

# Escapements

# Series MIW/MIS

ø8, ø12, ø20, ø25, ø32

## How to Order

**Double finger type** MIW 12 [ ] 12 D 1 A S [ ] M9B [ ]

**Single finger type** MIS 32 [ ] 50 D 1 A S [ ] M9B [ ]

**Cylinder bore**

8	8 mm
12	12 mm
20	10 mm
25	25 mm
32	32 mm

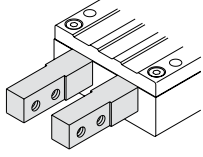
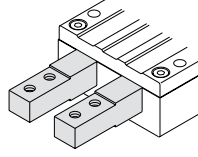
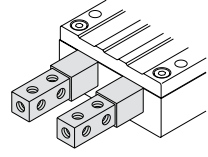
**Port thread type**

Symbol	Type	Bore size
Nil	M thread	ø8, ø12
	Rc	ø20, ø25
TN	NPT	ø32
TF	G	

**Stroke**

\* Refer to the next page for standard stroke table.

**Finger options**

<b>Nil:</b> Basic type (Standard type) 	<b>1:</b> Tapped on upper and lower faces 	<b>2:</b> Tapped on all faces (5 surfaces including end surface) 
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**Scraper**

Nil	No
S	Yes

**Stroke adjuster**

Nil	No
A	Yes

**Number of auto switches**

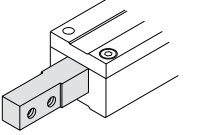
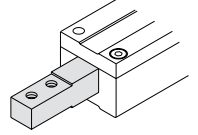
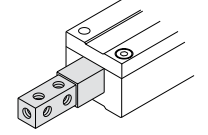
Nil	2 pcs.
S	1 pc.

**Type of auto switch**

Nil	Without auto switch (built-in magnet)
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\* Refer to the table below for auto switch part numbers.

**Finger options**

<b>Nil:</b> Basic type (Standard type) 	<b>1:</b> Tapped on upper and lower faces 	<b>2:</b> Tapped on all faces (5 surfaces including end surface) 
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**Applicable auto switches**/Refer to pages 14 to 18 for detailed specifications of auto switches.

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)		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	F9NV	M9N	●	●	○	IC circuit	Relay PLC
				3-wire (PNP)			F9PV	M9P	●	●	○		
				2-wire			F9BV	M9B	●	●	○		
	Diagnostic indication (2-color display)			3-wire (NPN)	5 V, 12 V	—	F9NWV	F9NW	●	●	○	IC circuit	
				3-wire (PNP)			F9PWV	F9PW	●	●	○		
				2-wire			F9BWV	F9BW	●	●	○		

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9N  
 3 m ..... L (Example) M9NL  
 5 m ..... Z (Example) M9NZ

\* Auto switches marked with a "O" symbol are produced upon receipt of order.

**Made to order specifications** Contact SMC.

- -50 Without indicator light
- -61 Flexible lead wire
- Pre-wire connector

## Specifications



Series	MIW (Double finger)	MIS (Single finger)
Fluid	Air	
Operating pressure	0.2 to 0.7MPa	
Ambient temperature and fluid temperature	-10 to 60°C (No freezing)	
Lubrication	Non-lube	
Action	Double acting	
Auto switch (optional) <sup>Note)</sup>	Solid state switch (3-wire, 2-wire)	
Stroke tolerance	+1 0 mm	

Note) Refer to pages 14 through 18 for auto switch specification.

## Option

<b>Finger options</b>	Standard, Tapped on upper and lower faces, Tapped on all faces (5 surfaces including end surface)
<b>Stroke adjuster (Rear end stroke only)</b>	MI□8: Arrangement range 4 mm
	MI□12: Arrangement range 6 mm
	MI□20: Arrangement range 12 mm
	MI□25: Arrangement range 15 mm
	MI□32: Arrangement range 20 mm
<b>Scraper</b>	Can be mounted on standard products

## Theoretical Output

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm <sup>2</sup> )	Operating pressure MPa					
				0.2	0.3	0.4	0.5	0.6	0.7
8	4	OUT	50	10	15	20	26	31	36
		IN	38	7	11	15	19	23	26
12	6	OUT	113	23	34	45	57	68	79
		IN	85	17	26	34	43	51	60
20	10	OUT	314	63	94	126	157	188	220
		IN	236	47	71	94	118	142	165
25	10	OUT	491	98	147	196	245	295	344
		IN	412	82	124	165	206	247	288
32	12	OUT	804	161	241	322	402	482	563
		IN	691	138	207	276	346	415	484

Unit: N

## Standard Stroke

### Double finger type/MIW (mm)

Bore size	Stroke
8	8 mm
12	12 mm
20	20 mm
25	25 mm
32	32 mm

\* For MIW, same stroke as bore size

### Single finger type/MIS (mm)

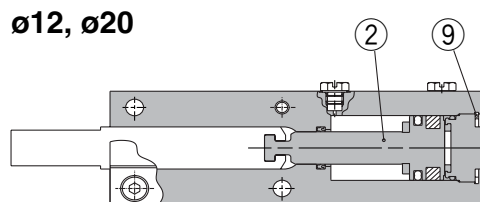
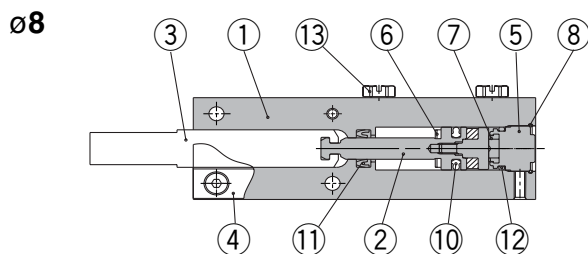
Bore size	Stroke
8	10, 20 mm
12	10, 20, 30 mm
20	10, 20, 30 mm
25	30, 50 mm
32	30, 50 mm

