ISO/VDMA Cylinders

Complete range of ISO/VDMA cylinders and accessories

Series C95

Series CP95

Series C85

Series C55

Compact Cylinder ISO Standard [ISO 21287]

Ø (mm)	8	10	12	16	20	25	32	40	50	63	80	100	125	160	200	250
					■	■	■	■	■	■						

Air Cylinder [ISO 6432 and CETOP RP52P]

Ø (mm)	8	10	12	16	20	25	32	40	50	63	80	100	125	160	200	250
	■	■	■	■	■	■										

Air Cylinder

Ø (mm)	8	10	12	16	20	25	32	40	50	63	80	100	125	160	200	250
							■	■								

Air Cylinder [ISO 6431, VDMA 24562, CETOP RP43P]

Ø (mm)	8	10	12	16	20	25	32	40	50	63	80	100	125	160	200	250
							■	■	■	■	■	■				

Air Cylinder [ISO 6431, VDMA24562, CETOP RP43P]

Ø (mm)	8	10	12	16	20	25	32	40	50	63	80	100	125	160	200	250
							■	■	■	■	■	■	■	■	■	■

Quick Reference Guide

Quick Delivery Service

Quick Reference Guide
Series C85

Air Cylinder [ISO 6432 and CETOP RP52P]

Ø (mm)	8	10	12	16	20	25	32	40	50	63	80	100	125	160	200	250

Specifications [1)]

Action	Double acting
Fluid	Air
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.05 MPa
Ambient and fluid temperature	Without auto switch: –20 to 70℃ (No freezing) With auto switch: –10 to 60℃ (No freezing)
Piston speed	50 to 1500 mm/s
Cushion	Rubber cushion, Air cushion
Port size	(ø8, ø10, ø12, ø16): M5; (ø20, ø25): G1/8

1) Please refer also to the detailed specification in chapter C85.

How to Order [1)]

1) For further cylinder variation please refer to chapter C85.

C85 Standard Stroke Variation with Rubber Cushion applicable for auto-switch[1)]

Standard stroke [2)] (mm)	Cylinder bore size (mm)					
	8	**10**	**12**	**16**	**20**	**25**
10	CD85N8-10-B	CD85N10-10-B	CD85N12-10-B	CD85N16-10-B	CD85N20-10-B	CD85N25-10-B
25	CD85N8-25-B	CD85N10-25-B	CD85N12-25-B	CD85N16-25-B	CD85N20-25-B	CD85N25-25-B
40	CD85N8-40-B	CD85N10-40-B	CD85N12-40-B	CD85N16-40-B	CD85N20-40-B	CD85N25-40-B
50	CD85N8-50-B	CD85N10-50-B	CD85N12-50-B	CD85N16-50-B	CD85N20-50-B	CD85N25-50-B
80	CD85N8-80-B	CD85N10-80-B	CD85N12-80-B	CD85N16-80-B	CD85N20-80-B	CD85N25-80-B
100	CD85N8-100-B	CD85N10-100-B	CD85N12-100-B	CD85N16-100-B	CD85N20-100-B	CD85N25-100-B
125	—	—	CD85N12-125-B	CD85N16-125-B	CD85N20-125-B	CD85N25-125-B
160	—	—	CD85N12-160-B	CD85N16-160-B	CD85N20-160-B	CD85N25-160-B
200	—	—	CD85N12-200-B	CD85N16-200-B	CD85N20-200-B	CD85N25-200-B
250	—	—	—	CD85N16-250-B	CD85N20-250-B	CD85N25-250-B
300	—	—	—	CD85N16-300-B	CD85N20-300-B	CD85N25-300-B

1) Quick Delivery Service, in just 24h (on request).
2) Intermediate strokes are also possible with on request quick delivery service (48 hr). For longer stroke please refer to chapter C85.

C85 Standard Stroke Variation with Air Cushion applicable for auto-switch[1)]

Standard stroke [2)] (mm)	Cylinder bore size (mm)				
	10	**12**	**16**	**20**	**25**
10	CD85N10-10C-B	CD85N12-10C-B	CD85N16-10C-B	CD85N20-10C-B	CD85N25-10C-B
25	CD85N10-25C-B	CD85N12-25C-B	CD85N16-25C-B	CD85N20-25C-B	CD85N25-25C-B
40	CD85N10-40C-B	CD85N12-40C-B	CD85N16-40C-B	CD85N20-40C-B	CD85N25-40C-B
50	CD85N10-50C-B	CD85N12-50C-B	CD85N16-50C-B	CD85N20-50C-B	CD85N25-50C-B
80	CD85N10-80C-B	CD85N12-80C-B	CD85N16-80C-B	CD85N20-80C-B	CD85N25-80C-B
100	CD85N10-100C-B	CD85N12-100C-B	CD85N16-100C-B	CD85N20-100C-B	CD85N25-100C-B
125	—	CD85N12-125C-B	CD85N16-125C-B	CD85N20-125C-B	CD85N25-125C-B
160	—	CD85N12-160C-B	CD85N16-160C-B	CD85N20-160C-B	CD85N25-160C-B
200	—	CD85N12-200C-B	CD85N16-200C-B	CD85N20-200C-B	CD85N25-200C-B
250	—	—	CD85N16-250C-B	CD85N20-250C-B	CD85N25-250C-B
300	—	—	CD85N16-300C-B	CD85N20-300C-B	CD85N25-300C-B

1) Quick Delivery Service, in just 24h (on request).
2) Intermediate strokes are also possible with on request quick delivery service (48 hr). For longer stroke please refer to chapter C85.

Auto Switches

Auto-switch for C85 (24VDC)[1)]

How to order	Description [2)]
D-M9PL	Solid state switch (PNP) with 3m cable, LED.
D-M9PSAPC	Solid state switch (PNP) with M8 (3-pin) connector, LED.
D-M9PSBPC	Solid state switch (PNP) with M8 (4-pin) connector, LED.
D-M9PSDPC	Solid state switch (PNP) with M12 connector, LED.
D-C73L	Reed switch with 3m cable, LED.

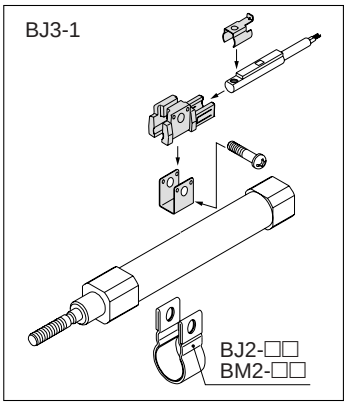
1) For further auto switch variation please refer to chapter C85.
2) Please refer also to the detailed Specification in chapter C85.

Auto-switch Mounting Bracket for C85

How to order	Applicable cylinder bore size
BJ3-1	ø8 to ø25

Auto-switch Mounting Band for C85

How to order	Applicable cylinder bore size
BJ2-008	ø8
BJ2-010	ø10
BJ2-012	ø12
BJ2-016	ø16
BM2-020	ø20
BM2-025	ø25



Mounting Accessories

Mounting Bracket for C85

Bore size (mm)	Foot (1 pc.)	Foot (2 pc.)	Flange	Trunnion	Clevis
8	**C85L10A**	**C85L10B**	**C85F10**	**C85T10**	**C85C10**
10	**C85L10A**	**C85L10B**	**C85F10**	**C85T10**	**C85C10**
12	**C85L16A**	**C85L16B**	**C85F16**	**C85T16**	**C85C16**
16	**C85L16A**	**C85L16B**	**C85F16**	**C85T16**	**C85C16**
20	**C85L25A**	**C85L25B**	**C85F25**	**C85T25**	**C85C25**
25	**C85L25A**	**C85L25B**	**C85F25**	**C85T25**	**C85C25**
					

Rod End Accessories for C85

Bore size (mm)	Single Knuckle Joint	Double Knuckle Joint	Flotating Joint
8	**KJ4D**	**GKM4-8**	**JA10-4-070**
10	**KJ4D**	**GKM4-8**	**JA10-4-070**
12	**KJ6D**	**GKM6-10**	**JA15-6-100**
16	**KJ6D**	**GKM6-10**	**JA15-6-100**
20	**KJ8D**	**GKM8-16**	**JA20-8-125**
25	**KJ10D**	**GKM10-20**	**JA30-10-125**
			

Quick Reference Guide
Series C76

Air Cylinder

Ø (mm)	8	10	12	16	20	25	32	40	50	63	80	100	125	160	200	250

Specifications [1)]

Action	Double acting
Fluid	Air
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.05 MPa
Ambient and fluid temperature	Without auto switch: –20 to 80℃ (No freezing) With auto switch: –10 to 60℃ (No freezing)
Piston speed	50 to 1500 mm/s
Cushion	Rubber cushion
Port size	(ø32): G1/8; (ø40): G1/4

1) Please refer also to the detailed specification in chapter C76.

How to Order [1)]

1) For further cylinder variation please refer to chapter C76.

C76 Standard Stroke Variation with Rubber Cushion applicable for auto-switch[1)]

Standard stroke [2)] (mm)	Cylinder bore size (mm)	
	32	**40**
10	CD76E32-10-B	CD76E40-10-B
25	CD76E32-25-B	CD76E40-25-B
40	CD76E32-40-B	CD76E40-40-B
50	CD76E32-50-B	CD76E40-50-B
80	CD76E32-80-B	CD76E40-80-B
100	CD76E32-100-B	CD76E40-100-B
125	CD76E32-125-B	CD76E40-125-B
160	CD76E32-160-B	CD76E40-160-B
200	CD76E32-200-B	CD76E40-200-B
250	CD76E32-250-B	CD76E40-250-B
300	CD76E32-300-B	CD76E40-300-B

1) Quick Delivery Service, in just 24h (on request).
2) Intermediate strokes are also possible with on request quick delivery service (48 hr). For longer stroke please refer to chapter C76.

Auto Switches

Auto-switch for C76 (24VDC)[1)]

How to order	Description [2)]
D-M9PL	Solid state switch (PNP) with 3m cable, LED.
D-M9PSAPC	Solid state switch (PNP) with M8 (3-pin) connector, LED.
D-M9PSBPC	Solid state switch (PNP) with M8 (4-pin) connector, LED.
D-M9PSDPC	Solid state switch (PNP) with M12 connector, LED.
D-C73L	Reed switch with 3m cable, LED.

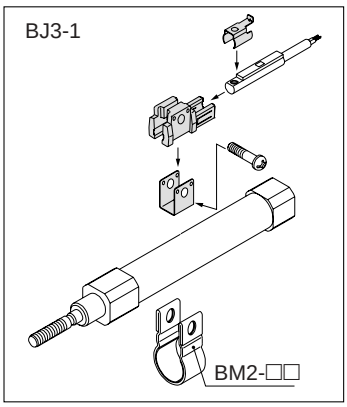
1) For further auto switch variation please refer to chapter C76.
2) Please refer also to the detailed Specification in chapter C76.

Auto-switch Mounting Bracket for C76

How to order	Applicable cylinder bore size
BJ3-1	ø32, ø40

Auto-switch Mounting Band for C76

How to order	Applicable cylinder bore size
BM2-032	ø32
BM2-040	ø40



Mounting Accessories

Mounting Bracket for C76

Bore size (mm)	Foot (1 pc.)	Flange, Foot (2 pc.)	Trunnion	Clevis
32	**C76F32A**	**C76F32B**	**C76T32**	**C76C32**
40	**C76F40A**	**C76F40B**	**C76T40**	**C76C40**
				

Rod End Accessories for C76

Bore size (mm)	Single Knuckle Joint	Double Knuckle Joint	Flotating Joint
32	**KJ10DA**	**GKM10-20A**	**JA25-10-150**
40	**KJ12DA**	**GKM12-24A**	**JA40-12-175**
			

Quick Reference Guide
Series CP95

Air Cylinder [ISO 6431, VDMA 24562, CETOP RP43P]

Ø (mm)	8	10	12	16	20	25	32	40	50	63	80	100	125	160	200	250

Specifications [1)]

Action	Double acting
Fluid	Air
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.05 MPa
Ambient and fluid temperature	Without auto switch: –10 to 70℃ (No freezing) With auto switch: –10 to 60℃ (No freezing)
Piston speed	50 to 1000 mm/s
Cushion	Air cushion (both ends)
Port size	(ø32): G1/8; (ø40, ø50): G1/4; (ø63, ø80): G3/8; (ø100): G1/2

1) Please refer also to the detailed specification in chapter CP95.

How to Order [1)]

1) For further cylinder variation please refer to chapter CP95.

CP95 Standard Stroke Variation applicable for auto-switch[1)]

Standard stroke [2)] (mm)	Cylinder bore size (mm)					
	32	**40**	**50**	**63**	**80**	**100**
25	CP95SDB32-25	CP95SDB40-25	CP95SDB50-25	CP95SDB63-25	CP95SDB80-25	CP95SDB100-25
50	CP95SDB32-50	CP95SDB40-50	CP95SDB50-50	CP95SDB63-50	CP95SDB80-50	CP95SDB100-50
80	CP95SDB32-80	CP95SDB40-80	CP95SDB50-80	CP95SDB63-80	CP95SDB80-80	CP95SDB100-80
100	CP95SDB32-100	CP95SDB340100	CP95SDB50-100	CP95SDB63-100	CP95SDB80-100	CP95SDB100-100
125	CP95SDB32-125	CP95SDB40-125	CP95SDB50-125	CP95SDB63-125	CP95SDB80-125	CP95SDB100-125
160	CP95SDB32-160	CP95SDB40-160	CP95SDB50-160	CP95SDB63-160	CP95SDB80-160	CP95SDB100-160
200	CP95SDB32-200	CP95SDB40-200	CP95SDB50-200	CP95SDB63-200	CP95SDB80-200	CP95SDB100-200
250	CP95SDB32-250	CP95SDB40-250	CP95SDB50-250	CP95SDB63-250	CP95SDB80-250	CP95SDB100-250
320	CP95SDB32-320	CP95SDB40-320	CP95SDB50-320	CP95SDB63-320	CP95SDB80-320	CP95SDB100-320
400	CP95SDB32-400	CP95SDB40-400	CP95SDB50-400	CP95SDB63-400	CP95SDB80-400	CP95SDB100-400
500	CP95SDB32-500	CP95SDB40-500	CP95SDB50-500	CP95SDB63-500	CP95SDB80-500	CP95SDB100-500
600	—	—	CP95SDB50-600	CP95SDB63-600	CP95SDB80-600	CP95SDB100-600

1) Quick Delivery Service, in just 24h (on request).
2) Intermediate strokes are also possible with on request quick delivery service (48 hr). For longer stroke please refer to chapter CP95.

Auto Switches

Auto-switch for CP95 (24VDC)[1)]

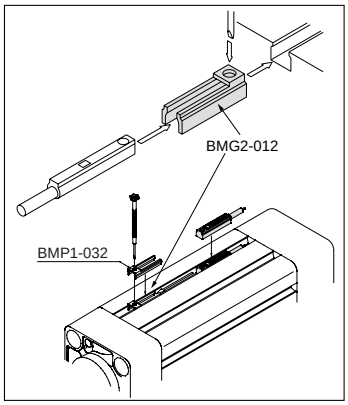
How to order	Description [2)]
D-M9PL	Solid state switch (PNP) with 3m cable, LED.
D-M9PSAPC	Solid state switch (PNP) with M8 (3-pin) connector, LED.
D-M9PSBPC	Solid state switch (PNP) with M8 (4-pin) connector, LED.
D-M9PSDPC	Solid state switch (PNP) with M12 connector, LED.
D-Z73L	Reed switch with 3m cable, LED.

1) For further auto switch variation please refer to chapter CP95.
2) Please refer also to the detailed Specification in chapter CP95.

Auto-switch Mounting Bracket for CP95

How to order	Applicable auto switch	Applicable cylinder bore size
BMP1-032 **BMG2-012**	D-M9□	ø32 to ø100
BMP1-032	D-Z73□	

Note: For the mounting of auto switch D-M9□,
both BMP1-032 and BMG2-012 are necessary.



Mounting Accessories

Mounting Bracket for CP95

Bore size (mm)	Foot (2 pc.)	Flange	Single rear clevis	Double rear clevis	Double rear clevis (for ES accessory)	Single rear clevis with ball joint	Angled rear clevis with ball joint	Angled rear clevis
32	**L5032**	**F5032**	**C5032**	**D5032**	**DS5032**	**CS5032**	**ES5032**	**E5032**
40	**L5040**	**F5040**	**C5040**	**D5040**	**DS5040**	**CS5040**	**ES5040**	**E5040**
50	**L5050**	**F5050**	**C5050**	**D5050**	**DS5050**	**CS5050**	**ES5050**	**E5050**
63	**L5063**	**F5063**	**C5063**	**D5063**	**DS5063**	**CS5063**	**ES5063**	**E5063**
80	**L5080**	**F5080**	**C5080**	**D5080**	**DS5080**	**CS5080**	**ES5080**	**E5080**
100	**L5100**	**F5100**	**C5100**	**D5100**	**DS5100**	**CS5100**	**ES5100**	**E5100**
								

Rod End Accessories for CP95

Bore size (mm)	Single Knuckle Joint (ISO 8139)	Double Knuckle Joint (ISO 8140)	Flotating Joint
32	**KJ10D**	**GKM10-20**	**JA30-10-125**
40	**KJ12D**	**GKM12-24**	**JA40-12-125**
50	**KJ16D**	**GKM16-32**	**JA50-16-150**
63	**KJ16D**	**GKM16-32**	**JA50-16-150**
80	**KJ20D**	**GKM20-40**	**JAH50-20-150**
100	**KJ20D**	**GKM20-40**	**JAH50-20-150**
			

Quick Reference Guide
Series C95

Air Cylinder [ISO 6431, VDMA24562, CETOP RP43P]

Ø (mm)	8	10	12	16	20	25	32	40	50	63	80	100	125	160	200	250

Specifications [1)]

Action	Double acting
Fluid	Air
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.05 MPa
Ambient and fluid temperature	Without auto switch: –10 to 70℃ (No freezing) With auto switch: –10 to 60℃ (No freezing)
Piston speed	50 to 1000 mm/s
Cushion	Air cushion (both ends)
Port size	(ø32): G1/8; (ø40, ø50): G1/4; (ø63, ø80): G3/8; (ø100): G1/2

1) Please refer also to the detailed specification in chapter C95.

How to Order [1)]

1) For further cylinder variation please refer to chapter C95.

C95 Standard Stroke Variation applicable for auto-switch[1)] (Bore size ø32 to ø100) [2)]

Standard stroke [3)] (mm)	Cylinder bore size (mm)					
	32	**40**	**50**	**63**	**80**	**100**
25	C95SDB32-25	C95SDB40-25	C95SDB50-25	C95SDB63-25	C95SDB80-25	C95SDB100-25
50	C95SDB32-50	C95SDB40-50	C95SDB50-50	C95SDB63-50	C95SDB80-50	C95SDB100-50
80	C95SDB32-80	C95SDB40-80	C95SDB50-80	C95SDB63-80	C95SDB80-80	C95SDB100-80
100	C95SDB32-100	C95SDB340100	C95SDB50-100	C95SDB63-100	C95SDB80-100	C95SDB100-100
125	C95SDB32-125	C95SDB40-125	C95SDB50-125	C95SDB63-125	C95SDB80-125	C95SDB100-125
160	C95SDB32-160	C95SDB40-160	C95SDB50-160	C95SDB63-160	C95SDB80-160	C95SDB100-160
200	C95SDB32-200	C95SDB40-200	C95SDB50-200	C95SDB63-200	C95SDB80-200	C95SDB100-200
250	C95SDB32-250	C95SDB40-250	C95SDB50-250	C95SDB63-250	C95SDB80-250	C95SDB100-250
320	C95SDB32-320	C95SDB40-320	C95SDB50-320	C95SDB63-320	C95SDB80-320	C95SDB100-320
400	C95SDB32-400	C95SDB40-400	C95SDB50-400	C95SDB63-400	C95SDB80-400	C95SDB100-400
500	C95SDB32-500	C95SDB40-500	C95SDB50-500	C95SDB63-500	C95SDB80-500	C95SDB100-500
600	—	—	C95SDB50-600	C95SDB63-600	C95SDB80-600	C95SDB100-600

1) Quick Delivery Service, in just 24h (on request).
2) For bore sizes ø125, ø160, ø200, ø250mm please refer to chapter C95.
3) Intermediate strokes are also possible with on request quick delivery service (48 hr). For longer stroke please refer to chapter C95.

Auto Switches

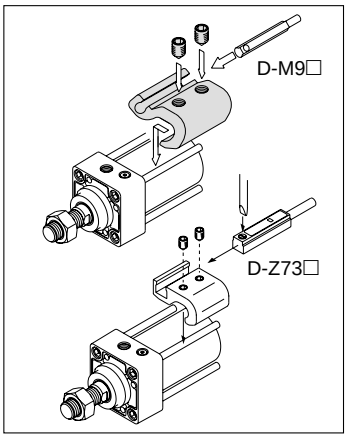
Auto-switch for C95 (24VDC)[1)]

How to order	Description [2)]
D-M9PL	Solid state switch (PNP) with 3m cable, LED.
D-M9PSAPC	Solid state switch (PNP) with M8 (3-pin) connector, LED.
D-M9PSBPC	Solid state switch (PNP) with M8 (4-pin) connector, LED.
D-M9PSDPC	Solid state switch (PNP) with M12 connector, LED.
D-Z73L	Reed switch with 3m cable, LED.

1) For further auto switch variation please refer to chapter C95.
2) Please refer also to the detailed Specification in chapter C95.

Auto-switch Mounting Bracket for C95

How to order	Applicable auto switch	Applicable cylinder bore size
BMB5-032	D-M9□	ø32, ø40
BA7-040		ø50, ø63
BA7-063		ø80, ø100
BMB4-032	D-Z73□	ø32, ø40
BMB4-050		ø50, ø63
BA4-063		ø80, ø100



Mounting Accessories

Mounting Bracket for C95

Bore size (mm)	Foot (2 pc.)	Flange	Single rear clevis	Double rear clevis	Double rear clevis (for ES accessory)	Single rear clevis with ball joint	Angled rear clevis with ball joint	Angled rear clevis	Trunnion pivot bracket
32	**L5032**	**F5032**	**C5032**	**D5032**	**DS5032**	**CS5032**	**ES5032**	**E5032**	**C95-S03**
40	**L5040**	**F5040**	**C5040**	**D5040**	**DS5040**	**CS5040**	**ES5040**	**E5040**	**C95-S04**
50	**L5050**	**F5050**	**C5050**	**D5050**	**DS5050**	**CS5050**	**ES5050**	**E5050**	**C95-S04**
63	**L5063**	**F5063**	**C5063**	**D5063**	**DS5063**	**CS5063**	**ES5063**	**E5063**	**C95-S06**
80	**L5080**	**F5080**	**C5080**	**D5080**	**DS5080**	**CS5080**	**ES5080**	**E5080**	**C95-S06**
100	**L5100**	**F5100**	**C5100**	**D5100**	**DS5100**	**CS5100**	**ES5100**	**E5100**	**C95-S10**
									

Rod End Accessories for C95

Bore size (mm)	Single Knuckle Joint (ISO 8139)	Double Knuckle Joint (ISO 8140)	Flotating Joint
32	**KJ10D**	**GKM10-20**	**JA30-10-125**
40	**KJ12D**	**GKM12-24**	**JA40-12-125**
50	**KJ16D**	**GKM16-32**	**JA50-16-150**
63	**KJ16D**	**GKM16-32**	**JA50-16-150**
80	**KJ20D**	**GKM20-40**	**JAH50-20-150**
100	**KJ20D**	**GKM20-40**	**JAH50-20-150**
			

ISO Standard [ISO 21287]
Compact Cylinder
Series C55
ø20, ø25, ø32, ø40, ø50, ø63

ISO Standard [ISO 21287]

ISO Standard [ISO 21287]
Compact Cylinder
Series C55
ø20, ø25, ø32, ø40, ø50, ø63

How to Order

Without auto switch C55 **B** **20** – **10** [ ]

With auto switch CD55 **B** **20** – **10** [ ] – **M9B** **S**

Built in magnet

Mounting style

B	Through-hole/Both ends tapped common (Standard)
L	Foot style
F	Rod side flange style
G	Head side flange style
C	Single clevis style

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
63	63 mm

Cylinder stroke (mm)
Refer to the next page for standard and intermediate strokes.

Rod end thread

-	Rod end female thread
M	Rod end male thread

Auto switch

-	Without auto switch (Built-in magnet cylinder)

∗ For the applicable auto switch model, refer to the table below.
∗ Auto switches are shipped together, (but not assembled).

Number of auto switches

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

Applicable Auto Switches

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Load voltage AC	Auto switch model: Electrical entry direction: Perpendicular	Auto switch model: Electrical entry direction: In-line	Lead wire length (m) ∗: 0.5 (Nil)	Lead wire length (m) ∗: 3 (L)	Lead wire length (m) ∗: 5 (Z)	Pre-wired connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	—	Relay, PLC
			—			5 V, 12 V	100 V or less	**A90V**	**A90**	●	●	—	—	IC circuit	
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	○	—	
	Diagnostic indication (2-colour indication)			3-wire (NPN)		5 V, 12 V		**F9NWV**	**F9NW**	●	●	○	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	○	—	
	Water resistant (2-colour indication)							—	**F9BA**	—	●	○	—		

∗ Lead wire length symbols: 0.5 m ····· Nil (Example) M9N
3 m ····· L (Example) M9NL
5 m ····· Z (Example) M9NZ
∗ ○ solid state auto switch is available after receiving an order.

⚠ Caution

① Be sure to read before handling. Refer to Best Pneumatics catalogue for Safety Instructions, Actuators and Auto Switches Precautions.
② This product should not be used as a stopper.
③ Use the PF thread fittings for this cylinder

Theoretical Output

Unit: N

Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
20	IN	71	118	165
	OUT	94	157	220
25	IN	113	189	264
	OUT	147	245	344
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1150
	OUT	589	982	1370
63	IN	841	1400	1960
	OUT	935	1560	2180

Mounting Bracket Part No.

Bore size (mm)	Foot	Flange	Single clevis
20	C55-L020	C55-F020	C55-C020
25	C55-L025	C55-F025	C55-C025
32	C55-L032	C55-F032	C55-C032
40	C55-L040	C55-F040	C55-C040
50	C55-L050	C55-F050	C55-C050
63	C55-L063	C55-F063	C55-C063

• Order two foot brackets per cylinder.
• Parts belonging to each bracket are as follows.
Foot, Flange, Single clevis/Body mounting bolt

Specifications

Type	Pneumatic (Non-lube)
Action	Double acting, Single rod
Fluid	Air
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.05 MPa
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)
Cushion	Rubber bumper on both end
Stroke length tolerance	+1.0 mm 0
Mounting	Through-hole/Both ends tapped common
Piston speed	50 to 500 mm/s

Standard Stroke

Bore size (mm)	Standard stroke (mm)
20 to 63	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 80, 100, 125, 150

Manufacture of Intermediate Stroke

Description	Dealing with the stroke by the 1 mm interval by using an exclusive body with the specified stroke
Part no.	Refer to “How to Order” for the standard model no. (page at left)
Stroke range	6 to 149
Example	Part no.: C55B32-47
	Makes 47 stroke tube

Weight

Without Auto Swtich

Unit: g

Bore size (mm)	Cylinder stroke (mm)														
	5	10	15	20	25	30	35	40	45	50	60	80	100	125	150
20	111	124	137	150	163	176	189	202	215	228	254	306	357	422	487
25	152	168	183	199	214	230	246	261	277	292	323	386	448	526	603
32	250	273	295	317	339	362	384	406	428	451	495	584	673	785	896
40	315	339	364	388	412	436	461	485	509	533	582	679	776	897	1018
50	497	534	570	607	644	681	718	755	791	828	902	1049	1197	1381	1565
63	677	717	757	797	837	877	917	957	997	1037	1117	1277	1437	1638	1838

With Auto Switch (Built-in magnet)

Unit: g

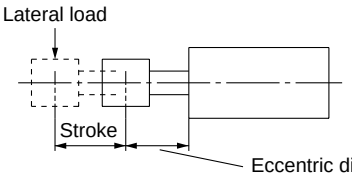
Bore size (mm)	Cylinder stroke (mm)														
	5	10	15	20	25	30	35	40	45	50	60	80	100	125	150
20	113	126	139	152	165	178	191	204	216	229	255	307	359	424	489
25	154	170	185	201	217	232	248	263	279	294	325	388	450	528	606
32	254	277	299	321	343	366	388	410	432	455	499	588	677	788	900
40	319	344	368	392	416	441	465	489	513	537	586	683	780	901	1022
50	502	539	575	612	649	686	723	760	796	833	907	1054	1202	1386	1570
63	685	725	765	805	845	885	925	965	1005	1045	1125	1285	1445	1645	1845

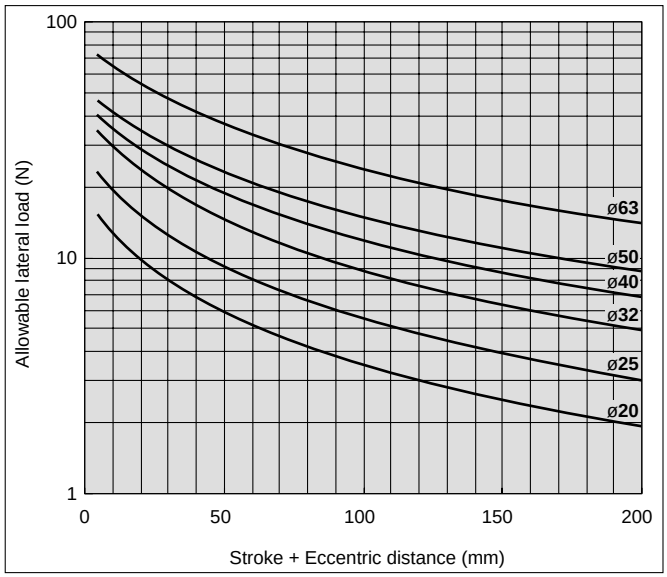
Add each weight of auto switches and mounting brackets when mounting an auto switches.

Allowable Lateral Load

Make sure to operate strictly within the allowable lateral load range to the rod end.

Operation outside of this range may result in shorter service life or damage to the device.



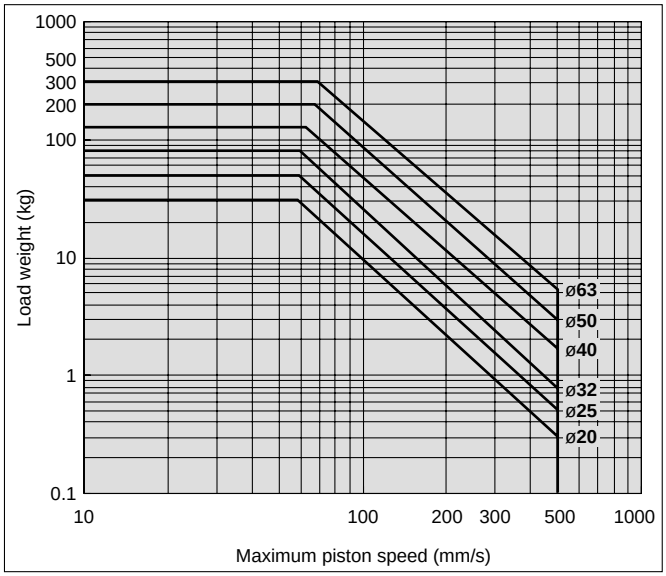


Allowable Kinetic Energy

Make sure to operate strictly within the allowable range of the load weight and maximum speed.

Operation outside of this range may cause excessive impact, which may result in the damage to the device.

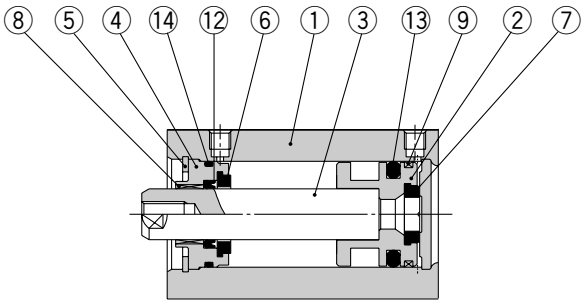
Operating pressure: 1 MPa



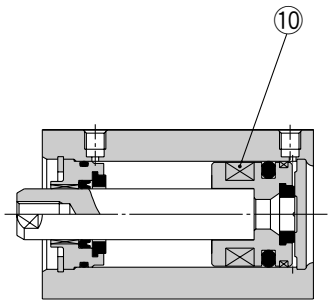
∗ Refer to Model Selection in Best Pneumatics catalogue for details about model selection procedure.

Construction

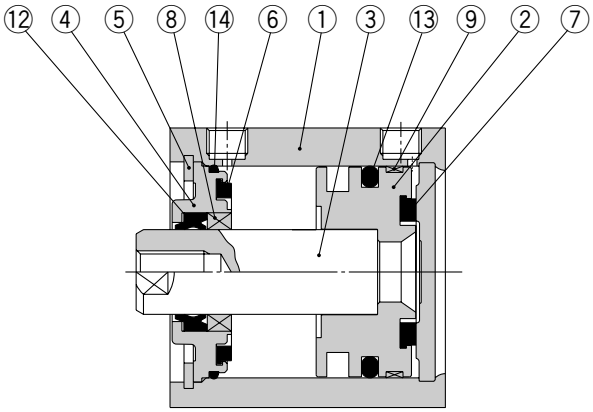
ø20, ø25



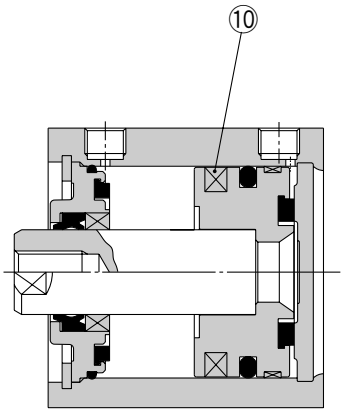
With auto switch (Built-in magnet)

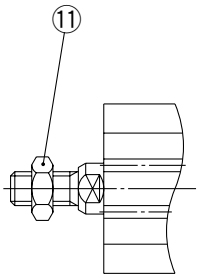


ø32 to ø63



With auto switch (Built-in magnet)





M: Rod end male thread

Component Parts

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Piston**	Aluminum alloy	Chromated
3	**Piston rod**	Stainless steel	ø20, ø25
		Carbon steel	ø32 to ø63 Hard chrome plated
4	**Collar**	Aluminum alloy	ø20 to ø40 Anodized
		Aluminum alloy casted	ø50, ø63 Painted after chromated
5	**Snap ring**	Carbon tool steel	Phosphate coated
6	**Bumper A**	Urethane	
7	**Bumper B**	Urethane	
8	**Bushing**	Oil-impregnated sintered alloy	ø20, ø25
		Phosphor bronze alloy	ø32 to ø63
9	**Wear ring**	Resin	
10	**Magnet**	—	
11	**Rod end nut**	Carbon steel	Nickel plated
12	**Rod seal**	NBR	
13	**Piston seal**	NBR	
14	**Tube gasket**	NBR	

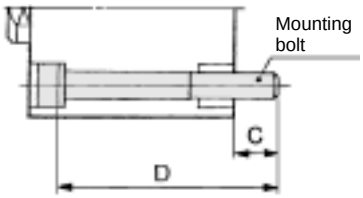
Replacement Parts: Seal Kit

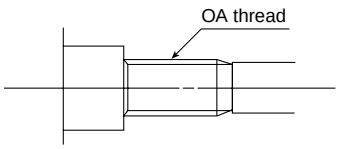
Bore size (mm)	Kit no.	Contents
20	CQ2B20-PS	Set of nos. above ⑫, ⑬, ⑭
25	CQ2B25-PS	
32	CQ2B32-PS	
40	CQ2B40-PS	
50	CQ2B50-PS	
63	CQ2B63-PS	

∗ Seal kit includes ⑫, ⑬, ⑭. Order the seal kit, based on each bore size.

Mounting Bolt

Should use recommended bolt shown as below table when mounting the cylinder using through-hole.





Note) To install a through-hole type mounting bolt, bore size 20 to 63 mm, make sure to use the flat washer that is provided.

Mounting Bolt for C55

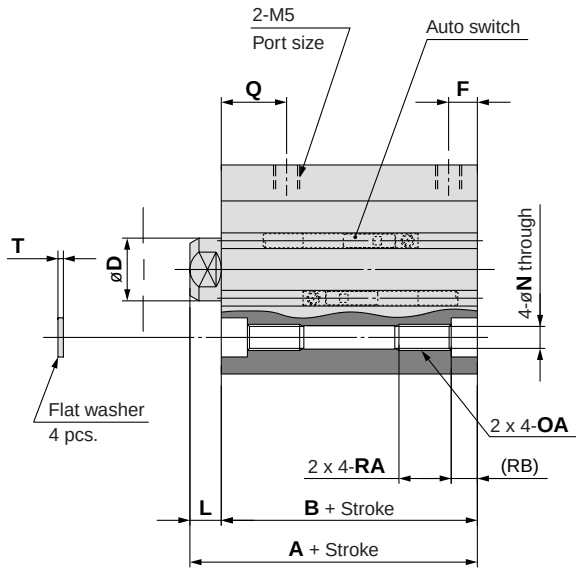
Model	C	D	Mounting bolt
C(D)55B20-5	7.2	45	M4 x 45 *l*
-10		50	x 50 *l*
-15		55	x 55 *l*
-20		60	x 60 *l*
-25		65	x 65 *l*
-30		70	x 70 *l*
-35		75	x 75 *l*
-40		80	x 80 *l*
-45		85	x 85 *l*
-50		90	x 90 *l*
-60	Fix the cylinder by using the OA thread that are provided with the cylinder tube.		
-80			
-100			
-125			
-150			
C(D)55B25-5	10.2	50	M4 x 50 *l*
-10		55	x 55 *l*
-15		60	x 60 *l*
-20		65	x 65 *l*
-25		70	x 70 *l*
-30		75	x 75 *l*
-35		80	x 80 *l*
-40		85	x 85 *l*
-45		90	x 90 *l*
-50		95	x 95 *l*
-60	Fix the cylinder by using the OA thread that are provided with the cylinder tube.		
-80			
-100			
-125			
-150			

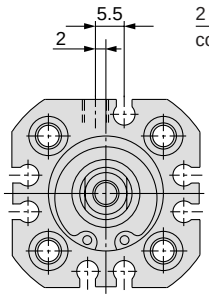
Model	C	D	Mounting bolt
C(D)55B32-5	10	55	M5 x 55 *l*
-10		60	x 60 *l*
-15		65	x 65 *l*
-20		70	x 70 *l*
-25		75	x 75 *l*
-30		80	x 80 *l*
-35		85	x 85 *l*
-40		90	x 90 *l*
-45		95	x 95 *l*
-50		100	x 100 *l*
-60		110	x 110 *l*
-80		130	x 130 *l*
-100		150	x 150 *l*
-125	Fix the cylinder by using the OA thread that are provided with the cylinder tube.		
-150			
C(D)55B40-5	9	55	M5 x 55 *l*
-10		60	x 60 *l*
-15		65	x 65 *l*
-20		70	x 70 *l*
-25		75	x 75 *l*
-30		80	x 80 *l*
-35		85	x 85 *l*
-40		90	x 90 *l*
-45		95	x 95 *l*
-50		100	x 100 *l*
-60		110	x 110 *l*
-80		130	x 130 *l*
-100		150	x 150 *l*
-125	Fix the cylinder by using the OA thread that are provided with the cylinder tube.		
-150			

Model	C	D	Mounting bolt
C(D)55B50-5	8.4	55	M6 x 55 *l*
-10		60	x 60 *l*
-15		65	x 65 *l*
-20		70	x 70 *l*
-25		75	x 75 *l*
-30		80	x 80 *l*
-35		85	x 85 *l*
-40		90	x 90 *l*
-45		95	x 95 *l*
-50		100	x 100 *l*
-60		110	x 110 *l*
-80		130	x 130 *l*
-100		150	x 150 *l*
-125	Fix the cylinder by using the OA thread that are provided with the cylinder tube.		
-150			
C(D)55B63-5	9.4	60	M6 x 60 *l*
-10		65	x 65 *l*
-15		70	x 70 *l*
-20		75	x 75 *l*
-25		80	x 80 *l*
-30		85	x 85 *l*
-35		90	x 90 *l*
-40		95	x 95 *l*
-45		100	x 100 *l*
-50		105	x 105 *l*
-60		115	x 115 *l*
-80		135	x 135 *l*
-100		155	x 155 *l*
-125	Fix the cylinder by using the OA thread that are provided with the cylinder tube.		
-150			

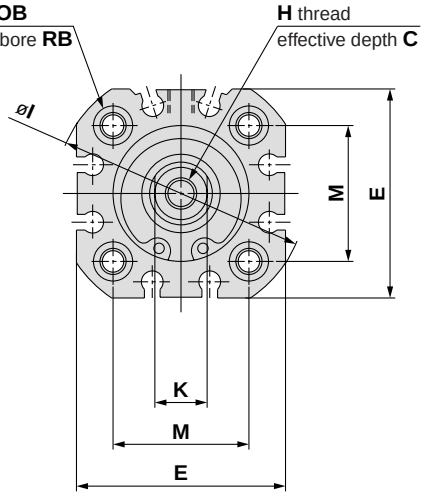
Dimensions

ø20, ø25





ø20

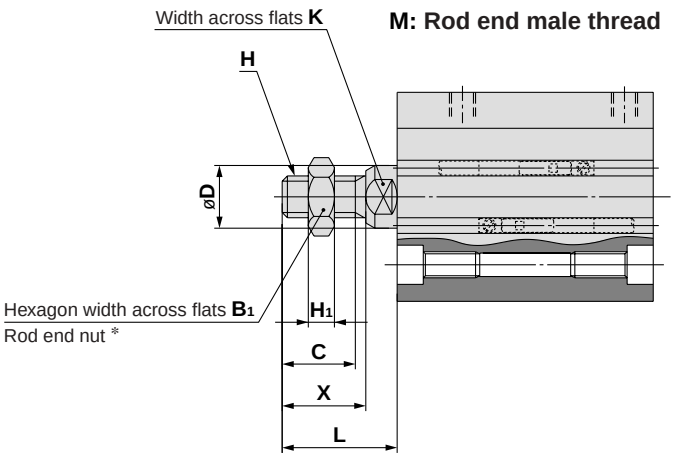


ø25

Basic Style (mm)

Bore size (mm)	A	B	C	D	E	F	H	I	K	L	M	N	OA	OB	Q	RA	RB	T
20	43	37	10	10	36	5.5	M6	43	8	6	22	4.5	M5	7.5	13	10	5	0.8
25	45	39	10	12	40	5.5	M6	48	10	6	26	4.5	M5	7.5	13	10	5	0.8

M: Rod end male thread

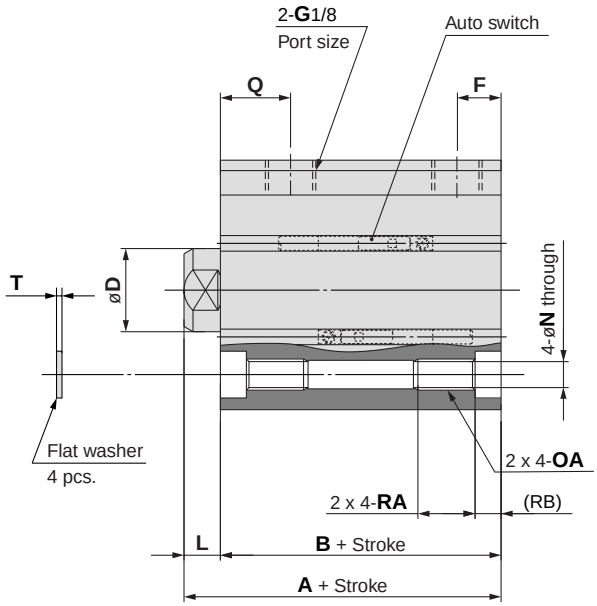


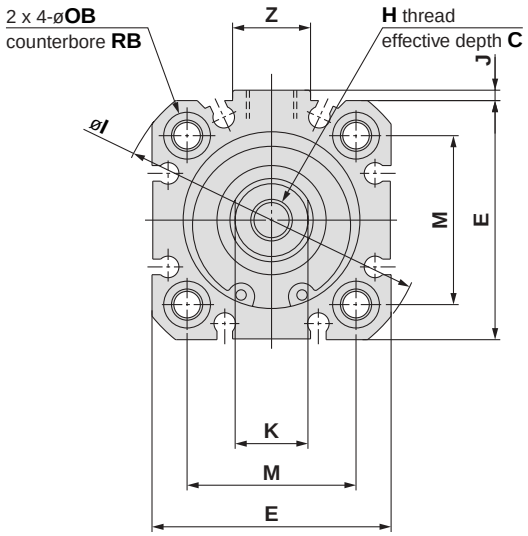
Rod End Male Thread (mm)

Bore size (mm)	B_1	C	D	H	H_1	K	L	X
20	13	14	10	M8	5	8	22	16
25	13	14	12	M8	5	10	22	16

Dimensions

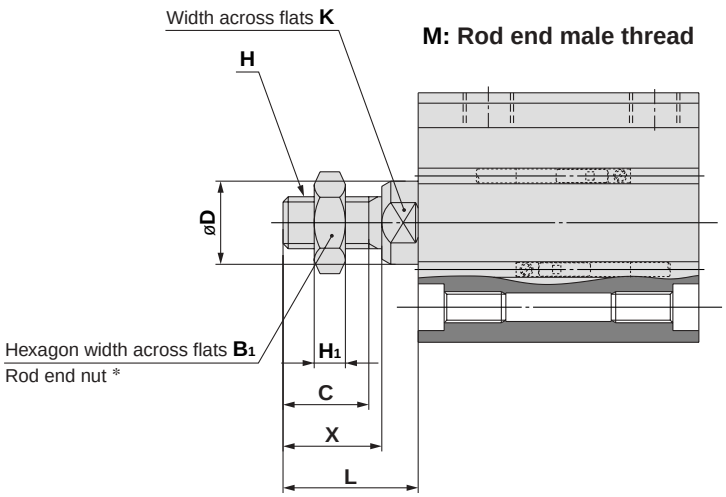
ø32 to ø63





Basic Style (mm)

Bore size (mm)	A	B	C	D	E	F	H	I	J	K	L	M	N	OA	OB	Q	RA	RB	T	Z
32	51	44	12	16	46	8.5	M8	59	2	14	7	32.5	5.5	M6	9	14.5	11	5	1	15
40	52	45	12	16	52	9.5	M8	67	3	14	7	38	5.5	M6	9	14.5	11	5	1	17
50	53	45	16	20	64	10.5	M10	82	2	17	8	46.5	6.6	M8	10.5	13.5	11	5	1.6	17
63	57	49	16	20	74	14.5	M10	96	3	17	8	56.5	6.6	M8	10.5	15.5	11	5	1.6	17

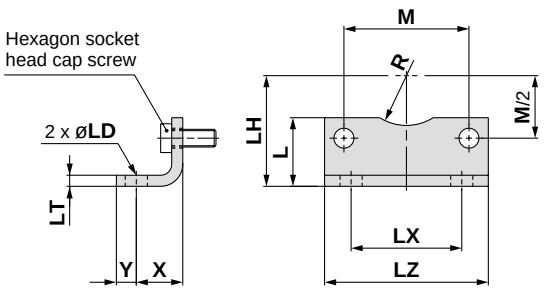


Rod End Male Thread (mm)

Bore size (mm)	B_1	C	D	H	H_1	K	L	X
32	17	16.5	16	M10 x 1.25	6	14	26	19
40	17	16.5	16	M10 x 1.25	6	14	26	19
50	19	19.5	20	M12 x 1.25	7	17	30	22
63	19	19.5	20	M12 x 1.25	7	17	30	22

Mounting Bracket

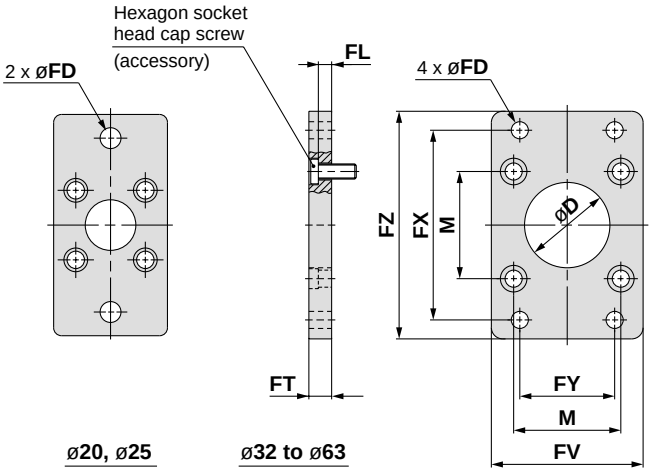
Foot bracket



(mm)

Bore size (mm)	L	LD	LH	LT	LX	LZ	M	R	X	Y	Hexagon socket head cap screw
20	22	7	27	4	22	36	22	8	16	7	M5
25	22	7	29	4	26	40	26	10	16	7	M5
32	24.5	7	33.5	4	32	46	32.5	15	16	7	M6
40	26	10	38	4	36	52	38	17.5	18	9	M6
50	31	10	45	5	45	64	46.5	20	21	9	M8
63	31	10	50	5	50	74	56.5	22.5	21	9	M8

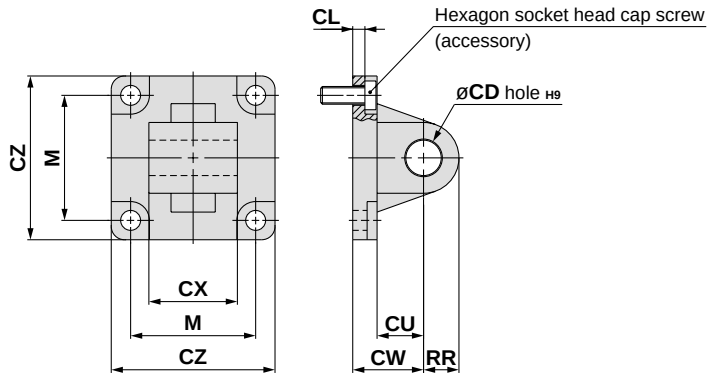
Flange bracket



(mm)

Bore size (mm)	D_{H11}	M	FD	FL	FT	FV	FX	FY	FZ	Hexagon socket head cap screw
20	16	22	6.6	2.8	8	38	55	—	68	M5
25	16	26	6.6	2.8	8	38	60	—	73	M5
32	30	32.5	7	5	10	50	64	32	79	M6
40	35	38	9	5	10	55	72	36	90	M6
50	40	46.5	9	6	12	70	90	45	110	M8
63	45	56.5	9	6	12	80	100	50	120	M8

Single clevis bracket



(mm)

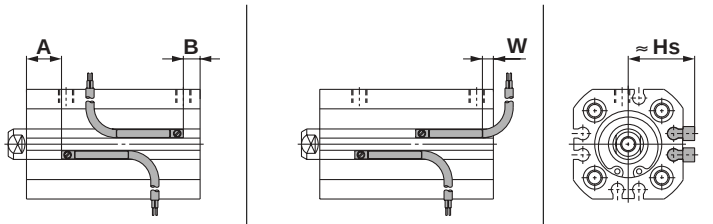
Bore size (mm)	CD_{H9}	CL	CU	CW	$CX^{-0.2}_{-0.6}$	CZ	M	RR	Hexagon socket head cap screw
20	8	3	12	20	16	35	22	9	M5
25	8	3	12	20	16	40	26	9	M5
32	10	5.5	12	22	26	45	32.5	9.5	M6
40	12	5.5	15	25	28	51	38	12	M6
50	12	6.5	15	27	32	64	46.5	12	M8
63	16	6.5	20	32	40	74	56.5	16	M8

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

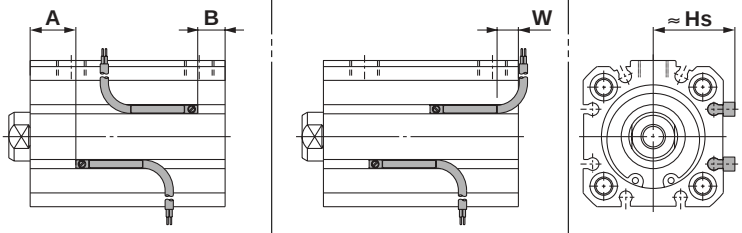
Reed switch
D-A9□

Solid state switch
D-M9□
D-F9BAL
D-F9□W

ø20, 25



ø32, 40, 50, 63



∗ Figures in the table below are used as a reference when mounting the auto switches for stroke end detection. In the case of actually setting the auto switches, adjust them after confirming their operation.

