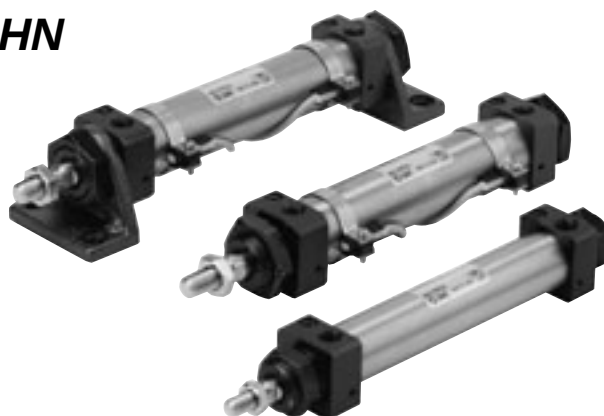


Small Bore Hydraulic Cylinder

Series *CHN*

Series *CHN*



Nominal pressure: **7 MPa**

Bore size (mm): 20, 25, 32, 40

CHQ

CHK ☐

CHN

CHM

CHS ☐

CH2 ☐

CHA

Related
Equipment

D- ☐

Stainless Steel Tube

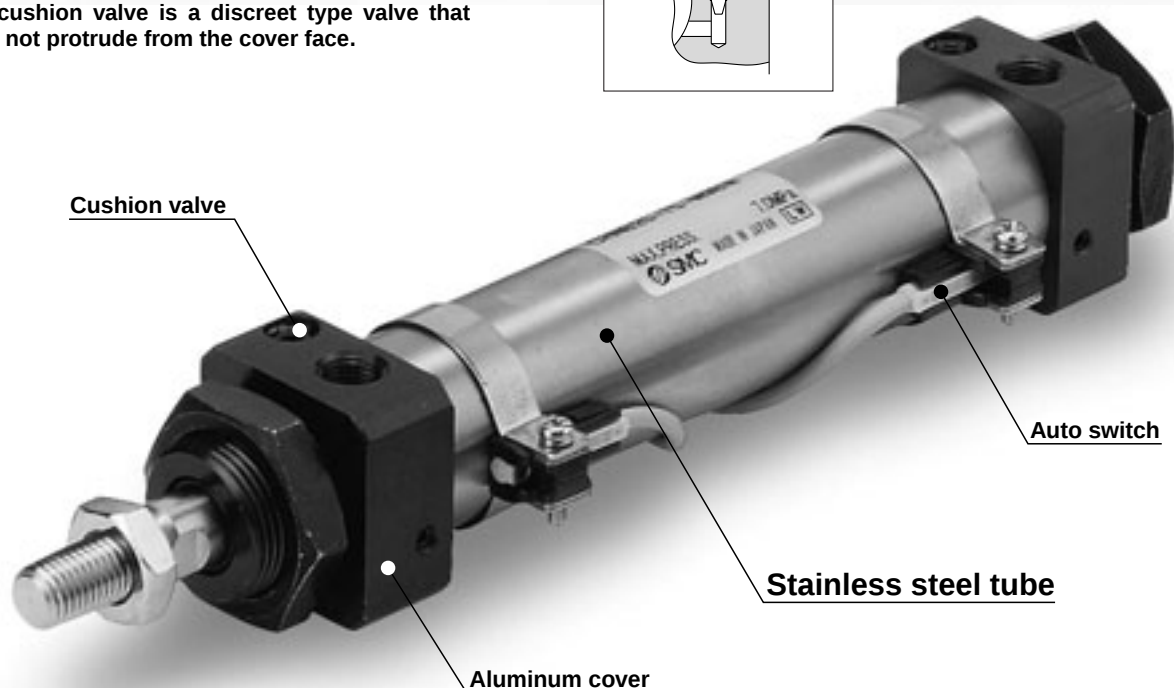
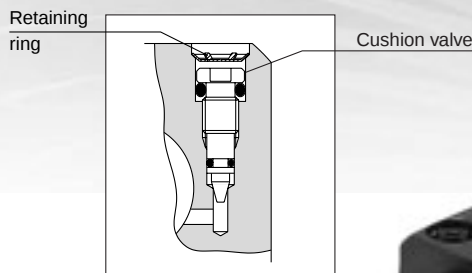
Small Bore Hydraulic Cylinder for 7 MPa

Series CHN

ø20, ø25, ø32, ø40

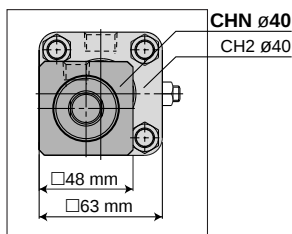
Equipped with cushion mechanism

- A cushion seal system mechanism is now a standard feature.
- Cushion valves are enhanced with a non-slip retaining mechanism.
- The cushion valve is a discreet type valve that does not protrude from the cover face.



Reduced cross sectional area

When compared to the same size tie-rod cylinder, the cross sectional area of our Series CHN cylinder projects less than 45%, thereby attaining better space savings.



Lightweight

Using aluminum alloy for both the rod cover and head cover reduces overall weight.

Model	Mass (kg)
CHNB20-100	0.51
CHNB25-100	0.63
CHNB32-100	0.89
CHNB40-100	1.51

Basic type with a 100 mm stroke

Built-in magnet

All cylinders come with a built-in magnet as a standard feature. This makes possible the mounting of an auto switch for piston position sensing even after the cylinder has been installed.

Series Variations

Series	Nominal pressure	Bore size (mm)	Mounting bracket	Auto Switches
CHN	7.0 MPa	20	Basic style Axial foot style Rod flange style Head flange style Single clevis style	Band mounting type Reed type Solid state type
		25		
		32		
		40		

7 MPa

Hydraulic Cylinder

Series CHN

Ø20, Ø25, Ø32, Ø40

How to Order

CHN **L** **25** - **100** - **M9BW**

Mounting style

B	Basic style
L	Axial foot style
F	Rod flange style
G	Head flange style
C	Single clevis style

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

Cylinder stroke (mm)

Refer to the standard stroke table on page 216.

Number of auto switches

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

Auto switch type

Nil	Without auto switch (built-in magnet)
------------	---------------------------------------

* Select applicable auto switches from the table below.

Applicable Auto Switches: Refer to pages 347 to 406 for further details on each auto switch.

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		0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)						
Solid state switch	————	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	●	●	●	○	—	○	IC circuit	Relay PLC		
		3-wire (PNP)		M9P				●	●	●	○	—	○					
		Connector		2-wire				12 V	M9B	●	●	●	○	—			○	—
				H7C				●	—	●	●	●	—					
	Diagnostic indication (2-color display)	Terminal conduit		3-wire (NPN)	5 V, 12 V	G39 *	—	—	—	—	●	—	IC circuit					
				2-wire	12 V	K39 *	—	—	—	—	●	—	—					
		Grommet		3-wire (NPN)	5 V, 12 V	M9NW	●	●	●	○	—	○	IC circuit					
				3-wire (PNP)	M9PW	●	●	●	○	—	○							
				2-wire	12 V	M9BW	●	●	●	○	—	○		—				
					H7BA **	○	○	●	○	—	○							
Water resistant (2-color display) With diagnostic output (2-color display)	Grommet	4-wire (NPN)	5 V, 12 V	H7NF	●	—	●	○	—	○	IC circuit							
		3-wire (NPN equiv.)	—	5 V	—	A96	●	—	●	—	—	—	IC circuit					
Reed switch	————	Grommet	Yes	2-wire	24 V	12 V	100 V	A93	●	—	●	—	—	—	IC circuit	Relay PLC		
							100 V or less	A90	●	—	●	—	—	—				
							100 V, 200 V	B54	●	—	●	●	—	—				
							200 V or less	B64	●	—	●	—	—	—				
		Connector					—	C73C	●	—	●	●	●	—	IC circuit			
							24 V or less	C80C	●	—	●	●	●	—				
							—	A33 *	—	—	—	—	●	—			—	PLC
							100 V, 200 V	A34 *	—	—	—	—	●	—				
		Terminal conduit	—	A44 *	—	—	—	—	●	—	Relay PLC							
			DIN terminal	Yes	—	—	B59W	●	—	●		—	—					
		Grommet			—	—	—	—	—	—	—	—	—					
		Diannostic indication (2-color display)	Grommet	Yes	2-wire	24 V	12 V	100 V, 200 V	A44 *	—	—	—	—	●	—	—	Relay PLC	
—	—							—	—	—	—	—	—					

** 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
None N (Example) H7CN

* Solid state auto switches marked "○" are produced upon receipt of order.
* You do not need to specify "N" (i.e., without lead wire) for D-A3□, D-A44, D-G39, and D-K39. This is the only standard specification automatically available for these models.
* D-A9□V, M9□V, M9□WV, and M9□A(V)L models cannot be mounted.

