

Air Cylinder: With End Lock

MBB Series

ø32, ø40, ø50, ø63, ø80, ø100



How to Order



MBB L 32 - 50 - H N

With auto switch

MDBB L 32 - 50 - H N - M9BW

With auto switch
(Built-in magnet)

Mounting type

B	Basic/Without bracket
L	Axial foot
F	Rod flange
G	Head flange
C	Single clevis
D	Double clevis
T	Center trunnion

Bore size

32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke [mm]

Refer to "Standard Strokes" on page 507.

Manual release

N	Non-locking
L	Locking

Made to Order
For details, refer to page 507.

Number of auto switches

Nil	2 pcs.
S	1 pc.
3	3 pcs.
n	"n" pcs.

Locking position

H	Locking at head end
R	Locking at rod end
W	Locking at both ends

Suffix (Rod boot)

Nil	None
J	Nylon tarpaulin
K	Heat resistant tarpaulin

Auto switch

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

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) MDBBB40-100

Applicable Auto Switches/Refer to pages 1271 to 1365 for further information on auto switches.

Type	Special function	Electrical entry	Indicate light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length [m]				Pre-wired connector	Applicable load			
					DC	AC	Tie-rod mounting	Band mounting	0.5 (Nil)	1 (M)	3 (L)	5 (Z)					
Solid state auto switch	—	Grommet	—	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	●	●	●	○	○	IC circuit	Relay, PLC		
				3-wire (PNP)				●	●	●	○	○					
		2-wire	●	●	●	○	○										
		3-wire (NPN)	●	●	●	○	○										
		2-wire	●	●	●	○	○										
	Diagnostic indication (2-color indicator)	Terminal conduit	Yes	—	3-wire (NPN)	24 V	5 V, 12 V	—	G39	—	—	—	—	—			
					2-wire				—	—	—	—					
		Grommet	—	—	3-wire (NPN)	24 V	5 V, 12 V	—	M9NW	●	●	●	○			○	IC circuit
					3-wire (PNP)				●	●	●	○	○				
					2-wire				●	●	●	○	○				
Water resistant (2-color indicator)	Grommet	—	—	3-wire (NPN)	24 V	5 V, 12 V	—	M9NA *1	—	○	○	●	○	IC circuit			
				3-wire (PNP)				—	○	○	●	○					
Diagnostic output (2-color indicator)	—	—	—	2-wire	24 V	12 V	—	M9BA *1	—	○	○	○	○	—			
				4-wire (NPN)				—	○	○	○	○					
Magnetic field resistant (2-color indicator)	—	—	—	2-wire (Non-polar)	24 V	5 V, 12 V	—	F59F	—	●	—	●	○	IC circuit			
				2-wire (Non-polar)				—	●	—	●	○					
Reed auto switch	—	Grommet	Yes (Equiv. to NPN)	3-wire (Equiv. to NPN)	24 V	12 V	—	A96	—	●	—	●	—	IC circuit	—		
				100 V				A93	—	●	—	●	—				
				100 V or less				A90	—	●	—	●	—				
				100 V, 200 V				A54	—	●	—	●	—				
				200 V or less				A64	—	●	—	●	—				
		Terminal conduit	Yes	—	—	2-wire	24 V	12 V	—	A33	—	—	—	—		—	
						—				A34	—	—	—	—			
						100 V, 200 V				A44	—	—	—	—			
						—				A59W	—	●	—	●			—
						—				A59W	—	●	—	●			—

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

Please contact SMC regarding water resistant types with the above model numbers.

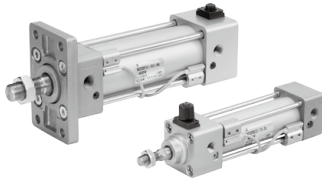
* Lead wire length symbols: 0.5 m Nil (Example) M9NW 3 m L (Example) M9NWL
1 m M (Example) M9NWM 5 m Z (Example) M9NWZ

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

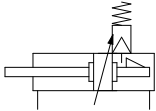
* Since there are other applicable auto switches than listed above, refer to page 522 for details.

* The D-A9□/M9□/P3DWA□A auto switches are shipped together, (but not assembled). (However, auto switch mounting brackets are assembled for the D-A9□/M9□ before shipment.)

Specifications



Symbol
Air cushion



Bore size [mm]	32	40	50	63	80	100
Action	Double acting, Single rod					
Fluid	Air					
Proof pressure	1.5 MPa					
Max. operating pressure	1.0 MPa					
Min. operating pressure	0.15 MPa*					
Ambient and fluid temperature	Without auto switch: -10 to 70°C With auto switch: -10 to 60°C (No freezing)					
Lubrication	Non-lube					
Operating piston speed	50 to 1000 mm/s					
Allowable stroke tolerance	Up to 250: $^{+1.0}_0$, 251 to 1000: $^{+1.4}_0$, 1001 to 1500: $^{+1.8}_0$					
Cushion	Air cushion					
Port size (Rc, NPT, G)	1/8	1/4	3/8	1/2		
Mounting	Basic, Axial foot, Rod flange, Head flange, Single clevis, Double clevis, Center trunnion					

* 0.05 MPa except locking parts



Made to Order
[Click here for details](#)

Symbol	Specifications
-XA□	Change of rod end shape
-XC7	Tie-rod, cushion valve, tie-rod nut, etc. made of stainless steel
-XC10	Dual stroke cylinder/Double rod type
-XC14	Change of trunnion bracket mounting position
-XC27	Double clevis and double knuckle joint pins made of stainless steel
-XC29	Double knuckle joint with spring pin
-XC30	Rod trunnion

* All Made-to-Order products have the same cover shapes as the current products.

Refer to pages 515 to 522 for cylinders with auto switches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Auto switch mounting brackets/Part no.
- Operating range

Locking Specifications

Locking position	Head end, Rod end, Both ends					
Holding force (Max.) N	ø32	ø40	ø50	ø63	ø80	ø100
		550	860	1340	2140	3450
Back lash	1.5 mm or less					
Manual release	Non-locking type, Locking type					

Standard Strokes

Bore size	Standard stroke [mm]
32	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
50	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600
63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600
80	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800
100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800

Note 1) Intermediate strokes are available. (No spacer is used.)

