

Air Cylinder

Double Acting, Single Rod

JCM Series

ø20, ø25, ø32, ø40

RoHS

How to Order

Without auto switch

JCM BZ 20 - 100

With auto switch

JCDM BZ 20 - 100 - M9BW

With auto switch
(Built-in magnet)

Mounting, Bracket

Mounting	
Direct mounting	With mounting bracket
BZ Basic (Female thread on rod cover)	L Axial foot
B Basic (Female thread on both covers)	F Rod flange
M Male thread on both covers	FZ Rod flange
MZ Male thread on rod cover	G Head flange

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

Port thread type

Nil	M5
TR	Rc1/8
TN	NPT1/8

Cylinder stroke [mm]

Refer to page 5 for standard strokes.

Rod end thread

Nil	Male thread
F	Female thread

Number of auto switches

Nil	2
S	1
n	n

Auto switch

Nil	Without auto switch
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* For applicable auto switches, refer to the table below.

Rod end bracket

Nil	No bracket
V	Single knuckle joint
W	Double knuckle joint

* Select option "Nil" for the female rod end.

* A knuckle joint pin is not provided with the single knuckle joint.

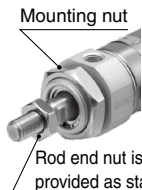
* The rod end bracket is shipped together with the product.

Mounting nut*1

Nil	None
D	With mounting nut*2

*1 Only "Nil" can be selected for mounting options "B" and "BZ", and only "D" can be selected for mounting options "L", "F", "FZ", and "G".
Either "Nil" or "D" can be selected for mounting options "M" and "MZ."

*2 Mounting option "L" is provided with 2 pcs. Other mounting options are only provided with 1 pc.
The mounting nut is shipped together with the product but does not come assembled.



Configuration contents of cylinders with a mounting bracket

Mounting	Bracket-mountable cylinder models	
	M: Male thread on both covers	MZ: Male thread on rod cover
L Axial foot	○ JCMM	×
F Rod flange	○ JCMM	×
FZ Rod flange	×	○ JCMMZ
G Head flange	○ JCMM	×

○...Bracket mountable ×...Not bracket mountable

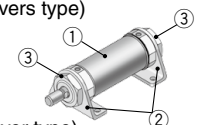
Configuration contents (e.g.) mounting bracket single unit part number (Refer to page 5)

Example 1) JCML20-100

- ① Cylinder : JCMM20-100 (Male thread on both covers type)
- ② Foot bracket : JCM-L020 x 2 pcs.
- ③ Mounting nut: JSN-020B x 2 pcs.

Example 2) JCMFZ20-100

- ① Cylinder : JCMMZ20-100 (Male thread on rod cover type)
- ② Rod flange : JCM-F020 x 1 pc.
- ③ Mounting nut: JSN-020B x 1 pc.



Applicable Auto Switches/Refer to the Web Catalog 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-wired connector	Applicable load		
					DC	AC			0.5	1	3	5				
							Perpendicular	In-line	(Nil)	(M)	(L)	(Z)				
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)		12 V		M9PV	M9P	●	●	●	○	○		
				2-wire		12 V		M9BV	M9B	●	●	●	○	○		
	Diagnostic indication (2-color indicator)			3-wire (NPN)	24 V	5 V, 12 V		M9NWV	M9NW	●	●	●	○	○	IC circuit	
				3-wire (PNP)		12 V		M9PWV	M9PW	●	●	●	○	○		
				2-wire		12 V		M9BWV	M9BW	●	●	●	○	○		
	Water resistant (2-color indicator)			3-wire (NPN)	24 V	5 V, 12 V		M9NAV*1	M9NA*1	○	○	●	○	○	IC circuit	
				3-wire (PNP)		12 V		M9PAV*1	M9PA*1	○	○	●	○	○		
				2-wire		12 V		M9BAV*1	M9BA*1	○	○	●	○	○		
				2-wire		12 V		M9BAV*1	M9BA*1	○	○	●	○	○		

*1 Water-resistant type auto switches can be mounted on the above models, but SMC cannot guarantee water resistance.
Please contact SMC regarding water-resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NV
1 m..... M (Example) M9NWM
3 m..... L (Example) M9NWL
5 m..... Z (Example) M9NWZ

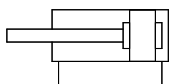
* Solid state auto switches marked with a "○" are produced upon receipt of order.

* Auto switches are shipped together with the product but do not come assembled. (Only the auto switch mounting brackets are assembled before shipment.)



Symbol

Double acting, Single rod



Refer to pages 13 to 15 for cylinders with auto switches.

- Auto Switch Proper Mounting Position (Detection at stroke end) and Mounting Height
- Minimum Stroke for Auto Switch Mounting
- Method of Mounting Two Auto Switches at the Stroke End of a Cylinder for Strokes Less Than 20 mm
- Precautions for Mounting Two D-M9 In-line Entry Type Auto Switches on the Same Surface
- Operating Range
- Auto Switch Mounting Brackets/Part Nos.

Specifications

Bore size [mm]		20	25	32	40
Type		Pneumatic			
Action		Double acting, Single rod			
Fluid		Air			
Proof pressure		1.0 MPa			
Max. operating pressure		0.7 MPa*2			
Min. operating pressure		0.05 MPa			
Ambient and fluid temperatures		5 to 60°C (No freezing)			
Lubrication		Not required (Non-lube)			
Stroke length tolerance		+2.0 0 mm			
Piston speed*1		50 to 500 mm/s*2			
Cushion		Rubber bumper			
Allowable kinetic energy [J]	Male thread	0.11	0.18	0.29	0.52
	Female thread	0.11	0.18	0.18	0.52

* Operate the cylinder within the allowable kinetic energy.

*1 Depending on the system configuration selected, the specified speed may not be satisfied.

*2 Max. operating pressure and piston speed are different from those of the existing model (CM2 series).

Standard Strokes

Bore size [mm]	Standard stroke [mm] *1
20	25, 50, 75, 100, 125, 150, 200, 250, 300
25	
32	
40	

*1 Intermediate strokes not listed above are produced upon receipt of order.

The minimum stroke is 25 mm.

Mounting Brackets/Part Nos.

Mounting bracket	Minimum order quantity	Bore size [mm]				Contents
		20	25	32	40	
Mounting nut (M18, M22, M27)	1	JSN-020B	JSN-032B		JSN-040B	1 mounting nut
Rod end nut	1	NT-02	NT-03		NT-04	1 rod end nut
Foot bracket*1	2	JCM-L020	JCM-L025	JCM-L032	JCM-L040	1 foot bracket, 1 mounting nut
Flange bracket*2	1	JCM-F020	JCM-F025	JCM-F032	JCM-F040	1 flange bracket, 1 mounting nut
Single knuckle joint	1	I-020B	I-032B		I-040B	1 single knuckle joint
Double knuckle joint	1	Y-020B	Y-032B		Y-040B	1 double knuckle joint, 1 clevis pin, 2 retaining rings

*1 The foot bracket can only be used with option "M."

Order 2 foot brackets for each cylinder unit.

*2 The rod flange can only be used with options "M" and "MZ."

The head flange can only be used with option "M."

* Refer to page 12 for dimensions.

