Cylinder with Lock
Double Acting, Single Rod
MNB Series
ø32, ø40, ø50, ø63, ø80, ø100

How to Order

MNB L 50 □ - 100 □ - D - □

With auto switch: MDNB L 50 □ - 100 □ - D - M9BW □ - □

With auto switch
(Built-in magnet)

Mounting type

B	Basic type
L	Axial foot type
F	Rod side flange type
G	Head side flange type
C	Single clevis type
D	Double clevis type

Bore size

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

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)
Refer to page 891 for the standard stroke.

With rod boot

Rod boot	Nil	None
	J	Nylon tarpaulin
	K	Heat resistant tarpaulin

Locking direction

D	Both directions

Auto switch

Nil	Without auto switch

∗ For the applicable auto switch model, refer to the table below.

Number of auto switch

Nil	2 pcs.
S	1 pc.
n	“n” pcs.

Made to Order
Refer to page 891 for details.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) MDNBL40-100-D

Applicable Auto Switches/Refer to pages 1119 to 1245 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model Tie-rod mounting	Auto switch model Band mounting	Lead wire length (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	—	●	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				M9P	—	●	●	●	○	○		
				2-wire		12 V		M9B	—	●	●	●	○	○	—	
		Terminal conduit		3-wire (NPN)	24 V	5 V, 12 V	—	—	G39	—	—	—	—	—		
				2-wire		12 V		—	K39	—	—	—	—	—		
	Diagnostic indication (2-color indicator)	Grommet		3-wire (NPN)		5 V, 12 V		M9NW	—	●	●	●	○	○	IC circuit	
				3-wire (PNP)				M9PW	—	●	●	●	○	○		
				2-wire		12 V		M9BW	—	●	●	●	○	○	—	
	Water resistant (2-color indicator)			3-wire (NPN)		5 V, 12 V		M9NA∗1	—	○	○	●	○	○	IC circuit	
				3-wire (PNP)				M9PA∗1	—	○	○	●	○	○		
				2-wire		12 V		M9BA∗1	—	○	○	●	○	○	—	
	With diagnostic output (2-color indicator)			4-wire (NPN)		5 V, 12 V		F59F	—	●	—	●	○	○	IC circuit	
	Magnetic field resistant (2-color indicator)			2-wire (Non-polar)		—		P3DWA	—	●	—	●	●	○	—	
								P4DW	—	—	—	●	●	○		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96	—	●	—	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	A93	—	●	●	●	●	—	—	Relay, PLC
			No				100 V or less	A90	—	●	—	●	—	—	IC circuit	
			Yes				100 V, 200 V	A54	—	●	—	●	●	—	—	
			No				200 V or less	A64	—	●	—	●	—	—		
		Terminal conduit	Yes				—	—	A33	—	—	—	—	—		PLC
							100 V, 200V	—	A34	—	—	—	—	—		Relay, PLC
		DIN terminal						—	A44	—	—	—	—	—		
	Diagnostic indication (2-color indicator)	Grommet				—	–	A59W	—	●	—	●	—	—		

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

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

∗ Solid state auto switches marked with “○” are produced upon receipt of order.

∗ Since there are other applicable auto switches than listed, refer to page 911 for details.

∗ D-A9□/M9□/P3DWA□ auto switches are shipped together (not assembled). (Only auto switch brackets are assembled at the time of shipment for D-A9□ and M9□.)

Cylinder Specifications

Bore size (mm)	32	40	50	63	80	100
Lubrication	Not required (Non-lube)					
Fluid	Air					
Proof pressure	1.5 MPa					
Max. operating pressure	1.0 MPa					
Min. operating pressure	0.08 MPa					
Piston speed	50 to 1000 mm/s*					
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)					
Cushion	Air cushion on both ends					
Stroke length tolerance	Up to 250: $^{+1.0}_{0}$, 251 to 1000: $^{+1.4}_{0}$					
Mounting	Basic type, Axial foot type, Rod side flange type, Head side flange type, Single clevis type, Double clevis type					

* Load limits exist depending upon piston speed when locked, mounting direction and operating pressure.

Made to Order **Made to Order Specifications**
Click here for details

Symbol	Specifications
-XA□	Change of rod end shape
-XC35	With coil scraper

Refer to pages 908 to 911 for cylinders with auto switches.

- Minimum auto switch mounting stroke
- Proper auto switch mounting position (detection at stroke end) and mounting height
- Operating range
- Auto switch mounting bracket: Part no.

Lock Specifications

Bore size (mm)	32	40	50	63	80	100
Locking action	Spring locking (Exhaust locking)					
Unlocking pressure	0.25 MPa or more					
Lock starting pressure	0.20 MPa or less					
Max. operating pressure	1.0 MPa					
Locking direction	Both directions					
Holding force (maximum static load) N*	552	882	1370	2160	3430	5390

* The holding force (max. static load) shows the maximum capability and does not show the normal holding capability. So, select an appropriate cylinder while referring to page 888.

Standard Stroke

For cases with auto switches, refer to the table of minimum strokes for /mounting of auto switches (page 910).

Bore size (mm)	Standard stroke (mm) (1)	Maximum manufacturable stroke (mm)
32, 40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500	ø32 : 700 ø40 : 800
50, 63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600	1000
80, 100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800	1000

Note 1) Intermediate strokes other than the above are produced upon receipt of order. Spacers are not used for intermediate strokes.
Note 2) When exceeding the stroke range for each bracket, determine the maximum strokes referring to the Selection Table (Best Pneumatics No. 2-1).

Stopping Accuracy

(mm)

Lock type	Piston speed (mm/s)			
	100	300	500	1000
Spring locking	±0.3	±0.6	±1.0	±2.0

Condition: Lateral, Supply pressure P = 0.5 MPa
Load mass ····· Upper limit of allowed value
Solenoid valve for locking mounted on the unlocking port
Maximum value of stopping position dispersion from 100 measurements

Mounting Bracket Part No.

Bore size (mm)	32	40	50	63	80	100
Foot (1)	MB-L03	MB-L04	MB-L05	MNB-L06*	MB-L08	MB-L10
Flange	MNB-F03*	MNB-F04*	MNB-F05*	MNB-F06*	MB-F08	MB-F10
Single clevis	MB-C03	MB-C04	MB-C05	MB-C06	MB-C08	MB-C10
Double clevis	MB-D03	MB-D04	MB-D05	MB-D06	MB-D08	MB-D10

Note 1) When ordering foot bracket, order 2 pieces per cylinder.
Note 2) Accessories for each mounting bracket are as follows.
Foot, Flange, Single clevis: Body mounting bolts
Double clevis: Clevis pin, Cotter pin, Flat washer, Body mounting bolts
Note 3) All are common to the MB series air cylinders, except the sections marked with a "*".

Rod Boot Material

Symbol	Rod boot material	Max. ambient temperature
J	Nylon tarpaulin	20°C
K	Heat resistant tarpaulin	110°C *

* Maximum ambient temperature for the rod boot itself.

