

# Air Cylinder: Standard Type Double Acting, Double Rod

# MBW Series

ø32, ø40, ø50, ø63, ø80, ø100, ø125



## How to Order



**MBW** **L** **32** **150** **Z**

**With auto switch** **MDBW** **L** **32** **150** **Z** **M9BW**

**With auto switch**  
(Built-in magnet)

**Mounting type**

<b>B</b>	Basic
<b>L</b>	Axial foot
<b>F</b>	Rod flange
<b>T</b>	Center trunnion

\* Trunnion type is mounted before shipment.  
\* Other mounting brackets ø32 to ø100: Shipped together. ø125: Assembled before shipment.

**Bore size**

<b>32</b>	32 mm
<b>40</b>	40 mm
<b>50</b>	50 mm
<b>63</b>	63 mm
<b>80</b>	80 mm
<b>100</b>	100 mm
<b>125</b>	125 mm

**Port thread type**

<b>Nil</b>	Rc
<b>TN</b>	NPT
<b>TF</b>	G

**Cylinder stroke [mm]**  
Refer to "Standard Strokes" on page 493.

**Auto switch**

<b>Nil</b>	Without auto switch
<b>S</b>	3
<b>n</b>	"n" pcs.

\* For applicable auto switches, refer to the table below.

**Number of auto switches**

<b>Nil</b>	2 pcs.
<b>S</b>	1 pc.
<b>3</b>	3 pcs.
<b>n</b>	"n" pcs.

**Made to Order**  
For details, refer to page 493.

**Suffix (Rod boot)**

<b>Nil</b>	None
<b>J</b>	Nylon tarpaulin (one end)
<b>KJ</b>	Nylon tarpaulin (both ends)
<b>K</b>	Heat resistant tarpaulin (one end)
<b>KK</b>	Heat resistant tarpaulin (both ends)

**Suffix (Cushion)**

<b>Nil</b>	Air cushion
<b>N*</b>	Rubber bumper

\* Since the bumpers are attached to the both sides of the piston for rubber bumper type, the overall length is longer than the cylinder with air cushion as follows: ø32, ø40: +6 mm, ø50, ø63: +8 mm, ø80, ø100: +10 mm, ø125: +12 mm.

## Applicable Auto Switches/Refer to pages 1271 to 1365 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	Tie-rod mounting	Band mounting	0.5 (Nil)	1 (M)	3 (L)	5 (Z)								
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	<b>M9N</b>	●	●	○	○	○	IC circuit	Relay, PLC					
				3-wire (PNP)				<b>M9P</b>	●	●	○	○	○							
		2-wire		12 V	<b>M9B</b>	●	●	○	○	○										
		3-wire (NPN)		24 V	5 V, 12 V	—	<b>G39</b>	—	—	—	—	—	—							
	2-wire	12 V	<b>K39</b>				—	—	—	—	—									
	Diagnostic indication (2-color indicator)	Terminal conduit	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	<b>M9NW</b>	●	●	○	○	○	IC circuit						
				3-wire (PNP)				<b>M9PW</b>	●	●	○	○	○							
	Water resistant (2-color indicator)	Grommet	Yes	2-wire	24 V	12 V	—	<b>M9BW</b>	●	●	○	○	○	—						
				3-wire (NPN)				<b>M9NA</b> *1	—	○	○	●	○			○				
	Diagnostic output (2-color indicator)	Grommet	Yes	3-wire (PNP)	24 V	5 V, 12 V	—	<b>M9PA</b> *1	—	○	○	○	○	○		IC circuit				
2-wire				12 V				<b>M9BA</b> *1	—	○	○	○	○	○						
Magnetic field resistant (2-color indicator)	Terminal conduit	Yes	4-wire (NPN)	24 V	5 V, 12 V	—	<b>F59F</b>	—	●	—	○	○	○	IC circuit						
			2-wire (Non-polar)				—	<b>P3DWA</b>	—	●	—	●	●		○					
Reed auto switch	—	Grommet	Yes	3-wire (Equiv. to NPN)	—	5 V	—	<b>A96</b>	—	●	—	●	—	—	IC circuit	—				
				No				2-wire	24 V	12 V	100 V	<b>A93</b>	—	●			●	●	—	—
											100 V or less	<b>A90</b>	—	●			—	●	—	—
											100 V, 200 V	<b>A54</b>	—	●			—	●	—	—
											200 V or less	<b>A64</b>	—	●			—	●	—	—
		Yes	Terminal conduit	No	2-wire	24 V	12 V	—	<b>A33</b>	—	—	—	—	—	—					
									<b>A34</b>	—	—	—	—	—	—					
									<b>A44</b>	—	—	—	—	—	—					
									<b>A59W</b>	—	●	—	●	—	—					
									<b>A96</b>	—	●	—	●	—	—					

