

Series CQSX

ø12, ø16, ø20, ø25

The dimensions are the same as the standard double acting single rod cylinder; refer to the series CQS/CDQS section in "Best Pneumatics No. 2"

How to Order

**Without
Auto Switch**

CQSX B 20 30 D

**With
Auto Switch**

CDQSX B 20 30 D A90

With auto switch
(built-in magnet)

Microspeed cylinder

Mounting

B	Through hole/ Double end tapped common (standard)
L	Foot type
F	Front flange type
G	Rear flange type
D	Double clevis type

Bore size

12	12mm
16	16mm
20	20mm
25	25mm

Cylinder stroke (mm)

Bore size (mm)	Standard stroke (mm)
12, 16	5, 10, 15, 20, 25, 30
20	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
25	

• **Manufacturing intermediate strokes**
Intermediate strokes can be manufactured in 1mm increments by installing spacers in a standard stroke cylinder. The cylinder length is the same as the longer standard cylinder.

Example) For CQSXB25-47D, a 3mm width spacer is installed in a standard stroke CQSXB25-50D cylinder.

Mounting bracket part numbers

Bore size (mm)	Foot type ^{Note 1)}	Flange type	Double clevis type
12	CQS-L012	CQS-F012	CQS-D012
16	CQS-L016	CQS-F016	CQS-D016
20	CQS-L020	CQS-F020	CQS-D020
25	CQS-L025	CQS-F025	CQS-D025

Note 1) When ordering the foot bracket, order 2 pieces per cylinder.

Note 2) Accessories for each bracket are as follows.

Foot/Flange types: Body mounting screws
Double clevis type: Clevis pins, C type snap ring for shaft, and body mounting screws

Number of auto switches

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

Auto switch type

Nil	Without auto switch (built-in magnet)
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* Select an auto switch model number from the table below.

Cushion/Rod end threads

Nil	Standard (rod end female threads)
C	With rubber bumper
M	Rod end male threads

* Combination of the above specifications is possible.

Action

D	Double acting
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Auto switch specifications

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

* Lead wire length symbols: 0.5m Nil (Example) A93

3m L (Example) A93L

5m Z (Example) F9NWZ

* Solid state auto switches with a "○" symbol are produced upon receipt of order.



Specifications

Type	Pneumatic (non-lube) type
Action	Double acting single rod
Fluid	Air
Proof pressure	1.5MPa (217psi)
Maximum operating pressure	1.0MPa (145psi)
Ambient and fluid temperature <small>(with no freezing)</small>	Without auto switch: -10 to 70°C (14 to 158°F) With auto switch: -10 to 60°C (14 to 140°F)
Rubber bumper	None
Rod end threads	Female threads
Rod end thread tolerance	JIS class 2
Stroke length tolerance	Standard stroke: $^{+1.0}_0$
Mounting	Through hole/Double end tapped common
Piston speed	ø12, ø16: 1 to 300mm/s (0.04 to 11.8in/s) ø20, ø25: 0.5 to 300mm/s (0.02 to 11.8in/s)

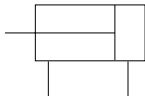
Minimum Strokes for Auto Switch Mounting

Number of auto switches	mm (in)				
	D-A9□, D-F9□WV	D-A9□V	D-F9N	D-F9 ^ø , D-F9□W	D-F9□V
2 pcs.	10 (0.4)	10 (0.4)	15 (0.6) ^{Note)}	20 (0.80) ^{Note)}	5 (0.2)
1 pc.	10 (0.4) ^{Note)}	5 (0.2)	15 (0.6) ^{Note)}	20 (0.80) ^{Note)}	5 (0.2)

Note) Consult SMC when operating with a stroke below those shown above.

JIS symbol

Double acting/Single rod



Minimum Operating Pressure

Bore size (mm)	MPa (psi)			
	12	16	20	25
Min. operating pressure	0.03 (4.3)	0.03 (4.3)	0.025 (3.6)	0.025 (3.6)

Body Options

Description	Application
Rod end male threads	Applicable to all standard double acting single rod types.
Rubber bumper	

⚠ Specific Product Precautions

- Be sure to read before handling.
- Refer to pages 15 to 24 for safety instructions and precautions.

Snap Ring Installation and Removal

⚠ Caution

- Use the correct pliers (C type snap ring mounting tool) for installation and removal.
- Be careful even when using the correct pliers (C type snap ring mounting tool). The snap ring may slip off the end of the pliers (C type snap ring mounting tool) and spring out, causing bodily injury or damage to nearby equipment. Furthermore, make sure the snap ring is securely seated in its mounting groove at the time of installation, before supplying air.

Maintenance

⚠ Caution

- Replacement parts/Seal kits
To order the kits, use the order numbers for each bore size.