Accessory

Mounting		Basic type	Foot type	Rod side flange type	Head side flange type	Single clevis type	Double clevis type
Standard equipment	Rod end nut	●	●	●	●	●	●
	Clevis pin	–	–	–	–	–	●
Option	Single knuckle joint	●	●	●	●	●	●
	Double knuckle joint (With pin)	●	●	●	●	●	●
	With rod boot	●	●	●	●	●	●

Single Rod Weight/Aluminum Tube

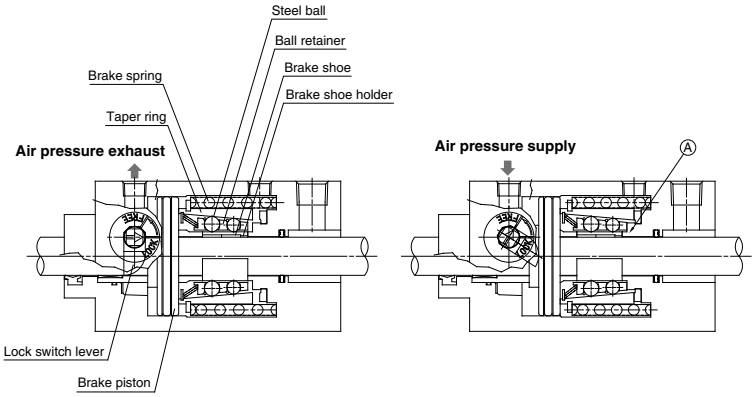
(kg)

Bore size (mm)		32	40	50	63	80	100
Basic weight	Basic type	1.20	1.72	2.76	4.06	6.85	10.26
	Foot type	1.30	1.84	2.94	4.32	7.28	10.85
	Flange type	1.44	2.04	3.29	4.80	8.30	12.09
	Single clevis type	1.45	1.98	3.10	4.69	7.96	11.84
	Double clevis type	1.46	1.99	3.19	4.85	8.25	12.11
Additional weight per each 50 mm of stroke	All mounting brackets	0.11	0.16	0.26	0.27	0.42	0.56
Accessory	Single knuckle	0.15	0.23	0.26	0.26	0.60	0.83
	Double knuckle (with pin)	0.22	0.37	0.43	0.43	0.87	1.27

Calculation:
(Example) **MNBB32-100-D** (Basic type, ø32, 100 st)
- Basic weight·····1.20 (Basic type, ø32)
- Additional weight ····· 0.11/50 stroke
- Cylinder stroke ····· 100 stroke

1.20 + 0.11 x 100/50 = 1.42 kg

Construction Principle



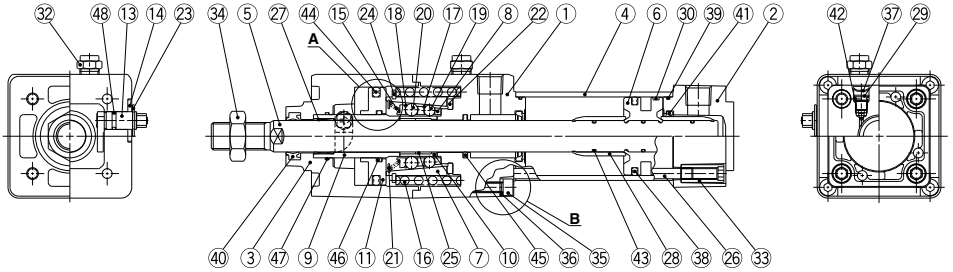
Locked state **Unlocked state**

Spring locking (Exhaust locking)

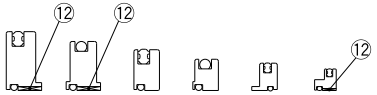
The spring force which acts upon the taper ring is magnified by a wedge effect, and is conveyed to all of the numerous steel balls which are arranged in two circles. These act on the brake shoe holder and brake, which locks the piston rod by tightening against it with a large force.

Unlocking is accomplished when air pressure is supplied to the unlocking port. The brake piston and taper ring oppose the spring force, moving to the right side, and the ball retainer strikes the cover section A. The braking force is released as the steel balls are removed from the taper ring by the ball retainer.

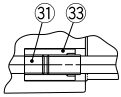
Construction



A section



B section



ø80, ø100

Component Parts

No.	Description		Material	Note
①	**Rod cover**		Aluminum alloy	Hard anodized and metallic painted
②	**Head cover**		Aluminum die-casted	Chromated and metallic painted
③	**Cover**		Aluminum alloy	Hard anodized and metallic painted
④	**Cylinder tube**		Aluminum alloy	Hard anodized
⑤	**Piston rod**		Carbon steel	Hard chrome plated
⑥	**Piston**		Aluminum alloy	Chromated
⑦	**Taper ring**		Carbon steel	Heat treated
⑧	**Ball retainer**		Special resin	
⑨	**Piston guide**		Carbon steel	Zinc chromated
⑩	**Brake shoe holder**		Special steel	Heat treated
⑪	**Release piston**	**ø32, ø80, ø100**	Aluminum alloy	Chromated
		ø40, ø50, ø63		Hard anodized
⑫	**Release piston bushing**		Steel + Special resin	ø32, ø80, ø100 only
⑬	**Unlocking cam**		Chromium molybdenum steel	Glossy chromated
⑭	**Washer**		Carbon steel	Colorless zinc chromated
⑮	**Retainer pre-load spring**	**ø32**	Steel wire	Zinc chromated
		ø40 to ø100	Stainless steel wire	
⑯	**Brake spring**		Steel wire	Zinc chromated
⑰	**Clip A**		Stainless steel	
⑱	**Clip B**		Stainless steel	
⑲	**Steel ball A**		Carbon steel	
⑳	**Steel ball B**		Carbon steel	
㉑	**Tooth ring**		Stainless steel	
㉒	**Bumper**		Polyurethane rubber	
㉓	Type C retaining ring for unlocking cam shaft		Carbon steel	
㉔	Type C retaining ring for taper ring		Carbon steel	
㉕	**Brake shoe**		Babbitt	
㉖	**Tie-rod**		Carbon steel	Zinc chromated
㉗	**Bushing**		Bearing alloy	
㉘	**Cushion ring**		Aluminum alloy	Anodized

Component Parts

No.	Description	Material	Note
㉙	**Cushion valve**	Steel wire	
㉚	**Wear ring**	Resin	
㉛	**Unit holding tie-rod**	Carbon steel	Chromated ø80, ø100 only
㉜	**BC element**		
㉝	**Tie-rod nut**	Carbon steel	
㉞	**Rod end nut**	Carbon steel	
㉟	**Hexagon socket head cap screw**	Chromium molybdenum steel	ø32 to ø63
㊱	Spring washer for hex. socket head cap screw	Steel wire	ø32 to ø63
㊲	**Retaining ring**	Spring steel	
㊳	**Piston seal**	NBR	
㊴	**Cylinder tube gasket**	NBR	
㊵	**Rod seal A**	NBR	
㊶	**Cushion seal**	NBR	
㊷	**Cushion valve seal**	NBR	
㊸	**Piston gasket**	NBR	
㊹	**Release piston seal**	NBR	
㊺	**Rod seal B**	NBR	
㊻	**Release piston gasket**	NBR	
㊼	**Piston guide gasket**	NBR	
㊽	**Unlocking cam gasket**	NBR	