Mounting Brackets/Material, Surface Treatment

Segment	Description	Material	Surface treatment
Mounting brackets	Mounting nut	Carbon steel	Zinc chromating
	Rod end nut	Carbon steel	Zinc chromating
Mounting brackets	Foot bracket	Carbon steel	Zinc chromating
	Flange bracket	Carbon steel	Zinc chromating
Accessories	Single knuckle joint	Carbon steel ø40: Free-cutting steel	Electroless nickel plating
	Double knuckle joint	Carbon steel ø40: Cast iron	Electroless nickel plating Metallic silver color painting for ø40
	Double knuckle joint pin	Carbon steel	(None)

Weight

Male Rod End, Without Magnet

[kg]

Bore size [mm]		20	25	32	40
Basic weight	JCMBZ□-□ (Basic (Female thread on rod cover), M5 port)	0.07	0.11	0.14	0.27
	JCMBZ□□-□ (Basic (Female thread on rod cover), Rc1/8, NPT1/8 port)	0.09	0.12	0.16	0.29
	JCMB□-□ (Basic (Female thread on both covers), M5 port)	0.07	0.11	0.14	0.27
	JCMB□□-□ (Basic (Female thread on both covers), Rc1/8, NPT1/8 port)	0.09	0.12	0.16	0.29
	JCMM□-□ (Male thread on both covers, M5 port)	0.08	0.12	0.15	0.28
	JCMM□□-□ (Male thread on both covers, Rc1/8, NPT1/8 port)	0.10	0.14	0.18	0.32
	JCMMZ□-□ (Male thread on rod cover, M5 port)	0.07	0.11	0.14	0.26
	JCMMZ□□-□ (Male thread on rod cover, Rc1/8, NPT1/8 port)	0.09	0.13	0.17	0.30
Additional weight per 50 mm of stroke		0.04	0.05	0.06	0.10
Additional weight for mounting bracket	Mounting nut (JCMM, JCMMZ only)	0.014	0.022	0.022	0.034
Additional weight for mounting bracket	Foot bracket (JCMM only)	0.03	0.04	0.05	0.06
	Flange bracket (JCMM, JCMMZ only)	0.02	0.03	0.04	0.05
Option Additional bracket weight	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (with pin)	0.07	0.07	0.07	0.20
Additional weight with magnet		0.01	0.02	0.02	0.03

Calculation: (Example) **JCDML32-100D**

- Basic weight.....0.15 (JCMM32-□)
- Additional weight.....0.06/50 mm stroke
- Stroke.....100 mm stroke
- Foot bracket (2 pcs.).....0.05 x 2
- Mounting nut (2 pcs.).....0.022 x 2
- Additional weight with magnet ..0.02

$$0.15 + (0.06 \times 100/50) + (0.05 \times 2) + (0.022 \times 2) + 0.02 = \mathbf{0.434 \text{ kg}}$$

Female Rod End, Without Magnet

[kg]

Bore size [mm]		20	25	32	40
Basic weight	JCMBZ□-□F (Basic (Female thread on rod cover), M5 port)	0.06	0.09	0.12	0.22
	JCMBZ□□-□F (Basic (Female thread on rod cover), Rc1/8, NPT1/8 port)	0.08	0.10	0.14	0.24
	JCMB□-□F (Basic (Female thread on both covers), M5 port)	0.06	0.09	0.12	0.22
	JCMB□□-□F (Basic (Female thread on both covers), Rc1/8, NPT1/8 port)	0.08	0.10	0.14	0.24
	JCMM□-□F (Male thread on both covers, M5 port)	0.07	0.10	0.13	0.24
	JCMM□□-□F (Male thread on both covers, Rc1/8, NPT1/8 port)	0.09	0.12	0.16	0.27
	JCMMZ□-□F (Male thread on rod cover, M5 port)	0.06	0.09	0.12	0.22
	JCMMZ□□-□F (Male thread on rod cover, Rc1/8, NPT1/8 port)	0.08	0.11	0.15	0.26
Additional weight per 50 mm of stroke		0.04	0.05	0.06	0.10
Additional weight for mounting bracket	Mounting nut (JCMM, JCMMZ only)	0.014	0.022	0.022	0.034
Additional weight for mounting bracket	Foot bracket (JCMM only)	0.03	0.04	0.05	0.06
	Flange bracket (JCMM, JCMMZ only)	0.02	0.03	0.04	0.05
Option Additional bracket weight	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (with pin)	0.07	0.07	0.07	0.20
Additional weight with magnet		0.01	0.02	0.02	0.03

Calculation: (Example) **JCMFZ32TR-100FD**

- Basic weight.....0.15 (JCMMZ32TR-□F)
- Additional weight.....0.06/50 mm stroke
- Stroke.....100 mm stroke
- Flange bracket0.04
- Mounting nut0.022

$$0.15 + (0.06 \times 100/50) + 0.04 + 0.022 = \mathbf{0.352 \text{ kg}}$$

Allowable Kinetic Energy

Table (1) Max. Allowable Kinetic Energy

[J]

Bore size [mm]	20	25	32	40
Male rod end	0.11	0.18	0.29	0.52
Female rod end	0.11	0.18	0.18	0.52

$$\text{Kinetic energy } E [J] = \frac{(m_1 + m_2) V^2}{2}$$

m_1 : Mass of cylinder moving parts kg
 m_2 : Load mass kg
 V : Piston speed at the end m/s

Table (2) Mass of Cylinder Moving Parts Without Built-in Magnet/0 Stroke

[kg]

Bore size [mm]		20	25	32	40
BZ	Basic (Female thread on rod cover)	0.02	0.03	0.04	0.07
B	Basic (Female thread on both covers)				
M	Male thread on both covers	0.03	0.04	0.05	0.1
MZ	Male thread on rod cover				

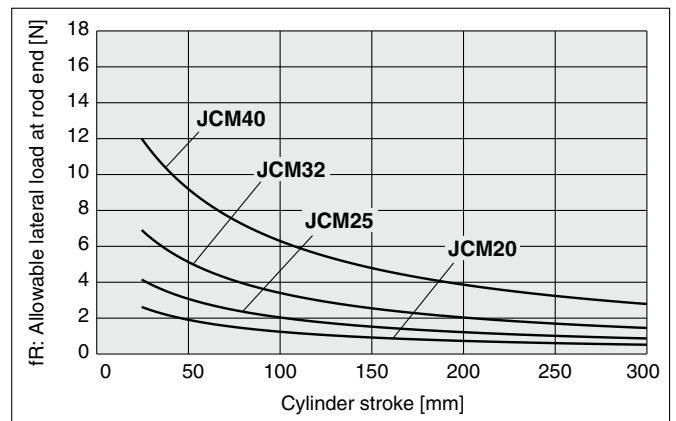
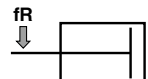
Table (3) Additional Weight

[kg]

Bore size [mm]	20	25	32	40
Additional weight per 50 mm of stroke	0.02	0.03	0.03	0.06

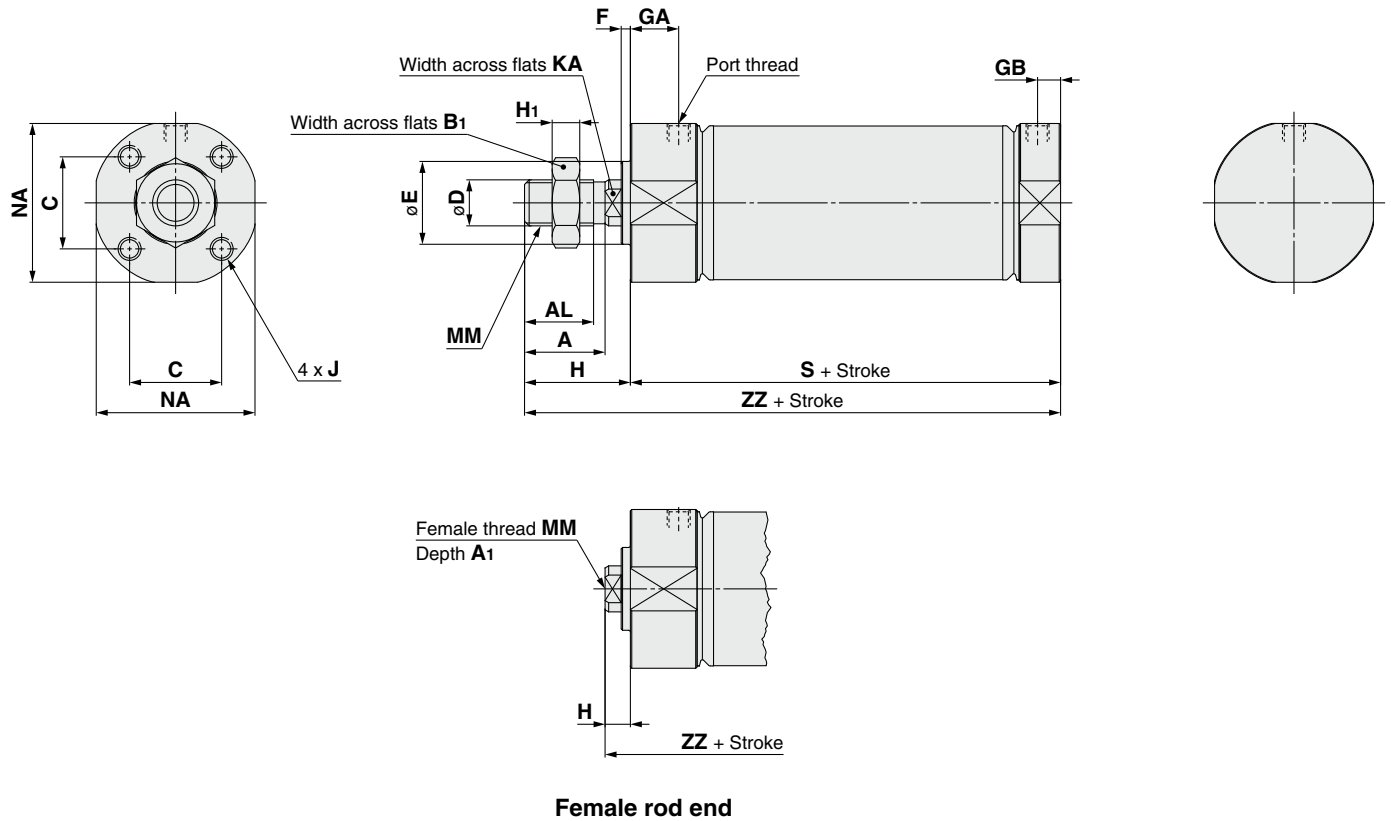
* Do not apply a lateral load over the allowable range to the rod end when it is mounted horizontally.

