

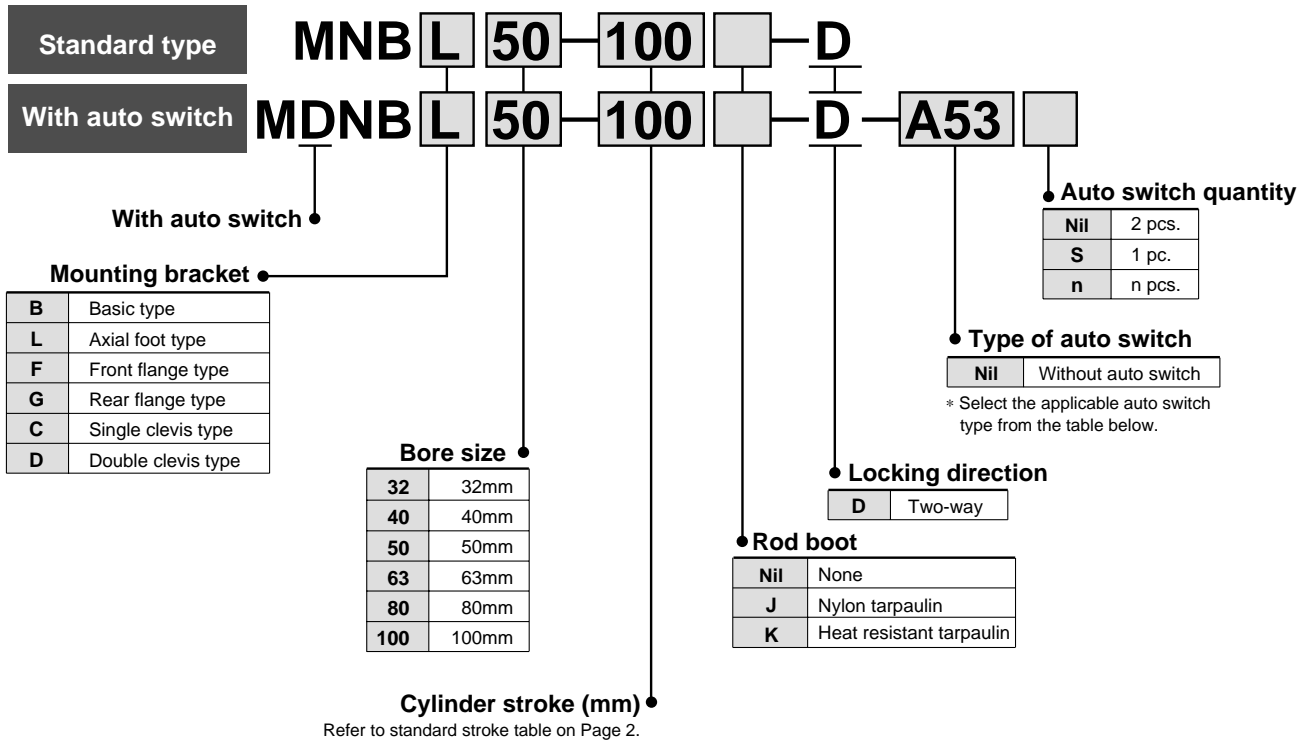
Cylinder
with Lock

Double
Acting:
Single Rod

Series MNB

ø32, ø40, ø50, ø63, ø80, ø100

How to Order



Applicable auto switch types / Tie-rod mount

Type	Special functions	Electrical entry	Indicator light	Wiring (output)	Load voltage		Auto switch part no.	* Lead wire length (m)			Applicable load				
					DC	AC		0.5 (Nil)	3 (L)	5 (Z)					
Reed switch	—	Grommet	Yes	3 wire (NPN equiv.)	—	5V	—	A56	●	●	—	IC circuit			
				2 wire	12V	—	A53	●	●	●	—				
					12V	100V, 200V	A54	●	●	●	—				
					12V	200V or less	A67	●	●	—	IC circuit				
Diagnostic indicator (2 color)	Grommet	No	2 wire	12V	200V or less	A64	●	●	—	IC circuit					
				—	—	A59W	●	●	—	—					
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	F59	●	●	○	IC circuit			
				3 wire (PNP)	—	—	100V, 200V	F5P	●	●	○	—			
				2 wire	12V	—	J51	●	●	○	—				
					12V	—	J59	●	●	○	—				
				Diagnostic indicator (2 color)	Grommet	Yes	3 wire (NPN)	5V, 12V	—	F59W	●	●	○	IC circuit	
										F5PW	●	●	○	—	
				Improved water resistance (2 color indicator)	Grommet	Yes	2 wire	24V	12V	—	J59W	●	●	○	—
											F5BA	—	●	○	—
				With timer	Grommet	Yes	3 wire (NPN)	5V, 12V	—	F5NT	—	●	○	IC circuit	
										F59F	●	●	○	—	
With diagnostic output (2 color indicator)	Grommet	Yes	4 wire (NPN)	—	—	—	F5LF	●	●	○	—				
							—	—	—	—	—				

* Lead wire length symbol
0.5m..... Nil (Ex.) A53
3m L (Ex.) A53L
5m Z (Ex.) A53Z

* Solid state switches marked with a O are manufactured upon receipt of order.

Cylinders with built-in magnets

In cases of built-in magnets without auto switches, the symbol for auto switch type will be Nil. (Ex.) MDNBL40-100-D

Mounting bracket parts

Refer to P.3 regarding types of mounting brackets for other than basic type air cylinders.

Auto switch mounting brackets/Part Nos.

Applicable bore size (mm)	32, 40	50, 63	80, 100
Mounting bracket part no.	BT-03	BT-05	BT-06

[Stainless steel mounting screw kit]

The following stainless steel mounting screw kit (including set screws) has been prepared for use, depending upon the operating environment.

(Mounting brackets are not included, and must be arranged separately.)

BBA1: Stainless steel screw kit for D-A5/A6/F5/J5

The above stainless steel screws are used when a cylinder is shipped with D-F5BA type switches. The above screw kit is also included when D-F5BA type switches are shipped separately.

Cylinder with Lock **Series MNB**

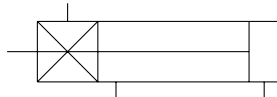
Double Acting: *Single Rod*

Models

Series	Model	Cylinder action	Locking action	Cylinder bore size (mm)
MNB	Non-lube type	Double acting	Spring lock	32, 40, 50, 63, 80, 100



JIS symbol
Cylinder with brake



Cylinder Specifications

Bore size (mm)	32, 40, 50, 63, 80, 100
Model	Non-lube type
Fluid	Air
Proof pressure	1.5MPa {15.3kgf/cm ² }
Maximum operating pressure	1.0MPa {10.2kgf/cm ² }
Minimum operating pressure	0.08MPa {0.82kgf/cm ² }
Piston speed	50 to 1000mm/s ^{Note)}
Ambient and fluid temperature	Without auto switch : -10°C to 70°C (without freezing) With auto switch : -10°C to 70°C (without freezing)
Cushion	Double side air cushion
Stroke length tolerance	to 250: ^{+1.0} ₀ , 251 to 1000: ^{+1.4} ₀ , 1001 to 1500: ^{+1.8} ₀
Bracket type	Basic type, Axial foot type, Front flange type, Rear flange type, Single clevis type, Double clevis type

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

Lock Specifications

Lock actuation	Spring lock (exhaust lock)
Unlocking pressure	0.25MPa {2.5kgf/cm ² } or more
Locking pressure	0.20MPa {2.0kgf/cm ² } or less
Maximum operating pressure	1.0MPa {10.0kgf/cm ² }
Locking direction	Two-way

Standard Stroke

For cases with auto switches, refer to the table of minimum strokes for mounting of auto switches on page 12.