* Since there are applicable auto switches other than listed, refer to page 228 for details.

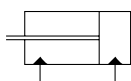
* For details about auto switches with pre-wired connector, refer to pages 389 and 390.

* D-A9□, M9□, and M9□W type auto switches are shipped with the hydraulic cylinder (but not assembled). (However, they are auto switch mounting brackets are shipped with the mounting brackets mounted already).

Series CHN



JIS symbol



Specifications

Bore size (mm)	20	25	32	40
Action	Double acting/Single rod			
Fluid	Hydraulic fluid			
Nominal pressure	7 MPa			
Proof pressure	10.5 MPa			
Maximum allowable pressure	9 MPa			
Minimum operating pressure	0.3 MPa			
Ambient and fluid temperature	Without auto switch: -10° to 80°C			
	With auto switch: -10° to 60°C			
Piston speed	8 to 300 mm/s			
Cushion	Cushion seal			
Stroke length tolerance	to 250 mm $\begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ 251 to 800 mm $\begin{smallmatrix} +1.4 \\ 0 \end{smallmatrix}$			
Mounting style	Basic style, Axial foot style Head flange style, Rod flange style Single clevis style			

Note) Refer to page 134 for definitions of terms related to pressure.

Accessories

Mounting style		Basic	Axial foot	Head flange	Rod flange	Single clevis
Standard	Mounting nut	● (2 pcs.)	● (2 pcs.)	● (1 pc.)	● (1 pc.)	—
	Rod end nut	●	●	●	●	●

Option

I-type single knuckle joint Y-type double knuckle joint Bracket for clevis type Knuckle pin Bracket pin	Refer to page 225
---	-------------------

Hydraulic Fluid Compatibility

Hydraulic fluid	Compatibility
Standard mineral hydraulic fluid	Compatible
W/O hydraulic fluids	Compatible
O/W hydraulic fluids	Compatible
Water/Glycol hydraulic fluids	*
Phosphate hydraulic fluids	Not compatible

* Consult with SMC.

Standard Strokes: Refer to page 227 for minimum strokes for auto switch mounting.

Bore size (mm)	Standard strokes (mm)	Long stroke
20	25 to 300	800
25	25 to 400	
32	25 to 500	
40		

* Standard strokes above have a minimal delivery time.

Consult with SMC for the manufacture of strokes other than the above.

Mounting Brackets: Part Nos.

Bore size (mm)	20	25	32	40
Axial foot *	CHN-L020	CHN-L025	CHN-L032	CHN-L040
Flange	CHN-F020	CHN-F025	CHN-F032	CHN-F040

* When ordering the axial foot type, order 2 pieces for each cylinder.

Theoretical Output

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)			
				1	3	5	7
20	10	OUT	314	314	942	1570	2198
		IN	235	235	705	1175	1645
25	12	OUT	490	490	1470	2450	3430
		IN	377	377	1131	1885	2639
32	16	OUT	804	804	2412	4020	5628
		IN	603	603	1809	3015	4221
40	18	OUT	1256	1256	3768	6280	8792
		IN	1002	1002	3006	5010	7014

Theoretical output (N) = Pressure (MPa) x Piston area (mm²)

Mass

Unit: kg					
Bore size (mm)		20	25	32	40
Basic Mass	Basic style	0.27	0.37	0.53	1.05
	Axial foot style	0.51	0.63	0.91	1.59
	Flange style	0.36	0.54	0.72	1.26
	Clevis style	0.25	0.45	0.67	1.00
	Additional mass per 50 mm	0.12	0.13	0.18	0.23

- Calculation method
(Example) **CHNL20-100**
(Foot type, ø20, 100 mm stroke)
- Basic mass 0.51 kg
- Additional mass ... 0.12/50 mm
- Cylinder stroke 100 mm
0.51 + 0.12/50 x 100 = 0.75 kg

⚠ Specific Product Precautions

Be sure to read before handling. Refer to front matters 30 and 31 for Safety Instructions, and pages 134 to 142 for precautions for hydraulic cylinder and auto switch.

⚠ Caution

When operating a cylinder for the first time, make sure to release the air at low pressure. When the air release is complete, operate the cylinder at reduced pressure, gradually increasing it to the normal operating pressure. However, the piston speed at this time should be adjusted to the minimum speed.

Mounting

⚠ Caution

1. When mounting with bracket mounting nuts, tighten them using the tightening torques in the table below as a guide.

Bore size (mm)	Mounting nut thread	Mounting nut width across flats (mm)	Tightening torque (N·m)
20	M22 x 1.5	26	45
25	M24 x 1.5	32	60
32	M30 x 1.5	38	85
40	M33 x 1.5	41	110

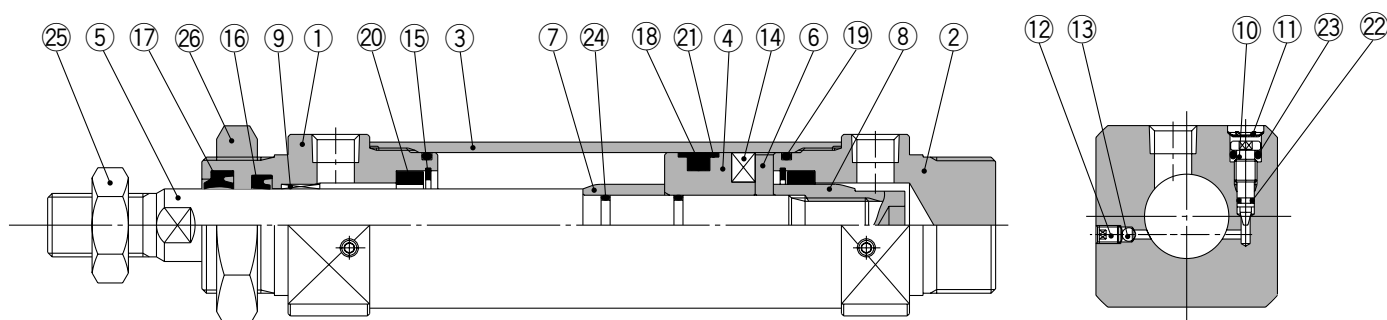
2. When mounted with one side attached and one side unattached (basic type and flange type) and operating at high speed, bending moment acts on the cylinder due to oscillation at the stroke end, which may cause cylinder damage. In this case, install brackets to suppress the oscillation of the cylinder body, or reduce the piston speed enough so that the cylinder body does not oscillate at the stroke end.

CHQ
CHK
CHN
CHM
CHS
CH2
CHA

Related
Equipment

D-

Construction



Parts List

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	Black anodized
2	Head cover	Aluminum alloy	Black anodized
3	Cylinder tube	Stainless steel	
4	Piston	Stainless steel	
5	Piston rod	ø20, 25: Stainless steel ø32, 40: Carbon steel	Hard chromium electro plating
6	Magnet plate	Stainless steel	
7	Cushion ring A	Carbon steel	
8	Cushion ring B	Carbon steel	
9	Bushing	Lead bronze	
10	Cushion valve	Carbon steel	
11	Retaining ring	Spring steel	
12	Air release valve	Alloy steel	
13	Check ball	Bearing steel	

Replacement Parts: Seal Kit

Bore size (mm)	Seal kit no.	Content
20	CHN20-PS	Nos. 16 to 21 from the chart
25	CHN25-PS	
32	CHN32-PS	
40	CHN40-PS	