Allowable Lateral Load at Rod End



Basic (Female Thread on Rod Cover) (BZ)

JC **D** MBZ Bore size Port thread type — Stroke



[mm]														Female Rod End [mm]			
Bore size	A	AL	B1	C	D	E	F	H	H1	J	KA	MM	NA	Bore size	A1	H	MM
20	14.5	12	13	15.5	8	14 ⁰ _{-0.1}	2	21	5	M4 x 0.7 depth 7	Width across flats 6 length 3.5	M8 x 1.25	24	20	8	6.5	M4 x 0.7
25	17.5	15	17	16.5	10	14 ⁰ _{-0.1}	2	24	6	M5 x 0.8 depth 7.5	Width across flats 8 length 3.5	M10 x 1.25	27	25	8	6.5	M5 x 0.8
32	17.5	15	17	20	10	18 ⁰ _{-0.1}	2	24	6	M5 x 0.8 depth 8	Width across flats 8 length 3.5	M10 x 1.25	34.5	32	12	6.5	M5 x 0.8
40	23.5	20.5	22	24	14	24 ⁰ _{-0.1}	2	30	8	M6 x 1 depth 10	Width across flats 12 length 3.5	M14 x 1.5	42.5	40	13	6.5	M8 x 1.25

Port Thread: M5 [mm]					Female Rod End [mm]	
Bore size	GA	GB	S	ZZ	Bore size	ZZ
20	9	5	41 (46.5)	62 (67.5)	20	47.5 (53)
25	11	5	43.5 (49)	67.5 (73)	25	50 (55.5)
32	10.5	5	43.5 (49.5)	67.5 (73.5)	32	50 (56)
40	11	5	50.5 (56.5)	80.5 (86.5)	40	57 (63)

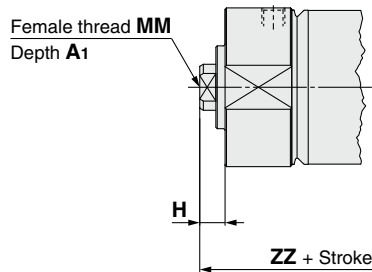
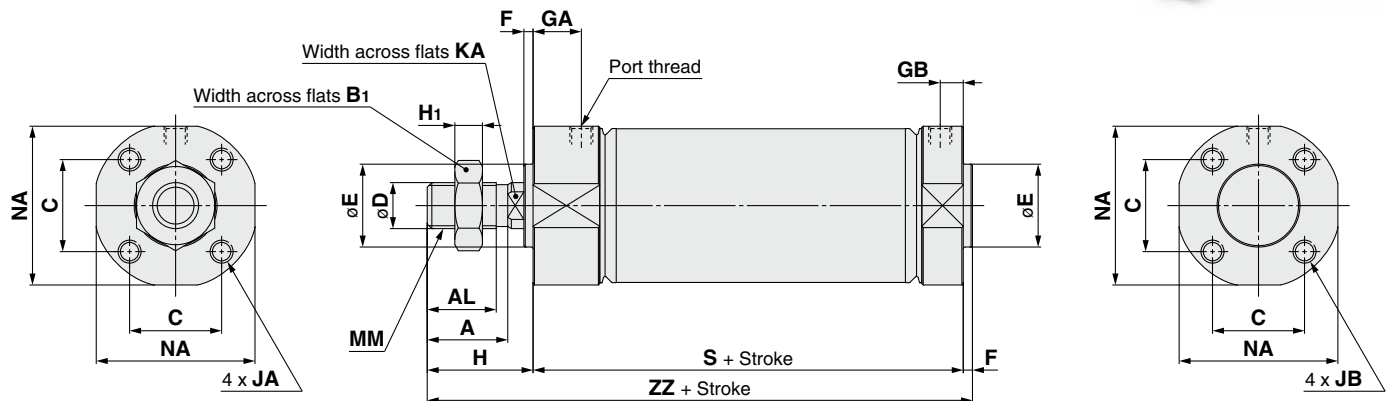
Port Thread: Rc1/8, NPT1/8 [mm]						Female Rod End [mm]	
Bore size	GA	NPT1/8	GB	S	ZZ	Bore size	ZZ
20	10.5	11	7.5	54 (59.5)	75 (80.5)	20	60.5 (66)
25	10.5	11	7.5	52.5 (58)	76.5 (82)	25	59 (64.5)
32	10.5	10.5	7.5	53 (59)	77 (83)	32	59.5 (65.5)
40	10.5	10.5	7.5	57.5 (63.5)	87.5 (93.5)	40	64 (70)

* (): Dimensions of built-in magnet type



Basic (Female Thread on Both Covers) (B)

JC MB —



Female rod end

[mm]															Female Rod End [mm]			
Bore size	A	AL	B ₁	C	D	E	F	H	H ₁	JA	JB	KA	MM	NA	Bore size	A ₁	H	MM
20	14.5	12	13	15.5	8	14 ⁰ _{-0.1}	2	21	5	M4 x 0.7 depth 7	M4 x 0.7 depth 5.5	Width across flats 6 length 3.5	M8 x 1.25	24	20	8	6.5	M4 x 0.7
25	17.5	15	17	16.5	10	14 ⁰ _{-0.1}	2	24	6	M5 x 0.8 depth 7.5	M5 x 0.8 depth 6	Width across flats 8 length 3.5	M10 x 1.25	27	25	8	6.5	M5 x 0.8
32	17.5	15	17	20	10	18 ⁰ _{-0.1}	2	24	6	M5 x 0.8 depth 8	M5 x 0.8 depth 6	Width across flats 8 length 3.5	M10 x 1.25	34.5	32	12	6.5	M5 x 0.8
40	23.5	20.5	22	24	14	24 ⁰ _{-0.1}	2	30	8	M6 x 1 depth 10	M6 x 1 depth 7	Width across flats 12 length 3.5	M14 x 1.5	42.5	40	13	6.5	M8 x 1.25

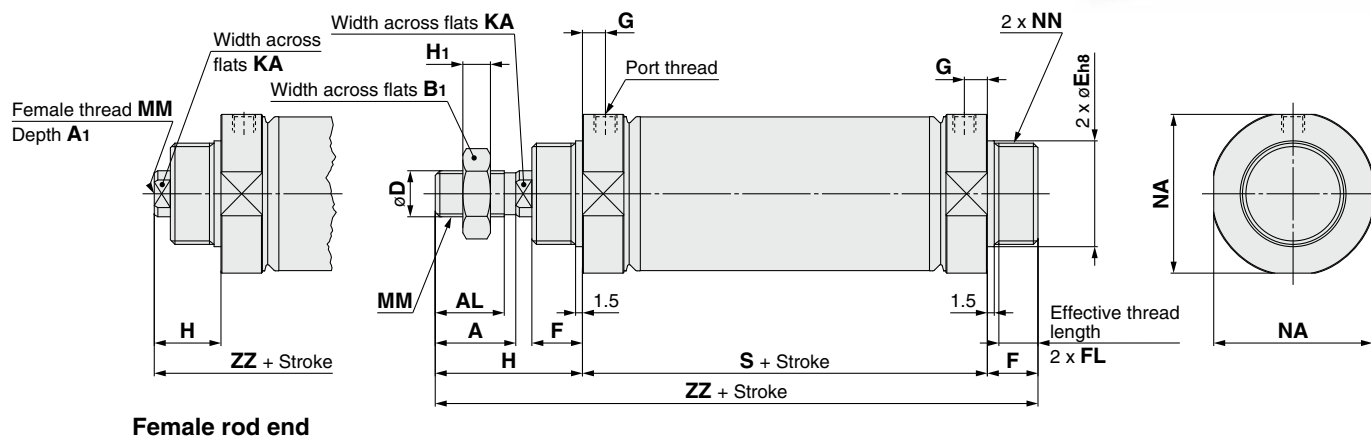
Port Thread: M5 [mm]					Female Rod End [mm]	
Bore size	GA	GB	S	ZZ	Bore size	ZZ
20	9	5	41 (46.5)	64 (69.5)	20	49.5 (55)
25	11	5	43.5 (49)	69.5 (75)	25	52 (57.5)
32	10.5	5	43.5 (49.5)	69.5 (75.5)	32	52 (58)
40	11	5	50.5 (56.5)	82.5 (88.5)	40	59 (65)