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

Stopping Accuracy

Unit: mm

Locking system	Piston speed (mm/s)			
	100	300	500	1000
Spring lock	±0.3	±0.6	±1.0	±2.0

Conditions / Horizontal supply pressure P=0.5MPa{5kgf/cm²}

Load weight Upper limit of allowable value

Solenoid valve for locking mounted on the unlocking port

Maximum value of stopping position dispersion from 100 measurements

Spring Lock Holding Power (Maximum Static Load)

Bore size (mm)	32	40	50	63	80	100
Holding power N {kgf}	552 {56}	882 {90}	1370 {140}	2160 {220}	3430 {350}	5390 {550}

Series MNB

Bracket Part Numbers

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

Note 1) When ordering foot type brackets, 2 pcs. should be arranged for each cylinder.

Note 2) The following parts are included with each mounting bracket.

Foot, Flange, Single clevis: Body mounting bolts

Double clevis: Clevis pin, Cotter pin

Note 3) All are common to the MB series air cylinders, except for the sections marked with a *.

Rod Boot

Symbol	Material	Maximum ambient temperature
J	Nylon tarpaulin	60°C
K	Heat resistant tarpaulin	110°C ^{Note)}

Note) Maximum ambient temperature for the rod boot itself.

Accessories

Mounting		Basic type	Foot type	Front flange type	Rear flange type	Single clevis type	Double clevis type
Standard equipment	Rod end nut	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●
Options	Single knuckle joint	●	●	●	●	●	●
	Double knuckle joint (with pin)	●	●	●	●	●	●
	With rod boot	●	●	●	●	●	●

Single Rod Weight Table/Aluminum Tube

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	13.57
	Single clevis type	1.45	1.98	3.10	4.69	7.96	13.43
	Double clevis type	1.46	1.99	3.19	4.85	8.25	13.95
Additional weight per 50mm of stroke	All mounting brackets	0.11	0.16	0.26	0.27	0.42	0.56
Accessories	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

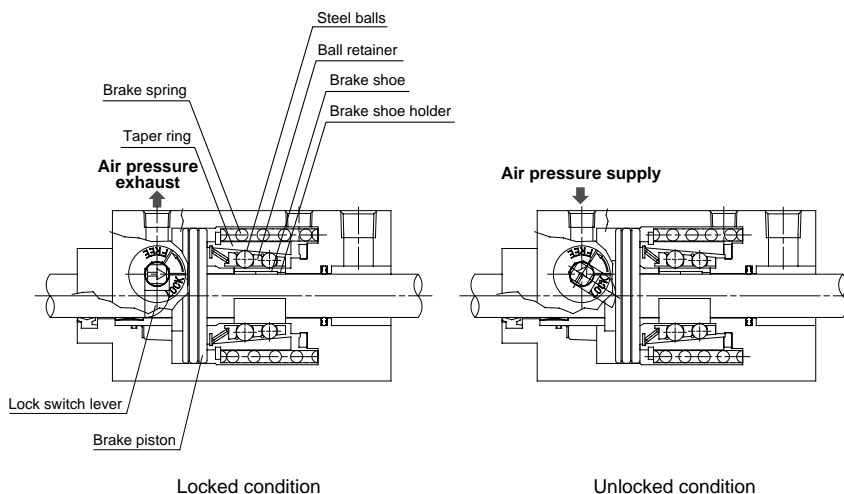
Calculation method

(Example) MNBB32-100 (basic type, ø32, 100st)

- Basic weight 1.20 (basic type, ø32)
- Additional weight 0.11/50mm stroke
- Cylinder stroke 100mm stroke

$$1.20 + 0.11 \times 100/50 = 1.42\text{kg}$$

Construction Principles



Spring lock (exhaust lock)

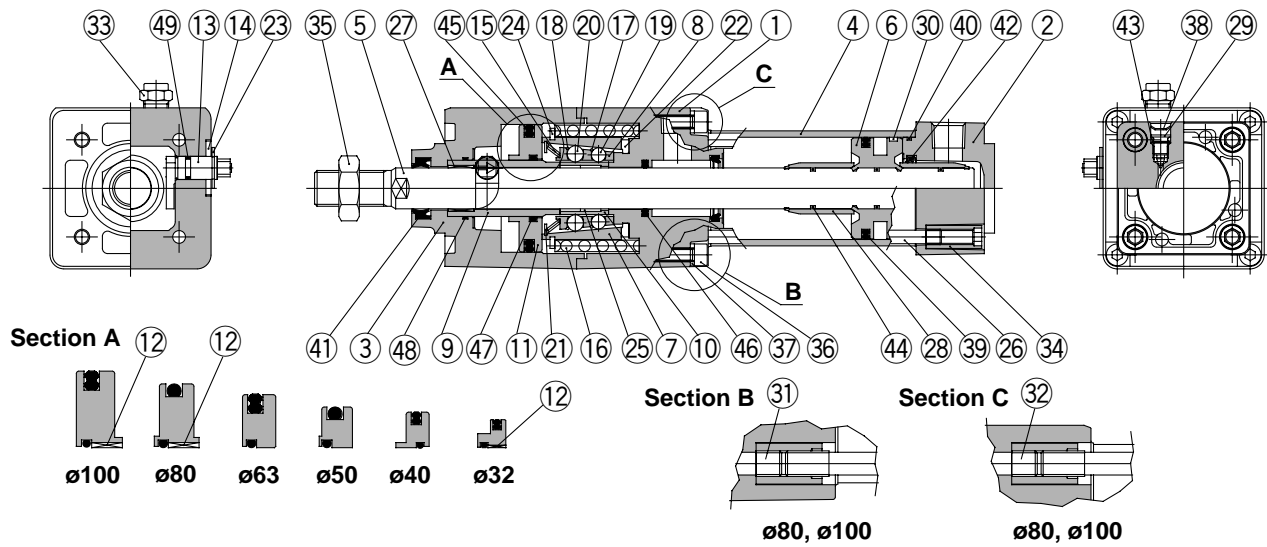
The spring force which acts upon the taper ring is magnified by a wedge effect, and is conveyed to all of the numerous steel balls which are arranged in two circles. These act on the brake shoe holder and brake, which locks the piston rod by tightening against it with a large force.

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.

