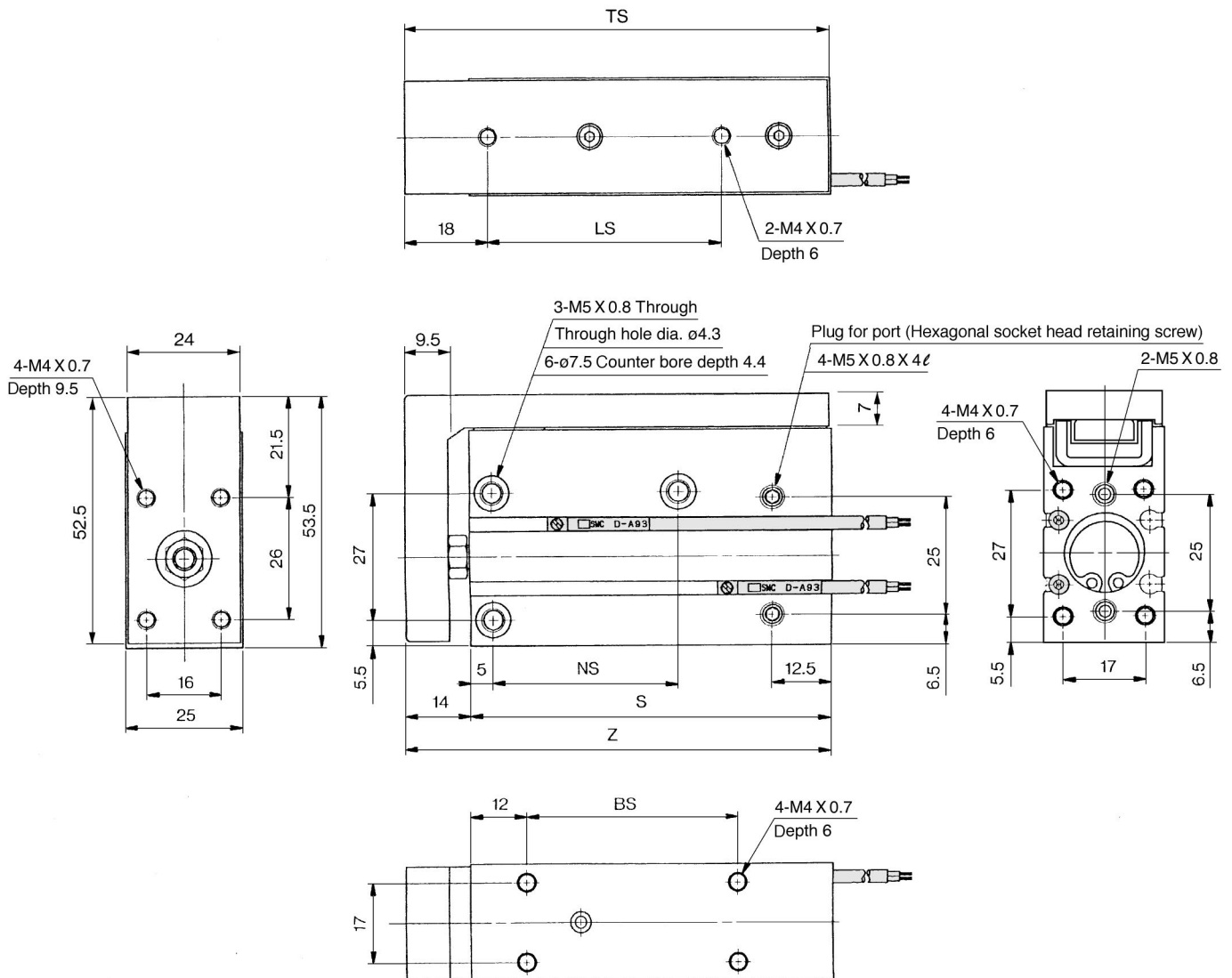


Stroke (mm)	BS	LS	NS	S	Z	TS
5	10	14	14	41.5	53	52.5
10	14	19	14	46.5	58	57.5
15	18	25	24	51.5	63	62.5
20	24	30	24	56.5	68	67.5
25	32	40	34	64.5	76	75.5
30	35	45	34	68.5	80	79.5



MXU10-5.....SMXU10, #1(#1+#7)
 MXU10-10.....SMXU10, #2(#2+#7)
 MXU10-15.....SMXU10, #3(#3+#7)
 MXU10-20.....SMXU10, #4(#4+#7)
 MXU10-25.....SMXU10, #5(#5+#7)
 MXU10-30.....SMXU10, #6(#6+#7)