Note 2) Using a stroke of a length which is smaller than the effective cushion length may result in reduced air cushion performance. Refer to "Technical Data 1" on page 1573 for details on the effective cushion length.

Accessories

Mounting		Basic	Axial foot	Rod flange	Head flange	Single clevis	Double clevis	Center trunnion
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
	Locking release bolt (N type only)	●	●	●	●	●	●	●
Option	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (with pin)	●	●	●	●	●	●	●
	Rod boot	●	●	●	●	●	●	●

* Refer to page 491 for dimensions and part numbers. (Except locking release bolt and rod boot)

MBB Series

Weights/Aluminum Tube

Bore size [mm]		32	40	50	63	80	100
Basic weight	Basic	0.50	0.69	1.19	1.47	2.73	3.7
	Axial foot	0.68	0.93	1.56	1.93	3.61	4.8
	Rod/Head flange	0.79	1.06	1.64	2.26	4.18	5.53
	Single clevis	0.75	0.92	1.53	2.1	3.84	5.28
	Double clevis	0.76	0.96	1.62	2.26	4.13	5.55
	Center trunnion	0.79	1.05	1.67	2.27	4.28	5.39
Additional weight per 50 mm of stroke	All mounting brackets	0.11	0.16	0.26	0.27	0.42	0.56
Accessories	Single knuckle joint	0.15	0.23	0.26	0.26	0.60	0.83
	Double knuckle joint (with pin)	0.22	0.37	0.43	0.43	0.87	1.27

Mounting Brackets/Part No.

Bore size [mm]	32	40	50	63	80	100
Axial foot ^{Note 1)}	MB-L03	MB-L04	MB-L05	MB-L06	MB-L08	MB-L10
Rod/Head flange	MB-F03	MB-F04	MB-F05	MB-F06	MB-F08	MB-F10
Single clevis	MB-C03	MB-C04	MB-C05	MB-C06	MB-C08	MB-C10
Double clevis	MB-D03	MB-D04	MB-D05	MB-D06	MB-D08	MB-D10

Note 1) Order two feet per cylinder.

Note 2) Accessories for each mounting bracket are as follows.

Axial foot, Rod/Head flange, Single clevis/Body mounting bolt; Double clevis/ Body mounting bolt, Clevis pins, Flat washer and Split pins. → Refer to page 491 for details.

Additional Weight of Locking Part

Bore size [mm]		32	40	50	63	80	100
Manual release non-locking (N)	Locking at head end (H)	0.08	0.13	0.21	0.30	0.75	1.1
	Locking at rod end (R)	0.08	0.13	0.20	0.29	0.71	1.03
	Locking at both ends (W)	0.16	0.26	0.41	0.59	1.46	2.13
Manual release locking (L)	Locking at head end (H)	0.09	0.15	0.23	0.32	0.78	1.13
	Locking at rod end (R)	0.09	0.15	0.22	0.31	0.74	1.06
	Locking at both ends (W)	0.18	0.30	0.45	0.63	1.52	2.19

Calculation

Example) **MBBL32-100-HN**

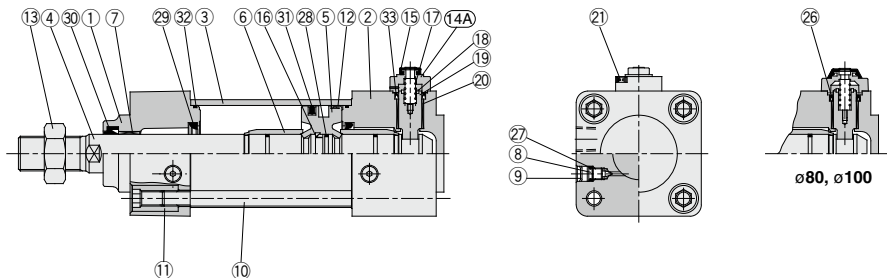
- Basic weight..... 0.68
- Additional weight..... 0.11/50 stroke
- Cylinder stroke..... 100 stroke
- Locking weight 0.08 (Locking at head end, manual release non-locking type)

$$0.68 + 0.11 \times 100/50 + 0.08 = \mathbf{0.98 \text{ kg}}$$

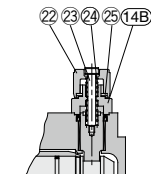
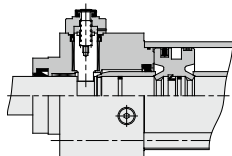
Construction

Locking at head end

Manual release non-locking type: N



Locking at rod end



Manual release locking type: L

Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	Metallic painted
2	Head cover	Aluminum alloy	Metallic painted
3	Cylinder tube	Aluminum alloy	Hard anodized
4	Piston rod	Carbon steel	Hard chrome plating
5	Piston	Aluminum alloy	Chromated
6	Cushion ring	Aluminum alloy	Anodized
7	Bushing	Bearing alloy	
8	Cushion valve	Steel wire	Trivalent zinc chromated
9	Retaining ring	Steel for spring	ø40 to ø100
10	Tie-rod	Carbon steel	Trivalent zinc chromated
11	Tie-rod nut	Carbon steel	Trivalent zinc chromated
12	Wear ring	Resin	
13	Rod end nut	Carbon steel	Trivalent zinc chromated
14A	Cover A	Aluminum alloy	Painted black
14B	Cover B	Carbon steel	Tuffride
15	Rubber cover	Synthetic rubber	
16	Piston holder	Urethane	

Component Parts

No.	Description	Material	Note
17	Lock spring	Steel wire	
18	Bumper	Urethane	
19	Lock piston	Carbon steel	Hardened, Hard chrome plating
20	Lock bushing	Copper alloy	
21	Bolt with hex. hole	Alloyed steel	Black zinc chromated
22	M/O knob	Zinc alloy	Painted black
23	M/O bolt	Alloyed steel	Black zinc chromated, Painted red
24	M/O spring	Steel wire	Zinc chromated
25	Stopper ring	Carbon steel	Zinc chromated
26	Seal retainer	Rolled steel	ø80, ø100 only
27	Cushion valve seal	NBR	
28	Piston gasket	NBR	
29*	Cushion seal	Urethane	
30*	Rod seal	NBR	
31*	Piston seal	NBR	
32*	Cylinder tube gasket	NBR	
33*	Lock piston seal	NBR	

Replacement Parts/Seal Kit (Locking at head or rod end)

Bore size [mm]	Kit no.	Contents
32	MBB32-PS	Set of the nos. 29, 30, 31, 32, 33
40	MBB40-PS	
50	MBB50-PS	
63	MBB63-PS	
80	MBB80-PS	
100	MBB100-PS	

Replacement Parts/Seal Kit (Locking at both ends)

Bore size [mm]	Kit no.	Contents
32	MBB32-PS-W	Set of the nos. 29, 30, 31, 32, 33
40	MBB40-PS-W	
50	MBB50-PS-W	
63	MBB63-PS-W	
80	MBB80-PS-W	
100	MBB100-PS-W	

* Seal kits consist of items 29 to 33, and can be ordered by using the seal kit number corresponding to each bore size.