Replacement Parts: Seal Kit

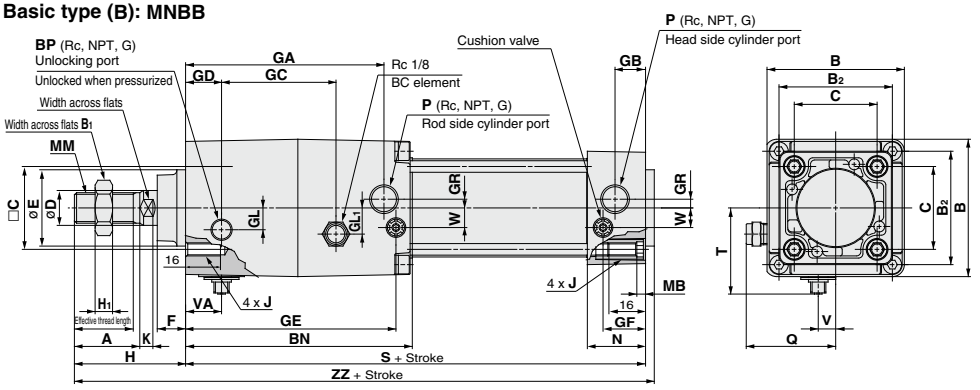
Bore size (mm)	Kit no.	Contents
32	MB32Z-PS	A set of ㊳, ㊴, ㊵ and ㊶ above
40	MB1-40Z-PS	
50	MB1-50Z-PS	
63	MB1-63Z-PS	
80	MB1-80Z-PS	
100	MB1-100Z-PS	

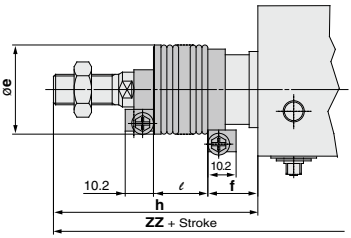
∗ Since the lock section for the MNB series is normally replaced as a unit, kits are for the cylinder section only. These can be ordered using the order number for each bore size.

∗ Seal kit includes a grease pack (ø32 to ø50: 10 g, ø63 and ø80: 20 g, ø100: 30 g). Order with the following part number when only the grease pack is needed.
Grease pack part number: GR-S-010 (10 g), **GR-S-020** (20 g)

Dimensions

Basic type (B): MNBB





With rod boot

(mm)

Bore size (mm)	Stroke range (mm)	Effective thread length (mm)	Width across flats	A	B	B1	H1	B2	BN	BP	C	D	Ee11	F	GA	GB	GC	GD	GL	GL1
32	Up to 500	19.5	10	22	54	17	6	46	97	1/8	32.5	12	30	13	83	13	45.5	13	8.5	12
40	Up to 500	27	14	30	63	22	8	52	104	1/8	38	16	35	13	91	14	52.5	16.5	10	12
50	Up to 600	32	18	35	75	27	11	65	120.5	1/4	46.5	20	40	14	104.5	15.5	58.5	19	12.5	15
63	Up to 600	32	18	35	90	27	11	75	134.5	1/4	56.5	20	45	14	119.5	16.5	68	23	17.5	12
80	Up to 800	37	22	40	102	32	13	95	169	1/4	72	25	45	20	150	19	81	33	22	18
100	Up to 800	37	26	40	116	41	16	114	189	1/4	89	30	55	20	170	19	96	37.5	25	20

Bore size (mm)	GR	GE	GF	J	MB	K	MM	N	P	Q	H	S	T	V	VA	W	ZZ
32	4	88.5	18.3	M6 x 1.0	4	6	M10 x 1.25	27	1/8	37	47	154	34	6.5	13	6.5	205
40	4	96.5	19.5	M6 x 1.0	4	6	M14 x 1.5	27	1/4	41.5	51	161	39.5	8	16.5	9	216
50	5	111.2	22.4	M8 x 1.25	5	7	M18 x 1.5	31.5	1/4	47.5	58	183	47	9	20	10.5	245
63	9	123.5	20.7	M8 x 1.25	5	7	M18 x 1.5	31.5	3/8	55	58	197	55.5	8.5	23	12	259
80	11.5	157	26	M10 x 1.5	5	10	M22 x 1.5	38	3/8	61	72	245	61.5	10.5	33	14	321
100	17	177	26	M10 x 1.5	5	10	M26 x 1.5	38	1/2	68	72	265	69.5	10.5	37.5	15	341

With Rod Boot

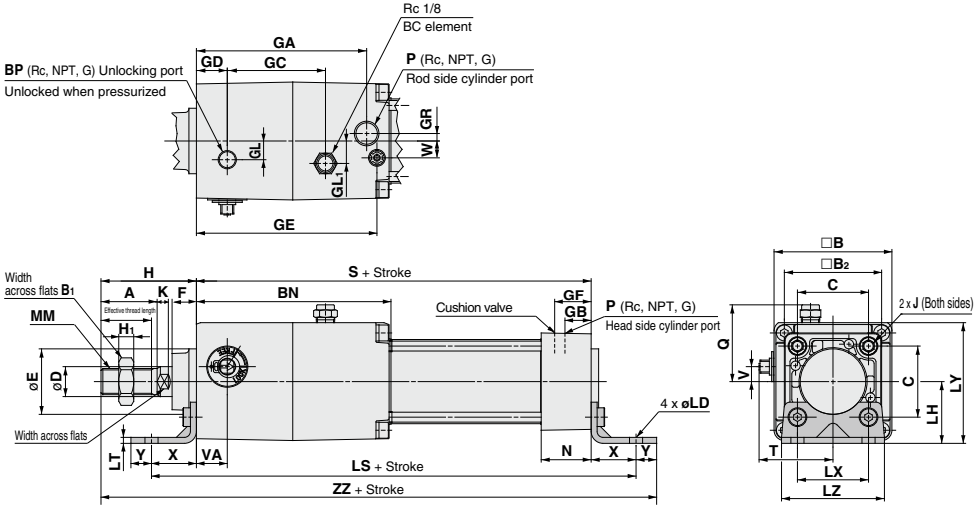
(mm)

Bore size (mm)	e	f	ℓ										h									
			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	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
32	36	23	12.5	25	37.5	50	75	100	125	—	—	—	73	86	98	111	136	161	186	—	—	—
40	41	23	12.5	25	37.5	50	75	100	125	—	—	—	81	94	106	119	144	169	194	—	—	—
50	51	25	12.5	25	37.5	50	75	100	125	150	—	—	89	102	114	127	152	177	202	227	—	—
63	51	25	12.5	25	37.5	50	75	100	125	150	—	—	89	102	114	127	152	177	202	227	—	—
80	56	29	12.5	25	37.5	50	75	100	125	150	175	200	101	114	126	139	164	189	214	239	264	289
100	61	29	12.5	25	37.5	50	75	100	125	150	175	200	101	114	126	139	164	189	214	239	264	289