Port Thread: Rc1/8, NPT1/8 [mm]						Female Rod End [mm]	
Bore size	GA		GB	S	ZZ	Bore size	ZZ
	Rc1/8	NPT1/8					
20	10.5	11	7.5	54 (59.5)	77 (82.5)	20	62.5 (68)
25	10.5	11	7.5	52.5 (58)	78.5 (84)	25	61 (66.5)
32	10.5	10.5	7.5	53 (59)	79 (85)	32	61.5 (67.5)
40	10.5	10.5	7.5	57.5 (63.5)	89.5 (95.5)	40	66 (72)

* (): Dimensions of built-in magnet type

Male Thread on Both Covers (M)

JC	D	MM	Bore size	Port thread type	–	Stroke	
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[mm]														Female Rod End				[mm]
Bore size	A	AL	B ₁	D	E	F	FL	H	H ₁	KA	MM	NA	NN	Bore size	A ₁	H	MM	
20	14.5	12	13	8	18 _{0.033}	11	8.5	30	5	Width across flats 6 length 3.5	M8 x 1.25	24	M18 x 1.5	20	8	15.5	M4 x 0.7	
25	17.5	15	17	10	22 _{0.033}	11	8.5	33	6	Width across flats 8 length 3.5	M10 x 1.25	27	M22 x 1.5	25	8	15.5	M5 x 0.8	
32	17.5	15	17	10	22 _{0.033}	11	8.5	33	6	Width across flats 8 length 3.5	M10 x 1.25	34.5	M22 x 1.5	32	12	15.5	M5 x 0.8	
40	23.5	20.5	22	14	27 _{0.039}	12	9.5	39	8	Width across flats 12 length 3.5	M14 x 1.5	42.5	M27 x 2	40	13	15.5	M8 x 1.25	

Port Thread: M5 [mm]			
Bore size	G	S	ZZ
20	5	37 (42.5)	78 (83.5)
25	5	37.5 (43)	81.5 (87)
32	5	38 (44)	82 (88)
40	5	44.5 (50.5)	95.5 (101.5)

Bore size	ZZ
20	63.5 (69)
25	64 (69.5)
32	64.5 (70.5)
40	72 (78)

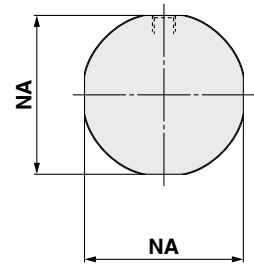
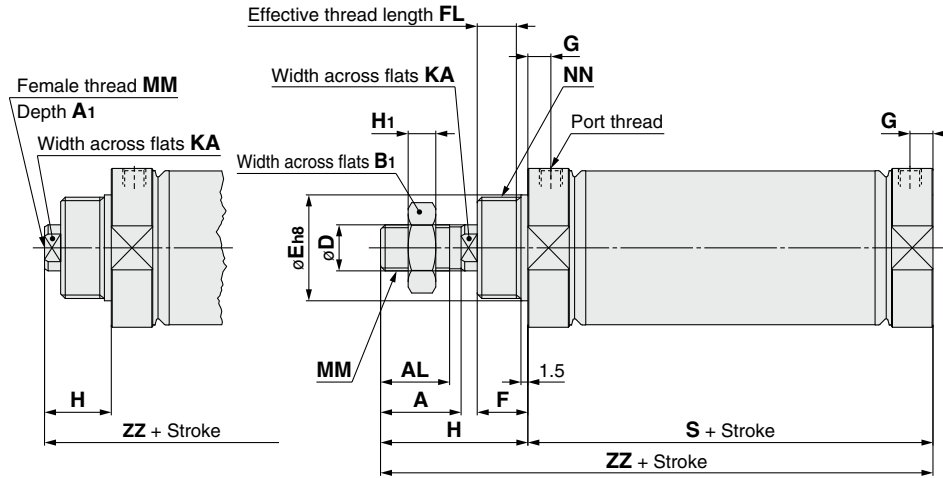
Port Thread: Rc1/8, NPT1/8 [mm]			
Bore size	G	S	ZZ
20	7.5	49 (54.5)	90 (95.5)
25	7.5	49.5 (55)	93.5 (99)
32	7.5	50 (56)	94 (100)
40	7.5	54.5 (60.5)	105.5 (111.5)

Female Rod End [mm]	
Bore size	ZZ
20	75.5 (81)
25	76 (81.5)
32	76.5 (82.5)
40	82 (88)

* (): Dimensions of built-in magnet type

Male Thread on Rod Cover (MZ)

JC **D** MMZ Bore size Port thread type — Stroke



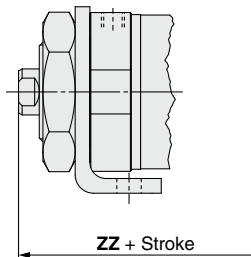
Female rod end

[mm]														Female Rod End				[mm]
Bore size	A	AL	B1	D	E	F	FL	H	H1	KA	MM	NA	NN	Bore size	A1	H	MM	
20	14.5	12	13	8	18 ⁰ _{-0.033}	11	8.5	30	5	Width across flats 6 length 3.5	M8 x 1.25	24	M18 x 1.5	20	8	15.5	M4 x 0.7	
25	17.5	15	17	10	22 ⁰ _{-0.033}	11	8.5	33	6	Width across flats 8 length 3.5	M10 x 1.25	27	M22 x 1.5	25	8	15.5	M5 x 0.8	
32	17.5	15	17	10	22 ⁰ _{-0.033}	11	8.5	33	6	Width across flats 8 length 3.5	M10 x 1.25	34.5	M22 x 1.5	32	12	15.5	M5 x 0.8	
40	23.5	20.5	22	14	27 ⁰ _{-0.039}	12	9.5	39	8	Width across flats 12 length 3.5	M14 x 1.5	42.5	M27 x 2	40	13	15.5	M8 x 1.25	

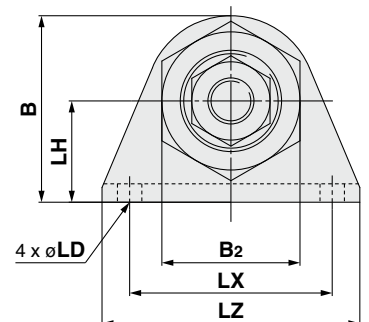
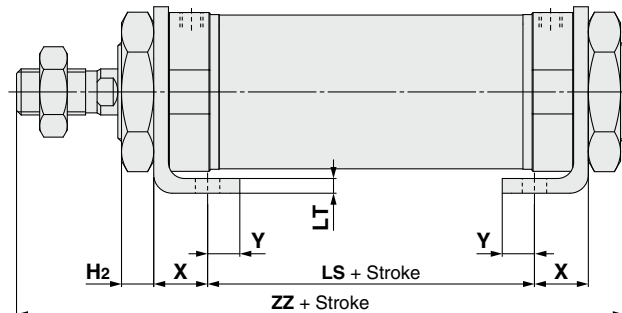
Port Thread: M5 [mm]				Female Rod End [mm]		Port Thread: Rc1/8, NPT1/8 [mm]				Female Rod End [mm]	
Bore size	G	S	ZZ	Bore size	ZZ	Bore size	G	S	ZZ	Bore size	ZZ
20	5	37 (42.5)	67 (72.5)	20	52.5 (58)	20	7.5	49 (54.5)	79 (84.5)	20	64.5 (70)
25	5	37.5 (43)	70.5 (76)	25	53 (58.5)	25	7.5	49.5 (55)	82.5 (88)	25	65 (70.5)
32	5	38 (44)	71 (77)	32	53.5 (59.5)	32	7.5	50 (56)	83 (89)	32	65.5 (71.5)
40	5	44.5 (50.5)	83.5 (89.5)	40	60 (66)	40	7.5	54.5 (60.5)	93.5 (99.5)	40	70 (76)