(mm)

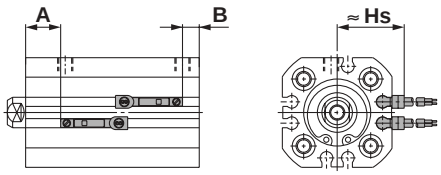
Auto switch model		D-A9□			D-M9□ D-F9□W			D-F9BAL			
Symbol		A	B	W	A	B	W	A	B	W	Hs
Bore size (mm)	20	11.5	5.5	3.5(1)	15.5	9.5	-0.5	14.5	8.5	-9.5	22
	25	11.5	7.5	5.5(3)	15.5	11.5	1.5	14.5	10.5	-7.5	24
	32	15	9	7 (4.5)	19	13	3	18	12	-6	27
	40	16	9	7 (4.5)	20	13	3	19	12	-6	30
	50	9.5	15.5	13.5(11.5)	13.5	19.5	9.5	12.5	18.5	0.5	36
	63	11.5	17.5	15.5(13.5)	15.5	21.5	11.5	14.5	20.5	2.5	41

The dimension inside ( ) is for D-A93.

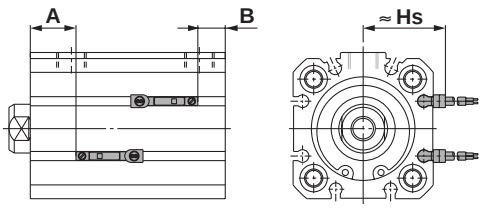
Reed switch
D-A9□V

Solid state switch
D-M9□V
D-F9□WV

ø20, 25



ø32, 40, 50, 63



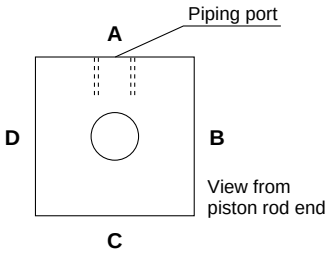
∗ Figures in the table below are used as a reference when mounting the auto switches for stroke end detection. In the case of actually setting the auto switches, adjust them after confirming their operation.

(mm)

Auto switch model		D-A9□V			D-M9□V D-F9□WV		
Symbol		A	B	Hs	A	B	Hs
Bore size (mm)	20	11.5	5.5	22	15.5	9.5	24
	25	11.5	7.5	24	15.5	11.5	26
	32	15	9	27	19	13	29
	40	16	9	30	20	13	32
	50	9.5	15.5	36	13.5	19.5	38
	63	11.5	17.5	41	15.5	21.5	43

The Number of Surfaces and Grooves Where an Auto Switch Can Be Mounted (As Direct Mounting)

The number of the surfaces and grooves where the auto switch can be mounted, by switch type, are shown in the table below.



Switch model	D-A9□, M9□, F9□			
Bore size (mm)	**A** (Mounting groove no.)	**B** (Mounting groove no.)	**C** (Mounting groove no.)	**D** (Mounting groove no.)
20	○ (1)	○ (2)	○ (2)	○ (2)
25	○ (2)	○ (2)	○ (2)	○ (2)
32	○ (2)	○ (2)	○ (2)	○ (2)
40	○ (2)	○ (2)	○ (2)	○ (2)
50	○ (2)	○ (2)	○ (2)	○ (2)
63	○ (2)	○ (2)	○ (2)	○ (2)

Operating Range

(mm)

Auto switch model	Bore size					
	20	**25**	**32**	**40**	**50**	**63**
D-F9□W(V) D-F9BAL	5	5.5	6	6	6	6.5
D-A9□(V)	9	9	9	9	9	10.5
D-M9□(V)	3	3.5	3.5	3.5	3.5	4

∗ The operating ranges are provided as guidelines including hystereses and are not guaranteed values (assuming approximately ±30% variations). They may vary significantly with ambient environments.

Minimum Auto Switch Mounting Stroke

(mm)

Bore size (mm)	Auto switch model / Number of auto switches	**D-A9□**	**A9□V**	**D-M9□**	**D-M9□V**	**D-F9□W**	**D-F9□WV**	**D-F9BAL**
20	2 pcs.	10	10	15	5	15	10	20
	1 pc.	10	5	15	5	15	5	20
25,32,40,50	2 pcs.	10	10	10	5	10	10	20
	1 pc.	10	5	10	5	10	5	20
63	2 pcs.	10	10	10	5	10	10	15
	1 pc.	5	5	5	5	10	5	15

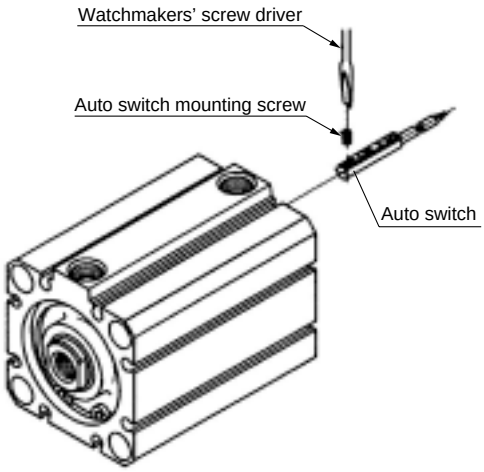
Besides the models listed in “How to Order,” the following auto switches are applicable.
Refer to Best Pneumatics for detailed specifications.

Type	Part no.	Electrical entry	Features
Solid state switch	**D-F9G**	Grommet (In-line)	Normally closed (N.C. = b contact), 3-wire
	D-F9H		Normally closed (N.C. = b contact), 2-wire

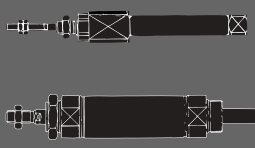
Mounting of Auto Switch

To mount auto switches, follow the instruction illustrated below.

ø20 to ø63/Direct mounting



- Use a watchmakers' screwdriver with a handle 5 to 6 mm in diameter when tightening the auto switch mounting screw.
  Tightening torque should be set 0.10 to 0.20 N·m.



ISO Cylinder

Series C85

ø8, ø10, ø12, ø16, ø20, ø25

Conforms to ISO 6432 and CETOP RP52P

Variations

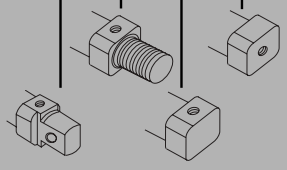
Series	Action	Rod style	Cushion	Head cover style N	Head cover style E	Head cover style F	Head cover style Y	Switch mount Rail	Switch mount Band	Rot boot (ø20, 25)	Bore (mm)	Page
Standard Series C85 	Double acting	Single	Rubber	●	●	●	●	●	●	●	ø8 to 25	3-2
			Air		●						ø10 to 25	
		Double	Rubber		●						ø8 to 25	
			Air		●						ø10 to 25	
	Single acting	Single (SR, SE)	Rubber	●	●	●	●	●	●	●	ø8 to 25	3-16
Non-rotating rod 	Double acting	Single	Rubber	●	●	●	●	●	●	●	ø8 to 25	3-2
	Single acting	Single (SR, SE)	Rubber	●	●	●	●	●	●	●	ø8 to 25	3-16
Direct mount 	Base Double acting	Single	Rubber		●	●	●				ø8 to 25	3-30
	Front Double acting	Single	Rubber		●	●	●				ø20, 25	

(Not for SE)

(Not for SE)

Mounting style

SR=Spring return
SE=Spring extend



ISO Cylinder/Standard, Non-rotating Rod: Double Acting

Series C85

ø8, ø10, ø12, ø16, ø20, ø25

How to Order

Double acting Single rod

C D 85 K N 20 – 40 C J A XC6

Double acting Double rod

C D 85 W E 20 – 40 C JJ – B

Magnet

—	None
D	Built-in magnet

Style

—	Standard
K	Non-rotating rod (only rubber bumper)

Head cover style

Symbol	Mounting
N	Basic integrated clevis
E*,**	Double end
F**	Boss cut
Y**	Boss cut - End port

* Double acting/Double rod: Only double end style (E).
** Except for: air cushion, single acting (T) style.

Bore size-Stroke

Bore size (mm)	Standard stroke (mm)**	Max. stroke		
		Standard	Non-rotating	Double rod
ø8*	10, 25, 40, 50, 80, 100	400	100	100
ø10				
ø12	10, 25, 40, 50, 80, 100, 125, 160, 200		200	200
ø16				
ø20	10, 25, 40, 50, 80, 100, 125, 160, 200, 250, 300	1000	1000	500
ø25				

* Not available with air cushion.
** Other strokes available on request.

Auto switch mounting style

A	Rail
B	Band

Applicable auto switches and bands are shown on p.3-35 Please order auto switches and bands separately.

Other variations' suffix

XC6B*	Stainless steel piston rod, piston rod nut and mounting nut
XC6A*	Stainless steel piston rod and piston rod nut

* Only ø20, ø25

Rod boot (only ø20, ø25)

—	Without rod boot
J	Nylon tarpaulin one side
K	Neoprene cloth one side
JJ*	Nylon tarpaulin both sides
KK*	Neoprene cloth both sides

* In case of double acting/double rod.

Cushion

—	Rubber bumper (Standard)
C	Air cushion (only "N" execution, bores 10 to 25mm)

Mounting Bracket Part No.

Bracket \ Bore (mm)	8	10	12	16	20	25
Foot (1 pc.)	C85L10A		C85L16A		C85L25A	
Foot (2 pcs. with mounting nut 1 pc.)	C85L10B		C85L16B		C85L25B	
Flange	C85F10		C85F16		C85F25	
Trunnion	C85T10		C85T16		C85T25	
Clevis	C85C10		C85C16		C85C25	
Single knuckle joint	KJ4D		KJ6D		KJ8D	KJ10D
Double knuckle joint	GKM4-8		GKM6-10		GKM8-16	GKM10-20
Floating joint	JA10-4-070		JA15-6-100		JA20-8-125	JA30-10-125

Note) Please order mounting brackets separately.

Replacement Parts

For Standard Cylinders

Bore (mm)	Kit No.	Note
20	C85-20PS	Every set includes: 1 rod seal, 1 packing retaining washer, 1 retaining ring
25	C85-25PS	

For Non-rotating Cylinders ("K")

Bore (mm)	Kit No.	Note
20	C85K-20PS	Every set includes: 1 rod seal, 1 packing retaining washer, 1 retaining ring
25	C85K-25PS	

Rubber Bumper/Single Rod

Air Cushion/Single Rod

Rubber Bumper/Double Rod

Air Cushion/Double Rod

Non-rotating rod/Single Rod

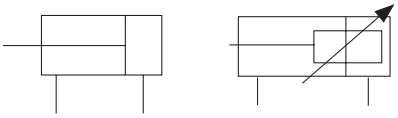
Specifications

Bore size (mm)		8	10	12	16	20	25
Piston rod dia. (mm)		4	4	6	6	8	10
Piston rod thread		M4	M4	M6	M6	M8	M10 X 1.25
Ports		M5	M5	M5	M5	G1/8	G1/8
Action		Double acting/Single or Double rod					
Fluid		Air					
Proof pressure		1.5MPa					
Max operating pressure		1.0MPa					
Min operating pressure		0.1MPa	0.08MPa		0.05MPa		
Ambient and fluid temperature		–20 to 80°C (Built-in magnet: –10 to 60°C)					
Cushion		Rubber bumper, Air cushion (Except for ø8) (Non-rotating: only rubber bumper)					
Lubrication		Not required. If necessary turbine oil no.1 ISOVG32 is recommended					
Rod boot	Nylon tarpaulin	—				Max ambient temperature 60°C	
	Neoprene cloth	—				Max ambient temperature 110°C*	
Piston speed		50 to 1500mm/s					
Allowable kinetic energy	Rubber bumper	0.02J	0.03J	0.04J	0.09J	0.27J	0.4J
	Air cushion	—	0.17J	0.19J	0.4J	0.66J	0.97J
Non-rotating accuracy**		±1° 30'	±1° 30'	± 1°	±1°	±0° 42'	±0° 42'
Stroke tolerance		0/+1				0/+1.4	

* Maximum ambient temperature of gaiters only.
** Applicable to non-rotating models only.

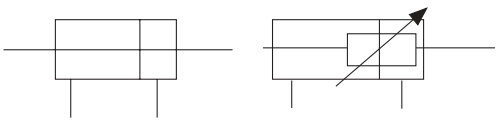
Symbol

Double Acting/Single Rod



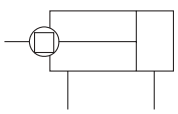
Rubber Bumper Air Cushion

Double Acting/Double Rod



Rubber Bumper Air Cushion

Non-rotating rod: Double Acting/Single Rod



Weight (Standard, Non-rotating rod)

(g)

Bore size (mm)			8	10	12	16	20	25
Double action	Basic weight		45	49	96	109	183(203)	258(286)
Double rod	Add'l weight for each 10mm of stroke		3	3.2	6.2	7.2	11.8	18.4
Mounting bracket		C85L□A	20		40		95	
		C85L□B	55		105		210	
		C85F□	12		25		90	
		C85T□	20		50		75	
		C85C□	20		40		85	
Accessories	Single knuckle joint	KJ□D	17		25		45	70
	Double knuckle joint	GKM□-□	10		20		50	100
	Floating joint	JA□-□-□	10		20		50	70

Calculation Example: C85N10-50, C85F10

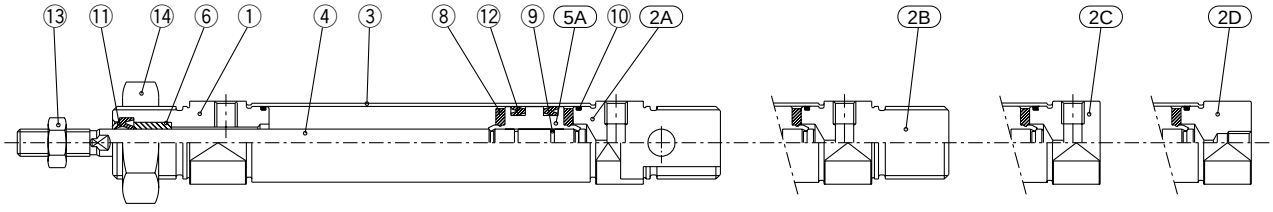
( ): In case of air cushion

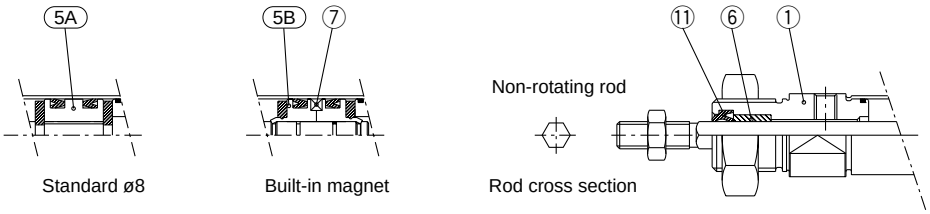
Basic weight·····49 (ø10)
Additional weight·····3.2/10mm of stroke
Cylinder stroke·····50mm
Mounting bracket····· 12
49+3.2 X 50/10=65 65+12=77

Construction

Double acting: Single rod

C□85□8 to16 Rubber bumper (Disassembly is not possible)



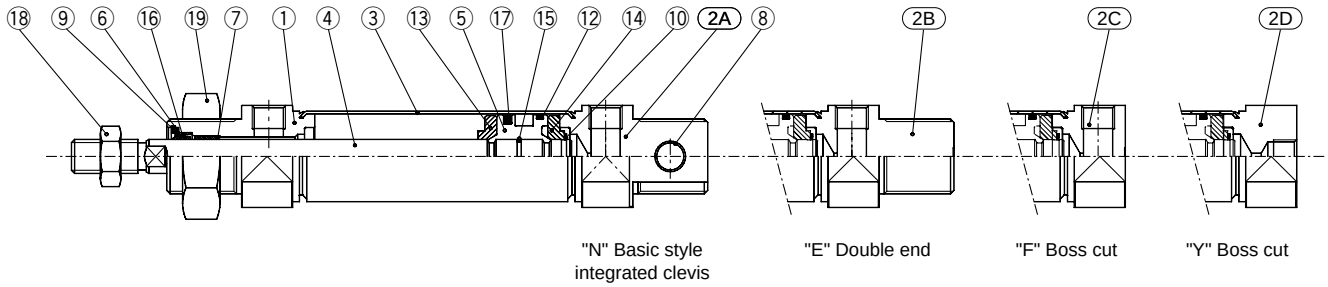


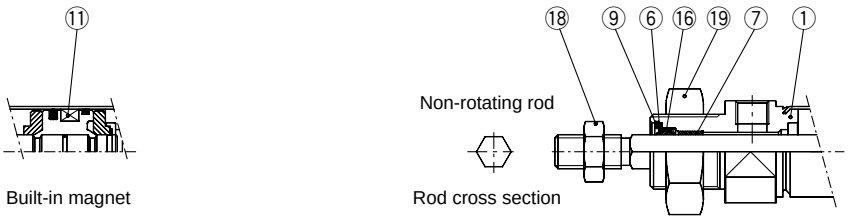
Component Parts

No.	Description	Material	Quantity	Remarks
①	Rod cover	Aluminum alloy	1	White anodized
2A	Head cover N	Aluminum alloy	1	White anodized
2B	Head cover E	Aluminum alloy	1	White anodized
2C	Head cover F	Aluminum alloy	1	White anodized
2D	Head cover Y	Aluminum alloy	1	White anodized
③	Cylinder tube	Stainless steel	1	
④	Piston rod	Stainless steel	1	
5A	Piston A	Brass	1	
5B	Piston B	Brass	2	(Switch style piston)

No.	Description	Material	Quantity	Remarks
⑥	Bushing	Sintered bronze	1	
⑦	Magnet		1	(Switch style only)
⑧	Bumper	Urethane	2	
⑨	Piston gasket	NBR	1	(2 for switch style)
⑩	Tube gasket	NBR	2	
⑪	Rod seal	NBR	1	
⑫	Piston seal	NBR	2	
⑬	Rod end nut	Carbon steel	1	Nickel plated
⑭	Mounting nut	Carbon steel	1	Nickel plated

C□85□20, 25 Rubber bumper





Component Parts

No.	Description	Material	Quantity	Remarks
①	Rod cover	Aluminum alloy	1	White anodized
2A	Head cover N	Aluminum alloy	1	White anodized
2B	Head cover E	Aluminum alloy	1	White anodized
2C	Head cover F	Aluminum alloy	1	White anodized
2D	Head cover Y	Aluminum alloy	1	White anodized
③	Cylinder tube	Stainless steel	1	
④	Piston rod	Carbon steel	1	Hard chrome plated
⑤	Piston	Aluminum alloy	1	Chromated
⑥	Plain washer	Carbon steel	1	Nickel plated
⑦	Bushing	Sintered bronze	1	
⑧	Bushing	Sintered bronze	2	

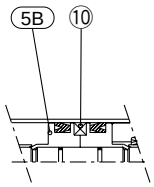
No.	Description	Material	Quantity	Remarks
⑨	Retaining ring	Carbon steel	1	Nickel plated
⑩	Retaining ring	Carbon steel	2	
⑪	Magnet		1	(Switch style only)
⑫	Wear ring	Phenolic resin	1	
⑬	Bumper A	Urethane	1	
⑭	Bumper B	Urethane	1	
⑮	Piston gasket	NBR	1	
⑯	Rod seal	NBR	1	
⑰	Piston seal	NBR	1	
⑱	Rod end nut	Carbon steel	1	Nickel plated
⑲	Mounting nut	Carbon steel	1	Nickel plated

∗ Stainless steel (Non-rotating rod)

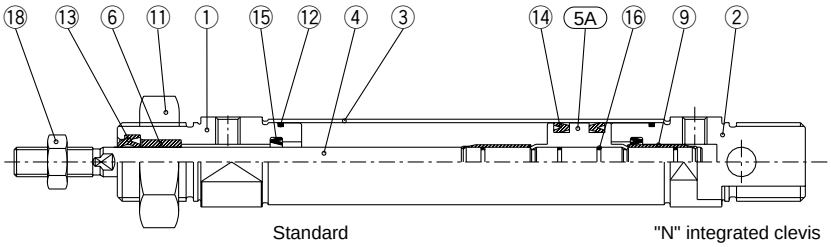
Construction

Double acting: Single rod

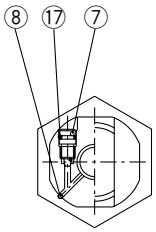
C□85□10 to 16 Air cushion (Disassembly is not possible)



Built-in magnet



Standard



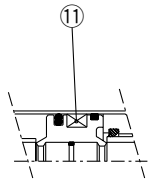
"N" integrated clevis

Component Parts

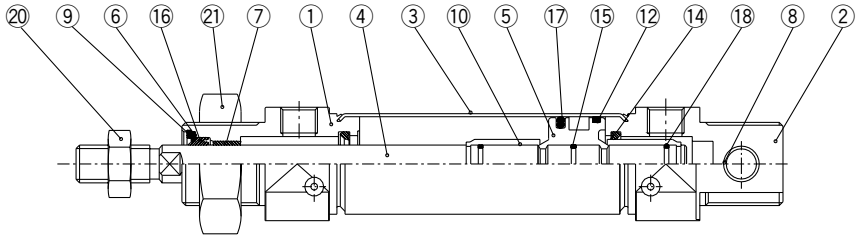
No.	Description	Material	Quantity	Remarks
①	Rod cover	Aluminum alloy	1	White anodized
②	Head cover N	Aluminum alloy	1	White anodized
③	Cylinder tube	Stainless steel	1	
④	Piston rod	Stainless steel	1	
5A	Piston A	Brass	1	
5B	Piston B	Brass	2	(Switch style piston)
⑥	Bush	Sintered bronze	1	
⑦	Cushion needle	Stainless steel	2	
⑧	Steel ball	Bearing steel	2	

No.	Description	Material	Quantity	Remarks
⑨	Cushion ring	Brass	2	
⑩	Magnet		1	
⑪	Mounting nut	Carbon steel	1	Nickel plated
⑫	Tube gasket	NBR	2	
⑬	Rod seal	NBR	1	
⑭	Piston seal	NBR	2	
⑮	Check seal	NBR	2	
⑯	Piston gasket & cushion ring gasket	NBR	3	
⑰	Needle seal	NBR	2	
⑱	Rod end nut	Carbon steel	1	Nickel plated

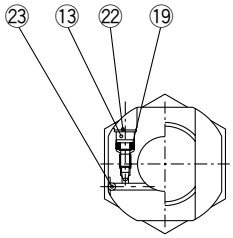
C□85□20, 25 Air cushion



Built-in magnet



Standard



"N" integrated clevis

Component Parts

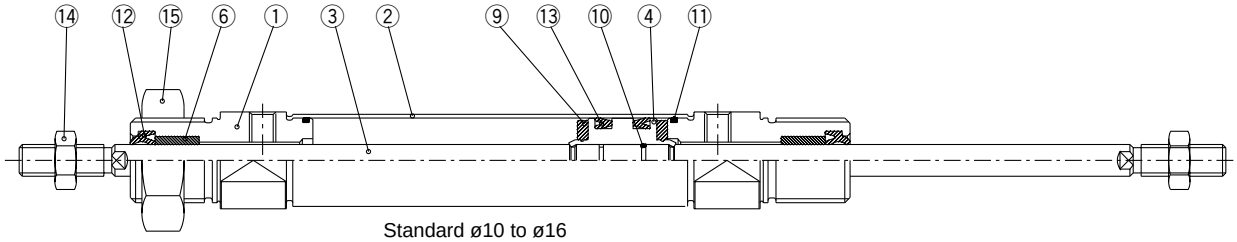
No.	Description	Material	Quantity	Remarks
①	Rod cover	Aluminum alloy	1	White anodized
②	Head cover N	Aluminum alloy	1	White anodized
③	Cylinder tube	Stainless steel	1	
④	Piston rod	Carbon steel	1	Hard chrome plated
⑤	Piston	Aluminum alloy	1	Chromated
⑥	Plain washer	Carbon steel	1	Nickel plated
⑦	Bushing	Sintered bronze	1	
⑧	Bushing	Sintered bronze	1	
⑨	Retaining ring	Carbon steel	1	Nickel plated
⑩	Cushion ring	Copper alloy	2	Hard chrome plated
⑪	Magnet		1	
⑫	Wear ring	Phenolic resin	1	

No.	Description	Material	Quantity	Remarks
⑬	Cushion valve	Carbon steel	2	Nickel plated
⑭	Cushion seal	Urethane	2	
⑮	Piston gasket	NBR	1	
⑯	Rod seal	NBR	1	
⑰	Piston seal	NBR	1	
⑱	Cushion ring gasket	NBR	2	
⑲	Cushion valve packing	NBR	2	
⑳	Rod end nut	Carbon steel	1	Nickel plated
㉑	Mounting nut	Carbon steel	1	Nickel plated
㉒	Self locking ring	Stainless steel	2	
㉓	Steel ball	Stainless steel	2	

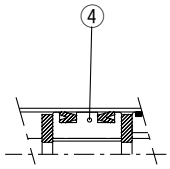
Construction

Double acting: Double rod

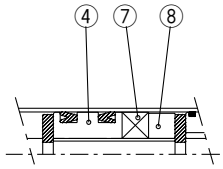
C□85WE 8 to 16 Rubber bumper (Disassembly is not possible)



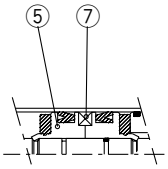
Standard ø10 to ø16



Standard ø8



Built-in magnet ø8



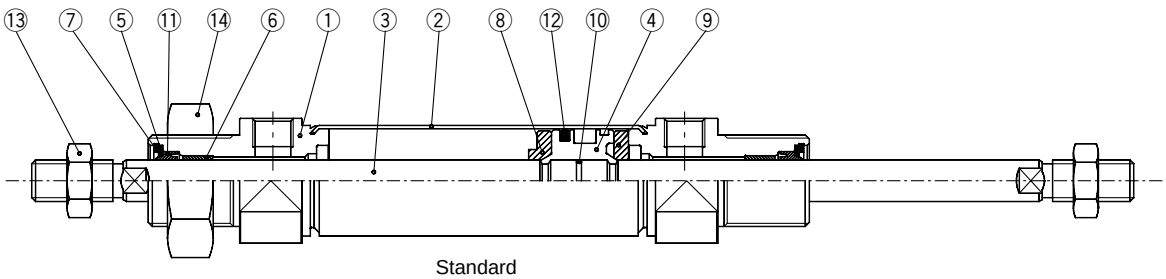
Built-in magnet ø10 to ø16

Component Parts

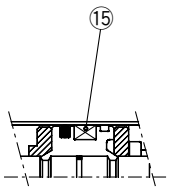
No.	Description	Material	Quantity	Remarks
①	Rod cover	Aluminum alloy	2	White anodized
②	Cylinder tube	Stainless steel	1	
③	Piston rod	Stainless steel	1	2 for ø8
④	Piston A	Brass	1	
⑤	Piston B	Brass	2	(Switch style piston)
⑥	Bushing	Sintered bronze	2	
⑦	Magnet		1	(Switch style only)
⑧	Spacer	Brass	1	

No.	Description	Material	Quantity	Remarks
⑨	Bumper	Urethane	2	
⑩	Piston gasket	NBR	1	2 for switch style
⑪	Tube gasket	NBR	2	
⑫	Rod seal	NBR	2	
⑬	Piston seal	NBR	2	
⑭	Rod end nut	Carbon steel	2	Nickel plated
⑮	Mounting nut	Carbon steel	1	Nickel plated

C□85WE 20, 25 Rubber bumper



Standard



Built-in magnet

Component Parts

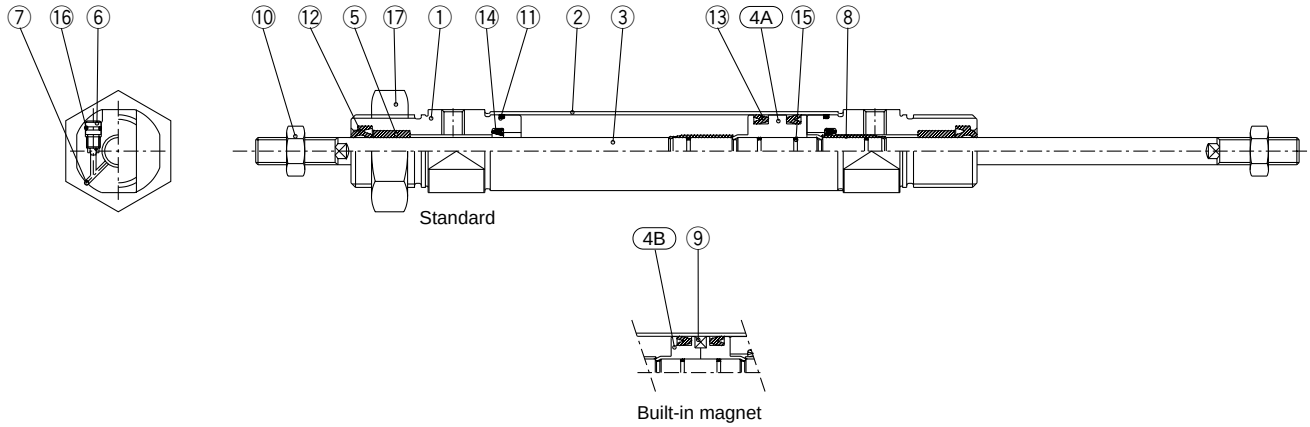
No.	Description	Material	Quantity	Remarks
①	Rod cover	Aluminum alloy	2	White anodized
②	Cylinder tube	Stainless steel	1	
③	Piston rod	Carbon steel	1	Hard chrome plated
④	Piston	Aluminum alloy	1	Chromated
⑤	Plain washer	Carbon steel	2	Nickel plated
⑥	Bushing	Sintered bronze	2	
⑦	Retaining ring	Carbon steel	2	Nickel plated
⑧	Bumper A	Urethane	1	

No.	Description	Material	Quantity	Remarks
⑨	Bumper B	Urethane	1	
⑩	Piston gasket	NBR	1	
⑪	Rod seal	NBR	2	
⑫	Piston seal	NBR	1	
⑬	Rod end nut	Carbon steel	2	Nickel plated
⑭	Mounting nut	Carbon steel	1	Nickel plated
⑮	Magnet		1	(Switch style only)

Construction

Double acting: Double rod

C□85WE 10 to 16 Air cushion (Disassembly is not possible)

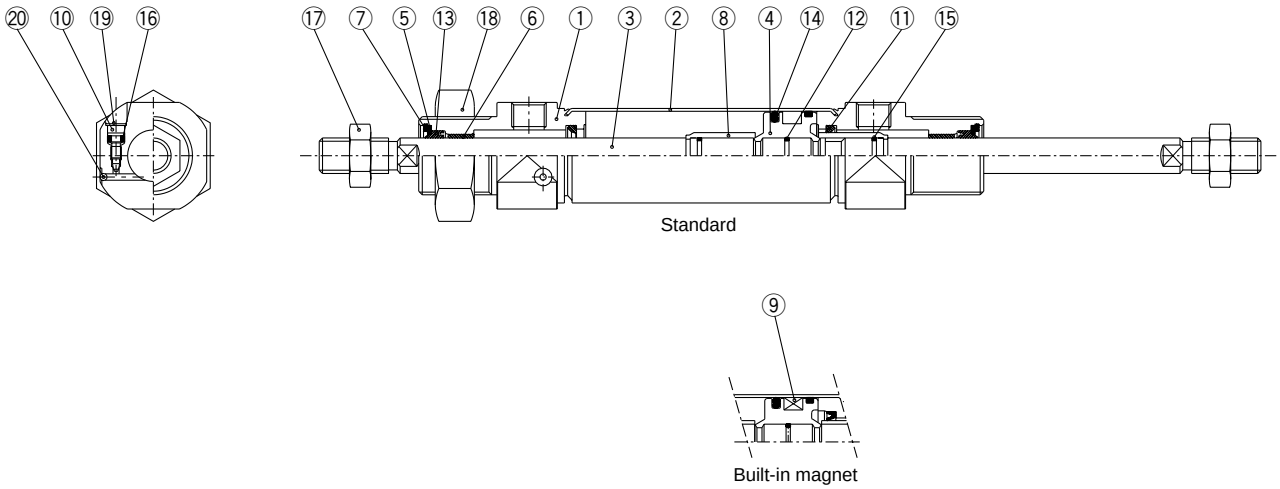


Component Parts

No.	Description	Material	Quantity	Remarks
①	Rod cover	Aluminum alloy	2	White anodized
②	Cylinder tube	Stainless steel	1	
③	Piston rod	Stainless steel	1	
4A	Piston A	Brass	1	
4B	Piston B	Brass	2	(Switch style piston)
⑤	Bushing	Sintered bronze	2	
⑥	Cushion needle	Stainless steel	2	
⑦	Steel ball	Bearing steel	2	
⑧	Cushion ring	Brass	2	

No.	Description	Material	Quantity	Remarks
⑨	Magnet		1	
⑩	Rod end nut	Carbon steel	2	Nickel plated
⑪	Tube gasket	NBR	2	
⑫	Rod seal	NBR	2	
⑬	Piston seal	NBR	2	
⑭	Check seal	NBR	2	
⑮	Piston gasket & cushion ring gasket	NBR	3	
⑯	Needle seal	NBR	2	
⑰	Mounting nut	Carbon steel	1	Nickel plated

C□85WE 20, 25 Air cushion



Component Parts

No.	Description	Material	Quantity	Remarks
①	Rod cover	Aluminum alloy	2	White anodized
②	Cylinder tube	Stainless steel	1	
③	Piston rod	Carbon steel	1	Hard chrome plated
④	Piston	Aluminum alloy	1	Chromated
⑤	Plain washer	Carbon steel	2	Nickel plated
⑥	Bushing	Sintered bronze	2	
⑦	Retaining ring	Carbon steel	2	Nickel plated
⑧	Cushion ring	Copper alloy	2	Hard chrome plated
⑨	Magnet			
⑩	Cushion valve	Carbon steel	2	Nickel plated

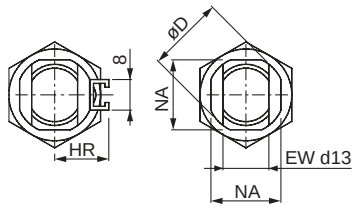
No.	Description	Material	Quantity	Remarks
⑪	Cushion seal	Urethane	2	
⑫	Piston gasket	NBR	1	
⑬	Rod seal	NBR	2	
⑭	Piston seal	NBR	1	
⑮	Cushion ring gasket	NBR	2	
⑯	Cushion valve packing	NBR	2	
⑰	Rod end nut	Carbon steel	2	Nickel plated
⑱	Mounting nut	Carbon steel	1	Nickel plated
⑲	Self locking ring	Stainless steel	2	
⑳	Steel ball	Stainless steel	2	

Dimensions

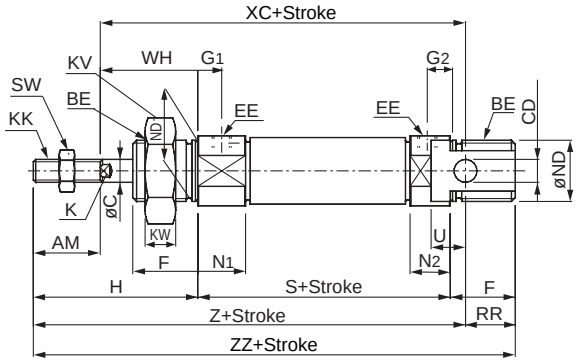
Double acting: Single rod

Rubber bumper/C□85N **Bore** — **Stroke** □

Without magnet, Built-in magnet

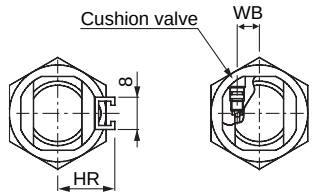


Rail style (A) Band style (B) or non-magnet

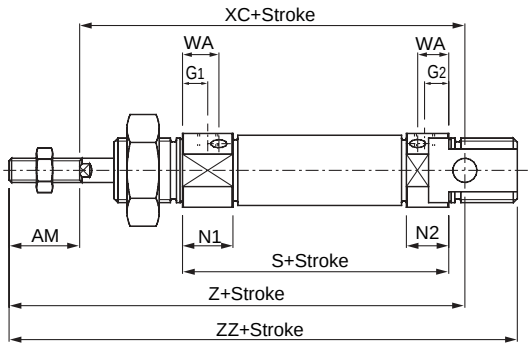


Air cushion/C□85N **Bore** — **Stroke** **C** — □

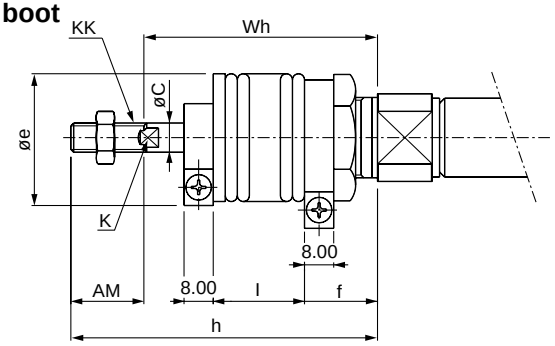
Without magnet, Built-in magnet



Rail style (A) Band style (B) or non-magnet

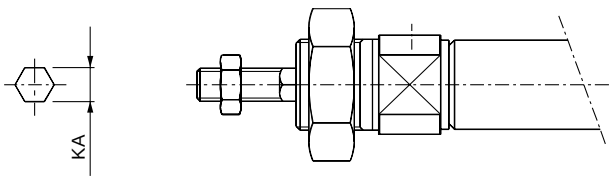


With rod boot



C□85KN

Non-rotating rod (Rubber bumper only)



Rod cross section

Unit: (mm)

Bore	AM	BE	øC	CD	øD	EE	EW	F	G1	G2	WA	WB	H	HR	K	KA	KK	KV	KW	N1	N2	NA	øND(h8)	RR	S	SW	U	WH	XC	Z	ZZ
ø8	12	M12 X 1.25	4	$4^{+0.030}_{0}$	16.7	M5	8	12	7	5	—	—	28	10	—	4.2	M4	19	6	11.5	9.5	15	12	10	46	7	6	16	64	76	86
ø10	12	M12 X 1.25	4	$4^{+0.030}_{0}$	16.7	M5	8	12	7 (5.5)	5 (5.5)	10.5	4.5	28	10.5	—	4.2	M4	19	6	11.5 (13.5)	9.5 (13.5)	15	12	10	46 (53)	7	6	16	64 (71)	76 (83)	86 (93)
ø12	16	M16 X 1.5	6	$6^{+0.030}_{0}$	19.7	M5	12	17	8 (5.5)	6 (5.5)	9.5	5.5	38	14	5	6.2	M6	24	8	12.5 (12.5)	10.5 (12.5)	18	16	14	50 (54)	10	9	22	75 (79)	91 (95)	105 (109)
ø16	16	M16 X 1.5	6	$6^{+0.030}_{0}$	19.7	M5	12	17	8 (5.5)	6 (5.5)	9.5	5.5	38	14	5	6.2	M6	24	8	12.5 (12.5)	10.5 (12.5)	18	16	13	56 (56)	10	9	22	82 (82)	98 (98)	111 (111)
ø20	20	M22 X 1.5	8	$8^{+0.036}_{-0.006}$	28	G1/8	16	20	8	8	13	8.5	44	17	6	8.2	M8	32	10	15(17)	15(17)	24	22	11	62	13	12	24	95	115	126
ø25	22	M22 X 1.5	10	$8^{+0.036}_{-0.006}$	33.5	G1/8	16	22	8	8	13	10.5	50	20	8	10.2	M10 X 1.25	32	10	15(17)	15(17)	30	22	11	65	17	12	28	104	126	137

( ): In case of air cushion.