Bore size (mm)	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
32	231	244	256	269	294	319	344	—	—	—
40	246	259	271	284	309	334	359	—	—	—
50	276	289	301	314	339	364	389	414	—	—
63	290	303	315	328	353	378	403	428	—	—
80	350	363	375	388	413	438	463	488	513	538
100	370	383	395	408	433	458	483	508	533	538

Dimensions

Axial foot type (L): MNBL



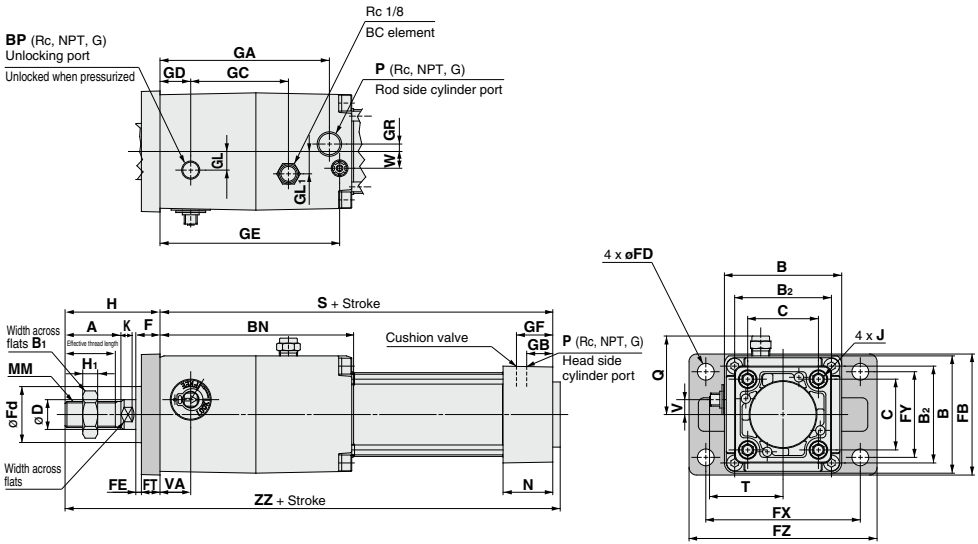
(mm)

Bore size (mm)	Stroke range (mm)	Effective thread length (mm)	Width across flats	A	B	B_1	H_1	B_2	BN	BP	C	D	Ee_{11}	F	GA	GB	GC	GD	GL	GL_1	GR	GE	GF
32	Up to 700	19.5	10	22	54	17	6	46	97	1/8	32.5	12	30	13	83	13	45.5	13	8.5	12	4	88.5	18.3
40	Up to 800	27	14	30	63	22	8	52	104	1/8	38	16	35	13	91	14	52.5	16.5	10	12	4	96.5	19.5
50	Up to 1000	32	18	35	75	27	11	65	120.5	1/4	46.5	20	40	14	104.5	15.5	58.5	19	12.5	15	5	111.2	22.4
63	Up to 1000	32	18	35	90	27	11	75	134.5	1/4	56.5	20	45	14	119.5	16.5	68	23	17.5	12	9	123.5	20.7
80	Up to 1000	37	22	40	102	32	13	95	169	1/4	72	25	45	20	150	19	81	33	22	18	11.5	157	26
100	Up to 1000	37	26	40	116	41	16	114	189	1/4	89	30	55	20	170	19	96	37.5	25	20	17	177	26

Bore size (mm)	J	LD	LH	LS	LT	LX	LY	LZ	K	MM	N	P	Q	H	S	T	V	VA	W	X	Y	ZZ
32	M6 x 1.0	7	30	198	3.2	32	57	50	6	M10 x 1.25	27	1/8	37	47	154	34	6.5	13	6.5	22	9	232
40	M6 x 1.0	9	33	209	3.2	38	64.5	55	6	M14 x 1.5	27	1/4	41.5	51	161	39.5	8	16.5	9	24	11	247
50	M8 x 1.25	9	40	237	3.2	46	77.5	70	7	M18 x 1.5	31.5	1/4	47.5	58	183	47	9	20	10.5	27	11	279
63	M8 x 1.25	12	48	251	3.6	56	93	80	7	M18 x 1.5	31.5	3/8	55	58	197	55.5	8.5	23	12	27	14	296
80	M10 x 1.5	12	55	305	4.5	72	106	100	10	M22 x 1.5	38	3/8	61	72	245	61.5	10.5	33	14	30	14	361
100	M10 x 1.5	14	65	329	4.5	89	123	120	10	M26 x 1.5	38	1/2	68	72	265	69.5	10.5	37.5	15	32	16	385

∗ Refer to page 895 for cylinders with a rod boot.

Rod side flange type (F): MNBF



(mm)

Bore size (mm)	Stroke range (mm)	Effective thread length (mm)	Width across flats	A	FB	B	B_1	H_1	B_2	BN	BP	C	D	F	Fd	FD	FE	FT	FX	FY	FZ	GA	GB
32	Up to 700	19.5	10	22	56	54	17	6	46	97	1/8	32.5	12	13	25	7	3	10	72	38	87	83	13
40	Up to 800	27	14	30	65	63	22	8	52	104	1/8	38	16	13	31	9	3	10	83	46	101	91	14
50	Up to 1000	32	18	35	77	75	27	11	65	120.5	1/4	46.5	20	14	38.5	9	2	12	100	52	120	104.5	15.5
63	Up to 1000	32	18	35	92	90	27	11	75	134.5	1/4	56.5	20	14	39.5	9	2	12	115	62	135	119.5	16.5
80	Up to 1000	37	22	40	100	102	32	13	95	169	1/4	72	25	20	45.5	12	4	16	126	63	153	150	19
100	Up to 1000	37	26	40	120	116	41	16	114	189	1/4	89	30	20	54	14	4	16	150	75	178	170	19

