

Air Cylinder: Standard Type Double Acting, Single Rod

MB Series

ø32, ø40, ø50, ø63, ø80, ø100, ø125

RoHS

How to Order



With auto switch **MB B 32** **-50** **Z** **-** **-** **-**

With auto switch **MDB B 32** **-50** **Z** **-** **-** **-** **M9BW** **-** **-** **-**

Mounting type

B	Basic
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
125	125 mm

Accessories 1

Nil	No bracket
N	Pivot bracket

* Only for D and T mounting types.
* Pivot bracket is shipped together with the product.
* For details, refer to page 490.

Suffix (Cushion)

Nil	Air cushion
N*	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.

Auto switch

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

Number of auto switches

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

Made to Order
For details, refer to page 483.

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke [mm]
Refer to "Standard Strokes" on page 483.

Suffix (Rod boot)

Nil	None
J	Nylon tarpaulin
K	Heat resistant tarpaulin

* Refer to "Ordering Example of Cylinder Assembly" on page 483.

Applicable Auto Switches/Refer to the 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	—	M9N	—	●	●	●	○	○	IC circuit							
				3-wire (PNP)				M9P	—	●	●	●	○	○								
		Terminal conduit		2-wire				M9B	—	●	●	●	○	○								
				3-wire (NPN)				—	G39	—	—	—	—									
	Diagnostic indication (2-color indicator)	Grommet		2-wire	24 V	5 V, 12 V	—	M9NW	—	●	●	●	○	○	IC circuit	Relay, PLC						
				3-wire (PNP)				M9PW	—	●	●	●	○	○								
				2-wire				M9BW	—	●	●	●	○	○								
				3-wire (NPN)				M9NA ^{*1}	—	○	○	●	○	○								
				3-wire (PNP)				M9PA ^{*1}	—	○	○	●	○	○								
				2-wire				M9BA ^{*1}	—	○	○	○	○	○								
	Water resistant (2-color indicator)	Grommet		4-wire (NPN)	24 V	5 V, 12 V	—	F59F	—	●	—	●	○	○	IC circuit							
				2-wire (Non-polar)				—														
				With diagnostic output (2-color indicator)				—														
								—														
Magnetic field resistant (2-color indicator)		Grommet		—	24 V	5 V	—	P3DWA	—	●	—	●	○	○	—							
				P4DW				—	—	—	●	○	○									
Reed auto switch	—	Grommet		Yes	3-wire (NPN equivalent)	24 V	12 V	—	A96	—	●	—	●	—	—	IC circuit						
					—				A93	—	●	●	●	—	—							
		—			A90				—	●	—	●	—	—								
		—			A54				—	●	—	●	—	—								
	Terminal conduit	—			24 V	12 V	—	A64	—	●	—	●	—	—	—	PLC						
		—						A33	—	—	—	—	—									
	DIN terminal	—			24 V	12 V	—	100 V, 200 V	A34	—	—	—	—	—	—	Relay, PLC						
		—						A44	—	—	—	—	—									
	Diagnostic indication (2-color indicator)		Grommet		Yes	—	24 V	12 V	—	A59W	—	●	—	●	—	—						
						—				—	—	—	—	—	—							

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

A water resistant type cylinder is recommended for use in an environment which requires water resistance.

* 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.

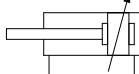
* Since there are other applicable auto switches than listed above, refer to page 522 for details.

* 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



Made to Order: Individual Specifications
(For details, refer to page 523.)

Symbol	Specifications
-X1184	Cylinder with heat resistant reed auto switch (-10 to 120°C)

Made to Order

[Click here for details](#)

Symbol	Specifications
-XA□	Change of rod end shape
-XB5	Oversized rod cylinder*1 #2 #3
-XB6	Heat resistant cylinder (-10 to 150°C)
-XC3	Special port location*3
-XC4	With heavy duty scraper
-XC5	Heat resistant cylinder (-10 to 110°C)
-XC6	Made of stainless steel*4
-XC7	Tie-rod, cushion valve, tie-rod nut, etc. made of stainless steel
-XC8	Adjustable stroke cylinder/Adjustable extension type
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC10	Dual stroke cylinder/Double rod type
-XC11	Dual stroke cylinder/Single rod type
-XC12	Tandem cylinder
-XC14	Change of trunnion bracket mounting position
-XC22	Fluororubber seal
-XC26	With split pins for double clevis pin/double knuckle joint pin and flat washers*4
-XC27	Double clevis and double knuckle joint pins made of stainless steel
-XC29	Double knuckle joint with spring pin
-XC30	Rod trunnion
-XC35	With coil scraper
-XC65	Made of stainless steel (Combination of XC7 and XC68)*2
-XC68	Made of stainless steel (with hard chrome plated piston rod)*2
-XC88	Scraper resistant coil scraper, Lube-retainer, Grease for welding (Piston rod: Stainless steel 304)
-XC89	Scraper resistant coil scraper, Lube-retainer, Grease for welding (Piston rod: S45C)
-XC91	Scraper resistant coil scraper, Grease for welding (Piston rod: S45C)

*1 Air cushion only

*2 Except ø125

*3 The cover shape is the same as the current product.

*4 ø125 only

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).

Specifications

Bore size [mm]	32	40	50	63	80	100	125
Action	Double acting, Single rod						
Fluid	Air						
Proof pressure	1.5 MPa						
Maximum operating pressure	1.0 MPa						
Minimum operating pressure	0.05 MPa						
Ambient and fluid temperature	Without auto switch: -10 to 70°C With auto switch: -10 to 60°C (No freezing)						
Lubricant	Not required (Non-lube)						
Piston speed	50 to 1000 mm/s						
Stroke length tolerance	Up to 250: $^{+1.0}_0$, 251 to 1000: $^{+1.4}_0$, 1001 to 1500: $^{+1.8}_0$, 1501 to 2000: $^{+2.2}_0$						
Cushion	Air cushion or Rubber bumper						
Port size (Rc)	1/8	1/4	3/8	1/2			
Mounting	Basic, Axial foot, Rod flange, Head flange Single clevis, Double clevis, Center trunnion						

Standard Strokes

			[mm]
Bore size	Standard stroke		Max. manufacturable stroke
	Stroke range ①	Stroke range ②	
32	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	Up to 1000	Up to 2700
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	Up to 1800	
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		
125	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000	Up to 2000	

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.