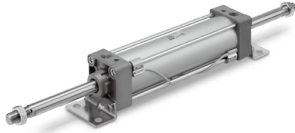
\*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please contact SMC regarding water resistant types with the above model numbers.

\* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW 3 m..... L (Example) M9NWL  
1 m..... M (Example) M9NWM 5 m..... Z (Example) M9NWX

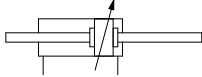
\* Solid state auto switches marked with "○" are produced upon receipt of order.

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

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



**Symbol**  
Double acting, Air cushion



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

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat resistant cylinder (-10 to 150°C)
-XC3	Special port location*1 *2
-XC4	With heavy duty scraper
-XC5	Heat resistant cylinder (-10 to 110°C)
-XC6	Made of stainless steel*2
-XC7	Tie-rod, cushion valve, tie-rod nut, etc. made of stainless steel
-XC14	Change of trunnion bracket mounting position
-XC22	Fluororubber seal
-XC30	Rod trunnion
-XC35	With coil scraper
-XC68	Made of stainless steel (with hard chrome plated piston rod)*3

\*1 The cover shape is the same as the current product.

\*2 ø125 only

\*3 Except ø125

For special port location (-XC3), the mounting bracket and port location can be determined using the standard product corresponding to the operating conditions. Also, this is only applicable to -XC3BB, -XC3CC and -XC3DD with trunnion bracket.

For parts made of stainless steel (-XC6), use the same specification stainless steel with the surface treatment (with hard chrome plated piston rod) (-XC68).

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

### Water Resistant Air Cylinder

Water resistant air cylinders are also available in the MB series, which are suitable for use on machine tools in an atmosphere with coolant and applicable to food machinery and automobile washing equipment in an environment with water splashes. Please refer to page 1189 for more information.

## Specifications

Bore size [mm]	32	40	50	63	80	100	125
<b>Action</b>	Double acting, Double rod						
<b>Fluid</b>	Air						
<b>Proof pressure</b>	1.5 MPa						
<b>Max. operating pressure</b>	1.0 MPa						
<b>Min. operating pressure</b>	0.05 MPa						
<b>Ambient and fluid temperature</b>	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C						
<b>Lubrication</b>	Not required (Non-lube)						
<b>Operating piston speed</b>	50 to 1000 mm/s						50 to 700 mm/s
<b>Allowable stroke tolerance</b>	Up to 250: $^{+1.0}_0$ , 251 to 1000: $^{+1.4}_0$ , 1001 to 1500						
<b>Cushion</b> <sup>(Note)</sup>	Air cushion or Rubber bumper						
<b>Port size (Rc, NPT, G)</b>	1/8	1/4		3/8			1/2
<b>Mounting</b>	Basic, Axial foot, Rod flange, Center trunnion						

Note) Kinetic energy absorbable by the cushion mechanism is identical to double acting, single rod.

## Standard Strokes

Bore size	Standard stroke					Stroke range ②	Max. manufacturable stroke
	Stroke range ①						
<b>32</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500					Up to 1000	Up to 1800
<b>40</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500						
<b>50</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600						
<b>63</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600					Up to 1200	
<b>80</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800						
<b>100</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800					Up to 1500	
<b>125</b>	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000						

Note 1) Manufacture of intermediate strokes is possible. (Spacers are not used.)

Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on pages 8 to 19. In addition, the products that exceed the stroke range ① might not be able to fulfill the specifications due to the deflection etc.