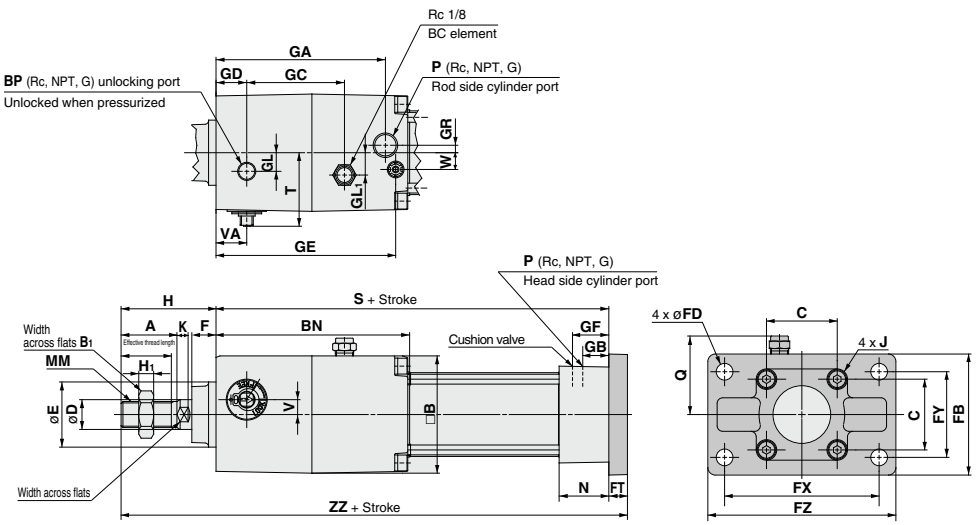
Bore size (mm)	GC	GD	GL	GL_1	GR	GE	GF	J	K	MM	N	P	Q	H	S	T	V	VA	W	ZZ
32	45.5	13	8.5	12	4	88.5	18.3	M6 x 1.0	6	M10 x 1.25	27	1/8	37	47	154	34	6.5	13	6.5	205
40	52.5	16.5	10	12	4	96.5	19.5	M6 x 1.0	6	M14 x 1.5	27	1/4	41.5	51	161	39.5	8	16.5	9	216
50	58.5	19	12.5	15	5	111.2	22.4	M8 x 1.25	7	M18 x 1.5	31.5	1/4	47.5	58	183	47	9	20	10.5	245
63	68	23	17.5	12	9	123.5	20.7	M8 x 1.25	7	M18 x 1.5	31.5	3/8	55	58	197	55.5	8.5	23	12	259
80	81	33	22	18	11.5	157	26	M10 x 1.5	10	M22 x 1.5	38	3/8	61	72	245	61.5	10.5	33	14	321
100	96	37.5	25	20	17	177	26	M10 x 1.5	10	M26 x 1.5	38	1/2	68	72	265	69.5	10.5	37.5	15	341

∗ Refer to page 895 for cylinders with a rod boot.

CLJ2
CLM2
CLG1
CL1
MLGC
CNG
MNB
CNA2
CNS
CLS
CLQ
RLQ
MLU
MLGP
ML1C
D-□
-X□

Dimensions

Head side flange type (G): MNBG



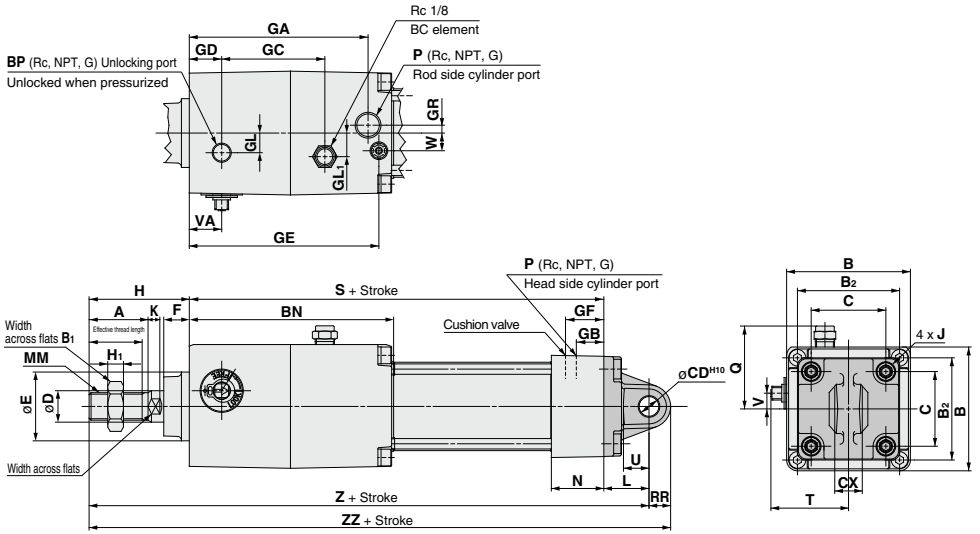
(mm)

Bore size (mm)	Stroke range (mm)	Effective thread length (mm)	Width across flats	A	FB	B	B_1	H_1	BN	BP	C	D	Ee_{11}	F	FD	FT	FX	FY	FZ	GA	GB	GC	GD
32	Up to 500	19.5	10	22	56	54	17	6	97	1/8	32.5	12	30	13	7	10	72	38	87	83	13	45.5	13
40	Up to 500	27	14	30	65	63	22	8	104	1/8	38	16	35	13	9	10	83	46	101	91	14	52.5	16.5
50	Up to 600	32	18	35	77	75	27	11	120.5	1/4	46.5	20	40	14	9	12	100	52	120	104.5	15.5	58.5	19
63	Up to 600	32	18	35	92	90	27	11	134.5	1/4	56.5	20	45	14	9	12	115	62	135	119.5	16.5	68	23
80	Up to 800	37	22	40	100	102	32	13	169	1/4	72	25	45	20	12	16	126	63	153	150	19	81	33
100	Up to 800	37	26	40	120	116	41	16	189	1/4	89	30	55	20	14	16	150	75	178	170	19	96	37.5

Bore size (mm)	GL	GL_1	GR	GE	GF	J	K	MM	N	P	Q	H	S	T	V	VA	W	ZZ
32	8.5	12	4	88.5	18.3	M6 x 1.0	6	M10 x 1.25	27	1/8	37	47	154	34	6.5	13	6.5	211
40	10	12	4	96.5	19.5	M6 x 1.0	6	M14 x 1.5	27	1/4	41.5	51	161	39.5	8	16.5	9	222
50	12.5	15	5	111.2	22.4	M8 x 1.25	7	M18 x 1.5	31.5	1/4	47.5	58	183	47	9	20	10.5	253
63	17.5	12	9	123.5	20.7	M8 x 1.25	7	M18 x 1.5	31.5	3/8	55	58	197	55.5	8.5	23	12	267
80	22	18	11.5	157	26	M10 x 1.5	10	M22 x 1.5	38	3/8	61	72	245	61.5	10.5	33	14	333
100	25	20	17	177	26	M10 x 1.5	10	M26 x 1.5	38	1/2	68	72	265	69.5	10.5	37.5	15	353

∗ Refer to page 895 for cylinders with a rod boot.