* (): Dimensions of built-in magnet type

Axial Foot: JCML



Female rod end

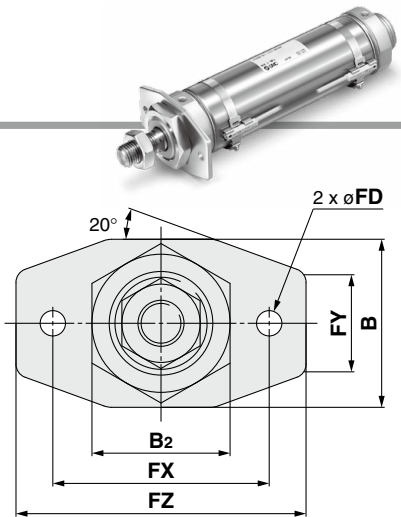
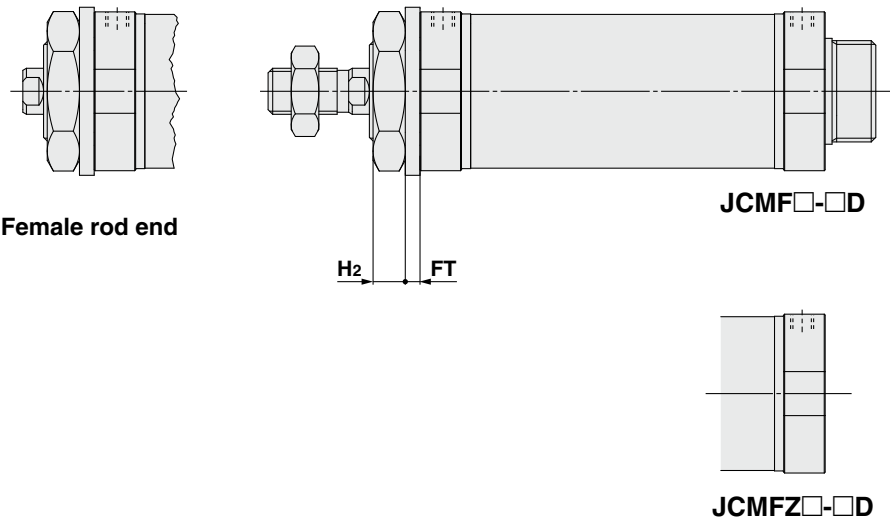


[mm]																
Bore size	B	B ₂	LD	LH	LT	LX	LZ	H ₂	X	Y	Port Thread: M5			Port Thread: Rc1/8, NPT1/8		
											LS	ZZ		LS	ZZ	
												Male rod end	Female rod end		Male rod end	Female rod end
20	29.5	24	4.5	16.5	3.2	32	43	7	11.7	4.8	20 (25.5)	78 (83.5)	63.5 (69)	32 (37.5)	90 (95.5)	75.5 (81)
25	32.5	30	4.5	18.5	3.2	35	46	7	11.7	4.8	20.5 (26)	81.5 (87)	64 (69.5)	32.5 (38)	93.5 (99)	76 (81.5)
32	40.5	30	5.5	22	3.2	44	56	7	11.7	7	21 (27)	82 (88)	64.5 (70.5)	33 (39)	94 (100)	76.5 (82.5)
40	48	36	5.5	26	3.2	51	62	8	11.7	7	27.5 (33.5)	95.5 (101.5)	72 (78)	37.5 (43.5)	105.5 (111.5)	82 (88)

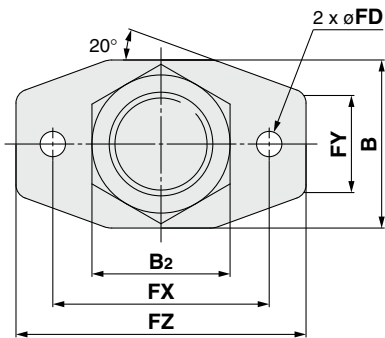
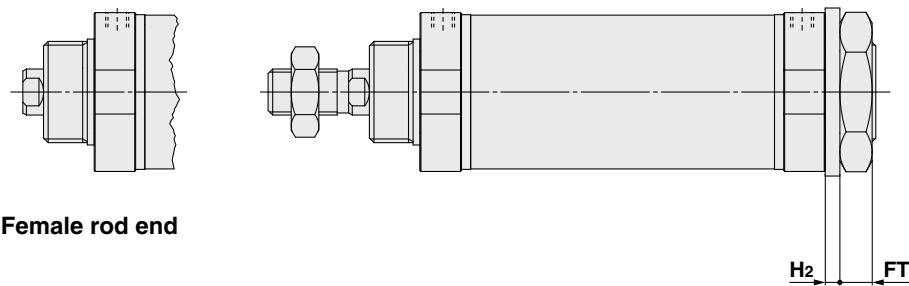
* (): Dimensions of built-in magnet type

Flange

Rod flange: JCMF, JCMFZ



Head flange: JCMG



[mm]								
Bore size	B	B ₂	FD	FT	FX	FY	FZ	H ₂
20	26	24	4.5	3.2	38	16.5	50	7
25	28	30	4.5	3.2	46	18.5	58	7
32	36.5	30	5.5	3.2	47	22	63	7
40	44.5	36	5.5	3.2	56	28	70	8

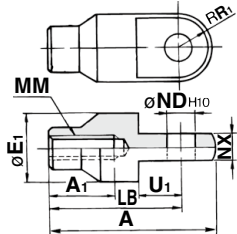
Dimensions of Accessories

Single Knuckle Joint

[mm]

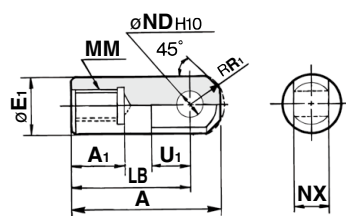
I-020B, 032B

Material: Carbon steel



I-040B

Material: Free cutting carbon steel



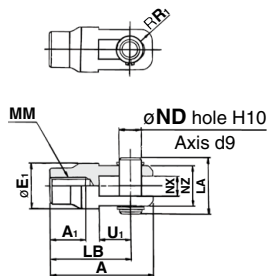
Part no.	Applicable bore size	A	A ₁	E ₁	LB	MM	ND _{H10}	NX	R ₁	U ₁
I-020B	20	46	16	20	36	M8 x 1.25	9 ^{+0.058} ₀	9 ^{-0.1} _{-0.2}	10	14
I-032B	25, 32	48	18	20	38	M10 x 1.25	9 ^{+0.058} ₀	9 ^{-0.1} _{-0.2}	10	14
I-040B	40	69	22	24	55	M14 x 1.5	12 ^{+0.070} ₀	16 ^{-0.1} _{-0.3}	15.5	20

Double Knuckle Joint

[mm]

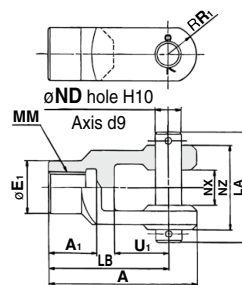
Y-020B, Y-032B

Material: Carbon steel



Y-040B

Material: Cast iron



Part no.	Applicable bore size	A	A ₁	E ₁	LA	LB	MM	ND	NX	NZ	R ₁	U ₁	Included pin part number	Retaining ring size Split pin
Y-020B	20	46	16	20	25	36	M8 x 1.25	9	9 ^{+0.2} _{-0.1}	18	5	14	CDP-1	Type C 9 for axis
Y-032B	25, 32	48	18	20	25	38	M10 x 1.25	9	9 ^{+0.2} _{-0.1}	18	5	14	CDP-1	Type C 9 for axis
Y-040B	40	68	22	24	49.7	55	M14 x 1.5	12	16 ^{+0.3} _{-0.1}	38	13	25	CDP-3	ø3 x 18L

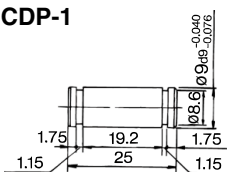
* A knuckle pin and retaining rings (split pins for $\varnothing 40$) are included.