* Trunnion type should not be disassembled. (Refer to page 524.)

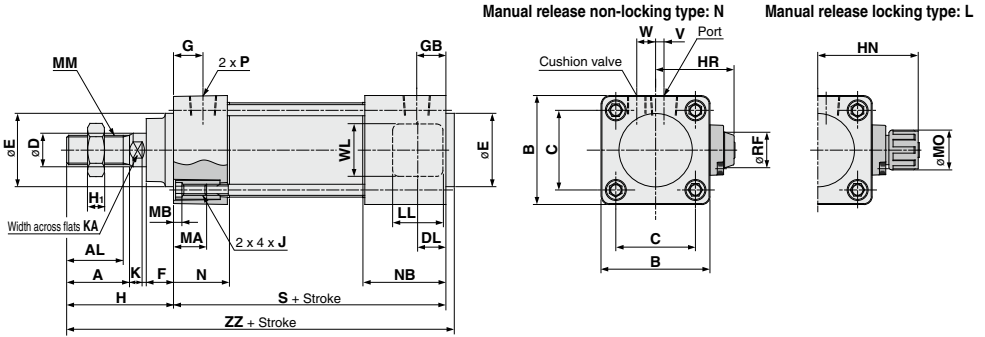
* Seal kit includes a grease pack (ø32 to 50: 10 g, ø63, 80: 20 g, ø100: 30 g). Order with the following part number when only the grease pack is needed.

Grease pack part number: GR-S-010 (10 g), GR-S-020 (20 g)

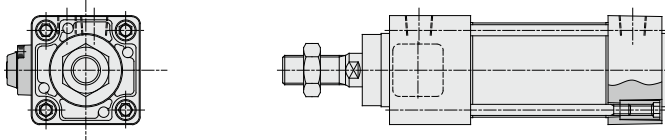
MBB Series

Basic: (B)

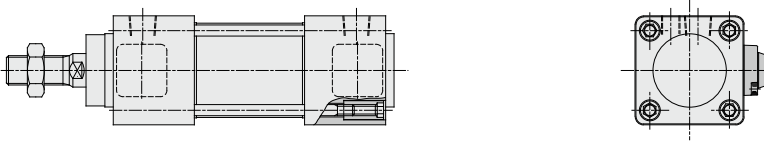
Locking at head end: MBBB Bore size Port thread type — Stroke — H□



Locking at rod end: MBBB Bore size Port thread type — Stroke — R□



Locking at both ends: MBBB Bore size Port thread type — Stroke — W□



-H□/R□

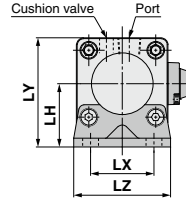
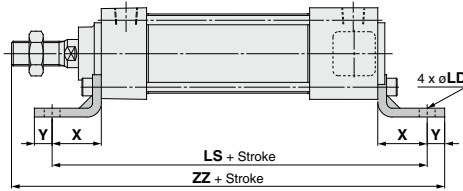
Bore size [mm]	AL	KA	A	B	C	D	DL	E	F	G	GB	H ₁	H	HR	HN	J	K	LL	MA	MB
32	19.5	10	22	46	32.5	12	9	30	13	13	21	6	47	33.5	45	M6 x 1	6	15	16	4
40	27	14	30	52	38	16	12	35	13	14	27	8	51	38.5	52.5	M6 x 1	6	21	16	4
50	32	18	35	65	46.5	20	13	40	14	15.5	27.5	11	58	45	59	M8 x 1.25	7	21	16	5
63	32	18	35	75	56.5	20	13	45	14	16.5	28.5	11	58	50	64	M8 x 1.25	7	21	16	5
80	37	22	40	95	72	25	16	45	20	19	37	13	72	62	76.5	M10 x 1.5	10	30	16	5
100	37	26	40	114	89	30	16	55	20	19	37	16	72	71.5	86	M10 x 1.5	10	30	16	5

-W□

Bore size [mm]	MM	MO	N	NB	P	RF	S	V	W	WL	ZZ	S	ZZ
32	M10 x 1.25	15	27	35	1/8	11	92	4	6.5	24	143	100	151
40	M14 x 1.5	19	27	40	1/4	11	97	4	9	24	152	110	165
50	M18 x 1.5	19	31.5	43.5	1/4	11	106	5	10.5	24	168	118	180
63	M18 x 1.5	19	31.5	43.5	3/8	11	106	9	12	24	168	118	180
80	M22 x 1.5	23	38	56	3/8	21	132	11.5	14	40	208	150	226
100	M26 x 1.5	23	38	56	1/2	21	132	17	15	40	208	150	226

With Mounting Bracket

Axial foot: (L) / Locking at head end: (-H□)

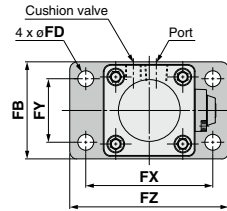
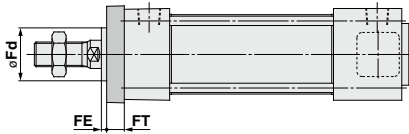


-H□/-R□

[mm] **-W□**

Bore size [mm]	X	Y	LD	LH	LS	LT	LX	LY	LZ	ZZ	LS	ZZ
32	22	9	7	30	136	3.2	32	53	50	170	144	178
40	24	11	9	33	145	3.2	38	59	55	183	158	196
50	27	11	9	40	160	3.2	46	72.5	70	202	172	214
63	27	14	12	45	160	3.6	56	82.5	80	205	172	217
80	30	14	12	55	192	4.5	72	102.5	100	248	210	266
100	32	16	14	65	196	4.5	89	122	120	252	214	270