Cylinder with Lock

Double Acting: Single Rod Series MNB

Construction



Parts list

No.	Description	Material	Note	
①	Rod cover	Aluminum alloy	Hard anodized & metallic coated	
②	Head cover	Die-cast aluminum	Chromated & metallic coated	
③	Cover	Aluminum alloy	Hard anodized & metallic coated	
④	Cylinder tubing	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	ø40	Aluminum alloy	Hard anodized
		ø50		
		ø63		
		ø32	Carbon steel	Zinc chromated
		ø80		
⑫	Release piston bushing	Steel + special resin	ø32, ø80, ø100 only	
⑬	Unlocking cam	Chrome molybdenum steel	Glossy chromated	
⑭	Washer	Carbon steel	Black zinc chromated	
⑮	Retainer pre-load spring	Steel wire	Zinc chromated	
⑯	Brake spring	Steel wire	Zinc chromated	
⑰	Clip A	Stainless steel		
⑱	Clip B	Stainless steel		
⑲	Steel ball A	Carbon steel		
⑲	Steel ball B	Carbon steel		
⑲	Tooth ring	Stainless steel		
⑲	Damper	Polyurethane rubber		
⑲	C type retaining ring for unlocking cam shaft	Carbon steel		
⑲	C type retaining ring for taper ring	Carbon steel		
⑲	Brake shoe	Special friction material		
⑲	Tie-rod	Carbon steel	Chromated	
⑲	Bushing	Lead-bronze casting		
⑲	Cushion ring	Brass		

Parts list

No.	Description	Material	Note
⑲	Cushion valve	Steel wire	Nickel plated
⑳	Wear ring	Resin	
㉑	Unit holding tie-rod A	Carbon steel	Chromated ø80, ø100 only
㉒	Unit holding tie-rod B	Carbon steel	Chromated ø80, ø100 only
㉓	BC element		
㉔	Tie-rod nut	Carbon steel	Nickel plated
㉕	Rod end nut	Carbon steel	Nickel plated
㉖	Hexagon socket head cap screw	Chrome molybdenum steel	Nickel plated ø32 to ø63 only
㉗	Spring washer for hex. socket head cap screw	Steel wire	Nickel plated ø32 to ø63 only
㉘	Retaining ring	Spring steel	
㉙	Piston seal	NBR	
㉚	Cylinder tube gasket	NBR	
㉛	Rod seal A	NBR	
㉜	Cushion seal	NBR	
㉝	Cushion valve seal	NBR	
㉞	Piston gasket	NBR	
㉟	Release piston seal	NBR	
㊱	Rod seal B	NBR	
㊲	Release piston gasket	NBR	
㊳	Piston guide gasket	NBR	
㊴	Unlocking cam gasket	NBR	

Replacement parts list (seal kits)

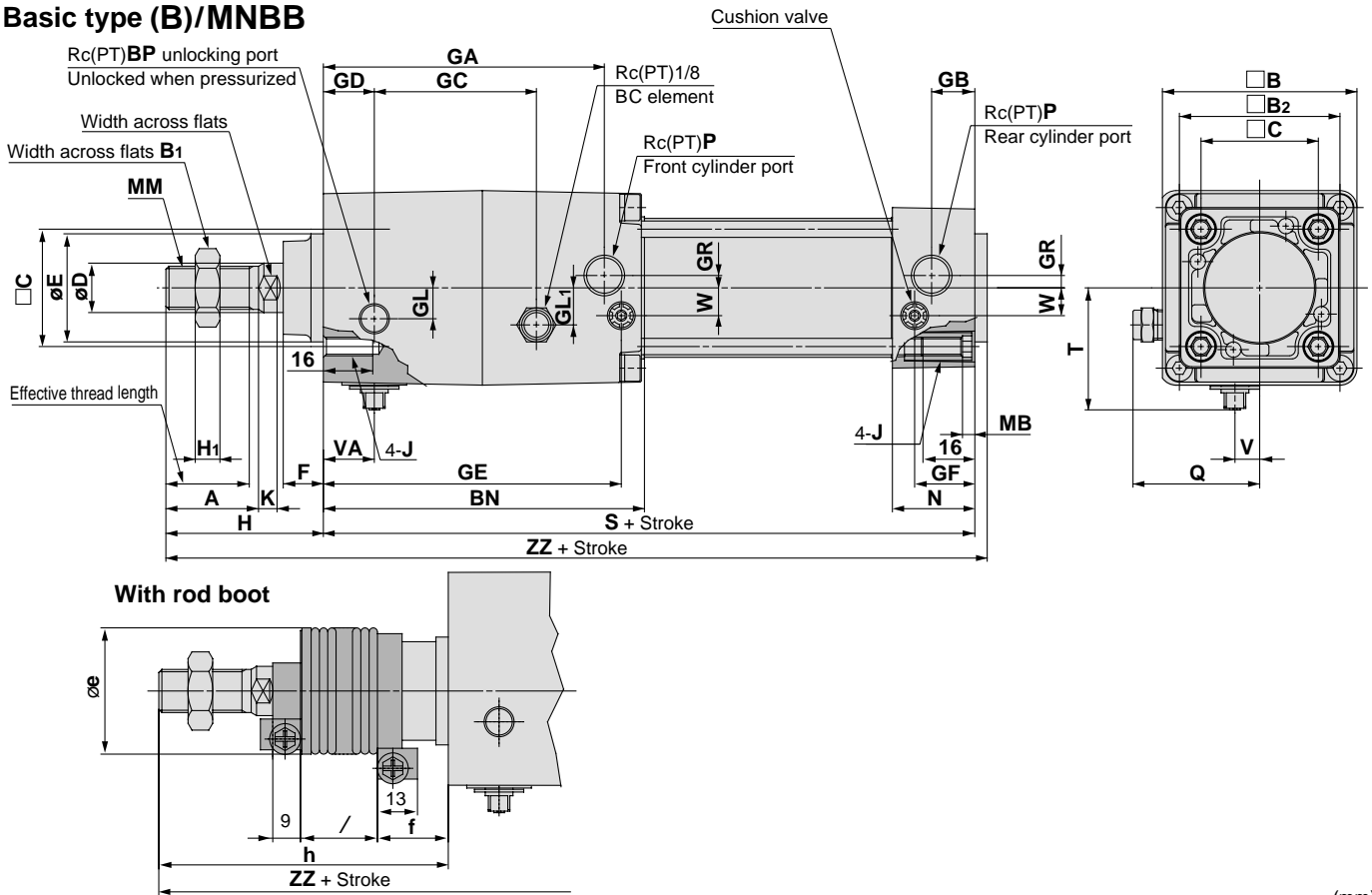
Bore size(mm)	Order No.	Contents
32	MB 32-PS	A kit containing nos. 39, 40, 41 and 42 (2pcs.) from the table above.
40	MB 40-PS	
50	MB 50-PS	
63	MB 63-PS	
80	MB 80-PS	
100	MB100-PS	

* As a general rule, the lock section of the MNB series is replaced as a unit, and therefore, the replacement seal kits are for the cylinder section only. These can be ordered using the order number for each bore size.