Dimensions MXU **16** (ø16)



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

- CL
- MLGC
- CNA
- CB
- CV/MVG
- CXW
- CXS
- CXT
- MX
- MXU**
- MXS
- MXQ
- MXF
- MXW
- MPX
- MG
- MGP
- MGQ
- MGG
- MGC
- MGF
- CY1
- MY1

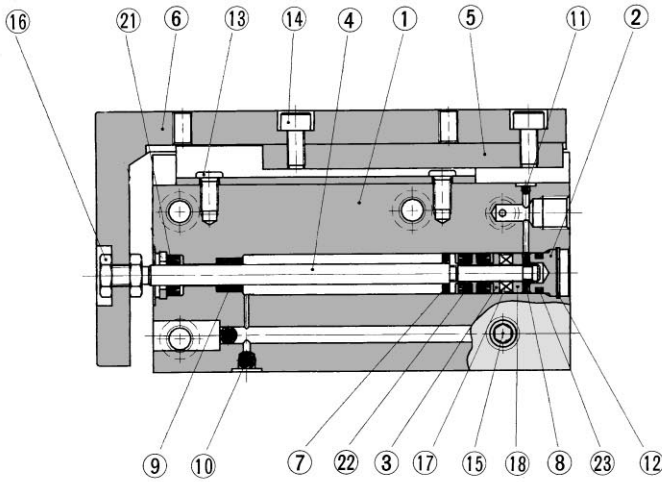


- MXU16-5.....SMXU16, #1 (#1+#7)
- MXU16-10.....SMXU16, #2 (#2+#7)
- MXU16-15.....SMXU16, #3 (#3+#7)
- MXU16-20.....SMXU16, #4 (#4+#7)
- MXU16-25.....SMXU16, #5 (#5+#7)
- MXU16-30.....SMXU16, #6 (#6+#7)

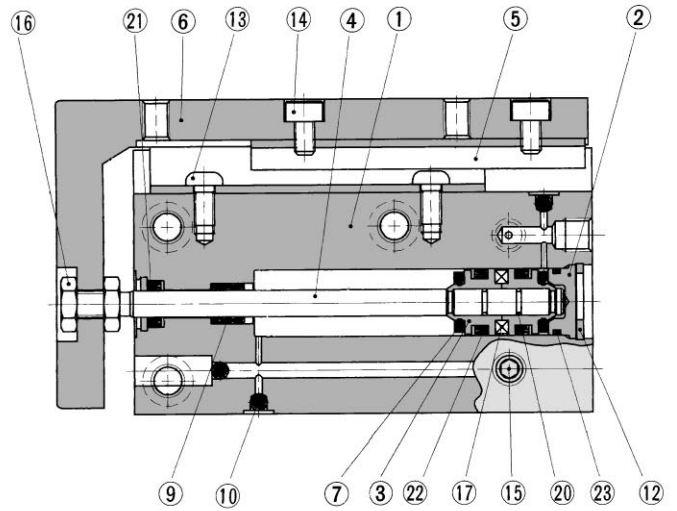
Series MXU

Construction

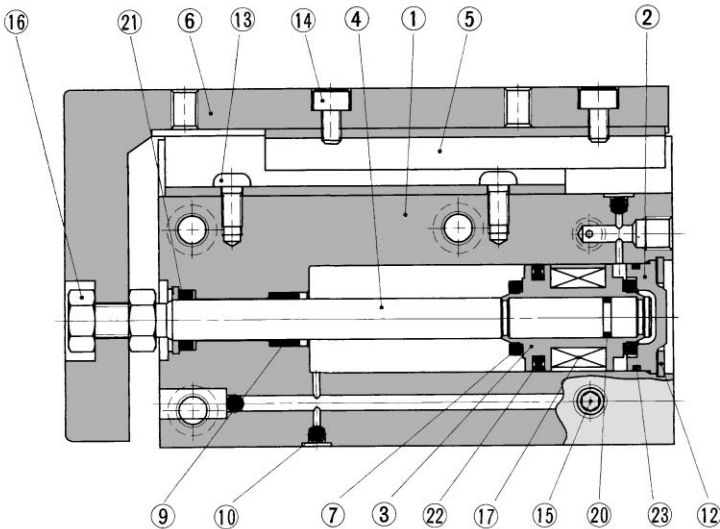
MXU6 (ø6)