With rod boot

Bore \ Item / Stroke	AM	øC	øe	f	K	KK	h						
							1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	20	8	35	20	6	M8	71	84	96	109	134	159	—
25	22	10	35	20	8	M10 X 1.25	74	87	99	112	137	162	187

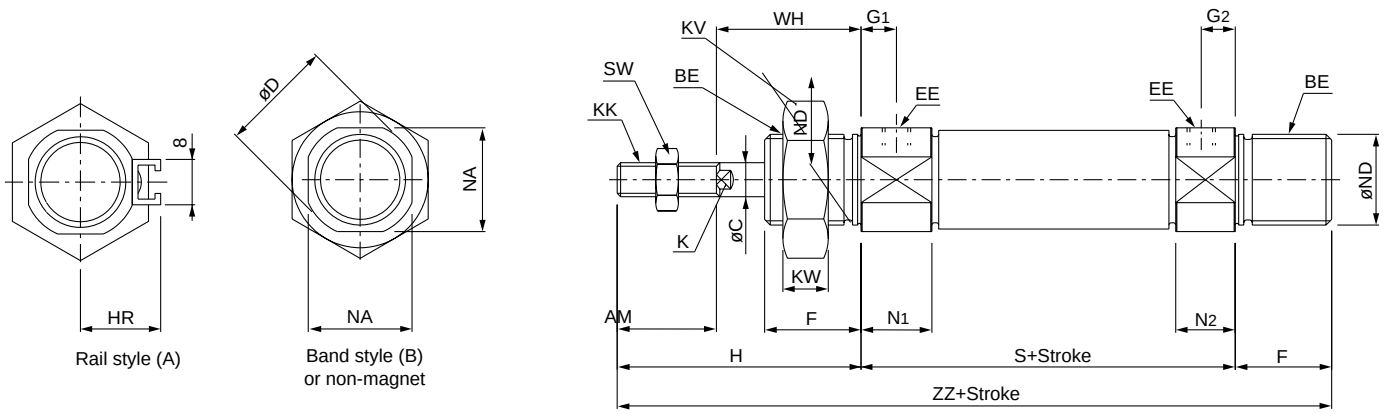
Bore \ Item / Stroke	l							Wh						
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	12.5	25	37.5	50	75	100	—	51	64	76	89	114	139	—
25	12.5	25	37.5	50	75	100	125	52	65	77	90	115	140	165

Dimensions

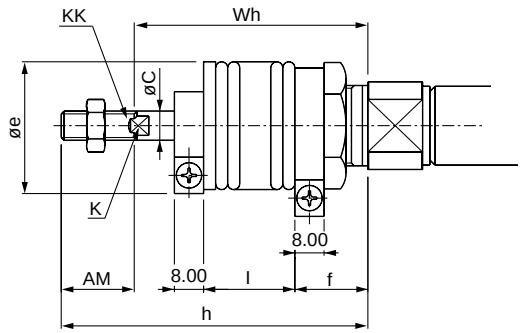
Double acting: Single rod

Rubber bumper/C□85E **Bore** — **Stroke** □

Without magnet, Built-in magnet

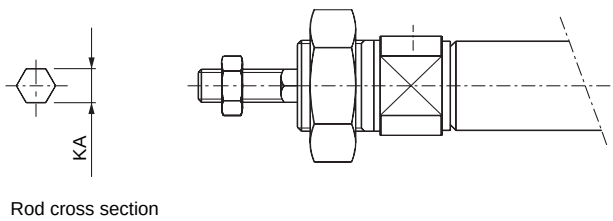


With rod boot



C□85KE

Non-rotating rod (Rubber bumper only)



Unit: (mm)

Bore	AM	BE	øC	øD	EE	F	G1	G2	H	HR	K	KA	KK	KV	KW	N1	N2	NA	øND(h8)	S	SW	WH	ZZ
ø8	12	M12 X 1.25	4	16.7	M5	12	7	5	28	10	—	4.2	M4	19	6	11.5	9.5	15	12	46	7	16	86
ø10	12	M12 X 1.25	4	16.7	M5	12	7	5	28	10.5	—	4.2	M4	19	6	11.5	9.5	15	12	46	7	16	86
ø12	16	M16 X 1.5	6	19.7	M5	17	8	6	38	14	5	6.2	M6	24	8	12.5	10.5	18	16	50	10	22	105
ø16	16	M16 X 1.5	6	19.7	M5	17	8	6	38	14	5	6.2	M6	24	8	12.5	10.5	18	16	56	10	22	111
ø20	20	M22 X 1.5	8	27.9	G1/8	20	8	8	44	17	6	8.2	M8	32	10	15	15	24	22	62	13	24	126
ø25	22	M22 X 1.5	10	33.4	G1/8	22	8	8	50	20	8	10.2	M10 X 1.25	32	10	15	15	30	22	65	17	28	137

With rod boot

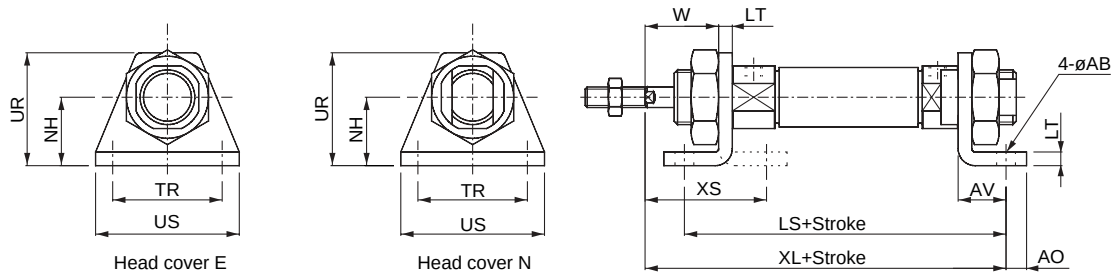
Item / Bore / Stroke	AM	øC	øe	f	K	KK	h						
							1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	20	8	35	20	6	M8	71	84	96	109	134	159	—
25	22	10	35	20	8	M10 X 1.25	74	87	99	112	137	162	187

Item / Bore / Stroke	l							Wh						
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	12.5	25	37.5	50	75	100	—	51	64	76	89	114	139	—
25	12.5	25	37.5	50	75	100	125	52	65	77	90	115	140	165

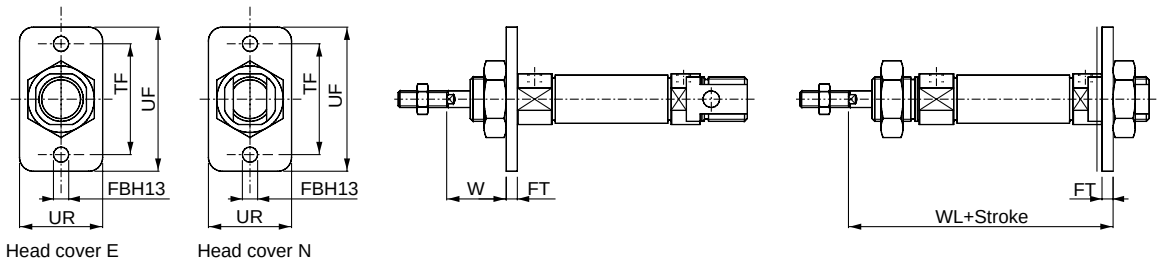
Dimensions with Mounting Brackets

Double acting: Single rod

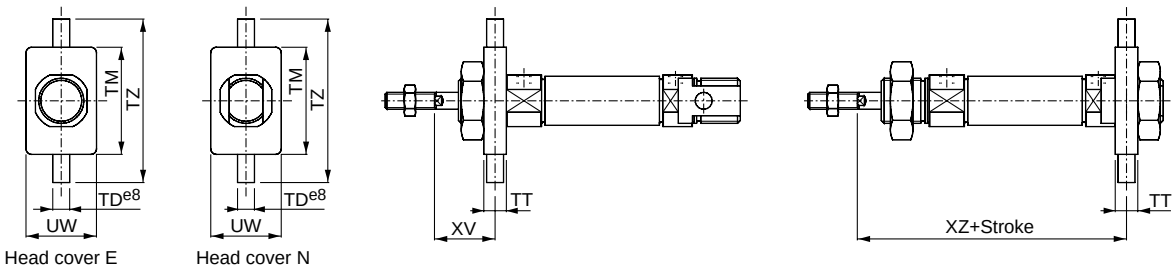
Front foot, Front and rear foot: C85L10$^{A}_{B}$, C85L16$^{A}_{B}$, C85L25$^{A}_{B}$



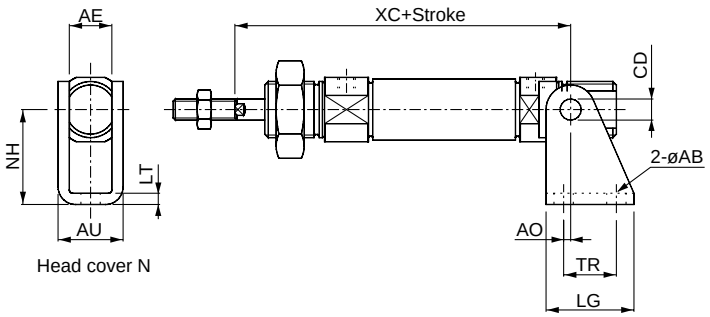
Front flange, Rear flange: C85F10, C85F16, C85F25



Front trunnion, Rear trunnion: C85T10, C85T16, C85T25



Clevis: C85C10, C85C16, C85C25



Unit: (mm)

Bore	Front foot, Front and rear foot												Front flange, Rear flange						
	AO	US	øAB	LT	NH	LS	XL	TR JS14	XS	AV	UR	W	UR	FBH13	FT	TF	UF	W	WL
ø8	5	35	4.5	3.2	16	68	73	25	23.8	11	26	12.8	22	4.5	3.2	30	40	12.8	65.2
ø10	5	35	4.5	3.2	16	68(75)	73(80)	25	23.8	11	26	12.8	22	4.5	3.2	30	40	12.8	65.2(72.2)
ø12	6	42	5.5	4	20	78(82)	86(90)	32	32	14	33	18	30	5.5	4	40	52	18	76(80)
ø16	6	42	5.5	4	20	84(84)	92(92)	32	32	14	33	18	30	5.5	4	40	52	18	82(82)
ø20	8	54	6.6	5	25	96	103	40	36	17	42	19	40	6.6	5	50	66	19	91
ø25	8	54	6.6	5	25	99	110	40	40	17	42	23	40	6.6	5	50	66	23	98

Bore	Front trunnion, Rear trunnion							Clevis									
	TT	UW	TD e8	TM	TZ	XV	XZ	CD	AE	øAB	AO	AU	TR	LG	NH	LT	XC
ø8	6	20	4	26	38	13	65	$4^{+0.030}_{0}$	8.1	4.5	1.5	13.1	12.5	20	24	2.5	64
ø10	6	20	4	26	38	13	65(72)	$4^{+0.030}_{0}$	8.1	4.5	1.5	13.1	12.5	20	24	2.5	64(71)
ø12	8	25	6	38	58	18	76(80)	$6^{+0.030}_{0}$	12.1	5.5	2	18.5	15	25	27	3.2	75(79)
ø16	8	25	6	38	58	18	82(82)	$6^{+0.030}_{0}$	12.1	5.5	2	18.5	15	25	27	3.2	82(82)
ø20	8	32	6	46	66	20	90	$8^{+0.036}_{0}$	16.1	6.6	4	24.1	20	32	30	4	95
ø25	8	32	6	46	66	24	97	$8^{+0.036}_{0}$	16.1	6.6	4	24.1	20	32	30	4	104

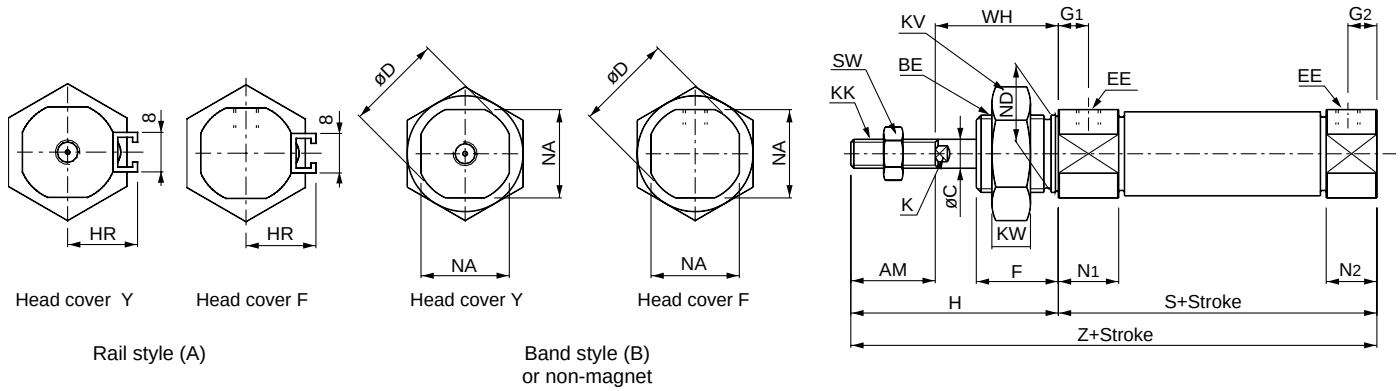
( ): In case of air cushion.

Dimensions

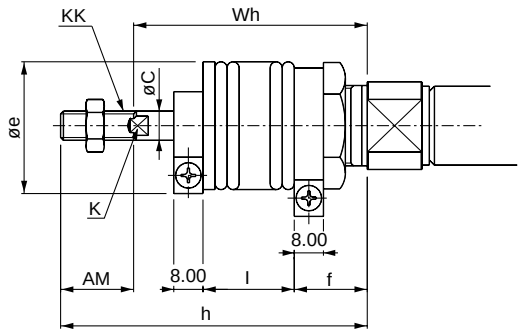
Double acting: Single rod

Rubber bumper/C□85F, Y **Bore** — **Stroke** □

Without magnet, Built-in magnet

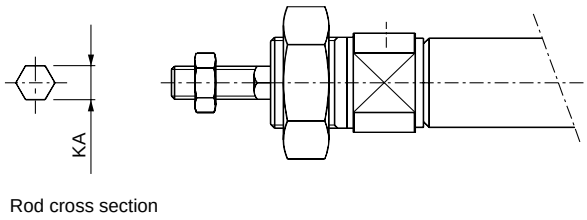


With rod boot



C□85KF, Y **Bore** — **Stroke** □

Non-rotating rod (Rubber bumper only)



Rod cross section

Unit: (mm)

Bore	AM	BE	øC	øD	EE	F	G1	G2	H	HR	K	KA	KK	KV	KW	N1	N2	NA	øND(h8)	S	SW	WH	Z
ø8	12	M12 X 1.25	4	16.7	M5	12	7	5	28	10	—	4.2	M4	19	6	11.5	9.5	15	12	46	7	16	74
ø10	12	M12 X 1.25	4	16.7	M5	12	7	5	28	10.5	—	4.2	M4	19	6	11.5	9.5	15	12	46	7	16	74
ø12	16	M16 X 1.5	6	19.7	M5	17	8	6	38	14	5	6.2	M6	24	8	12.5	10.5	18	16	50	10	22	88
ø16	16	M16 X 1.5	6	19.7	M5	17	8	6	38	14	5	6.2	M6	24	8	12.5	10.5	18	16	50	10	22	88
ø20	20	M22 X 1.5	8	27.9	G1/8	20	8	8	44	17	6	8.2	M8	32	10	15	15	24	22	62	13	24	106
ø25	22	M22 X 1.5	10	33.4	G1/8	22	8	8	50	20	8	10.2	M10 X 1.25	32	10	15	15	30	22	65	17	28	115

With rod boot

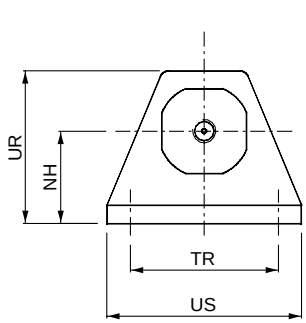
Item / Bore / Stroke	AM	øC	øe	f	K	KK	h						
							1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	20	8	35	20	6	M8	71	84	96	109	134	159	—
25	22	10	35	20	8	M10 X 1.25	74	87	99	112	137	162	187

Item / Bore / Stroke	l							Wh						
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	12.5	25	37.5	50	75	100	—	51	64	76	89	114	139	—
25	12.5	25	37.5	50	75	100	125	52	65	77	90	115	140	165

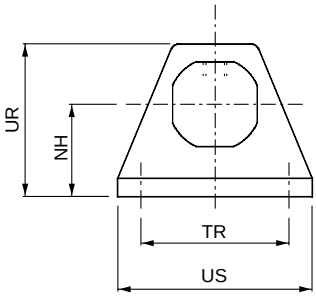
Dimensions with Mounting Brackets

Double acting: Single rod

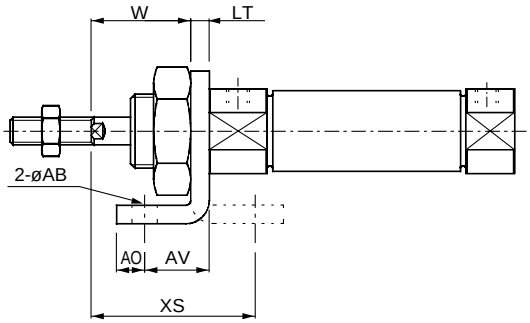
Front foot: C85L10A, C85L16A, C85L25A



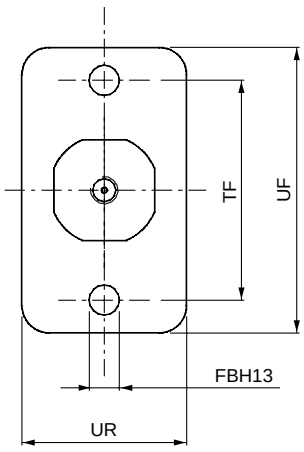
Head cover Y



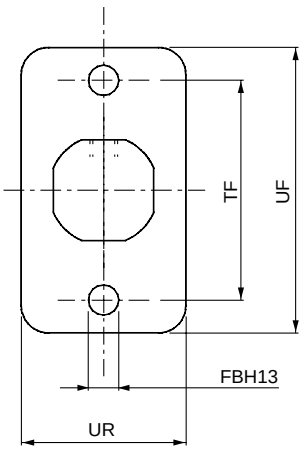
Head cover F



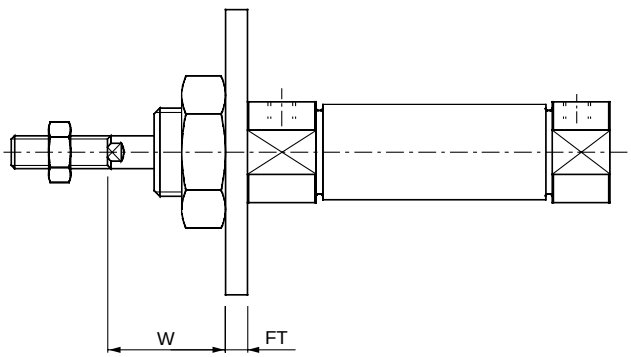
Front flange: C85F10, C85F16, C85F25



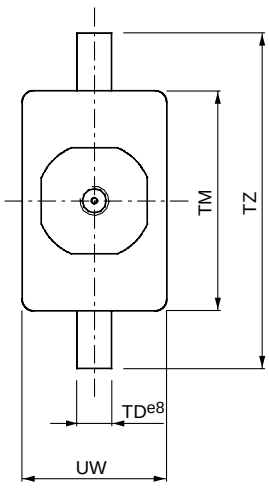
Head cover Y



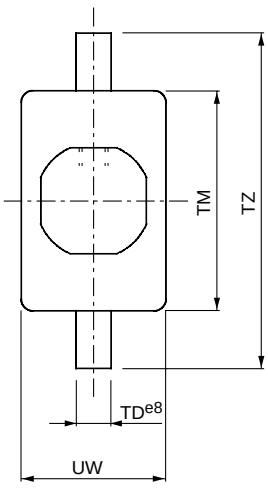
Head cover F



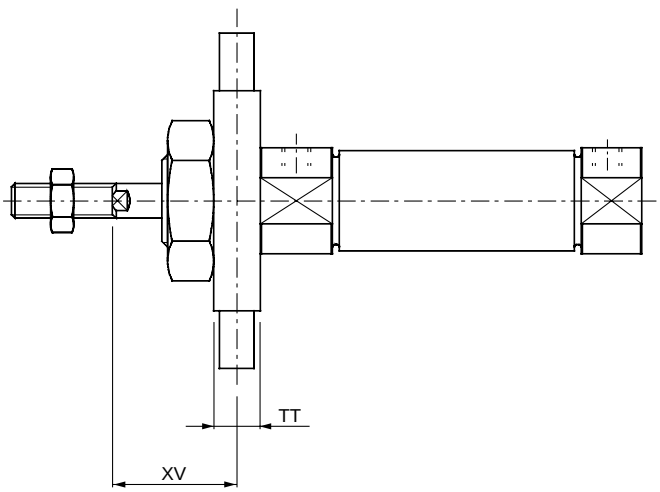
Front trunnion: C85T10, C85T16, C85T25



Head cover Y



Head cover F



Unit: (mm)

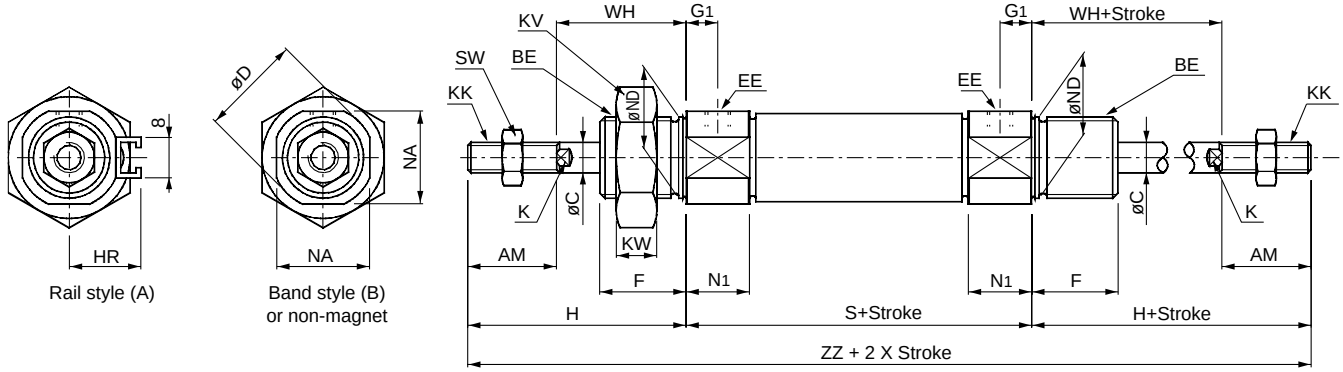
Bore	Front foot										Front flange						Front trunnion					
	AO	US	øAB	LT	NH	TR JS14	XS	AV	UR	W	UR	FBH13	FT	TF	UF	W	TT	UW	TD e8	TM	TZ	XV
ø8	5	35	4.5	3.2	16	25	23.8	11	26	12.8	22	4.5	3.2	30	40	12.8	6	20	4	26	38	13
ø10	5	35	4.5	3.2	16	25	23.8	11	26	12.8	22	4.5	3.2	30	40	12.8	6	20	4	26	38	13
ø12	6	42	5.5	4	20	32	32	14	33	18	30	5.5	4	40	52	18	8	25	6	38	58	18
ø16	6	42	5.5	4	20	32	32	14	33	18	30	5.5	4	40	52	18	8	25	6	38	58	18
ø20	8	54	6.6	5	25	40	36	17	42	19	40	6.6	5	50	66	19	8	32	6	46	66	20
ø25	8	54	6.6	5	25	40	40	17	42	23	40	6.6	5	50	66	23	8	32	6	46	66	24

Dimensions

Double acting: Double rod

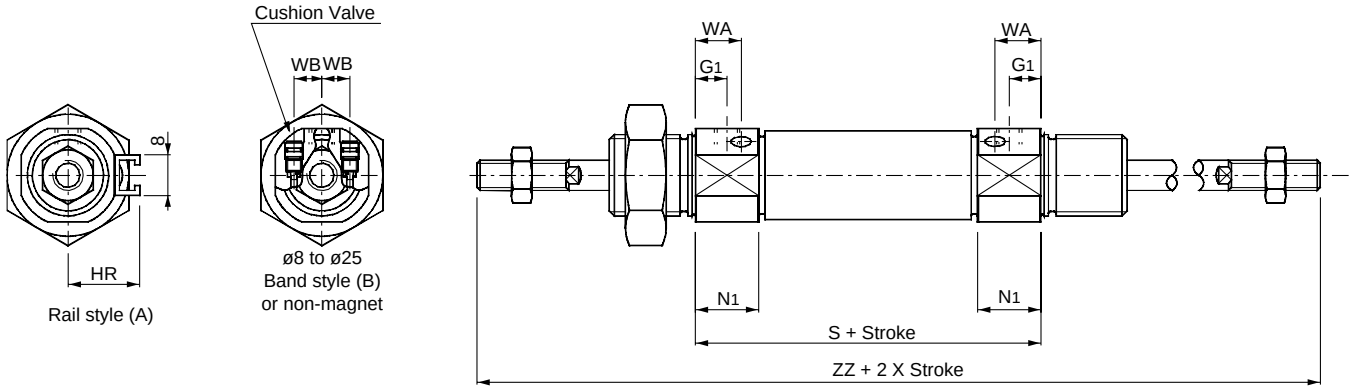
Rubber bumper/C□85WE **Bore** — **Stroke** □

Without magnet, Built-in magnet

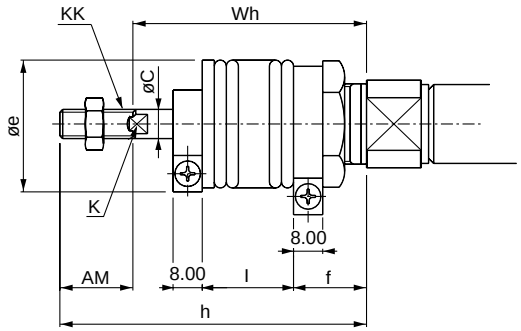


Air cushion/C□85WE **Bore** — **Stroke** **C** — □

Without magnet, Built-in magnet



With rod boot



Unit: (mm)

Bore	AM	BE	øC	øD	EE	F	G1	WA	WB	H	HR	K	KK	KV	KW	N1	NA	øND(h8)	S	SW	WH	ZZ
ø8	12	M12 X 1.25	4	16.7	M5	12	7	—	—	28	10	—	M4	19	6	11.5	15	12	48{54}	7	16	104{110}
ø10	12	M12 X 1.25	4	16.7	M5	12	7(5.5)	10.5	4.5	28	10.5	—	M4	19	6	11.5(13.5)	15	12	48(53)	7	16	104(109)
ø12	16	M16 X 1.5	6	19.7	M5	17	8(5.5)	9.5	5.5	38	14	5	M6	24	8	12.5(12.5)	18	16	52(54)	10	22	128(130)
ø16	16	M16 X 1.5	6	19.7	M5	17	8(5.5)	9.5	5.5	38	14	5	M6	24	8	12.5(12.5)	18	16	52(54)	10	22	128(143)
ø20	20	M22 X 1.5	8	28	G1/8	20	8	13	8.5	44	17	6	M8	32	11	15(17)	24	22	62	13	24	150
ø25	20	M22 X 1.5	10	33.5	G1/8	22	8	13	10.5	50	20	8	M10 X 1.25	32	11	15(17)	30	22	65	17	28	165

( ): In case of air cushion. { }: In case of built in magnet

With rod boot

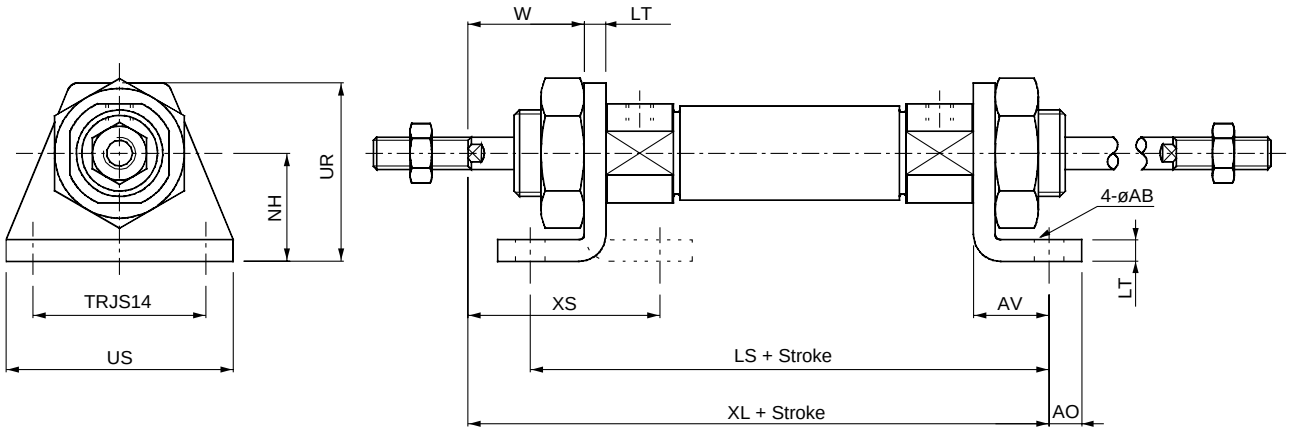
Bore \ Item / Stroke	AM	øC	øe	f	K	KK	h						
							1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	20	8	35	20	6	M8	71	84	96	109	134	159	—
25	22	10	35	20	8	M10 X 1.25	74	87	99	112	137	162	187

Bore \ Item / Stroke	l							Wh						
	1 to 50	50 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	12.5	25	37.5	50	75	100	—	51	64	76	89	114	139	—
25	12.5	25	37.5	50	75	100	125	52	65	77	90	115	140	165

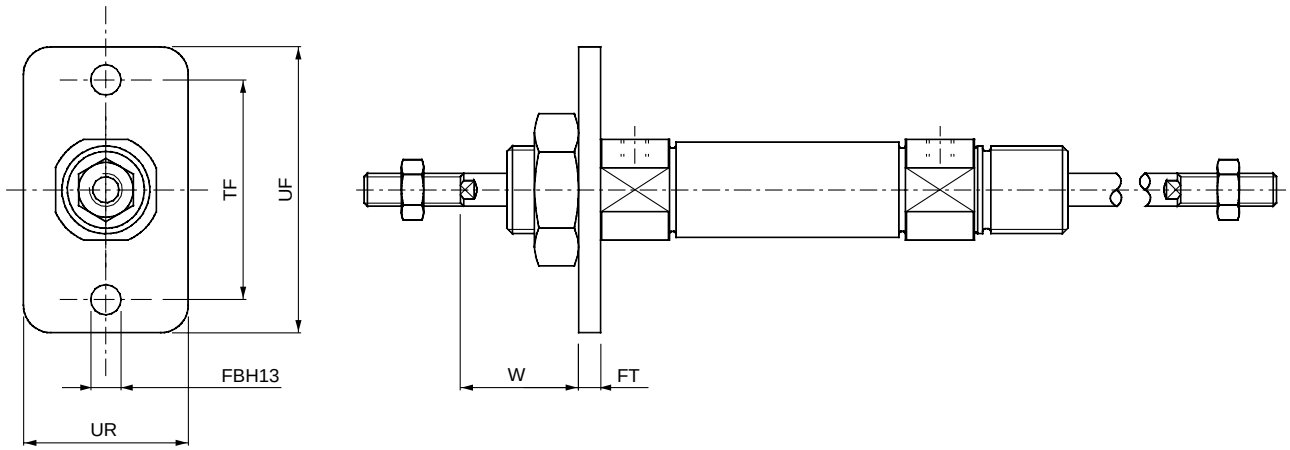
Dimensions with Mounting Brackets

Double acting: Double rod

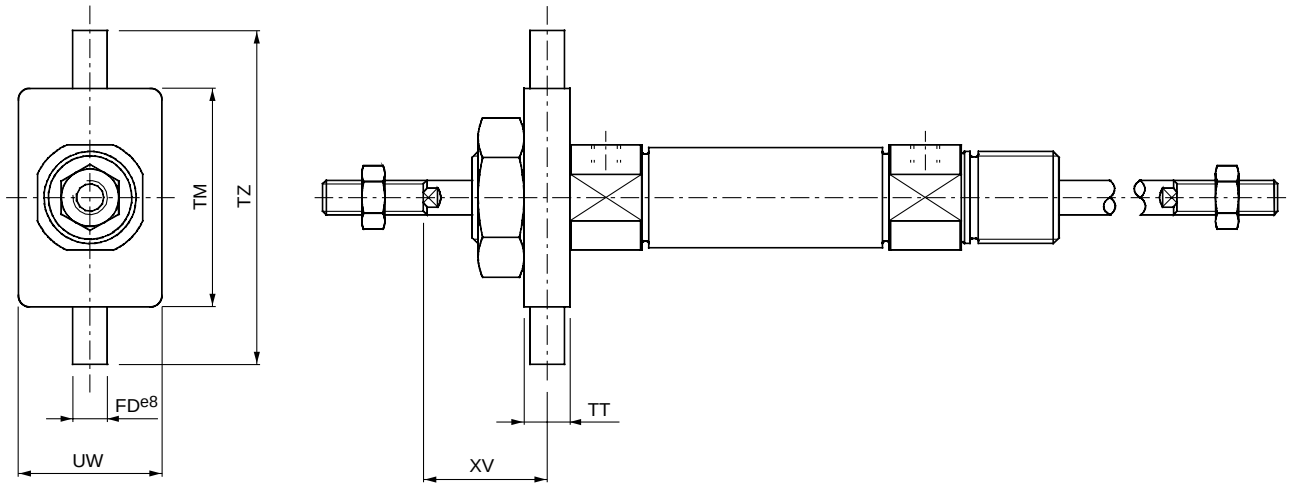
Front foot, Front and rear foot: C85L10 $^{A}_{B}$, C85L16 $^{A}_{B}$, C85L25 $^{A}_{B}$



Flange: C85F10, C85F16, C85F25



Trunnion: C85T10, C85T16, C85T25



Unit: (mm)

Bore	Front foot, Front and rear foot												Flange						Trunnion					
	AO	US	øAB	LT	NH	LS	XL	TR JS14	XS	AV	UR	W	UR	FBH13	FT	TF	UF	W	TT	UW	TD e8	TM	TZ	XV
ø8	5	35	4.5	3.2	16	70{76}	75{81}	25	23.8	11	26	12.8	22	4.5	3.2	30	40	12.8	6	20	4	26	38	13
ø10	5	35	4.5	3.2	16	70(75)	75(80)	25	23.8	11	26	12.8	22	4.5	3.2	30	40	12.8	6	20	4	26	38	13
ø12	6	42	5.5	4	20	80(82)	88(90)	32	32	14	33	18	30	5.5	4	40	52	18	8	25	6	38	58	18
ø16	6	42	5.5	4	20	80(82)	88(90)	32	32	14	33	18	30	5.5	4	40	52	18	8	25	6	38	58	18
ø20	8	54	6.6	5	25	96	103	40	36	17	42	19	40	6.6	5	50	66	19	8	32	6	46	66	20
ø25	8	54	6.6	5	25	99	110	40	40	17	42	23	40	6.6	5	50	66	23	8	32	6	46	66	24

( ): In case of air cushion. { }: In case of auto switch.

ISO Cylinder/Standard, Non-rotating Rod: Single Acting Spring Return/Extend

Series C85

ø8, ø10, ø12, ø16, ø20, ø25

How to Order

Single acting Spring return/extend

C D 85 K N 16 — 50 S — B

Magnet

—	None
D	Built-in magnet

Style

—	Standard
K	Non-rotating rod (only rubber bumper)

Mounting

Symbol	Mounting
N	Basic integrated clevis
E	Double end
F	Boss cut
Y*	Boss cut - End port

* Except for: air cushion, single acting (T) style.

Bore size-Stroke

Bore size (mm)	Standard stroke (mm)*	Max. stroke (mm)
ø8	10, 25, 50	50
ø10		
ø12		
ø16	10, 25, 50, 100, 150	150
ø20		
ø25		

* Other strokes available on request.

Single acting function

S	Spring return
T	Spring extend

Auto switch mounting

A	Rail sytle
B	Band style

Auto switches and bands are shown on p.3-35 Please order auto switches and bands separately.

Mounting Bracket Parts No.

Bracket \ Bore (mm)	8	10	12	16	20	25
Foot (1 pc.)	C85L10A		C85L6A		C85L25A	
Foot (2 pcs. with mounting nut 1 pc.)	C85L10B		C85L16B		C85L25B	
Flange	C85F10		C85F16		C85F25	
Trunnion	C85T10		C85T16		C85T25	
Clevis	C85C10		C85C16		C85C25	
Single knuckle joint	KJ4D		KJ6D		KJ8D	KJ10D
Double knuckle joint	GKM4-8		GKM6-10		GKM8-16	GKM10-20
Floating joint	JA10-4-070		JA15-6-100		JA20 -8-125	JA30 -10-125

Note) Please order mounting brackets separately.

Replacement Parts

For Standard Cylinders

Bore (mm)	Kit No.	Note
20	C85-20PS	Every set includes: 1 rod seal 1 packing retaining washer 1 retaining ring
25	C85-25PS	

For Non-rotating Cylinders ("K")

Bore (mm)	Kit No.	Note
20	C85K-20PS	Every set includes: 1 rod seal 1 packing retaining washer 1 retaining ring
25	C85K-25PS	

Spring return

Spring extend

Rubber bumper

Non-rotating rod

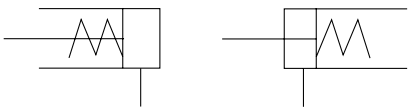
Specifications

Bore size (mm)		8	10	12	16	20	25
Piston rod dia. (mm)		4	4	6	6	8	10
Piston rod thread		M4	M4	M6	M6	M8	M10 X 1.25
Ports		M5	M5	M5	M5	G1/8	G1/8
Action		Single acting/Single rod, Spring return, Spring extend					
Fluid		Air					
Proof pressure		1.5MPa					
Max. operating pressure		1.0MPa					
Min. operating pressure	Spring return	0.22MPa	0.18MPa		0.13MPa	0.18MPa	
	Spring extended					0.23MPa	
Ambient and fluid temperature		–20 to 80°C (Built-in magnet style: –10 to 60°C)					
Cushion		Rubber bumper (Standard)					
Lubrication		Not required. If necessary, turbine oil no.1 ISOVG32 is recommended					
Piston speed		50 to 1500mm/s					
Allowable kinetic energy		0.02J	0.03J	0.04J	0.09J	0.27J	0.4J
Non-rotating accuracy*		±1° 30'	±1° 30'	± 1°	±1°	±0° 42'	±0° 42'
Stroke tolerance		0/+1				0/+1.4	

∗ Applicable to non-rotating models only.