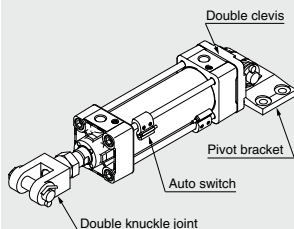
Note 3) Please consult with SMC for manufacturability and the part numbers when exceeding the stroke range ②.

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.

Ordering Example of Cylinder Assembly

Cylinder model: MDBD32-50Z-NW-M9BW



Mounting D: Double clevis
Pivot bracket N: Yes
Rod end bracket W: Double knuckle joint
Auto switch D-M9BW: 2 pcs.

* Pivot bracket, double knuckle joint and auto switch are shipped together with the product, but not assembled.

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

Accessories

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

* Refer to page 491 for dimensions and part numbers. (Refer to page 486 for rod boot.)

Mounting Brackets/Part No.

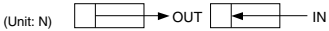
Bore size [mm]	32	40	50	63	80	100	125
Axial foot Note 1)	MB-L03	MB-L04	MB-L05	MB-L06	MB-L08	MB-L10	MB-L12
Rod/Head flange	MB-F03	MB-F04	MB-F05	MB-F06	MB-F08	MB-F10	MB-F12
Single clevis	MB-C03	MB-C04	MB-C05	MB-C06	MB-C08	MB-C10	MB-C12
Double clevis	MB-D03	MB-D04	MB-D05	MB-D06	MB-D08	MB-D10	MB-D12

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 pin, Flat washers and Split pins. → Refer to page 491 for details.

Theoretical Force



Bore size [mm]	Rod diameter [mm]	Operating direction	Piston area [mm ²]	Operating pressure [MPa]									
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
32	12	OUT	804	161	241	322	402	482	563	643	724	804	
		IN	691	138	207	276	346	415	484	553	622	691	
40	16	OUT	1257	251	377	503	629	754	880	1006	1131	1257	
		IN	1056	211	317	422	528	634	739	845	950	1056	
50	20	OUT	1963	393	589	785	982	1178	1374	1570	1767	1963	
		IN	1649	330	495	660	825	989	1154	1319	1484	1649	
63	20	OUT	3117	623	935	1247	1559	1870	2182	2494	2805	3117	
		IN	2803	561	841	1121	1402	1682	1962	2242	2523	2803	
80	25	OUT	5027	1005	1508	2011	2514	3016	3519	4022	4524	5027	
		IN	4536	907	1361	1814	2268	2722	3175	3629	4082	4536	
100	30	OUT	7854	1571	2356	3142	3927	4712	5498	6283	7069	7854	
		IN	7147	1429	2144	2859	3574	4288	5003	5718	6432	7147	
125	32	OUT	12272	2454	3682	4909	6136	7363	8590	9818	11045	12272	
		IN	11468	2294	3440	4588	5734	6881	8028	9174	10321	11468	

Note) Theoretical force [N] = Pressure [MPa] x Piston area [mm²]

Weights

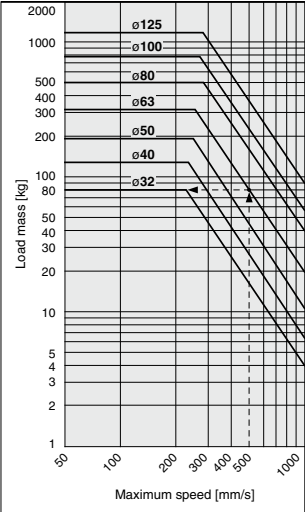
Bore size [mm]		32	40	50	63	80	100	125
Basic weight	Basic	0.44	0.59	1.04	1.29	2.41	3.36	5.48
	Axial foot	0.56	0.73	1.26	1.57	2.91	4.02	7.56
	Rod/Head flange	0.73	0.96	1.49	2.08	3.86	5.19	9.64
	Single clevis	0.69	0.82	1.38	1.92	3.52	4.94	8.05
	Double clevis	0.7	0.86	1.47	2.08	3.81	5.21	8.25
	Center trunnion	0.73	0.95	1.52	2.09	3.96	5.05	8.46
Additional weight per 50 mm of stroke								
Accessories	All mounting brackets	0.11	0.16	0.26	0.27	0.42	0.56	0.71
	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

Rod Boot Material

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

* Max. ambient temperature for rod boot itself.

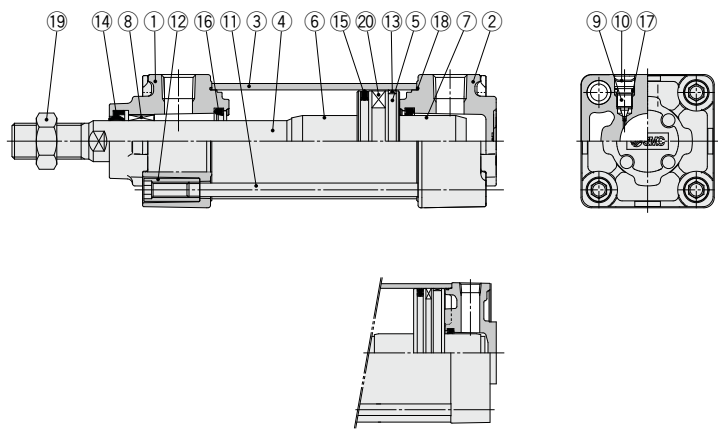
Allowable Kinetic Energy



Example) Load limit at rod end when the air cylinder ø63 is actuated at 500 mm/s.
Extend upward from 500 mm/s on the horizontal axis of the graph to the intersection point with the line for a tube bore size of 63 mm, and then extend leftward from this point to find the load of 80 kg.

