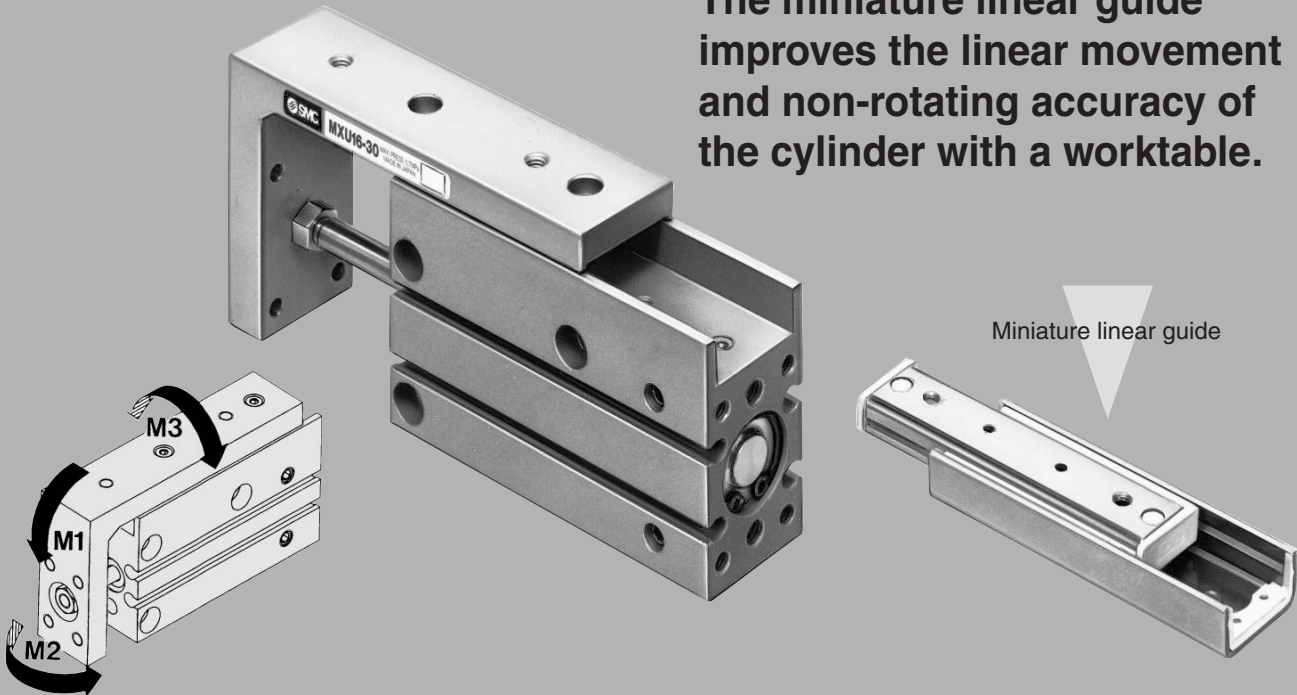


Compact Slide Series MXU

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.



- MX□
- MTS
- MY□
- CY□
- MG□
- CX□
- D-
- X
- 20-
- Data

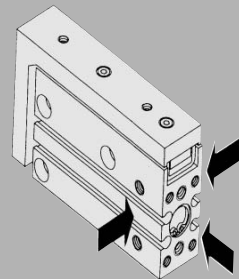
Displacement accuracy against moments

- Table edge displacement
- Table turning angle
- M1 (Pitch moment): **0.02 mm or less**
- M2 (Yaw moment): **0.01 mm or less**
- 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