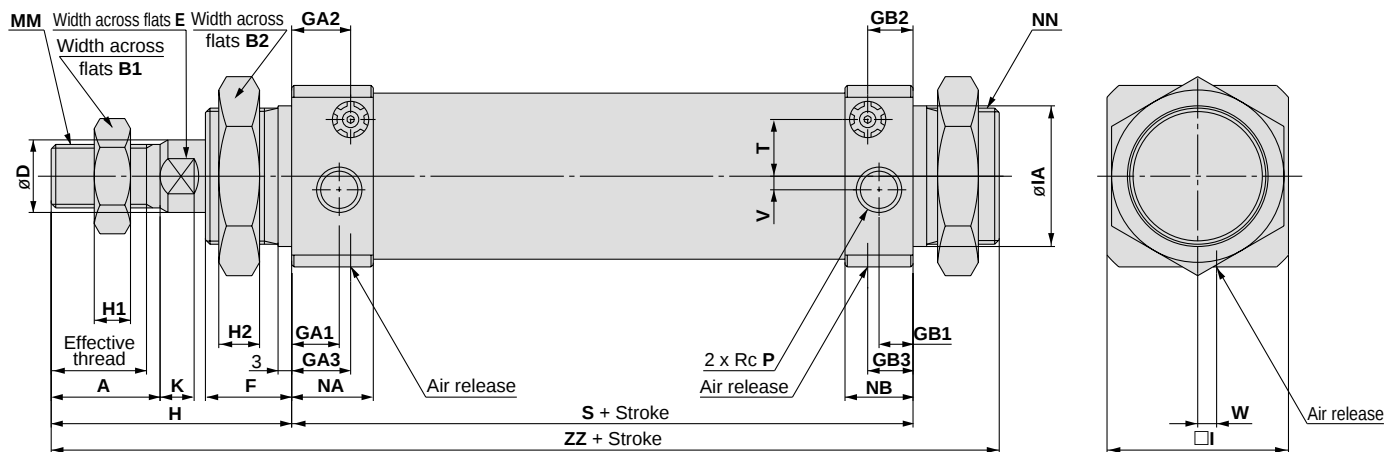
* Seal kit consists of items 16 to 20 and 22 and can be ordered by using the seal kit number for each bore size.

Parts List

No.	Description	Material	Note
14	Magnet	—	
15	Retaining ring	Spring steel	
16	Rod seal	NBR	
17	Scraper	NBR	
18	Piston seal	NBR	
19	Tube gasket	NBR	
20	Cushion seal	—	
21	Back-up ring	Resin	
22	Cushion valve seal A	NBR	
23	Cushion valve seal B	NBR	
24	Piston gasket	NBR	
25	Rod end nut	Carbon steel	
26	Mounting nut	Carbon steel	

Dimensions

Basic style: CHNB



CHQ

CHK

CHN

CHM

CHS

CH2

CHA

Related Equipment

D-

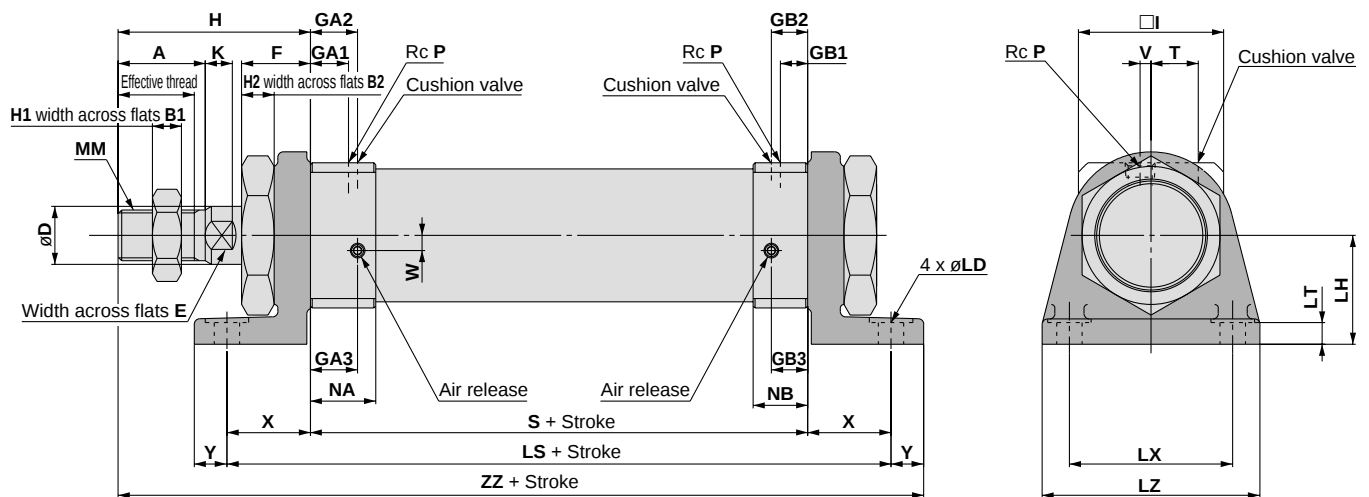
Bore size (mm)	Stroke range (mm)	Effective thread length (mm)	A	B1	B2	D	E	F	GA1	GA2	GA3	GB1	GB2	GB3	H	H1	H2	I
20	25 to 300	15.5	18	13	26	10	8	16	10	12	12	8	10	10	41	5	8	31
25	25 to 400	19.5	22	17	32	12	10	16	10	12	12	8	10	10	46	6	8	34
32	25 to 500	21	24	22	38	16	14	19	11	13	13	8	10	10	53	8	9	40
40	25 to 500	21	24	24	41	18	16	21	12	17	17	11	16	16	54	10	11	48

Bore size (mm)	IA	K	MM	NA	NB	NN	P	S	T	V	W	ZZ
20	23f8 ^{-0.020} _{-0.053}	5	M8 x 1.25	17	15	M22 x 1.5	1/8	81	9.5	4.5	6.5	138
25	25f8 ^{-0.020} _{-0.053}	5.5	M10 x 1.25	17	15	M24 x 1.5	1/8	81	11	3.5	5.5	143
32	31f8 ^{-0.025} _{-0.064}	7.5	M14 x 1.5	18	15	M30 x 1.5	1/8	87	13	3	4	159
40	34f8 ^{-0.025} _{-0.064}	7.5	M16 x 1.5	22	21	M33 x 2	1/4	108	16	5	0	183

Series CHN

Dimensions

Axial foot style: CHNL



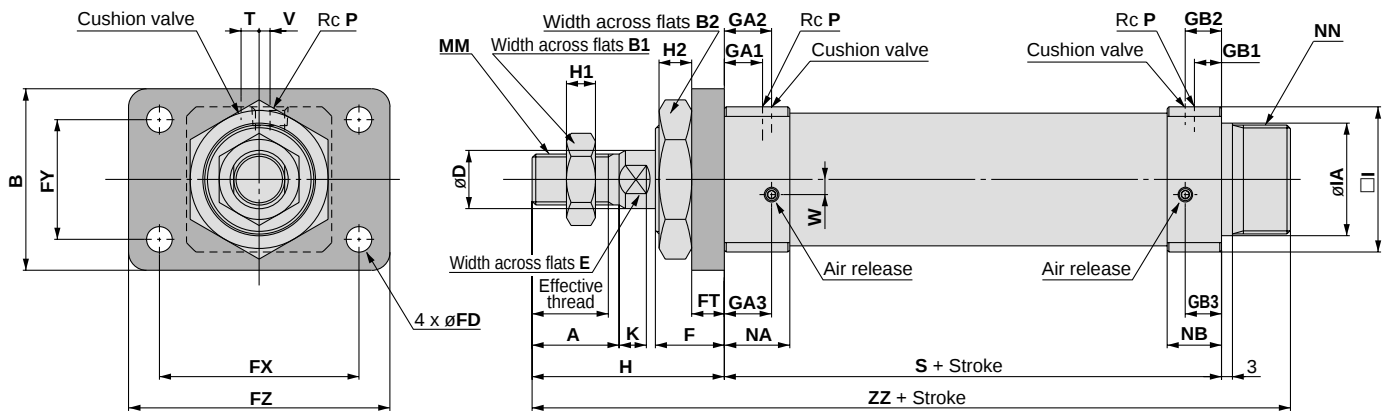
(mm)

Bore size (mm)	Stroke range (mm)	Effective thread length (mm)	A	B1	B2	D	E	F	GA1	GA2	GA3	GB1	GB2	GB3	H	H1	H2	I	K
20	25 to 300	15.5	18	13	26	10	8	16	10	12	12	8	10	10	41	5	8	31	5
25	25 to 400	19.5	22	17	32	12	10	16	10	12	12	8	10	10	46	6	8	34	5.5
32	25 to 500	21	24	22	38	16	14	19	11	13	13	8	10	10	53	8	9	40	7.5
40	25 to 500	21	24	24	41	18	16	21	12	17	17	11	16	16	54	10	11	48	7.5

(mm)