Double Clevis Pin

[mm]

Bore size: Ø20, Ø25, Ø32

CDP-1

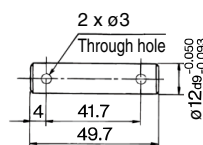


Retaining ring: Type C9 for axis

* Retaining rings (split pins for ø40) are included.

Bore size: Ø40

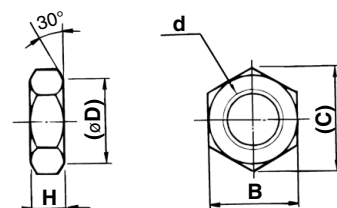
CDP-3



Split pin
ø3 x 18L

Rod End Nut (Standard)/Material: Carbon steel

[mm]

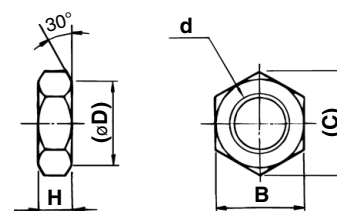


Part no.	Applicable bore size	B	(C)	(D)	d	H
NT-02	20	13	(15.0)	12.5	M8 x 1.25	5
NT-03	25, 32	17	(19.6)	16.5	M10 x 1.25	6
NT-04	40	22	(25.4)	21.0	M14 x 1.5	8

Mounting Nut

[mm]

* For M and MZ only



Part no.	Applicable bore size	B	(C)	(D)	d	H
JSN-020B	20	24	(27.7)	24	M18 x 1.5	7
JSN-032B	25, 32	30	(34.6)	30	M22 x 1.5	7
JSN-040B	40	36	(41.6)	36	M27 x 2.0	8

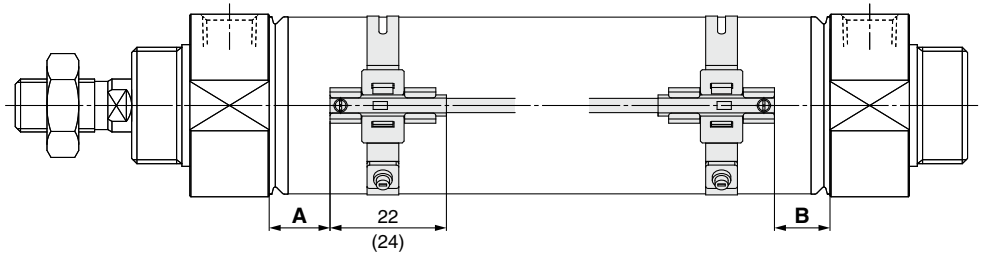
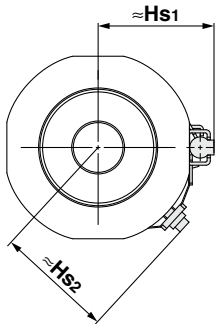
JCM Series

Auto Switch Mounting

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

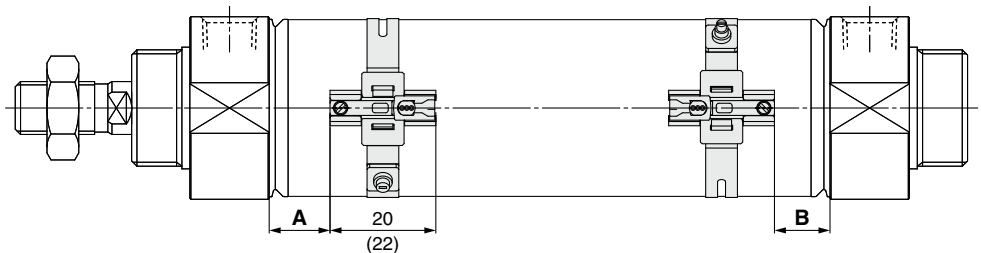
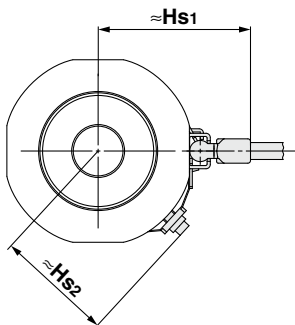
Solid state auto switch

D-M9□
D-M9□W
D-M9□A



() : Dimension of the D-M9□A
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-M9□V
D-M9□WV
D-M9□AV



() : Dimension of the D-M9□AV
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

When the cylinder is shipped from the factory, the set screw of the auto switch mounting band is sometimes mounted facing 180° in the opposite direction of the figure above.

Auto Switch Proper Mounting Position

[mm]

Auto switch model Bore size	D-M9□(V) D-M9□W(V) D-M9□A(V)	
	A	B
20	4	8.5
25	4.5	9
32	4.5	9.5
40	7	12

* Adjust the auto switch after confirming the operating condition in the actual setting.

Auto Switch Mounting Height

[mm]

Auto switch model Bore size	D-M9□ D-M9□W		D-M9□A	D-M9□V D-M9□WV D-M9□AV	
	Hs1	Hs2	Hs1, Hs2	Hs1	Hs2
20	16.5	17	17	23	17
25	19	19.5	19.5	25.5	19.5
32	22.5	23	23	29	23
40	26.5	27	27	32.5	27

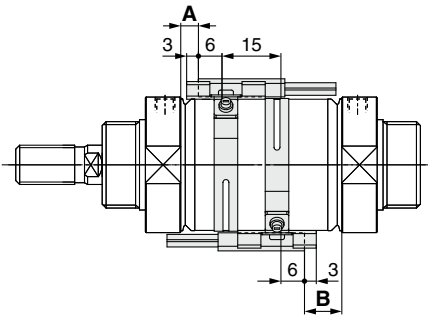
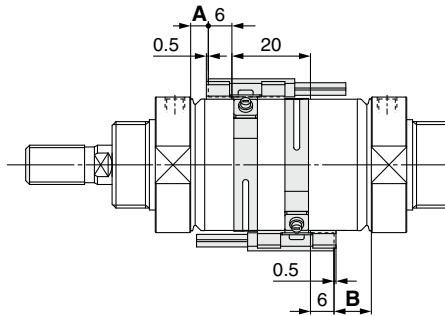
Minimum Stroke for Auto Switch Mounting

n: Number of auto switches [mm]

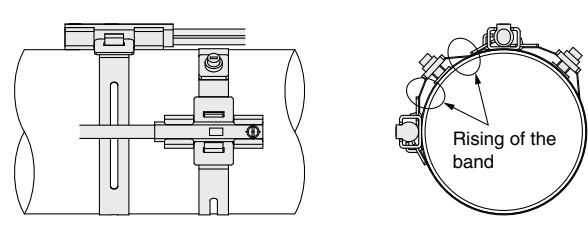
Auto switch model	Number of auto switches				
	1	2		n	
		Different surfaces	Same surface	Different surfaces	Same surface
D-M9□	25	25	40	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)*1	$55 + 35 (n-2)$ (n = 2, 3, 4, 5...)
D-M9□W	25	25	40	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)*1	$55 + 35 (n-2)$ (n = 2, 3, 4, 5...)
D-M9□A	25	25	40	$25 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)*1	$60 + 35 (n-2)$ (n = 2, 3, 4, 5...)
D-M9□V	25	25	35	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)*1	$35 + 35 (n-2)$ (n = 2, 3, 4, 5...)
D-M9□WV D-M9□AV	25	25	35	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)*1	$35 + 35 (n-2)$ (n = 2, 3, 4, 5...)

*1 When "n" is an odd number, an even number that is one larger than the odd number is to be used for the calculation.