Rod flange: (F) / Locking at head end: (-H□)

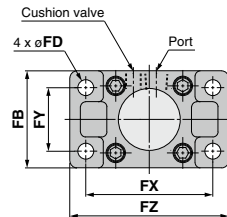
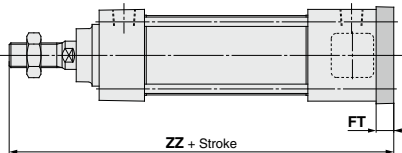


-H□/-R□/-W□

[mm]

Bore size [mm]	FB	FD	FE	FT	FX	FY	FZ	Fd
32	50	7	3	10	64	32	79	25
40	55	9	3	10	72	36	90	31
50	70	9	2	12	90	45	110	38.5
63	80	9	2	12	100	50	120	39.5
80	100	12	4	16	126	63	153	45
100	120	14	4	16	150	75	178	54

Head flange: (G) / Locking at head end: (-H□)



-H□/-R□

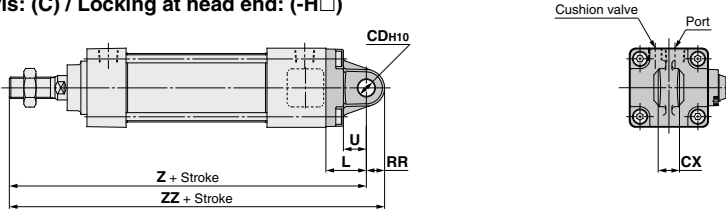
[mm] **-W□**

Bore size [mm]	FB	FD	FT	FX	FY	FZ	ZZ	ZZ
32	50	7	10	64	32	79	149	157
40	55	9	10	72	36	90	158	171
50	70	9	12	90	45	110	176	188
63	80	9	12	100	50	120	176	188
80	100	12	16	126	63	153	220	238
100	120	14	16	150	75	178	220	238

MBB Series

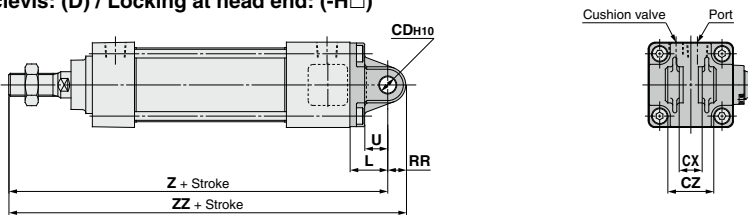
With Mounting Bracket

Single clevis: (C) / Locking at head end: (-H□)



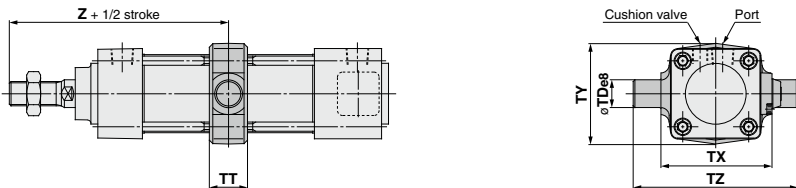
Bore size [mm]	-H□-R□ [mm]							-W□	
	L	RR	U	CDH10	CX ^{+0.1 -0.3}	Z	ZZ	Z	ZZ
32	23	10.5	13	10	14	162	172.5	170	180.5
40	23	11	13	10	14	171	182	184	195
50	30	15	17	14	20	194	209	206	221
63	30	15	17	14	20	194	209	206	221
80	42	23	26	22	30	246	269	264	287
100	42	23	26	22	30	246	269	264	287

Double clevis: (D) / Locking at head end: (-H□)



Bore size [mm]	-H□-R□ [mm]							-W□		
	L	RR	U	CDH10	CX ^{+0.3 -0.1}	CZ	Z	ZZ	Z	ZZ
32	23	10.5	13	10	14	28	162	172.5	170	180.5
40	23	11	13	10	14	28	171	182	184	195
50	30	15	17	14	20	40	194	209	206	221
63	30	15	17	14	20	40	194	209	206	221
80	42	23	26	22	30	60	246	269	264	287
100	42	23	26	22	30	60	246	269	264	287

Center trunnion: (T) / Locking at head end: (-H□)



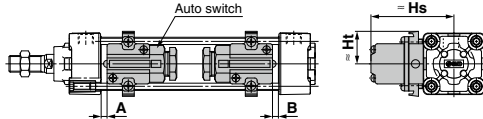
Bore size [mm]	-H□ [mm]							-R□-W□	
	TDøø	TT	TX	TY	TZ	Z	Z	Z	Z
32	12	17	50	49	74	89	97		
40	16	22	63	58	95	93	106		
50	16	22	75	71	107	105	117		
63	20	28	90	87	130	105	117		
80	20	34	110	110	150	129	147		
100	25	40	132	136	182	129	147		

Auto Switch Mounting

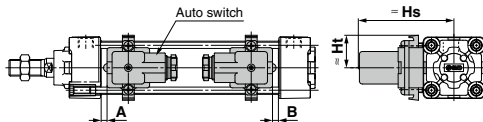
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Band mounting>

D-G39/K39/A3□



D-A44



<Tie-rod mounting>

D-M9□/M9□V

D-M9□W/M9□WV

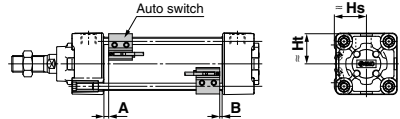
D-M9□A/M9□AV

D-A9□/A9□V

D-Y59□/Y69□/Y7P/Y7PV

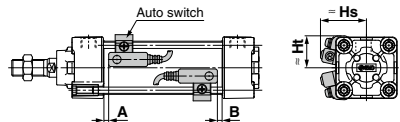
D-Y7□W/Y7□WV/Y7BA

D-Z7□/Z80



D-A5□/A6□

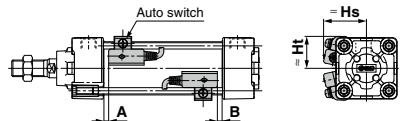
D-A59W



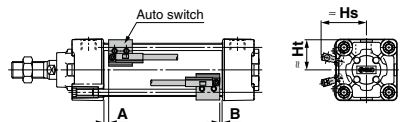
D-F5□/J59

D-F5□W/J59W/F5BA

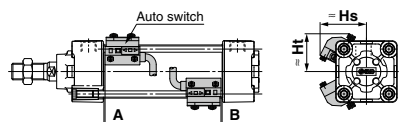
D-F59F/F5NT



D-P3DWA



D-P4DW



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

Auto Switch Proper Mounting Position (Standard type)