Series MNB

Dimensions

Basic type (B)/MNBB



(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
32	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	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	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	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	to 750	37	22	40	102	32	13	95	169	1/4	72	25	45	20	150	19	81	33	22	18
100	to 750	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

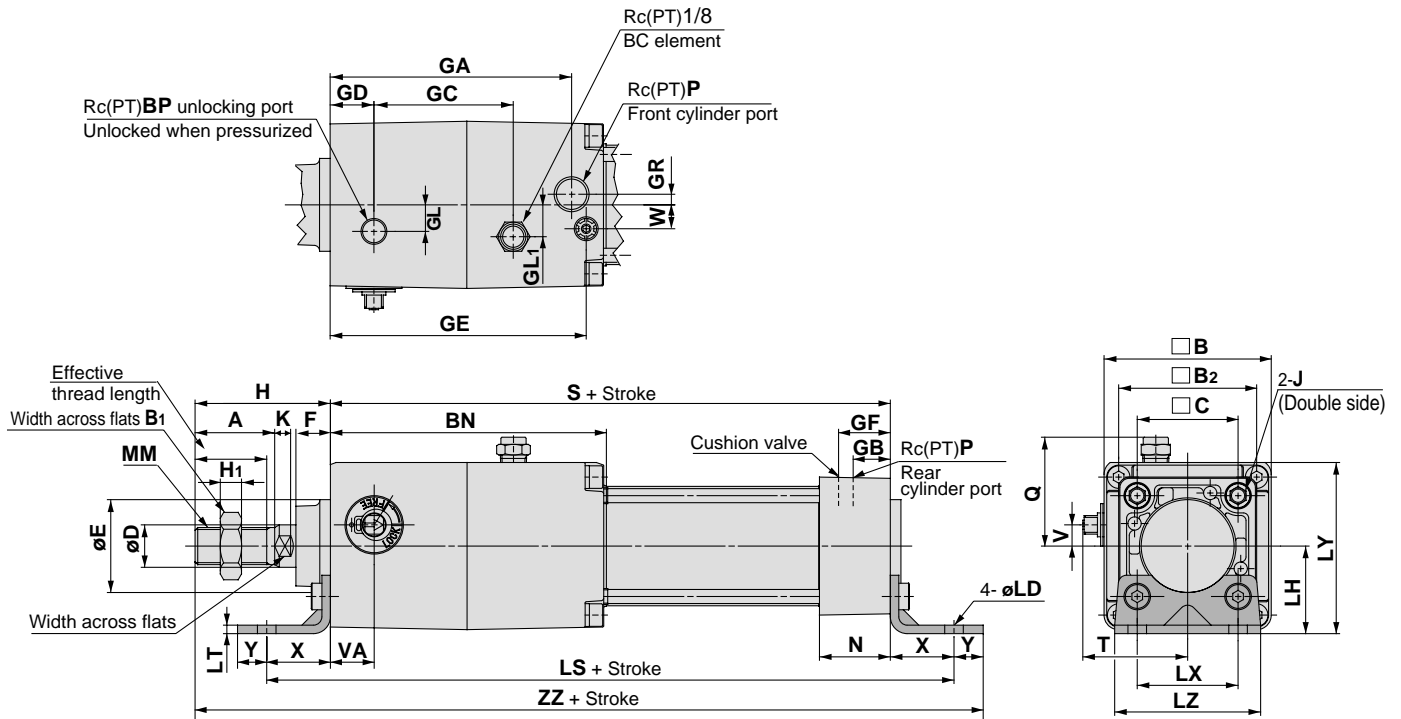
With rod boot

(mm)

Bore size (mm)	e	f	/										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 750	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 750
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	187.5	101	114	126	139	164	189	214	239	264	276
100	61	29	12.5	25	37.5	50	75	100	125	150	175	187.5	101	114	126	139	164	189	214	239	264	276

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 750
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	525
100	370	383	395	408	433	458	483	508	533	545

Axial foot type (L)/MNBL



(mm)

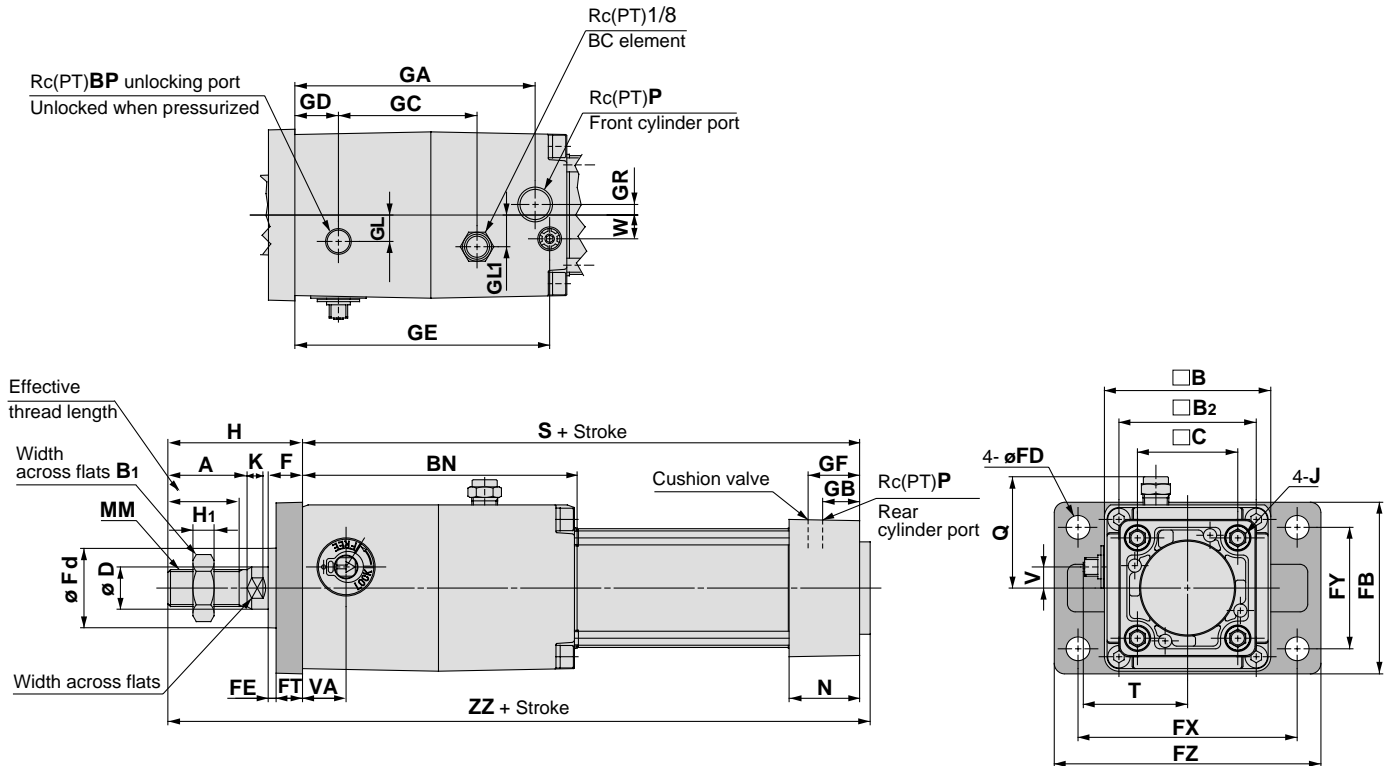
Bore size (mm)	Stroke range (mm)	Effective thread length (mm)	Width across flats	A	B	B ₁	H ₁	B ₂	BN	BP	C	D	Ee ₁₁	F	GA	GB	GC	GD	GL	GL ₁	GR	GE	GF
32	to 700	19.5	10	22	54	17	6	46	97	1/8	32.5	12	30	13	83	13	45.5	13	8.5	12	4	88.5	18.3
40	to 800	27	14	30	63	22	8	52	104	1/8	38	16	35	13	91	14	52.5	16.5	10	12	4	96.5	19.5
50	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	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	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	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

Series MNB

Dimensions

Front flange type (F)/MNBF



(mm)