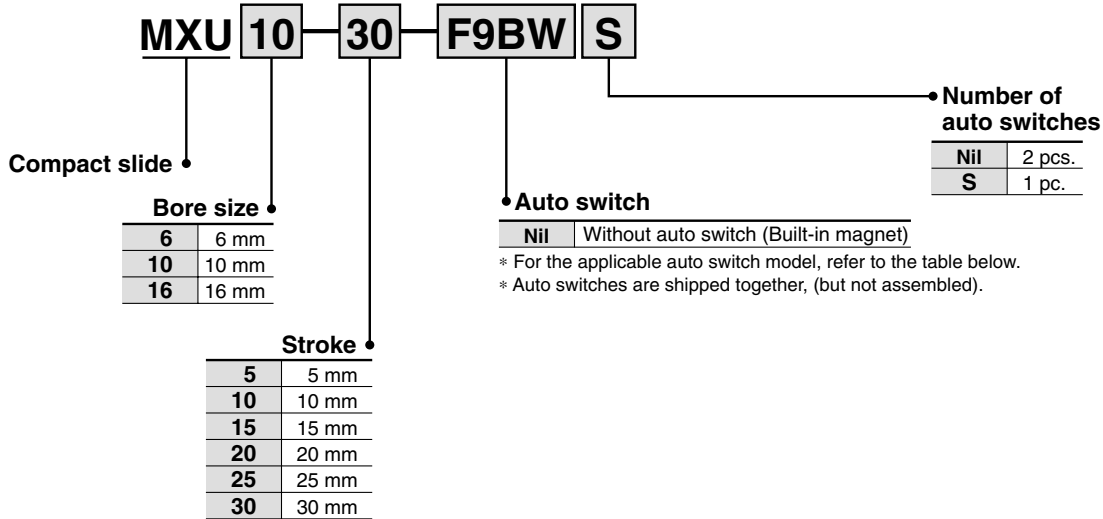
| | | | |
|--|---|---|--|
| <p>Vertical mounting (Body tapped)</p> <p>3 in parallel (Dispenser)</p> | <p>Lateral mounting (Body through-hole)</p> <p>Transferring of component parts</p> | <p>Lateral mounting (Body tapped)</p> <p>Absorbing precisely</p> | <p>Axial mounting (Body tapped)</p> <p>Positioning of pin</p> |
|--|---|---|--|

Compact Slide

Series *MXU*

ø6, ø10, ø16

How to Order



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) | IC circuit | | Relay, PLC | |
| | | | | | | | | | | | | | | | 24 V |
| Reed switch | — | Grommet | Yes | 3-wire (NPN equivalent) | — | 5 V | — | A96V | A96 | ● | ● | — | — | — | — |
| | | | | 2-wire | 24 V | 12 V | 100 V | A93V | A93 | ● | ● | — | — | — | Relay, PLC |
| Solid state switch | Diagnostic indication (2-color indication) | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9NV | M9N | ● | ● | ○ | ○ | — | IC circuit |
| | | | | 3-wire (PNP) | | | | M9PV | M9P | ● | ● | ○ | ○ | — | IC circuit |
| | | | | 2-wire | | | | M9BV | M9B | ● | ● | ○ | ○ | — | — |
| | | | | 3-wire (NPN) | | | | F9NVV | F9NW | ● | ● | ○ | ○ | — | IC circuit |
| | | | | 3-wire (PNP) | | | | F9PVV | F9PW | ● | ● | ○ | ○ | — | IC circuit |
| | | | | 2-wire | | | | F9BVV | 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.

Compact Slide Series MXU



Made to Order

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

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

Theoretical Output

| 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

| 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 |

MX□

MTS

MY□

CY□

MG□

CX□

D-

-X

20-

Data

Series MXU

Allowable Moment

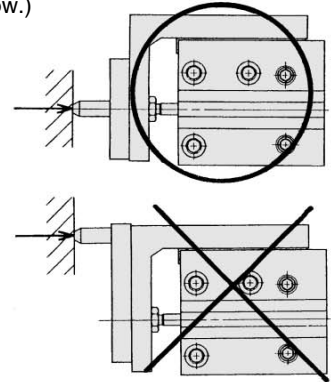
| Model | Stroke | Allowable moment (N·m) | | | Correction value of moment center position distance (mm) | |
|-------|--------|------------------------|-------|-------|--|-----|
| | | M1 | M2 | M3 | Cp, Cy | Cr |
| MXU6 | 5 | 0.046 | 0.040 | 0.049 | 28.3 | 7.5 |
| | 10 | 0.046 | 0.040 | 0.049 | 28.3 | |
| | 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

- 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 figure below.)