Calculation
Example) **MBB32-100Z** (Basic, ø32, 100 stroke)
• Basic weight..... 0.44 (Basic, ø32)
• Additional weight..... 0.11/50 stroke
• Cylinder stroke..... 100 stroke
0.44 + 0.11 x 100/50 = **0.66 kg**

Construction



MB125

Component Parts

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

No.	Description	Material	Q'ty	Note
11	Tie-rod	Carbon steel	4	Trivalent zinc chromated
12	Tie-rod nut	Carbon steel	8	Trivalent zinc chromated
13	Wear ring	Resin	1	
14	Rod seal	NBR	1	
15	Piston seal	NBR	1	
16	Cushion seal	Urethane	2	
17	Cushion valve seal	NBR	2	
18	Cylinder tube gasket	NBR	2	
19	Rod end nut	Rolled steel	1	Trivalent zinc chromated
20	Magnet	—	(1)	

Replacement Parts/Seal Kit

Bore size [mm]	Kit no.	Contents
32	MB32Z-PS	Set of the nos. 14, 15, 16, 18
40	CA2-40Z-PS	
50	CA2-50Z-PS	
63	CA2-63Z-PS	
80	CA2-80Z-PS	
100	CA2-100Z-PS	
125	MB125-PS	

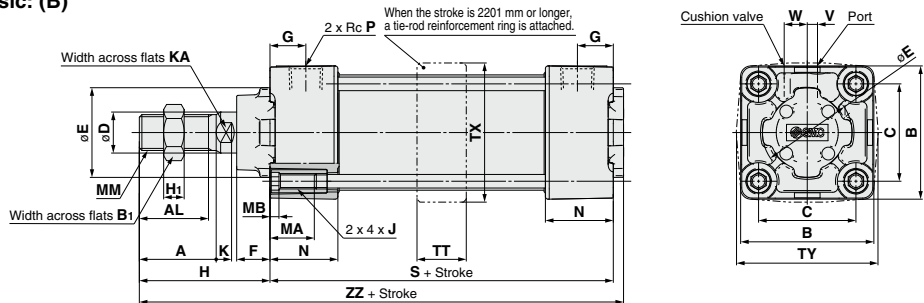
* Seal kits consist of items 14, 15, 16, 18, and can be ordered by using the seal kit number corresponding to each bore size.
* Center trunnion type should not be disassembled. (Refer to page 524.)
* The seal kit includes a grease pack (10 g for ø32 to ø50, 20 g for ø63 and ø80, 30 g for ø100 and ø125).
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)

Water Resistant Air Cylinder

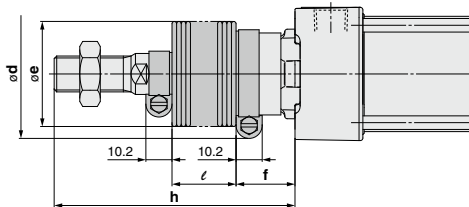
Water resistant air cylinders are also available in the MB series, which are suitable for use on machine tools, where exposure to coolant is possible and applicable for food machinery and automobile washing equipment in an environment where water splashes. Please refer to page 1189 for more information.

Standard

Basic: (B)



With rod boot



Bore size [mm]	A	AL	B	B ₁	C	D	E	F	G	H	H ₁	J	K	KA	MA	MB	MM	N	P	S	TT	TX	TY	V	W	ZZ
32	22	19.5	46	17	32.5	12	30	13	13	47	6	M6 x 1	6	10	16	4	M10 x 1.25	27	1/8	84	17	48	49	4	6.5	135
40	30	27	52	22	38	16	35	13	14	51	8	M6 x 1	6	14	16	4	M14 x 1.5	27	1/4	84	22	55	58	4	9	139
50	35	32	65	27	46.5	20	40	14	15.5	58	11	M8 x 1.25	7	18	16	5	M18 x 1.5	31.5	1/4	94	22	68	71	5	10.5	156
63	35	32	75	27	56.5	20	45	14	16.5	58	11	M8 x 1.25	7	18	16	5	M18 x 1.5	31.5	3/8	94	28	81	81	9	12	156
80	40	37	95	32	72	25	45	20	19	72	13	M10 x 1.5	10	22	16	5	M22 x 1.5	38	3/8	114	34	102	102	11.5	14	190
100	40	37	114	41	89	30	55	20	19	72	16	M10 x 1.5	10	26	16	5	M26 x 1.5	38	1/2	114	40	124	124	17	15	190
125	54	50	136	41	110	32	60	27	19	97	16	M12 x 1.75	13	27	20	6	M27 x 2	38	1/2	120	50	148	148	17	15	223

With Rod Boot

Bore size [mm]	d	e	f	ℓ															
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	801 to 900	901 to 1000				
32	54	36	23	12.5	25	37.5	50	75	100	125	150	175	200	225	250				
40	56	41	23	12.5	25	37.5	50	75	100	125	150	175	200	225	250				
50	64	51	25	12.5	25	37.5	50	75	100	125	150	175	200	225	250				
63	64	51	25	12.5	25	37.5	50	75	100	125	150	175	200	225	250				
80	68	56	29	12.5	25	37.5	50	75	100	125	150	175	200	225	250				
100	76	61	29	12.5	25	37.5	50	75	100	125	150	175	200	225	250				
125	82	75	27	10	20	30	40	60	80	100	120	140	160	180	200				