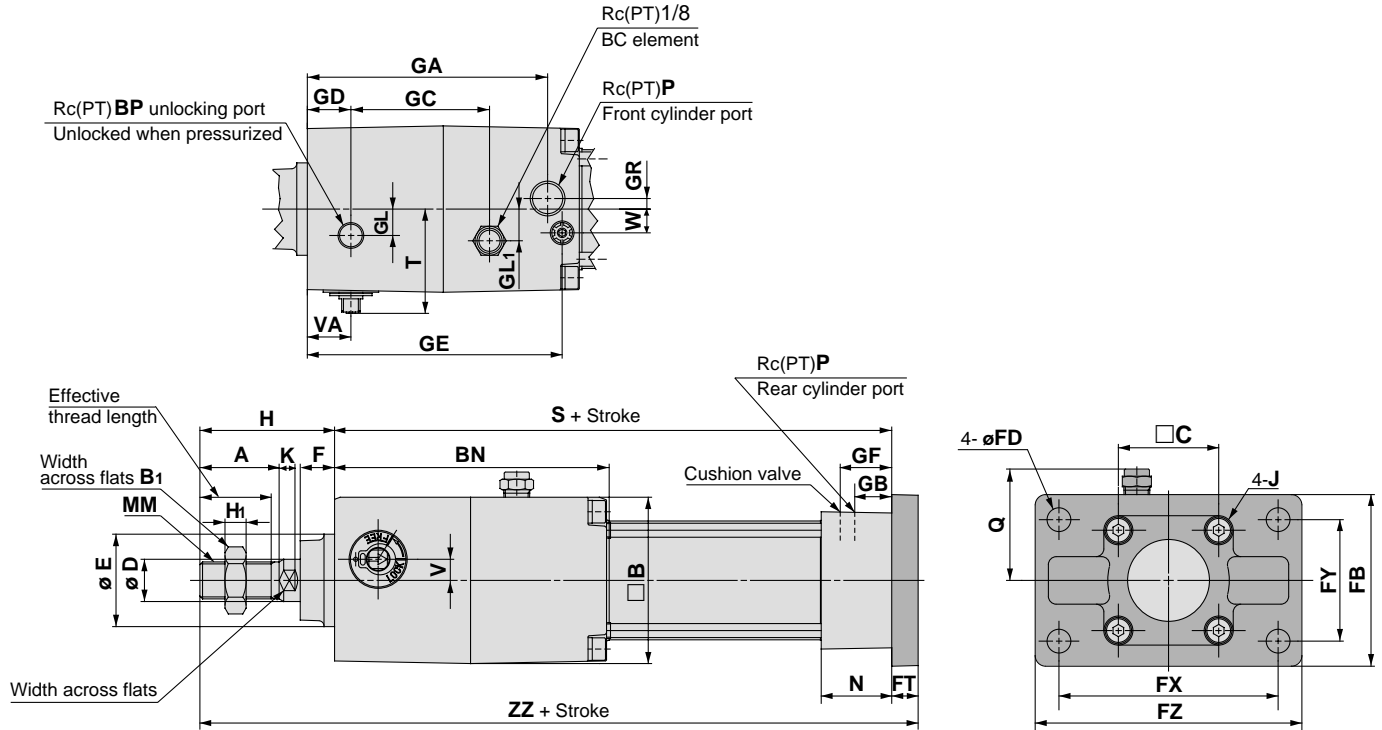
Bore size (mm)	Stroke range (mm)	Effective thread length (mm)	Width across flats	A	FB	B	B ₁	H ₁	B ₂	BN	BP	C	D	F	F _d	FD	FE	FT	FX	FY	FZ	GA	GB
32	to 700	19.5	10	22	56	54	17	6	46	97	1/8	32.5	12	13	25	7	3	10	72	38	87	83	13
40	to 800	27	14	30	65	63	22	8	52	104	1/8	38	16	13	31	9	3	10	83	46	101	91	14
50	to 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	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	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	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

Cylinder with Lock **Series MNB**

Double Acting: *Single Rod*

Rear flange type (G)/MNBG



(mm)

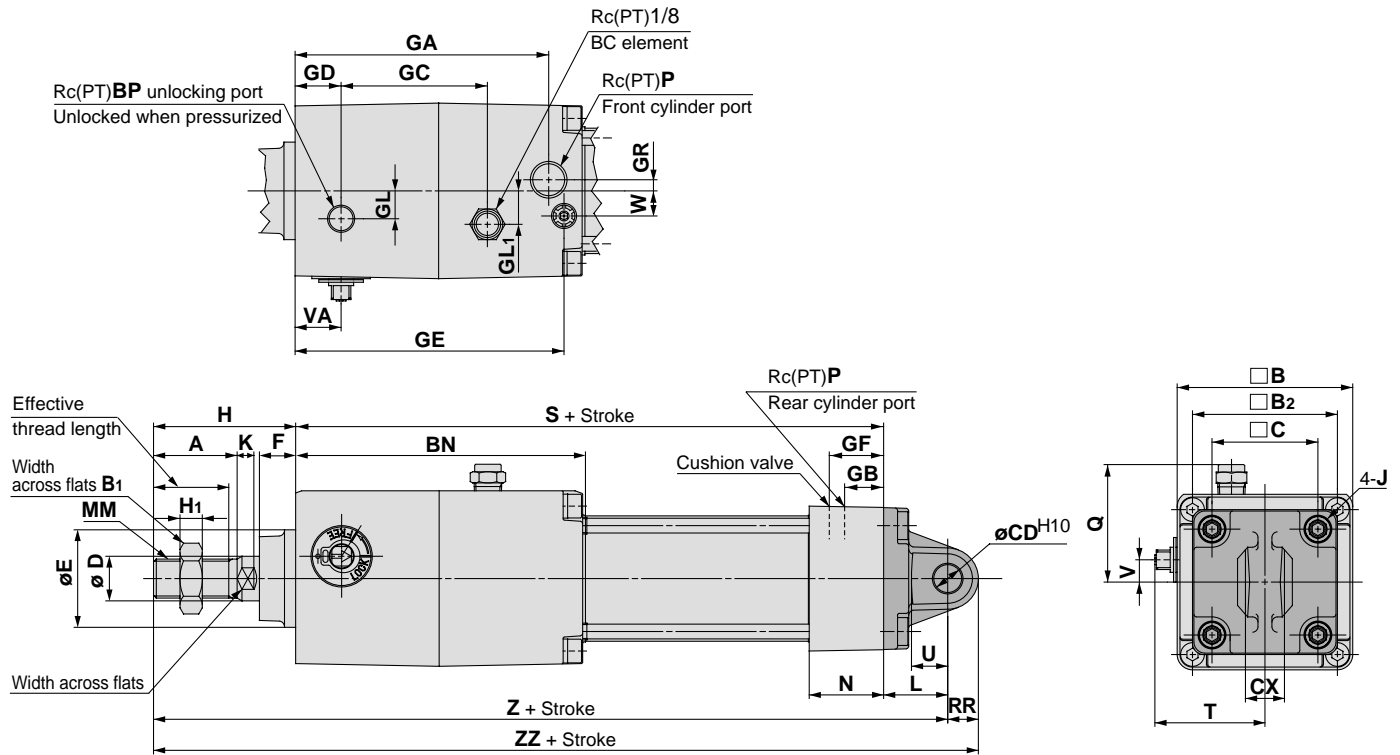
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32	to 500	19.5	10	22	56	54	17	6	97	1/8	32.5	12	30	13	7	10	72	38	87	83	13	45.5	13
40	to 500	27	14	30	65	63	22	8	104	1/8	38	16	35	13	9	10	83	46	101	91	14	52.5	16.5
50	to 600	32	18	35	77	75	27	11	120.5	1/4	46.5	20	40	14	9	12	100	52	120	104.5	15.5	58.5	19
63	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	to 750	37	22	40	100	102	32	13	169	1/4	72	25	45	20	12	16	126	63	153	150	19	81	33
100	to 750	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