Single clevis type (C): MNBC



(mm)

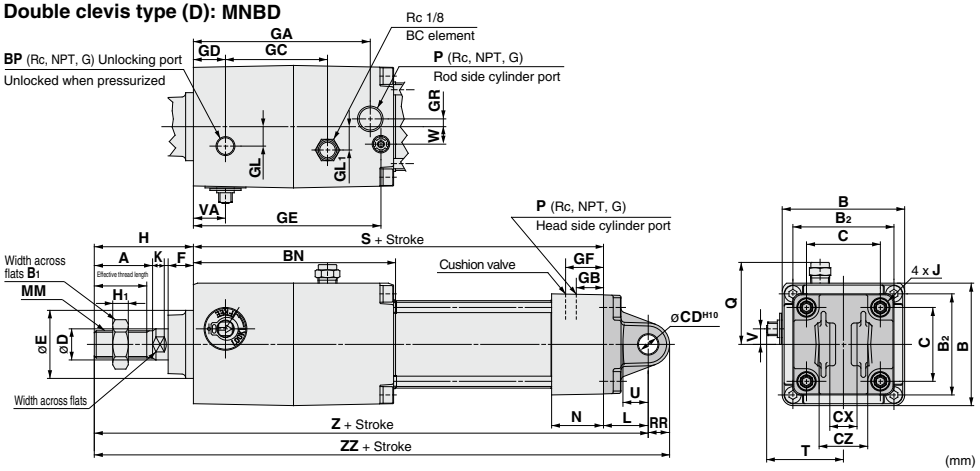
Bore size (mm)	Stroke range (mm)	Effective thread length (mm)	Width across flats	A	B	B_1	H_1	B_2	BN	BP	C	CD^{H10}	$CX^{-0.1}_{-0.3}$	D	Ee_{11}	F	GA	GB	GC	GD	GL	GL_1	GR
32	Up to 500	19.5	10	22	54	17	6	46	97	1/8	32.5	10	14	12	30	13	83	13	45.5	13	8.5	12	4
40	Up to 500	27	14	30	63	22	8	52	104	1/8	38	10	14	16	35	13	91	14	52.5	16.5	10	12	4
50	Up to 600	32	18	35	75	27	11	65	120.5	1/4	46.5	14	20	20	40	14	104.5	15.5	58.5	19	12.5	15	5
63	Up to 600	32	18	35	90	27	11	75	134.5	1/4	56.5	14	20	20	45	14	119.5	16.5	68	23	17.5	12	9
80	Up to 800	37	22	40	102	32	13	95	169	1/4	72	22	30	25	45	20	150	19	81	33	22	18	11.5
100	Up to 800	37	26	40	116	41	16	114	189	1/4	89	22	30	30	55	20	170	19	96	37.5	25	20	17

Bore size (mm)	GE	GF	J	K	L	MM	N	P	Q	RR	H	S	T	U	V	VA	W	Z	ZZ
32	88.5	18.3	M6 x 1.0	6	23	M10 x 1.25	27	1/8	37	10.5	47	154	34	13	6.5	13	6.5	224	234.5
40	96.5	19.5	M6 x 1.0	6	23	M14 x 1.5	27	1/4	41.5	11	51	161	39.5	13	8	16.5	9	235	246
50	111.2	22.4	M8 x 1.25	7	30	M18 x 1.5	31.5	1/4	47.5	15	58	183	47	17	9	20	10.5	271	286
63	123.5	20.7	M8 x 1.25	7	30	M18 x 1.5	31.5	3/8	55	15	58	197	55.5	17	8.5	23	12	285	300
80	157	26	M10 x 1.5	10	42	M22 x 1.5	38	3/8	61	23	72	245	61.5	26	10.5	33	14	359	382
100	177	26	M10 x 1.5	10	42	M26 x 1.5	38	1/2	68	23	72	265	69.5	26	10.5	37.5	15	379	402

∗ Refer to page 895 for cylinders with a rod boot.

Dimensions

Double clevis type (D): MNBD

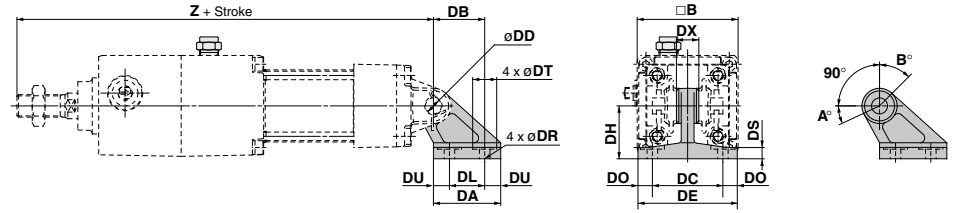


Bore size (mm)	Stroke range (mm)	Effective thread length (mm)	Width across flats	A	B	B_1	H_1	B_2	BN	BP	C	CD^{H10}	$CX^{+0.3}_{+0.1}$	CZ	D	Ee_{11}	F	GA	GB	GC	GD	GL	GL_1
32	Up to 500	19.5	10	22	54	17	6	46	97	1/8	32.5	10	14	28	12	30	13	83	13	45.5	13	8.5	12
40	Up to 500	27	14	30	63	22	8	52	104	1/8	38	10	14	28	16	35	13	91	14	52.5	16.5	10	12
50	Up to 600	32	18	35	75	27	11	65	120.5	1/4	46.5	14	20	40	20	40	14	104.5	15.5	58.5	19	12.5	15
63	Up to 600	32	18	35	90	27	11	75	134.5	1/4	56.5	14	20	40	20	45	14	119.5	16.5	68	23	17.5	12
80	Up to 800	37	22	40	102	32	13	95	169	1/4	72	22	30	60	25	45	20	150	19	81	33	22	18
100	Up to 800	37	26	40	116	41	16	114	189	1/4	89	22	30	60	30	55	20	170	19	96	37.5	25	20

Bore size (mm)	GR	GE	GF	J	K	L	MM	N	P	Q	RR	H	S	T	U	V	VA	W	Z	ZZ
32	4	88.5	18.3	M6 x 1.0	6	23	M10 x 1.25	27	1/8	37	10.5	47	154	34	13	6.5	13	6.5	224	234.5
40	4	96.5	19.5	M6 x 1.0	6	23	M14 x 1.5	27	1/4	41.5	11	51	161	39.5	13	8	16.5	9	235	246
50	5	111.2	22.4	M8 x 1.25	7	30	M18 x 1.5	31.5	1/4	47.5	15	58	183	47	17	9	20	10.5	271	286
63	9	123.5	20.7	M8 x 1.25	7	30	M18 x 1.5	31.5	3/8	55	15	58	197	55.5	17	8.5	23	12	285	300
80	11.5	157	26	M10 x 1.5	10	42	M22 x 1.5	38	3/8	61	23	72	245	61.5	26	10.5	33	14	359	382
100	17	177	26	M10 x 1.5	10	42	M26 x 1.5	38	1/2	68	23	72	265	69.5	26	10.5	37.5	15	379	402

∗ Refer to page 895 for cylinders with a rod boot.