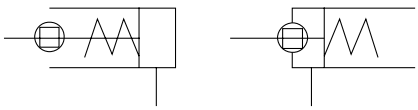
Symbol

Standard



Spring return　　Spring extend

Non-rotating rod



Spring return　　Spring extend

Spring Retracting Force (Standard, Non-rotating rod)

Spring Return

Unit: N

Bore (mm)	Standard stroke (mm)	Spring force									
		10		25		50		100		150	
		Retracted	Extended	Retracted	Extended	Retracted	Extended	Retracted	Extended	Retracted	Extended
8	10, 25, 50	4.41	4.02	4.41	3.43	4.41	2.45	—	—	—	—
10		6.28	5.69	6.28	4.90	6.28	3.53	—	—	—	—
12		7.16	6.57	7.16	5.79	7.16	4.41	—	—	—	—
16	10, 25, 50, 100, 150	13.2	12.1	13.2	10.3	13.2	7.45	13.2	7.45	13.2	7.45
20		21.6	18.6	21.6	16.7	21.6	11.8	39.2	9.81	39.2	9.81
25		27.5	25.3	27.5	22.1	27.5	16.7	47.1	13.7	47.1	15.7

Spring Extend

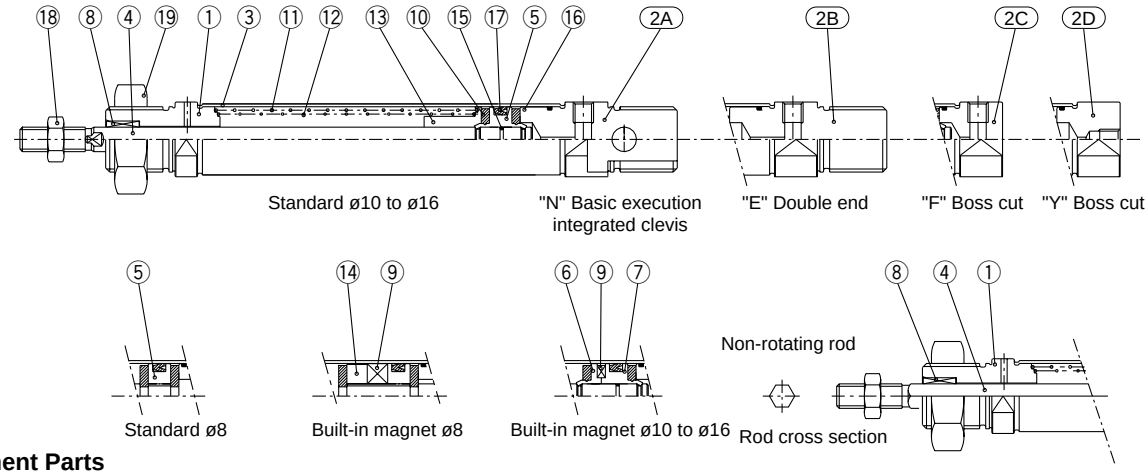
Unit: N

Bore (mm)	Standard stroke (mm)	Spring force									
		10		25		50		100		150	
		Retracted	Extended	Retracted	Extended	Retracted	Extended	Retracted	Extended	Retracted	Extended
8	10, 25, 50	5.30	3.92	5.30	3.14	5.30	2.65	—	—	—	—
10		5.98	4.81	5.98	4.02	5.98	3.53	—	—	—	—
12		6.57	5.59	6.57	4.90	6.57	4.51	—	—	—	—
16	10, 25, 50, 100, 150	14.7	11.3	14.7	9.22	14.7	7.85	14.7	7.85	14.7	7.85
20		39.2	33.0	39.2	23.5	39.2	9.81	39.2	9.81	39.2	9.81
25		47.1	40.4	47.1	30.4	47.1	13.7	47.1	13.7	47.1	15.7

Construction

Single acting: Single rod

Spring return/C□85□8 to 16-□S (Disassembly is not possible)

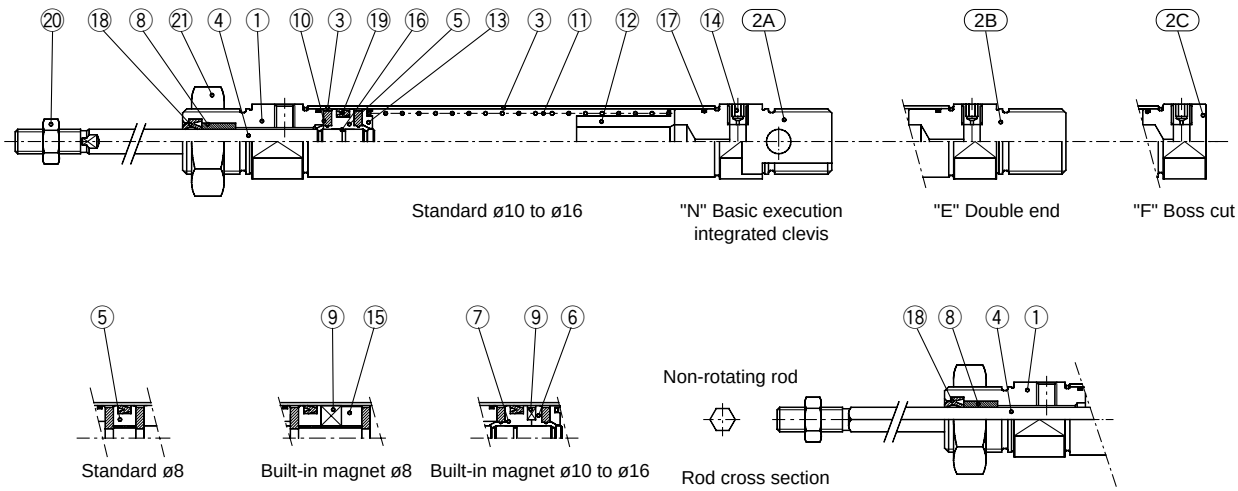


Component Parts

No.	Description	Material	Quantity	Remarks
①	Rod cover	Aluminum alloy	1	White anodized
2A	Head cover N	Aluminum alloy	1	White anodized
2B	Head cover E	Aluminum alloy	1	White anodized
2C	Head cover F	Aluminum alloy	1	White anodized
2D	Head cover Y	Aluminum alloy	1	White anodized
③	Cylinder tube	Stainless steel	1	
④	Piston rod	Stainless steel	1	
⑤	Piston	Brass	1	
⑥	Piston A	Brass	1	(Switch style only)
⑦	Piston B	Brass	1	(Switch style only)
⑧	Bushing	Sintered bronze	1	

No.	Description	Material	Quantity	Remarks
⑨	Magnet		1	(Switch style only)
⑩	Bumper	Urethane	2	
⑪	Return spring A	Piano wire	1	
⑫	Return spring B	Piano wire	1	
⑬	Spring guide	Brass	1	
⑭	Spacer	Brass	1	
⑮	Piston gasket	NBR	1	
⑯	Tube gasket	NBR	1	
⑰	Piston seal	NBR	1	
⑱	Rod end nut	Carbon steel	1	Nickel plated
⑲	Mounting nut	Carbon steel	1	Nickel plated

Spring extend/C□85□8 to 16-□T (Disassembly is not possible)



Component Parts

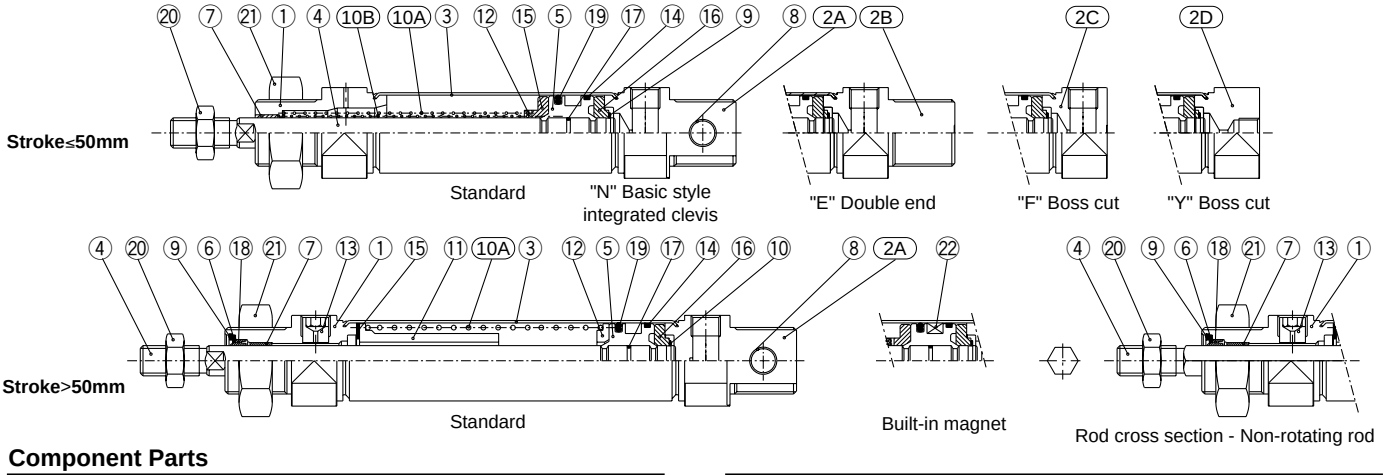
No.	Description	Material	Quantity	Remarks
①	Rod cover	Aluminum alloy	1	White anodized
2A	Head cover N	Aluminum alloy	1	White anodized
2B	Head cover E	Aluminum alloy	1	White anodized
2C	Head cover F	Aluminum alloy	1	White anodized
③	Cylinder tube	Stainless steel	1	
④	Piston rod	Stainless steel	1	
⑤	Piston	Brass	1	
⑥	Piston A	Brass	1	(Switch style only)
⑦	Piston B	Brass	1	(Switch style only)
⑧	Bushing	Sintered bronze	1	
⑨	Magnet		1	(Switch style only)

No.	Description	Material	Quantity	Remarks
⑩	Bumper	Urethane	2	
⑪	Return spring C	Piano wire	1	
⑫	Spring guide	Brass	1	
⑬	Spring seat	Brass	1	
⑭	Plug	Steel	1	
⑮	Spacer	Brass	1	
⑯	Piston gasket	NBR	1	2 for switch style
⑰	Tube gasket	NBR	1	
⑱	Rod seal	NBR	1	
⑲	Piston seal	NBR	1	
⑳	Rod end nut	Carbon steel	1	Nickel plated
㉑	Mounting nut	Carbon steel	1	Nickel plated

Construction

Single acting: Single rod

Spring return/C□85□20, 25-□S



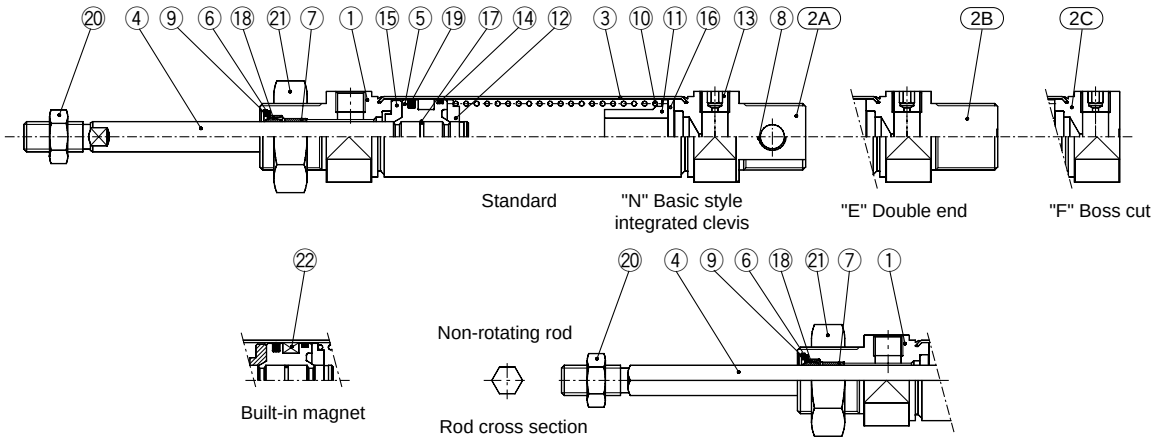
Component Parts

No.	Description	Material	Quantity	Remarks
①	Rod cover	Aluminum alloy	1	White anodized
2A	Head cover N	Aluminum alloy	1	White anodized
2B	Head cover E	Aluminum alloy	1	White anodized
2C	Head cover F	Aluminum alloy	1	White anodized
2D	Head cover Y	Aluminum alloy	1	White anodized
③	Cylinder tube	Stainless steel	1	
④	Piston rod	Carbon steel*	1	Hard chrome plated
⑤	Piston	Aluminum alloy	1	Chromated
⑥	Plain washer	Carbon steel	1	Nickel plated
⑦	Bushing	Sintered bronze	1	
⑧	Bushing	Sintered bronze	1	
⑨	Retaining ring	Carbon steel	1	Nickel plated
10A	Return spring A	Piano wire	1	Zinc chromated

No.	Description	Material	Quantity	Remarks
10B	Return spring B	Piano wire	1	Zinc chromated
⑪	Spring guide	Aluminum alloy	1	
⑫	Spring holder	Aluminum alloy	1	
⑬	Set screw	Carbon steel	1	
⑭	Wear ring	Phenolic resin	1	
⑮	Bumper A	Urethane	1	
⑯	Bumper B	Urethane	1	
⑰	Piston gasket	NBR	1	
⑱	Rod seal	NBR	1	
⑲	Piston seal	NBR	1	
⑳	Rod end nut	Carbon steel	1	Nickel plated
㉑	Mounting nut	Carbon steel	1	Nickel plated
㉒	Magnet		1	(Switch style only)

∗ Stainless steel (Non-rotating rod)

Spring extend/C□85□20, 25-□T



Component Parts

No.	Description	Material	Quantity	Remarks
①	Rod cover	Aluminum alloy	1	White anodized
2A	Head cover N	Aluminum alloy	1	White anodized
2B	Head cover E	Aluminum alloy	1	White anodized
2C	Head cover F	Aluminum alloy	1	White anodized
③	Cylinder tube	Stainless steel	1	
④	Piston rod	Carbon steel*	1	Hard chrome plated
⑤	Piston	Aluminum alloy	1	Chromated
⑥	Plain washer	Carbon steel	1	Nickel plated
⑦	Bushing	Sintered bronze	1	
⑧	Bushing	Sintered bronze	1	
⑨	Retaining ring	Carbon steel	1	Nickel plated
⑩	Return spring	Piano wire	1	Zinc chromate

No.	Description	Material	Quantity	Remarks
⑪	Spring guide	Aluminum alloy	1	
⑫	Spring guide	Aluminum alloy	1	
⑬	Set screw	Carbon steel	1	
⑭	Wear ring	Phenolic resin	1	
⑮	Bumper A	Urethane	1	
⑯	Bumper B	Urethane	1	
⑰	Piston gasket	NBR	1	
⑱	Rod seal	NBR	1	
⑲	Piston seal	NBR	1	
⑳	Rod end nut	Carbon steel	1	Nickel plated
㉑	Mounting nut	Carbon steel	1	Nickel plated
㉒	Magnet		1	(Switch style only)

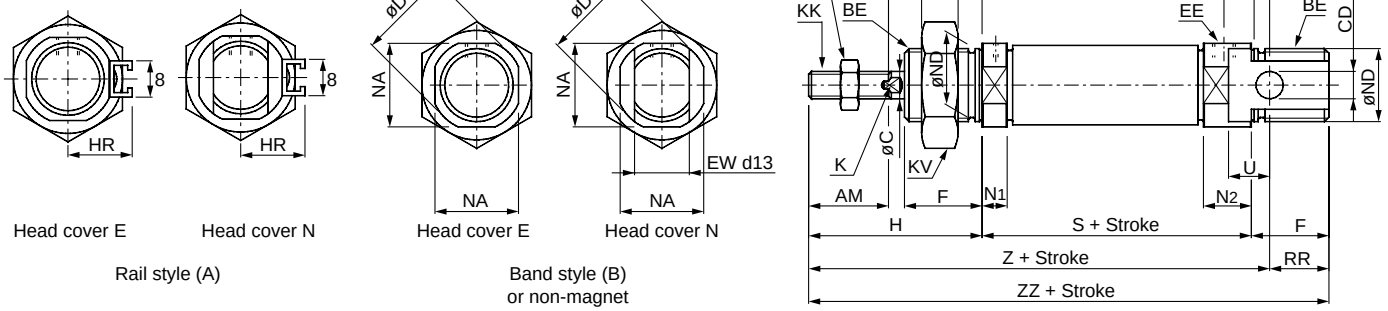
∗ Stainless steel (Non-rotating rod)

Dimensions

Single acting: Spring return

C□85$^{N}_{E}$ Bore — Stroke S — ☐

Without magnet, Built-in magnet

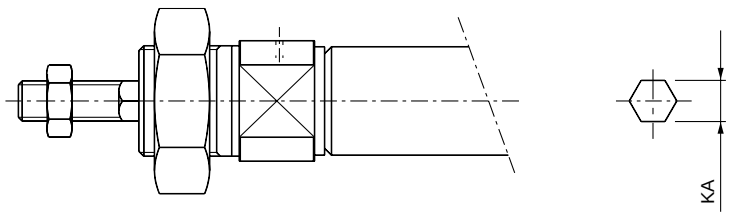


Head cover E | Head cover N | Head cover E | Head cover N

Rail style (A) | Band style (B) or non-magnet

C□85KN, C□85KE

Non-rotating rod



Rod cross section

Unit: (mm)

Bore	AM	BE	øC	CD	øD	EE	EW	F	G2	H	HR	K	KA	KK	KV	KW	N1	N2	NA	øND(h8)	RR	SW	U	WH
ø8	12	M12 X 1.25	4	$4^{+0.030}_{0}$	16.7	M5	8	12	5	28	10	—	4.2	M4	19	6	5.5	9.5	15	12	10	7	6	16
ø10	12	M12 X 1.25	4	$4^{+0.030}_{0}$	16.7	M5	8	12	5	28	10.5	—	4.2	M4	19	6	5.5	9.5	15	12	10	7	6	16
ø12	16	M16 X 1.5	6	$6^{+0.030}_{0}$	19.7	M5	12	17	6	38	14	5	6.2	M6	24	8	5.5	10.5	18	16	14	10	9	22
ø16	16	M16 X 1.5	6	$6^{+0.030}_{0}$	19.7	M5	12	17	6	38	14	5	6.2	M6	24	8	5.5	10.5	18	16	13	10	9	22
ø20	20	M22 X 1.5	8	$8^{+0.036}_{-0.006}$	27.9	G1/8	16	20	8	44	17	6	8.2	M8	32	11	15	15	24	22	11	13	12	24
ø25	22	M22 X 1.5	10	$8^{+0.036}_{-0.006}$	33.4	G1/8	16	22	8	50	20	8	10.2	M10 X 1.25	32	11	15	15	30	22	11	17	12	28

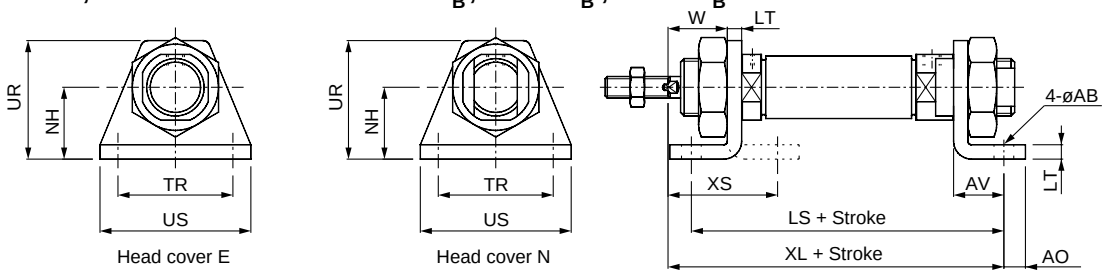
Bore	S			XC			Z			ZZ		
	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	1 to 50
ø8	46(52){56(62)}	—	—	64(70){74(80)}	—	—	76(82){86(92)}	—	—	86(92){96(102)}	—	—
ø10	46(50){56(60)}	—	—	64(68){74(78)}	—	—	76(80){86(90)}	—	—	86(90){96(100)}	—	—
ø12	50(53.5){60(63.5)}	—	—	75(78.5){85(88.5)}	—	—	91(94.5) {101(104.5)}	—	—	105(108.5) {115(118.5)}	—	—
ø16	56(59.5){66(69.5)}	71.5(75) {92(95.5)}	87(90.5) {118(121.5)}	82(85.5) {92(95.5)}	97.5(101) {118(121.5)}	113(116.5) {144(147.5)}	98(101.5) {108(111.5)}	113.5(117) {134(137.5)}	129(132.5) {160(163.5)}	111(114.5) {121(124.5)}	126.5(130) {147(150.5)}	142(145.5) {173(176.5)}
ø20	62{87}	112	137	95{120}	145	170	115{140}	165	190	126{151}	176	201
ø25	65{88.5}	113.5	138.5	104{127.5}	152.5	177.5	126{149.5}	174.5	199.5	137{160.5}	185.5	210.5

( ): In case of auto switch style. { }: In case of non-rotating rod.

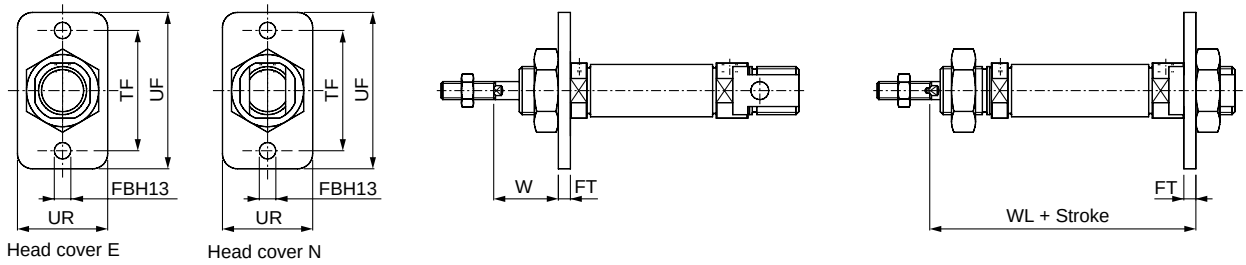
Dimensions with Mounting Brackets

Single acting: Spring return

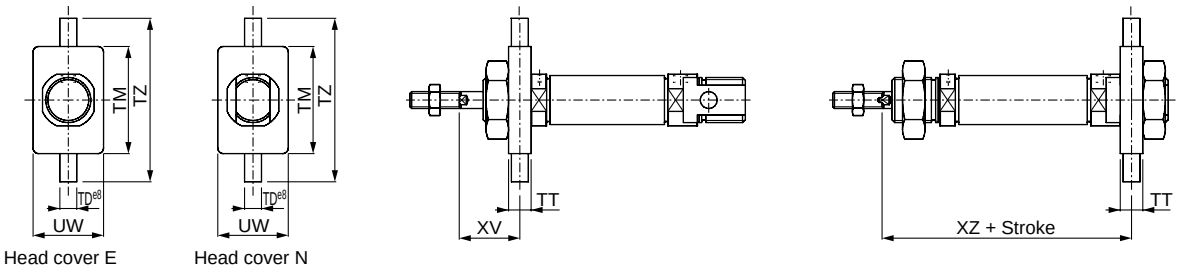
Front foot, Front and rear foot: C85L10$^{A}_{B}$, C85L16$^{A}_{B}$, C85L25$^{A}_{B}$



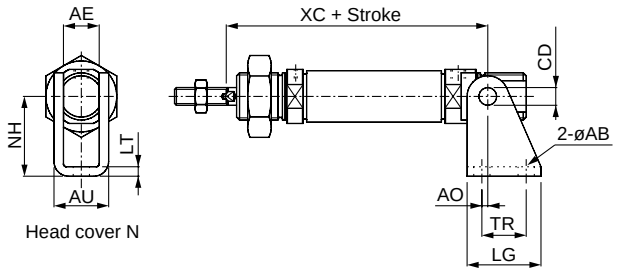
Front flange, Rear flange: C85F10, C85F16, C85F25



Front trunnion, Rear trunnion: C85T10, C85T16, C85T25



Clevis: C85C10, C85C16, C85C25



Unit: (mm)

Bore	Front foot, Front and rear foot															Front flange, Rear flange								
	AO	US	øAB	LT	NH	LS			XL			TR JS14	XS	AV	UR	W	UR	FBH13	FT	TF	UF	W	WL		
						1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150												1 to 50	51 to 100	101 to 150
ø8	5	35	4.5	3.2	16	68(74) {78(84)}	—	—	73(79) {83(89)}	—	—	25	23.8	11	26	12.8	22	4.5	3.2	30	40	12.8	65.2(71.2) {75.2(81.2)}	—	—
ø10	5	35	4.5	3.2	16	68(72) {78(82)}	—	—	73(77) {83(87)}	—	—	25	23.8	11	26	12.8	22	4.5	3.2	30	40	12.8	65.2(69.2) {75.2(79.2)}	—	—
ø12	6	42	5.5	4	20	78(81.5) {88(91.5)}	—	—	86(89.5) {96(99.5)}	—	—	32	32	14	33	18	30	5.5	4	40	52	18	76(79.5) {86(89.5)}	—	—
ø16	6	42	5.5	4	20	84(87.5) {94(97.5)}	99.5(103) {120(123.5)}	115(118.5) {146(149.5)}	92(95.5) {102(105.5)}	107.5(111) {128(131.5)}	123(126.5) {154(157.5)}	32	32	14	33	18	30	5.5	4	40	52	18	82(85.5) {92(95.5)}	97.5(101) {118(121.5)}	113(116.5) {144(147.5)}
ø20	8	54	6.6	5	25	96{121}	146	171	103{128}	153	178	40	36	17	42	19	40	6.6	5	50	66	19	91{116}	141	166
ø25	8	54	6.6	5	25	96{122.5}	147.5	172.5	110{133.5}	158.5	183.5	40	40	17	42	23	40	6.6	5	50	66	23	98{121.5}	146.5	171.5

Bore	Front trunnion, Rear trunion									Clevis												
	TT	UW	TD e8	TM	TZ	XV	ZX			CD	AE	øAB	AO	AU	TR	LG	NH	LT	XC		
							1 to 50	51 to 100	101 to 150										1 to 50	51 to 100	101 to 150
ø8	6	20	4	26	38	13	65(71) {75(81)}	—	—	$4^{+0.030}_{0}$	8.1	4.5	1.5	13.1	12.5	20	24	2.5	64(70) {74(80)}	—	—
ø10	6	20	4	26	38	13	65(69) {75(79)}	—	—	$4^{+0.030}_{0}$	8.1	4.5	1.5	13.1	12.5	20	24	2.5	64(68) {74(78)}	—	—
ø12	8	25	6	38	58	18	76(79.5) {86(89.5)}	—	—	$6^{+0.030}_{0}$	12.1	5.5	2	18.5	15	25	27	3.2	75(78.5) {85(88.5)}	—	—
ø16	8	25	6	38	58	18	82(85.5) {92(95.5)}	97.5(101) {118(121.5)}	113(116.5) {144(147.5)}	$6^{+0.030}_{0}$	12.1	5.5	2	18.5	15	25	27	3.2	82(88.5) {92(95.5)}	97.5(101) {118(121.5)}	113(116.5) {144(147.5)}
ø20	8	32	6	46	66	20	90{115}	140	165	$8^{+0.036}_{0}$	16.1	6.6	4	24.1	20	32	30	4	95{120}	145	170
ø25	8	32	6	46	66	24	97{120.5}	145.5	170.5	$8^{+0.036}_{0}$	16.1	6.6	4	24.1	20	32	30	4	104{127.5}	152.5	177.5

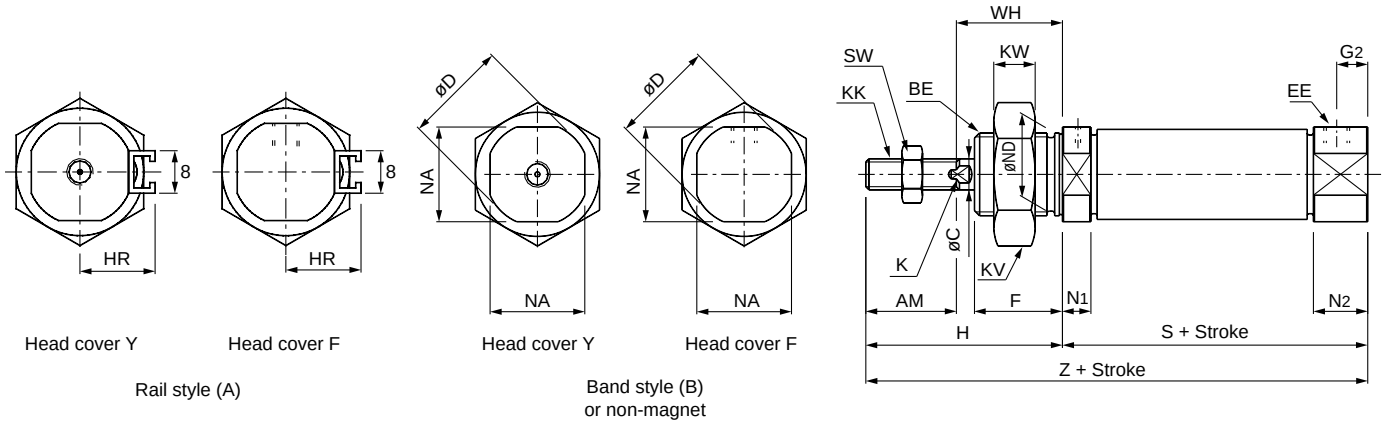
( ): In case of auto switch style. { }: In case of non-rotating rod.

Dimensions

Single acting: Spring return

C□85$^{F}_{Y}$ Bore — Stroke S — □

Without magnet, Built-in magnet

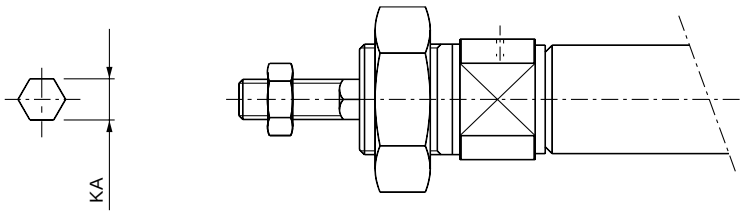


Head cover Y — Head cover F — Head cover Y — Head cover F

Rail style (A) — Band style (B) or non-magnet

C□85KF, C□85KY

Non-rotating rod



Rod cross section

Unit: (mm)

Bore	AM	BE	øC	øD	EE	F	G2	H	HR	K	KA	KK	KV	KW	N1	N2	NA	øND(h8)	SW	WH
ø8	12	M12 X 1.25	4	16.7	M5	12	5	28	10	—	4.2	M4	19	6	5.5	9.5	15	12	7	16
ø10	12	M12 X 1.25	4	16.7	M5	12	5	28	10.5	—	4.2	M4	19	6	5.5	9.5	15	12	7	16
ø12	16	M16 X 1.5	6	19.7	M5	17	6	38	14	5	6.2	M6	24	8	5.5	10.5	18	16	10	22
ø16	16	M16 X 1.5	6	19.7	M5	17	6	38	14	5	6.2	M6	24	8	5.5	10.5	18	16	10	22
ø20	20	M22 X 1.5	8	27.9	G1/8	20	8	44	17	6	8.2	M8	32	10	15	15	24	22	13	24
ø25	22	M22 X 1.5	10	33.4	G1/8	22	8	50	20	8	10.2	M10 X 1.25	32	10	15	15	30	22	17	28

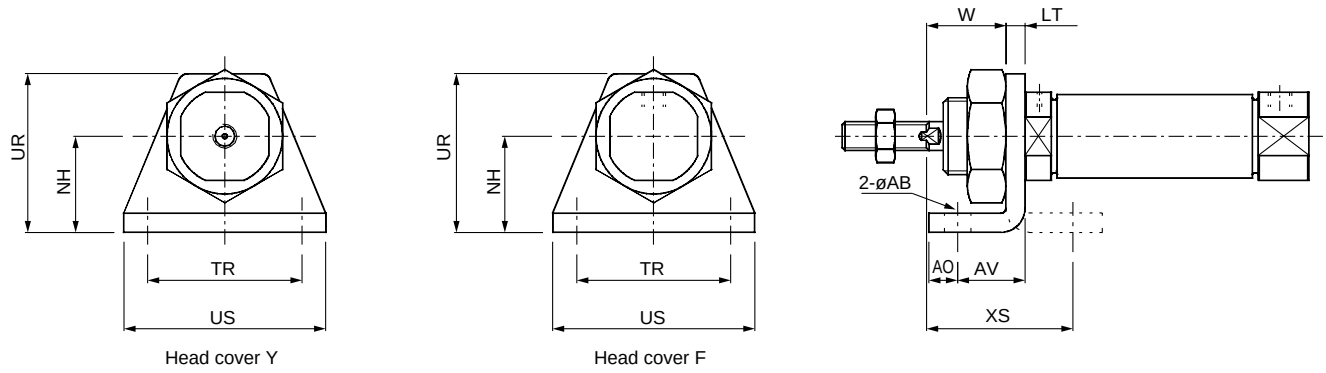
Bore	S			Z		
	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150
ø8	46(52){56(62)}	—	—	74(80){84(90)}	—	—
ø10	46(50){56(60)}	—	—	74(78){84(88)}	—	—
ø12	50(53.5){60(63.5)}	—	—	88(91.5){98(101.5)}	—	—
ø16	50(53.5){60(63.5)}	65.5(69){86(89.5)}	81(84.5){112(115.5)}	88(91.5){98(101.5)}	103.5(107){124(127.5)}	119(122.5){150(153.5)}
ø20	62{87}	112	137	106{131}	156	181
ø25	65{88.5}	113.5	138.5	115{138.5}	163.5	188.5

( ): In case of auto switch style. { }: In case of non-rotating rod.

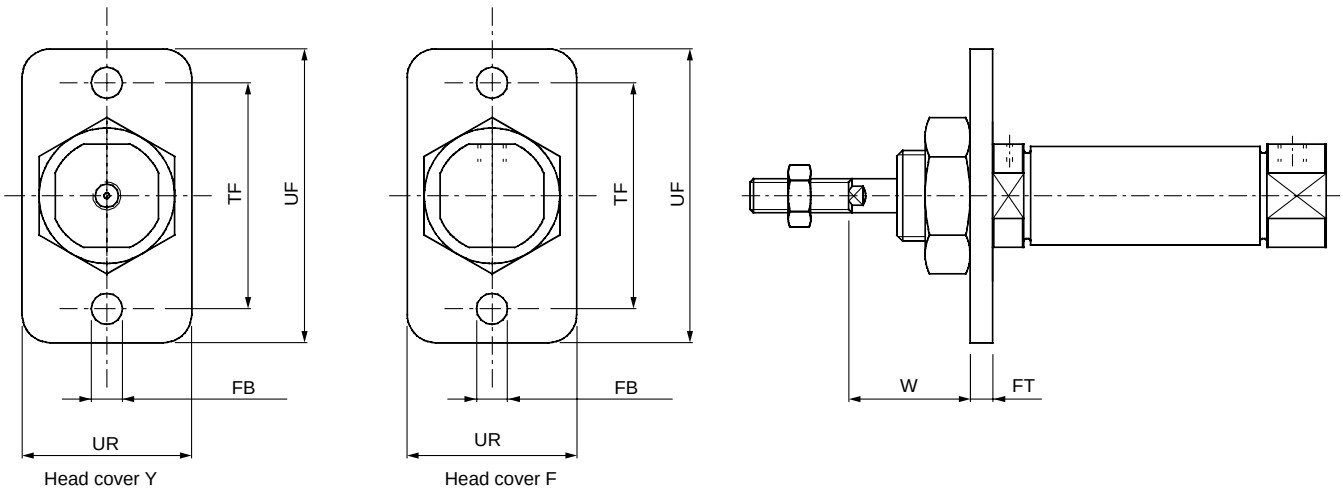
Dimensions with Mounting Brackets

Single acting: Spring return

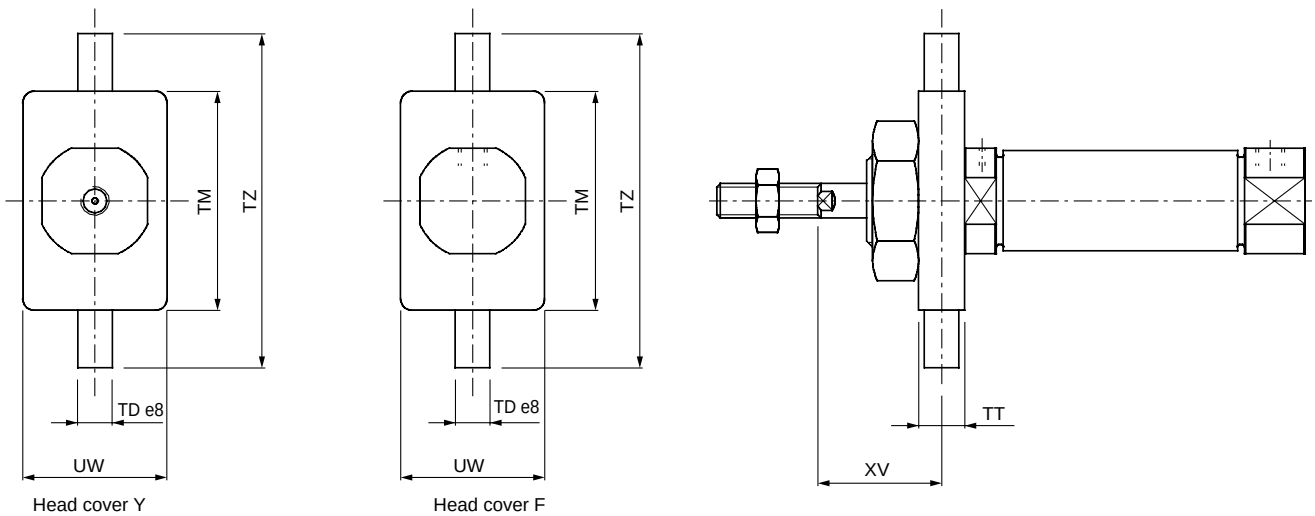
Front foot: C85L10A, C85L16A, C85L25A



Front flange: C85F10, C85F16, C85F25



Front trunnion: C85T10, C85T16, C85T25



Unit: (mm)

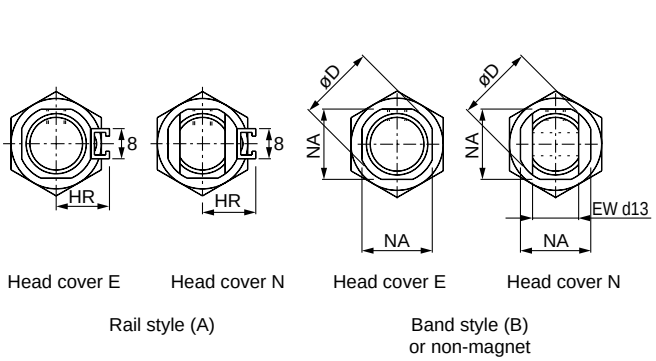
Bore	Front foot										Front flange						Front trunnion					
	AO	US	øAB	LT	NH	TR JS14	XS	AV	UR	W	UR	FBH13	FT	TF	UF	W	TT	UW	TD e8	TM	TZ	XV
ø8	5	35	4.5	3.2	16	25	23.8	11	26	12.8	22	4.5	3.2	30	40	12.8	6	20	4	26	38	13
ø10	5	35	4.5	3.2	16	25	23.8	11	26	12.8	22	4.5	3.2	30	40	12.8	6	20	4	26	38	13
ø12	6	42	5.5	4	20	32	32	14	33	18	30	5.5	4	40	52	18	8	25	6	38	58	18
ø16	6	42	5.5	4	20	32	32	14	33	18	30	5.5	4	40	52	18	8	25	6	38	58	18
ø20	8	54	6.6	5	25	40	36	17	42	19	40	6.6	5	50	66	19	8	32	6	46	66	20
ø25	8	54	6.6	5	25	40	40	17	42	23	40	6.6	5	50	66	23	8	32	6	46	66	24

Dimensions

Single acting: Spring extend

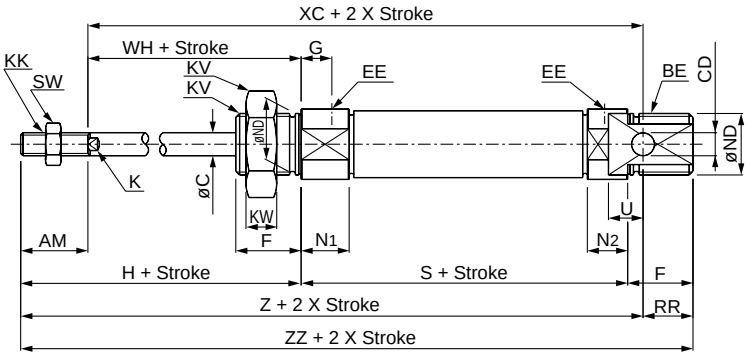
C□85$^{N}_{E}$ Bore — Stroke T — □

Without magnet, Built-in magnet



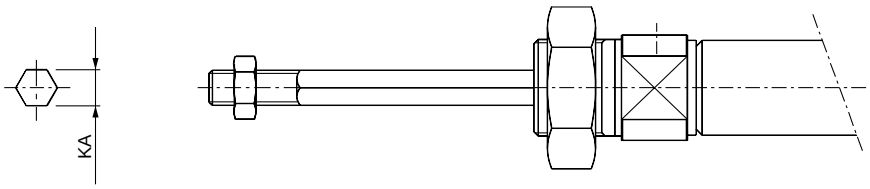
Head cover E | Head cover N | Head cover E | Head cover N

Rail style (A) | Band style (B) or non-magnet



C□85KN, E

Non-rotating rod



Rod cross section

Unit: (mm)

Bore	AM	BE	øC	CD	øD	EE	EW	F	G	H	HR	K	KA	KK	KV	KW	N1	N2	NA	øND(h8)	RR	SW	U	WH
ø8	12	M12 X 1.25	4	$4^{+0.030}_{0}$	16.7	M5	8	12	7	28	10	—	4.2	M4	19	6	11.5	9.5	15	12	10	7	6	16
ø10	12	M12 X 1.25	4	$4^{+0.030}_{0}$	16.7	M5	8	12	7	28	10.5	—	4.2	M4	19	6	11.5	9.5	15	12	10	7	6	16
ø12	16	M16 X 1.5	6	$6^{+0.030}_{0}$	19.7	M5	12	17	8	38	14	5	6.2	M6	24	8	12.5	10.5	18	16	14	10	9	22
ø16	16	M16 X 1.5	6	$6^{+0.030}_{0}$	19.7	M5	12	17	8	38	14	5	6.2	M6	24	8	12.5	10.5	18	16	13	10	9	22
ø20	20	M22 X 1.5	8	$8^{+0.036}_{-0.006}$	27.9	G1/8	16	20	8	44	17	6	8.2	M8	32	10	15	15	24	22	11	13	12	24
ø25	22	M22 X 1.5	10	$8^{+0.036}_{-0.006}$	33.4	G1/8	16	22	8	50	20	8	10.2	M10 X 1.25	32	10	15	15	30	22	11	17	12	28

Bore	S			Z			XC			ZZ		
	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150
ø8	64.5(70.5)	—	—	94.5(100.5)	—	—	82.5(88.5)	—	—	104.5(110.5)	—	—
ø10	64.5(68.5)	—	—	94.5(98.5)	—	—	82.5(86.5)	—	—	104.5(108.5)	—	—
ø12	70(73.5)	—	—	111(114.5)	—	—	95(98.5)	—	—	125(128.5)	—	—
ø16	75(78.5)	101(104.5)	127(130.5)	117(120.5)	143(146.5)	169(172.5)	101(104.5)	127(130.5)	153(156.5)	130(133.5)	156(159.5)	182(185.5)
ø20	87	112	137	140	165	190	120	145	170	151	176	201
ø25	88.5	113.5	138.5	149.5	174.5	199.5	127.5	152.5	177.5	160.5	185.5	210.5

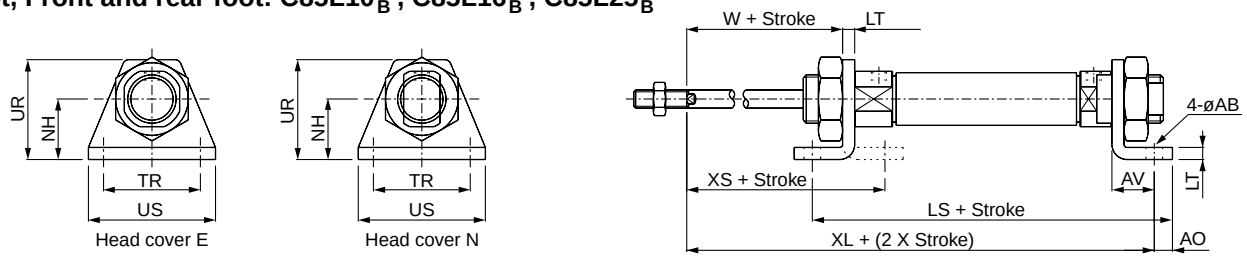
( ): In case of auto switch style.

Dimensions with Mounting Brackets

Single acting: Spring extend

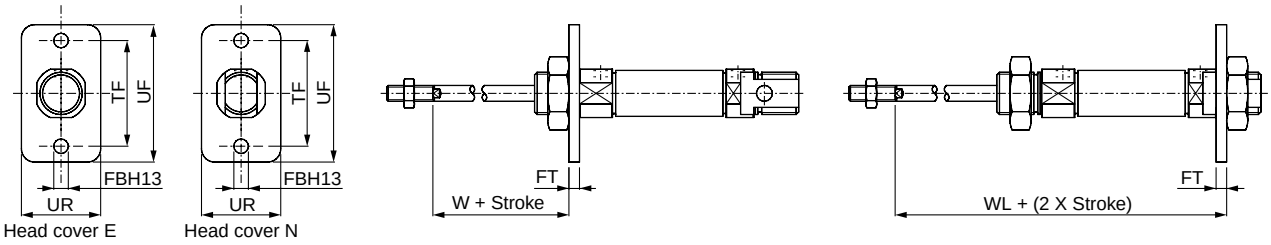
C□85N, C□85E

Front foot, Front and rear foot: C85L10$^{A}_{B}$, C85L16$^{A}_{B}$, C85L25$^{A}_{B}$



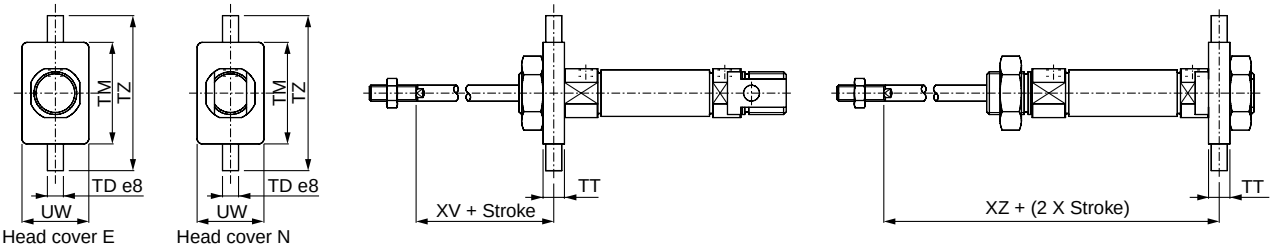
C□85N, C□85E

Front flange, Rear flange: C85F10, C85F16, C85F25



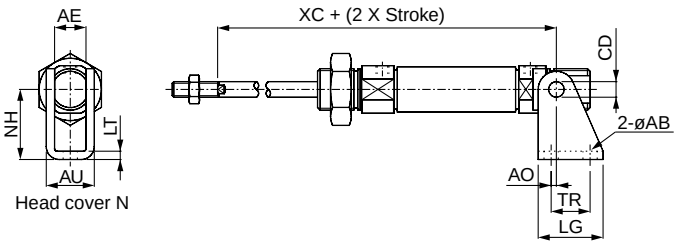
C□85N, C□85E

Front trunnion, Rear trunnion: C85T10, C85T16, C85T25



C□85N

Clevis: C85C10, C85C16, C85C25



Unit: (mm)

Bore	Front foot, Front and rear foot																Front flange, Rear flange								
	AO	US	øAB	LT	NH	LS			XL			TR JS14	XS	AV	UR	W	UR	FBH13	FT	TF	UF	W	WL		
						1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150												1 to 50	51 to 100	101 to 150
ø8	5	35	4.5	3.2	16	86.5(92.5)	—	—	91.5(97.5)	—	—	25	23.8	11	26	12.8	22	4.5	3.2	30	40	12.8	83.7(89.7)	—	—
ø10	5	35	4.5	3.2	16	86.5(90.5)	—	—	91.5(95.5)	—	—	25	23.8	11	26	12.8	22	4.5	3.2	30	40	12.8	83.7(87.7)	—	—
ø12	6	42	5.5	4	20	98(101.5)	—	—	106(109.5)	—	—	32	32	14	33	18	30	5.5	4	40	52	18	96(99.5)	—	—
ø16	6	42	5.5	4	20	103(106.5)	129(132.5)	155(158.5)	111(114.5)	137(140.5)	163(166.5)	32	32	14	33	18	30	5.5	4	40	52	18	101(104.5)	127(130.5)	153(156.5)
ø20	8	54	6.6	5	25	121	146	171	128	153	178	40	36	17	42	19	40	6.6	5	50	66	19	116	141	166
ø25	8	54	6.6	5	25	122.5	147.5	172.5	133.5	158.5	183.5	40	40	17	42	23	40	6.6	5	50	66	23	121.5	146.5	171.5

Bore	Front trunnion, Rear trunnion									Clevis											
	TT	UW	TD e8	TM	TZ	XV	ZX			CD	AE	øAB	AO	AU	TR	LG	NH	LT	XC		
							1 to 50	51 to 100	101 to 150										1 to 50	51 to 100	101 to 150
ø8	6	20	4	26	38	13	83.5(89.5)	—	—	$4^{+0.030}_{0}$	8.1	4.5	1.5	13.1	12.5	20	24	2.5	82.5(88.5)	—	—
ø10	6	20	4	26	38	13	83.5(87.5)	—	—	$4^{+0.030}_{0}$	8.1	4.5	1.5	13.1	12.5	20	24	2.5	82.5(86.5)	—	—
ø12	8	25	6	38	58	18	96(99.5)	—	—	$6^{+0.030}_{0}$	12.1	5.5	2	18.5	15	25	27	3.2	95(98.5)	—	—
ø16	8	25	6	38	58	18	101(104.5)	127(130.5)	153(156.5)	$6^{+0.030}_{0}$	12.1	5.5	2	18.5	15	25	27	3.2	101(104.5)	127(130.5)	153(156.5)
ø20	8	32	6	46	66	20	115	140	165	$8^{+0.036}_{0}$	16.1	6.6	4	24.1	20	32	30	4	120	145	170
ø25	8	32	6	46	66	24	120.5	145.5	170.5	$8^{+0.036}_{0}$	16.1	6.6	4	24.1	20	32	30	4	127.5	152.5	177.5

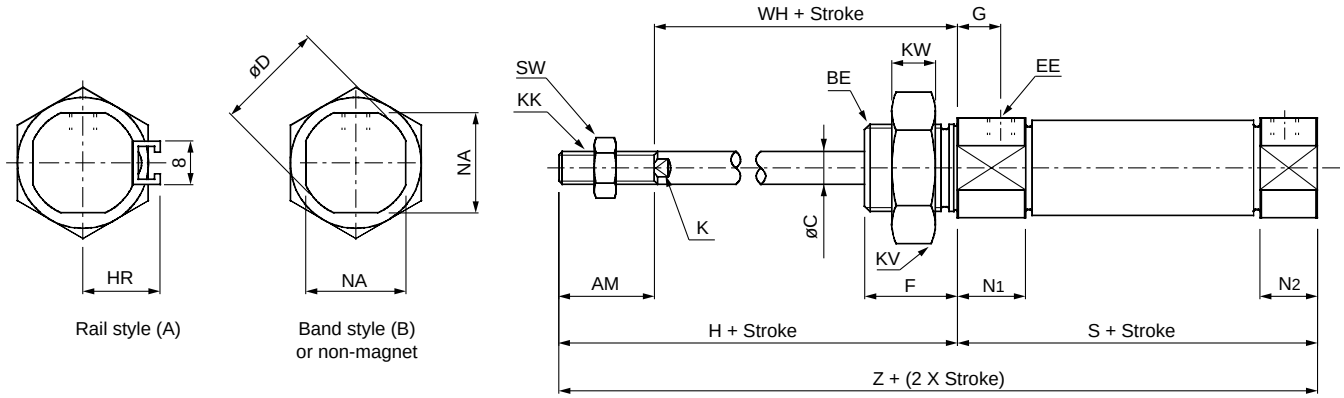
( ): In case of auto switch style.