## Weight

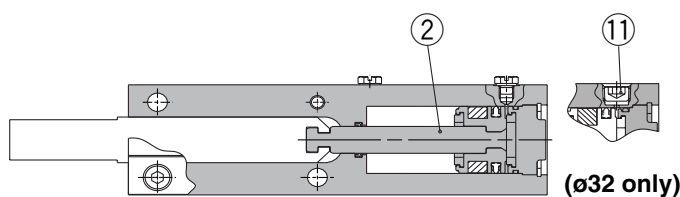
Model	Model	Stroke (mm)	Weight (g)	Increase by stroke adjuster	Increase by scraper
MIW	MIW8-8D	8	110	6	3
	MIW12-12D	12	240	10	5
	MIW20-20D	20	650	30	10
	MIS25-25D	25	1550	30	20
	MIS32-32D	32	2650	100	35
MIS	MIS8-10D	10	62	3	2
	MIS8-20D	20	80		
	MIS12-10D	10	130	5	3
	MIS12-20D	20	160		
	MIS12-30D	30	190		
	MIS20-10D	10	300	15	5
	MIS20-20D	20	355		
	MIS20-30D	30	410		
	MIS25-30D	30	800	15	10
	MIS25-50D	50	1000		
	MIS32-30D	30	1350	50	18
MIS32-50D	50	1650			

Unit: g

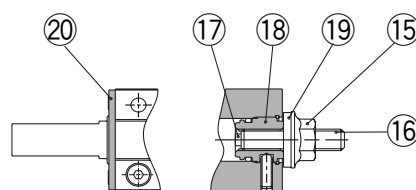
**Construction/Single Finger Type (MIS)**



**ø25, ø32**



**Option**



**Scraper**

**Stroke adjuster**

**Component parts**

No.	Description	Material	Note
1	<b>Body</b>	Aluminium alloy	Hard anodized
2	<b>Piston assembly</b>		
3	<b>Finger</b>	Carbon steel	Heat treatment/Special treatment
4	<b>Cover</b>	Aluminium alloy	Hard anodized
5	<b>Cap (S)</b>	Aluminium alloy	White anodized
6	<b>Bumper</b>	Urethane rubber	
7	<b>Head bumper</b>	Urethane rubber	
8	<b>Clip</b>	Carbon steel	(MIS8)
9	<b>R shape snap ring</b>	Carbon steel	(MIS12 to 32)

No.	Description	Material	Note
10	<b>Piston seal</b>	NBR	
11	<b>Rod seal</b>	NBR	
12	<b>Gasket</b>	NBR	
13	<b>Plug</b>		(MIW8 ... M-3P) (MIW12 to 25 ... M-5P)
14	<b>Hexagon socket taper plug</b>		(MIW32 ... Rc1/8)

**Option: adjuster**

No.	Description	Material	Note
15	<b>Hexagon nut with flange</b>	Carbon steel	Nickel plated
16	<b>Adjustment bolt</b>	Carbon steel	Nickel plated
17	<b>Adjustment bumper</b>	Urethane rubber	
18	<b>Adjustment cap</b>	Aluminium alloy	White anodized
19	<b>Die thread</b>	NBR	

**Option: scraper**

No.	Description	Material	Note
20	<b>Scraper</b>	Stainless steel + NBR	

**Replacement parts**

Model	Finger			Seal kit	Scraper assembly	Grease pack
	Description	Standard	Tapped on upper and lower faces			
MIS8-10D	MI-A0801-10	MI-A0802-10	MI-A0803-10	MIS8-PS	MIS-A0804	MH-G01 (contents quantity 30 g)
MIS8-20D	MI-A0801-20	MI-A0802-20	MI-A0803-20			
MIS12-10D	MI-A1201-10	MI-A1202-10	MI-A1203-10			
MIS12-20D	MI-A1201-20	MI-A1202-20	MI-A1203-20	MIS12-PS	MIS-A1204	
MIS12-30D	MI-A1201-30	MI-A1202-30	MI-A1203-30			
MIS20-10D	MI-A2001-10	MI-A2002-10	MI-A2003-10			
MIS20-20D	MI-A2001-20	MI-A2002-20	MI-A2003-20	MIS20-PS	MIS-A2004	
MIS20-30D	MI-A2001-30	MI-A2002-30	MI-A2003-30			
MIS25-30D	MI-A2501-30	MI-A2502-30	MI-A2503-30			
MIS25-50D	MI-A2501-50	MI-A2502-50	MI-A2503-50	MIS25-PS	MIS-A2504	
MIS32-30D	MI-A3201-30	MI-A3202-30	MI-A3203-30			
MIS32-50D	MI-A3201-50	MI-A3202-50	MI-A3203-50	MIS32-PS	MIS-A3204	
<b>Main parts No.</b>	③ (1 pc.)					⑩, ⑪, ⑫