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

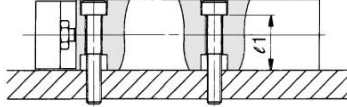
Expression of Calculation of Allowable Fp, Fy, Fr

| Pitch moment | Yaw moment | Roll moment |
|---|---|---|
| <p>$F_p = L_p \times C_p \times (St/12) \text{ (N)}$</p> <p>Lp: Distance between table and loading point (mm) Cp: Correction value of moment center position distance (mm) St: Stroke (mm)</p> | <p>$F_y = L_y \times C_y \times (St/12) \text{ (N)}$</p> <p>Ly: Distance between table and loading point (mm) Cy: Correction value of moment center position distance (mm) St: Stroke (mm)</p> | <p>$F_r = L_r \times C_r \text{ (N)}$</p> <p>Lr: Distance between table and loading point (mm) Cr: Correction value of moment center position distance (mm)</p> |

Mounting of Compact Slide

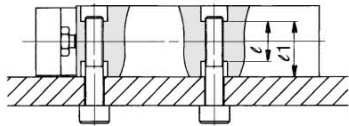
The compact slide can be mounted in four directions. Select the best direction according to the machine and work to be used.

Lateral Mounting (Body through-hole)



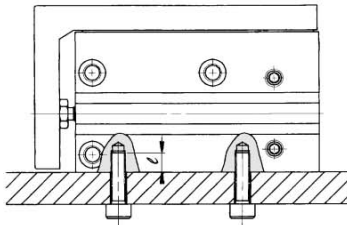
| Model | Bolt | Maximum tightening torque (N-m) | l |
|--------------|----------|---------------------------------|------|
| MXU6 | M3 x 0.5 | 1.1 | 12.7 |
| MXU10 | M4 x 0.7 | 2.5 | 15.6 |
| MXU16 | M4 x 0.7 | 2.5 | 20.6 |

Lateral Mounting (Body tapped)



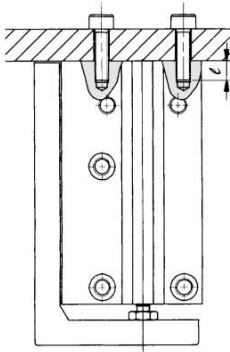
| Model | Bolt | Maximum tightening torque (N-m) | l | l_1 |
|--------------|----------|---------------------------------|------|-------|
| MXU6 | M4 x 0.7 | 2.5 | 12.7 | 9.4 |
| MXU10 | M5 x 0.8 | 5.1 | 15.6 | 11.2 |
| MXU16 | M5 x 0.8 | 5.1 | 20.6 | 16.2 |

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)

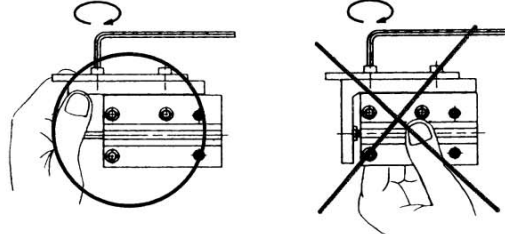


| Model | Bolt | Maximum tightening torque (N-m) | l |
|--------------|----------|---------------------------------|-----|
| MXU6 | M3 x 0.5 | 1.1 | 4.8 |
| MXU10 | M4 x 0.7 | 2.5 | 6 |
| MXU16 | M4 x 0.7 | 2.5 | 6 |

Mounting of Workpiece

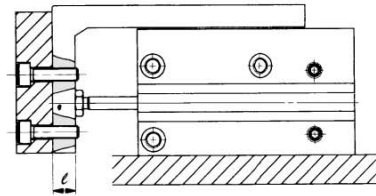
Workpieces can be mounted on 2 surfaces of the compact slide.

- 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.



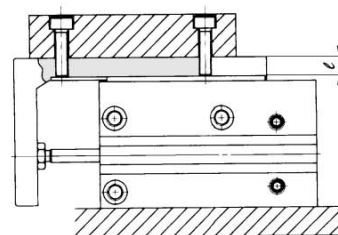
- When tightening the work on the table with bolts, it should be done while holding the table. If holding the body, it may cause more than allowable moment to the guide, leading to decrease in accuracy.
- For connection with a load having an external support/guide mechanism, select an appropriate connection 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