Method of Mounting Two Auto Switches at the Stroke End of a Cylinder for Strokes Less Than 20 mm

Auto switch model	Applicable strokes	
	15 mm stroke	20 mm stroke
D-M9□(V) D-M9□W(V) D-M9□A(V)	 <p>· The correct mounting position of the D-M9 is 3 mm from the end face of the switch holder (dimensions A and B).</p>	 <p>· The correct mounting position of the D-M9 is 0.5 mm from the end face of the switch holder (dimensions A and B).</p>

Precautions for Mounting Two D-M9 In-line Entry Type Auto Switches on the Same Surface

Auto switch model	Applicable strokes	When mounting two auto switches on the same surface at the stroke indicated to the left
D-M9□ D-M9□W	40 to 54	 <p>· The location where the M3 set screw for securing the auto switch mounting band is mounted (nut part) is raised, so it is necessary to adjust the mounting position in the circumferential direction of the cylinder tube to prevent interference with the D-M9 and the lead wires.</p>
D-M9□A	40 to 59	

Operating Range

[mm]

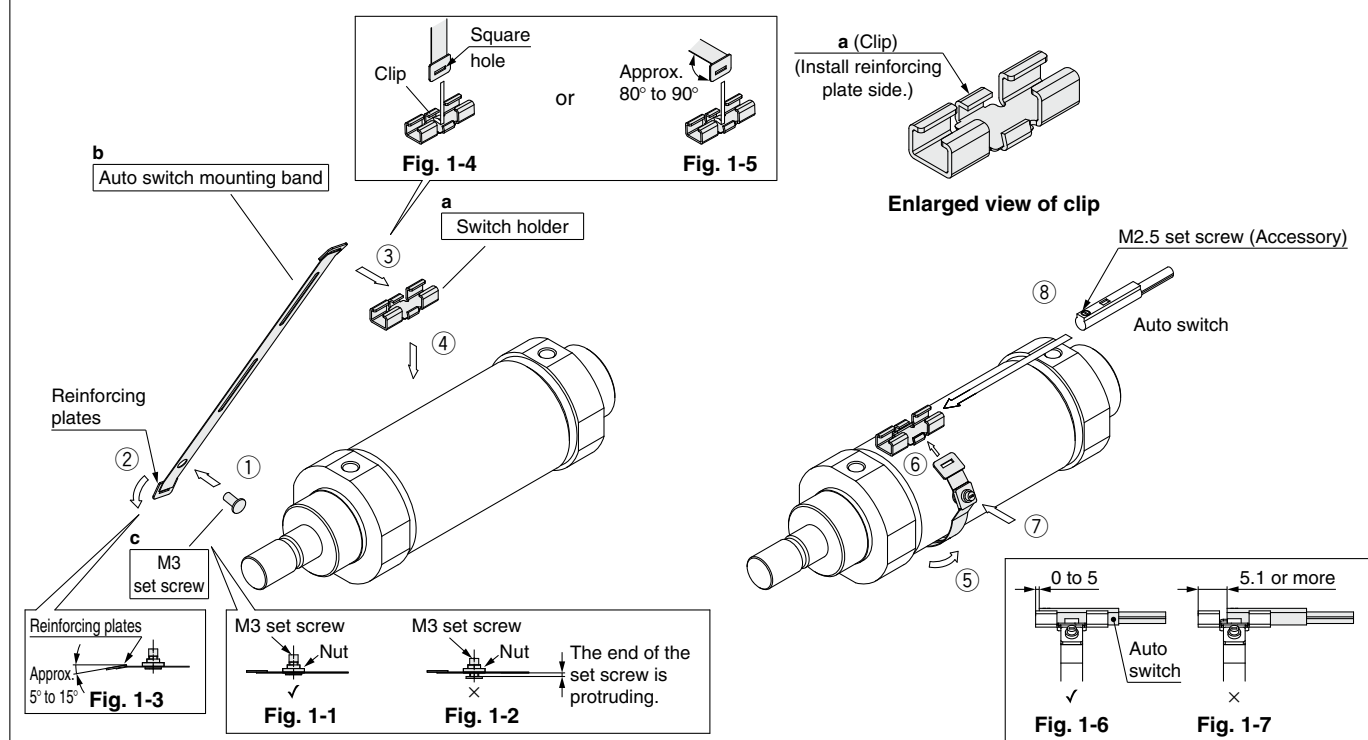
Auto switch model	Bore size			
	20	25	32	40
D-M9□(V) D-M9□W(V) D-M9□A(V)	2.5	2.5	3	3

* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

* When an auto switch is used, mount it at the center of the operating range.

Auto Switch Mounting Brackets/Part Nos.

Auto switch model	Bore size [mm]			
	ø20	ø25	ø32	ø40
D-M9□(V) D-M9□W(V)	BM8-020 (A set of a, b, c)	BM8-025 (A set of a, b, c)	BM8-032 (A set of a, b, c)	BM8-040 (A set of a, b, c)
D-M9□A(V)	BM8-020S (A set of a, b, c) * S: Stainless steel set screw	BM8-025S (A set of a, b, c) * S: Stainless steel set screw	BM8-032S (A set of a, b, c) * S: Stainless steel set screw	BM8-040S (A set of a, b, c) * S: Stainless steel set screw



<Mounting the Auto Switch>

* When the cylinder is ordered fitted with an auto switch, it is shipped with the auto switch mounting band installed. In this case, only step ⑧ is necessary. The installation position of the auto switch mounting band serves only as a rough guide, so check the operating condition of the auto switch and then readjust the band.

- ① As shown in Fig. 1-1, turn the set screw (c) into the nut (M3) of the auto switch mounting band (b. Hereafter called "band") in the clockwise direction from the bottom side of the nut.
 - * When mounting the set screw, take care that it does not protrude. (Fig. 1-2)
- ② Bend the reinforcing plate on the nut (M3) side, as shown in Fig. 1-3.
- ③ Pass the clip of the switch holder (a) through the square hole in the side of the reinforcing plate that was not bent in step ②. (Fig. 1-4 and Fig. 1-5)
- ④ Place the switch holder on the cylinder tube in the state of step ③.
- ⑤ Wrap the band around the cylinder tube.
 - It is necessary to press down on the switch holder with your fingers to ensure that it does not move out of position.
- ⑥ Push the other clip of the switch holder into the square hole in the band, and fit these parts together.
 - This can be facilitated by bringing the clip near the square hole in the band.
- ⑦ Set the switch holder of step ⑥ in the approximate mounting position on the cylinder tube, then turn the set screw of step ① in the clockwise direction and secure the band in place.
 - Use a watchmaker's (precision) screwdriver that has a bit diameter of between 1.4 and 1.8 mm.
 - The tightening torque of the M3 set screw is between 0.1 and 0.15 N·m. A tightening condition that is equivalent to this torque is obtained by tightening the set screw until 1.5 to 2 thread ridges remain visible on the head side of the set screw.

* A watchmaker's (precision) screwdriver has a small gripping diameter, so the tightening of the M3 set screw of the band may sometimes be insufficient. To prevent this, check the number of thread ridges that remain visible on the head side of the set screw in step ⑦, and confirm that the band is securely fastened.

- ⑧ Install the auto switch on the switch holder, and secure it in place.

- Install the auto switch in the state of Fig. 1-6.
- The tightening torque for the M2.5 set screw for fixing the auto switch is between 0.02 and 0.05 N·m. As a rough guide, use a precision screwdriver that has a gripping diameter of 5 to 6 mm, and turn 90° from the position in which it comes to feel tight.

<Removing the Auto Switch>

- Turn the M2.5 set screw provided with the auto switch in the counterclockwise direction, and remove the auto switch.

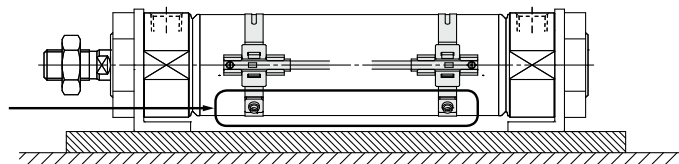
<When Removing the Auto Switch Mounting Band>

- First, remove the auto switch from the switch holder.
- Turn the M3 set screw that was used for securing the band, in the counterclockwise direction, so that the state of Fig. 1-1 is obtained.
- Press the switch holder against the cylinder tube, then while pushing up the set screw in the state of Fig. 1-1 and the reinforcing plate on the nut side, along the clip (oblique profile side), raise the part of the reinforcing plate that has the square hole, and remove the clip from the square hole.

* Because the auto switch mounting part on the switch holder has only a small clearance, the auto switch may sometimes fail to move when the M2.5 set screw provided is loosened. In such a case, press down on the top part of the auto switch using your fingers.

Caution

When the band set screw on the cylinder tube and also the mounting face of the D-M9 are located at the bottom of the cylinder mounting face, as shown in the figure to the right, it is conceivable that this may interfere with maintenance. For this reason, when installing the cylinder, be careful of the mounting of the D-M9.