Bore size (mm)	LD	LH	LS	LT	LX	LZ	MM	NA	NB	P	S	T	V	W	X	Y	ZZ
20	7	25	121	5.5	40	55	M8 x 1.25	17	15	1/8	81	9.5	4.5	6.5	20	9	151
25	7	28	121	5.5	40	55	M10 x 1.25	17	15	1/8	81	11	3.5	5.5	20	9	156
32	7	30	133	6	45	60	M14 x 1.5	18	15	1/8	87	13	3	4	23	9	172
40	9	35	158	6	55	75	M16 x 1.5	22	21	1/4	108	16	5	0	25	11	198

Rod flange style: CHNF



CHQ

CHK

CHN

CHM

CHS

CH2

CHA

Related Equipment

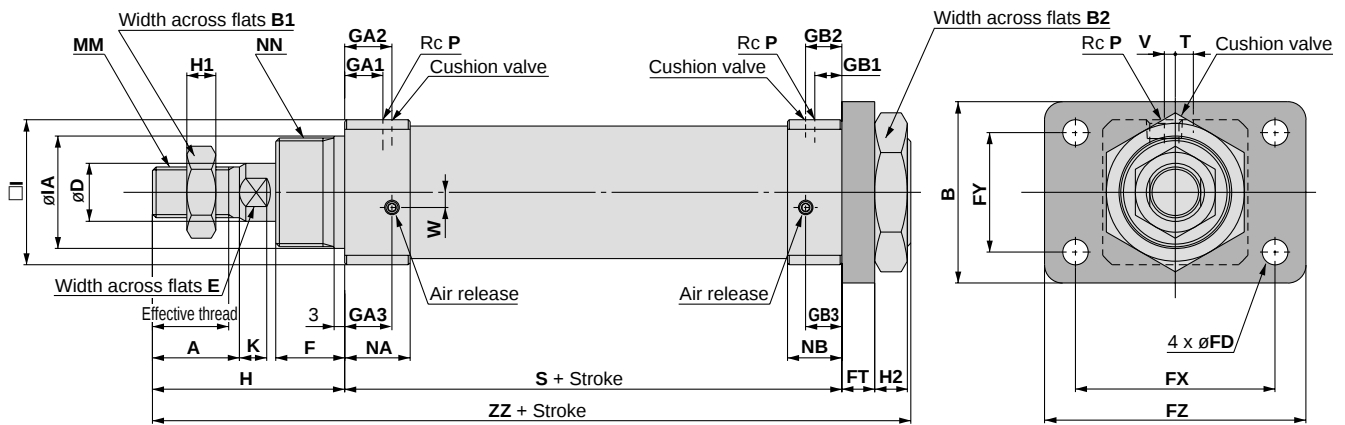
D-

Bore size (mm)	Stroke range (mm)	Effective thread length (mm)	A	B	B1	B2	D	E	F	FD	FT	FX	FY	FZ	GA1	GA2	GA3	GB1	GB2
20	25 to 300	15.5	18	38	13	26	10	8	16	7	6	51	21	68	10	12	12	8	10
25	25 to 400	19.5	22	44	17	32	12	10	16	7	9	53	27	70	10	12	12	8	10
32	25 to 500	21	24	50	22	38	16	14	19	7	9	55	33	72	11	13	13	8	10
40	25 to 500	21	24	60	24	41	18	16	21	9	9	66	36	84	12	17	17	11	16

Bore size (mm)	GB3	H	H1	H2	I	IA	K	MM	NA	NB	NN	P	S	T	V	W	ZZ
20	10	41	5	8	31	23f8 ^{-0.020} _{-0.053}	5	M8 x 1.25	17	15	M22 x 1.5	1/8	81	9.5	4.5	6.5	138
25	10	46	6	8	34	25f8 ^{-0.020} _{-0.053}	5.5	M10 x 1.25	17	15	M24 x 1.5	1/8	81	11	3.5	5.5	143
32	10	53	8	9	40	31f8 ^{-0.025} _{-0.064}	7.5	M14 x 1.5	18	15	M30 x 1.5	1/8	87	13	3	4	159
40	16	54	10	11	48	34f8 ^{-0.025} _{-0.064}	7.5	M16 x 1.5	22	21	M33 x 2	1/4	108	16	5	0	183

Dimensions

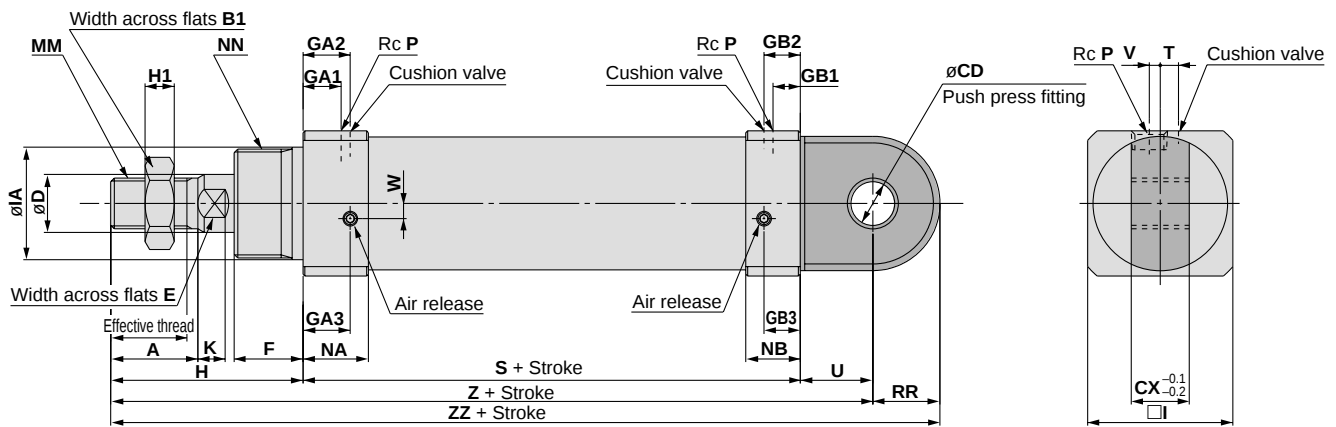
Head flange style: CHNG



Bore size (mm)	Stroke range (mm)	Effective thread length (mm)	A	B	B1	B2	D	E	F	FD	FT	FX	FY	FZ	GA1	GA2	GA3	GB1	GB2
20	25 to 300	15.5	18	38	13	26	10	8	16	7	6	51	21	68	10	12	12	8	10
25	25 to 400	19.5	22	44	17	32	12	10	16	7	9	53	27	70	10	12	12	8	10
32	25 to 500	21	24	50	22	38	16	14	19	7	9	55	33	72	11	13	13	8	10
40	25 to 500	21	24	60	24	41	18	16	21	9	9	66	36	84	12	17	17	11	16

Bore size (mm)	GB3	H	H1	H2	I	IA	K	MM	NA	NB	NN	P	S	T	V	W	ZZ
20	10	41	5	8	31	23f8 ^{-0.020} _{-0.053}	5	M8 x 1.25	17	15	M22 x 1.5	1/8	81	9.5	4.5	6.5	138
25	10	46	6	8	34	25f8 ^{-0.020} _{-0.053}	5.5	M10 x 1.25	17	15	M24 x 1.5	1/8	81	11	3.5	5.5	143
32	10	53	8	9	40	31f8 ^{-0.025} _{-0.064}	7.5	M14 x 1.5	18	15	M30 x 1.5	1/8	87	13	3	4	159
40	16	54	10	11	48	34f8 ^{-0.025} _{-0.064}	7.5	M16 x 1.5	22	21	M33 x 2	1/4	108	16	5	0	183

Single clevis style: CHNC



Bore size (mm)	Stroke range (mm)	Effective thread length (mm)	A	B1	CD	CX	D	E	F	GA1	GA2	GA3	GB1	GB2	GB3	H	H1	I
20	25 to 300	15.5	18	13	10 ^{+0.109} ₀	16	10	8	16	10	12	12	8	10	10	41	5	31
25	25 to 400	19.5	22	17	10 ^{+0.109} ₀	16	12	10	16	10	12	12	8	10	10	46	6	34
32	25 to 500	21	24	22	12 ^{+0.109} ₀	16	16	14	19	11	13	13	8	10	10	53	8	40
40	25 to 500	21	24	24	16 ^{+0.034} _{-0.015}	24	18	16	21	12	17	17	11	16	16	54	10	48