Note 3) Please consult with SMC for manufacturability and the part numbers when exceeding the stroke range ②.  
Note 4) The stroke range with rod boot is up to 1000 mm. Please consult with SMC when exceeding 1000 mm strokes.  
Note 5) 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	Center trunnion	
Standard	Rod end nut	●	●	●	●	
	Single knuckle joint	●	●	●	●	
Option	Double knuckle joint (with pin)	●	●	●	●	
	Rod boot	●	●	●	●	

\* Refer to page 491 for dimensions and part numbers. (Refer to page 496 for rod boot.)

## Rod Boot Material

Symbol	Material	Max. ambient temp.
<b>J</b>	Nylon tarpaulin	70°C
<b>K</b>	Heat resistant tarpaulin	110°C*

\* Max. ambient temperature for rod boot itself.

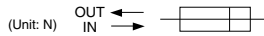
## Mounting Brackets/Part No.

Bore size [mm]	32	40	50	63	80	100	125
Axial foot	MB-L03	MB-L04	MB-L05	MB-L06	MB-L08	MB-L10	MB-L12
Rod flange	MB-F03	MB-F04	MB-F05	MB-F06	MB-F08	MB-F10	MB-F12

\* Order two boots per cylinder.

# MBW Series

## Theoretical Force



Bore size [mm]	Rod diameter [mm]	Operating direction	Piston area [mm <sup>2</sup> ]	Operating pressure [MPa]								
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
<b>32</b>	12	IN, OUT	691	138	207	276	346	415	484	553	622	691
<b>40</b>	16	IN, OUT	1056	211	317	422	528	634	739	845	950	1056
<b>50</b>	20	IN, OUT	1649	330	495	660	825	989	1154	1319	1484	1649
<b>63</b>	20	IN, OUT	2803	561	841	1121	1402	1682	1962	2242	2523	2803
<b>80</b>	25	IN, OUT	4536	907	1361	1814	2268	2722	3175	3629	4082	4536
<b>100</b>	30	IN, OUT	7147	1429	2144	2859	3574	4288	5003	5718	6432	7147
<b>125</b>	32	IN, OUT	11468	2294	3440	4588	5734	6881	8028	9174	10321	11468

Note) Theoretical force [N] = Pressure [MPa] x Piston area [mm<sup>2</sup>]

## Weights/Aluminum Tube

Bore size [mm]		[kg]						
		32	40	50	63	80	100	125
Basic weight	Basic	0.56	0.78	1.37	1.64	3.05	4.23	6.48
	Axial foot	0.68	0.92	1.59	1.92	3.55	4.89	8.56
	Rod flange	0.85	1.15	1.82	2.43	4.50	6.06	10.64
	Center trunnion	0.85	1.14	1.85	2.44	4.60	5.92	9.46
Additional weight per 50 mm of stroke	All mounting brackets	0.15	0.24	0.37	0.38	0.61	0.82	1.02
Accessories	Single knuckle joint	0.15	0.23	0.26	0.26	0.60	0.83	1.08
	Double knuckle joint (with pin)	0.22	0.37	0.43	0.43	0.87	1.27	1.58

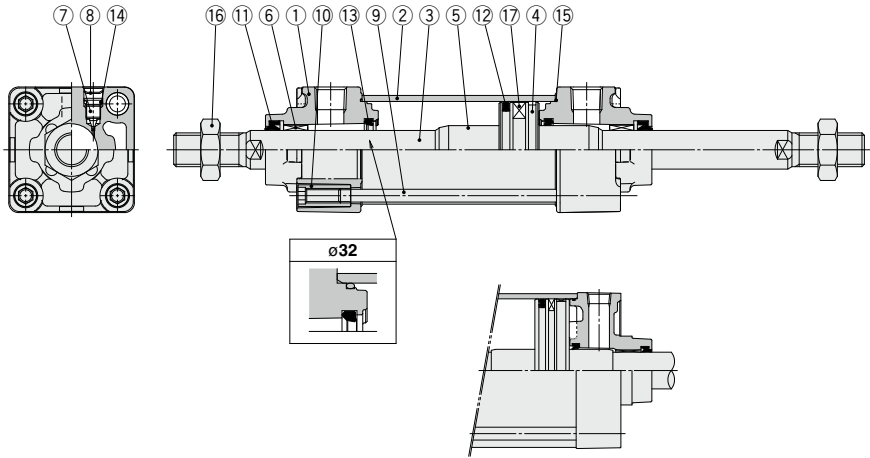
Calculation

Example) **MBWB32-100Z** (Basic, ø32, 100 stroke)