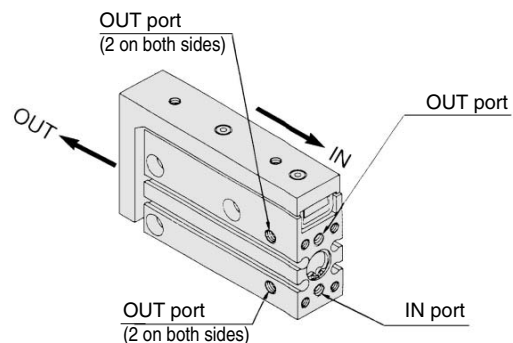
| Model | Bolt | Maximum tightening torque (N-m) | l |
|--------------|----------|---------------------------------|-----|
| MXU6 | M3 x 0.5 | 1.1 | 5 |
| MXU10 | M4 x 0.7 | 2.5 | 7 |
| MXU16 | M4 x 0.7 | 2.5 | 9.5 |

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



MX□

MTS

MY□

CY□

MG□

CX□

D-

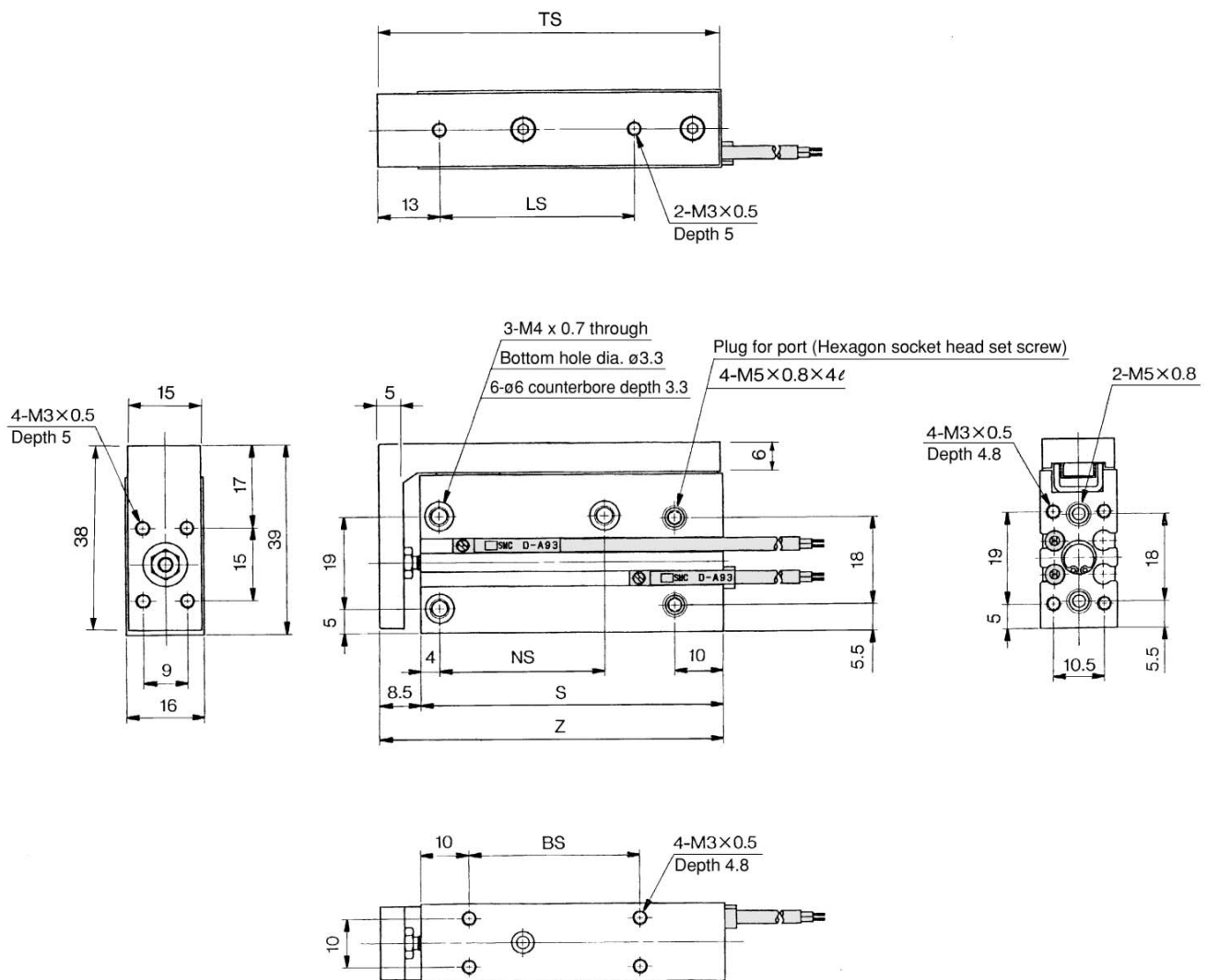
-X

20-

Data

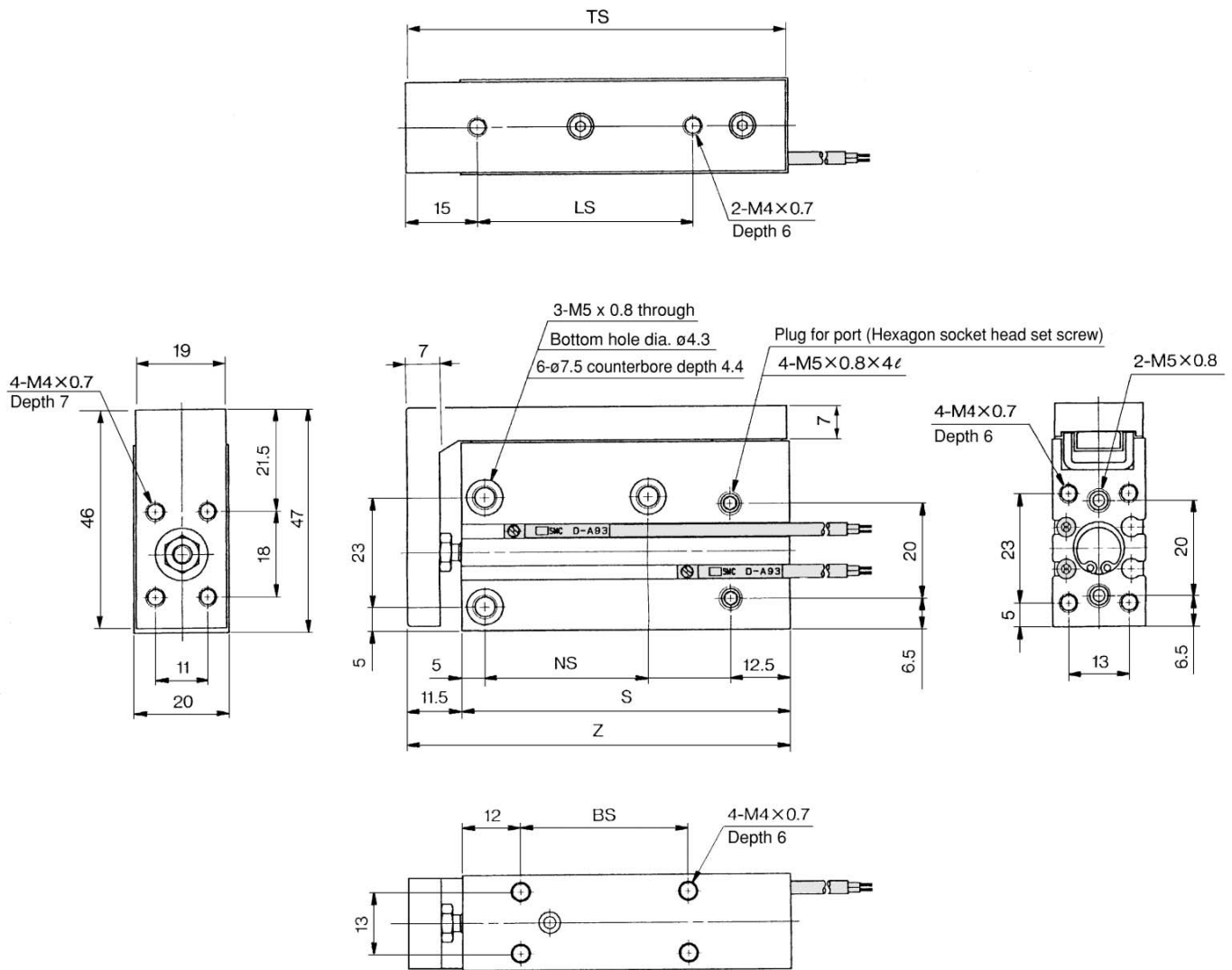