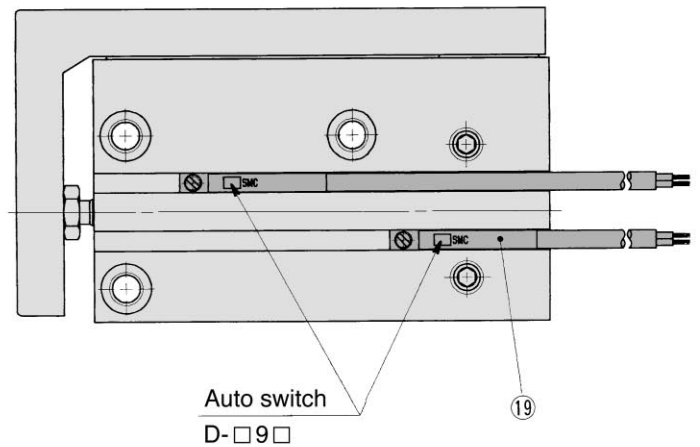
MXU10 (ø10)



MXU16 (ø16)



With auto switch



Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Head cover	Brass	ø6, ø10Electroless nickel plated
		Aluminum alloy	ø16White 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	Damper A	Urethane	
⑧	Damper B	Urethane	
⑨	Bush	Oil impregnated sintered alloy	Oil impregnated
⑩	Steel ball A	Hi-carbon chromium bearing	
⑪	Steel ball B	Hi-carbon chromium bearing	
⑫	For hole C type retaining ring	Carbon tool steel	Phosphate coated
⑬	Cross-recessed pan-head screw	Carbon steel	

Component Parts

No.	Description	Material	Note
⑭	Hex. socket head cap screw	Chrome molybdenum steel	Nickel plated
⑮	Hex. socket head plug	Chrome molybdenum steel	Nickel plated
⑯	Rod end nut	Carbon steel	Nickel plated
⑰	Magnet	Magnet	ø6, ø10Nickel 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	

Solid-state Auto Switches for Direct Mounting Series D-M9N(V)/D-M9P(V)/D-M9B(V)



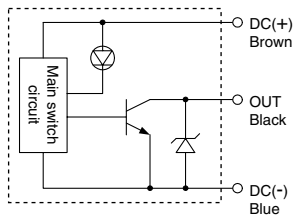
Grommet

- Reduced load currents for two-wire model (2.5 to 40 mA)
- Compliance with lead-free requirements
- Use of UL-approved lead wires (style 2844)

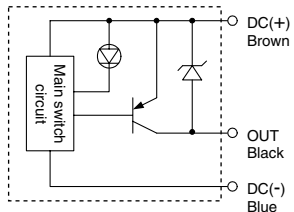


Internal circuits

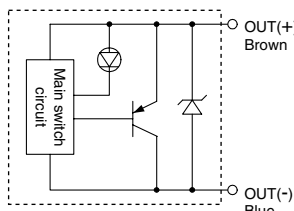
D-M9N/M9NV



D-M9P/M9PV



D-M9B/M9BV



Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□/D-M9□V (with Indicator light)						
Model number	D-M9N	D-M9NV	D-M9P	D-M9PV	D-M9B	D-M9BV
Electrical entry	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring	Three-wire			Two-wire		
Output	NPN		PNP		—	
Applicable load	Integrated circuit, relay and PLC				24 V DC relay and PLC	
Power voltage	5, 12, or 24 V DC (4.5 to 28 V DC)				—	
Current consumption	10 mA or less				—	
Load voltage	28 V DC or less		—		24 V DC (10 to 28 V DC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less				4 V or less	
Leakage current	100 μA max. at 24 V DC				0.8 mA or less	
Indicator light	Red LED lights when ON.					

- Lead wire: oil-proof heavy-duty vinyl cable
2.7 x 3.2 with elliptic cross-section, 0.15 mm², two cores (D-M9B),
or three cores (D-M9N and D-M9P)

Solid state switch specifications

Leakage current	3-wire: 100 μA or less; 2-wire: 0.8 mA max.
Operating time	1 ms or less
Impact resistance	1000 m/s ²
Insulation resistance	50 MΩ or more at 500 V DC (between lead wire and case)
Withstand voltage	1000 V AC for 1 min. (between lead wire and case)
Ambient temperature	-10°C to 60°C
Enclosure	IEC529 standard IP67, JIS C 0920 watertight construction