Double Clevis Pivot Bracket



(mm)

Part no.	Bore size (mm)	B	DA	DB	DL	DU	DC	DX	DE	DO	DR	DT	DS	DH	Z	DD_{H10} (Hole)
MB-B03	**32**	54	42	32	22	10	44	14	62	9	6.6	15	7	33	224	$10^{+0.058}_{0}$
	40	63	42	32	22	10	44	14	62	9	6.6	15	7	33	235	$10^{+0.058}_{0}$
MB-B05	**50**	75	53	43	30	11.5	60	20	81	10.5	9	18	8	45	271	$14^{+0.070}_{0}$
	63	90	53	43	30	11.5	60	20	81	10.5	9	18	8	45	285	$14^{+0.070}_{0}$
MB-B08	**80**	102	73	64	45	14	86	30	111	12.5	11	22	10	65	359	$22^{+0.084}_{0}$
	100	116	73	64	45	14	86	30	111	12.5	11	22	10	65	379	$22^{+0.084}_{0}$

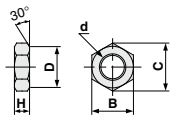
Rotating Angle

Bore size (mm)	A°	B°	A° + B° + 90°
32, 40	25°	45°	160°
50, 63	40°	60°	190°
80, 100	30°	55°	175°

Accessory Bracket Dimensions

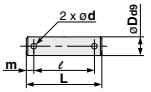
Accessory Bracket Dimensions

Rod End Nut (Standard equipment)



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

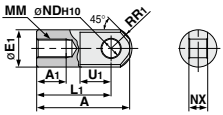
Knuckle Joint Pin, Clevis Pin



Part no.	Bore size (mm)		D_{d9}	L	ℓ	m	d (Drill through)	Cotter pin Note)
	Clevis	Knuckle						
CD-M03	32, 40		$10^{-0.040}_{-0.076}$	44	36	4	3	ø3 x 18 ℓ
CD-M05	50, 63		$14^{-0.050}_{-0.093}$	60	51	4.5	4	ø4 x 25 ℓ
CD-M08	80, 100		$22^{-0.065}_{-0.117}$	82	72	5	4	ø4 x 35 ℓ

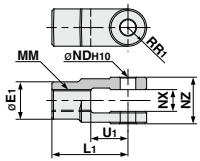
Note) Cotter pins and flat washers are included.

I Type Single Knuckle Joint



Part no.	Bore size (mm)	A	A_1	E_1	L_1	MM	R_1	U_1	ND_{H10}	NX
I-03M	32	40	14	20	30	M10 x 1.25	12	16	$10^{+0.058}_{0}$	$14^{-0.10}_{-0.30}$
I-04M	40	50	19	22	40	M14 x 1.5	12.5	19	$10^{+0.058}_{0}$	$14^{-0.10}_{-0.30}$
I-05M	50, 63	64	24	28	50	M18 x 1.5	16.5	24	$14^{+0.070}_{0}$	$20^{-0.10}_{-0.30}$
I-08M	80	80	26	40	60	M22 x 1.5	23.5	34	$22^{+0.084}_{0}$	$30^{-0.10}_{-0.30}$
I-10M	100	80	26	40	60	M26 x 1.5	23.5	34	$22^{+0.084}_{0}$	$30^{-0.10}_{-0.30}$

Y Type Double Knuckle Join



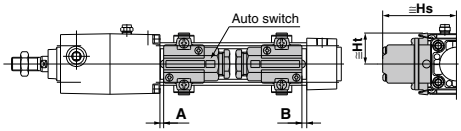
Part no.	Bore size (mm)	E_1	L_1	MM	R_1	U_1	ND_{H10}	NX	NZ
Y-03M	32	20	30	M10 x 1.25	10	16	$10^{+0.058}_{0}$	$14^{+0.30}_{+0.10}$	$28^{-0.10}_{-0.30}$
Y-04M	40	22	40	M14 x 1.5	11	19	$10^{+0.058}_{0}$	$14^{+0.30}_{+0.10}$	$28^{-0.10}_{-0.30}$
Y-05M	50, 63	28	50	M18 x 1.5	14	24	$14^{+0.070}_{0}$	$20^{+0.30}_{+0.10}$	$40^{-0.10}_{-0.30}$
Y-08M	80	40	65	M22 x 1.5	20	34	$22^{+0.084}_{0}$	$30^{+0.30}_{+0.10}$	$60^{-0.10}_{-0.30}$
Y-10M	100	40	65	M26 x 1.5	20	34	$22^{+0.084}_{0}$	$30^{+0.30}_{+0.10}$	$60^{-0.10}_{-0.30}$

Note) Pin, cotter pin and plain washer are attached with double knuckle joint.

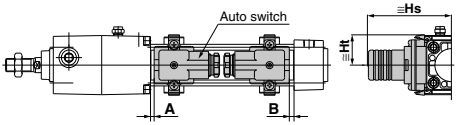
Auto Switch Mounting 1

Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

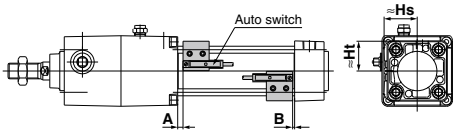
<Band mounting type>
D-A3□/G39/K39



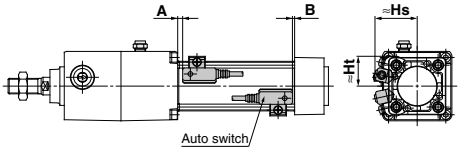
D-A44



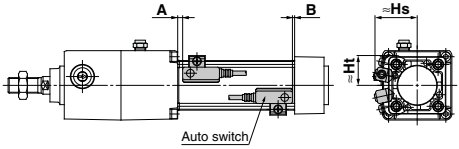
<Tie-rod mounting type>
D-M9□/M9□V
D-M9□W/M9□WV
D-M9□A/M9□AV
D-A9□/A9□V
D-Z7□/Z80
D-Y59/Y69/Y7P/Y7PV
D-Y7□W/Y7□WV/Y7BA



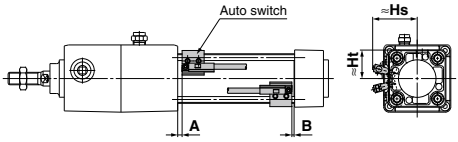
D-A5□/A6□
D-A59W



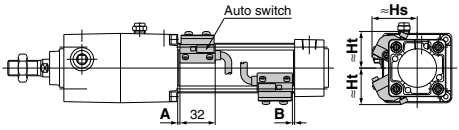
D-F5□/J59
D-F5□W/J59W/F5BA
D-F59F/F5NT



D-P3DWA



D-P4DW



Auto Switch Proper Mounting Position (Detection at Stroke End) and Mounting Height

Auto Switch Proper Mounting Position

(mm)

Auto switch model / Bore size (mm)	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-A5□ D-A6□		D-A59W		D-F5□W D-J59W D-F5□ D-J59 D-F5BA D-F59F		D-F5NT		D-A3□ D-A44 D-G39 D-K39		D-Z7□ D-Z80 D-Y59□ D-Y69□ D-Y7P D-Y7PV D-Y7□W D-Y7□WV D-Y7BA		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	0.5	0	4.5	2	7	4.5	12	9.5	0.5	0	4	1.5	6	3	3.5	1
40	10.5	8	6.5	4	0.5	0	4.5	2	7	4.5	12	9.5	0.5	0	4	1.5	6	3.5	3.5	1
50	11	8.5	7	4.5	1	0	5	2.5	7.5	5	12.5	10	1	0	4.5	2	6.5	4	4	1.5
63	11	8.5	7	4.5	1	0	5	2.5	7.5	5	12.5	10	1	0	4.5	2	6.5	4	4	1.5
80	14	12.5	10	8.5	4	2.5	8	6.5	10.5	9	15.5	14	4	2.5	7.5	6	9.5	8	7	5.5
100	14	12.5	10	8.5	4	2.5	8	6.5	10.5	9	15.5	14	4	2.5	7.5	6	9.5	8	7	5.5

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

Auto Switch Mounting Height

(mm)

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

Operating Range

(mm)

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

∗ Since this is a guideline including hysteresis, not meant to be guaranteed.
(Assuming approximately ±30% dispersion.)
There may be the case it will vary substantially depending on an ambient environment.