Series MXU

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 |

MX□

MTS

MY□

CY□

MG□

CX□

D-

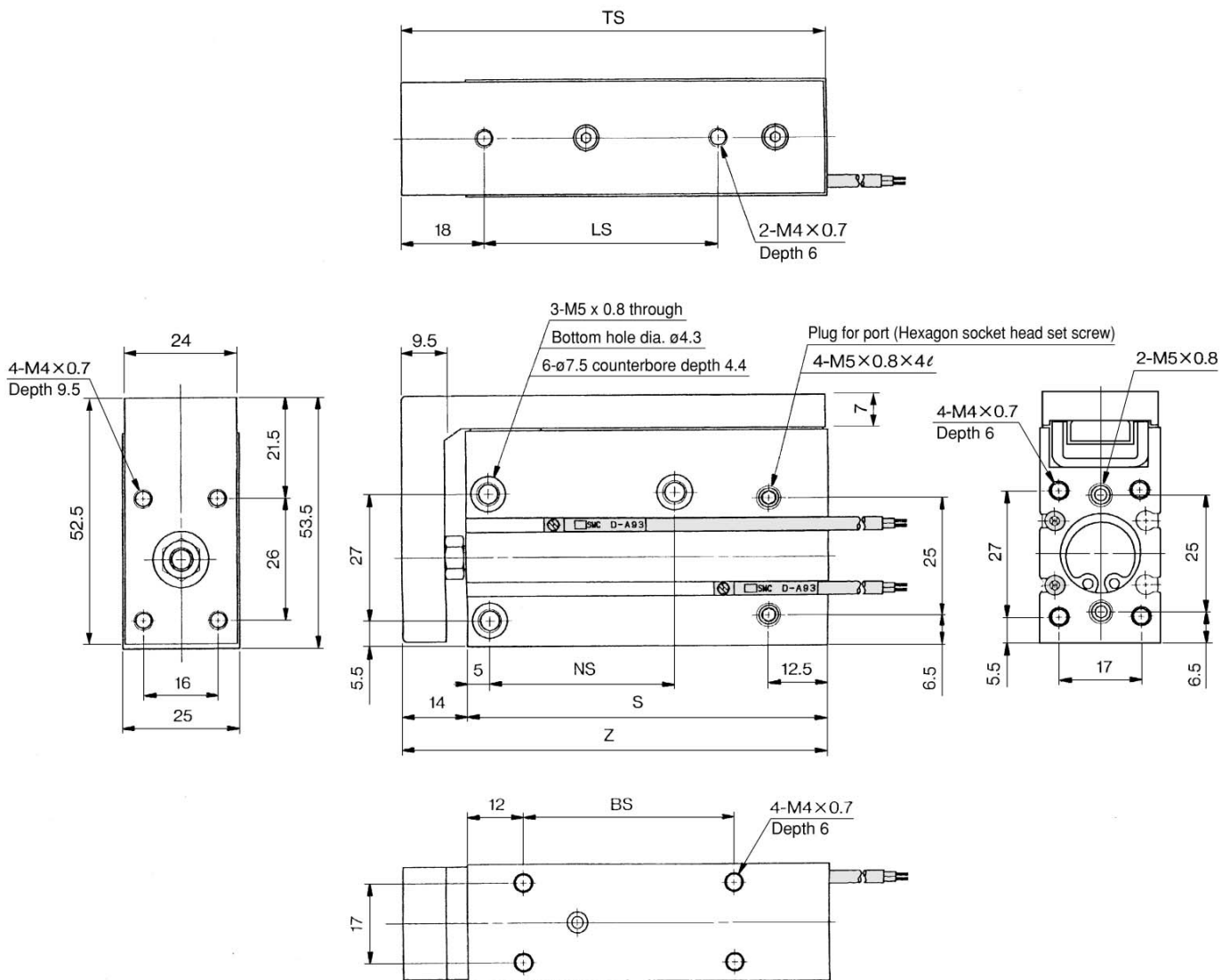
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Data