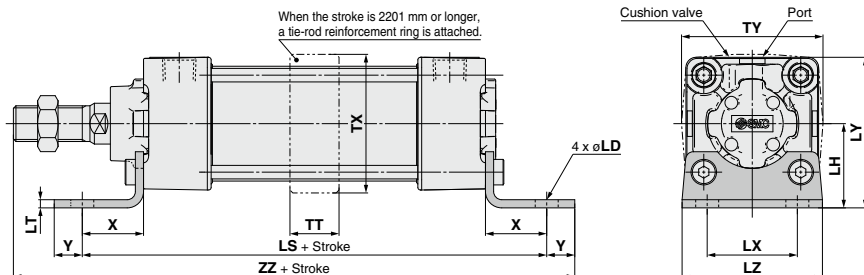
[mm]													Rubber Bumper		
Bore size [mm]	h												Bore size [mm]	S	ZZ
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	501 to 600	601 to 700	701 to 800	801 to 900	901 to 1000			
32	73	86	98	111	136	161	186	211	236	261	286	311	32	90	141
40	81	94	106	119	144	169	194	219	244	269	294	319	40	90	145
50	89	102	114	127	152	177	202	227	252	277	302	327	50	102	164
63	89	102	114	127	152	177	202	227	252	277	302	327	63	102	164
80	101	114	126	139	164	189	214	239	264	289	314	339	80	124	200
100	101	114	126	139	164	189	214	239	264	289	314	339	100	124	200
125	120	130	140	150	170	190	210	230	250	270	290	310	125	132	235

* 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

Standard/With Mounting Bracket

* Refer to Basic (B) for other dimensions.

Axial foot: (L)



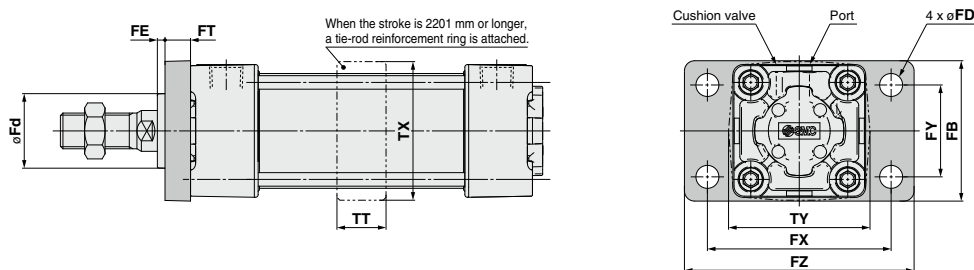
Bore size [mm]	LD	LH	LS	LT	LX	LY	LZ	TT	TX	TY	X	Y	ZZ
32	7	30	128	3.2	32	53	50	17	48	49	22	9	162
40	9	33	132	3.2	38	59	55	22	55	58	24	11	170
50	9	40	148	3.2	46	72.5	70	22	68	71	27	11	190
63	12	45	148	3.6	56	82.5	80	28	81	81	27	14	193
80	12	55	174	4.5	72	102.5	100	34	102	102	30	14	230
100	14	65	178	4.5	89	122	120	40	124	124	32	16	234
125	14	81	210	8	90	149	136	50	148	148	45	20	282

Rubber Bumper

Bore size [mm]	LS	ZZ
32	134	168
40	138	176
50	156	198
63	156	201
80	184	240
100	188	244
125	222	294

* 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

Rod flange: (F)



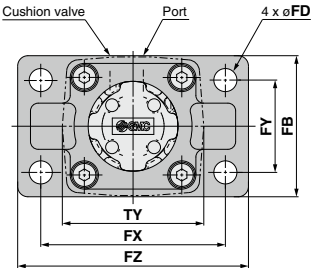
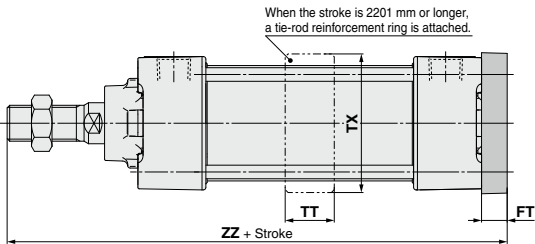
Bore size [mm]	FB	FD	FE	FT	FX	FY	FZ	Fd	TT	TX	TY
32	50	7	3	10	64	32	79	24.5	17	48	49
40	55	9	3	10	72	36	90	29.5	22	55	58
50	70	9	2	12	90	45	110	35.5	22	68	71
63	80	9	2	12	100	50	120	38.5	28	81	81
80	100	12	4	16	126	63	153	41	34	102	102
100	120	14	4	16	150	75	178	46	40	124	124
125	138	14	7	20	180	102	216	57	50	148	148

* 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

Standard/With Mounting Bracket

* Refer to Basic (B) for other dimensions.

Head flange: (G)



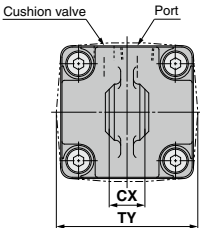
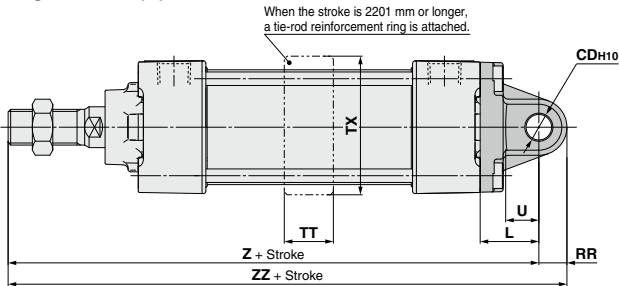
Bore size [mm]	FB	FD	FT	FX	FY	FZ	TT	TX	TY	ZZ
32	50	7	10	64	32	79	17	48	49	141
40	55	9	10	72	36	90	22	55	58	145
50	70	9	12	90	45	110	22	68	71	164
63	80	9	12	100	50	120	28	81	81	164
80	100	12	16	126	63	153	34	102	102	202
100	120	14	16	150	75	178	40	124	124	202
125	138	14	20	180	102	216	50	148	148	237