Bore size (mm)	IA	K	MM	NA	NB	NN	P	RR	S	T	U	V	W	Z	ZZ
20	23f8 ^{-0.020} _{-0.053}	5	M8 x 1.25	17	15	M22 x 1.5	1/8	13.5	81	9.5	14	4.5	6.5	136	149.5
25	25f8 ^{-0.020} _{-0.053}	5.5	M10 x 1.25	17	15	M24 x 1.5	1/8	14.5	81	11	15	3.5	5.5	142	156.5
32	31f8 ^{-0.025} _{-0.064}	7.5	M14 x 1.5	18	15	M30 x 1.5	1/8	18.5	87	13	20	3	4	160	178.5
40	34f8 ^{-0.025} _{-0.064}	7.5	M16 x 1.5	22	21	M33 x 2	1/4	22.5	108	16	20	5	0	182	204.5

CHQ

CHK

CHN

CHM

CHS

CH2

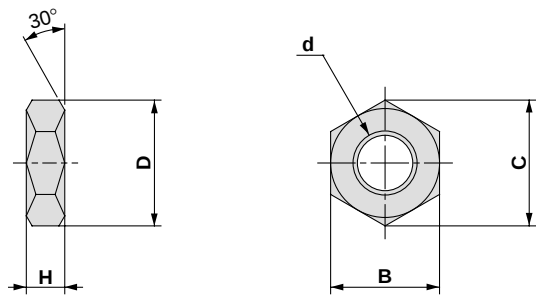
CHA

Related Equipment

D-

Accessories (Standard)

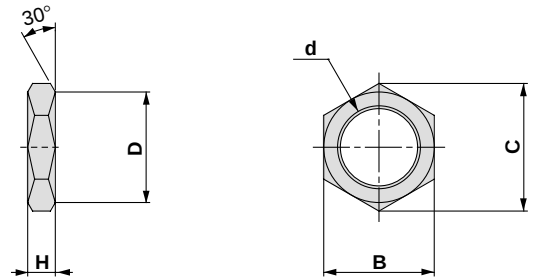
Rod end nut



Material: Carbon steel

Part no.	Applicable bore size (mm)	d	H	B	C	D
NT-02	20	M8 x 1.25	5	13	15.0	12.5
NT-03	25	M10 x 1.25	6	17	19.6	16.5
NT-04	32	M14 x 1.5	8	22	25.4	21.0
AC-NI-50	40	M16 x 1.5	10	24	27.7	23

Mounting nut



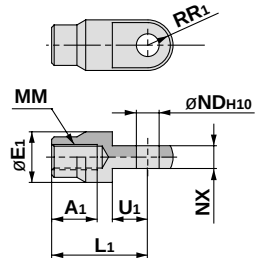
Material: Carbon steel

Part no.	Applicable bore size (mm)	d	H	B	C	D
SO-02	20	M22 x 1.5	8	26	30	26
SO-03	25	M24 x 1.5	8	32	36.9	32
SO-04	32	M30 x 1.5	9	38	43.9	38
SO-05	40	M33 x 2.0	11	41	47.3	41

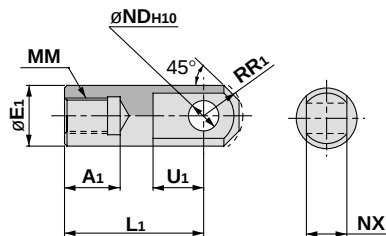
Accessory Brackets (Optional)

I-type single knuckle joint

ø20: I-02
ø25: I-03



ø32: I-04
ø40: IHN-04



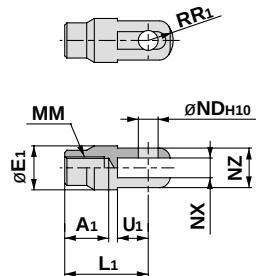
Material: Rolled steel plate

Material: Rolled steel plate

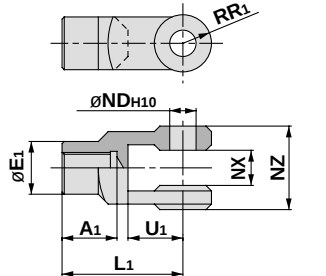
Part no.	Applicable bore size (mm)	A1	E1	L1	MM	R1	U1	ND ^{H10}	NX
I-02	20	16	20	36	M8 x 1.25	10	14	9 ^{+0.058} ₀	9 ^{-0.1} _{-0.2}
I-03	25	18	20	38	M10 x 1.25	10	14	9 ^{+0.058} ₀	9 ^{-0.1} _{-0.2}
I-04	32	22	24	55	M14 x 1.5	15.5	20	12 ^{+0.070} ₀	16 ^{-0.1} _{-0.3}
IHN-04	40	22	24	55	M16 x 1.5	15.5	20	15 ^{+0.070} ₀	16 ^{-0.1} _{-0.3}

Y-type double knuckle joint

ø20: Y-02
ø25: Y-03



ø32: Y-04C
ø40: YHN-04



Material: Rolled steel plate

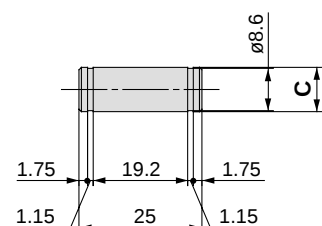
Material: Cast iron

Part no.	Applicable bore size (mm)	A1	E1	L1	MM	R1	U1	ND ^{H10}	NX
Y-02	20	16	20	36	M8 x 1.25	12	14	9 ^{+0.058} ₀	9 ^{+0.2} _{+0.1}
Y-03	25	18	20	38	M10 x 1.25	12	14	9 ^{+0.058} ₀	9 ^{+0.2} _{+0.1}
Y-04C	32	22	24	55	M14 x 1.5	13	25	12 ^{+0.070} ₀	16 ^{+0.3} _{+0.1}
YHN-04	40	22	24	55	M16 x 1.5	13	25	15 ^{+0.070} ₀	16 ^{+0.3} _{+0.1}

Part no.	NZ	Note
Y-02	18	With CDP-1 (with retaining ring)
Y-03	18	With CDP-1 (with retaining ring)
Y-04C	38	With CDP-3 (with cotter pin)
YHN-04	38	With CDPN-4 (with cotter pin)

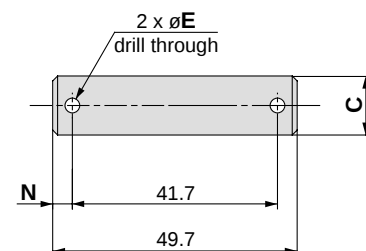
Knuckle pin

ø20, ø25
Part no.: CDP-1
Material: Carbon steel



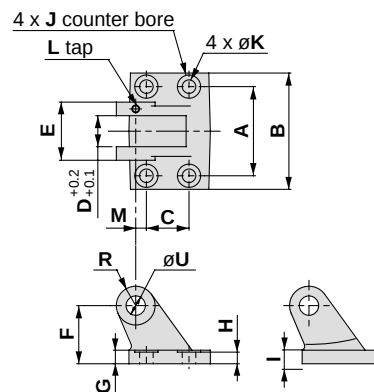
Retaining ring: C type 9 for shaft

ø32 ø40
Part no.: CDP-3 CDPN-4
Material: Carbon steel



Cotter pin: ø3 x 18 ℓ

Bracket for clevis type

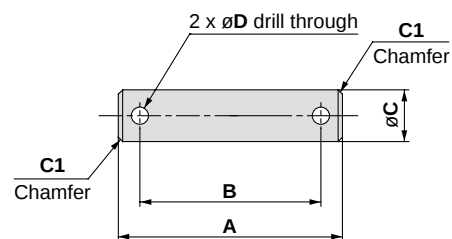


Material: Cast iron

Part no.	Applicable bore size (mm)	A	B	C	D	U (H8)	E	F	G	H	I
AD-FI-20	20	46	60	22	16	10	30	28	6.5	5.5	10
AD-FI-25	25	46	60	22	16	10	30	30	6.5	5.5	10
AD-FI-32	32	56	80	30	16	12	36	40	10	9	13
AD-CHN-40	40	64	88	30	24	16	44	43	10	9	13

Part no.	J	K	L	M	R	Note
AD-FI-20	12	7	M4	5.5	10	With AD-EI-20 (with cotter pin), and M4 set screws (once)
AD-FI-25	12	7	M4	5.5	10	With AD-EI-25 (with cotter pin), and M4 set screws (once)
AD-FI-32	12	7	M5	7	12	With AD-EI-32 (with cotter pin), and M5 set screws (once)
AD-CHN-40	16	9	M5	10	12	With AD-CHN-40 (with cotter pin), and M5 set screws (once)