Series MNB

Dimensions

Single clevis type (C)/MNBC



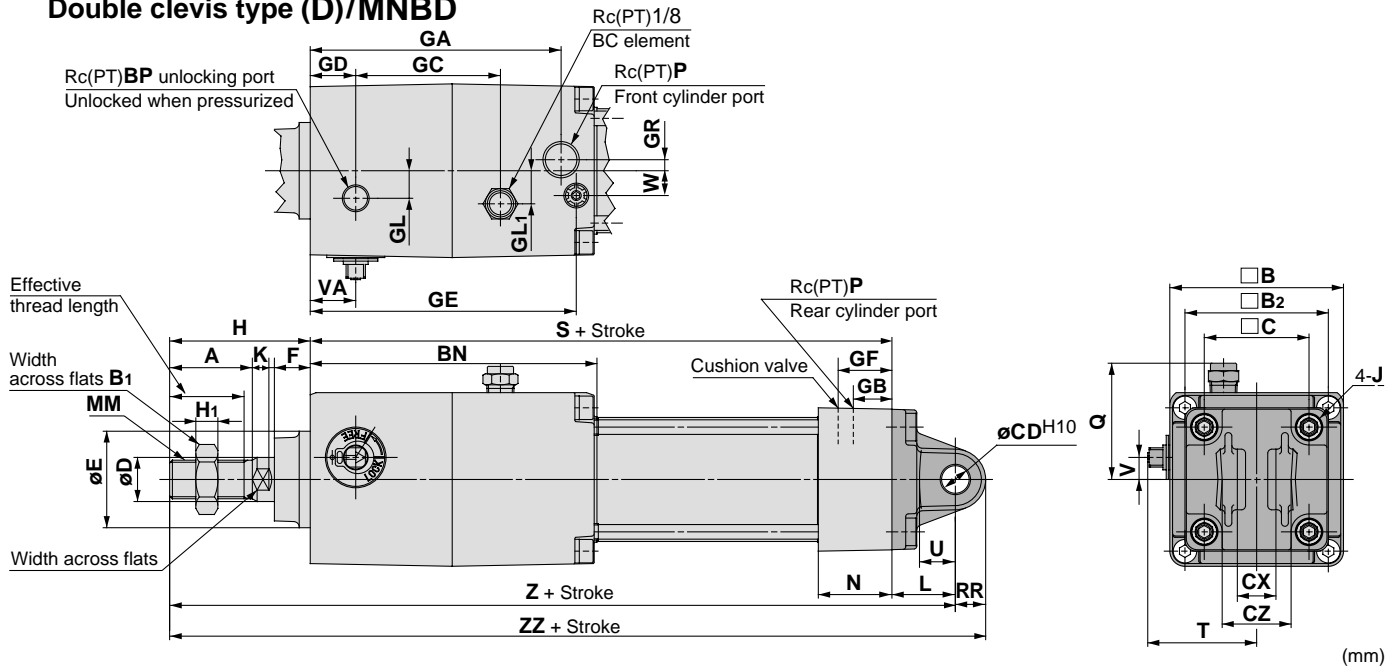
(mm)

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	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	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	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	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	to 750	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	to 750	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

Cylinder with Lock Double Acting: *Single Rod* Series **MNB**

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	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	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	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	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	to 750	37	22	40	102	32	13	95	169	1/4	72	22	30	60	25	45	20	150	19	81	33	22	18
100	to 750	37	26	40	116	41	16	114	189	1/4	89	22	30	60	30	55	20	170	19	96	37.5	25	20

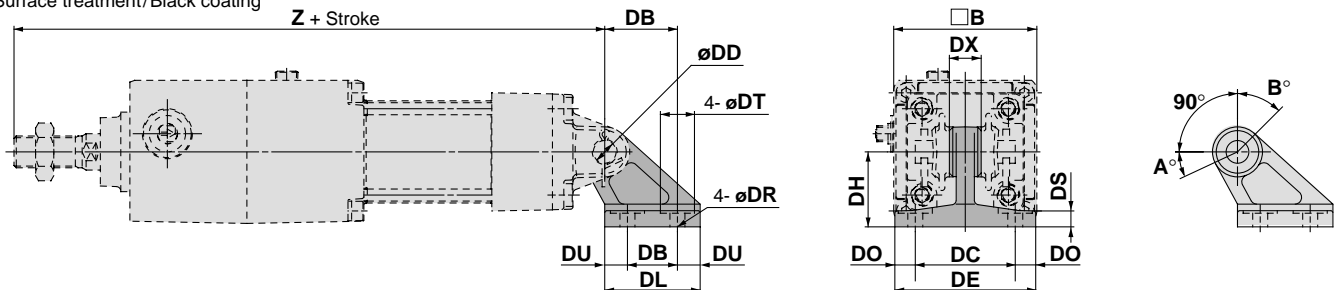
Bore size (mm)	GR	GE	GF	J	K	L	MM	N	P	Q	RR	H	S	T	U	V	VA	W	Z	ZZ
32	4	88.5	18.3	M6 x 1.0	6	23	M10 x 1.25	27	1/8	37	10.5	47	154	34	13	6.5	13	6.5	224	234.5
40	4	96.5	19.5	M6 x 1.0	6	23	M14 x 1.5	27	1/4	41.5	11	51	161	39.5	13	8	16.5	9	235	246
50	5	111.2	22.4	M8 x 1.25	7	30	M18 x 1.5	31.5	1/4	47.5	15	58	183	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

Double Clevis Bracket

Material/Cast iron

Surface treatment/Black coating

• Strength is the same as cylinder brackets.



No.	Bore size (mm)	B	DA	DB	DL	DU	DC	DX	DE	DO	DR	DT	DS	DH	Z	DD _{H10} (Aperture)
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 ^{+0.084} 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

Rotation

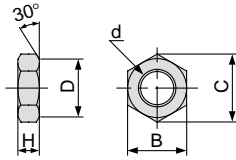
Bore size (mm)	A°	B°	A°+B°+90°
32, 40	25°	45°	160°
50, 63	40°	60°	190°
80, 100	30°	55°	175°

Series MNB

Dimensions of Accessories

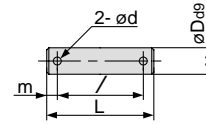
Dimensions of Accessories

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

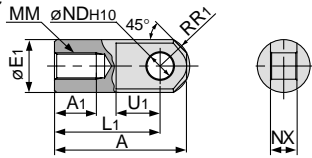
Knuckle joint pin
Clevis pin



Part No.	Bore size (mm)		D _{d9}	L	/	m	d (Drill through)	Cotter pin ^{Note 1)}
	Clevis	Knuckle						
CD-M03	32, 40	10	10 ^{-0.040 -0.076}	44	36	4	3	ø3 x 18 /
CD-M05	50, 63	14	14 ^{-0.050 -0.093}	60	51	4.5	4	ø4 x 25 /
CD-M08	80, 100	22	22 ^{-0.065 -0.117}	82	72	5	4	ø4 x 35 /

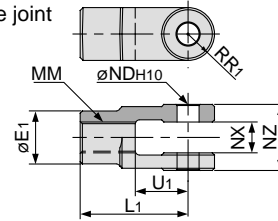
Note 1) A cotter pin should be used together with a plain washer.