Rubber Bumper

Bore size [mm]	ZZ
32	147
40	151
50	172
63	172
80	212
100	212
125	249

* 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

Single clevis: (C)



Bore size [mm]	CDH10	CX	L	RR	TT	TX	TY	U	Z	ZZ
32	10 ^{+0.058} ₀	14 ^{+0.1} _{-0.3}	23	10.5	17	48	49	13	154	164.5
40	10 ^{+0.058} ₀	14 ^{+0.1} _{-0.3}	23	11	22	55	58	13	158	169
50	14 ^{+0.070} ₀	20 ^{+0.1} _{-0.3}	30	15	22	68	71	17	182	197
63	14 ^{+0.070} ₀	20 ^{+0.1} _{-0.3}	30	15	28	81	81	17	182	197
80	22 ^{+0.084} ₀	30 ^{+0.1} _{-0.3}	42	23	34	102	102	26	228	251
100	22 ^{+0.084} ₀	30 ^{+0.1} _{-0.3}	42	23	40	124	124	26	228	251
125	25 ^{+0.084} ₀	32 ^{+0.1} _{-0.3}	50	28	50	148	148	30	267	295

Rubber Bumper

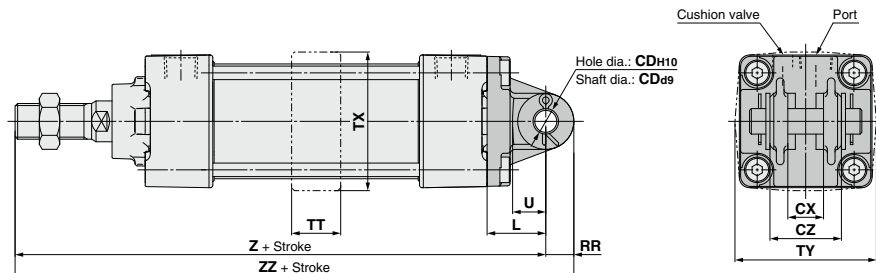
Bore size [mm]	Z	ZZ
32	160	170.5
40	164	175
50	190	205
63	190	205
80	238	261
100	238	261
125	279	307

* 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

Standard/With Mounting Bracket

* Refer to Basic (B) for other dimensions.

Double clevis: (D)



Bore size [mm]	CDH10	CDø9	CX	CZ	L	RR	TT	TX	TY	U	Z	ZZ
32	10 ^{+0.058} ₀	10 ^{-0.040} _{-0.076}	14 ^{+0.3} _{-0.1}	28	23	10.5	17	48	49	13	154	164.5
40	10 ^{+0.058} ₀	10 ^{-0.04} _{-0.076}	14 ^{+0.3} _{-0.1}	28	23	11	22	55	58	13	158	169
50	14 ^{+0.070} ₀	14 ^{-0.050} _{-0.093}	20 ^{+0.3} _{-0.1}	40	30	15	22	68	71	17	182	197
63	14 ^{+0.070} ₀	14 ^{-0.050} _{-0.093}	20 ^{+0.3} _{-0.1}	40	30	15	28	81	81	17	182	197
80	22 ^{+0.084} ₀	22 ^{-0.065} _{-0.117}	30 ^{+0.3} _{-0.1}	60	42	23	34	102	102	26	228	251
100	22 ^{+0.084} ₀	22 ^{-0.065} _{-0.117}	30 ^{+0.3} _{-0.1}	60	42	23	40	124	124	26	228	251
125	25 ^{+0.084} ₀	25 ^{-0.065} _{-0.117}	32 ^{+0.3} _{-0.1}	64	50	28	50	148	148	30	267	295

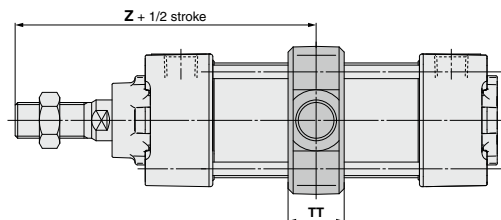
Rubber Bumper

Bore size [mm]	Z	ZZ
32	160	170.5
40	164	175
50	190	205
63	190	205
80	238	261
100	238	261
125	279	307

* 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

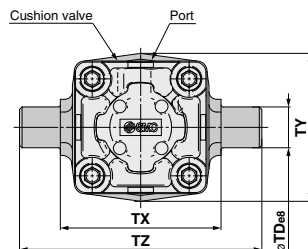
Center trunnion: (T)



Bore size [mm]	TDø8	TT	TX	TY	TZ	Z
32	12 ^{-0.032} _{-0.059}	17	50	49	74	89
40	16 ^{-0.032} _{-0.059}	22	63	58	95	93
50	16 ^{-0.032} _{-0.059}	22	75	71	107	105
63	20 ^{-0.040} _{-0.073}	28	90	87	130	105
80	20 ^{-0.040} _{-0.073}	34	110	110	150	129
100	25 ^{-0.040} _{-0.073}	40	132	136	182	129
125	25 ^{-0.040} _{-0.073}	50	160	160	210	157

Rubber Bumper

Bore size [mm]	Z
32	92
40	96
50	109
63	109
80	134
100	134
125	163



* 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

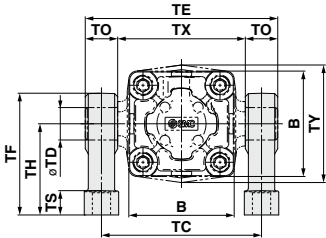
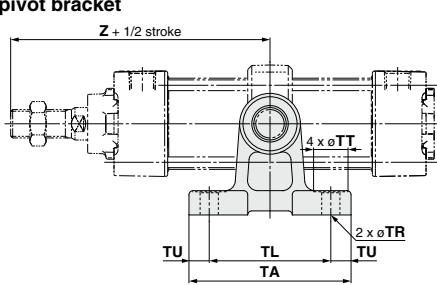
Pivot Bracket/Trunnion and Double Clevis Pivot Bracket

Part No.