# Series MIW/MIS

## Dimensions/Single Finger Type

MIS□-□D

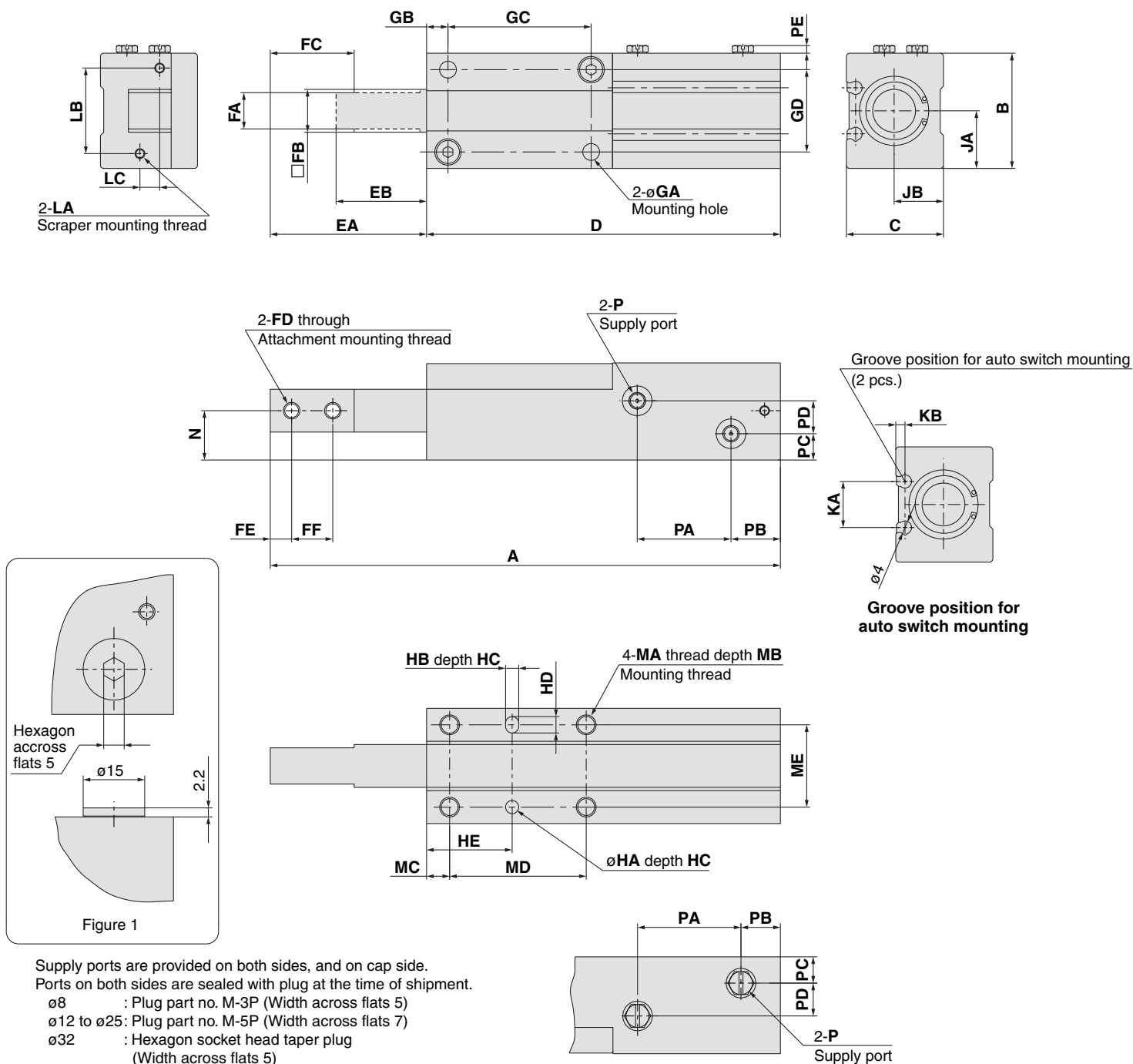


Figure 1

Supply ports are provided on both sides, and on cap side.  
Ports on both sides are sealed with plug at the time of shipment.

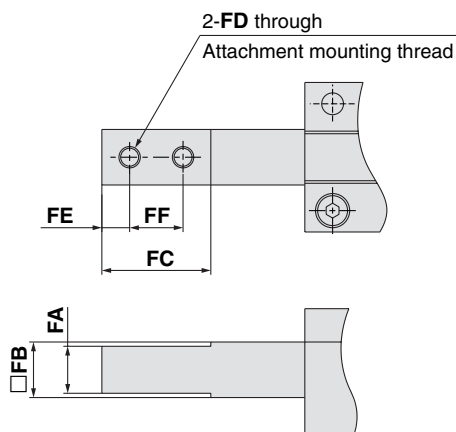
- ø8 : Plug part no. M-3P (Width across flats 5)
- ø12 to ø25: Plug part no. M-5P (Width across flats 7)
- ø32 : Hexagon socket head taper plug (Width across flats 5)