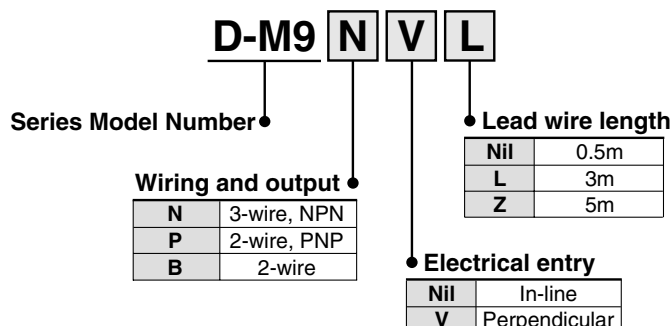
Weight

Unit: g

Model	D-M9N(V)	D-M9P(V)	D-M9B(V)
Lead wire length (m)	0.5	8	7
	3	41	38
	5	68	63

How to Order

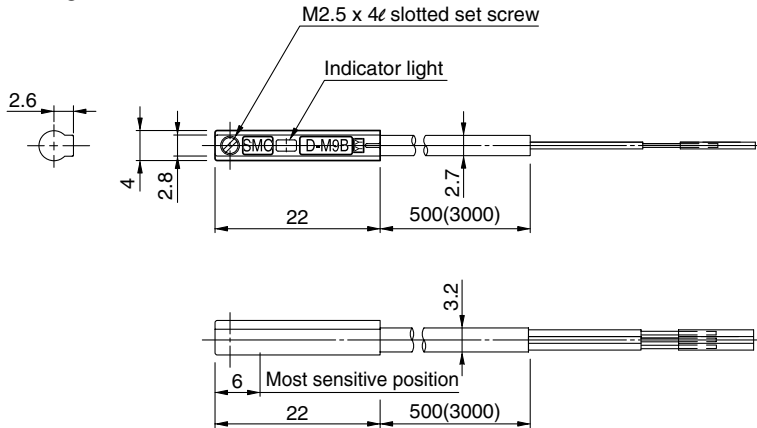
Standard Model Number



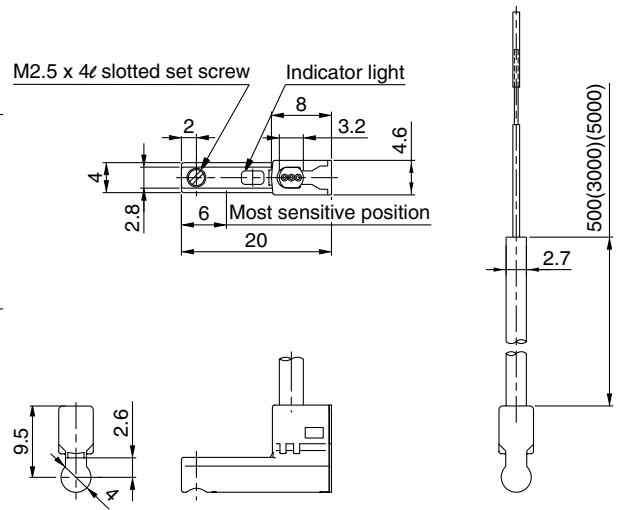
Series D-M9

Auto Switch Dimensions

D-M9□



D-M9□V



⚠ Specific Product Precautions

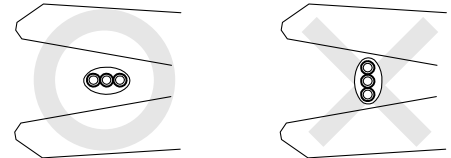
Be sure to read before handling. Contact SMC when the required specification is out of range.

Handling

⚠ Caution

Observe the following precautions when handling the product.

- The D-M9 series of auto switches is not overcurrent-protected. Faulty wiring or short circuit may result in breakage or burning-out of the switch.
- When stripping the cable clad, be careful about the orientation of the cable being stripped. The insulator may be accidentally torn or damaged depending on the orientation, as shown on the right.



- We recommend the following tools

Manufacturer	Product name	Product number
VESSEL	Wire stripper	No 3000G
Tokyo Ideal	Strip master	45-089

* The stripper for the round shape cords (ø2.0) is for a 2-wire style.

- Please do not attach the switch with any other screws than those already attached to the auto switch body.

The operation range is shorter than that of the conventional models.

If the auto switch replaces the conventional model, it may not function depending on its application because the operation range is shorter. Refer to the examples below.

- In an application where at the end, the stopping position shifting range is larger than the operation range. For example, pushing a work against something, or pressing a work into a hole, or clamping a work.
- In an application where the auto switch is used to detect an intermediate stopping position. (Detecting time is shortened.)

Note) Please contact SMC for the operation range details for each actuator.

The switch is damaged instantly when a load is shortened since short circuit protection is not built-in. Pay special attention to avoid reversing the connection of the brown lead of the power supply line and the black output line connection.