Bore size	MB□32	MB□40	MB□50	MB□63	MB□80	MB□100	MB□125
Description							
Trunnion pivot bracket (Note)	MB-S03	MB-S04	MB-S06	MB-S10	MB-S12		
Double clevis pivot bracket	MB-B03	MB-B05	MB-B08	MB-B12			

(Note) Order 2 trunnion pivot brackets per cylinder.

Trunnion pivot bracket

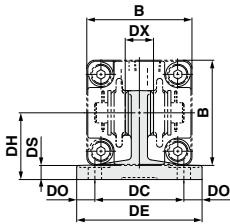
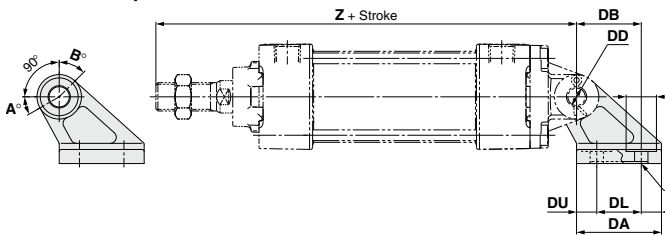


Part no.	Bore size [mm]	B	TA	TL	TU	TC	TX	TE	TO	TR	TT	TS	TH	TF	Z**	TDH10
MB-S03	32	46	62	45	8.5	62	50	74	12	7	13	10	35	47	89	12 ^{+0.070} ₋₉
MB-S04	40	52	80	60	10	80	63	97	17	9	17	12	45	60	93	16 ^{+0.070} ₋₉
	50	65	80	60	10	92	75	109	17	9	17	12	45	60	105	16 ^{+0.070} ₋₉
MB-S06	63	75	100	70	15	110	90	130	20	11	22	14	60	80	105	20 ^{+0.084} ₋₉
	80	95	100	70	15	130	110	150	20	11	22	14	60	80	129	20 ^{+0.084} ₋₉
MB-S10	100	114	120	90	15	158	132	184	26	13.5	24	17	75	100	129	25 ^{+0.084} ₋₉
MB-S12	125	136	142	105	18.5	186	160	212	26	13.5	24	25	85	115	157	25 ^{+0.084} ₋₉

Rubber Bumper

Bore size [mm]	Z
32	92
40	96
50	109
63	109
80	134
100	134
125	163

Double clevis pivot bracket



Part no.	Bore size [mm]	B	DA	DB	DL	DU	DC	DX	DE	DO	DR	DT	DS	DH	Z**	DDH10
MB-B03	32	46	42	32	22	10	44	14	62	9	6.6	15	7	33	154	10 ^{+0.058} ₋₉
	40	52	42	32	22	10	44	14	62	9	6.6	15	7	33	158	10 ^{+0.058} ₋₉
MB-B05	50	65	53	43	30	11.5	60	20	81	10.5	9	18	8	45	182	14 ^{+0.070} ₋₉
	63	75	53	43	30	11.5	60	20	81	10.5	9	18	8	45	182	14 ^{+0.070} ₋₉
MB-B08	80	95	73	64	45	14	86	30	111	12.5	11	22	10	65	228	22 ^{+0.084} ₋₉
	100	114	73	64	45	14	86	30	111	12.5	11	22	10	65	228	22 ^{+0.084} ₋₉
MB-B12	125	136	90	78	60	15	110	32	136	13	13.5	24	14	75	267	25 ^{+0.084} ₋₉

Rubber Bumper

Bore size [mm]	Z
32	160
40	164
50	190
63	190
80	238
100	238
125	279

Rotating Angle

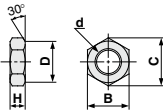
Bore size [mm]	A°	B°	A° + B° + 90°
32, 40	25°	45°	160°
50, 63	40°	60°	190°
80, 100	30°	55°	175°
125	30°	50°	170°

** 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

* 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

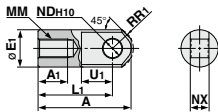
Dimensions of Accessories

Rod end nut
(Standard)



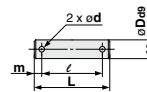
Part no.	Bore size [mm]	d	H	B	C	D
NT-03	32	M10 x 1.25	6	17	19.6	16.5
NT-04	40	M14 x 1.5	8	22	25.4	21
NT-05	50, 63	M18 x 1.5	11	27	31.2	26
NT-08	80	M22 x 1.5	13	32	37.0	31
NT-10	100	M26 x 1.5	16	41	47.3	39
NT-12M	125	M27 x 2	16	41	47.3	39

I type
Single knuckle joint



Part no.	Bore size [mm]	A	A ₁	E ₁	L ₁	MM	R ₁	U ₁	NDH10	NX
I-03M	32	40	14	20	30	M10 x 1.25	12	16	10 ^{+0.058} ₀	14 ^{+0.10} ₀
I-04M	40	50	19	22	40	M14 x 1.5	12.5	19	10 ^{+0.058} ₀	14 ^{+0.10} ₀
I-05M	50, 63	64	24	28	50	M18 x 1.5	16.5	24	14 ^{+0.070} ₀	20 ^{+0.10} ₀
I-08M	80	80	26	40	60	M22 x 1.5	23.5	34	22 ^{+0.084} ₀	30 ^{+0.10} ₀
I-10M	100	80	26	40	60	M26 x 1.5	23.5	34	22 ^{+0.084} ₀	30 ^{+0.10} ₀
I-12M	125	119	36	46	92	M27 x 2	28.5	34	25 ^{+0.084} ₀	32 ^{+0.10} ₀