\* Refer to the Figure 1 for G thread

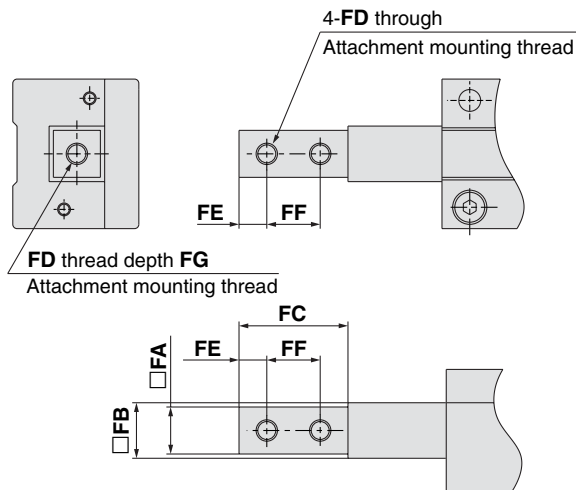
Model	A	B	C	D	EA	EB	FA	FB	FC	FD	FE	FF	FG	GA	GB	GC	GD	HA, HB
MIS8-10	87	19	16	59	28	18	6 <sup>0</sup> <sub>-0.1</sub>	7h9 <sup>0</sup> <sub>-0.036</sub>	15	M3 x 0.5	4	7	6 (Effective depth 2.5)	2.6	4	20	13	2H9 <sup>+0.025</sup> <sub>0</sub>
MIS8-20	117			79	38											30		
MIS12-10	105	26	21	72	33	23	8 <sup>0</sup> <sub>-0.1</sub>	10h9 <sup>0</sup> <sub>-0.036</sub>	19	M3 x 0.5	4.5	9.5	6 (Effective depth 3)	3.3	5	28	18	2.5H9 <sup>+0.025</sup> <sub>0</sub>
MIS12-20	135			92	43											38		
MIS12-30	165			112	53											48		
MIS20-10	125	35	29.5	86.5	38.5	28.5	11 <sup>0</sup> <sub>-0.1</sub>	13h9 <sup>0</sup> <sub>-0.043</sub>	25.5	M5 x 0.8	6.5	12.5	10 (Effective depth 4)	5.1	7	32	25	4H9 <sup>+0.030</sup> <sub>0</sub>
MIS20-20	155			106.5	48.5											42		
MIS20-30	185			126.5	58.5											52		
MIS25-30	215	41	40	144	71	41	15 <sup>0</sup> <sub>-0.1</sub>	17h9 <sup>0</sup> <sub>-0.043</sub>	37	M6 x 1	10	17	15 (Effective depth 7)	6.8	10	55	28	5H9 <sup>+0.030</sup> <sub>0</sub>
MIS25-50	270			184	91											75		
MIS32-30	250	50	47	165	85	55	19.5 <sup>0</sup> <sub>-0.1</sub>	21h9 <sup>0</sup> <sub>-0.052</sub>	51	M8 x 1.25	12.5	22	17 (Effective depth 8.5)	8.6	12	64	34	6H9 <sup>+0.030</sup> <sub>0</sub>
MIS32-50	310			205	105											84		

## Finger options

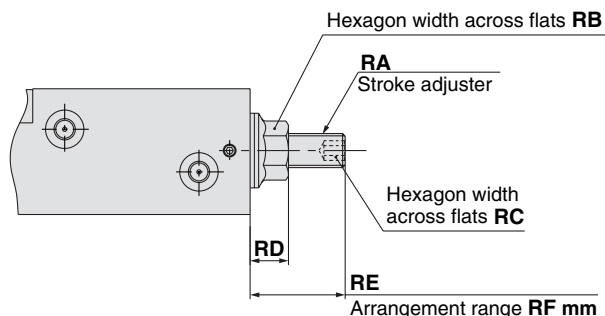
### Tapped on upper and lower faces



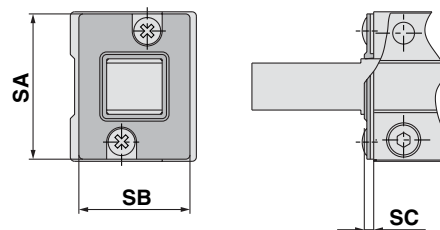
### Tapped on all faces



### With adjuster



### With scraper



Note) Observe the specified adjustment range when adjusting with a stroke adjuster.

Model	HC	HD	HE	JA	JB	KA	KB	LA	LB	LC	MA	MB	MC	MD	ME	N	P	PA	PB	PC
MIS8-10	2	3	14	9.5	7.5	6.2	1.6	M2 x 0.4	14	3	M3 x 0.5	5	4	20	13	7.5	M3 x 0.5	19	8	4.5
MIS8-20														30				29		
MIS12-10														28				19		
MIS12-20	4	3.5	17.5	13	11	11.6	2.2	M2.6 x 0.45	19	4	M4 x 0.7	7	5	38	18	11	M5 x 0.8	29	10	6
MIS12-30														48				39		
MIS20-10														32				20.5		
MIS20-20	5	5	26	17.5	15	14	2.8	M3 x 0.5	26	6	M6 x 1	10	7	42	25	15	M5 x 0.8	30.5	12	8
MIS20-30														52				40.5		
MIS25-30	5	7	32	20.5	20	11	3	M3 x 0.5	32	10	M8 x 1.25	14	10	55	28	20	M5 x 0.8	47	14	12
MIS25-50														75				67		
MIS32-30	6	8	40	25	25	20.4	2.5	M4 x 0.7	39	12	M10 x 1.5	15	12	64	34	25	Rc1/8	47	14.5	11
MIS32-50														84				67		

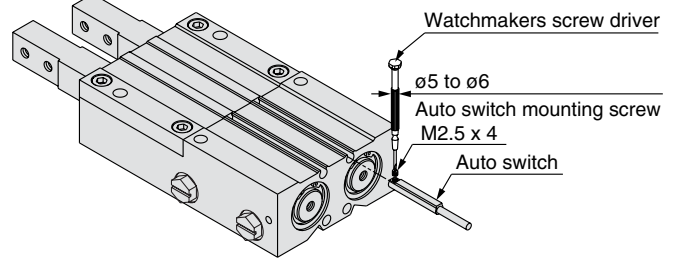
Model	PD	PE	RA	RB	RC	RD	RE	RF	RG	SA	SB	SC
MIS8-10	6	2.2	M4 x 0.7	7	2	5.7	12.5	4	8.5	18.6	14	1.4
MIS8-20												
MIS12-10												
MIS12-20	7	2.8	M5 x 0.8	8	2.5	6	14	6	8	24	18	1.8
MIS12-30												
MIS20-10												
MIS20-20	10	2.7	M8 x 1	12	4	9	22.5	12	10.5	34	26	2.2
MIS20-30												
MIS25-30	14	2.7	M8 x 1	12	4	9	26	15	11	40	36	2.8
MIS25-50												
MIS32-30	27	—	M12 x 1.25	17	6	12.4	33	20	13	49	41	3.4
MIS32-50												