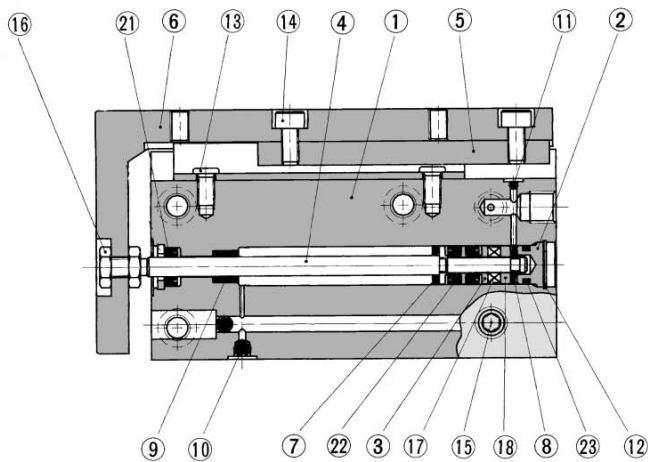
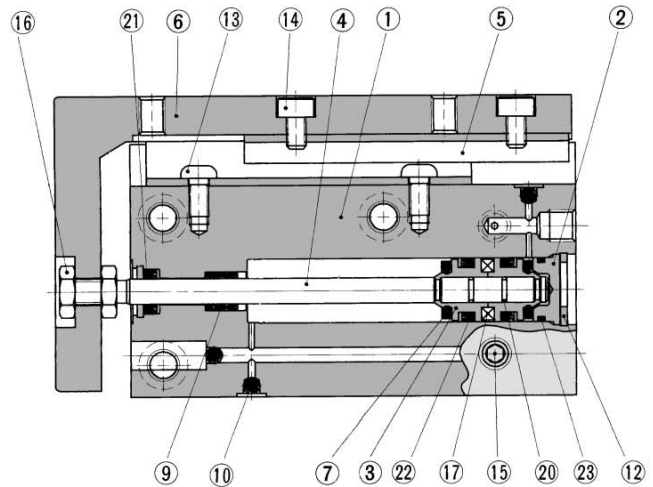
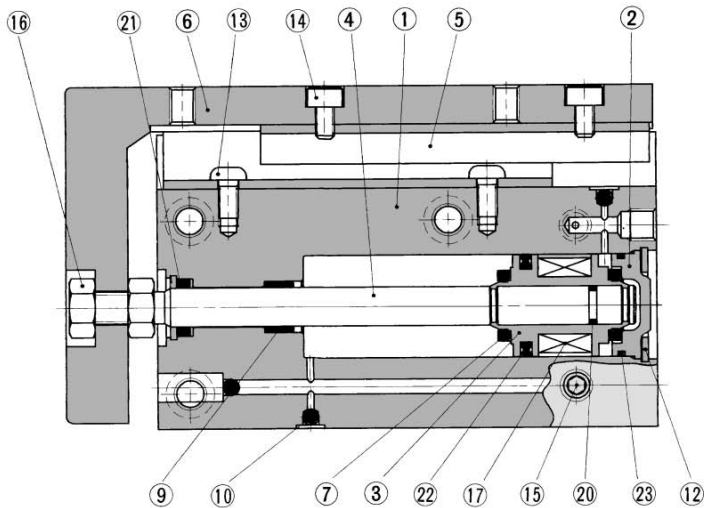
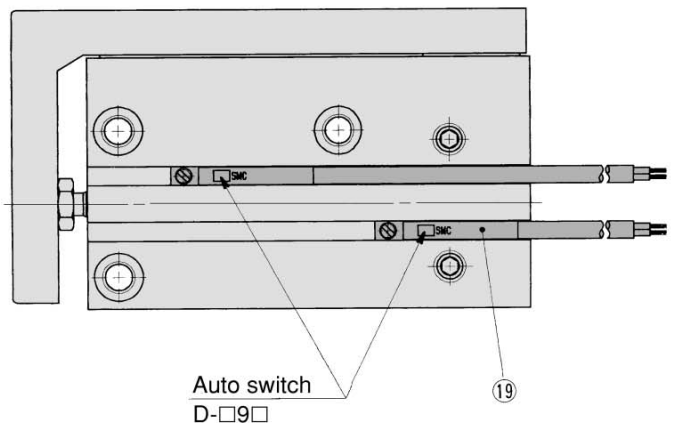
Series MXU