- Basic weight..... 0.56 (Basic, ø32)
- Additional weight..... 0.15/50 stroke
- Cylinder stroke..... 100 stroke

$$0.56 + 0.15 \times 100/50 = \mathbf{0.86 \text{ kg}}$$

## Construction



MBW125

### Component Parts

No.	Description	Material	Qty	Note
1	Rod cover	Aluminum die-cast	2	Trivalent chromated
2	Cylinder tube	Aluminum alloy	1	Hard anodized
3	Piston rod	Carbon steel	1	Hard chrome plating
4	Piston	Aluminum alloy	1	
5	Cushion ring	Aluminum alloy	2	Anodized
6	Bushing	Bearing alloy	2	
7	Cushion valve	Steel wire	2	Trivalent zinc chromated
8	Retaining ring	Steel for spring	2	ø40 to ø125
9	Tie-rod	Carbon steel	4	Trivalent zinc chromated

No.	Description	Material	Qty	Note
10	Tie-rod nut	Carbon steel	8	Trivalent zinc chromated
11	Rod seal	NBR	2	
12	Piston seal	NBR	1	
13	Cushion seal	Urethane	2	
14	Cushion valve seal	NBR	2	
15	Cylinder tube gasket	NBR	2	
16	Rod end nut	Rolled steel	2	Trivalent zinc chromated
17	Magnet	—	(1)	

### Replacement Parts/Seal Kit

Bore size [mm]	Kit no.	Contents
32	MBW32Z-PS	Set of the nos. ①, ⑫, ⑬, ⑮
40	CA2W40Z-PS	
50	CA2W50Z-PS	
63	CA2W63Z-PS	
80	CA2W80Z-PS	
100	CA2W100Z-PS	
125	MBW125-PS	

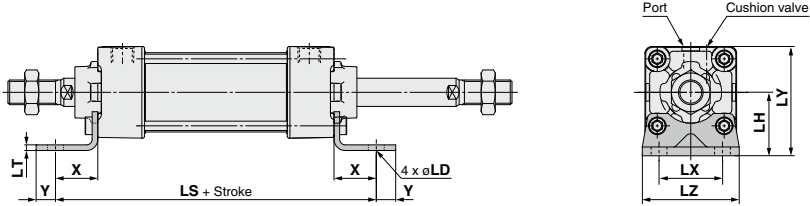
- \* Seal kits consist of items ①, ⑫, ⑬, ⑮, and can be ordered by using the seal kit number corresponding to each bore size.
  - \* Trunnion type should not be disassembled. (Refer to page 524.)
  - \* The seal kit includes a grease pack (10 g for ø32 to ø50, 20 g for ø63 and ø80, 30 g for ø100 and ø125).
- 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)



**Standard/With Mounting Bracket**

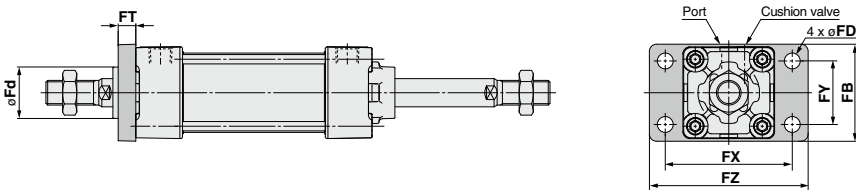
\* Refer to Basic (B) for other dimensions and with rod boot.