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	M10x1.25	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 joint



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 included with the double knuckle joint.

Series MDNB Auto Switch Specifications



Applicable auto switches

Auto switch type	Auto switch model	Electrical entry
Reed switch	D-A5□, A6□	Grommet
	D-A59W	Grommet (2 color indication type)
Solid state switch	D-F5□, J5□	Grommet
	D-F5□W, J59W	Grommet (2 color indication type)
	D-F5BAL	Grommet (2 color indication, water resistant type)
	D-F5□F	Grommet (2 color indication type with diagnostic output)
	D-F5NTL	Grommet (with timer)



Specific Product Precautions

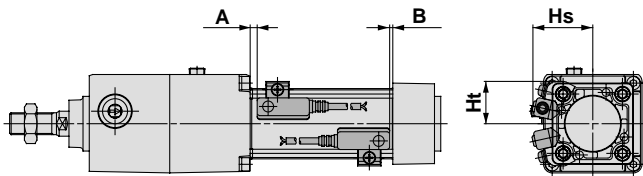
Be sure to read before handling.
Refer to pages 24 through 26 for auto switch precautions.

Minimum stroke for mounting of auto switches

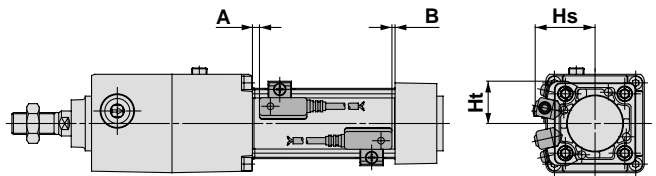
Type	Auto switch model	Number of auto switches	ø32	ø40	ø50	ø63	ø80	ø100
Reed switch	D-A5, D-A6	2 pcs. (different sides or same side)		15				20
		1 pc.						
Reed switch	D-A59W	2 pcs. (different sides or same side)		20				25
		1 pc.		15				
Solid state switch	D-F5, J5	2 pcs. (different sides or same side)		15				25
		1 pc.		10				
	D-F5NTL	2 pcs. (different sides or same side)		15				25
		1 pc.		10				
	D-F5□W D-J59W D-F5BAL D-F5□F D-F5LF	2 pcs. (different sides or same side)		15				25
1 pc.			10					

Auto Switches/Proper Mounting Position and Height for Stroke End Detection

Reed switch



Solid state switch



Auto switch mounting position

Bore size (mm)	D-A5, D-A6		D-A59W		D-F5□ D-J5□		D-F5□W D-J59W D-F5BAL			D-F5NTL	
	A	B	A	B	A	B	A	B	A	B	
32	1.5	0	5.5	2	8	4.5	12	8.5	13	9.5	
40	1.5	0	5.5	2	8	4.5	12	8.5	13	9.5	
50	3.5	0	7.5	2.5	10	5	14	9	15	10	
63	3.5	0	7.5	2.5	10	5	14	9	15	10	
80	5	2.5	9	6.5	11.5	9	15.5	13	16.5	14	
100	5	2.5	9	6.5	11.5	9	15.5	13	16.5	14	

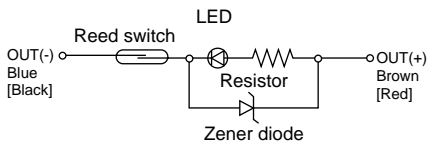
Auto switch mounting height

Bore size (mm)	D-A5 D-A6 D-A59W		D-F5, D-J5□ D-F5□W, D-J59W D-F5BAL, D-F5NTL	
	Ht	Hs	Ht	Hs
32	24.5	35	25	32.5
40	27.5	38.5	27.5	36.5
50	34.5	43.5	34	41
63	39.5	48.5	39	46
80	46.5	55	46.5	52.5
100	55	62	55	59.5

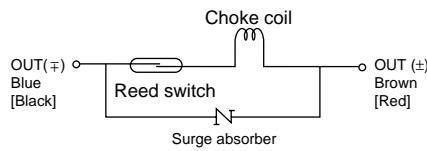
Series MDNB Auto Switch Internal Circuits