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**

MX□

MTS

MY□

CY□

MG□

CX□

D-

-X

20-

Data

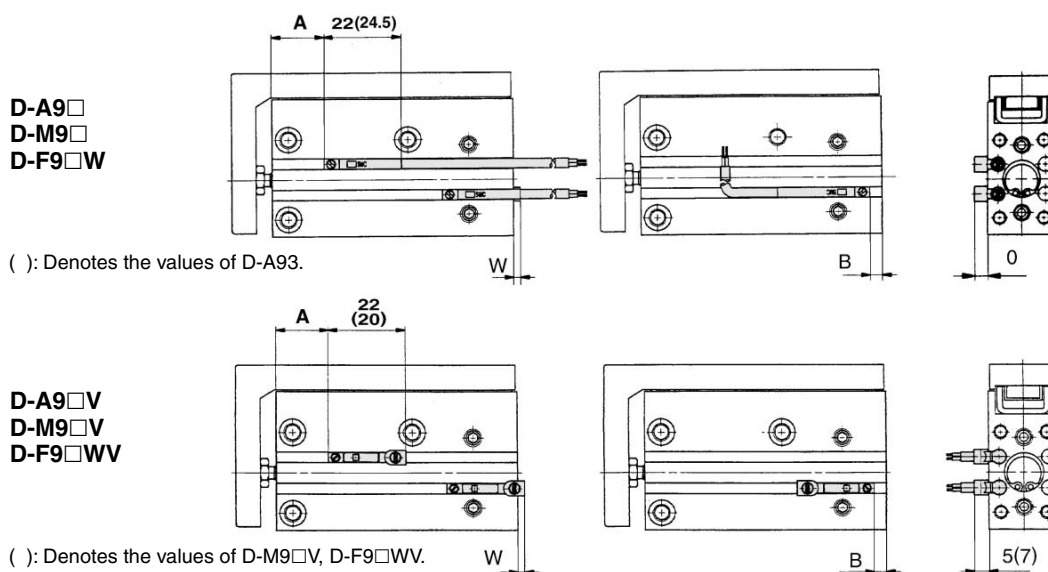
Component Parts

| 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 | |

Series MXU

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



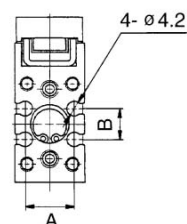
| Bore size (mm) | Application stroke | D-A□, D-A9□V | | | D-M9□, D-F9□W | | | D-M9□V, D-F9□WV | | |
|----------------|--------------------|--------------|-----|-------------|---------------|-----|-----|-----------------|-----|-----|
| | | A | B | W | A | B | W | A | B | W |
| 6 | 5 to 30 | 13 | 0 |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

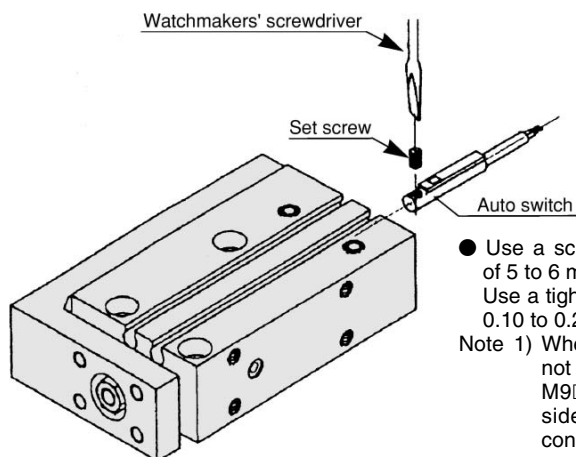
| No. of auto switches mounted | Applicable auto switch model | | |
|------------------------------|------------------------------|-----------------|-------------------|
| | D-A9□ D-A9□V | D-M9□ D-M9□V | D-F9□W D-F9□WV |
| 1 pc. | 5 | 5 | 5 |
| 2 pcs. | 10 | 5 | 10 |

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.

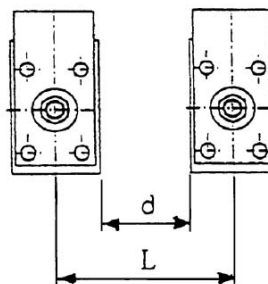


Table (1)

| 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.

MX□

MTS

MY□

CY□

MG□

CX□

D-

-X

20-

Data