[mm]

Auto switch model	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-F5□ D-J59 D-F59F		D-F5NT		D-A5□ D-A6□		D-A59W		D-G39 D-K39 D-A3□ D-A44		D-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7H D-Y7□W D-Y7□WV D-Z7□ D-Z8□		D-P3DWA		D-P4DW	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
32	10	8	6	4	6.5	4.5	11.5	9.5	0	0	4	2	0	0	3.5	1.5	5.5	3.5	3	1
40	9	9	5	5	5.5	5.5	10.5	10.5	0	0	3	3	0	0	2.5	2.5	4.5	4.5	2	2
50	10	9	6	5	6.5	5.5	11.5	10.5	0	0	4	3	0	0	3.5	2.5	5.5	4.5	3	2
63	10	9	6	5	6.5	5.5	11.5	10.5	0	0	4	3	0	0	3.5	2.5	5.5	4.5	3	2
80	14.5	11.5	10.5	7.5	11	8	16	13	4.5	1.5	8.5	5.5	4.5	1.5	8	5	10	7	7.5	4.5
100	14	12	10	8	10.5	8.5	15.5	13.5	4	2	8	6	4	2	7.5	5.5	9.5	7.5	7	5
125	16	16	12	12	12.5	12.5	17.5	17.5	6	6	10	10	6	6	9.5	9.5	11.5	11.5	9	9

* Models with rubber bumper have different dimensions for auto switch proper mounting positions (A and B). Add the following values to both A and B: 3 mm (ø32 and 40), 4 mm (ø50 and 63), 5 mm (ø80 and 100), 6 mm (ø125).

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Proper Mounting Height (Standard type)

[mm]

Auto switch model	D-M9□ D-M9□W D-M9□A D-A9□		D-A9□V		D-M9□V D-M9□WV D-M9□AV		D-F5□ D-J59 D-F59F D-F5□W D-J59W D-F5BA D-F5NT		D-A5□ D-A6□ D-A59W		D-G39 D-K39 D-A3□		D-A44		D-Y59□ D-Y7P D-Y7□W D-Y7BA D-Z7□ D-Z8□		D-Y69□ D-Y7PV D-Y7□WV		D-P3DWA		D-P4DW	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht
32	24.5	23	27.5	23	30.5	23	32.5	25	35	24.5	67	27.5	77	27.5	25.5	23	26.5	23	38	31	38	31
40	28.5	25.5	31.5	25.5	34	25.5	36.5	27.5	38.5	27.5	71.5	27.5	81.5	27.5	29.5	26	30	26	39	25.5	42	33
50	33.5	31	36	31	38.5	31	41	34	43.5	34.5	77	—	87	—	33.5	31	34.5	31	43	31	46.5	39
63	38.5	36	40.5	36	43	36	46	39	48.5	39.5	83.5	—	93.5	—	39	36	40	36	48	36	51.5	44
80	46.5	45	49	45	52	45	52.5	46.5	55	46.5	92.5	—	103	—	47.5	45	48.5	45	56.5	45	58	51.5
100	54	53.5	57	53.5	59.5	53.5	59.5	55	62	55	103	—	113.5	—	55.5	53.5	56.5	53.5	64.5	53.5	65.5	60.5
125	65.5	64.5	68.5	64.5	71	64.5	70.5	66.5	71.5	66.5	115	—	125	—	67.5	65	68.5	65	76	64.5	76.5	72

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

Auto Switch Proper Mounting Position (Non-rotating rod type, With end lock) [mm]

Auto switch model	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-F5□ D-J59 D-F59F		D-F5NT		D-A5□ D-A6□		D-A59W		D-G39 D-K39 D-A3□ D-A44		D-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7H D-Y7□W D-Y7□WV D-Z7□ D-Z8□		D-P3DWA		D-P4DW	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
32	10.5	8	6.5	4	7	4.5	12	9.5	0.5	0	4.5	2	0.5	0	4	1.5	5.5	3.5	3.5	1
40	10.5	8	6.5	4	7	4.5	12	9.5	0.5	0	4.5	2	0.5	0	4	1.5	6	3.5	3.5	1
50	11	8.5	7	4.5	7.5	5	12.5	10	1	0	5	2.5	1	0	4.5	2	6.5	4	4	1.5
63	11	8.5	7	4.5	7.5	5	12.5	10	1	0	5	2.5	1	0	4.5	2	6.5	4	4	1.5
80	14	12.5	10	8.5	10.5	9	15.5	14	4	2.5	8	6.5	4	2.5	7.5	6	9.5	8	7	5.5
100	14	12.5	10	8.5	10.5	9	15.5	14	4	2.5	8	6.5	4	2.5	7.5	6	9.5	8	7	5.5

* Models with rubber bumper have different dimensions for auto switch proper mounting positions (A and B). Add the following values to both A and B: 3 mm (ø32 and 40), 4 mm (ø50 and 63), 5 mm (ø80 and 100).