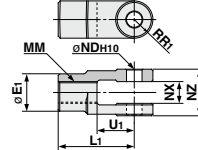
Knuckle joint pin
Clevis pin



Part no.	Bore size [mm] Clevis/Knuckle	Dø8	L	ℓ	m	d	Applicable split pin
CD-M03 ^{Note 1)}	32, 40	10 ^{+0.040} _{-0.076}	44	36	4	3	ø3 x 18 ℓ
CD-M05 ^{Note 1)}	50, 63	14 ^{+0.050} _{-0.093}	60	51	4.5	4	ø4 x 25 ℓ
CD-M08 ^{Note 1)}	80, 100	22 ^{+0.075} _{-0.117}	82	72	5	4	ø4 x 35 ℓ
IY-12 ^{Note 2)}	125	25 ^{+0.085} _{-0.117}	79.5	69.5	5	4	ø4 x 40 ℓ

Note 1) Split pins and flat washers are included. Note 2) Only pins are included when shipped.

Y type
Double knuckle joint



Part no.	Bore size [mm]	E ₁	L ₁	MM	R ₁	U ₁	NDH10	NX	NZ
Y-03M ^{Note 1)}	32	20	30	M10 x 1.25	10	16	10 ^{+0.058} ₀	14 ^{+0.10} ₀	28 ^{+0.10} ₀
Y-04M ^{Note 1)}	40	22	40	M14 x 1.5	11	19	10 ^{+0.058} ₀	14 ^{+0.10} ₀	28 ^{+0.10} ₀
Y-05M ^{Note 1)}	50, 63	28	50	M18 x 1.5	14	24	14 ^{+0.070} ₀	20 ^{+0.10} ₀	40 ^{+0.10} ₀
Y-08M ^{Note 1)}	80	40	65	M22 x 1.5	20	34	22 ^{+0.084} ₀	30 ^{+0.10} ₀	60 ^{+0.10} ₀
Y-10M ^{Note 1)}	100	40	65	M26 x 1.5	20	34	22 ^{+0.084} ₀	30 ^{+0.10} ₀	60 ^{+0.10} ₀
Y-12M ^{Note 2)}	125	46	100	M27 x 2	27	42	25 ^{+0.084} ₀	32 ^{+0.10} ₀	64 ^{+0.10} ₀

Note 1) A pin, split pins and flat washers are included. Note 2) A pin and split pins are included.

Bracket Combinations

Bracket combination available►Refer to the figure below.

Bracket for cylinder	Single clevis	Double clevis	Single knuckle joint	Double knuckle joint	Clevis pivot bracket
Single clevis	—	①	—	②	—
Double clevis	③	—	④	—	⑤
Single knuckle joint	—	⑥	—	⑦	—
Double knuckle joint	⑧	—	⑨	—	⑩

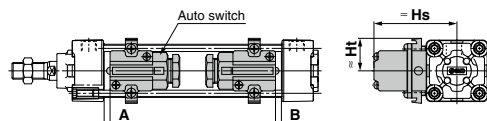
No.	Appearance	No.	Appearance
①	Single clevis + Double clevis	⑥	Single knuckle joint + Double knuckle joint
②	Single clevis + Double knuckle joint	⑦	Double knuckle joint + Single clevis
③	Double clevis + Single clevis	⑧	Double knuckle joint + Single knuckle joint
④	Double clevis + Single knuckle joint	⑨	Double clevis + Clevis pivot bracket
⑤	Single knuckle joint + Double clevis	⑩	Double knuckle joint + Clevis pivot bracket

Auto Switch Mounting

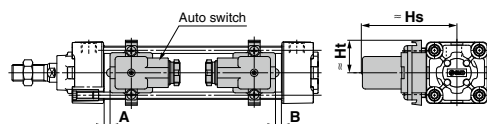
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Band mounting>