**Axial foot: (L)**



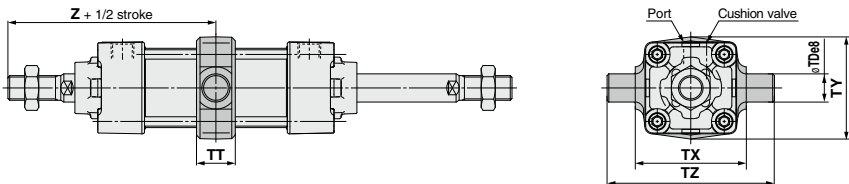
Bore size [mm]	X	Y	LD	LH	LS*	LT	LX	LY	LZ
32	22	9	7	30	128	3.2	32	53	50
40	24	11	9	33	132	3.2	38	59	55
50	27	11	9	40	148	3.2	46	72.5	70
63	27	14	12	45	148	3.6	56	82.5	80
80	30	14	12	55	174	4.5	72	102.5	100
100	32	16	14	65	178	4.5	89	122	120
125	45	20	14	81	210	8	90	149	136

**Rod flange: (F)**



Bore size [mm]	FB	FD	FT	FX	FY	FZ	Fd
32	50	7	10	64	32	79	24.5
40	55	9	10	72	36	90	29.5
50	70	9	12	90	45	110	35.5
63	80	9	12	100	50	120	38.5
80	100	12	16	126	63	153	41
100	120	14	16	150	75	178	46
125	138	14	20	180	102	216	57

**Center trunnion: (T)**



Bore size [mm]	TDe8	TT	TX	TY	TZ	Z**
32	12	17	50	49	74	89
40	16	22	63	58	95	93
50	16	22	75	71	107	105
63	20	28	90	87	130	105
80	20	34	110	110	150	129
100	25	40	132	136	182	129
125	25	50	160	160	210	157

\* Model without air cushion is designed to include rubber bumpers. Since the bumpers are attached to the both sides of the piston, the overall length is longer than the cylinder with air cushion as follows: ø32, ø40: +6 mm, ø50, ø63: +8 mm, ø80, ø100: +10 mm, ø125: +12 mm

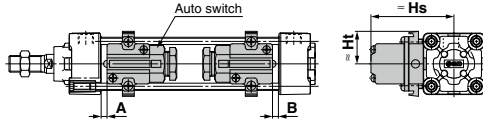
\*\* Model without air cushion is designed to include rubber bumpers. Since the bumpers are attached to the both sides of the piston, the "Z" dimension is longer than the cylinder with air cushion as follows: ø32, ø40: +3 mm, ø50, ø63: +4 mm, ø80, ø100: +5 mm, ø125: +6 mm (For trunnion mounting)

# Auto Switch Mounting

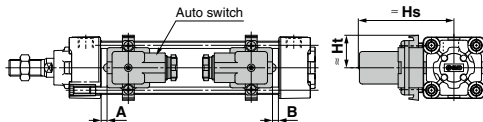
## Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Band mounting>