Dimensions

Single acting: Spring extend

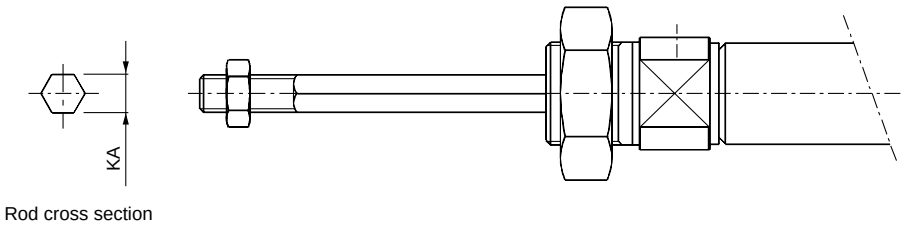
C□85F Bore — Stroke T — ☐

Without magnet, Built-in magnet



C85KF, CD85KF

Non-rotating rod



Unit: (mm)

Bore	AM	BE	øC	øD	EE	F	G	H	HR	K	KA	KK	KV	KW	N1	N2	NA	SW	WH
ø8	12	M12 X 1.25	4	16.7	M5	12	7	28	10	—	4.2	M4	19	6	11.5	9.5	15	7	16
ø10	12	M12 X 1.25	4	16.7	M5	12	7	28	10.5	—	4.2	M4	19	6	11.5	9.5	15	7	16
ø12	16	M16 X 1.5	6	19.7	M5	17	8	38	14	5	6.2	M6	24	8	12.5	10.5	18	10	22
ø16	16	M16 X 1.5	6	19.7	M5	17	8	38	14	5	6.2	M6	24	8	12.5	10.5	18	10	22
ø20	20	M22 X 1.5	8	27.9	G1/8	20	8	44	17	6	8.2	M8	32	10	15	15	24	13	24
ø25	20	M22 X 1.5	10	33.4	G1/8	22	8	50	20	8	10.2	M10 X 1.25	32	10	15	15	30	17	28

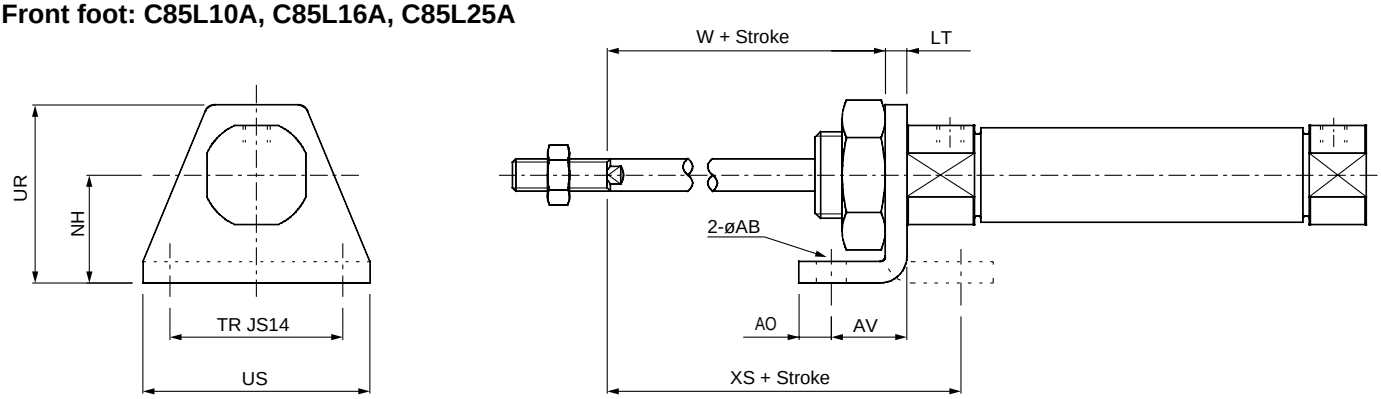
Bore	S			Z		
	1 to 50	51 to 100	101 to 150	1 to 50	51 to 100	101 to 150
ø8	64.5(70.5)	—	—	92.5(98.5)	—	—
ø10	64.5(68.5)	—	—	92.5(96.5)	—	—
ø12	70(73.5)	—	—	108(111.5)	—	—
ø16	69(72.5)	95(98.5)	121(124.5)	107(110.5)	133(136.5)	159(162.5)
ø20	87	112	137	131	156	181
ø25	88.5	113.5	138.5	138.5	163.5	188.5

( ): In case of auto switch style.

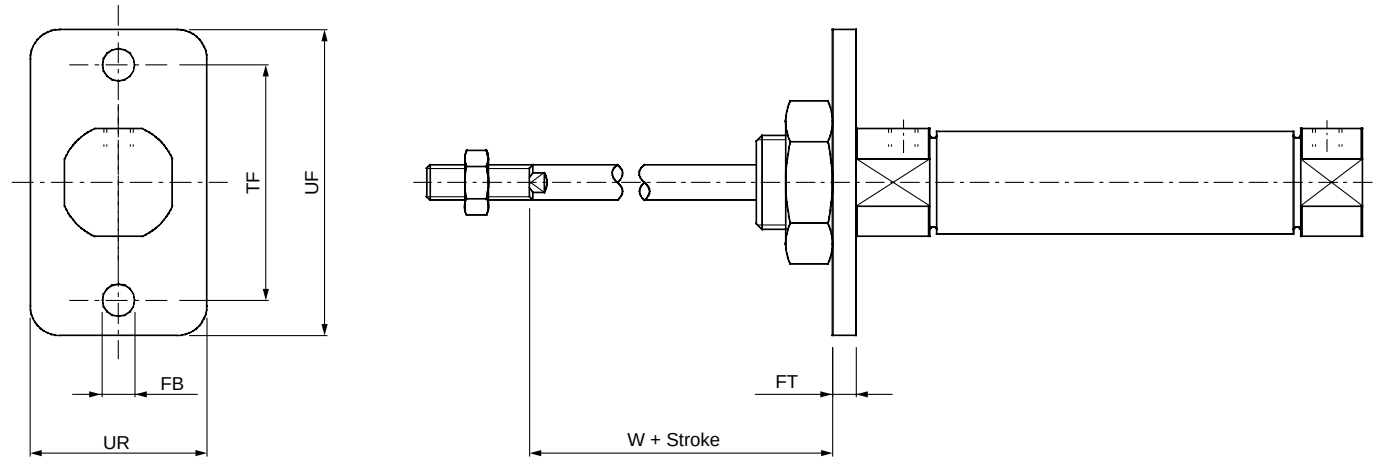
Dimensions with Mounting Brackets

Single acting: Spring extend

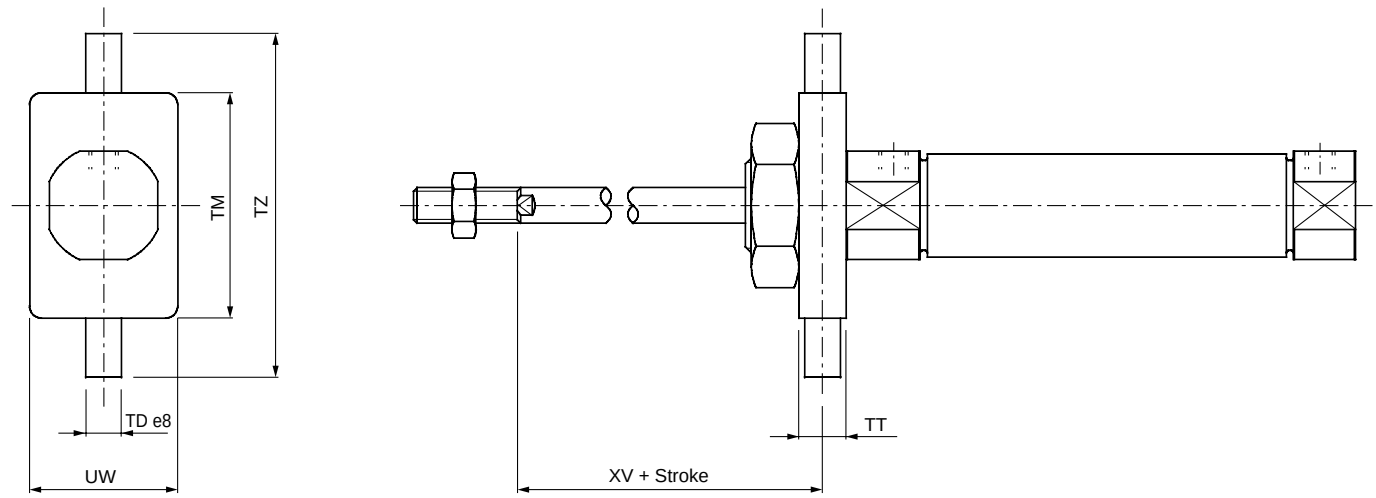
Front foot: C85L10A, C85L16A, C85L25A



Front flange: C85F10, C85F16, C85F25



Front trunnion: C85T10, C85T16, C85T25



Unit: (mm)

Bore	Front foot										Front flange						Front trunnion					
	AO	US	øAB	LT	NH	TR JS14	XS	AV	UR	W	UR	FBH13	FT	TF	UF	W	TT	UW	TD e8	TM	TZ	XV
ø8	5	35	4.5	3.2	16	25	23.8	11	26	12.8	22	4.5	3.2	30	40	12.8	6	20	4	26	38	13
ø10	5	35	4.5	3.2	16	25	23.8	11	26	12.8	22	4.5	3.2	30	40	12.8	6	20	4	26	38	13
ø12	6	42	5.5	4	20	32	32	14	33	18	30	5.5	4	40	52	18	8	25	6	38	58	18
ø16	6	42	5.5	4	20	32	32	14	33	18	30	5.5	4	40	52	18	8	25	6	38	58	18
ø20	8	54	6.6	5	25	40	36	17	42	19	40	6.6	5	50	66	19	8	32	6	46	66	20
ø25	8	54	6.6	5	25	40	40	17	42	23	40	6.6	5	50	66	23	8	32	6	46	66	24

High Temperature XB6

C85 | **Mounting** | **Bore size** — **Stroke** — **XB6**

N, E, F, Y — 8, 10, 12, 16, 20, 25mm

Standard cylinder seals are replaced with special ones and other modifications are made in order to enable the cylinder to operate at a high ambient temperature (–10 to +150°C).

Possible applications:
- Bore size 8 + 0 and 25mm
- Rubber bumper
- Without magnets (Auto switches cannot be used at high temperature.)
- Single rod - Double acting
- Double rod - Double acting (W)

Dimensions unchanged

Specifications

Style	Air cylinder
Applicable sizes	ø8, ø10, ø12, ø16, ø20, ø25mm
Action	Double acting
Ambient temperature range	–10 to 150°C
Cushion	Rubber bumper
Material	Seal: Fluorocarbon rubber Wear ring: Fluorocarbon resin
Grease	Fluoroplastics grease

Low Temperature XB7

C85 | **Mounting** | **Bore size** — **Stroke** — **XB7**

N, E, F, Y — 20, 25mm

Standard cylinder seals are replaced with special ones and other modifications are made in order to enable the cylinder to operate at a low ambient temperature (–40 to +70°C).

Possible applications:
- Bore size 20 and 25mm
- Rubber bumper
- Without magnets (Auto switches cannot be used at low temperature.)
- Single rod - Double acting
- Double rod - Double acting (W)

Dimensions unchanged

Specifications

Style	Air cylinder
Applicable sizes	ø20, ø25mm
Action	Double acting
Ambient temperature range	–40 to 70°C
Cushion	Rubber bumper
Material	Seal: Low nitrile rubber Wear ring: Fluorocarbon resin
Grease	Fluoroplastics grease

Low Speed XB9

C85 | **Mounting** | **Bore size** — **Stroke** — **XB9**

N, E, F, Y 20, 25mm

The cylinder does not generate any stick-slip phenomenon even at the rated low speed of 10 to 50mm/sec. All strokes smoothly drive at a constant speed.

Possible applications:
- Bore size 20 and 25mm
- Rubber bumper style only
- With or without magnets
- Single rod - Double acting

Dimensions unchanged

Specifications

Style	Air cylinder
Applicable sizes	ø20, ø25mm
Action	Double acting
Piston speed	10 to 50mm/sec
Cushion	Rubber bumper

Heavy-duty Scraper XC4

C85 | **Mounting** | **Bore size** — **Stroke** — **XC4**

N, E, F, Y 20, 25mm

A heavy-duty scraper is used as wiper ring. Ideal for severe applications where the cylinder is exposed to dust, earth and sand. Applicable to casting machines, construction machines, industrial vehicles, etc..

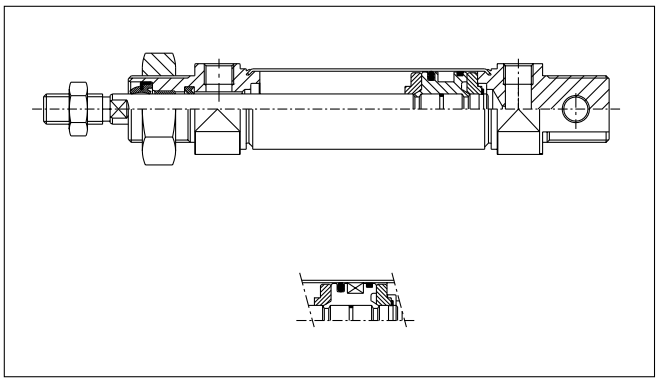
Possible applications:
- Bore size 20 and 25mm
- Rubber bumper style only
- With or without magnets
- Single rod - Double acting
- Double rod - Double acting (W)

Dimensions unchanged

Specifications

Style	Air cylinder
Applicable sizes	ø20, ø25mm
Max. operating pressure	1MPa
Min. operating pressure	0.08MPa
Cushion	Rubber bumper
Wiper ring	NBR (SCB)

Construction



ISO Cylinder/Direct Mount: Double Acting

Series C85R

ø8, ø10, ø12, ø16, ø20, ø25

How to Order

Double acting Single rod

C [D] 85 R [A] [F] [16] — [40] — [B] [R2]

Magnet

—	None
D	Built-in magnet

Style

A	Bottom side mounting
B*	Front side mounting

* Only ø20, ø25

Mounting

Symbol	Mounting
F	Boss cut
Y	Boss cut-end port

Bore size-stroke

Bore size (mm)	Standard stroke (mm)*	Max. stroke (mm)
ø8	10, 25, 40, 50, 80, 100	100
ø10		
ø12	10, 25, 40, 50, 80, 100 125, 160	160
ø16		
ø20	10, 25, 40, 50, 80, 100 125, 160	160
ø25		

* Other strokes on request.

Other variations' suffix

R2	Stainless steel piston rod and piston rod nut

Auto switch mounting

B	Band style

Auto switches and bands are shown on p.3-35

Mounting Brackets Parts No.

Bore (mm) / Bracket	8	10	12	16	20	25
Single knuckle joint	KJ4D		KJ6D		KJ8D	KJ10D
Double knuckle joint	GKM4-8		GKM6-10		GKM8-16	GKM10-20
Floating joint	JA10-4-070		JA15-6-100		JA20 -8-125	JA30 -10-125

Replacement Parts

Bore (mm)	Kit No.	Note
20	C85-20PS	Every set includes: 1 rod seal 1 packing retaining washer 1 retaining ring
25	C85-25PS	

Square rod cover makes direct contact mounting possible

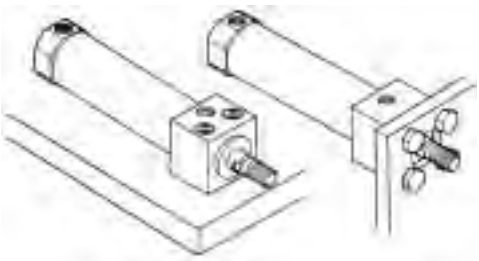
Space saving

Mounting accuracy and rigidity made possible by means of faucet joint and direct mounting.

Front face mounting style and base mounting available to suit your applications.

Bottom side mounting

Front side mounting



Bottom side mounting **Front side mounting**

Specifications

Bore size (mm)	8	10	12	16	20	25
Piston rod dia. (mm)	4	4	6	6	8	10
Piston rod thread	M4	M4	M6	M6	M8	M10 X 1.25
Ports	M5	M5	M5	M5	G1/8	G1/8
Action	Double acting/Single Rod					
Fluid	Air					
Proof pressure	1.5MPa					
Max operating pressure	1.0MPa					
Min operating pressure	0.1MPa	0.08MPa		0.05MPa		
Ambient and fluid temperature	–20 to 80°C (Built-in magnet style: –10 to 60°C)					
Cushion	Rubber bumper (Standard)					
Lubrication	Not required. If necessary, turbine oil no.1 ISOVG32 is recommended					
Piston speed	50 to 1500mm/s					
Allowable kinetic energy	0.02J	0.03J	0.04J	0.09J	0.27J	0.4J
Stroke tolerance	0/+1				0/+1.4	

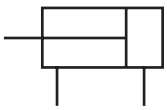
Weight

(g)

Bore size (mm)		8	10	12	16	20	25
Basic wight	Bottom side mounting	43	46	84	95	167	253
	Front side mounting	—	—	—	—	163	230
Additional weight for each 10mm of stroke		2	2.2	4.1	5.1	7.8	12.2

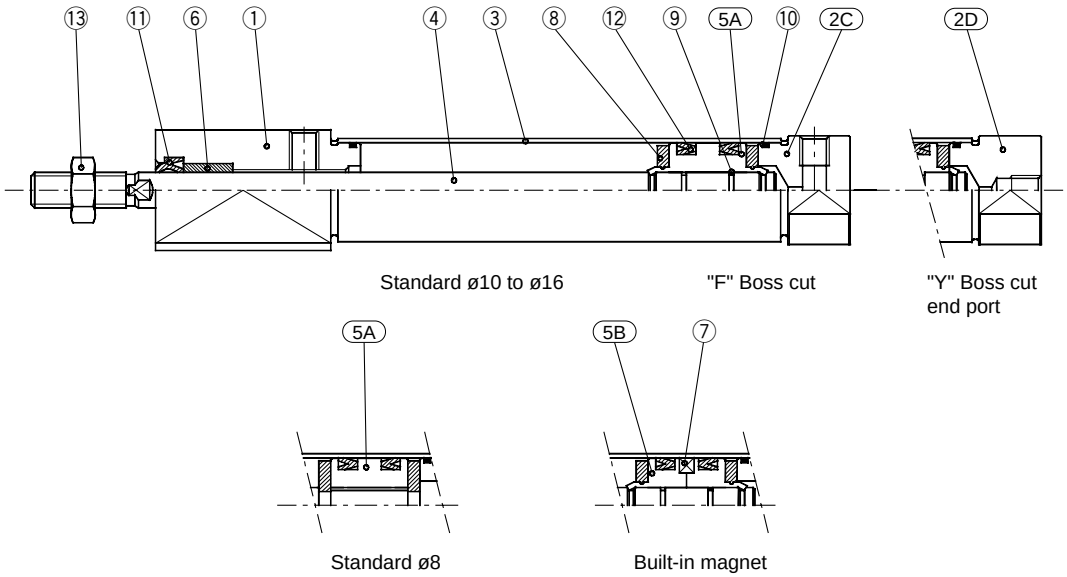
Symbol

Double Acting/Single Rod



Construction

Double acting: Single rod
C□85RA8 to 16 (Disassembly is not possible)

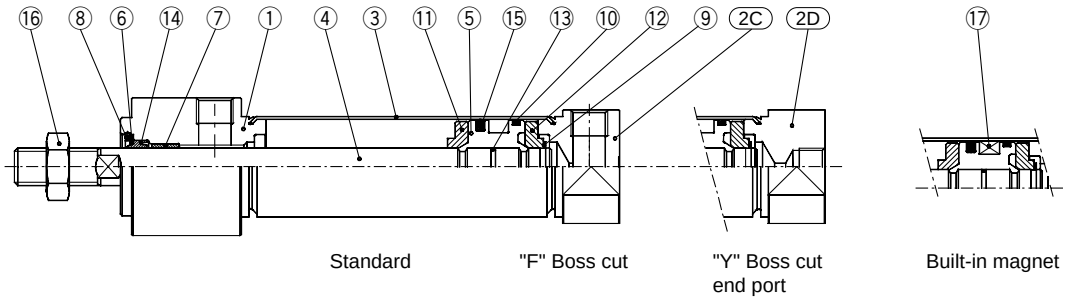


Component Parts

No.	Description	Material	Quantity	Remarks
①	Rod cover	Aluminum alloy	1	White anodized
2C	Head cover F	Aluminum alloy	1	White anodized
2D	Head cover Y	Aluminum alloy	1	White anodized
③	Cylinder tube	Stainless steel	1	
④	Piston rod	Stainless steel	1	
5A	Piston "A"	Brass	1	
5B	Piston "B"	Brass	2	(Switch style piston)

No.	Description	Material	Quantity	Remarks
⑥	Bushing	Sintered bronze	1	
⑦	Magnet		1	(Switch style only)
⑧	Bumper	Urethane	2	
⑨	Piston gasket	NBR	1	(2 for switch style)
⑩	Tube gasket	NBR	2	
⑪	Rod seal	NBR	1	
⑫	Piston seal	NBR	2	

C□85R$^{A}_{B}$20, 25



Component Parts

No.	Description	Material	Quantity	Remarks
①	Rod cover	Aluminum alloy	1	White anodized
2C	Head cover F	Aluminum alloy	1	White anodized
2D	Head cover Y	Aluminum alloy	1	White anodized
③	Cylinder tube	Stainless steel	1	
④	Piston rod	Carbon steel	1	Hard chrome plated
⑤	Piston	Aluminum alloy	1	Chromated
⑥	Plain washer	Carbon steel	1	Nickel plated
⑦	Bushing	Sintered bronze	1	
⑧	Retaining ring	Carbon steel	1	Nickel plated

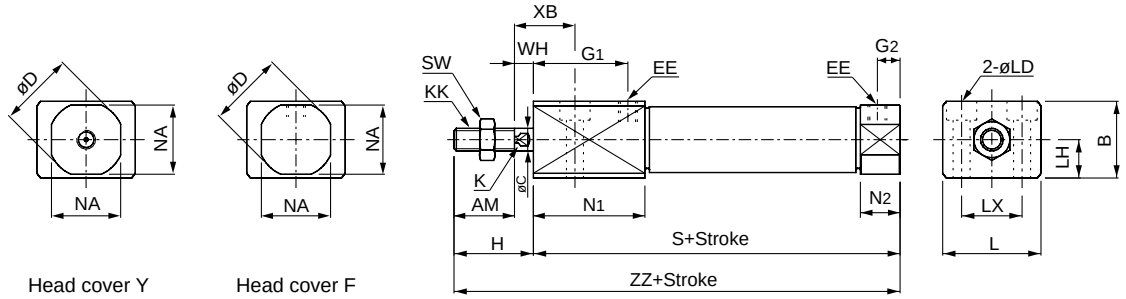
No.	Description	Material	Quantity	Remarks
⑨	Retaining ring	Carbon steel	1	
⑩	Wear ring	Phenolic resin	1	
⑪	Bumper A	Urethane	1	
⑫	Bumper B	Urethane	1	
⑬	Piston gasket	NBR	1	
⑭	Rod seal	NBR	1	
⑮	Piston seal	NBR	1	
⑯	Rod end nut	Carbon steel	1	Nickel plated
⑰	Magnet		1	(Switch style only)

Dimensions

Double acting: Single rod

Bottom side mounting/C□85RA $^{F}_{Y}$ 8 to 16—Stroke B

Without magnet, Built-in magnet (Band style)

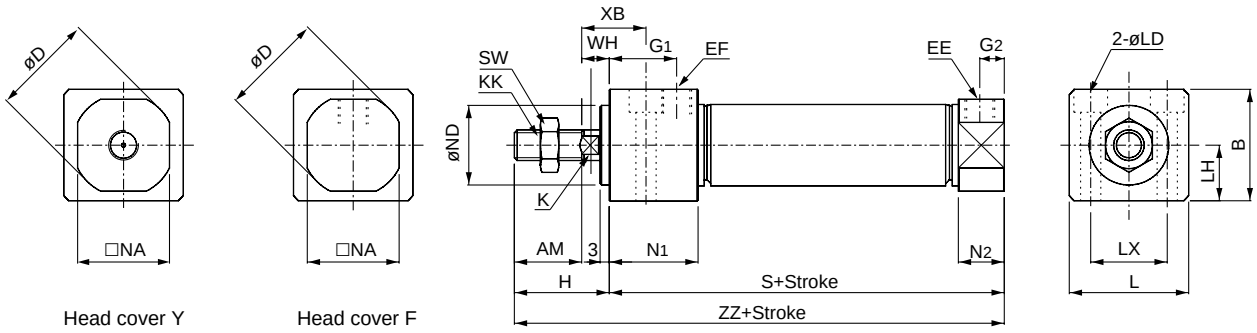


Unit: (mm)

Bore	AM	B	øC	øD	EE	G1	G2	H	K	KK	L	øLD	LH	LX	N1	N2	NA	S	SW	WH	XB	ZZ
ø8	12	16	4	16.7	M5	19	5	16	—	M4	23	ø3.5, ø6.5 Depth of counter bore 4	8	14	23.5	9.5	15	58	7	4	12	74
ø10	12	16	4	16.7	M5	19	5	16	—	M4	23	ø3.5, ø6.5 Depth of counter bore 4	8	14	23.5	9.5	15	58	7	4	12	74
ø12	16	20	6	19.7	M5	25	6	21	5	M6	26	ø4.5, ø8 Depth of counter bore 5	10	16	29.5	10.5	18	67	10	5	16	88
ø16	16	20	6	19.7	M5	25	6	21	5	M6	26	ø4.5, ø8 Depth of counter bore 5	10	16	29.5	10.5	18	67	10	5	16	88

Bottom side mounting/C□85RA $^{F}_{Y}$ 20/25—Stroke B

Without magnet, Built-in magnet (Band style)

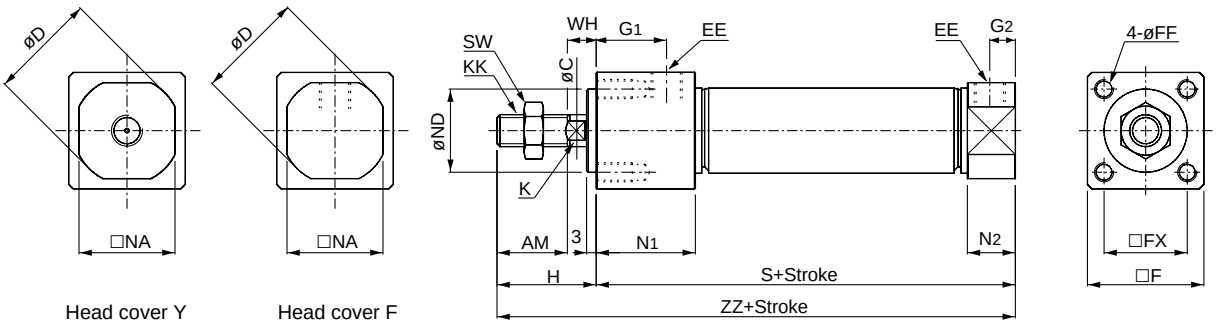


Unit: (mm)

Bore	AM	B	øC	øD	EE	G1	G2	H	K	KK	L	øLD	LH	LX	N1	N2	□NA	øND	S	SW	WH	XB	ZZ
ø20	20	30.5	8	28	G1/8	22	8	30	6	M8	33.5	ø5.5, ø9.5 Depth of counter bore 6.5	15	21	29	15	24	20 $^{0}_{-0.033}$	76	13	10	22	106
ø25	22	36.3	10	33.5	G1/8	22	8	36	8	M10 X 1.25	39	ø6.6, ø11 Depth of counter bore 7.5	18	25	29	15	30	26 $^{0}_{-0.033}$	79	17	14	26	115

Front side mounting/C□85RA $^{F}_{Y}$ 20/25—Stroke B

Without magnet, Built-in magnet (Band style)



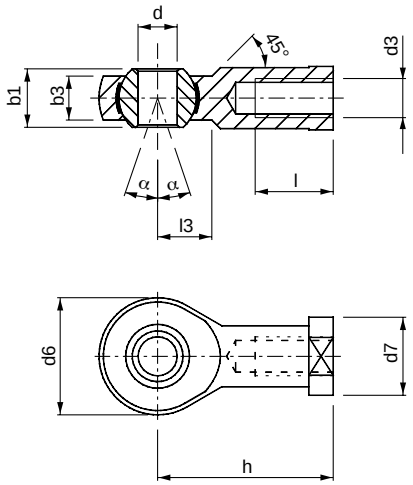
Unit: (mm)

Bore	AM	øC	øD	EE	□F	FF	□FX	G1	G2	H	K	KK	N1	N2	□NA	øND	S	SW	WH	ZZ
ø20	20	8	28	G1/8	30.4	M5 Depth 9	22	22	8	30	6	M8	29	15	24	20 $^{0}_{-0.033}$	76	13	10	106
ø25	22	10	33.5	G1/8	36.4	M6 Depth 11	26	22	8	36	8	M10 X 1.25	29	15	30	26 $^{0}_{-0.033}$	79	17	14	115

Dimensions

Rod Accessories

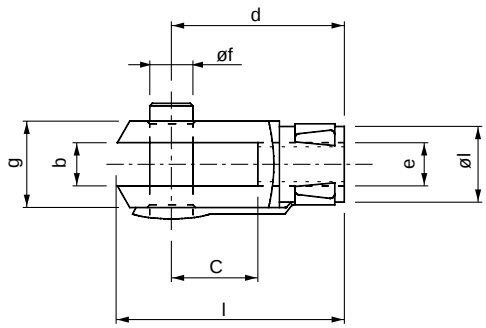
Single Knuckle Joint/DIN648-DIN24335



Unit: (mm)

Bore	Model	Thread d3	dh7	h	d6	b3	b1	l	d7	α°	l3
ø8	KJ4D	M4	5	27	18	6.0	8	10	11	7.5	10
ø10	KJ4D	M4	5	27	18	6.0	8	10	11	7.5	10
ø12	KJ6D	M6	6	30	20	6.75	9	12	13	6.5	10
ø16	KJ6D	M6	6	30	20	6.75	9	12	13	6.5	10
ø20	KJ8D	M8	8	36	24	9	12	16	16	13	12
ø25	KJ10D	M10 X 1.25	10	43	28	10.5	14	20	19	13	14

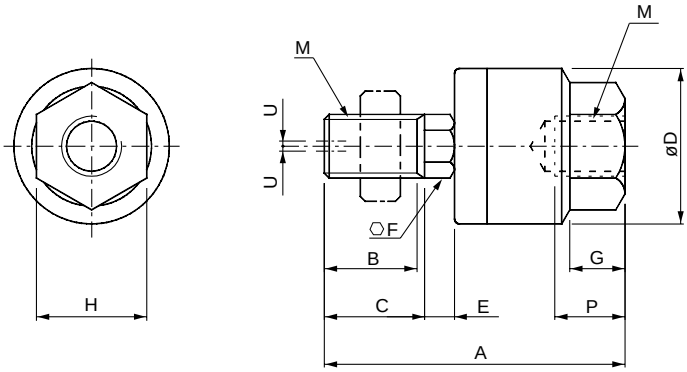
Double Knuckle Joint/ISO8140-DIN71752



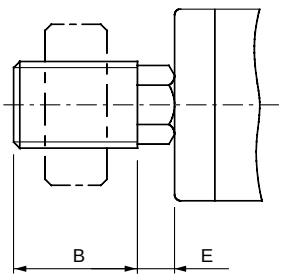
Unit: (mm)

Bore	Model	Thread e	b	d	f	g	c	j	a
ø8	GKM4-8	M4	4	16	4	8	8	6	8
ø10	GKM4-8	M4	4	16	4	8	8	6	8
ø12	GKM6-12	M6	6	24	6	10	12	8	12
ø16	GKM6-12	M6	6	24	6	10	12	8	12
ø20	GKM8-16	M8	8	32	8	12	16	10	16
ø25	GKM10-20	M10 X 1.25	10	40	10	18	20	12	20

Floating Joint/Series JA



In case of dimension without C



Unit: (mm)

Bore	Model	M		A	B	C	D	E	F	G	H	Maximum screwed depth P	Allowable eccentricity U	Max. operating tension and compression power (KN)
		Nominal thread dia.	Pitch											
ø8, ø10	JA10-4-070	4	0.7	26	9	10	12	1.5	4	4	7	5.5	0.5	0.054
ø12, ø16	JA10-6-100	6	1	34.5	12.5	14	16	2	6	5	10	7	0.5	0.123
ø20	JA20-8-125	8	1.25	44	17.5	—	21	4.5	7	7	13	8	0.5	1.1
ø25	JA30-10-125	10	1.25	49.5	19.5	—	24	5	8	8	17	9	0.5	2.5

Applicable Auto Switches

Style	Special function	Electrical entry	Indicator	Wiring (output)	Load voltage DC		Load voltage AC	Auto switch model** Band mounting	Rail mounting Perpendicular	Rail mounting In-line	Lead wire* (mm) 0.5 (—)	3 (L)	5 (Z)	None (N)	Applicable load	
Reed switch	——	Grommet	Yes	3 wire (NPN)	—	5V	—	C76	—	A76H	●	●	—	—	IC	—
				2 wire	—	—	200V	—	A72	A72H	●	●	—	—	——	Relay PLC
					24V	12V	100V	C73	A73	A73H	●	●	●	—		
			No			5V,12V	≤100V	C80	A80	A80H	●	●	—	—	IC	
		Connector	Yes			12V	—	C73C	A73C	—	●	●	●	●	——	
			No			5V,12V	≤24V	C80C	A80C	—	●	●	●	●	IC	
	Diagnostic indicator (2 colour)	Grommet	Yes			—	—	—	A79W	—	●	●	—	—	——	
Solid state switch	——	Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	H7A1	F7NV	F79	●	●	○	—	IC	Relay PLC
				3 wire (PNP)				H7A2	F7PV	F7P	●	●	○	—		
				2 wire		12V	—	H7B	F7BV	J79	●	●	○	—	——	
		Connector					—	H7C	J79C	—	●	●	●	●		
	Diagnostic indicator (2 colour)	Grommet		3 wire (NPN)		5V,12V	—	H7NW	F7NWV	F79W	●	●	○	—	IC	
				3 wire (PNP)				H7PW	—	F7PW	●	●	○	—		
				2 wire		12V		H7BW	H7BWV	J79W	●	●	○	—	——	
	Water resistant (2 colour)							H7BA	—	F7BA	—	●	○	—		
	With timer			3 wire (NPN)		5V,12V		—	—	F7NT	—	●	○	—	IC	
	With diagnostic output (2 colour)			4 wire (NPN)				H7NF	—	F79F	●	●	○	—		
	Latch style with diagnostic output (2 colour)					—		H7LF	—	F7LF	●	●	○	—	——	
	——	Connector and Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	M9N	—	—	●	●	—	—	IC	Relay PLC
				3 wire (PNP)				M9P	—	—	●	●	—	—		
				2 wire		12V		M9B	—	—	●	●	—	—	——	

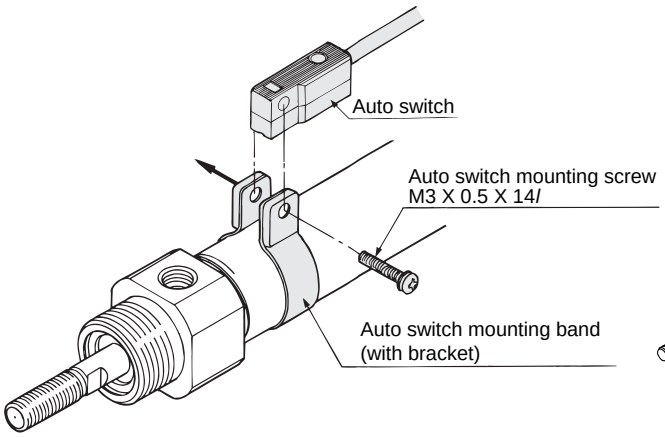
∗ Lead wire length 0.5m·····— e.g.) C73C 5m·····Z e.g.) C73CZ
3m·····L C73CL None·····N C73CN

∗ Solid state switches marked with "○" are manufactured upon receipt of order.

∗∗ "D-A79W" cannot be mounted on bore size ø10 cylinder with air cushion.

Auto Switch Mounting Band Part No.

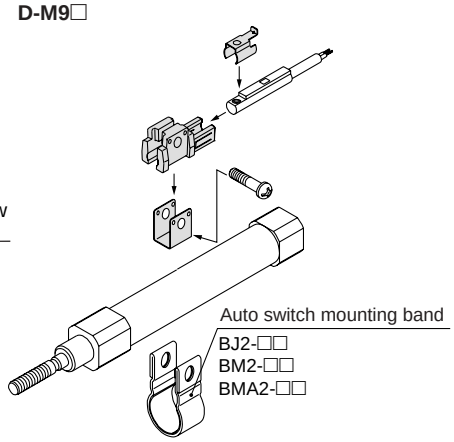
<Applicable auto switch>
D-C7□/C80, D-C73C/80C, D-H7□, D-H7C



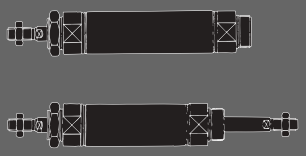
Bore size (mm)	Order No.
8	**BJ2-008**
10	**BJ2-010**
12	**BJ2-012**
16	**BJ2-016**
20	**BM2-020**
25	**BM2-025**

Auto Switch Mounting Band Part No.

<Applicable auto switch>
D-M9□



Bore size (mm)	Order No.
ø8~ø25	**BJ3-1**



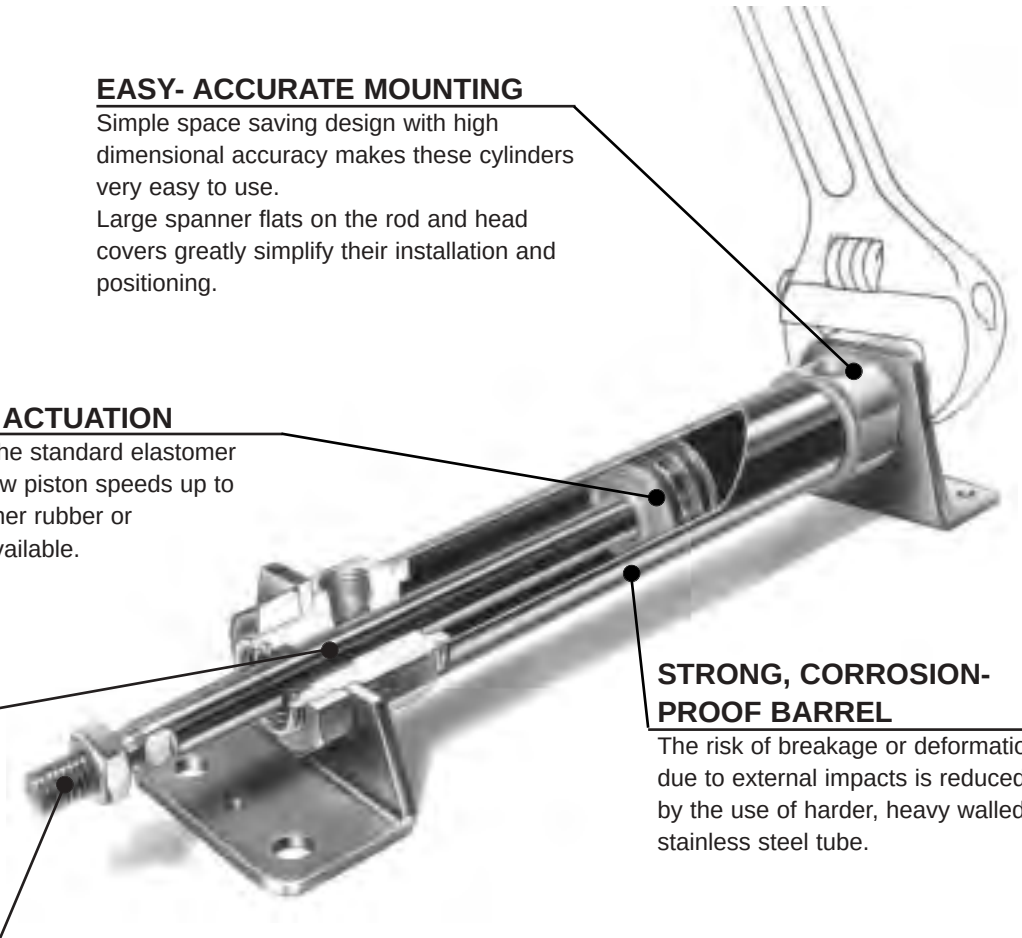
Air cylinders

Series C76

ø32, ø40

Standard Type, Non-rotating Type, Direct Mounting Type

C76 Series: Ø32, Ø40



EASY- ACCURATE MOUNTING

Simple space saving design with high dimensional accuracy makes these cylinders very easy to use.
Large spanner flats on the rod and head covers greatly simplify their installation and positioning.

HIGH SPEED ACTUATION

Low friction and the standard elastomer cushion rings allow piston speeds up to 1500mm/sec. Either rubber or air cushion are available.

REPLACEABLE ROD PACKING

Rod packing can be quickly replaced, greatly extending the cylinder life.
(C85 Ø20, 25).

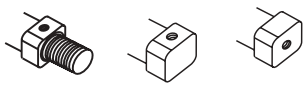
STRONG, CORROSION-PROOF BARREL

The risk of breakage or deformation due to external impacts is reduced by the use of harder, heavy walled stainless steel tube.

MINIMIZED SIDE CLEARANCE

The close tolerance of the piston rod in the front end bush allows greater side loading.

(Head cover)
To realize the rational mounting and the saving space by three or four different head covers.

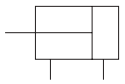
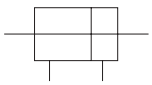
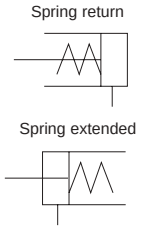
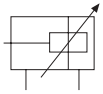
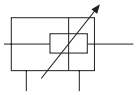
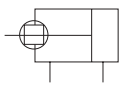
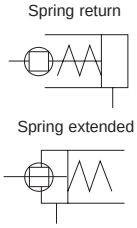
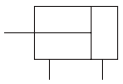


Series	Type	Action
C76	Standard	Double acting: Single rod
		Double acting: Double rod
		Single acting: Spring return
		Single acting: Spring extended
	Non-rotating	Double acting: Single rod
		Single acting: Spring return
		Single acting: Spring extended
	Direct mounting	Double acting: Single rod
	Mounting bracket	Rod foot /Rod flange (Single)
		Rod and head foot (Double)
		Rod trunnion
		Head trunnion
		Rod clevis
		Head clevis

(Note 1) No double acting:
Double rod:
Recommendable combination ◉

(Note 2)
Except for with air cushion

Variations of C76 Series

	Standard (Rubber cushion)			Standard (Air cushion)		Non-rotating		Direct mounting
	Double acting Single rod	Double acting Double rod	Single acting Spring return Spring extended	Double acting Single rod	Double acting Double rod	Double acting Single rod	Single acting Spring return Spring extended	Double acting Single rod
								
Bore size (mm)	32, 40			32,40		32,40	32,40	32,40
Type	Non-lubricated							
Mounting (Head cover)	Double end type Front nose type Front nose in line type	Double end type	Spring return/ Double end type Front nose type Front nose in line type Spring extend-ed/ Double end type Front nose type	Double end type	Double end type	Double end type Front nose type Front nose in line type	Spring return/ Double end type Front nose type Front nose in line type Spring extend-ed/ Double end type Front nose type	Front nose type
Built-in magnet	Band mounted type, Rail mounted type							Band mount-ed type
Mounting bracket	Rod foot Rod and head foot Rod flange Rod trunnion Head trunnion Rod clevis Head clevis	Rod and head foot Flange Trunnion	Rod foot Rod and head foot Rod flange Rod trunnion Head trunnion Rod clevis Head clevis	Rod foot Rod and head foot Rod flange Rod trunnion Head trunnion Rod clevis Head clevis	Rod and head foot Flange Trunnion	Rod foot Rod and head foot Rod flange Rod trunnion Head trunnion Rod clevis Head clevis		Bottom side mounting Front nose mounting
Accessories	Standard/Mounting nut, Rod end nut Option/Single knuckle joint, Double knuckle joint (with pin) Floating joint		Standard/Mounting nut, Rod end nut, Option/Single knuckle joint Double knuckle joint (with pin) Floating joint	Standard/Mounting nut, Rod end nut, Option/Single knuckle joint, Double knuckle joint (with pin) Floating joint		Standard/Mounting nut, Rod end nut, Option/Single knuck-le joint, Double knuckle joint (with pin) Floating joint		Standard/Rod end nut Option/Single knuckle joint, Double knuckle joint (with pin) Floating joint
Page	P.4-4		P.4-18	P.4-4		P.4-4	P.4-4	P.4-35

Air cylinder/ Double acting, single and double rod

Series C76

ø32, ø40

How to order

Double acting Single rod	C	D	76		K	E	32	100	C		J	A		XB6
Double acting Double rod	C	D	76	W		E	32	100	C	J	J	B		
Single acting Spring return Spring extended	C	D	76		K	E	32	100		S		B		

Magnet
Nil — None
D — Built-in magnet

Double rod

Type
Nil — Standard.
K — Non-rotating (Rubber cushion only).