# Series MIW/MIS

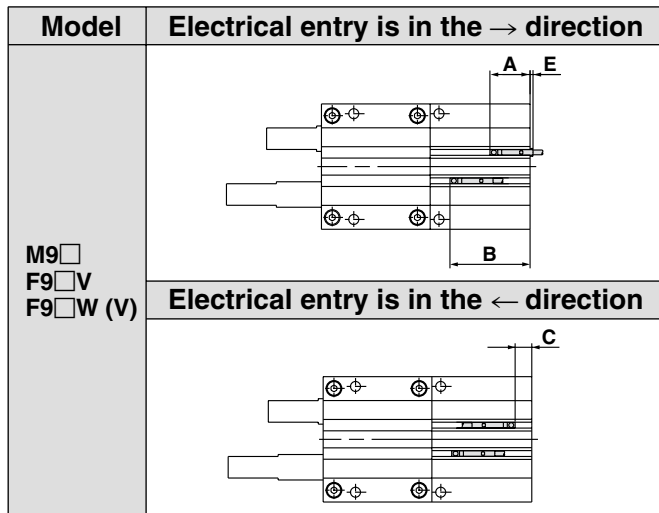
## Auto Switch Mounting

When mounting an auto switch, insert the switch in the switch mounting groove on the escapement from the direction as below figure. Having set the mounting position, tighten the attached switch mounting screws with a flat head watchmakers screw driver.

- \* When adjusting the auto switch mounting screws, use a watchmakers screw driver with a handle 5 to 6 mm in diameter. (This is to prevent fracture due to an excessive torque.) The guideline of the tightening torque is 0.05 to 0.1 Nm. Turn another 90° from the position where tightening is felt by hand.



## Proper mounting position for stroke end detection



## Auto Switch Operating Range

MIW/MIS	(mm)				
Auto switch model	ø8	ø12	ø20	ø25	ø32
D-M9□	2	2	2.5	3.5	4.5
D-F9□W (V)	2.5	3	3.5	5	5.5
D-F9□V					

Note) The operating ranges are provided as guidelines including hysteresis and are not guaranteed values (with ±30% variations). Hysteresis may fluctuate due to the operating environments.

Model	Proper mounting position		Model	Proper mounting position		Model	Proper mounting position	
	D-M9□ D-F9□W	D-F9□V D-F9□WV		D-M9□ D-F9□W	D-F9□V D-F9□WV		D-M9□ D-F9□W	D-F9□V D-F9□WV
MIW8-8D	A	16.5	MIS12-30D	A	18.5	MIS25-30D	A	7.5
	B	25		B	49		B	38
	C	4.5		C	6.5		C	21
	D	—		D	—		D	—
	E	6   4		E	3.5   1.5		E	—   —
MIS8-10D	A	16.5	MIW20-20D	A	20.5	MIS25-50D	A	7.5
	B	27		B	41		B	38
	C	4.5		C	8.5		C	21
	D	—		D	—		D	—
	E	6   4		E	4   2		E	—   —
MIS8-20D	A	16.5	MIS20-10D	A	20.5	MIW32-32D	A	8.5
	B	37		B	31		B	41
	C	4.5		C	8.5		C	29
	D	—		D	—		D	—
	E	6   4		E	4   2		E	—   —
MIW12-12D	A	18.5	MIS20-20D	A	20.5	MIS32-30D	A	8.5
	B	31		B	51		B	39
	C	6.5		C	8.5		C	29
	D	—		D	—		D	—
	E	3.5   1.5		E	4   2		E	—   —
MIS12-10D	A	18.5	MIS20-30D	A	20.5	MIS32-50D	A	8.5
	B	29		B	61		B	59
	C	6.5		C	8.5		C	29
	D	—		D	—		D	—
	E	3.5   1.5		E	4   2		E	—   —
MIS12-20D	A	18.5	MIW25-25D	A	7.5			
	B	39		B	33			
	C	6.5		C	21			
	D	—		D	—			
	E	3.5   1.5		E	—   —			

# Series MIW/MIS Auto Switch Common Specifications

## Auto Switch Common Specifications

Type	Solid state switch
Operating time	1 ms or less
Impact resistance	1000 m/s <sup>2</sup>
Insulation resistance	50 MΩ or more at 500 mega VDC (between lead wire and case)
Withstand voltage	1000 VAC for 1min. (between lead wire and case)
Ambient temperature	-10 to 60°C
Enclosure	IEC529 standard IP67 JISC0920 watertight construction

## Lead Wire Length

### Lead wire length indication

(Example)

D-M9P **L**

● Lead wire length

Nil	0.5 m
<b>L</b>	3 m
<b>Z</b>	5 m

- Note 1) Lead wire length Z: Auto switch applicable to 5m length  
Solid state switches: All models produced upon receipt of order (standard procedure).
- Note 2) The water resistant 2-color solid state switch uses a 3 m lead wire as standard. (0.5 m is not available.)
- Note 3) For solid state with flexible wire specification, add "-61" after the lead wire length.
- Note 4) D-M9□ type use flexible wire as standard.

(Example) D-F9NV-**61**

● Flexible specification

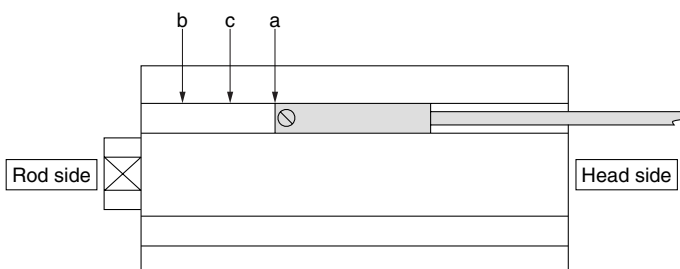
## How to Mount Auto Switch

Point "a" is the ON position when moving switch from head side of the cylinder.

Point "b" is the ON position when moving switch from rod side of the cylinder.

Point "c", center of point "a" and "b", is the proper mounting position.