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Proper Mounting Height (Non-rotating rod type, With end lock) [mm]

Auto switch model	D-M9□ D-M9□W D-M9□A D-A9□		D-A9□V		D-M9□V D-M9□WV D-M9□AV		D-F5□ D-J59 D-F59F D-F5□W D-J59W D-F5BA D-F5NT		D-A5□ D-A6□ D-A59W		D-G39 D-K39 D-A3□		D-A44		D-Y59□ D-Y7P D-Y7□W D-Y7BA D-Z7□ D-Z80		D-Y69□ D-Y7PV D-Y7□WV		D-P3DWA		D-P4DW	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht
32	24.5	23	27.5	23	30.5	23	32.5	25	35	24.5	67	27.5	77	27.5	25.5	23	26.5	23	38	31	38	31
40	28.5	25.5	31.5	25.5	34	25.5	36.5	27.5	38.5	27.5	71.5	27.5	81.5	27.5	29.5	26	30	26	39	25.5	42	33
50	33.5	31	36	31	38.5	31	41	34	43.5	34.5	77	—	87	—	33.5	31	34.5	31	43	31	46.5	39
63	38.5	36	40.5	36	43	36	46	39	48.5	39.5	83.5	—	93.5	—	39	36	40	36	48	36	51.5	44
80	46.5	45	49	45	52	45	52.5	46.5	55	46.5	92.5	—	103	—	47.5	45	48.5	45	56.5	45	58	51.5
100	54	53.5	57	53.5	59.5	53.5	59.5	55	62	55	103	—	113.5	—	55.5	53.5	56.5	53.5	64.5	53.5	65.5	60.5

Minimum Stroke for Auto Switch Mounting

Mounting Brackets Except Center Trunnion

n: Number of auto switches [mm]

Auto switch model	Number of auto switches	ø32, ø40, ø50, ø63	ø80, ø100	ø125 <small>Note 2)</small>
D-M9 □ D-M9 □W	2 (Different surfaces, same surface) 1	15		
	n	$15 + 40 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>		
D-M9 □V D-M9 □WV	2 (Different surfaces, same surface) 1	10		
	n	$10 + 30 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>		
D-M9 □A	2 (Different surfaces, same surface) 1	15		
	n	$15 + 40 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>		
D-M9 □AV	2 (Different surfaces, same surface) 1	15		
	n	$15 + 30 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>		
D-A9 □	2 (Different surfaces, same surface) 1	15		
	n	$15 + 40 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>		
D-A9 □V	2 (Different surfaces, same surface) 1	10		
	n	$10 + 30 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>		
D-G39 D-K39 D-A3 □	2 (Different surfaces)	35		
	2 (Same surface)	100		
	n (Different surfaces)	$35 + 30 (n - 2)$ <small>(n = 2, 3, 4...)</small>		
	n (Same surface)	$100 + 100 (n - 2)$ <small>(n = 2, 3, 4...)</small>		
	1	10		
D-A44	2 (Different surfaces)	35		
	2 (Same surface)	55		
	n (Different surfaces)	$35 + 30 (n - 2)$ <small>(n = 2, 3, 4...)</small>		
	n (Same surface)	$55 + 50 (n - 2)$ <small>(n = 2, 3, 4...)</small>		
	1	10		
D-F5 □ D-J59 D-F5 □W D-J59 □W D-F5BA D-F59F	2 (Different surfaces, same surface)	15	25	25
	n (Same surface)	$15 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>	$25 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>	$25 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>
	1	10	25	25
	2 (Different surfaces, same surface) 1	15	20	20
D-A5 □ D-A6 □	2 (Different surfaces, same surface) 1	20	25	25
	n (Different surfaces)	$15 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>	$20 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>	$20 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>
D-A59W	2 (Different surfaces, same surface) 1	20	25	25
	n (Same surface)	$20 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>	$25 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>	$25 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>
	1	15	25	25
D-F5NT	2 (Different surfaces, same surface) 1	15	25	30
	n (Same surface)	$15 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>	$25 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>	$30 + 55 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>
	1	10	25	30
D-Y59 □ D-Y7P D-Y7 □W D-Z70 D-Z80	2 (Different surfaces, same surface) 1	15		
	n	$15 + 40 \frac{(n-2)}{2}$ <small>(n = 2, 4, 6, 8...)</small> <small>Note 1)</small>		

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Note 2) Non-rotating rod type and with end lock are applicable to ø32 to ø100.

Minimum Stroke for Auto Switch Mounting

Mounting Brackets Except Center Trunnion

n: Number of auto switches [mm]

Auto switch model	Number of auto switches	ø32, ø40, ø50, ø63, ø80, ø100	ø125 Note 3)
D-Y69□ D-Y7PV D-Y7□WV	2 (Different surfaces, same surface)	10	
	n	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	
D-Y7BA	2 (Different surfaces, same surface)	20	
	n	$20 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	
D-P3DWA	2 (Different surfaces, same surface)	15	
	n	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	
D-P4DW	2 (Different surfaces, same surface)	15	20
	n	$15 + 65 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$20 + 65 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Note 3) Non-rotating rod type and with end lock are applicable to ø32 to ø100.

Center Trunnion

n: Number of auto switches [mm]

Auto switch model	Number of auto switches	ø32	ø40	ø50	ø63	ø80	ø100	ø125 Note 3)
D-M9□ D-M9□W	2 (Different surfaces, same surface)	75	80	85	90	95	105	
	n	$75 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
D-M9□V D-M9□WV	2 (Different surfaces, same surface)	50	55	60	65	70	80	
	n	$50 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$70 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$80 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
D-M9□A	2 (Different surfaces, same surface)	80	85	90	95	100	110	
	n	$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$90 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$100 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$110 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
D-M9□AV	2 (Different surfaces, same surface)	55	60	65	70	75	85	
	n	$55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$65 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$70 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$85 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
D-A9□	2 (Different surfaces, same surface)	70	75	80	85	95	100	
	n	$70 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$75 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$80 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$85 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$95 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$100 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	
D-A9□V	2 (Different surfaces, same surface)	45	50	55	60	70	75	
	n	$45 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$50 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$55 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$60 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$70 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	$75 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2)	

Note 2) When "n" is an odd number, a multiple of 4 that is larger than this odd number is used for the calculation.

Note 3) Non-rotating rod type and with end lock are applicable to ø32 to ø100.