Bracket pin



Material: Carbon steel

Part no.	Applicable bore size (mm)	A	B	C (f7)	D	Note
AD-EI-20	20	45.5	35.5	10	3.2	with (2) cotter pins ø3.2 x 16 ℓ
AD-EI-25	25	45.5	35.5	10	3.2	with (2) cotter pins ø3.2 x 16 ℓ
AD-EI-32	32	52	42	12	4	with (2) cotter pins ø4 x 20 ℓ
AE-CHN-40	40	60	50	16	4	with (2) cotter pins ø4 x 20 ℓ

Part no.	Applicable bore size (mm)	C (d9)	N	E	Note
CDP-1	20	9	—	—	with (2) retaining rings: C type 9
CDP-3	32	12	4	3	with (2) cotter pins ø3 x 18 ℓ
CDPN-4	40	15	5	3.2	with (2) cotter pins ø3.2 x 20 ℓ

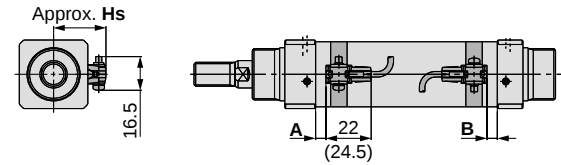
Series CHN Auto Switch Specifications

Refer to pages 347 to 406 for detailed auto switch specifications.

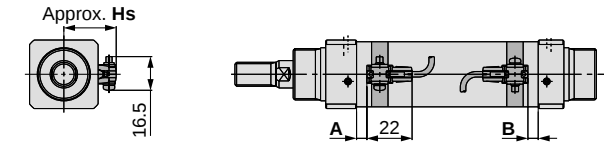


Auto Switches: Proper Mounting Positions and Mounting Heights for Stroke End Detection

D-A9□

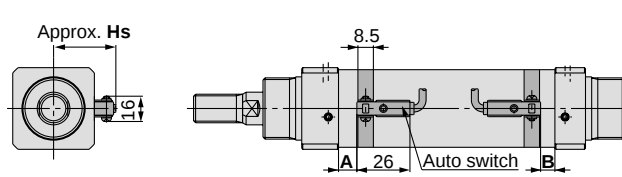


D-M9□/M9□W

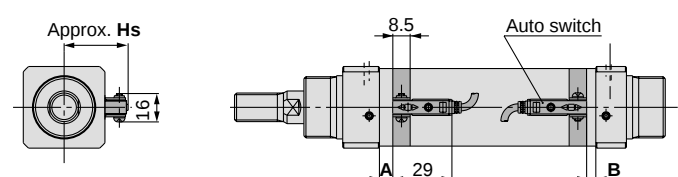


* Dimensions inside () are for D-A93.

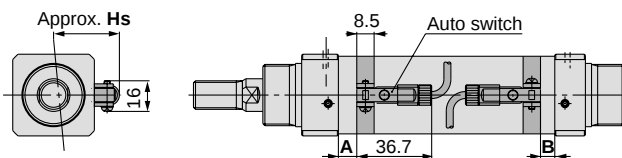
D-C□7/C80



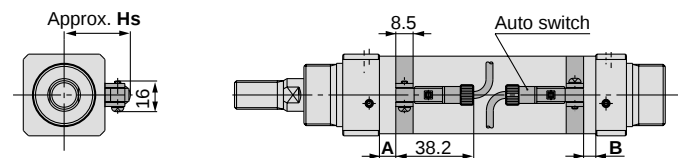
D-H7□/H7□W/H7NF/H7BAL



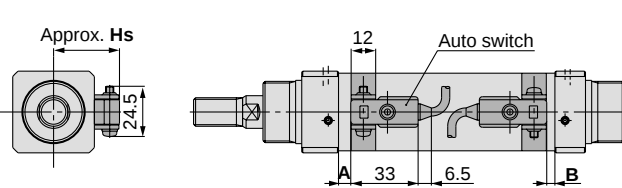
D-C73C/C80C



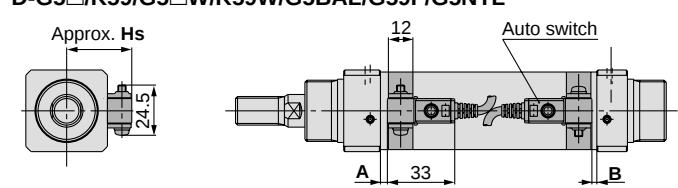
D-H7C



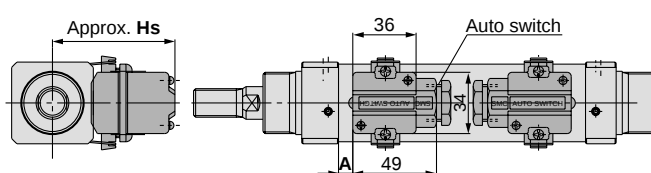
D-B5□/B64/B59W



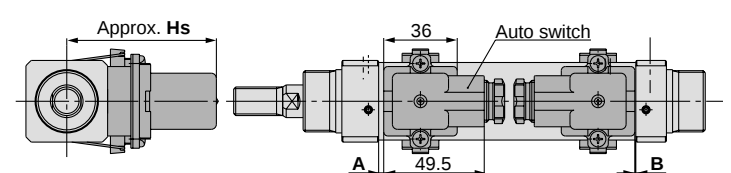
D-G5□/K59/G5□W/K59W/G5BAL/G59F/G5NTL



D-A3□/G39/K39



D-A44



Auto Switch Proper Mounting Positions

(mm)

Bore size (mm)	Solid state auto switch								Reed auto switch									
	D-M9□ D-M9□W		D-H7□ D-H7□W/H7C D-H7NF/H7BAL		D-G5□/K59 D-G5□W/K59W D-G59F/G5BAL D-G5NTL		D-G39/K39		D-A9□		D-C7□/C80 D-C73C/C80C		D-B5□/B64		D-B59W		D-A3□/A44	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	23	14	18.5	9.5	15	6	13	4	19	10	19.5	10.5	13.5	4.5	16.5	7.5	13	4
25	23.5	13.5	19	9	15.5	5.5	13.5	3.5	19.5	9.5	20	10	14	4	17	7	13.5	3.5
32	25.5	16.5	21	12	17.5	8.5	15.5	6.5	21.5	12.5	22	13	16	7	19	10	15.5	6.5
40	31.5	21.5	27	17	23.5	13.5	21.5	11.5	27.5	17.5	28	18	22	12	25	15	21.5	11.5

Auto Switch Mounting Heights

(mm)

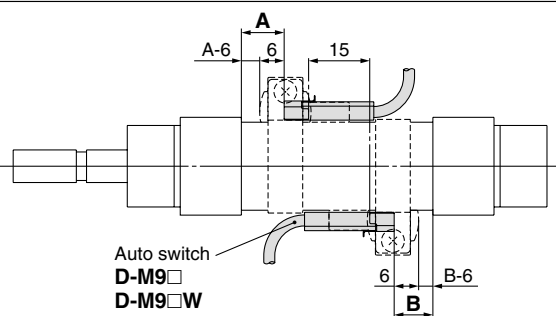
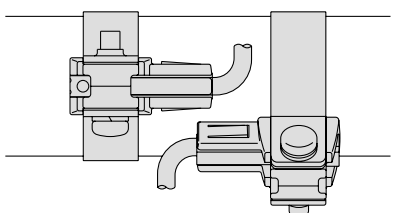
Bore size (mm)	D-M9□/M9□W D-A9□	D-H7□/H7□W D-H7NF/H7BAL D-C7□/C80	D-C73C/C80C	D-G5□/K59 D-G5□W/K59W D-G59F/G5BAL D-G5NTL/H7C D-B5□/B64 D-B59W	D-G39/K39 D-A3□	D-A44
	Hs	Hs	Hs	Hs	Hs	Hs
20	24	25.5	27	27.5	62	72
25	26	27.5	29	29.5	64	74
32	29.5	31	32.5	33	67.5	77.5
40	33.5	35	36.5	37	71.5	81.5

Minimum Auto Switch Mounting Stroke

(mm)

Auto switch model	Number of auto switches mounted				
	1 pc.	2 pcs.		n pcs.	
		Different surfaces	Same surface	Different surfaces	Same surface
D-M9□/M9□W D-A9□	10	15 Note 1)	45 Note 1)	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6 ...)	45 + 45 (n - 2)
D-H7□/H7□W D-H7NF/H7BAL	10	15	60	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6 ...)	60 + 45 (n - 2)
D-C7□ D-C80	10	15	50	$15 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6 ...)	50 + 45 (n - 2)
D-H7C D-C73C D-C80C	10	15	65	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6 ...)	65 + 50 (n - 2)
D-G5□/K59 D-G5□W/K59W D-G59F/G5BAL/G5NTL D-B5□/B64	10	15	75	$15 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6 ...)	75 + 55 (n - 2)
D-B59W	15	20	75	$20 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6 ...)	75 + 55 (n - 2)
D-G39/K39 D-A3□/A44	10	35	100	$35 + 30 \frac{(n-2)}{2}$ (n = 2, 3, 4, 5 ...)	100 + 100 (n - 2)

Note 1) Auto switch mounting (The adjustment as shown in the figures below is required with the following stroke ranges.)