\* If switch is mounted in the center between ON position and OFF position, the switch will not be on the proper position due to the hysteresis.



## Lead Wire Color Change

Lead wire colors of SMC auto switches have been changed as shown in the tables below starting from production in September 1996, in order to meet the IEC947-5-2 standard.

Take special care regarding wire polarity during the time when the old colors still coexist with the new colors.

### 2-wire

	Old	New
Output (+)	Red	Brown
Output (-)	Black	Blue

### 3-wire

	Old	New
Power supply +	Red	Brown
Power supply GND	Black	Blue
Output	White	Black

### Solid state with diagnostic output

	Old	New
Power supply +	Red	Brown
Power supply GND	Black	Blue
Output	White	Black
Diagnostic output	Yellow	Orange

### Solid state with latch type diagnostic output

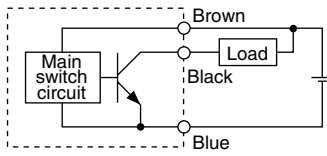
	Old	New
Power supply +	Red	Brown
Power supply GND	Black	Blue
Output	White	Black
Latch type diagnostic output	Yellow	Orange

# Series MIW/MIS

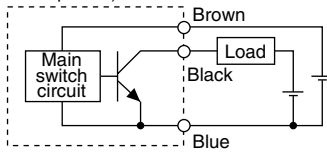
## Auto Switch Connections and Examples

### Basic Wiring

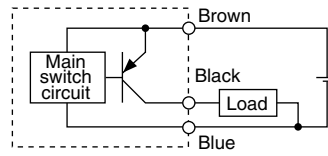
#### Solid state 3-wire, NPN



(Power supplies for switch and load are separate.)

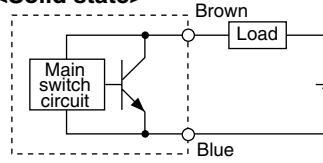


#### Solid state 3-wire, PNP



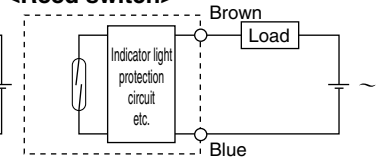
#### 2-wire

<Solid state>



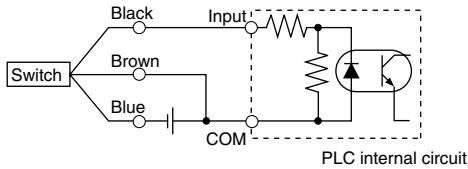
#### 2-wire

<Reed switch>

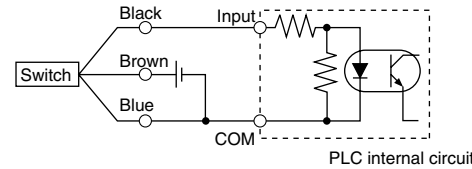


### Examples of Connection to PLC

#### • Sink input specification 3-wire, NPN

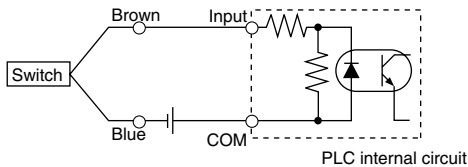


#### • Source input specification 3-wire, PNP

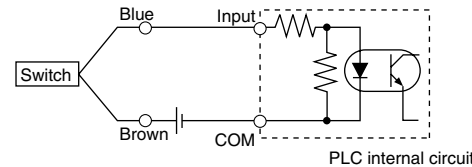


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

#### 2-wire



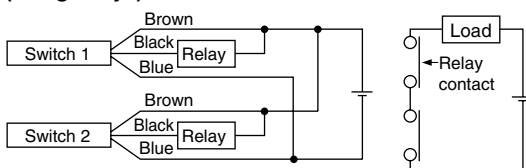
#### 2-wire



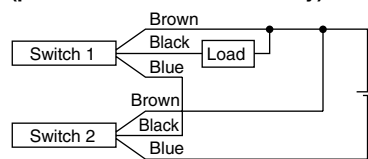
### Connection Examples for AND (Series) OR (Parallel)

#### • 3-wire

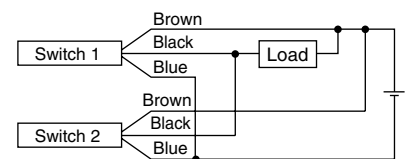
#### AND connection for NPN output (using relays)



#### AND connection for NPN output (performed with switches only)

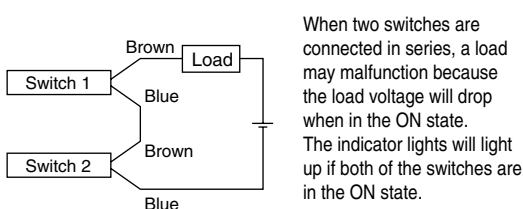


#### OR connection for NPN output



The indicator lights will light up when both switches are turned ON.