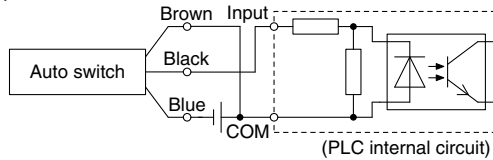


Prior to Use

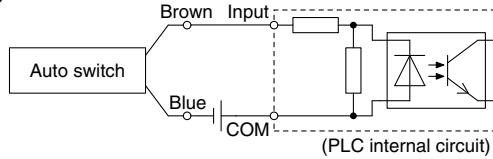
Auto Switch Connections and Examples

Sink Input Specifications

3-wire, NPN

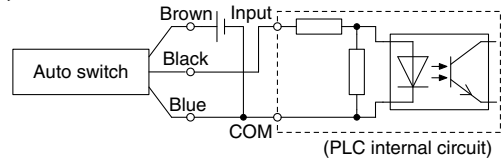


2-wire

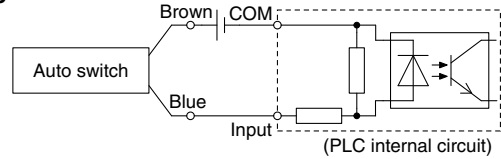


Source Input Specifications

3-wire, PNP



2-wire



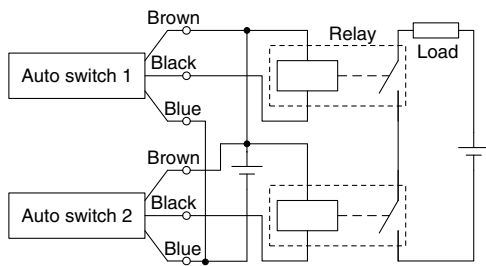
Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

Examples of AND (Series) and OR (Parallel) Connections

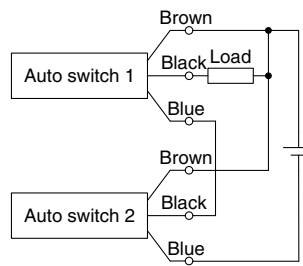
* When using solid state auto switches, ensure the application is set up so the signals for the first 50 ms are invalid. Depending on the operating environment, the product may not operate properly.

3-wire AND connection for NPN output

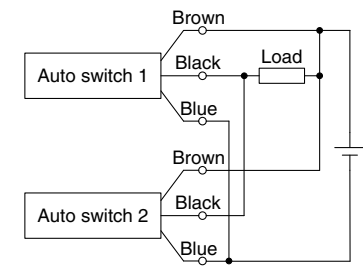
(Using relays)



(Performed with auto switches only)

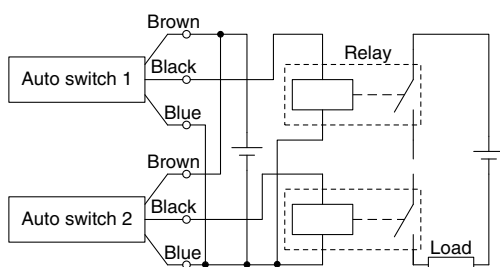


3-wire OR connection for NPN output

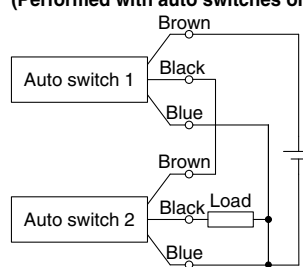


3-wire AND connection for PNP output

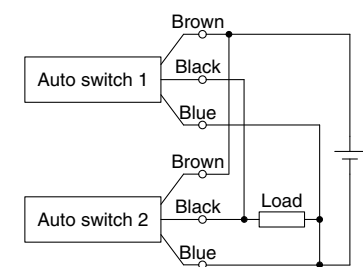
(Using relays)



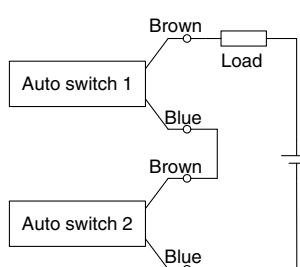
(Performed with auto switches only)



3-wire OR connection for PNP output



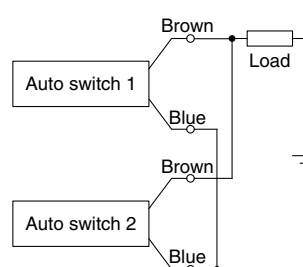
2-wire AND connection



When two auto switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state. The indicator lights will light up when both of the auto switches are in the ON state. Auto switches with a load voltage less than 20 V cannot be used. Please contact SMC if using AND connection for a heat-resistant solid state auto switch or a trimmer switch.

Example) Load voltage at ON
Power supply voltage: 24 VDC
Internal voltage drop: 4 V
Load voltage at ON = Power supply voltage –
Internal voltage drop x 2 pcs.
= 24 V – 4 V x 2 pcs.
= 16 V

2-wire OR connection



Example) Load voltage at OFF
Leakage current: 1 mA
Load impedance: 3 kΩ
Load voltage at OFF = Leakage current x 2 pcs. x
Load impedance
= 1 mA x 2 pcs. x 3 kΩ
= 6 V

(Solid state)
When two auto switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

(Reed)
Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of auto switches in the ON state, the indicator lights may sometimes grow dim or not light up, due to the dispersion and reduction of the current flowing to the auto switches.

JCM Series Related Components

Standard/Lightweight and Compact Type Floating Joint JT Series

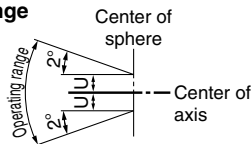
A more compact and lightweight combination is possible by using the JCM series with a JT series floating joint, standard/lightweight and compact type. (Refer to page 3 for details.)



Specifications

Model	Nominal thread size	Allowable axial force [N]	Allowable eccentricity U [mm]	Rotating angle [°]	Operating temperature range
JT20	M8 x 1.25	220	0.5	±2	-10 to 70°C
JT32	M10 x 1.25	560	0.5	±2	
JT40	M14 x 1.5	880	0.75	±2	

Operating range



Applicable Cylinder

Model	Applicable cylinder*1		Recommended cylinder
	Bore size	Operating pressure	
JT20	ø20	0.7 MPa or less	JC□M20 (Rod end male thread type)
JT32	ø25		JC□M25 (Rod end male thread type)
	ø32		JC□M32 (Rod end male thread type)
JT40	ø40		JC□M40 (Rod end male thread type)

*1 Make sure to use a cylinder with a built-in cushion mechanism.

How to Order

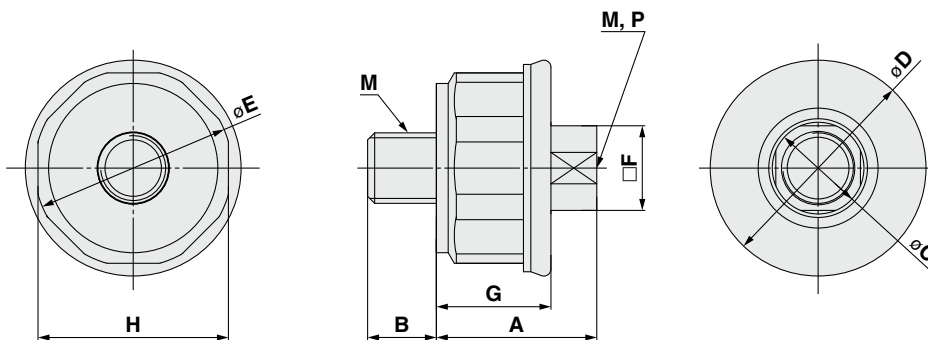
JT 20

Size	Applicable cylinder	Nominal thread size
20	For ø20	M8 x 1.25
32	For ø25	M10 x 1.25
	For ø32	M10 x 1.25
40	For ø40	M14 x 1.5

Operating conditions

Operating pressure	Pneumatic cylinder: 0.7 MPa or less
Mounting	Basic
Operating temperature	-10 to 70°C

Dimensions



Standard Pneumatic: Up to 0.7 MPa

Model	Connection thread M	A	B	øC	øD	øE	□F	G	Width across flats H	Maximum thread depth P	Weight
JT20	M8 x 1.25	19.2	8	11	(25.4)	23	10	13.6	22	9.5	22 g
JT32	M10 x 1.25	23	10	13.4	(30.6)	28	12	16.3	27	11.5	38 g
JT40	M14 x 1.5	29	14	19	(40.4)	37.4	17	20.3	36	15.5	98 g

* Value in () is the dimension when the dust cover is used.

For details other than the above, and specific product precautions, refer to the **Web Catalog** for the JT series.