Auto switch model	Auto switches — 2 pcs.	
	Different surfaces Note 1)	Same surface Note 1)
	 The proper mounting position is at 6 mm inward from the end surface of the switch holder.	 Mount auto switches offset (in circumferential direction of cylinder tube) so that auto switch units and lead wires do not run up against each other.
D-A93	—	45 to less than 50 stroke
D-M9□ D-M9□W	15 to less than 20 stroke	45 to less than 55 stroke

Operating Range

(mm)

Auto switch model	Bore size			
	20	25	32	40
D-M9□ D-M9□W	4.5	4	4	4.5
D-H7□/H7C D-H7□W D-H7NF/H7BAL	4.5	5	4.5	5
D-G5□/K59/G59F D-G5□W/K59W D-G5BAL/G5NTL	5.5	5	4.5	5
D-G39/K39	9	8.5	10	10.5
D-A9□	8	7.5	7	8
D-C7□/C80 D-C73C/C80C	10.5	9.5	8.5	10
D-B5□/B64	13.5	11.5	10	12
D-B59W	13.5	13	11.5	13.5
D-A3□/A44	11.5	10	9	10.5

* 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 Brackets: Part Nos.

Auto switch models	Bore size (mm)			
	ø20	ø25	ø32	ø40
D-M9□ M9□W D-A9□	Note) ①BMA2-020 ②BJ3-1	Note) ①BHN3-025 ②BJ3-1	Note) ①BHN3-032 ②BJ3-1	Note) ①BHN3-040 ②BJ3-1
D-H7□/H7□W/H7NF D-H7BAL/C7□/C80 D-C73C/C80C	BMA2-020	BHN3-025	BHN3-032	BHN3-040
D-G5□/G5□W/G59F D-G5BAL/G5NTL D-B5□/B64/B59W	BA-01	BHN2-025	BGS1-032	BH2-040
D-G39/K39/A3□/A44	BD1-01M	BD1-02M	BHN1-032	BDS-04M

Note) Two types of auto switch mounting bracket are used as a set.

[Stainless steel mounting screw kits]

The following stainless steel mounting screw kits are available for use depending on the operating environment.
(Switch mounting bands are not included and should be ordered separately.)

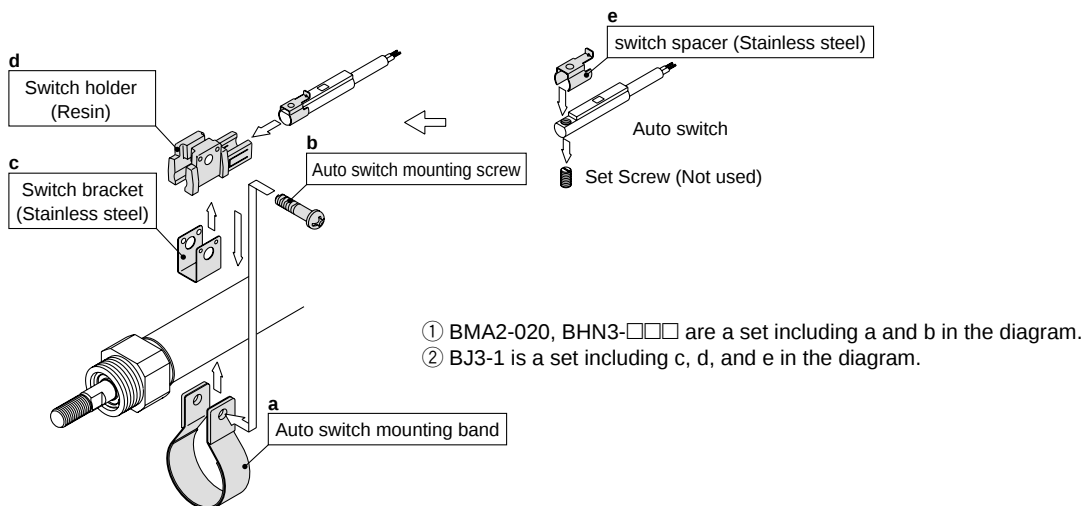
BBA3: D-B5, D-B6, D-G5, and D-K5

BBA4: D-C7, D-C8, D-H7

* When D-H7BAL switches are shipped mounted on a cylinder, the above stainless steel screws are used. Also, when switches are shipped separately, BBA4, BBA3 is included.

Stainless steel mounting screw kit details.

Part no.	Contents			Applicable auto switch mounting bracket part nos.	Applicable auto switches
	Description	size	pcs.		
BBA3	Auto switch mounting screw set	M4 x 0.7 x 22L	1	BA-01, BA-02, BA-32, BA-04, BA-05, BA-06, BA-08, BA-10	D-B5, B6 D-G5, K5
				BA2-020, BA2-025, BA2-032, BA2-040	
				BA5-050, BHN2-025, BSG1-032	
				BH2-040, BH2-050, BH2-080, BH2-100	
				BAF-32, BAF-04, BAF-05, BAF-06, BAF-08, BAF-10	
				BJ2-006, BJ2-010, BJ2-016	
BBA4	Auto switch mounting screw set	M3 x 0.5 x 14L	1	BM2-020, BM2-025, BM2-032, BM2-040	D-C7, C8 D-H7
				BMA2-020, BMA2-025, BMA2-032, BMA2-040, BMA2-050, BMA2-063	
				BHN3-025, BHN3-032, BHN3-040	



Besides the models listed in "How to Order," the following auto switches are applicable.
Refer to pages 347 to 406 for detailed auto switch specifications.

Auto switch type	Part no.	Electrical entry	Features
Solid state	D-H7A1, H7A2, H7B	Grommet (in-line)	—
	D-G59, G5P, K59		Diagnostic indication (2-color display)
	D-H7NW, H7PW, H7BW		Water resistant (2-color display)
	D-G59W, G5PW, K59W		With timer
	D-G5BAL		With diagnostic output (2-color display)
	D-G5NTL		—
	D-G59F		Without indicator light
Reed	D-C73, C76, B53	Grommet (in-line)	—
	D-C80		Without indicator light

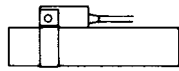
* Solid state auto switches are also available with pre-wired connector. Refer to pages 389 and 390 for details.

* Normally closed (N.C. = b contact), solid state auto switches (D-F9G, F9H) are also available. For details, refer to page 365.

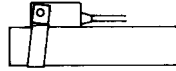
How to Mount and Move the Auto Switch

⚠ Caution

1. Tighten the screw under the specified torque when mounting auto switch.
2. Set the auto switch mounting band perpendicularly to cylinder tube.



Mounting correctly



Mounting incorrectly

<Applicable auto switch>

Solid state D-M9N, D-M9P, D-M9B
D-M9NW, D-M9PW, D-M9BW
Reed D-A90, A93, A96

How to Mount and Move the Auto Switch

Mounting the Auto Switch

1. Attach the switch bracket to the switch holder.
(Fit the convex part of the switch bracket over the concave part of the holder.)
2. Mount the auto switch mounting band to the cylinder tube.
3. Set the switch holder between the reinforcing plates of the auto switch mounting band which is already attached to the cylinder.
4. Insert the auto switch mounting screw in the hole of the reinforcing plate through the switch holder, and thread it into the other plate. Tighten the screw temporarily.
5. Remove the set screw attached to the auto switch.
6. Attach the switch spacer to the auto switch.
7. Insert the auto switch with a switch spacer from the back of the switch holder and set it at the specified position.
(Insert the auto switch with an angle of approximately 10 to 15°. See figure 1.)
8. To secure the auto switch, tighten the switch mounting screw with the specified torque (0.8 N·m to 1.0 N·m).