#### 2-wire with 2 switch AND connection

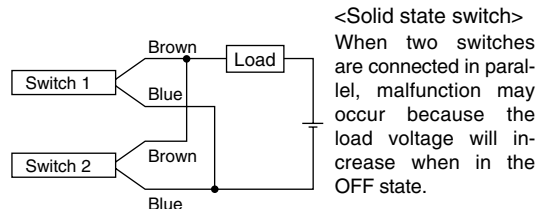


When two switches are connected in series, a load may malfunction because the load voltage will drop when in the ON state. The indicator lights will light up if both of the switches are in the ON state.

$$\begin{aligned} \text{Load voltage at ON} &= \text{Power supply voltage} - \text{Internal voltage drop} \times 2 \text{ pcs.} \\ &= 24 \text{ V} - 4 \text{ V} \times 2 \text{ pcs.} \\ &= 16 \text{ V} \end{aligned}$$

Example: Power supply is 24 VDC  
Internal voltage drop in switch is 4 V

#### 2-wire with 2 switch OR connection



<Solid state switch>  
When two switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

<Reed switch>  
Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of switches in the ON state, the indicator lights may sometimes get dark or not light up, because of dispersion and reduction of the current flowing to the switches.

$$\begin{aligned} \text{Load voltage at OFF} &= \text{Leakage current} \times 2 \text{ pcs.} \times \text{Load impedance} \\ &= 1 \text{ mA} \times 2 \text{ pcs.} \times 3 \text{ k}\Omega \\ &= 6 \text{ V} \end{aligned}$$

Example: Load impedance is 3 kΩ  
Leakage current from switch is 1 mA



# Solid State Auto Switches/Direct Mount Type D-M9N, D-M9P, D-M9B



Refer to [www.smcworld.com](http://www.smcworld.com) for details of products compatible with overseas standards.

## Grommet

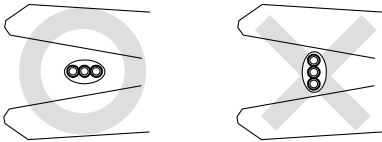
- 2-wire load current is reduced (2.5 to 40 mA).
- Lead-free
- Use of lead wire compliant with UL standards (style 2844)



## ⚠ Caution

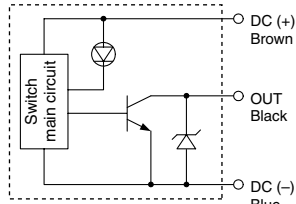
### Operating Precautions

When the cable sheath is stripped, confirm the stripping direction. The insulator may be split or damaged depending on the direction.

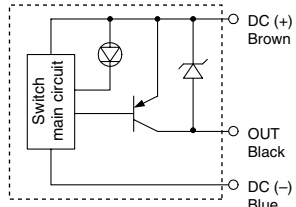


## Auto Switch Internal Circuit

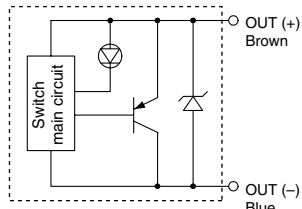
### D-M9N



### D-M9P



### D-M9B



## Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□ (with indicator light)			
Auto switch model	D-M9N	D-M9P	D-M9B
Wiring type	3-wire		2-wire
Output type	NPN	PNP	—
Applicable load	IC circuit, Relay, PLC		24 VDC relay, PLC
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)		—
Current consumption	10 mA or less		—
Load voltage	28 VDC or less	—	24 VDC (10 to 28 VDC)
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 or less at 24 VDC		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 ellipse  
 D-M9B 0.15 mm<sup>2</sup> x 2 cores  
 D-M9N, D-M9P 0.15 mm<sup>2</sup> x 3 cores

Note 1) Refer to page 14 for auto switch common specifications.

Note 2) Refer to page 14 for lead wire lengths.

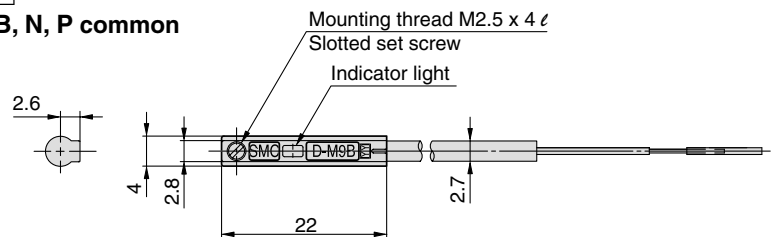
## Weight

Unit: g

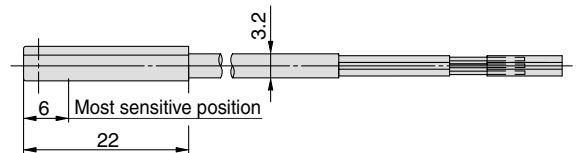
Auto switch model	D-M9N	D-M9P	D-M9B
Lead wire length (m)	0.5	8	7
	3	41	38
	5	68	63

## Dimensions

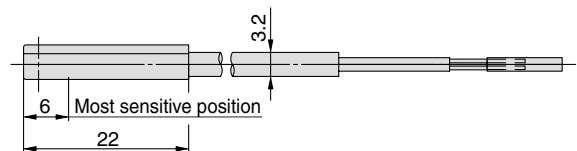
### D-M9□ D-M9B, N, P common



### D-M9N, P (3-wire)



### D-M9B (2-wire)



# Solid State Auto Switches/Direct Mount Type D-F9NV, D-F9PV, D-F9BV



Refer to [www.smcworld.com](http://www.smcworld.com) for details of products compatible with overseas standards.

## Auto Switch Specifications

PLC: Programable Logic Controller

D-F9□V (with indicator light)			
Auto switch model	D-F9NV	D-F9PV	D-F9BV
Electrical direction	Perpendicular	Perpendicular	Perpendicular
Wiring type	3-wire		2-wire
Output type	NPN	PNP	—
Applicable load	IC circuit, Relay, PLC		24 VDC relay, PLC
Power supply voltage	5, 12, 24VDC (4.5 to 28 V)		—
Current consumption	10 mA or less		—
Load voltage	28 VDC or less	—	24 VDC (10 to 28 VDC)
Load current	40 mA or less	80 mA or less	5 to 40 mA
Internal voltage drop	1.5 V or less (0.8 V or less at 10 mA load current)	0.8 V or less	4 V or less
Leakage current	100 μA or less at 24 VDC		0.8 mA or less
Indicator light	Red LED lights when ON		

- Lead wire ..... Oil proof heavy duty vinyl cable,  $\phi 2.7$ , 3 cores (brown, black, blue), 0.15 mm<sup>2</sup>, 2 cores (brown, blue), 0.18 mm<sup>2</sup>, 0.5 m

Note 1) Refer to page 14 for solid state switch common specifications.