Minimum Stroke for Auto Switch Mounting

Center Trunnion

n: Number of auto switches [mm]

Auto switch model	Number of auto switches	ø32	ø40	ø50	ø63	ø80	ø100	ø125 (Note 3)
D-G39 D-K39 D-A3□	2 (Different surfaces)	60	65	75	80	85	90	90
	2 (Same surface)	90	95	100	105	110	125	
	n (Different surfaces)	$60 + 30(n-2)$ (n = 2, 4, 6, 8...) Note 1	$65 + 30(n-2)$ (n = 2, 4, 6, 8...) Note 1	$75 + 30(n-2)$ (n = 2, 4, 6, 8...) Note 1	$80 + 30(n-2)$ (n = 2, 4, 6, 8...) Note 1	$85 + 30(n-2)$ (n = 2, 4, 6, 8...) Note 1	$90 + 30(n-2)$ (n = 2, 4, 6, 8...) Note 1	
	n (Same surface)	$90 + 100(n-2)$ (n = 2, 4, 6, 8...) Note 1	$95 + 100(n-2)$ (n = 2, 4, 6, 8...) Note 1	$100 + 100(n-2)$ (n = 2, 4, 6, 8...) Note 1	$105 + 100(n-2)$ (n = 2, 4, 6, 8...) Note 1	$110 + 100(n-2)$ (n = 2, 4, 6, 8...) Note 1	$125 + 100(n-2)$ (n = 2, 4, 6, 8...) Note 1	
	1	60	65	75	80	85	90	
D-A44	2 (Different surfaces)	70	75	80	85	90		
	2 (Same surface)							
	n (Different surfaces)	$70 + 30(n-2)$ (n = 2, 4, 6, 8...) Note 1	$75 + 30(n-2)$ (n = 2, 4, 6, 8...) Note 1	$80 + 30(n-2)$ (n = 2, 4, 6, 8...) Note 1	$85 + 30(n-2)$ (n = 2, 4, 6, 8...) Note 1	$90 + 30(n-2)$ (n = 2, 4, 6, 8...) Note 1		
	n (Same surface)	$70 + 50(n-2)$ (n = 2, 4, 6, 8...) Note 1	$75 + 50(n-2)$ (n = 2, 4, 6, 8...) Note 1	$80 + 50(n-2)$ (n = 2, 4, 6, 8...) Note 1	$85 + 50(n-2)$ (n = 2, 4, 6, 8...) Note 1	$90 + 50(n-2)$ (n = 2, 4, 6, 8...) Note 1		
	1	70	75	80	85	90		
D-F5□/J59 D-F5□W D-J59W D-F5BA D-F59F	2 (Different surfaces, same surface)	90	95	110	115	120	130	
	n (Same surface)	$90 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$95 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$110 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$115 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$120 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$130 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	
	1	90	95	110	115	120	130	
	n (Same surface)	100	105	120	125	130	140	
	1	100	105	120	125	130	140	
D-A5□ D-A6□	2 (Different surfaces, same surface)	60	80	105	110	115		
	1							
	n (Same surface)	$60 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$80 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$105 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$110 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$115 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2		
	1	60	70	85	110	115	120	
	n (Same surface)	$60 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$70 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$85 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$110 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$115 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$120 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	
D-A59W	2 (Different surfaces, same surface)	60	70	85	110	115	120	
	1							
	n (Same surface)	$60 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$70 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$85 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$110 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$115 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$120 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	
	1	60	70	85	110	115	120	
	n (Same surface)	$60 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$70 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$85 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$110 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$115 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$120 + 55\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	
D-Y59□ D-Y7P D-Y7□W D-Z7□ D-Z80	2 (Different surfaces, same surface)	80	85	90	95	100	105	
	1							
	n	$80 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$85 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$90 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$95 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$100 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$105 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	
	1	80	85	90	95	100	105	
	n	$80 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$85 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$90 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$95 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$100 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$105 + 40\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	
D-Y69□ D-Y7PV D-Y7□WV	2 (Different surfaces, same surface)	60	65	70	75	85	85	
	1							
	n	$60 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$65 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$70 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$75 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$85 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$85 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	
	1	60	65	70	75	85	85	
	n	$60 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$65 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$70 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$75 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$85 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$85 + 30\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	
D-Y7BA	2 (Different surfaces, same surface)	85	90	100	105	110	115	
	1							
	n	$85 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$90 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$100 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$105 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$110 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$115 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	
	1	85	90	100	105	110	115	
	n	$85 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$90 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$100 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$105 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$110 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$115 + 45\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	
D-P3DWA	2 (Different surfaces, same surface)	80	85	90	95	100	100	
	1							
	n	$80 + 50\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$85 + 50\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$90 + 50\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$95 + 50\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$100 + 50\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$100 + 50\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	
	1	80	85	90	95	100	100	
	n	$80 + 50\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$85 + 50\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$90 + 50\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$95 + 50\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$100 + 50\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$100 + 50\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	
D-P4DW	2 (Different surfaces, same surface)	120	130	140	150			
	1							
	n	$120 + 65\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$130 + 65\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$140 + 65\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$150 + 65\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2			
	1	120	130	140	150			
	n	$120 + 65\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$130 + 65\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$140 + 65\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	$150 + 65\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2			

Note 1) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Note 2) When "n" is an odd number, a multiple of 4 that is larger than this odd number is used for the calculation.

Note 3) Non-rotating rod type and with end lock are applicable to ø32 to ø100.

Auto Switch Mounting Brackets/Part No.

Auto switch model	Bore size [mm]						
	ø32	ø40	ø50	ø63	ø80	ø100	ø125
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV D-A9□/A9□V	BMB5-032	BMB5-032	BA7-040	BA7-040	BA7-063	BA7-063	BA7-080
D-A3□/A44 D-G39/K39	BMB2-032	BMB2-040	BMB1-050	BMB1-063	BMB1-080	BMB1-100	BS1-125
D-F5□/J59 D-F5□W/J59W D-F59F/F5BA D-F5NT D-A5□/A6□/A59W	BT-03	BT-03	BT-05	BT-05	BT-06	BT-06	BT-08
D-P3DWA	BA10-032S	BA10-040S	BA10-050S	BA10-050S	BA10-063S	BA10-063S	BA10-080S
D-P4DW	BMB3T-040	BMB3T-040	BMB3T-050	BMB3T-050	BMB3T-080	BMB3T-080	BAP2T-080
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA D-Z7□/Z80	BMB4-032	BMB4-032	BMB4-050	BMB4-050	BA4-063	BA4-063	BA4-080

[Stainless Steel Mounting Screw]

The following stainless steel mounting screw kit (including set screws) is available. Use it in accordance with the operating environment. (Since the auto switch mounting bracket is not included, order it separately.)