D-G39/K39/A3□



D-A44



<Tie-rod mounting>

D-M9□/M9□V

D-M9□W/M9□WV

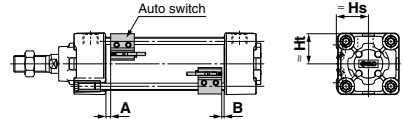
D-M9□A/M9□AV

D-A9□/A9□V

D-Y59□/Y69□/Y7P/Y7PV

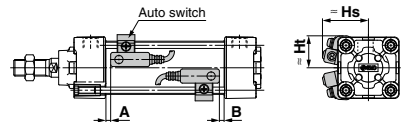
D-Y7□W/Y7□WV/Y7BA

D-Z7□/Z80



D-A5□/A6□

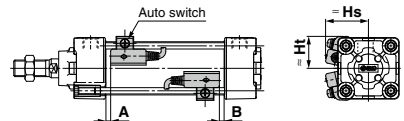
D-A59W



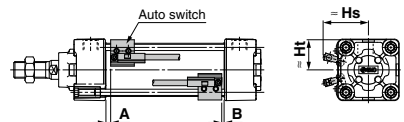
D-F5□/J59

D-F5□W/J59W/F5BA

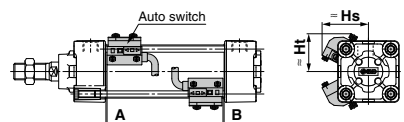
D-F59F/F5NT



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
<b>32</b>	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
<b>40</b>	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
<b>50</b>	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
<b>63</b>	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
<b>80</b>	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
<b>100</b>	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
<b>125</b>	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
<b>32</b>	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
<b>40</b>	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
<b>50</b>	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
<b>63</b>	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
<b>80</b>	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
<b>100</b>	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
<b>125</b>	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
<b>32</b>	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
<b>40</b>	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
<b>50</b>	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
<b>63</b>	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
<b>80</b>	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
<b>100</b>	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
<b>32</b>	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
<b>40</b>	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
<b>50</b>	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
<b>63</b>	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
<b>80</b>	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
<b>100</b>	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>
<b>D-M9</b> □ <b>D-M9</b> □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>		
<b>D-M9</b> □V <b>D-M9</b> □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>		
<b>D-M9</b> □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>		
<b>D-M9</b> □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>		
<b>D-A9</b> □	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>		
<b>D-A9</b> □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>		
<b>D-G39</b> <b>D-K39</b> <b>D-A3</b> □	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		
<b>D-A44</b>	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		
<b>D-F5</b> □ <b>D-J59</b> <b>D-F5</b> □W <b>D-J59</b> □W <b>D-F5BA</b> <b>D-F59F</b>	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
<b>D-A5</b> □ <b>D-A6</b> □	2 (Different surfaces, same surface) 1	15	20	20
	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>
<b>D-A59W</b>	2 (Different surfaces, same surface)	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
<b>D-F5NT</b>	2 (Different surfaces, same surface)	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
<b>D-Y59</b> □ <b>D-Y7P</b> <b>D-Y7</b> □W <b>D-Z70</b> <b>D-Z80</b>	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.)

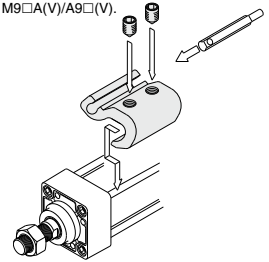
BBA1: For D-A5/A6/F5/J5 types

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).

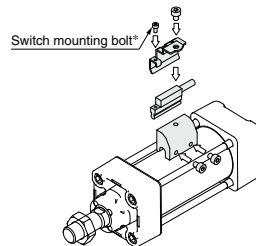


**Operating Range**

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		Diagnostic indication (2-color indicator)	
	D-M9NVW/M9PWV/M9BWW		Water resistant (2-color indicator)	
	D-Y7NWW/Y7PWV/Y7BWW		Magnetic field resistant (2-color indicator)	
	D-M9NAV/M9PAV/M9BAV		—	
	D-P4DW		Diagnostic indication (2-color indicator)	
	D-F59/F5P/J59	Grommet (In-line)	Water resistant (2-color indicator)	
	D-Y59A/Y59B/Y7P		With timer	
	D-Y7H		Magnetic field resistant (2-color indicator)	
	D-F59W/F5PW/J59W		—	
	D-Y7NWW/Y7PWV/Y7BWW		Without indicator light	
	D-F5BA/Y7BA		—	
	D-F5NT		Without indicator light	
	D-P5DW		—	
	Reed	D-A93V/A96V	Grommet (Perpendicular)	—
		D-A90V	Grommet (In-line)	Without indicator light
D-A53/A56/Z73/Z76		—		
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)

Symbol  
**-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.

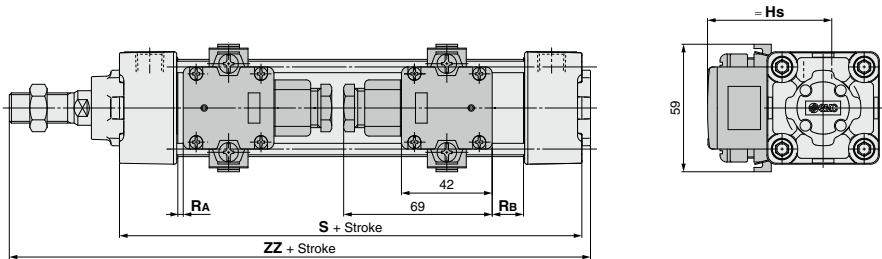
### Specifications

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