Reed Switch Internal Circuits

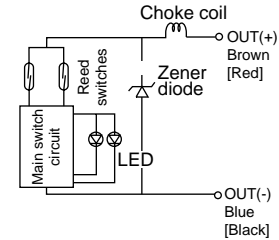
D-A53



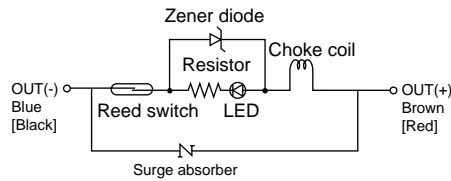
D-A64



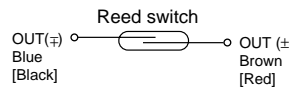
D-A59W



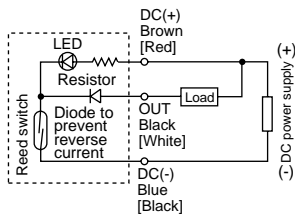
D-A54



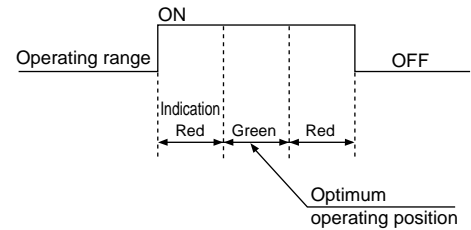
D-A67



D-A56

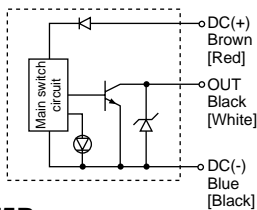


Indicator light

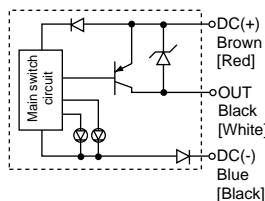


Solid State Switch Internal Circuits

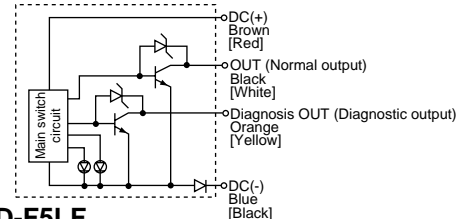
D-F59



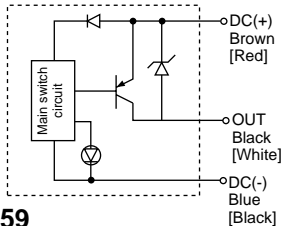
D-F5PW



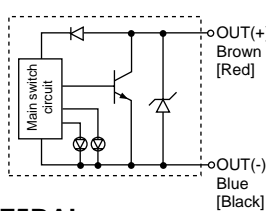
D-F59F



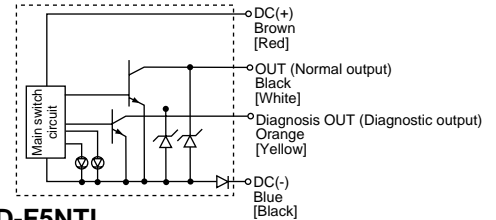
D-F5P



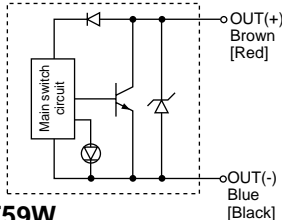
D-J59W



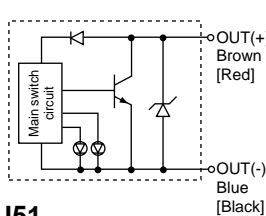
D-F5LF



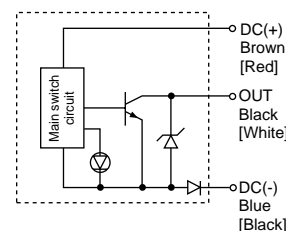
D-J59



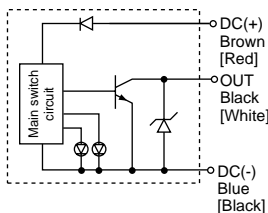
D-F5BAL



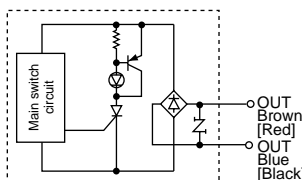
D-F5NTL



D-F59W



D-J51

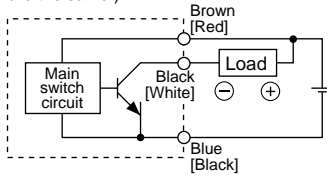


Series MDNB Auto Switches Connections and Examples

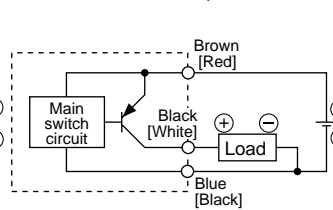
Basic Wiring

Solid state 3 wire, NPN

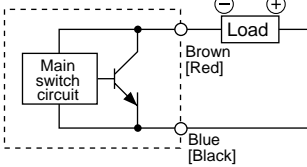
(Power supply for switch and load are the same.)



Solid state 3 wire, PNP

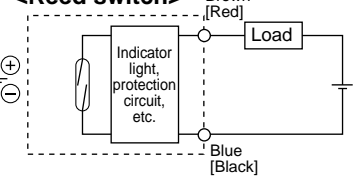


2 wire <Solid state>

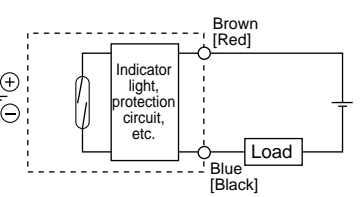
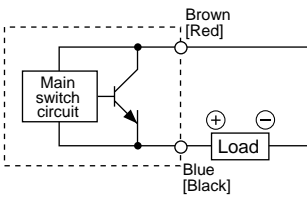
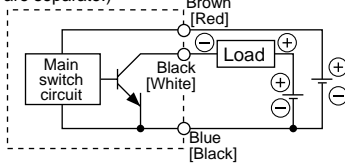


2 wire

<Reed switch>



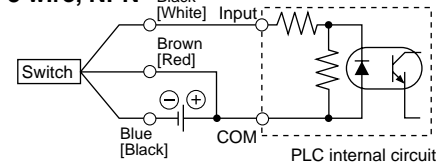
(Power supply for switch and load are separate.)



Examples of Connection to PLC (Sequence Controller)

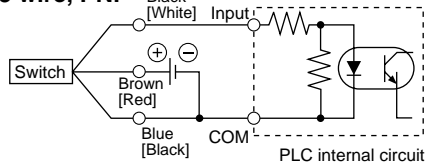
Specification for sink input

3 wire, NPN

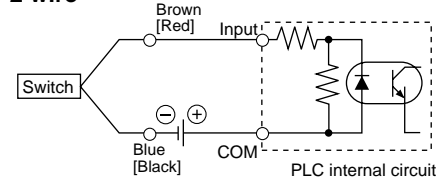


Specification for source input

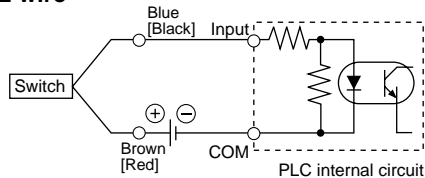
3 wire, PNP



2 wire



2 wire

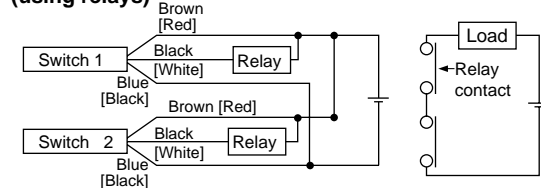


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

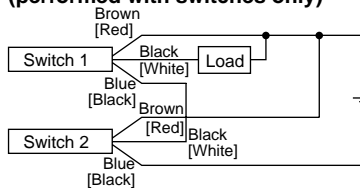
Connection Examples for AND (Series) and OR (Parallel)

3 wire

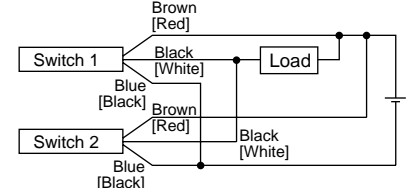
AND connection for NPN output (using relays)



AND connection for NPN output (performed with switches only)

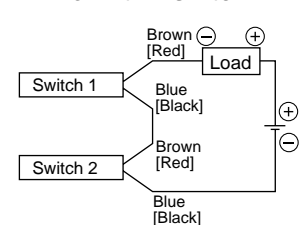


OR connection for NPN output



The indicator lights will light up when both switches are turned ON.

2 wire with 2 switch AND connection

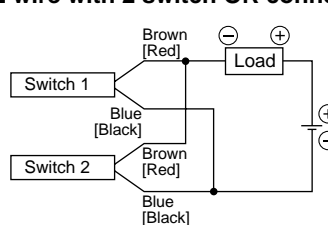


When two switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state. The indicator lights will light up if both of the switches are in the ON state.

$$\begin{aligned} \text{Load voltage at ON} &= \text{Power supply voltage} - \text{Residual voltage} \times 2 \text{ pcs.} \\ &= 24\text{V} - 4\text{V} \times 2 \text{ pcs.} \\ &= 16\text{V} \end{aligned}$$

Example: Power supply is 24VDC
Voltage decline in switch is 4V

2 wire with 2 switch OR connection



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

<Reed switch>
Because there is no current leakage, the load voltage will not increase when turned OFF, but due to the number of switches in the ON state, the indicator lights will sometimes get dark or not light up, because of variance and reduction of the current flowing to the switches.

$$\begin{aligned} \text{Load voltage at OFF} &= \frac{\text{Leakage current}}{\text{Load impedance}} \times 2 \text{ pcs.} \times \text{Load impedance} \\ &= 1\text{mA} \times 2 \text{ pcs.} \times 3\text{k}\Omega \\ &= 6\text{V} \end{aligned}$$

Example: Load impedance is 3kΩ
Leakage current from switch is 1mA