Mounting

Mark	Mounting
*E	Double end type
** F	Front nose type
** Y	Front nose in line type

* Double acting/Double rod type: Only double end type. (E).
**Except for air cushion type.

Auto switch mounting type
A — Rail mounted type
B — Band mounted type

Other variations suffix

XB6	Higth operating temperature: -10÷150°C (Non-magnetic)
XB7	Low operating temperature: -55÷70°C available for bores 20 to 25mm
XB9	Low speed
XC6B	Stainless steel piston rod, piston rod nut and mounting nut
XC6A	Stainless steel piston rod and piston rod nut

Gaiter

Nil	Without gaiter
J	Nylon tarpaulin one side
K	Neoprene cloth one side
* JJ	Nylon tarpaulin both sides
*KK	Neoprene cloth both sides

* In case of double acting/double rod.

Action
S — Spring return
T — Spring extended

Cushion
Nil — Rubber cushion (Standard)
C — Air cushion (only "E" execution)

Bore size (mm)	Standard stroke (mm)	Max. stroke (mm)
32	10, 25, 40, 50, 80, 100, 125, 160, 200, 250**, 300*	1000
40		

* Except single acting type.
** Except single acting type, (ø32)

Parts No. of Mounting Bracket

Mounting bracket \ Bore size (mm)		32	40
Mounting bracket	Flange, Foot (1pc.)	C76F32A	C76F40A
	Flange, Foot (2 pcs. with mounting nut 1 pc.)	C76F32B	C76F40B
	Trunnion	C76T32	C76T40
	Clevis	C76C32	C76C40
Accessories	Single knuckle joint	KJ10DA	KJ12DA
	Double knuckle joint	GKM10-20A	GKM12-24A
	Floating joint	JA25-10-150	JA40-12-175

Bore (mm)	Code number		Note
	Standard	Non-rotating	
32	C76-32PS	C76K-32PS	Every set includes: n°1 rod packing, n°1 packing retaining washer, n°1 retaining ring
40	C76-40PS	C76K-40PS	

Suitable also C76 series

Example of How to Order

1 In case of without auto switch, bore size: 32, stroke: 100, double acting/single rod and double end type.
C76E32-100 1 pc.—— Cylinder
2 In case of without auto switch, bore size: 32, stroke: 50, double acting/double rod, double end type and rod and head foot mounting.
C76WE32-50 1 pc.—— Cylinder
C76L32B 2 pcs.—— Foot bracket
3 In case of with auto switch (band mounted type, 2 pcs.), bore size: 40, stroke: 100, double acting/single rod, front nose in line type and flange mounting.
CD76Y40-100-B 1 pc.—— Cylinder
C76F40A 1 pc.—— Flange mounting
D-C73L 2 pcs.—— Auto switch
BM2-040 2 pcs.—— For auto switch mounting band
4 In case of with auto switch (rail mounted type, 2 pcs.), bore size: 40, stroke: 50, single acting/spring return, front nose type and trunnion mounting.
CD76F40-50S-A 1 pc.—— Cylinder
C76T40 1 pc.—— Trunnion mounting
D-A73L 2 pcs.—— Auto switch
5 Non-rotating : In case of without auto switch, bore size: 32, stroke: 100, double acting/single rod and double end type.
C76KE32-100 1 pc. —— Cylinder

Specifications

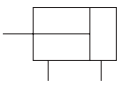
Bore size (mm)		32	40
Piston rod dia. (mm)		12	14
Piston rod thread		M10	M12
Ports		G1/8	G1/4
Action		Double acting/Single or Double Rod	
Fluid		Air	
Proof pressure		1.5MPa {15bar}	
Max operating pressure		1.0MPa {10bar}	
Min operating pressure		0.05MPa {0.5bar}	
Ambient and fluid temperature		-20÷80°C (Built-in magnet type: -10÷60°C)	
Cushion		Rubber cushion, Air cushion	
Lubrication		Not required. If necessary turbine oil #1 ISOVG32 is recommended	
Gaiter	Nylon tarpaulin	Max ambient temperature 60°C	
	Neoprene cloth	Max ambient temperature *110°C	
Piston speed		50÷1500mm/s	
Allowable kinetic energy (J)	Rubber cushion	0.65	1.2
	Air cushion	1.07	2.35
Non-rotating accuracy		±0.5°	±0.5°

* Maximum ambient temperature of gaiters only.

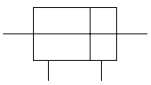
Symbol

Standard: double action

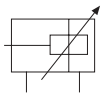
Rubber Cushion
Single rod



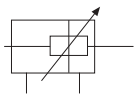
Rubber Cushion
Double rod



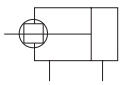
Air Cushion
Single rod



Air Cushion
Double rod



Non-rotating: Double acting/Single rod



Weight Table (Standard, Non-rotating)

(g)

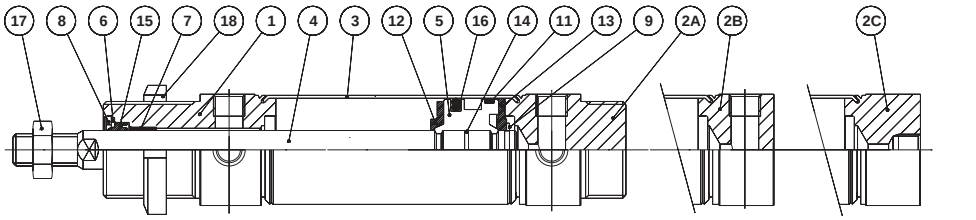
Bore size (mm)			32	40
Basic weight		Single rod	340 (375)	655 (725)
		Double rod	420	810
Additional weight for each 10mm of stroke		Single rod	16.8	26.6
		Double rod	25.6	96.5
Mounting bracket		C75F○A	110	200
		C75F○B	240	455
		C75T○	15	25
		C85C○	165	305
Accessories	Single knuckle joint	KJ○D	70	105
	Double knuckle joint	GKM○-○	100	165
	Floating joint	JA○-○-○	70	160

( ): In case of air cushion

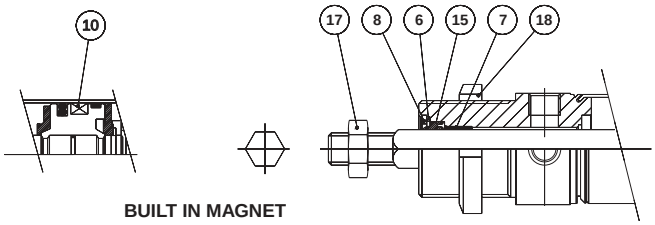
Calculation Example: C76E32-50, C76F32A

Basic weight ——— 340 (Ø32)
Additional weight ——— 16.8/10mm of stroke
Cylinder stroke ——— 50mm
Mounting bracket ——— 110
340+16.8x50/10=424 424+110=534

C◯76◯32 ~ 40 Rubber Cushion (Disassembly is not possible)



"E" BASIC EXECUTION BOSS CUT "F" BOSS CUT "Y"



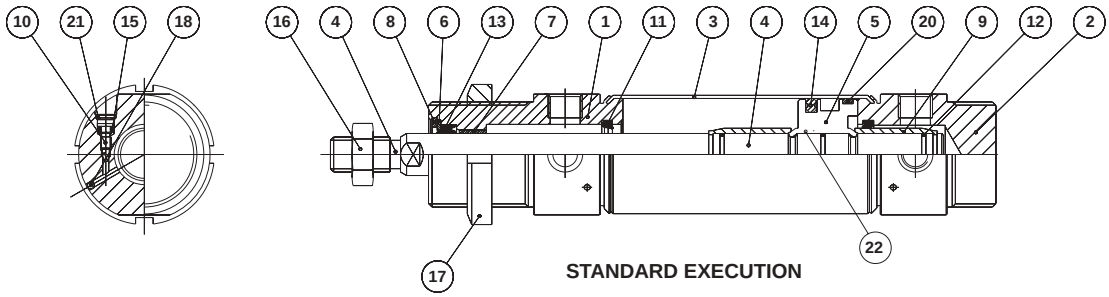
BUILT IN MAGNET

Parts List

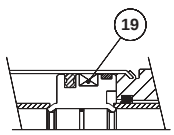
Item	Part name	Material	Quantity	Remarks
1	Rod cover	Aluminum alloy	1	White alumite
2A	Head cover E	Aluminum alloy	1	White alumite
2B	Head cover F	Aluminum alloy	1	White alumite
2C	Head cover Y	Aluminum alloy	1	White alumite
3	Cylinder tube	Stainless steel	1	
4	Piston rod	Carbon steel	1	Hard chrome plated
5	Piston	Aluminum alloy	1	Chromate
6	Plain washer	Carbon steel	1	Nickel plating
7	Bush	Sintered bronze	1	
8	Retaing ring	Carbon steel	1	Nickel plating

Item	Part name	Material	Quantity	Remarks
9	Retaining ring	Carbon steel	1	Nickel plating
10	Magnet	Magnet	1	(Switch type only)
11	Wear ring	Phenolic resin	1	
12	Bumper A	Urethane	1	
13	Bumper B	Urethane	1	
14	Piston gasket	NBR	1	
15	Rod seal	NBR	1	
16	Piston seal	NBR	1	
17	Rod end nut	Carbon steel	1	Nickel plating
18	Mounting nut	Carbon steel	1	Nickel plating

C◯76◯32 ~ 40 Air Cushion (Disassembly is not possible)



STANDARD EXECUTION



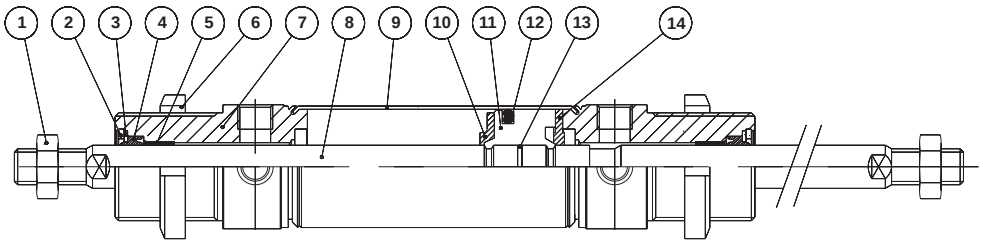
BUILT IN MAGNET

Parts List

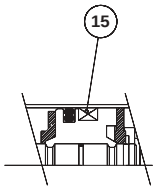
Item	Part name	Material	Quantity	Remarks
1	Rod cover	Aluminum alloy	1	White alumite
2	Head cover E	Aluminum alloy	1	White alumite
3	Cylinder tube	Stainless steel	1	
4	Piston rod	Carbon steel	1	Hard chrome plated
5	Piston	Aluminum alloy	1	Chromate
6	Plain washer	Carbon steel	1	Nickel plating
7	Bush	Sintered bronze	1	
8	Retaining ring	Carbon steel	1	Nickel plating
9	Cushion ring	Copper alloy	2	
10	Cushion valve	Rolled Steel	2	Kanigen plating
11	Cushion packing	NBR	2	

Item	Part name	Material	Quantity	Remarks
12	Cushion ring gasket	NBR	2	
13	Rod seal	NBR	1	
14	Piston seal	NBR	1	
15	Cushion valve packing	NBR	1	
16	Rod end nut	Carbon steel	1	Nickel plating
17	Mounting nut	Carbon steel	1	Nickel plating
18	Steel ball	Stainless steel	2	
19	Magnet		1	
20	Wear ring	Phenolic resin	1	
21	Retaining ring	Stainless steel	2	
22	Piston gasket	NBR	1	

C○76○32 ~ 40 Rubber Cushion (Disassembly is not possible)



STANDARD EXECUTION



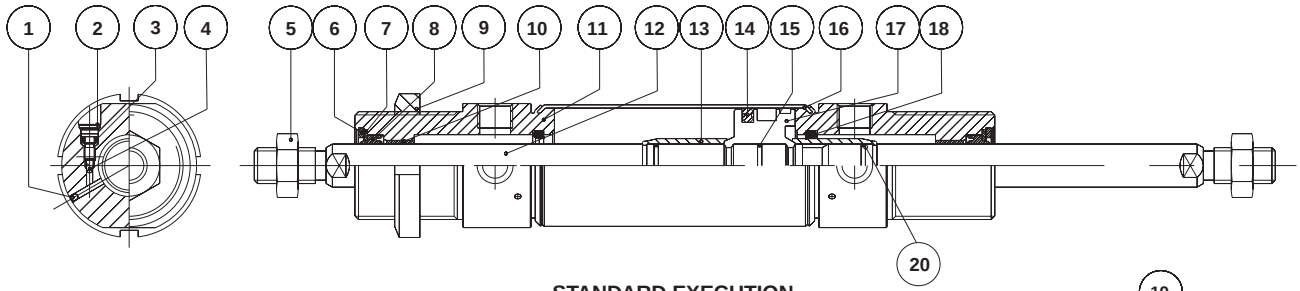
BUILT IN MAGNET

Parts List

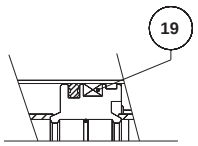
Item	Part name	Material	Quantity	Remarks
1	Rod end nut	Carbon steel	1	Nickel plating
2	Retaining ring	Carbon steel	2	Nickel plating
3	Plain washer	Carbon steel	2	Nickel plating
4	Rod seal	NBR	2	
5	Bush	Sintered bronze	2	
6	Mounting nut	Carbon steel	1	Nickel plating
7	Rod cover	Aluminum alloy	2	White alumite
8	Piston rod	Stainless steel	1	Hard chrome plated

Item	Part name	Material	Quantity	Remarks
9	Cylinder tube	Stainless steel	1	
10	Bumper A	Urethane	1	
11	Piston	Aluminum alloy	1	Chromate
12	Piston seal	NBR	1	
13	Piston gasket	NBR	1	
14	Bumper B	Urethane	1	
15	Magnet		1	(Switch type only)

C○76○32 ~ 40 Air Cushion (Disassembly is not possible)



STANDARD EXECUTION



BUILT IN MAGNET

Parts List

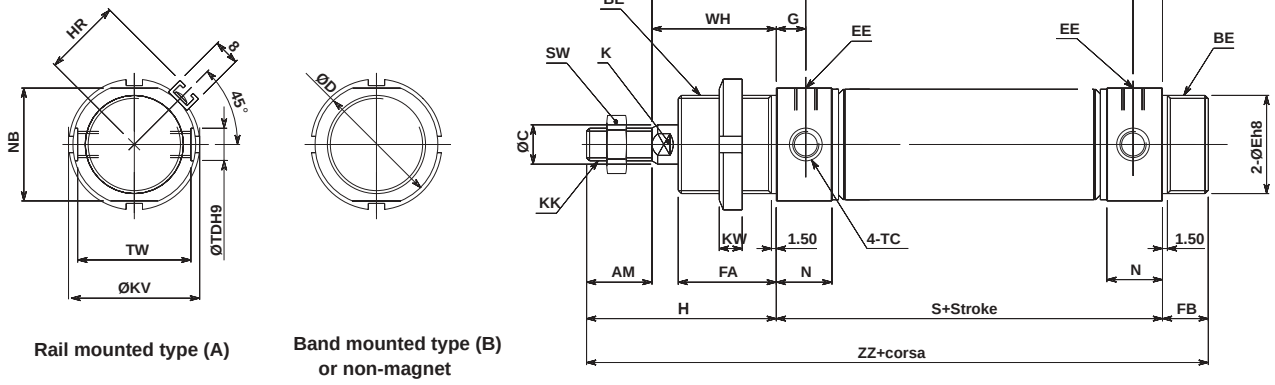
Item	Part name	Material	Quantity	Remarks
1	Steel ball	Stainless steel	2	
2	Retaining ring	Stainless steel	2	
3	Cushion valve packing	NBR	2	
4	Cushion valve	Rolled steel	2	Kaunigen plating
5	Rod end nut	Carbon steel	2	Nickel plating
6	Retaining ring	Carbon steel	2	Nickel plating
7	Plain washer	Carbon steel	2	Nickel plating
8	Rod seal	NBR	2	
9	Mounting nut	Carbon steel	1	Nickel plating
10	Bush	Sintered bronze	2	

Item	Part name	Material	Quantity	Remarks
11	Rod cover	Aluminum alloy	2	White alumite
12	Piston rod	Carbon steel	1	Hard chrome plated
13	Cushion ring	Copper alloy	2	Hard chrome plated
14	Piston seal	NBR	1	
15	Piston gasket	NBR	1	
16	Cylinder tube	Stainless steel	1	
17	Piston	Aluminum alloy	1	Chromate
18	Cushion packing	NBR	2	
19	Magnet			
20	Cushion ring gasket	NBR	2	

C◯76E Double end type, Standard, Non-rotating

Dimensions

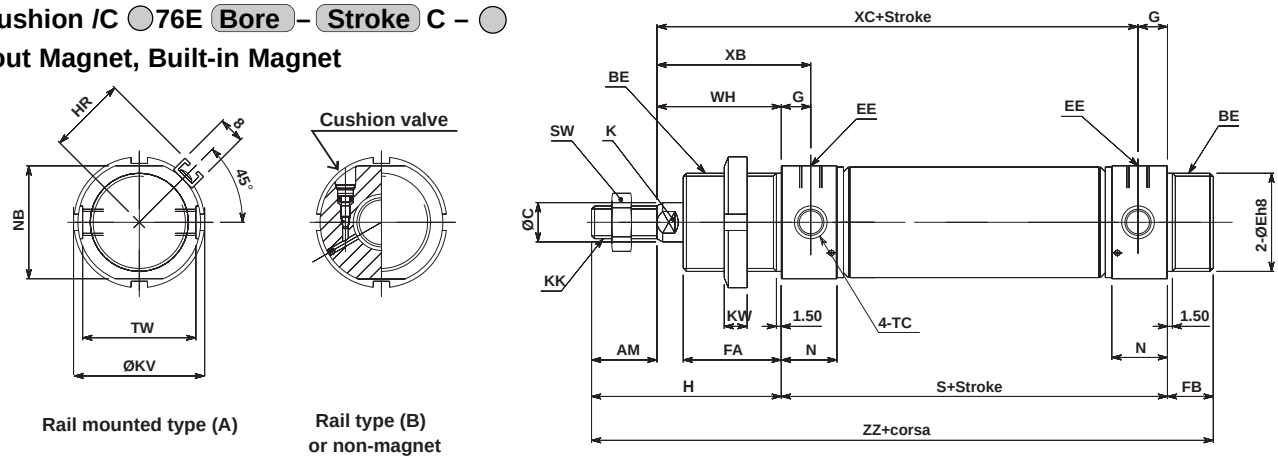
Rubber Cushion/ C◯76E Bore – Stroke – ◯
Without Magnet, Built-in Magnet



Rail mounted type (A)

Band mounted type (B) or non-magnet

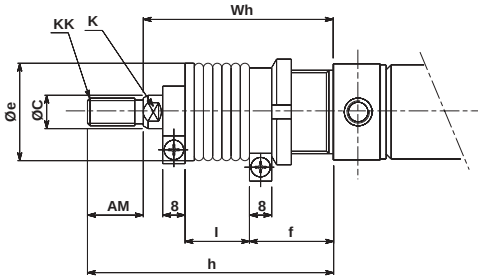
Air Cushion /C◯76E Bore – Stroke C – ◯
Without Magnet, Built-in Magnet



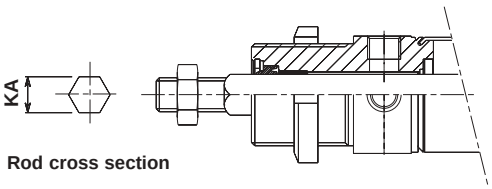
Rail mounted type (A)

Rail type (B) or non-magnet

With Gaiter



C◯76KE
Non-rotating, Piston rod (Rubber Cushion Only)



Rod cross section

Unit:mm

Bore	AM	BE	ØC	ØD	ØEh8	EE	FA	FB	G	H	HR	K	KA	KK	ØKV	KW	N	NB	S	SW	TC	ØTDH9	TW	WH	XB	XC	ZZ
32	20	M30x1.5	12	37.5	30 -0 -0.033	G1/8	30	14	9	58	23.8	10	12.2	M10	38	7	17(19)	34.5	68	17	M8x1	10	34.5	38	47	97	140
40	24	M38x1.5	14	46.5	38 -0 -0.039	G1/4	35	16	12	69	28.3	12	14.2	M12	50	8	22(25)	42.5	89	19	M10x1	12	42.5	45	57	122	174

( ): In case of air cushion

With Gaiter

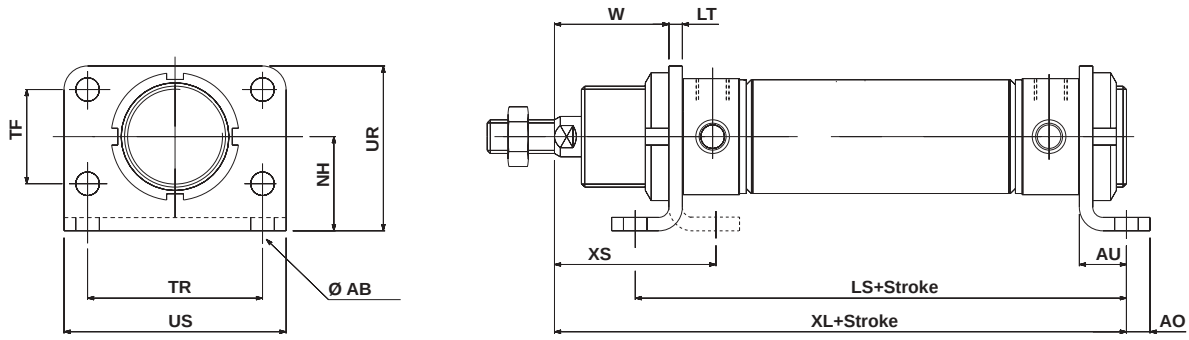
Bore \ Item / Stroke	AM	ØC	Øe	f	K	KK	h						
							1~50	51~100	101~150	151~200	201~300	301~400	401~500
32	20	12	35	30	10	M10	77	90	102	115	140	165	190
40	24	14	46	35	12	M12	88	101	113	126	151	176	201

Bore \ Item / Stroke	l							Wh						
	1~50	51~100	101~150	151~200	201~300	301~400	401~500	1~50	51~100	101~150	151~200	201~300	301~400	401~500
32	12.5	25	37.5	50	75	100	125	57	70	82	95	120	145	170
40	12.5	25	37.5	50	75	100	125	64	77	89	102	127	152	177

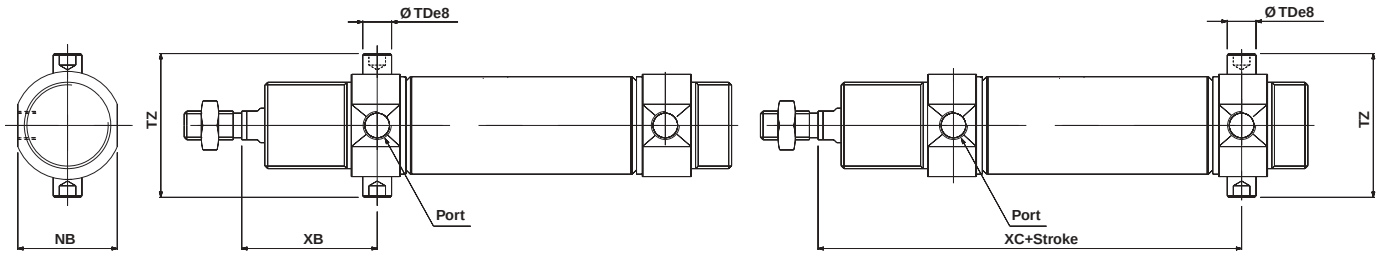
C◯76E Accessories

Dimensions with mounting brackets

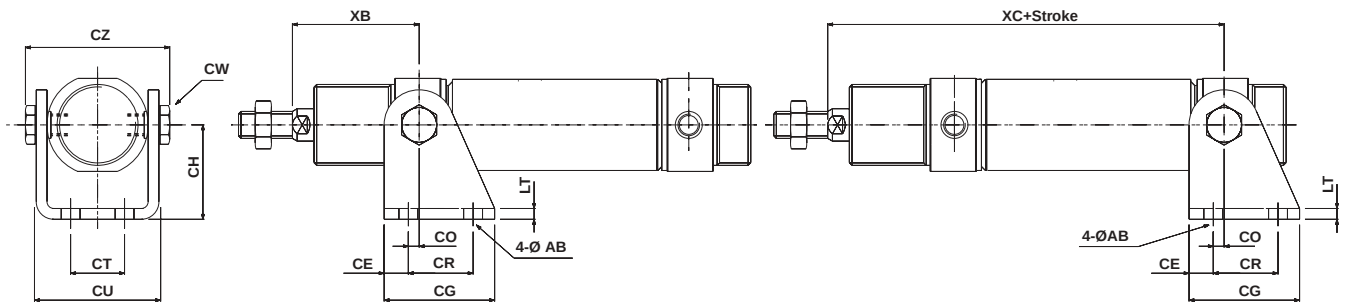
Rod Foot Flange, Rod And Head Foot: C76F32 $^{A}_{B}$, C76F40 $^{A}_{B}$



Rod Trunnion, Head Trunnion: C76T32, C76T40



Rod clevis, Head clevis: C76C32, C75C40



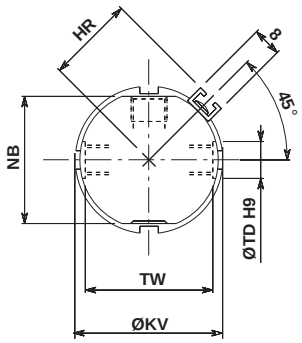
Unit:mm

Bore	Rod foot (flange)													Rod/head trunnion					Rod clevis, Head clevis											
	ØAB	AO	AU	LS	LT	NH	TF	TR	UR	US	W	XL	XS	NB	ØTDe8	TZ	XB	XC	ØAB	CE	CG	CH	CO	CR	CT	CU	CW	CZ	LT	XB	XC
32	7	7	14	96	4	28	28	52	49	66	34	120	48	34.5	$10^{-0.025}_{-0.047}$	47.9	47	97	7	9	41	35	4	24	20	46.8	13	57.9	4	47	97
40	9	10	20	129	5	33	30	60	58	80	40	154	60	42.5	$12^{-0.032}_{-0.059}$	59.3	57	122	9	12	52	40	3	30	28	58.2	17	72.3	5	57	122

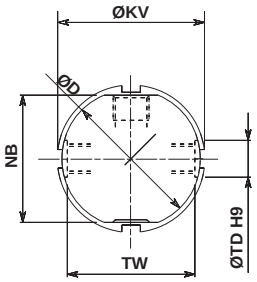
C◯76F Front nose type, Standard, Non-rotating

Dimensions

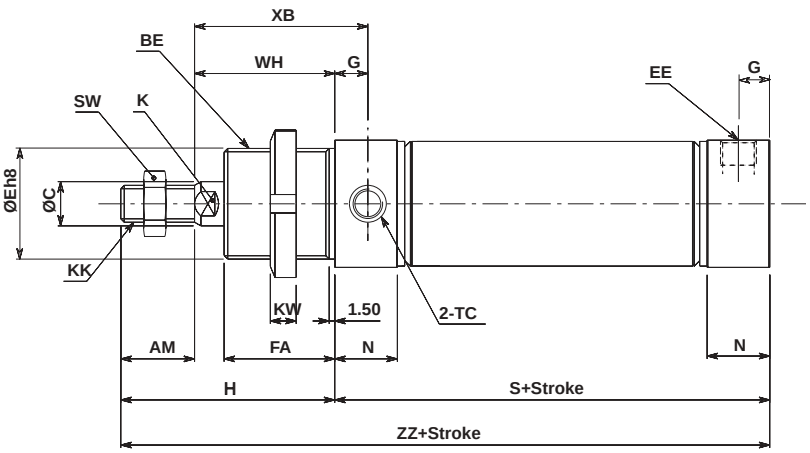
Rubber Cushion/ C◯76F Bore – Stroke – ◯
Without Magnet, Built-in Magnet



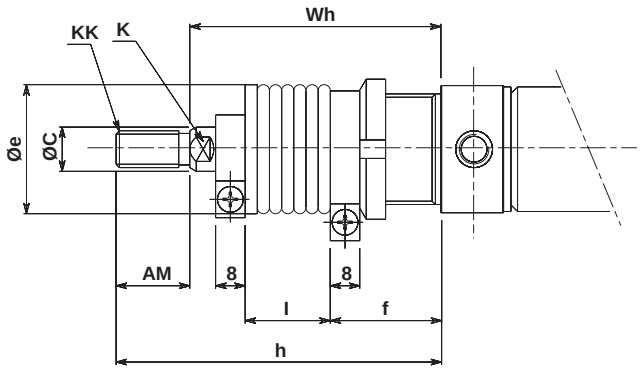
Rail mounted type (A)



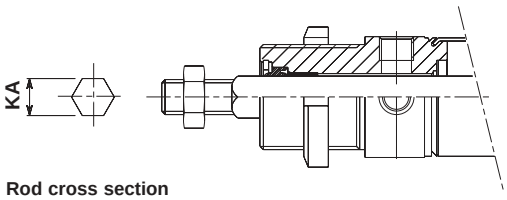
Band mounted type (B)
or non-magnet



With Gaiter



C◯76KF
Non-rotating, Piston rod



Rod cross section

Unit:mm

Bore	AM	BE	ØC	ØD	ØEh8	EE	FA	G	H	HR	K	KA	KK	ØKV	KW	N	NB	S	SW	TC	ØTDH9	TW	WH	XB	ZZ
32	20	M30x1.5	12	37.5	$30^{0}_{-0.033}$	G1/8	30	9	58	23.8	10	12.2	M10	38	7	17	34.5	68	17	M8x1	$10^{+0.036}_{0}$	34.5	38	47	126
40	24	M38x1.5	14	46.5	$38^{0}_{-0.039}$	G1/4	35	12	69	28.3	12	14.2	M12	50	8	22	42.5	89	19	M10x1	$12^{+0.036}_{0}$	42.5	45	57	158

With Gaiter

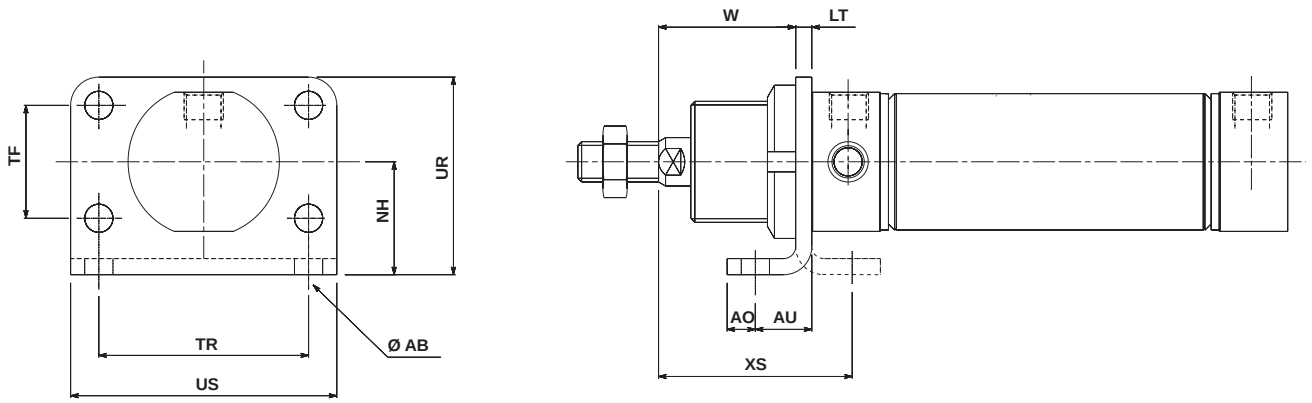
Bore \ Item / Stroke	AM	ØC	Øe	f	K	KK	h						
							1~50	51~100	101~150	151~200	201~300	301~400	401~500
32	20	12	35	30	10	M10	77	90	102	115	140	165	190
40	24	14	46	35	12	M12	88	101	113	126	151	176	201

Bore \ Item / Stroke	l							Wh						
	1~50	51~100	101~150	151~200	201~300	301~400	401~500	1~50	51~100	101~150	151~200	201~300	301~400	401~500
32	12.5	25	37.5	50	75	100	125	57	70	82	95	120	145	170
40	12.5	25	37.5	50	75	100	125	64	77	89	102	127	152	177

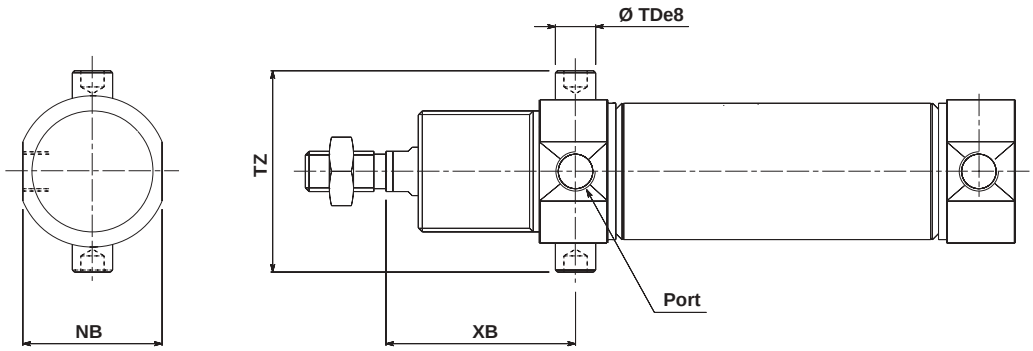
C◯76F Accessories

Dimensions with mounting brackets

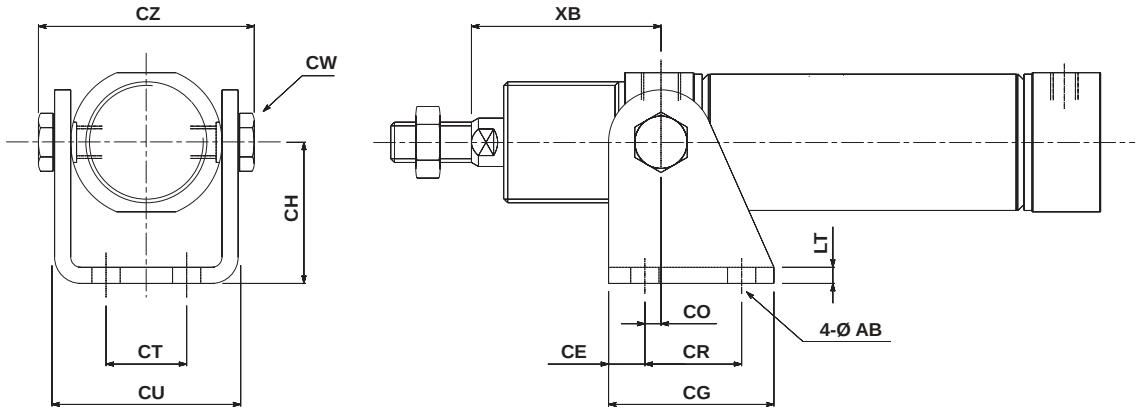
Rod Foot (flange): C76F32A, C76F40A



Rod Trunnion: C76T32, C76T40



Rod Clevis: C76C32, C76C40



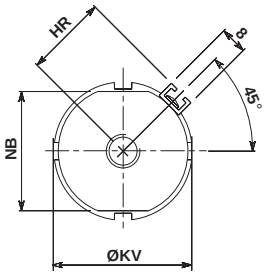
Unit:mm

Bore	Rod foot (flange)											Rod Trunnion				Rod clevis											
	ØAB	AO	AU	LT	NH	TF	TR	UR	US	W	XS	NB	ØTDe8	TZ	XB	ØAB	CE	CG	CH	CO	CR	CT	CU	CW	CZ	LT	XB
32	7	7	14	4	28	28	52	49	66	34	48	34.5	$10^{-0.025}_{-0.047}$	47.9	47	7	9	41	35	4	24	20	46.8	13	57.9	4	47
40	9	10	20	5	33	30	60	58	80	40	60	42.5	$12^{-0.032}_{-0.059}$	59.3	57	9	12	52	40	3	30	28	58.2	17	72.3	5	57

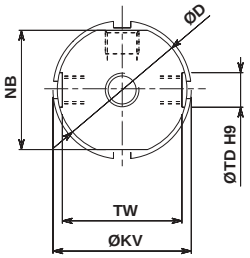
C◯76Y Front nose in line type, Standard, Non-rotating

Dimensions

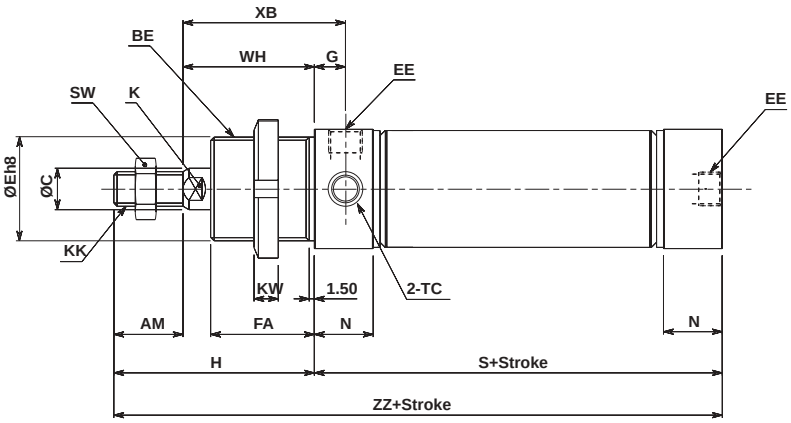
Rubber Cushion/C◯ 76Y Bore – Stroke – ◯
Without Magnet, Built-in Magnet



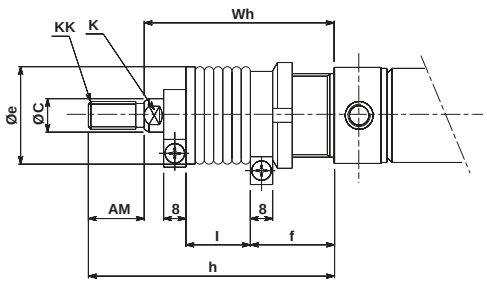
Rail mounted type (A)



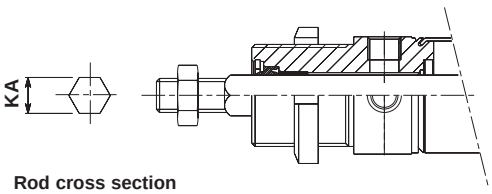
Band mounted type (B)
or non-magnet



With Gaiter



C◯ 76KY
Non-rotating, Piston rod



Rod cross section

Unit:mm

Bore	AM	BE	ϕC	ϕD	ϕEh8	EE	FA	G	H	HR	K	KA	KK	ϕKV	KW	N	□NB	S	SW	TC	ϕTDH9	TW	WH	XB	ZZ
32	20	M30x1.5	12	37.5	$30^{0}_{-0.033}$	G1/8	30	9	58	23.8	10	12.2	M10	38	7	17	34.5	68	17	M8x1	$10^{+0.036}_{0}$	34.5	38	47	126
40	24	M38x1.5	14	46.5	$38^{0}_{-0.039}$	G1/4	35	12	69	28.3	12	14.2	M12	50	8	22	42.5	89	19	M10x1	$12^{+0.036}_{0}$	42.5	45	57	158

With Gaiter

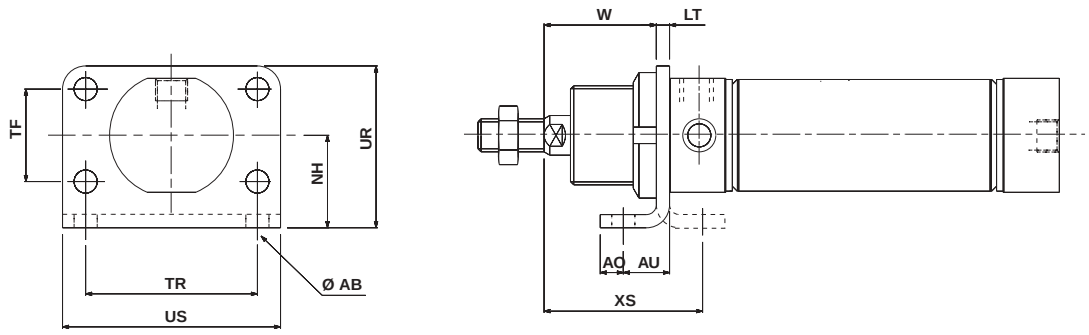
Bore \ Item / Stroke	AM	ØC	Øe	f	K	KK	h						
							1~50	51~100	101~150	151~200	201~300	301~400	401~500
32	20	12	35	30	10	M10	77	90	102	115	140	165	190
40	24	14	46	35	12	M12	88	101	113	126	151	176	201

Bore \ Item / Stroke	l							Wh						
	1~50	51~100	101~150	151~200	201~300	301~400	401~500	1~50	51~100	101~150	151~200	201~300	301~400	401~500
32	12.5	25	37.5	50	75	100	125	57	70	82	95	120	145	170
40	12.5	25	37.5	50	75	100	125	64	77	89	102	127	152	177

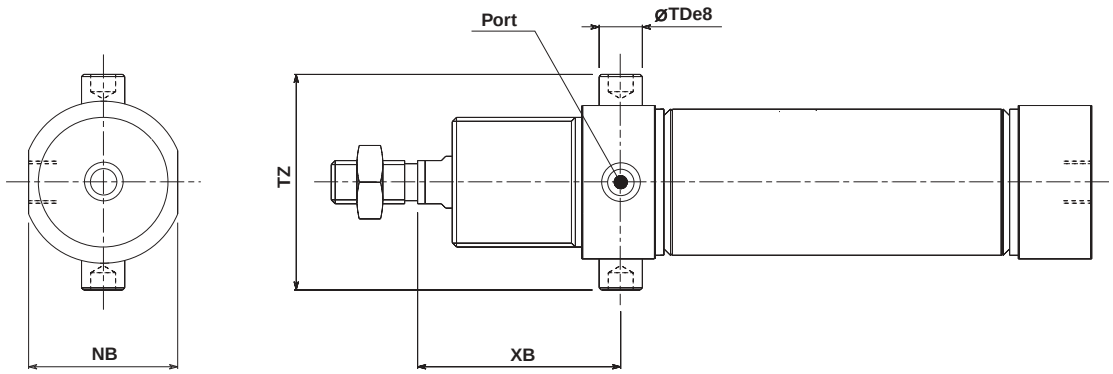
C◯76Y Accessories

Dimensions with mounting brackets

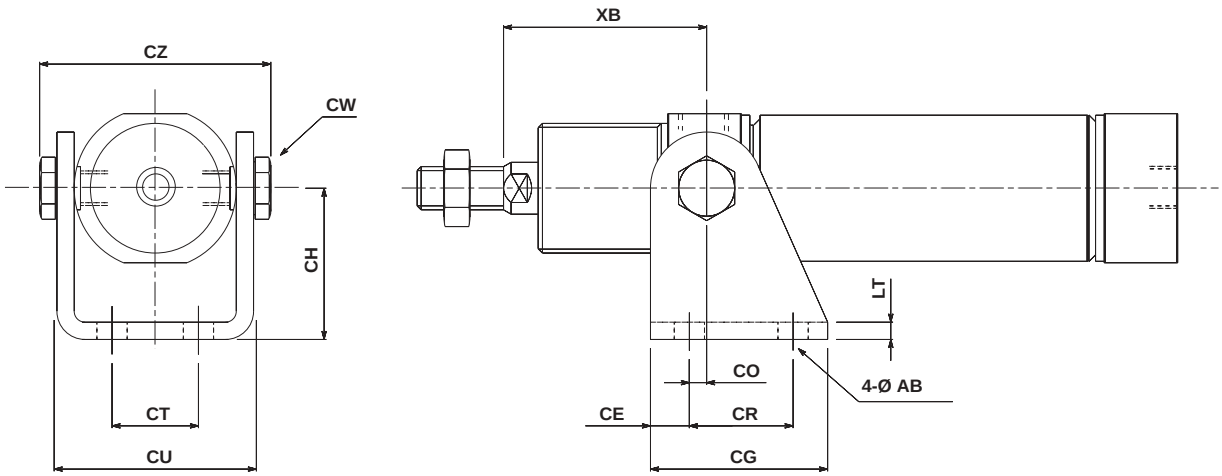
Rod Foot (flange): C76F32A, C76F40A



Rod Trunnion: C76T32, C76T40



Rod Clevis: C76C32, C76C40



Unit:mm

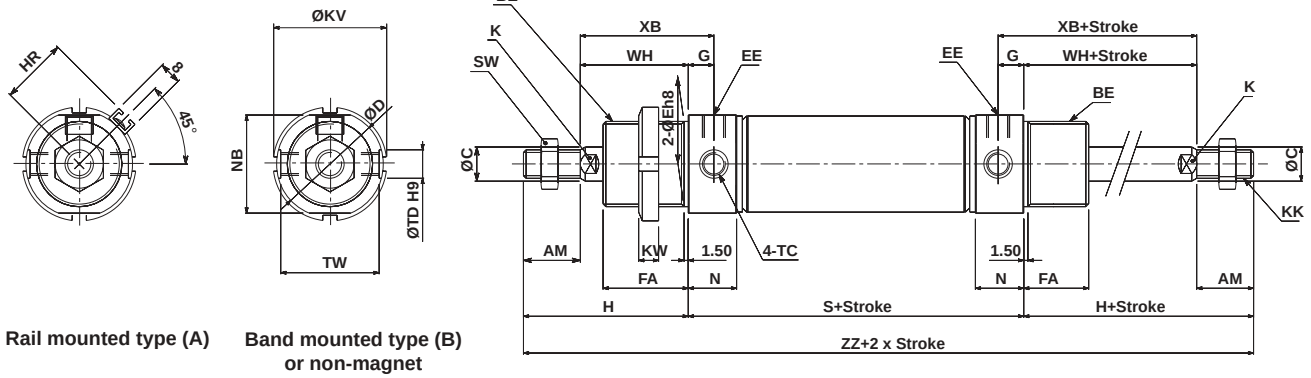
Bore	Rod floot (flange)											Rod trunnion				Rod clevis											
	ØAB	AO	AU	LT	NH	TF	TR	UR	US	W	XS	NB	ØTDe8	TZ	XB	ØAB	CE	CG	CH	CO	CR	CT	CU	CW	CZ	LT	XB
32	7	7	14	4	28	28	52	49	66	34	48	34.5	$10^{-0.025}_{-0.047}$	47.9	47	7	9	41	35	4	24	20	46.8	13	57.9	4	47
40	9	10	20	5	33	30	60	58	80	40	60	42.5	$12^{-0.032}_{-0.059}$	59.3	57	9	12	52	40	3	30	28	58.2	17	72.3	5	57