Bore size (mm)	Order no.	Kit contents
12	CQ5X12-PS	Piston seal 1 pc.
16	CQ5X16-PS	Rod seal 1 pc.
20	CQ5X20-PS	Tube gasket 1 pc.
25	CQ5X25-PS	Grease pack (10g) 1 pc.

2. Grease packs

When grease only is required for maintenance, order using the following part numbers.

- Grease pack
- GR-L-005 (5g)
- GR-L-010 (10g)
- GR-L-150 (150g)

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



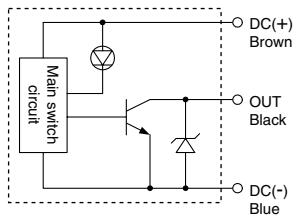
Grommet

- 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)

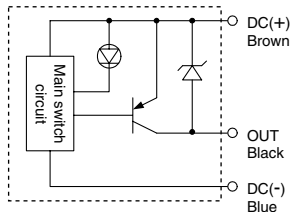


Internal circuits

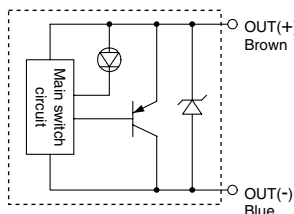
D-M9N/M9NV



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

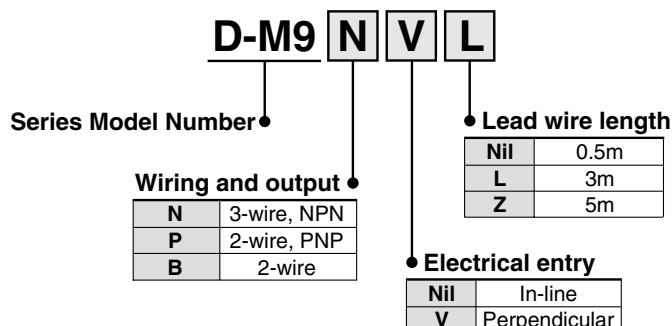
Weight

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

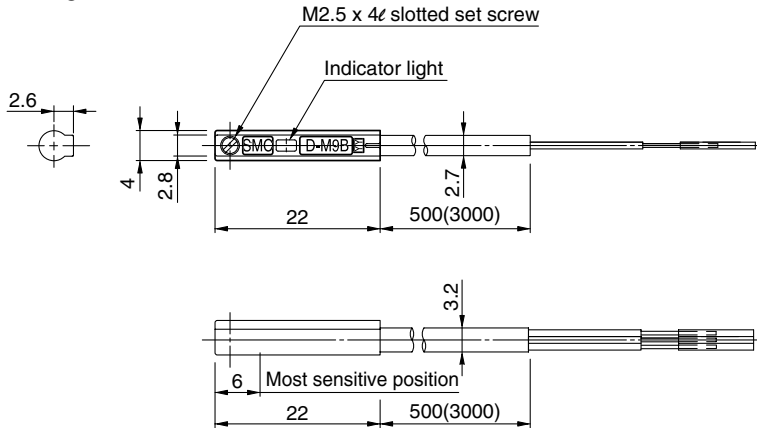
Standard Model Number



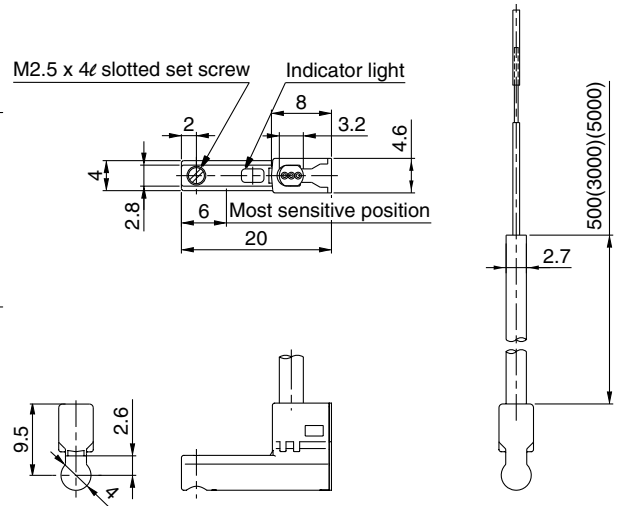
Series D-M9

Auto Switch Dimensions

D-M9□



D-M9□V



⚠ Specific Product Precautions

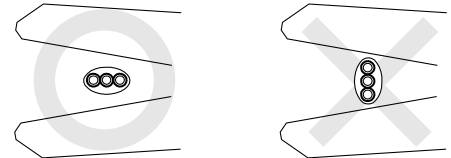
Be sure to read before handling. Contact SMC when the required specification is out of range.

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.