Adjusting the Switch Position

1. Unloosen the auto switch mounting screw 3 turns to adjust the auto switch set position.
2. Tighten the screw as described above (8) after adjustment.

Dismounting Auto Switch

1. Remove the auto switch mounting screw from the switch holder.
2. Move the auto switch back towards the position where it stops at the lead wire side.
3. Hold up the lead wire side of the auto switch at the angle of around 45°.
4. Maintain the angle, and pull back the auto switch obliquely at the same angle.

Note 1) Be careful not to pull or strain the lead wires.

Be careful not to apply excess tensile force (over 10 N) to the auto switches.

Adjust the auto switch position after sufficiently loosening its screw. For the band mounting type BJ3-1, loosen the screw three rotations or more.

Note 2) Be sure to use the switch spacer and switch bracket for the band mounting type.

Use together with the conventional auto switch mounting bands (brackets) BMA2-020, or BHN3-□□□.

Confirm that a switch spacer is mounted to the end of the auto switch before fastening the auto switch. If the switch bracket is not mounted, the auto switch may move after installation.

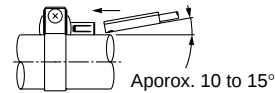
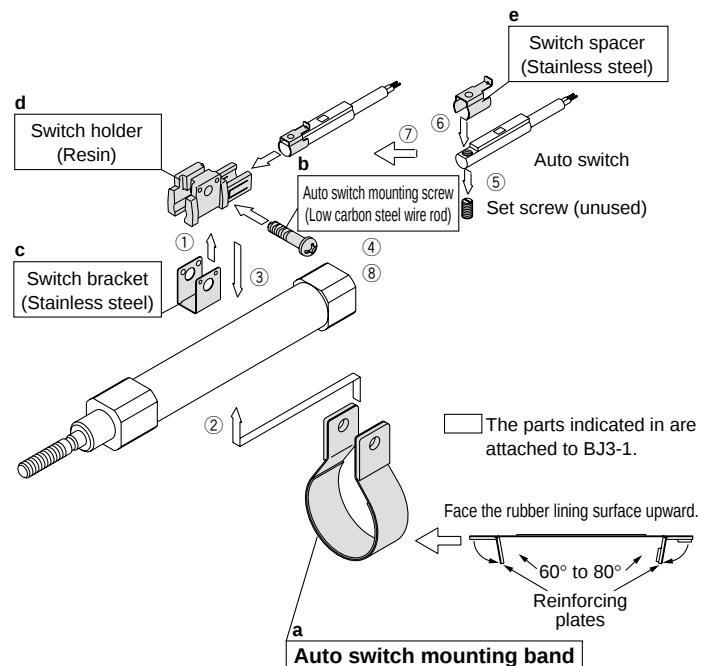


Figure 1. Switch insert angle



- BMA2-020 and BHN3-□□□ are a set of a and b shown above.
- BJ3-1 is a set of c, d and e shown above.

CHQ

CHK

CHN

CHM

CHS

CH2

CHA

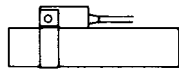
Related Equipment

D-□

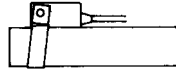
How to Mount and Move the Auto Switch

⚠ Caution

1. Tighten the screw under the specified torque when mounting auto switch.
2. Set the auto switch mounting band perpendicularly to cylinder tube.



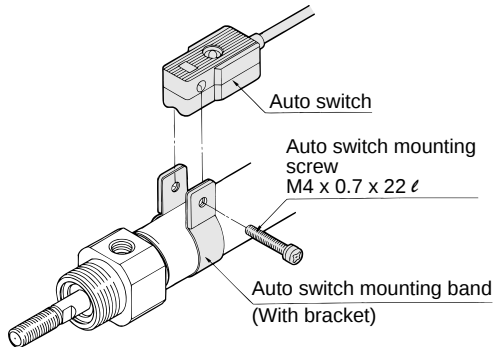
Mounting correctly



Mounting incorrectly

<Applicable auto switch>

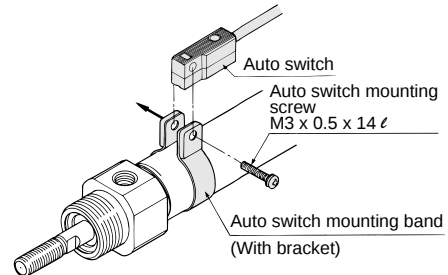
Solid state D-G59, D-G5P, D-K59, D-G5BAL
D-G59W, D-G5PW, D-K59W
D-G59F, D-G5NTL, D-G5NBL
Reed D-B53, D-B54, D-B64, D-B59W



1. Put an auto switch mounting band on the cylinder tube and set it at the auto switch mounting position.
2. Put the mounting section of the auto switch between the auto switch mounting band mounting holes, then adjust the position of mounting holes of switch to those of mounting band.
3. Lightly thread the auto switch mounting screw through the mounting hole into the thread part of band fitting.
4. After reconfirming the detection position, tighten the auto switch mounting screw to secure the auto switch while properly contacting the auto switch bottom part and the cylinder tube. (The tightening torque of M4 screw should be about 1 to 1.2 N·m.)
5. Modification of the detection position should be made in the condition of 3.

<Applicable auto switch>

Solid state D-H7A1, D-H7A2, D-H7B, D-H7BAL
D-H7C, D-H7NF, D-H7NW, D-H7PW
D-H7BW
Reed D-C73, D-C76, D-C80, D-C73C, D-C80C

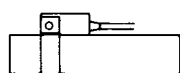


1. Put a mounting band on the cylinder tube and set it at the auto switch mounting position.
2. Put the mounting section of the auto switch between the auto switch mounting band mounting holes, then adjust the position of mounting holes of switch to those of mounting band.
3. Lightly thread the auto switch mounting screw through the mounting hole into the thread part of the auto switch mounting band fitting.
4. After setting the whole body to the detecting position by sliding, tighten the auto switch mounting screw to secure the auto switch while properly contacting the auto switch bottom part and the cylinder tube. (Tightening torque of M3 screw should be 0.8 to 1 N·m.)
5. Modification of the detection position should be made in the condition of 3.

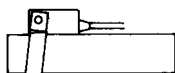
How to Mount and Move the Auto Switch

⚠ Caution

1. Tighten the screw under the specified torque when mounting auto switch.
2. Set the auto switch mounting band perpendicularly to cylinder tube.



Mounting correctly



Mounting incorrectly

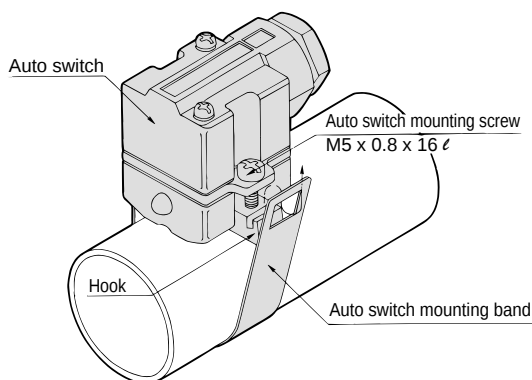
<Applicable auto switch>

Solid state D-G39, D-K39

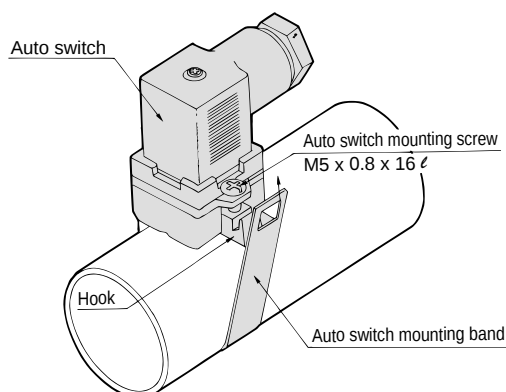
Reed D-A33, D-A34, D-A44

How to Mount and Move the Auto Switch

D-A3, D-G3/K3 type



D-A4



1. Loosen the auto switch mounting screws at both sides to pull down the hook.
2. Put an auto switch mounting band on the cylinder tube and set it at the auto switch mounting position, and then hook the band.
3. Screw lightly the auto switch mounting screw.
4. Set the whole body to the detecting position by sliding, tighten the mounting screw to secure the auto switch. (The tightening torque should be about 2 to 3 N·m.)
5. Modification of the detecting position should be made in the condition of 3.

CHQ

CHK

CHN

CHM

CHS

CH2

CHA

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