C◯76WE Double end type/Standard

Dimensions

Rubber Cushion/C◯76WE Bore – Stroke – ◯

Without Magnet, Built-in Magnet

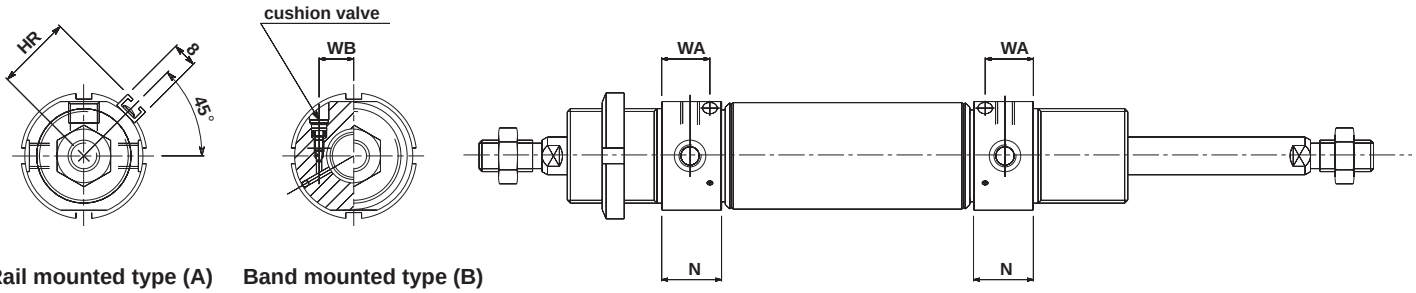


Rail mounted type (A)

Band mounted type (B) or non-magnet

Air Cushion/C◯76WE Bore – Stroke C – ◯

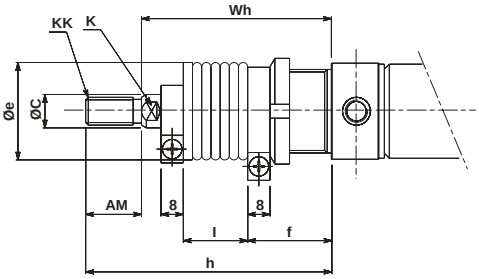
Built-in Magnet



Rail mounted type (A)

Band mounted type (B) or non-magnet

With Gaiter



Unit:mm

Bore	AM	BE	ØC	ØD	ØEh8	EE	FA	G	H	HR	K	KK	ØKV	WB	KW	N	NB	S	SW	TC	ØTDH9	TW	WH	XB	ZZ	WA
32	20	M30x1.5	12	37.5	$30^{0}_{-0.033}$	G1/8	30	9	58	23.8	10	M10	38	11	7	17(19)	34.5	68	17	M8x1	$10^{+0.036}_{0}$	34.5	38	47	184	15.3
40	24	M38x1.5	14	46.5	$38^{0}_{-0.039}$	G1/4	35	12	69	28.3	12	M12	50	13	8	22(25)	42.5	89	19	M10x1	$12^{+0.043}_{0}$	42.5	45	57	227	20

( ): in case of air cushion

With Gaiter

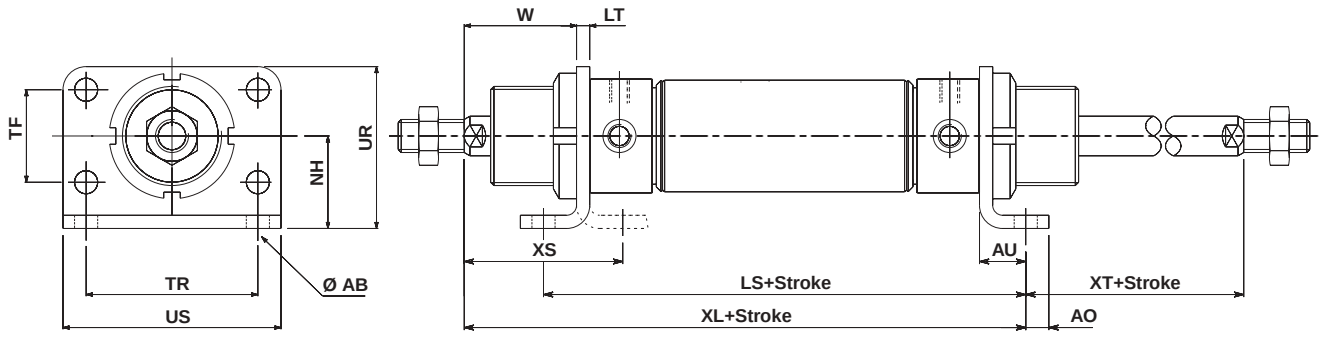
Bore \ Item / Stroke	AM	ØC	Øe	f	K	KK	h						
							1~50	51~100	101~150	151~200	201~300	301~400	401~500
32	20	12	35	30	10	M10	77	90	102	115	140	165	190
40	24	14	46	35	12	M12	88	101	113	126	151	176	201

Bore \ Item / Stroke	l							Wh						
	1~50	51~100	101~150	151~200	201~300	301~400	401~500	1~50	51~100	101~150	151~200	201~300	301~400	401~500
32	12.5	25	37.5	50	75	100	125	57	70	82	95	120	145	170
40	12.5	25	37.5	50	75	100	125	64	77	89	102	127	152	177

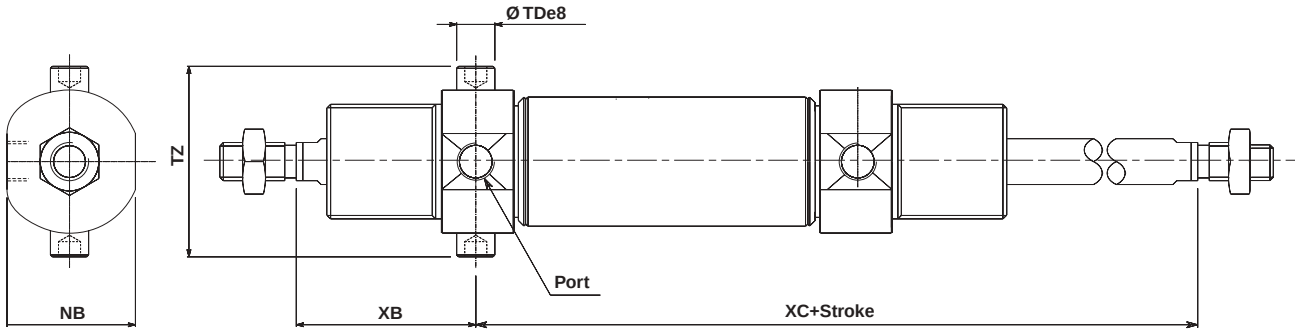
C◯76E Accessories

Dimensions with mounting brackets

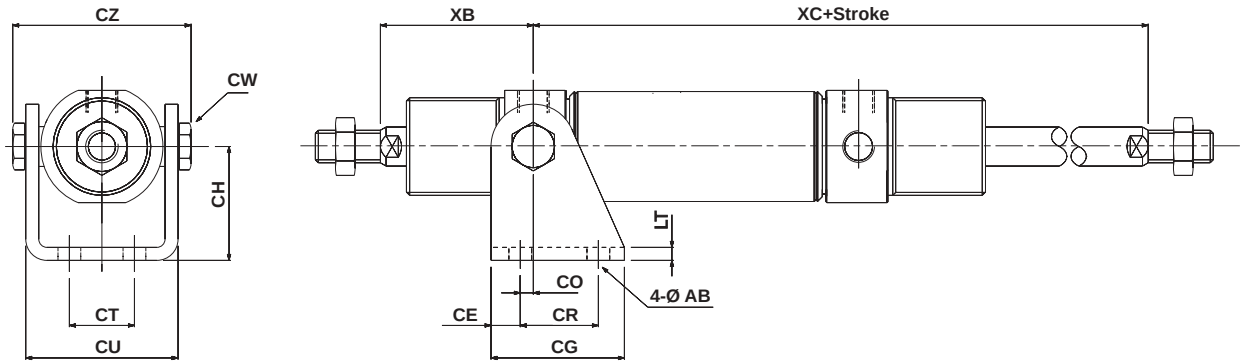
Rod Foot, Rod And Head Foot: C76F32 $^{A}_{B}$, C76F40 $^{A}_{B}$



Rod Trunnion, Head Trunnion: C76T32, C76T40



Rod clevis, Head clevis: C76C32, C75C40

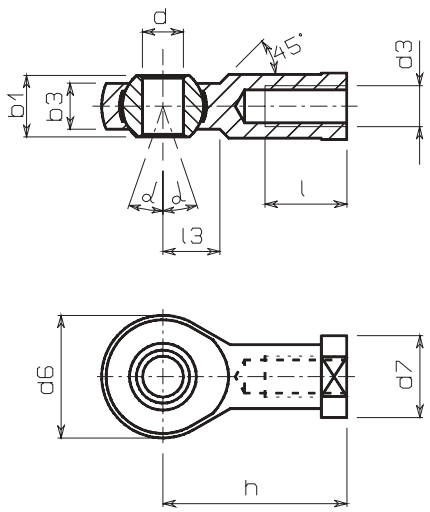


Unit:mm

Bore	Rod floot (flange)														Rod trunnion					Clevis										
	ØAB	AO	AU	LS	LT	NH	TF	TR	UR	US	W	XL	XS	XT	NB	ØTDe8	TZ	XB	XC	ØAB	CE	CG	CH	CO	CR	CT	CU	CW	CZ	LT	XB	XC
32	7	7	14	96	4	28	28	52	49	66	34	120	48	24	34.5	$10^{-0.025}_{-0.047}$	47.9	47	97	7	9	41	35	4	24	20	46.8	13	57.9	4	47	97
40	9	10	20	129	5	33	30	60	58	80	40	150	60	25	42.5	$12^{-0.032}_{-0.059}$	59.3	57	122	9	12	52	40	3	30	28	58.2	17	72.3	5	57	122

Accessories/Dimensions

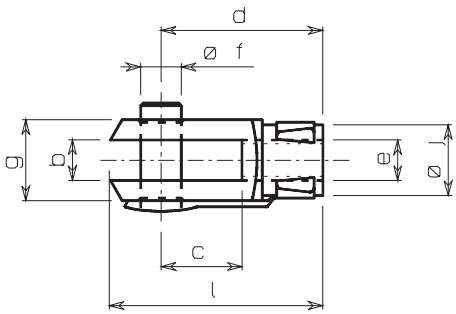
Single Knuckle Joint/DIN648



Unit: mm

Bore Size	Model	Thread d3	dH71	h	d6	b3	b1	l	d7	α^0	l3
Ø32	KJ10DA	M10	10	43	20	10.5	14	20	19	13	14
Ø40	KJ12DA	M12	12	50	30	12	16	22	22	13	16

Double Knuckle Joint/DIN71751

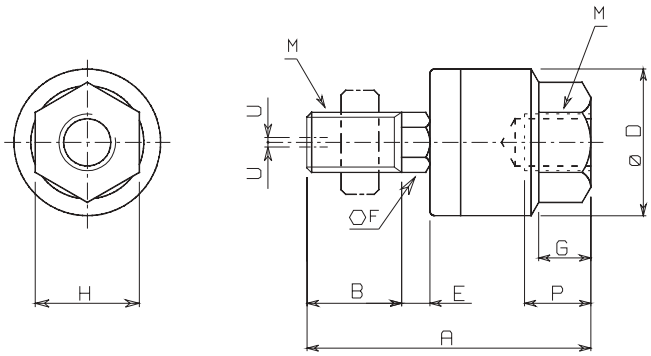


Unit: mm

Bore Size	Model	Thread e	b	d	f	g	c	j	a
ø32	GKM10-20A	M10	10	40	10	18	20	12	20
ø40	GKM12-24A	M12	12	48	12	23	24	15	24

Floating-Joint/Series JA

JA25•40



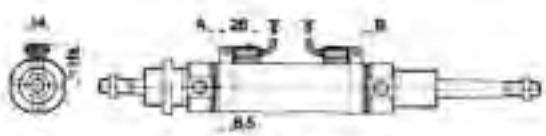
Unit: mm

Bore Size	Model	M		A	B	D	E	F	G	H	Maximum screwed depth P	Allowable eccentricity U	Max. operating tension and compression power kgf (KN)
		Nominal thread dia.	Pitch										
Ø32	JA25-10-150	10	1.5	49.5	19.5	24	5	8	8	17	9	0.5	250 (2.5)
Ø40	JA40-12-175	12	1.75	60	20	31	6	11	11	22	13	0.75	440 (4.4)

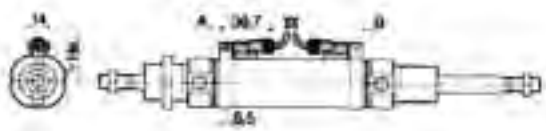
Reed Switch Setting Position (Stroke End)

(Band Mounted Type)

D-C73L
D-C80L



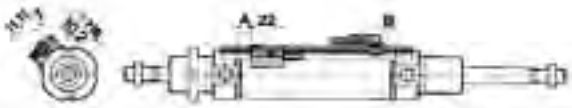
D-C73CN
D-C80CN



(Rail Mounted Type)

D-A73L
D-A80L

D-A73HL
D-A80HL



D-A73CN
D-A80CN

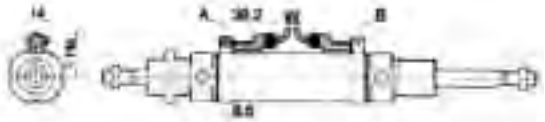
D-A79WL

Solid State Switch Setting Position (Stroke End)

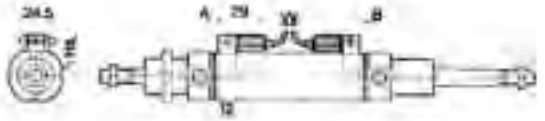
(Band Mounted Type)

D-H7A1L
D-H7A2L
D-H7BL

D-H7CN

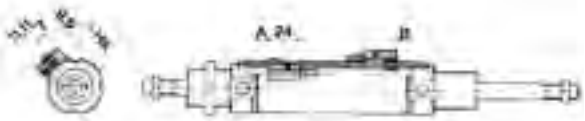


D-H7NWL
D-H7PWL
D-H7BWL



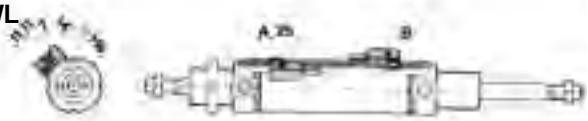
(Rail Mounted Type)

D-F7PL
D-F79L
D-J79L



D-J79CN

D-F7PWL
D-F79WL
D-J79WL



Auto Switch Mounting, Minimum Possible Cylinder Strokes

Unit:mm

Band Mounted Type

Auto switch model	No. of auto switches				1pc.
	2pcs.		npcs.		
	Different orientation	Same orientation	Different orientation	Same orientation	
D-C73L, D-C80L D-H7A1L, D-H7A2L D-H7BL	15	50	$15+45(\frac{n-2}{2})$ (n=2,4...)	50+45(n-2)	10
D-C73CN, D-C80CN, D-H7CN	15	65	$15+45(\frac{n-2}{2})$ (n=2,4...)	65+50(n-2)	10
D-H7NWL, D-H7PWL, D-H7BWL	15	75	$15+45(\frac{n-2}{2})$ (n=2,4...)	75+55(n-2)	10

Rail Mounted Type

Auto switch model	No. of auto switches				1pc.
	2pcs.		npcs.		
	Different orientation	Same orientation	Different orientation	Same orientation	
D-A73L, D-A80L, D-A73HL, D-A80HL, D-A73CN, D-A80CN, D-F79L, D-J79L, D-F7PL, D-J79CN	—	10	—	$15+35(\frac{n-2}{2})$ (n=2,4...)	5
D-A79WL, D-F79WL, D-F7PWL D-J79WL	—	15	—	$15+35(\frac{n-2}{2})$ (n=2,4...)	10

Bore (mm)	Reed type																		Solid state type type																	
	D-C73L D-C80L			D-C73CN D-C80CN			D-A73L D-A80L			D-A73HL D-A80HL			D-A73CN D-A80CN			D-A79WL			D-H7A1L D-H7A2L D-H7BL			D-H7CN			D-H7NWL D-H7PWL D-H7BWL			D-F79L D-F7PL D-J79L			D-J79CN			D-F79WL D-F7PWL D-J79WL		
	A	B	Hs	A	B	Hs	A	B	Hs	A	B	Hs	A	B	Hs	A	B	Hs	A	B	Hs	A	B	Hs	A	B	Hs	A	B	Hs	A	B	Hs	A	B	Hs
32	8	7	28.5	8	7	31	9	8	30.3	9	8	27.8	9	8	36.2	6	5	31.6	7	6	28.5	7	6	31.5	5.5	4.5	28.5	9	8	30	9	8	34.6	13	12	30
40	13	12	32.5	13	12	35	14	13	34.8	14	13	32.3	14	13	40.7	11	10	36.1	12	11	32.5	12	11	35.5	10.5	9.5	32.5	14	13	34.5	14	13	39.1	18	17	34.5

Single acting: spring return/spring extended

Series C76

Bore size: ø32, ø40

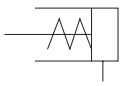
Specifications

Bore size (mm)	32	40
Piston rod dia. (mm)	12	14
Piston rod thread	M10	M12
Ports	G1/8	G1/4
Action	Single acting/single rod, spring return, spring extended	
Fluid	Air	
Proof pressure	1.5MPa {15bar}	
Max operating pressure	1.0MPa {10bar}	
Min operating pressure	Spring return: 0.18MPa (1.8bar) spring extended: 0.23MPa (2.3bar)	
Ambient and fluid temperature	-20÷80°C (Built-in magnet type: -10÷60°C)	
Lubrication	None (Non lubrificated)	
Piston speed	50÷750mm/s	
Allowable kinetic energy (J)	0.65	1.2
Non-rotating accuracy	±0.5°	±0.5°

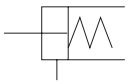
Symbol

Standard

Spring return

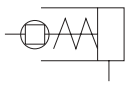


Spring extended

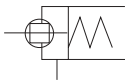


Non-rotating

Spring return



Spring extended



Spring force (Standard, Non-rotating)

Spring return (N)

Bore size (mm)	Standard stroke	Spring force													
		10		25		50		100		150		200		250	
		Extended position	Retracting position	Extended position	Retracting position	Extended position	Retracting position	Extended position	Retracting position	Extended position	Retracting position	Extended position	Retracting position	Extended position	Retracting position
32	10, 25, 50, 100 150, 200	53.9	48.8	53.9	41.2	53.9	28.4	66.7	19.6	66.7	18.1	66.7	19.6	—	—
40	10, 25 50, 100 150, 200 250	78.5	72.6	78.5	63.7	78.5	49	76.5	23.5	76.5	23.5	76.5	23.5	76.5	23.5

Spring extended (N)

Bore size (mm)	Standard stroke	Spring force													
		10		25		50		100		150		200		250	
		Extended position	Retracting position	Extended position	Retracting position	Extended position	Retracting position	Extended position	Retracting position	Extended position	Retracting position	Extended position	Retracting position	Extended position	Retracting position
32	10, 25, 50, 100 150, 200	66.7	56.3	66.7	40.7	66.7	14.7	66.7	19.6	66.7	18.1	66.7	19.6	—	—
40	10, 25 50, 100 150, 200 250	76.5	65.9	76.5	50	76.5	23.5	76.5	23.5	76.5	23.5	76.5	23.5	76.5	23.5

Weigh table

Spring Return

(g)

Bore size			32	40
Basic weight		**10 stroke**	365	700
		25 stroke	390	735
		50 stroke	430	805
		100 stroke	685	1185
		150 stroke	860	1450
		200 stroke	1025	1705
		250 stroke	—	1960
Mounting bracket		**C76FOA**	110	200
		C76FOB	240	455
		C76TO	15	25
		C76CO	165	305
Accessories	Single knuckle joint	**KJOD**	70	105
	Double knuckle joint	**GKMO-OA**	100	165
	Floating joint	**JAO-O-O**	70	160

Calculation (Example) C76E32-50S, C76T32
Base weight ——— 430 (Ø32)
Mounting bracket ——— 15
430+15=445

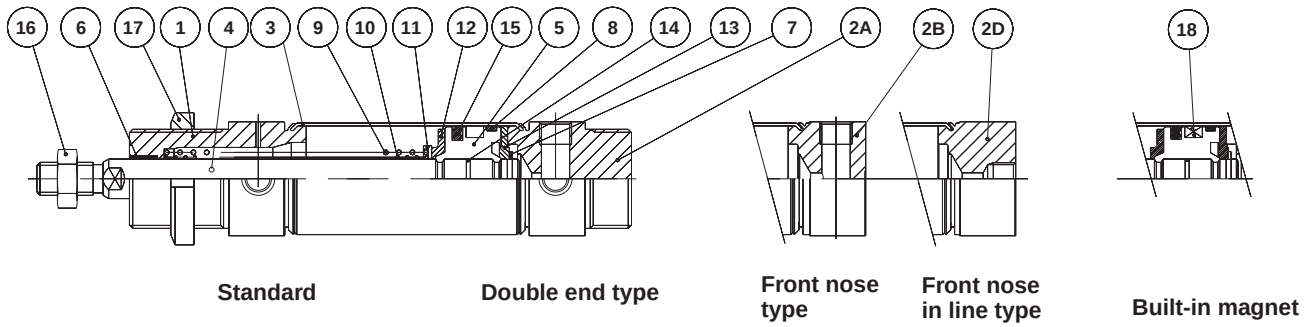
Spring Extended

(g)

Bore size			32	40
Basic weight		**10 stroke**	430	795
		25 stroke	455	835
		50 stroke	495	900
		100 stroke	640	1125
		150 stroke	795	1360
		200 stroke	940	1585
		250 stroke	—	1720
Mounting bracket		**C76FOA**	110	200
		C76FOB	240	455
		C76TO	15	25
		C76CO	165	305
Accessories	Single knuckle joint	**KJODA**	70	105
	Double knuckle joint	**GKMO-OA**	100	165
	Floating joint	**JAO-O-O**	70	160

Calculation (Example) C76F40-100T, C76C40, KJ12DA
Base weight ——— 11250(Ø40)
Mounting bracket ——— 305
Single knuckle joint ——— 105
1125+305+105=1535

C○76○32,40-50S Spring return
50mm stroke or less



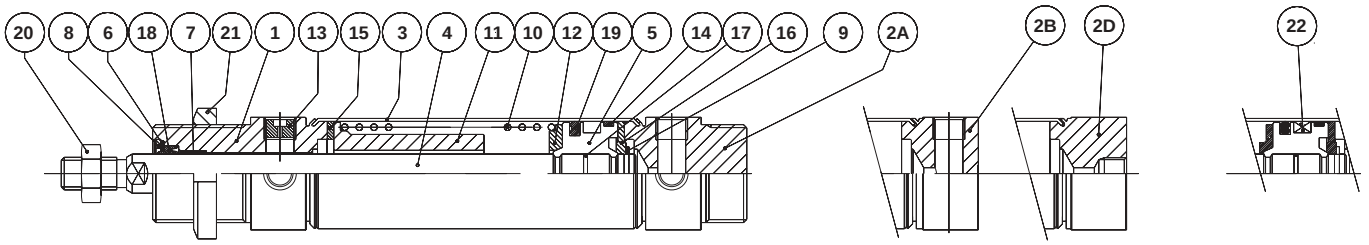
Standard | Double end type | Front nose type | Front nose in line type | Built-in magnet

Parts List

Item	Part name	Material	Quantity	Remarks
1	Rod cover	Aluminum alloy	1	White alumite
2A	Head cover E	Aluminum alloy	1	White alumite
2B	Head cover F	Aluminum alloy	1	White alumite
2D	Head cover Y	Aluminum alloy	1	White alumite
3	Cylinder tube	Stainless steel	1	
4	Piston rod	Carbon steel	1	Hard chrome plated
5	Piston	Aluminum alloy	1	Chromate
6	Bush	Sintered bronze	1	
7	Retaining ring	Carbon steel	1	
8	Wear ring	Phenolic resin	2	

Item	Part name	Material	Quantity	Remarks
9	Return spring A	Steel wire	1	Chromate
10	Return spring B	Steel wire	1	Chromate
11	Spring holder	Carbon steel	1	Zinc chromate
12	Bumper A	Urethane	1	
13	Bumper B	Urethane	1	
14	Piston gasket	NBR	1	
15	Piston seal	NBR	1	
16	Rod end nut	Carbon steel	1	Nickel plating
17	Mounting nut	Carbon steel	1	Nickel plating
18	Magnet			

C○76○32;40-S Spring return
over 50mm stroke



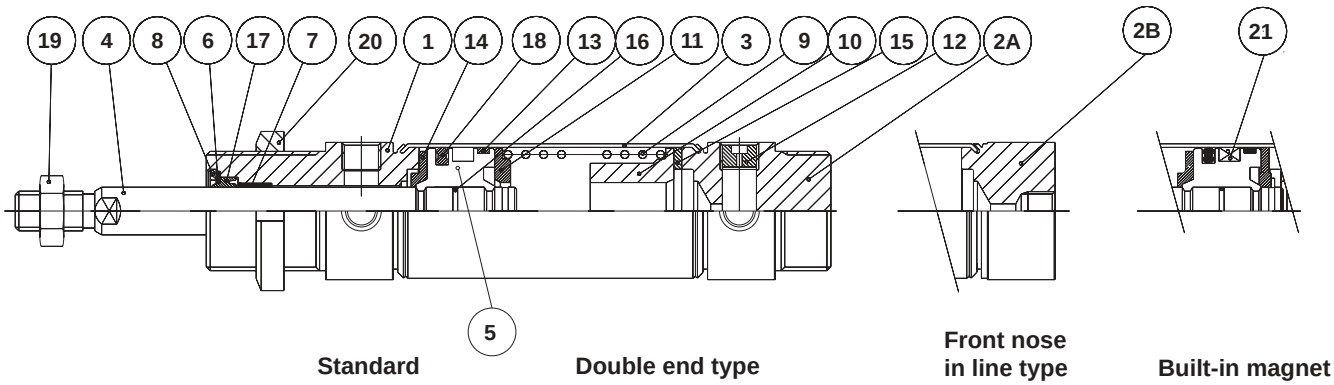
Standard | Double end type | Front nose type | Front nose in line type | Built-in magnet

Parts List

Item	Part name	Material	Quantity	Remarks
1	Rod cover	Aluminum alloy	1	White alumite
2A	Head cover E	Aluminum alloy	1	White alumite
2B	Head cover F	Aluminum alloy	1	White alumite
2D	Head cover Y	Aluminum alloy	1	White alumite
3	Cylinder tube	Stainless steel	1	
4	Piston rod	Carbon steel	1	Hard chrome plated
5	Piston	Aluminum alloy	1	Chromate
6	Plain washer	Carbon steel	1	
7	Bush	Sintered bronze	1	
8	Retaining ring	Carbon steel	1	
9	Retaining ring	Carbon steel	1	Chromate
10	Return spring	Steel wire	1	Chromate
11	Spring guide	Aluminum alloy	1	Zinc chromate
12	Spring holder	Aluminum alloy	1	

Item	Part name	Material	Quantity	Remarks
13	Set screw	Carbon steel	1	
14	Wear ring	Phenolic resin	1	
15	Bumper A	Urethane	1	
16	Bumper B	Urethane	1	
17	Piston gasket	NBR	1	
18	Rod seal	NBR	1	
19	Piston seal	NBR	1	
20	Rod end nut	Carbon steel	1	Nickel plating
21	Mounting nut	Carbon steel	1	Nickel plating
22	Magnet			

C○76○ 32,40 T Spring extended



Standard | Double end type | Front nose in line type | Built-in magnet

Parts List

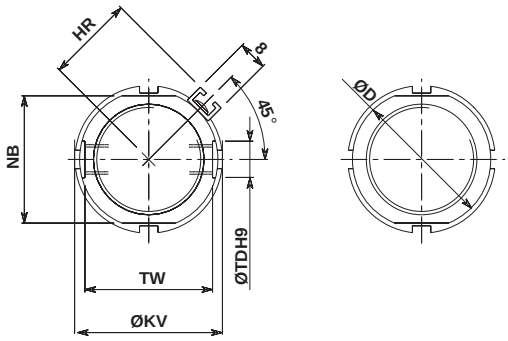
Item	Part name	Material	Quantity	Remarks
1	Rod cover	Aluminum alloy	1	White alumite
2A	Head cover E	Aluminum alloy	1	White alumite
2B	Head cover F	Aluminum alloy	1	White alumite
3	Cylinder tube	Stainless steel	1	
4	Piston rod	Carbon steel	1	Hard chrome plated
5	Piston	Aluminum alloy	1	Chromate
6	Plain washer	Carbon steel	1	Nickel plating
7	Bush	Sintered bronze	1	
8	Retaining ring	Carbon steel	1	Nickel plating
9	Return spring	Steel wire	1	Zinc chromate
10	Spring guide	Aluminium alloy	1	
11	Spring holder	Aluminium alloy	1	
12	Set screw	Carbon steel	1	

Item	Part name	Material	Quantity	Remarks
13	Wear ring	Phenolic resin	1	
14	Bumper A	Urethane	1	
15	Bumper B	Urethane	1	
16	Piston gasket	NBR	1	
17	Rod seal	NBR	1	
18	Piston seal	NBR	1	
19	Rod end nut	Carbon steel	1	Nickel plating
20	Mounting nut	Carbon steel	1	Nickel plating
21	Magnet			

C◯76E Double end type - S

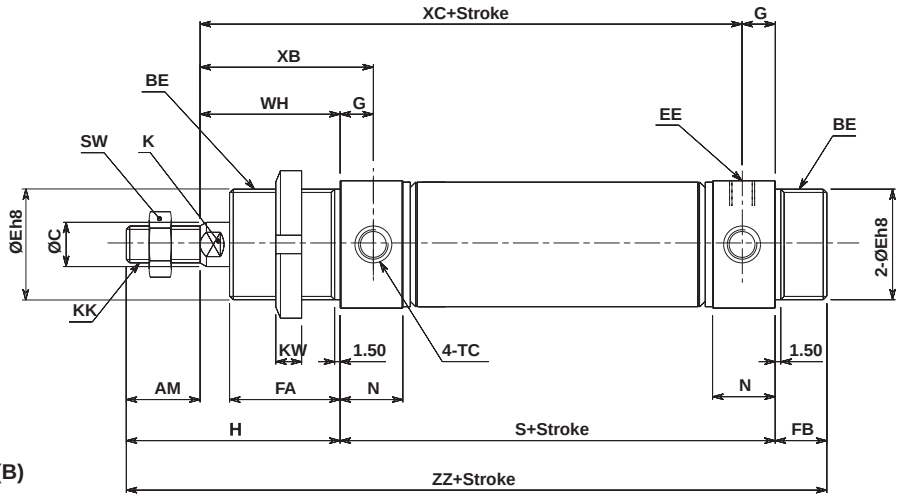
Dimensions

Rubber Cushion/C◯76E Bore – Stroke S — ◯
Without Magnet, Built-in Magnet

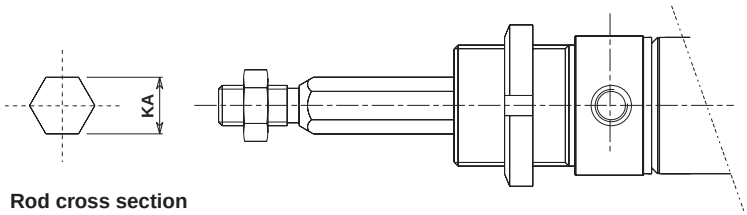


Rail mounted type (A)

Band mounted type (B) or non-magnet



C◯76KE
Non-rotating, Piston rod



Rod cross section

Unit:mm

Bore	AM	BE	ØC	ØD	ØEh8	EE	FA	FB	G	H	HR	K	KA	KK	ØKV	KW	N	NB	SW	TC	ØTDH9	TW	WH	XB
32	20	M30x1.5	12	37.5	30	G1/8	30	14	9	58	23.8	10	12.2	M10	38	7	17	34.5	17	M8x1	10	34.5	38	47
40	24	M38x1.5	14	46.5	38	G1/8	35	16	12	69	28.3	12	14.2	M12	50	8	22	42.5	19	M10x1	12	42.5	45	57

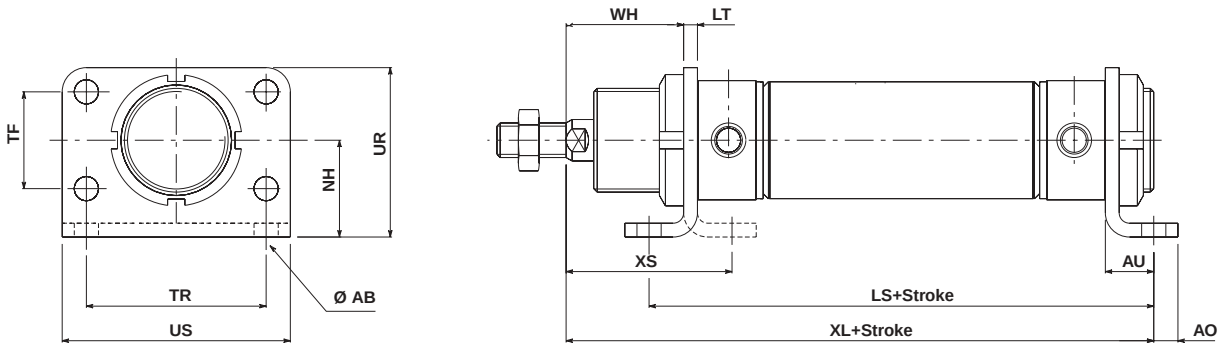
Item / Bore / Stroke	S					XC					ZZ				
	1~50	51~100	101~150	151~200	201~250	1~50	51~100	101~150	151~200	201~250	1~50	51~100	101~150	151~200	201~250
32	68 (93)	118	143	168	-	97 (122)	147	172	197	-	140 (165)	190	215	240	-
40	89 (114)	139	164	189	214	122 (147)	172	197	222	247	174 (199)	224	249	274	299

( ): in case of non-rotating

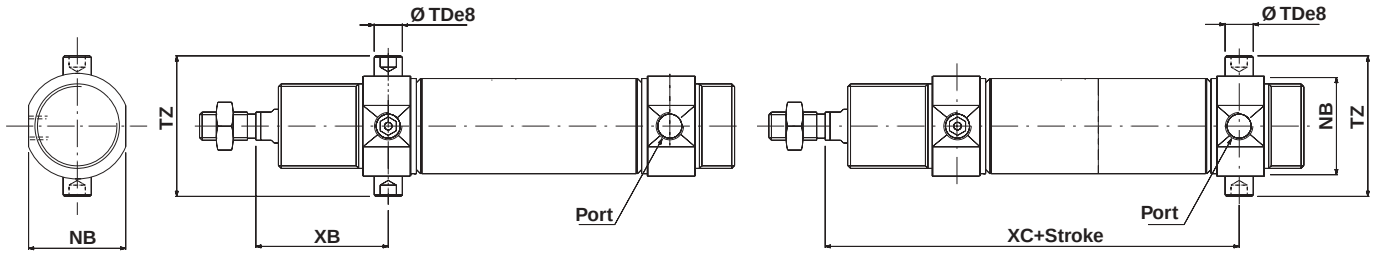
C◯76E Accessories

Dimensions with mounting brackets

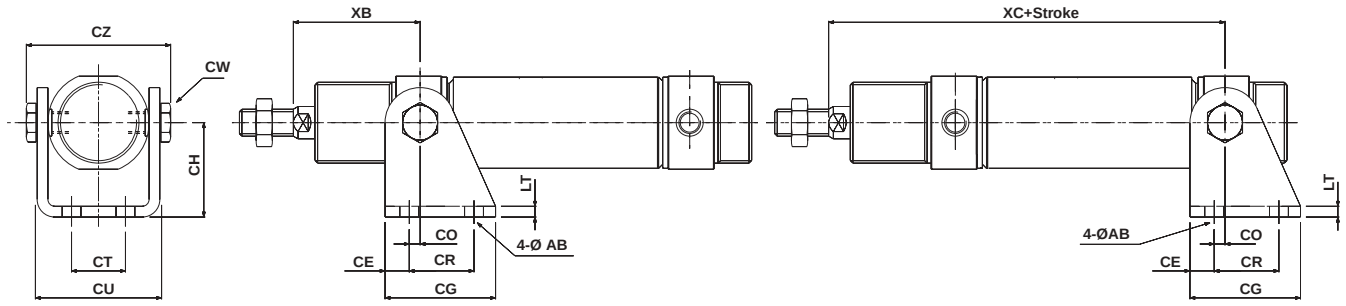
Rod Foot, Rod And Head Foot: C76F32 $^{A}_{B}$, C76F40 $^{A}_{B}$



Rod Trunnion, Head Trunnion: C76T32, C76T40



Rod clevis, Head clevis: C76C32, C75C40



Unit:mm

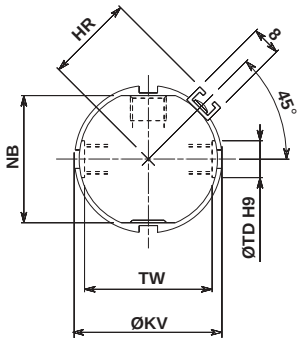
Bore	Rod foot (flange)											Rod trunnion				Rod clevis											
	ØAB	AO	AU	LT	NH	TF	TR	UR	US	W	XS	NB	ØTDe8	TZ	XB	ØAB	CE	CG	CH	CO	CR	CT	CU	CW	CZ	LT	XB
32	7	7	14	4	28	28	52	49	66	34	48	34.5	$10^{-0.025}_{-0.047}$	49.9	47	7	9	41	35	4	24	20	46.8	13	57.9	4	47
40	9	10	20	5	33	30	60	58	80	40	60	42.5	$12^{-0.032}_{-0.059}$	62.3	57	9	12	52	40	3	30	28	58.2	17	72.3	5	57

Item / Stroke	Rod foot (flange), rod and head foot										Head trunnion					Head clevis				
	LS					XL					XC					XC				
Bore	1~50	51~100	101~150	151~200	201~250	1~50	51~100	101~150	151~200	201~250	1~50	51~100	101~150	151~200	201~250	1~50	51~100	101~150	151~200	201~250
32	96	146	171	196	—	120	170	195	220	—	97	147	172	197	—	97	147	172	197	—
40	129	179	204	229	254	154	204	229	254	279	122	172	197	222	247	122	172	197	222	247

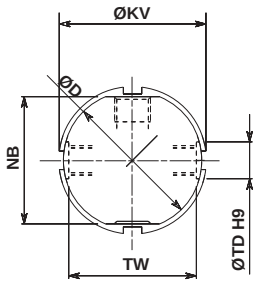
C◯76F Front nose type

Dimensions

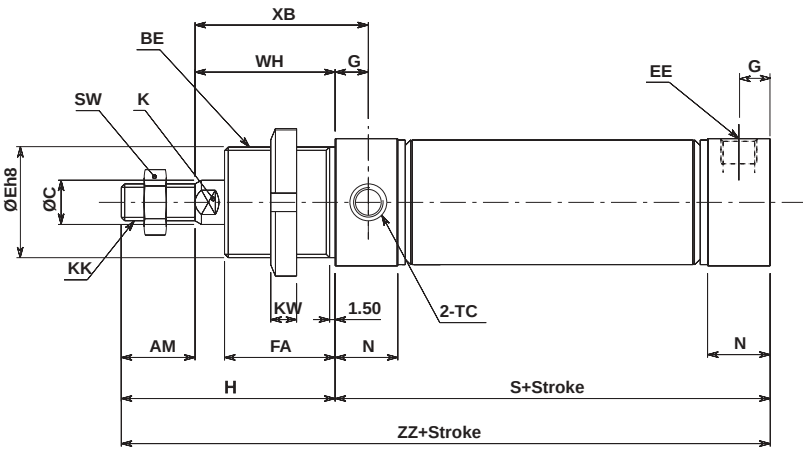
Rubber Cushion/C◯76F Bore – Stroke S – ◯
Without Magnet, Built-in Magnet



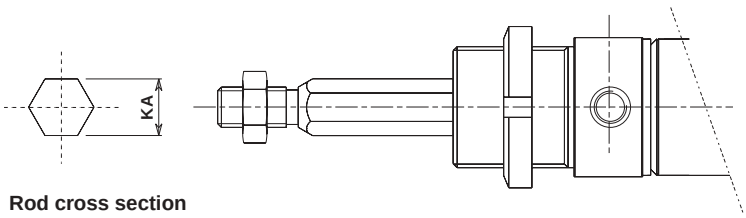
Rail mounted type (A)



Band mounted type (B)
or non-magnet



C◯76KF
Non-rotating, Piston rod



Rod cross section

Unit:mm

Bore	AM	BE	ØC	ØD	ØEh8	EE	FA	G	H	K	KA	KK	ØKV	KW	HR	N	□NB	SW	TC	ØTDH9	TW	WH	XB
32	20	M30x1.5	12	37.5	30	G1/8	30	9	58	10	12.2	M10	38	7	23.8	17	34.5	17	M8x1	10	34.5	38	47
40	24	M38x1.5	14	46.5	38	G1/4	35	12	69	12	14.2	M12	50	8	28.3	22	42.5	19	M10x1	12	42.5	45	57

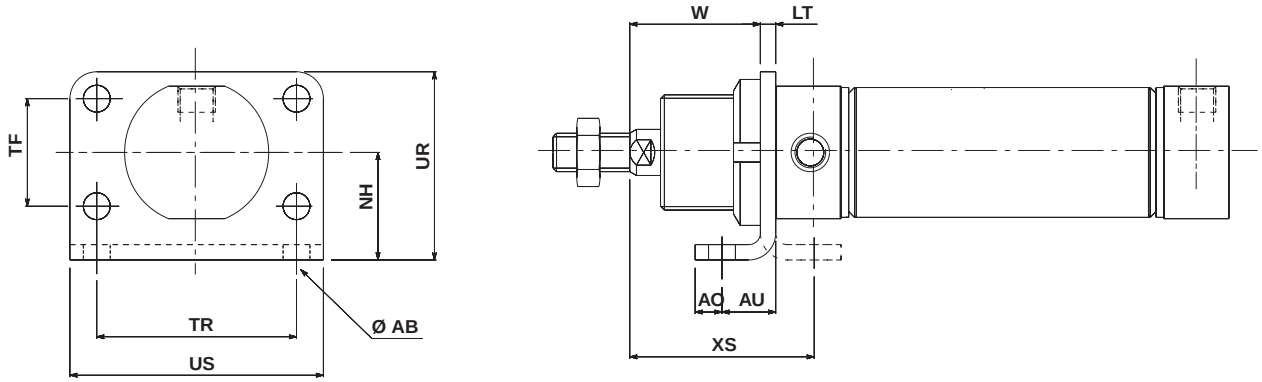
Item / Bore / Stroke	S					ZZ				
	1~50	51~100	101~150	151~200	201~250	1~50	51~100	101~150	151~200	201~250
32	68 (93)	118	143	168	—	126 (151)	176	201	226	—
40	89 (114)	139	164	189	214	158 (183)	208	233	258	283