D-G39/K39/A3□



D-A44



<Tie-rod mounting>

D-M9□/M9□V

D-M9□W/M9□WV

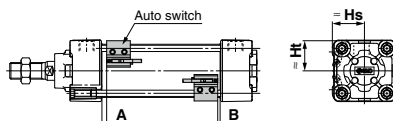
D-M9□A/M9□AV

D-A9□/A9□V

D-Y59□/Y69□/Y7P/Y7PV

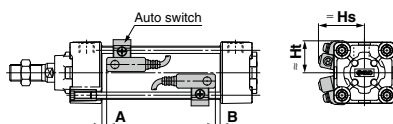
D-Y7□W/Y7□WV/Y7BA

D-Z7□/Z80



D-A5□/A6□

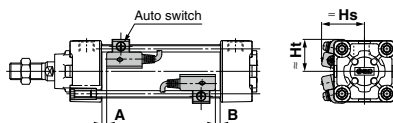
D-A59W



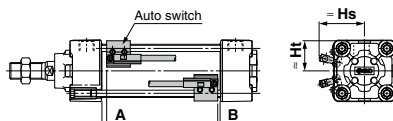
D-F5□/J59

D-F5□W/J59W/F5BA

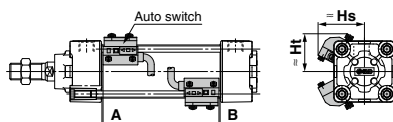
D-F59F/F5NT



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 Bore size	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 Bore size	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 Bore size	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 Bore size	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 (Note 2)
D-M9□ D-M9□W	2 (Different surfaces, same surface) 1	15		
	n	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)		
D-M9□V D-M9□WV	2 (Different surfaces, same surface) 1	10		
	n	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)		
D-M9□A	2 (Different surfaces, same surface) 1	15		
	n	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)		
D-M9□AV	2 (Different surfaces, same surface) 1	15		
	n	$15 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)		
D-A9□	2 (Different surfaces, same surface) 1	15		
	n	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)		
D-A9□V	2 (Different surfaces, same surface) 1	10		
	n	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)		
D-G39 D-K39 D-A3□	2 (Different surfaces)	35		
	2 (Same surface)	100		
	n (Different surfaces)	$35 + 30 (n-2)$ (n = 2, 3, 4...)		
	n (Same surface)	$100 + 100 (n-2)$ (n = 2, 3, 4...)		
	1	10		
D-A44	2 (Different surfaces)	35		
	2 (Same surface)	55		
	n (Different surfaces)	$35 + 30 (n-2)$ (n = 2, 3, 4...)		
	n (Same surface)	$55 + 50 (n-2)$ (n = 2, 3, 4...)		
	1	10		
D-F5□ D-J59 D-F5□W D-J59W D-F5BA D-F59F	2 (Different surfaces, same surface)	15	25	25
	n (Same surface)	$15 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)
	1	10	25	25
D-A5□ D-A6□	2 (Different surfaces, same surface) 1	15	20	20
	n (Different surfaces)	$15 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$20 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$20 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)
D-A59W	2 (Different surfaces, same surface)	20	25	25
	n (Same surface)	$20 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)
	1	15	25	25
D-F5NT	2 (Different surfaces, same surface)	15	25	30
	n (Same surface)	$15 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	$30 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)
	1	10	25	30
D-Y59□ D-Y7P D-Y7□W D-Z7□ D-Z80	2 (Different surfaces, same surface) 1	15		
	n	$15 + 40 \frac{(n-2)}{2}$ (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 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	
	1	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	
D-Y7BA	2 (Different surfaces, same surface)	20	
	1	$20 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	
D-P3DWA	2 (Different surfaces, same surface)	15	
	1	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...) Note 1)	
D-P4DW	2 (Different surfaces, same surface)	15	20
	1	$15 + 65 \frac{(n-2)}{2}$ (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
	1	$75 + 40 \frac{(n-4)}{2}$ (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
	1	$50 + 30 \frac{(n-4)}{2}$ (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
	1	$80 + 40 \frac{(n-4)}{2}$ (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
	1	$55 + 30 \frac{(n-4)}{2}$ (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
	1	$70 + 40 \frac{(n-4)}{2}$ (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
	1	$45 + 30 \frac{(n-4)}{2}$ (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	
	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	
	2 (Different surfaces, same surface)	100	105	120	125	130	140	
	n (Same surface)	100 + 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	120 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	125 + 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	140 + 55 $\frac{(n-4)}{2}$ (n = 4, 8, 12, 16...) Note 2	
D-F5NT	1	100	105	120	125	130	140	
	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		
	2 (Different surfaces, same surface)	60	70	85	110	115	120	
D-A5□ D-A6□	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	
	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	
D-Y59□ D-Y7P D-Y7□W D-Z7□ D-Z80	2 (Different surfaces, same surface)	60	65	70	75	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	
	2 (Different surfaces, same surface)	85	90	100	105	110	115	
	1							
D-Y69□ D-Y7PV D-Y7□WV	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	
	2 (Different surfaces, same surface)	80	85	90	95	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		
	2 (Different surfaces, same surface)	120	130	140	150			
D-P3DWA	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			
	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			

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.)

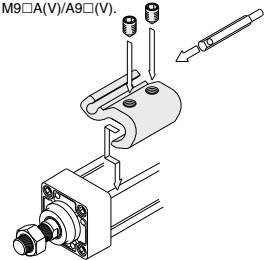
BBA1: For D-A5/A6/F5/J5 types

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).

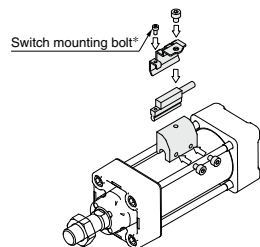


Operating Range

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-M9NVV/M9PWV/M9BWV		Diagnostic indication (2-color indicator)
	D-Y7NVV/Y7PWV/Y7BWV		Water resistant (2-color indicator)
	D-M9NAV/M9PAV/M9BAV	Grommet (In-line)	Magnetic field resistant (2-color indicator)
	D-P4DW		—
	D-F59/F5P/J59		—
	D-Y59A/Y59B/Y7P		—
	D-Y7H		Diagnostic indication (2-color indicator)
	D-F59W/F5PW/J59W		Water resistant (2-color indicator)
	D-Y7NW/Y7PW/Y7BW		With timer
	D-F5BA/Y7BA		Magnetic field resistant (2-color indicator)
	D-F5NT		—
	D-P5DW		—
Reed	D-A93V/A96V	Grommet (Perpendicular)	Without indicator light
	D-A90V	Grommet (In-line)	—
	D-A53/A56/Z73/Z76		Without indicator light
	D-A67/Z80		

* 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

Symbol	Description
Nil	Without switch
B30	D-B30
B30J	D-B30J
B31	D-B31
B31J	D-B31J
B35	D-B35
B35J	D-B35J

Number of switches

Symbol	Description
S	1 pc.
Nil	2 pcs.
n	n pcs.

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.

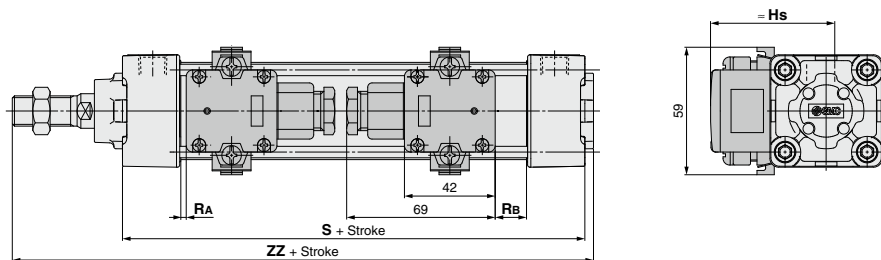
Specifications

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