Auto Switch Mounting 2

Minimum Stroke for Auto Switch Mounting

n: No. of auto switches (mm)

Auto switch model	No. of auto switches mounted	ø32, ø40, ø50, ø63, ø80, ø100
D-M9□ **D-M9□W** **D-M9□A**	2 (Different surfaces, same surface), 1	15
	n	$15 + 40\frac{(n-2)}{2}$ (n=2, 4, 6, 8···) Note)
D-M9□V **D-M9□WV** **D-M9□AV**	2 (Different surfaces, same surface), 1	10
	n	$10 + 30\frac{(n-2)}{2}$ (n=2, 4, 6, 8···) Note)
D-A9□	2 (Different surfaces, same surface), 1	15
	n	$15 + 40\frac{(n-2)}{2}$ (n = 2, 4, 6, 8···) Note)
D-A9□V	2 (Different surfaces, same surface), 1	10
	n	$10 + 30\frac{(n-2)}{2}$ (n=2, 4, 6, 8···) Note)
D-A3□ **D-G39** **D-K39**	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

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

Auto switch model	No. of auto switches mounted	ø32, ø40, ø50, ø63	ø80, ø100
D-A5□ **D-A6□**	2 (Different surfaces, same surface), 1	15	20
	n (Same surface)	$15 + 55\frac{(n-2)}{2}$ (n=2, 4, 6, 8···) Note)	$20 + 55\frac{(n-2)}{2}$ (n=2, 4, 6, 8···) Note)
D-A59W	2 (Different surfaces, same surface)	20	25
	n (Same surface)	$20 + 55\frac{(n-2)}{2}$ (n=2, 4, 6, 8···) Note)	$25 + 55\frac{(n-2)}{2}$ (n=2, 4, 6, 8···) Note)
	1	15	25
D-F5□/J59 **D-F5□W** **D-J59W** **D-F5BA** **D-F59F** **D-F5NT**	2 (Different surfaces, same surface)	15	25
	n (Same surface)	$15 + 55\frac{(n-2)}{2}$ (n=2, 4, 6, 8···) Note)	$25 + 55\frac{(n-2)}{2}$ (n=2, 4, 6, 8···) Note)
	1	10	25
D-Z7□ **D-Z80** **D-Y59□** **D-Y7P** **D-Y7□W**	2 (Different surfaces, same surface), 1	15	
	n	$15 + 40\frac{(n-2)}{2}$ (n=2, 4, 6, 8···) Note)	
D-Y69□ **D-Y7PV** **D-Y7□WV**	2 (Different surfaces, same surface), 1	10	
	n	$10 + 30\frac{(n-2)}{2}$ (n=2, 4, 6, 8···) Note)	
D-Y7BA	2 (Different surfaces, same surface), 1	20	
	n	$20 + 45\frac{(n-2)}{2}$ (n=2, 4, 6, 8···) Note)	
D-P3DWA	2 (Different surfaces, same surface), 1	15	
	n	$15 + 50\frac{(n-2)}{2}$ (n=2, 4, 6, 8···) Note)	
D-P4DW	2 (Different surfaces, same surface), 1	15	
	n	$15 + 65\frac{(n-2)}{2}$ (n=2, 4, 6, 8···) Note)	

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)					
	ø32	ø40	ø50	ø63	ø80	ø100
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
D-A3□/A44 **D-G39/K39**	BMB2-032	BMB2-040	BMB1-050	BMB1-063	BMB1-080	BMB1-100
D-A5□/A6□ **D-A59W** **D-F5□/J59** **D-F5□W/J59W** **D-F5□F** **D-F5BA** **D-F5NT**	BT-03	BT-03	BT-05	BT-05	BT-06	BT-06
D-P3DWA	BA10-032S	BA10-040S	BA10-050S	BA10-050S	BA10-063S	BA10-063S
D-P4DW	BMB3T-040	BMB3T-040	BMB3T-050	BMB3T-050	BMB3T-080	BMB3T-080
D-Z7□/Z80 **D-Y59□/Y69□** **D-Y7P/Y7PV** **D-Y7□W** **D-Y7□WV** **D-Y7BA**	BMB4-032	BMB4-032	BMB4-050	BMB4-050	BA4-063	BA4-063

[Mounting screws set made of stainless steel]

The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment. (Please order the auto switch mounting bracket separately, since it is not included.)

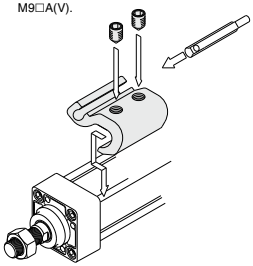
BBA1: For D-A5/A6/F5/J5 types

D-F5BA auto switch is set on the cylinder with the stainless steel screws above when shipped. When an auto switch is shipped independently, BBA1 is attached.

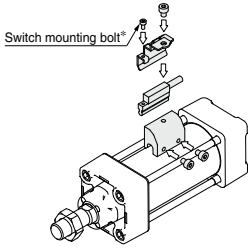
Note 1) Refer to page 1233 for the details of BBA1.

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

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



<Mounting example for ø32, D-P3DWA>



* The switch mounting bolt is supplied with the switch.

Besides the models listed in How to Order, the following auto switches are applicable.
For detailed specifications, refer to pages 1119 to 1245.

Auto switch type	Model	Electrical entry (Fetching direction)	Features
Reed	D-A93V, A96V	Grommet (Perpendicular)	—
	D-A90V		Without indicator light
	D-A53, A56, Z73, Z76	Grommet (In-line)	—
	D-A67, Z80		Without indicator light
Solid state	D-M9NV, M9PV, M9BV	Grommet (Perpendicular)	—
	D-Y69A, Y69B, Y7PV		
	D-M9NWV, M9PWV, M9BWV		Diagnostic indication (2-color indicator)
	D-Y7NWV, Y7PWV, Y7BWV		
	D-M9NAV, M9PAV, M9BAV		Water resistant (2-color indicator)
	D-F59, F5P, J59	Grommet (In-line)	—
	D-Y59A, Y59B, Y7P		
	D-F59W, F5PW, J59W		Diagnostic indication (2-color indicator)
	D-Y7NW, Y7PW, Y7BW		
	D-F5BA, Y7BA		Water resistant (2-color indicator)
	D-F5NT		With timer
	D-P5DW		Magnetic field resistant (2-color indicator)

* With pre-wired connector is available for solid state auto switches. For details, refer to pages 1192 and 1193.
* Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)/Y7G/Y7H) are also available. For details, refer to pages 1592-1 and 1139.