Note 2) Refer to page 14 for lead wire lengths.

### Grommet



### Caution

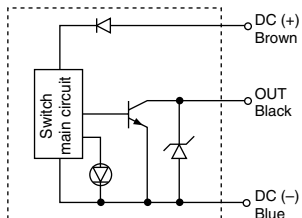
#### Operating Precautions

Be sure to use the attached fixing screws to secure the auto switch.

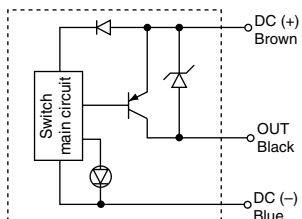
Use of screws beyond the specified range can damage the switch.

### Auto Switch Internal Circuit

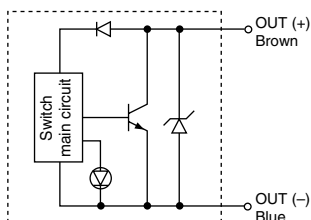
#### D-F9NV



#### D-F9PV



#### D-F9BV



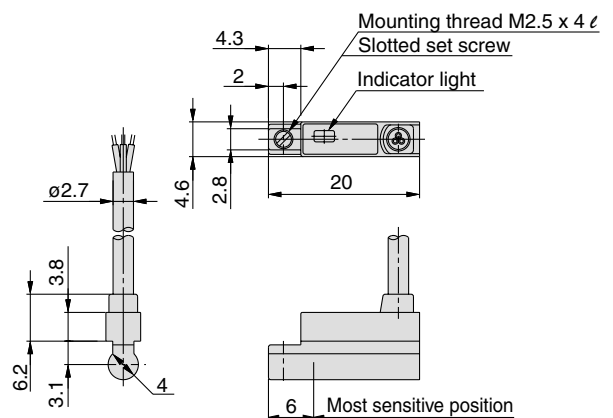
### Weight

Unit: g

Auto switch model	D-F9NV	D-F9PV	D-F9BV
Lead wire length (m)	0.5	7	7
	3	37	37
	5	61	61

### Dimensions

#### D-F9□V



# 2-Color Display Solid State Auto Switches/ Direct Mount Type

## D-F9NW(V), D-F9PW(V), D-F9BW(V)



Refer to [www.smcworld.com](http://www.smcworld.com) for details of products compatible with overseas standards.

### Auto Switch Specifications

PLC: Programmable Logic Controller

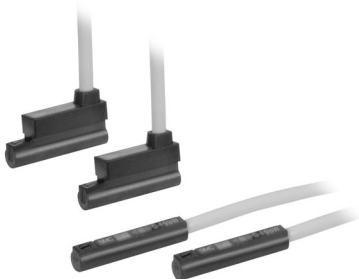
D-F9□W, D-F9□WV (with indicator light)						
Auto switch model	D-F9NW	D-F9NWV	D-F9PW	D-F9PWV	D-F9BW	D-F9BWV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay IC, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 V)	
Load current	40 mA or less		80 mA or less		5 to 40 mA	
Internal voltage drop	1.5 V or less (0.8 V or less at 10 mA load current)		0.8 V or less		4 V or less	
Leakage current	100 μA or less at 24 VDC				0.8 mA or less	
Indicator light	Operating position ··········· Red LED lights up Optimum operating position ··· Green LED lights up					

● Lead wire ····· Oil proof heavy duty vinyl cable,  $\phi 2.7$ , 3 cores (brown, black, blue), 0.15 mm<sup>2</sup>, 2 cores (brown, blue), 0.18 mm<sup>2</sup>, 0.5 m

Note 1) Refer to page 14 for solid state switch common specifications.

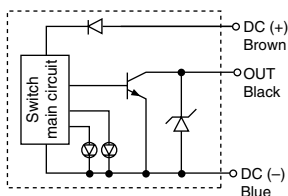
Note 2) Refer to page 14 for lead wire length.

### Grommet

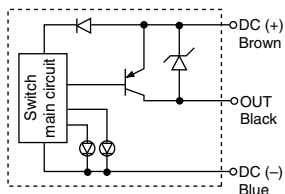


### Auto Switch Internal Circuit

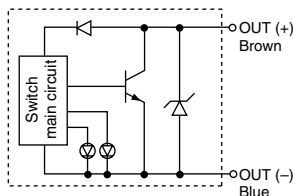
#### D-F9NW, F9NWV



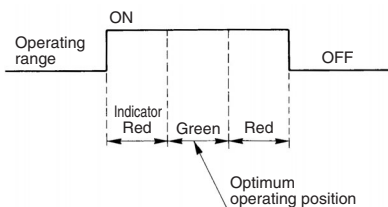
#### D-F9PW, F9PWV



#### D-F9BW, F9BWV



### Indicator light/Display method



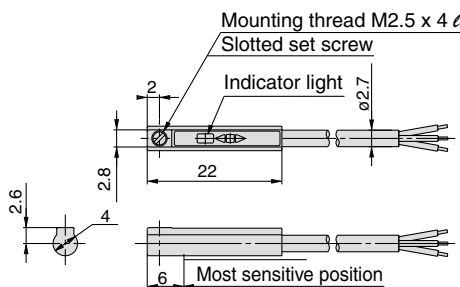
### Weight

Unit: g

Auto switch model	D-F9NW(V)	D-F9PW(V)	D-F9BW(V)
Lead wire length (m)	0.5	7	7
	3	34	32
	5	56	52

### Dimensions

#### D-F9□W



#### D-F9□WV