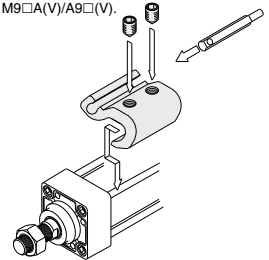
BBA1: For D-A5/A6/F5/J5 types

Note 1) Refer to page 1377 for details on the BBA1.

The above stainless steel screws are used when a cylinder is shipped with the D-F5BA auto switch. When only one auto switch is shipped independently, the BBA1 is attached.

Note 2) When using the D-M9□A(V) or Y7BA, do not use the steel set screws which are included with the auto switch mounting brackets above (BMB5-032, BA7-□□□, BMB4-□□□, BA4-□□□). Order a stainless steel screw kit (BBA1) separately, and use the M4 x 6 L stainless steel set screws included in the BBA1.

• The figure shows the mounting example for the D-M9□(V)/M9□W(V)/M9□A(V)/A9□(V).

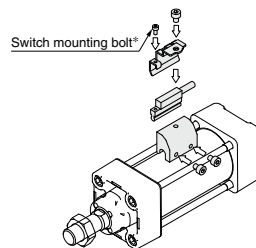


Operating Range

Auto switch model	Bore size [mm]						
	32	40	50	63	80	100	125
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	4	4.5	4.5	4.5	5	6	7
D-Y59□/Y69□ D-Y7P/Y7□V D-Y7□W/Y7□WV D-Y7BA	5.5	5.5	7	7.5	6.5	5.5	7
D-F5□/J59 D-F5□W/J59W D-F5BA/F5NT D-F59F	3.5	4	4	4.5	4.5	4.5	5
D-G39/K39	9	9	9	10	10	11	11
D-P3DWA	3	4.5	4.5	5	5	5.5	6.5
D-P4DW	4	4	4	4.5	4	4.5	4.5
D-A9□/A9□V	7	7.5	8.5	9.5	9.5	10.5	12
D-Z7□/Z80	7.5	8.5	7.5	9.5	9.5	10.5	13
D-A5□/A6□	9	9	10	11	11	11	10
D-A59W	13	13	13	14	14	15	17
D-A3□/A44	9	9	10	11	11	11	10

* 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.

<Mounting example for ø32, D-P3DWA>



* The switch mounting bolt is supplied with the switch.

Other than the applicable auto switches listed in “How to Order”, the following auto switches are mountable.

Refer to pages 1271 to 1365 for the detailed specifications.

Type	Model	Electrical entry	Features
Solid state	D-M9NV/M9PV/M9BV	Grommet (Perpendicular)	—
	D-Y69A/Y69B/Y7PV		—
	D-M9NVW/M9PWV/M9BWW		Diagnostic indication (2-color indicator)
	D-Y7NWW/Y7PWV/Y7BWW		Water resistant (2-color indicator)
	D-M9NAV/M9PAV/M9BAV		Magnetic field resistant (2-color indicator)
	D-P4DW		—
	D-F59/F5P/J59	Grommet (In-line)	—
	D-Y59A/Y59B/Y7P		—
	D-Y7H		—
	D-F59W/F5PW/J59W		Diagnostic indication (2-color indicator)
	D-Y7NWW/Y7PWV/Y7BWW		Water resistant (2-color indicator)
	D-F5BA/Y7BA		With timer
	D-F5NT		Magnetic field resistant (2-color indicator)
	D-P5DW		—
Reed	D-A93V/A96V	Grommet (Perpendicular)	—
	D-A90V	—	Without indicator light
	D-A53/A56/Z73/Z76	Grommet (In-line)	—
	D-A67/Z80		Without indicator light

* With pre-wired connector is also available for solid state switches. For details, refer to pages 1340 and 1341.

* Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)/Y7G/Y7H) are also available. For details, refer to pages 1290 and 1292.



1 Cylinder with Heat Resistant Reed Auto Switch (-10 to 120°C)

-X1184

Applicable Series

Description	Model	Action	Note
Standard type	MB	Double acting, Single rod	

How to Order

MDB Standard model no. Z – Pivot bracket Rod end bracket – Heat resistant reed auto switch – X1184

Switch model		Number of switches	
Symbol	Description	Symbol	Description
Nil	Without switch	S	1 pc.
B30	D-B30	Nil	2 pcs.
B30J	D-B30J	n	n pcs.
B31	D-B31		
B31J	D-B31J		
B35	D-B35		
B35J	D-B35J		

Cylinder with heat resistant reed auto switch

* Refer to pages 1363 to 1365 for details about the D-B3 auto switch and the Specific Product Precautions.

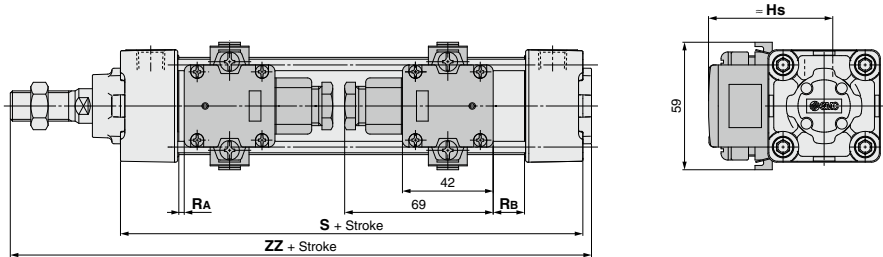
Specifications

Ambient temperature range	-10°C to 120°C
Bore size	40, 50, 63, 80, 100
Seal material	Fluororubber
Grease	Heat resistant grease

Warning Precautions

Be aware that smoking cigarettes etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

Dimensions (Dimensions other than below are the same as standard type.)



Bore size	S	ZZ	Hs	RA	RB	Minimum mounting stroke		Auto switch mounting bracket part number
						Other than center trunnion	Center trunnion	
40	99	154	57.5	2.5	14.5	1 pc.: 50 st or more	200 st or more	BMB2-040
50	109	171	63	3.5	14.5	2 pcs.: Different surfaces	200 st or more	BMB1-050
63	109	171	69.5	0.5	14.5	50 st or more	200 st or more	BMB1-063
80	129	205	78.5	2.5	22.5	2 pcs.: Same surface	210 st or more	BMB1-080
100	129	205	89	1	22	220 st or more	210 st or more	BMB1-100