( ): in case of non-rotating

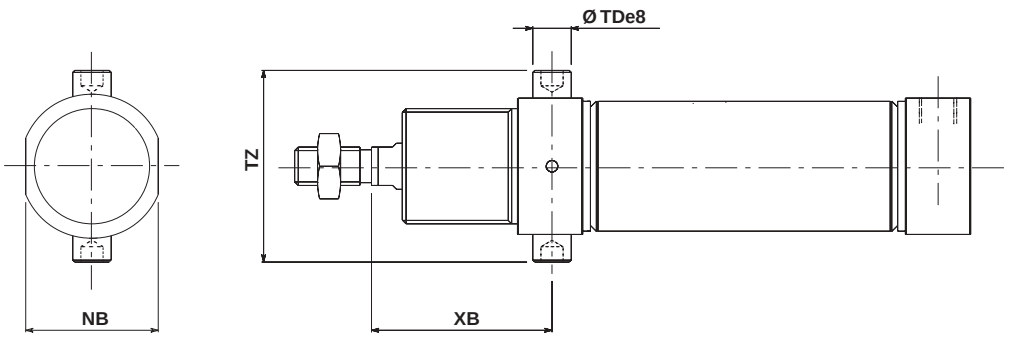
C◯76F Accessories

Dimensions with mounting brackets

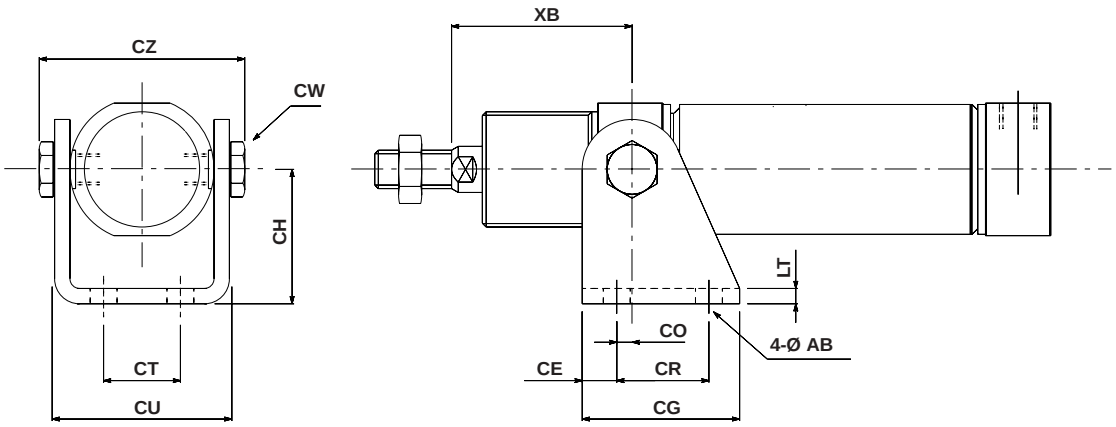
Rod Foot, Rod And Head Foot: C76F32$^{A}_{B}$, C76F40$^{A}_{B}$



Rod Trunnion, Head Trunnion: C76T32, C76T40



Rod clevis, Head clevis: C76C32, C75C40



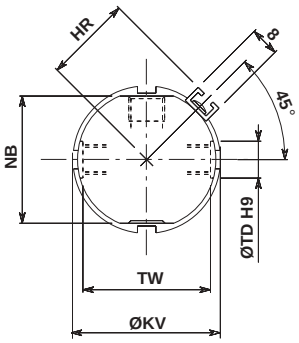
Unit:mm

Bore	Rod foot (flange)											Rod trunnion				Rod clevis											
	ØAB	AO	AU	LT	NH	TF	TR	UR	US	W	XS	NB	ØTDe8	TZ	XB	ØAB	CE	CG	CH	CO	CR	CT	CU	CW	CZ	LT	XB
32	7	7	14	4	28	28	52	49	66	34	48	34.5	$10^{-0.025}_{-0.047}$	49.9	47	7	9	41	35	4	24	20	46.8	13	57.9	4	47
40	9	10	20	5	33	30	60	58	80	40	60	42.5	$12^{-0.032}_{-0.059}$	62.3	57	9	12	52	40	3	30	28	58.2	17	72.3	5	57

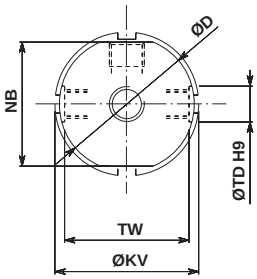
C◯76Y Front nose in Line Type

Dimensions

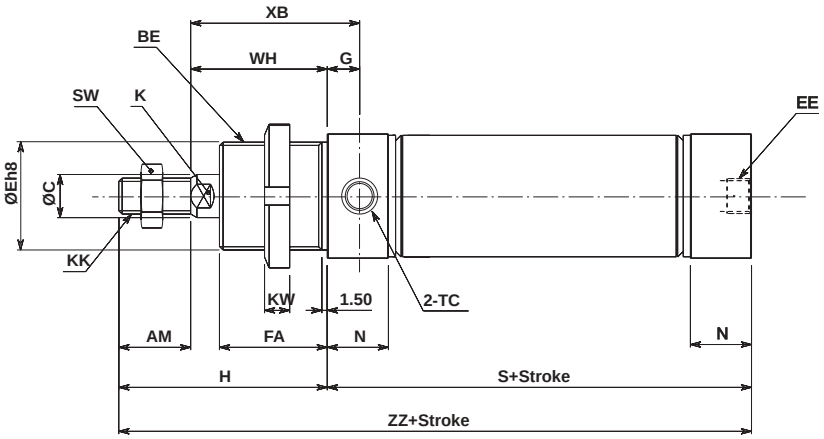
Rubber Cushion/C◯76Y Bore – Stroke – S◯
Without Magnet, Built-in Magnet



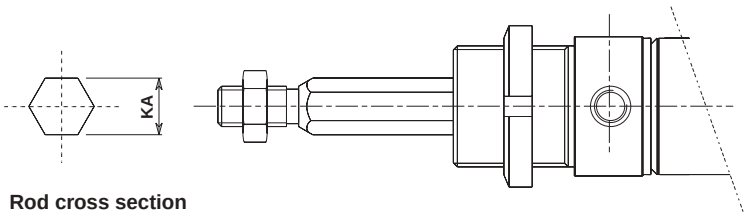
Rail mounted type (A)



Band mounted type (B)
or non magnetic



C◯76KY
Non-rotating, Piston rod



Rod cross section

Unit:mm

Bore	AM	BE	ØC	ØD	ØEh8	EE	FA	G	H	K	KA	KK	ØKV	KW	HR	N	□NB	SW	TC	ØTDH9	TW	WH	XB
32	20	M30x1.5	12	37.5	30	G1/8	30	9	58	10	12.2	M10	38	7	23.8	17	34.5	17	M8x1	10	34.5	38	47
40	24	M38x1.5	14	46.5	38	G1/4	35	12	69	12	14.2	M12	50	8	28.3	22	42.5	19	M10x1	12	42.5	45	57

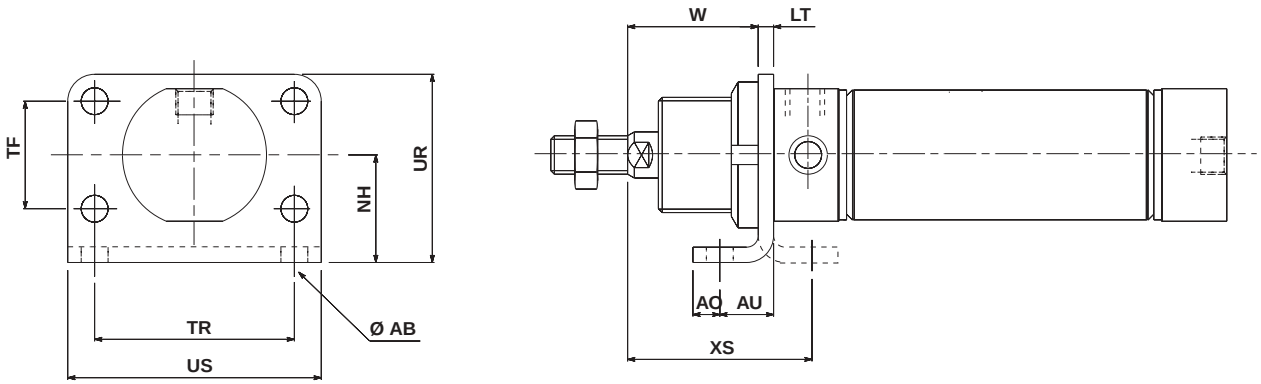
Item / Bore / Stroke	S					ZZ				
	1~50	51~100	101~150	151~200	201~250	1~50	51~100	101~150	151~200	201~250
32	68 (93)	118	143	168	—	126 (151)	176	201	226	—
40	89 (114)	139	164	189	214	158 (183)	208	233	258	283

( ): in case of non-rotating

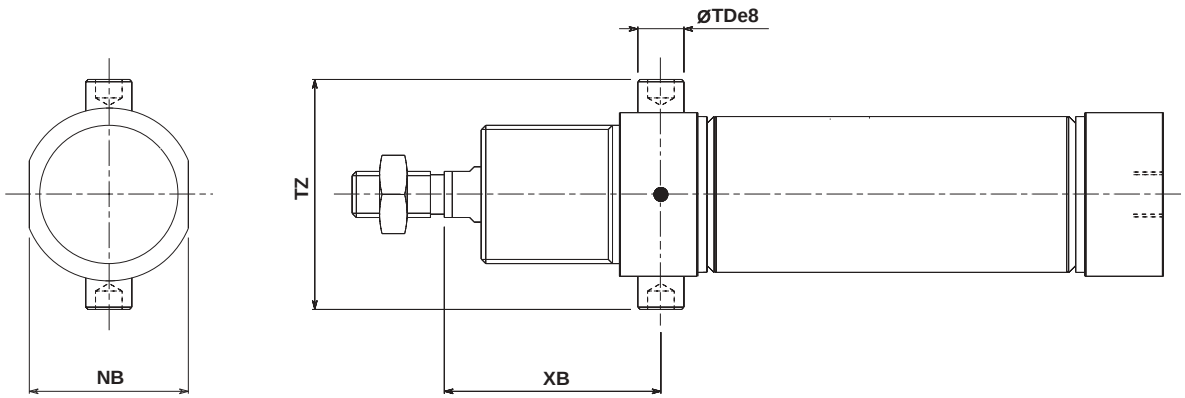
C◯76Y Accessories

Dimensions with mounting brackets

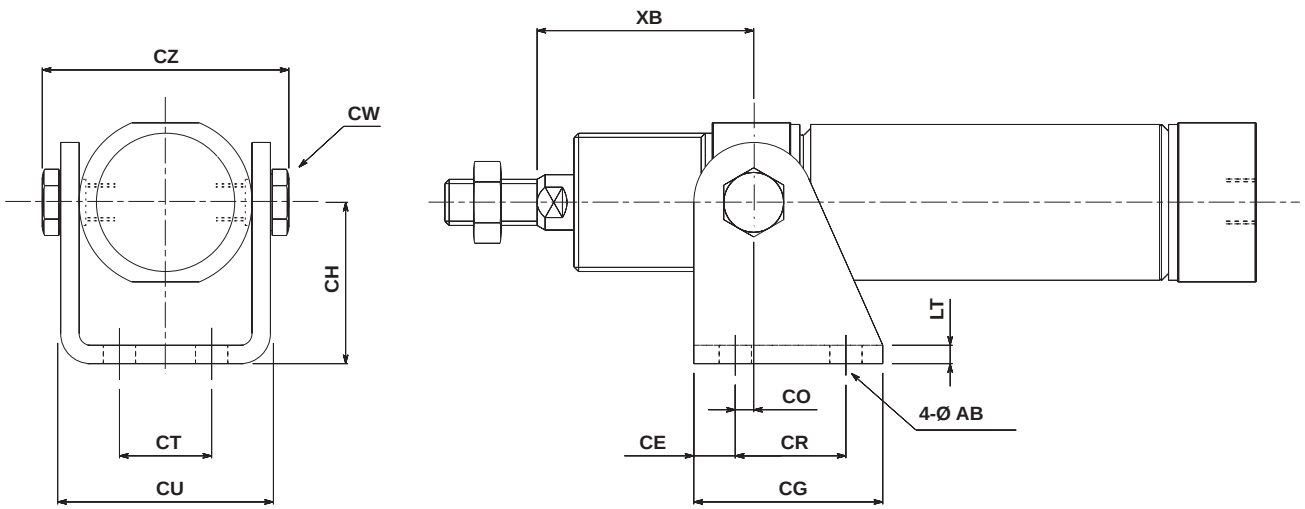
Rod Foot (flange): C76F32A, C76F40A



Rod Trunnion: C76T32, C76T40



Rod Clevis: C76C32, C76C40



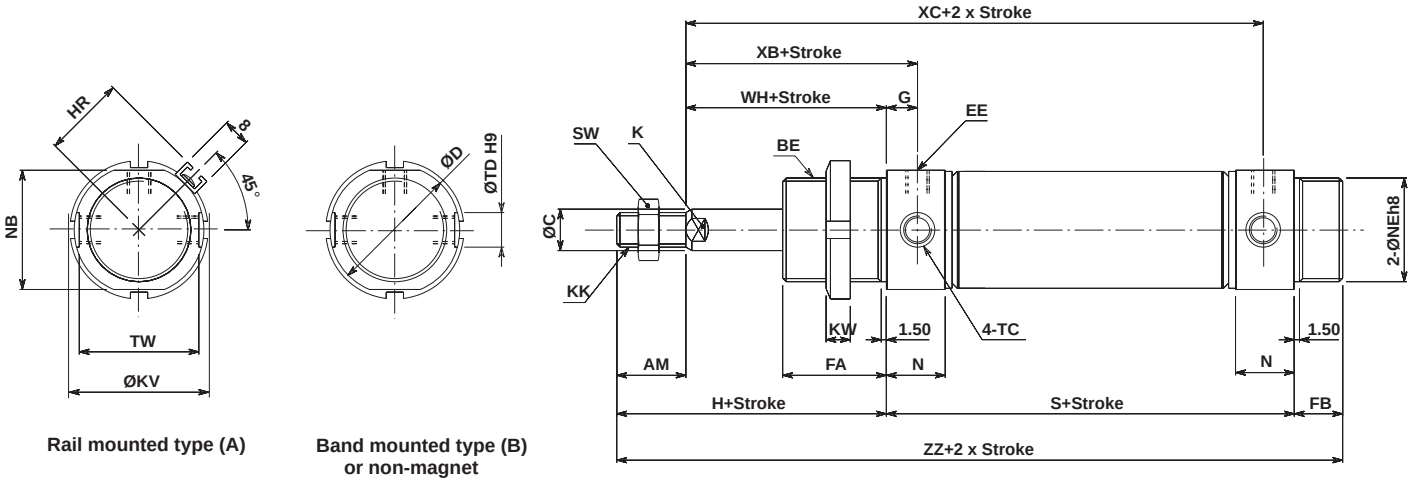
Unit:mm

Bore	Rod foot (flange)											Rod trunnion				Rod clevis											
	ØAB	AO	AU	LT	NH	TF	TR	UR	US	W	XS	NB	ØTDes	TZ	XB	ØAB	CE	CG	CH	CO	CR	CT	CU	CW	CZ	LT	XB
32	7	7	14	4	28	28	52	49	66	34	48	34.5	$10^{-0.025}_{-0.047}$	49.9	47	7	9	41	35	4	24	20	46.8	13	57.9	4	47
40	9	10	20	5	33	30	60	58	80	40	60	62.3	$12^{-0.032}_{-0.059}$	62.3	57	9	12	52	40	3	30	28	58.2	17	72.3	5	57

C◯76E Double end type

Dimensions

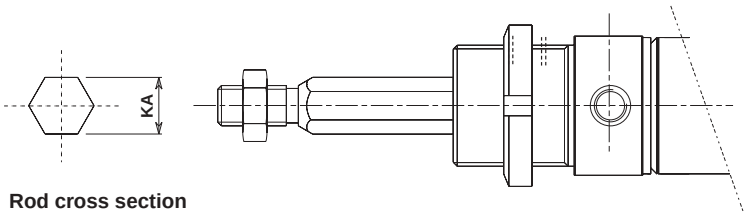
Rubber Cushion/C◯76E Bore – Stroke T – ◯
Without Magnet, Built-in Magnet



Rail mounted type (A)

Band mounted type (B) or non-magnet

C◯76KE
Non-rotating, Piston rod



Rod cross section

Unit:mm

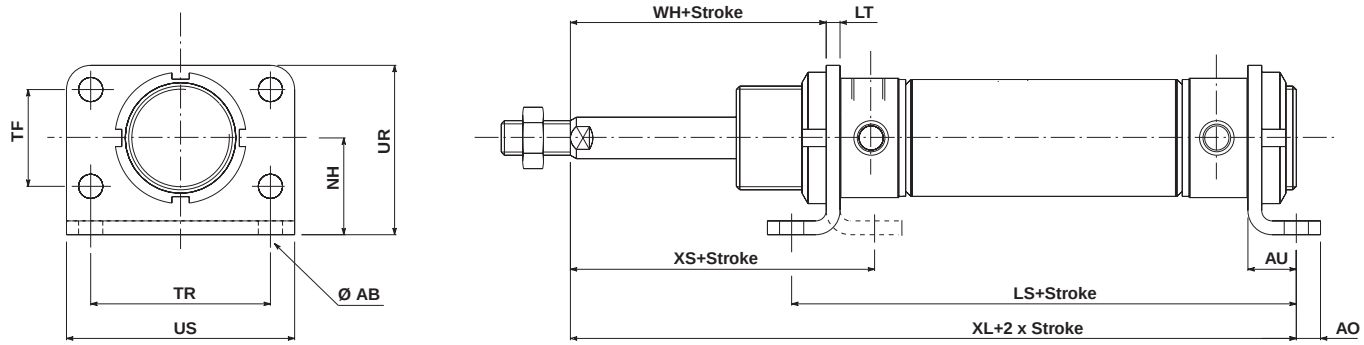
Bore	AM	BE	ØC	ØD	ØEh8	EE	FA	FB	G	H	K	KA	KK	ØKV	KW	HR	N	□NB	SW	TC	ØTDH9	TW	WH	XB
32	20	M30x1.5	12	37.5	$30^{-0}_{-0.033}$	G1/8	30	14	9	58	10	12.2	M10	38	7	23.8	17	34.5	17	M8x1	10	34.5	38	47
40	24	M38x1.5	14	46.5	$38^{-0}_{0.039}$	G1/4	35	16	12	69	12	14.2	M12	50	8	28.3	22	42.5	19	M10x1	12	42.5	45	57

Item / Bore / Stroke	S					XC					ZZ				
	1~50	51~100	101~150	151~200	201~250	1~50	51~100	101~150	151~200	201~250	1~50	51~100	101~150	151~200	201~250
32	93	118	143	168	—	122	147	172	197	-	165	190	215	240	-
40	114	139	164	189	214	147	172	197	222	247	199	224	249	274	299

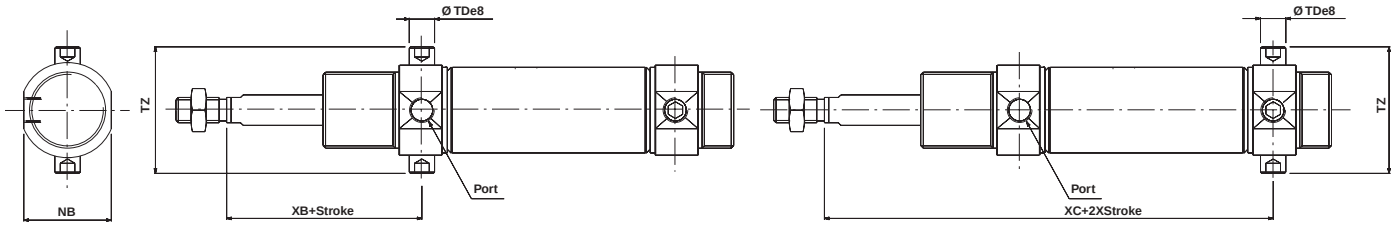
C◯76E Accessories

Dimensions with mounting brackets

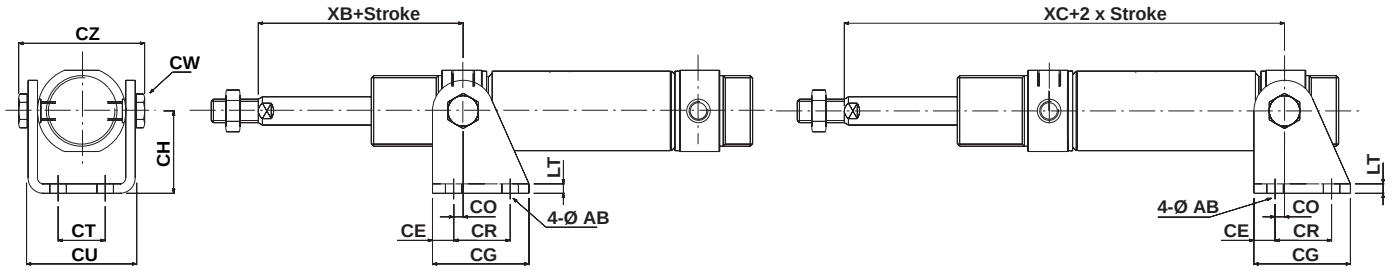
Rod Foot (flange): C76F32A, C76F40A



Rod Trunnion: C76T32, C76T40



Rod Clevis: C76C32, C76C40



Unit:mm

Bore	Rod foot (flange), rod and head foot											Rod trunnion				Rod clevis											
	ØAB	AO	AU	LT	NH	TF	TR	UR	US	WH	XS	NB	ØTDe8	TZ	XB	ØAB	CE	CG	CH	CO	CR	CT	CU	CW	CZ	LT	XB
32	7	7	14	4	28	28	52	49	66	34	48	34.5	$10^{-0.025}_{-0.047}$	49.9	47	7	9	41	35	4	24	20	46.8	13	57.9	4	47
40	9	10	20	5	33	30	60	58	80	40	60	42.5	$12^{-0.032}_{-0.059}$	62.3	57	9	12	52	40	3	30	28	58.2	17	72.3	5	57

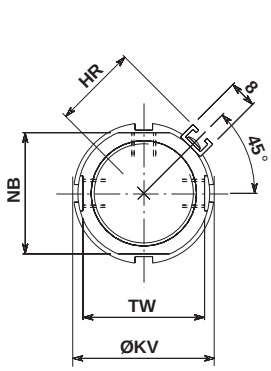
Item / Bore / Stroke	Rod foot (flange), rod and head foot										Head trunnion				
	LS					XL					XC				
	1~50	51~100	101~150	151~200	201~250	1~50	51~100	101~150	151~200	201~250	1~50	51~100	101~150	151~200	201~250
32	121	146	171	196	—	145	170	195	220	—	122	147	172	197	—
40	154	179	204	229	254	179	204	229	254	279	147	172	197	222	247

Item / Bore / Stroke	Head clevis				
	XC				
	1~50	51~100	101~150	151~200	201~250
32	122	147	172	197	—
40	147	172	197	222	247

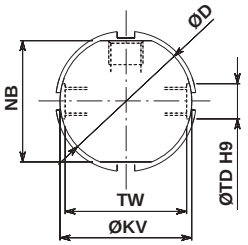
C◯76F Front nose type

Dimensions

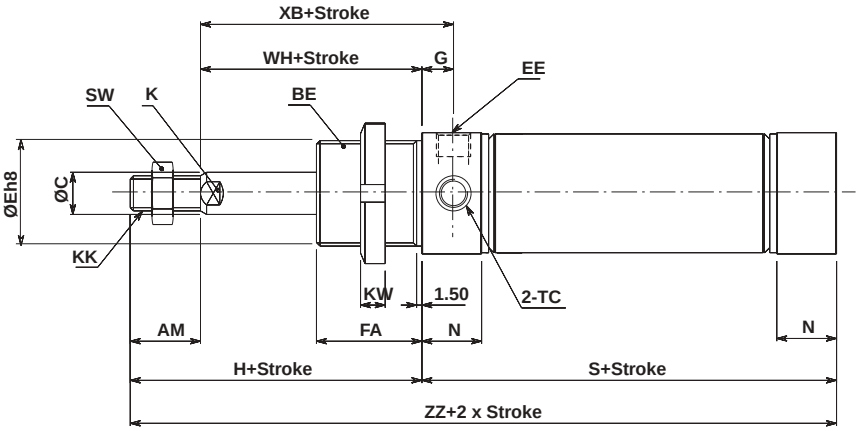
Rubber Cushion/C◯ 76F Bore – Stroke T – ◯
Without Magnet, Built-in Magnet



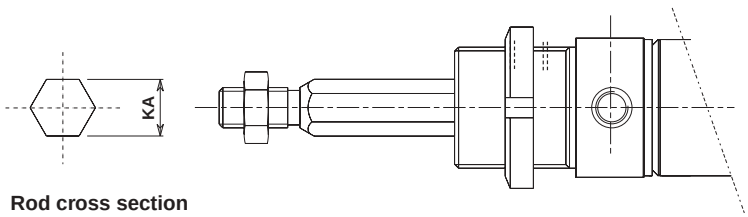
Rail mounted type (A)



Band mounted type (B)
or non-magnet



C◯ 76KF
Non-rotating, Piston rod



Rod cross section

Unit:mm

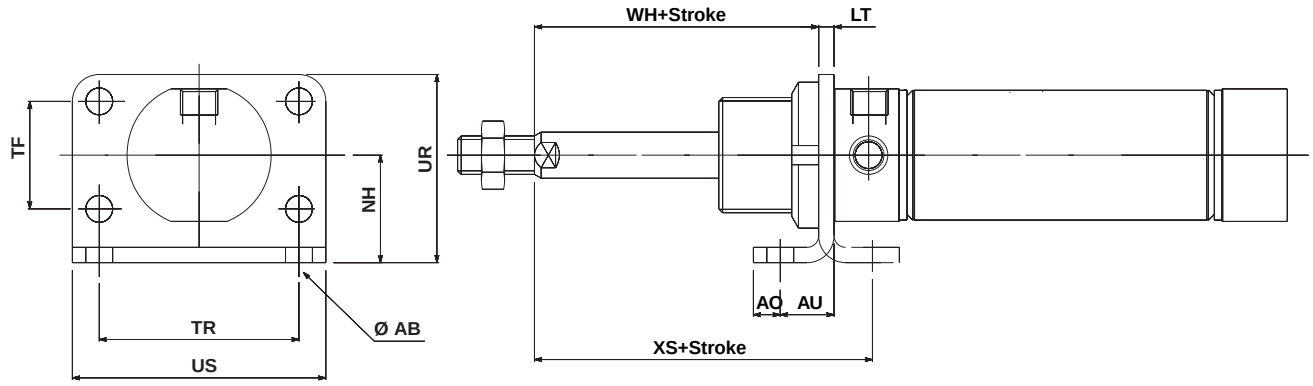
Bore	AM	BE	ØC	ØD	ØEh8	EE	FA	G	H	K	KA	KK	ØKV	KW	HR	N	□NB	SW	TC	ØTDH9	TW	WH	XB
32	20	M30x1.5	12	37.5	30	G1/8	30	9	58	10	12.2	M10	38	7	23.8	17	34.5	17	M8x1	10	34.5	38	47
40	24	M38x1.5	14	46.5	38	G1/4	35	12	69	12	14.2	M12	50	8	28.3	22	42.5	19	M10x1	12	42.5	45	57

Item / Bore / Stroke	S					ZZ				
	1~50	51~100	101~150	151~200	201~250	1~50	51~100	101~150	151~200	201~250
32	93	118	143	168	—	151	176	201	226	—
40	114	139	164	189	214	183	208	233	258	283

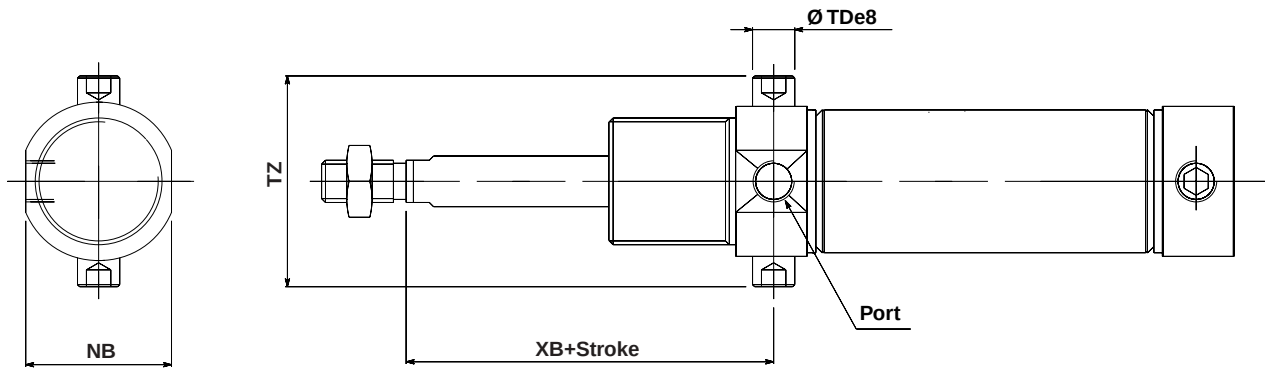
C◯76F Accessories

Dimensions with mounting brackets

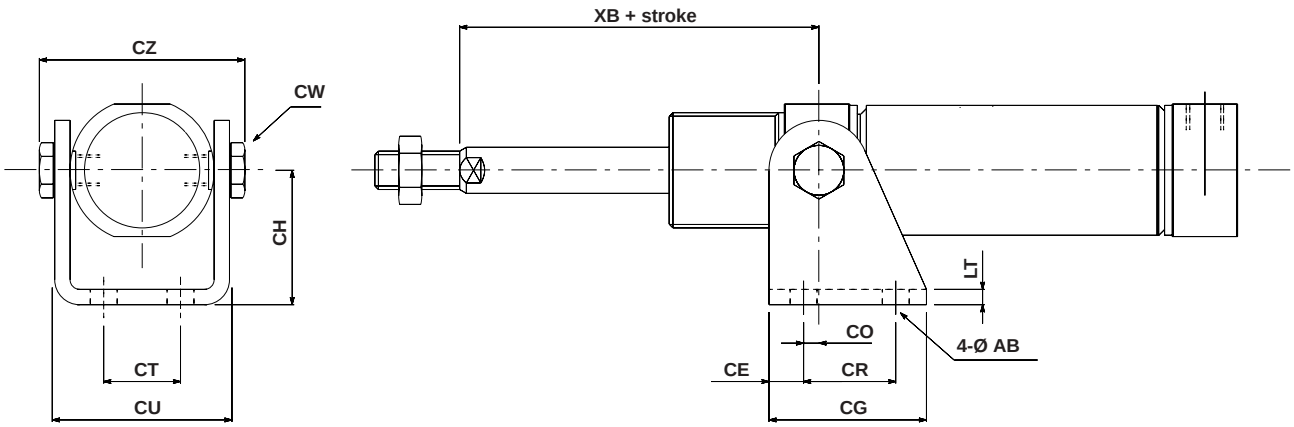
Rod Foot (flange): C76F32A, C76F40A



Rod Trunnion: C76T32, C76T40



Rod Clevis: C76C32, C76C40

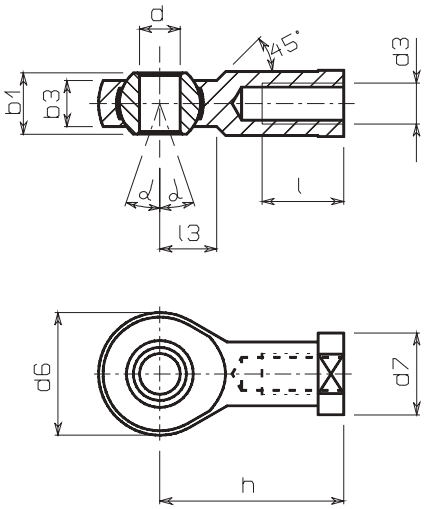


Unit:mm

Bore	Rod foot (flange)											Rod trunnion				Rod clevis											
	ØAB	AO	AU	LT	NH	TF	TR	UR	US	WH	XS	NB	ØTDes	TZ	XB	ØAB	CE	CG	CH	CO	CR	CT	CU	CW	CZ	LT	XB
32	7	7	14	4	28	28	52	49	66	34	48	34.5	$10^{-0.025}_{-0.047}$	49.9	47	7	9	41	35	4	24	20	46.8	13	57.9	4	47
40	9	10	20	5	33	30	60	58	80	40	60	42.5	$12^{-0.032}_{-0.059}$	62.3	57	9	12	52	40	3	30	28	58.2	17	72.3	5	57

Accessories/Dimensions

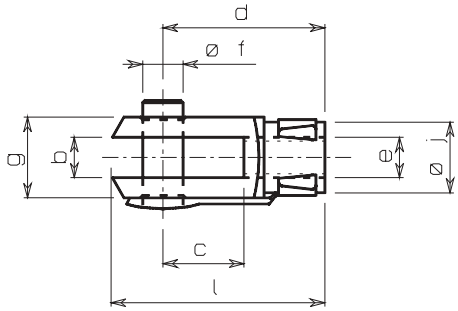
Single Knuckle Joint/DIN648 - DIN24335



Unit: mm

Bore Size	Model	Thread d3	dH71	h	d6	b3	b1	l	d7	α^0	l3
Ø32	KJ10DA	M10	10	43	20	10.5	14	20	19	13	14
Ø40	KJ12DA	M12	12	50	30	12	16	22	22	13	16

Double Knuckle Joint/ISO8140 - DIN71752

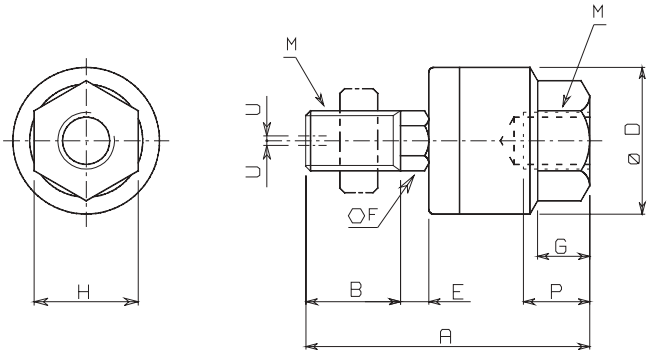


Unit: mm

Bore Size	Model	Thread e	b	d	f	g	c	j	a
ø32	GKM10-20A	M10	10	40	10	18	20	12	20
ø40	GKM12-24A	M12	12	48	12	23	24	15	24

Floating-Joint/Series JA

JA25•40



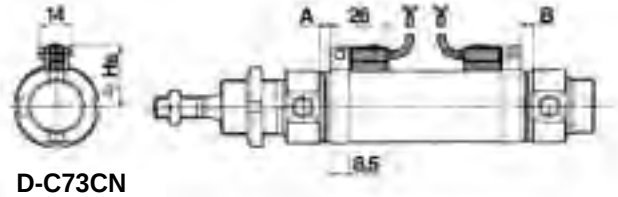
Unit: mm

Bore Size	Model	M		A	B	D	E	F	G	H	Maximum screwed depth P	Allowable eccentricity U	Max. operating tension and compression power kgf (KN)
		Nominal thread dia.	Pitch										
Ø32	JA25-10-150	10	1.5	49.5	19.5	24	5	8	8	17	9	0.5	250 (2.5)
Ø40	JA40-12-175	12	1.75	60	20	31	6	11	11	22	13	0.75	440 (4.4)

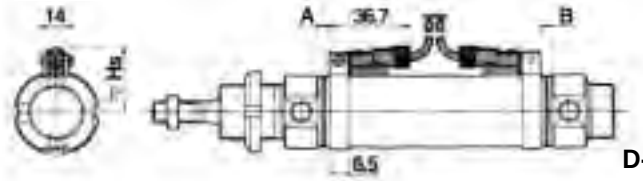
Reed Switch Setting Position (Stroke End)

(Band Mounted Type) **(Rail Mounted Type)**

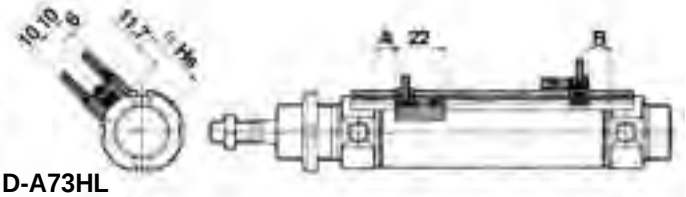
D-C73L
D-C80L



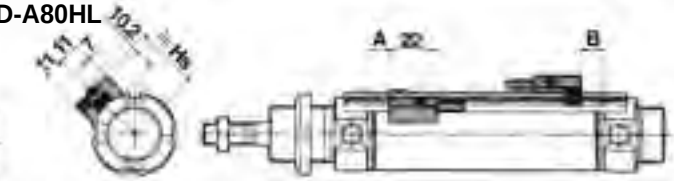
D-C73CN
D-C80CN



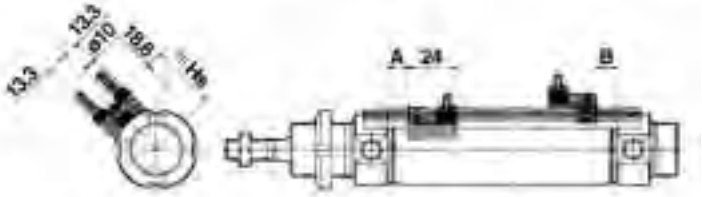
D-A73L
D-A80L



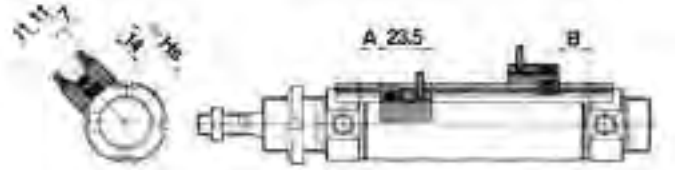
D-A73HL
D-A80HL



D-A73CN
D-A80CN



D-A79WL



Auto Switch Mounting, Minimum Possible Cylinder Strokes

Unit:mm

Band Mounted Type

Auto switch model	No. of auto switches				1pc.
	2pcs.		npcs.		
	Different orientation	Same orientation	Different orientation	Same orientation	
D-C73L **D-C80L**	15	50	15+45($\frac{n-2}{2}$) (n=2,4...)	50+45(n-2)	10
D-C73CN **D-C80CN**	15	65	15+50($\frac{n-2}{2}$) (n=2,4...)	65+50(n-2)	10

Rail Mounted Type

Auto switch model	No. of auto switches				1pc.
	2pcs.		npcs.		
	Different orientation	Same orientation	Different orientation	Same orientation	
D-A73L, D-A80L, **D-A73HL, D-A80HL,** **D-A73CN, D-A80CN**	—	10	—	10+35($\frac{n-2}{2}$) (n=2,4...)	5
D-A79WL	—	15	—	15+35($\frac{n-2}{2}$) (n=2,4...)	10

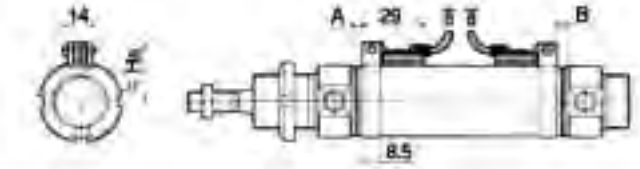
Auto switch model	Bore size	Single acting/Spring return						Single acting/Spring extended						Hs
		A					B	A	B					
		1÷50st	51÷100st	101÷150st	151÷200st	201÷250st			1÷50st	51÷100st	101÷150st	151÷200st	201÷250st	
D-C73L	32	8(33)	58	83	108	—	7	8	32	57	82	107	—	28.5
D-C80L	40	13(38)	63	88	113	138	12	13	37	62	87	112	137	32.5
D-C73CN	32	8(33)	58	83	108	—	7	8	32	57	82	107	—	31
D-C80CN	40	13(38)	63	88	113	138	12	13	37	62	87	112	137	35
D-A73L	32	9(34)	59	84	109	—	1	9	33	58	83	108	—	29.3
D-A80L	40	14(39)	64	89	114	139	6	14	38	63	88	113	138	33.8
D-A73HL	32	9(34)	59	84	109	—	8	9	33	58	83	108	—	30.3
D-A80HL	40	14(39)	64	89	114	139	13	14	38	63	88	113	138	34.8
D-A73CN	32	9(34)	59	84	109	—	8	9	33	58	83	108	—	36.2
D-A80CN	40	14(39)	64	89	114	139	13	14	38	63	88	113	138	40.7
D-A79WL	32	6(31)	56	81	106	—	5	6	30	55	80	105	—	31.6
	40	11(36)	61	86	111	136	10	11	35	60	85	110	135	36.1

( ): In case of non-rotating

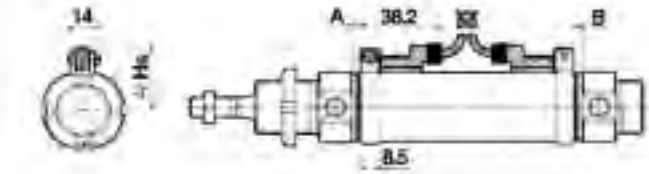
Solid State Switch Setting Position (Stroke End)

(Band Mounted Type)

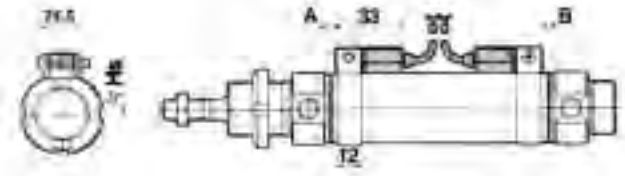
D-H7A1L
D-H7A2L
D-H7BL



D-H7CN

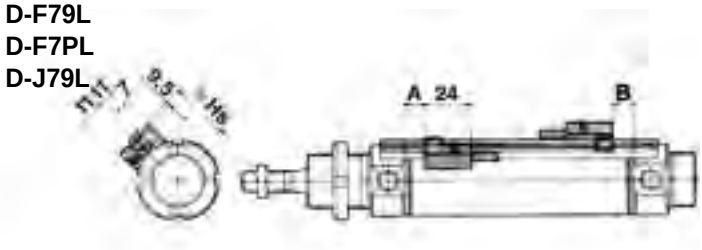


D-H7NWL
D-H7PWL
D-H7BWL

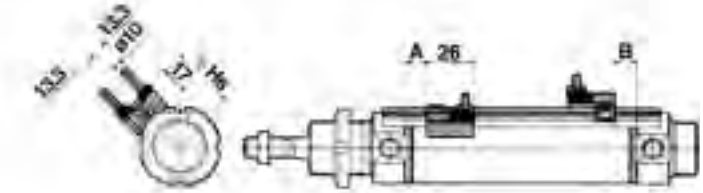


(Rail Mounted Type)

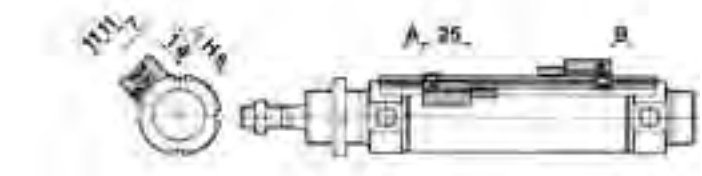
D-F79L
D-F7PL
D-J79L



D-J79CN



D-F79WL
D-F7PWL
D-J79WL



Auto Switch Mounting, Minimum Possible Cylinder Strokes

Unit:mm

Band Mounted Type

Auto switch model	No. of auto switches				1pc.
	2pcs.		npcs.		
	Different orientation	Same orientation	Different orientation	Same orientation	
D-H7A1L, D-H7A2L D-H7BL	15	50	15+45($\frac{n-2}{2}$) (n=2,4...)	50+45(n-2)	10
D-H7CN	15	65	15+50($\frac{n-2}{2}$) (n=2,4...)	65+50(n-2)	10
D-H7NWL, D-H7PWL, D-H7BWL	15	75	15+50($\frac{n-2}{2}$) (n=2,4...)	75+55(n-2)	10

Rail Mounted Type

Auto switch model	No. of auto switches				1pc.
	2pcs.		npcs.		
	Different orientation	Same orientation	Different orientation	Same orientation	
D-F79L, D-J79L, D-F7PL, D-J79CN	—	10	—	10+35($\frac{n-2}{2}$) (n=2,4...)	5
D-F79WL, D-F7PWL, D-J79WL	—	15	15+50($\frac{n-2}{2}$) (n=2,4...)	15+35($\frac{n-2}{2}$) (n=2,4...)	10

Auto switch model	Bore size	Single acting/Spring return						Single acting/Spring extended						Hs
		A					B	A	B					
		1÷50st	51÷100st	101÷150st	151÷200st	201÷250st			1÷50st	51÷100st	101÷150st	151÷200st	201÷250st	
D-H7A1L D-H7A2L D-H7BL	32	7(32)	57	82	107	—	6	7	31	56	81	106	—	28.5
	40	12(37)	62	87	112	137	11	12	36	61	86	111	136	32.5
D-H7CN	32	7(32)	57	82	107	—	6	7	31	56	81	106	—	31.5
	40	12(37)	62	87	112	137	11	12	36	61	86	111	136	35.5
D-H7NWL D-H7PWL D-H7BWL	32	5.5(30.5)	55.5(58.5)	80.5	105.5	—	4.5	5.5	29.5	54.5	79.5	104.5	—	25.5
	40	10.5(35.5)	60.5	85.5	110.5	135	9.5	10.5	34.5	59.5	84.5	109.5	134.5	29.5
D-F79L D-F7PL D-J79L	32	9(34)	59	84	109	—	8	9	33	58	83	108	—	30
	40	14(39)	64	89	114	139	13	14	38	63	88	113	138	34.5
D-J79CN	32	9(34)	59	84	109	—	8	9	33	58	83	108	—	34.6
	40	14(39)	64	89	114	139	13	14	38	63	88	113	138	39.1
D-F79WL D-F7PWL D-J79WL	32	13(38)	63	88	113	—	12	13	35	60	85	112	—	28.5
	40	18(43)	68	93	118	143	17	16	40	65	90	117	142	32.5

Double Acting, Single Rod

Series C76

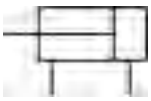
Bore size: ø32, ø40

Specifications

Bore size (mm)	32	40
Piston rod dia. (mm)	12	14
Piston rod thread	M10	M12
Ports	G1/8	G1/4
Action	Double acting/Single Rod	
Fluid	Air	
Proof pressure	1.5MPa {15bar}	
Max operating pressure	1.0MPa {10bar}	
Min operating pressure	0.05MPa {0.5bar}	
Ambient and fluid temperature	-20÷80°C (Built-in magnet type: -10÷60°C)	
Cushion	Rubber cushion	
Lubrication	None (Non lubricated)	
Piston speed	50÷1500mm/s	
Allowable kinetic energy (J)	0.65	1.2

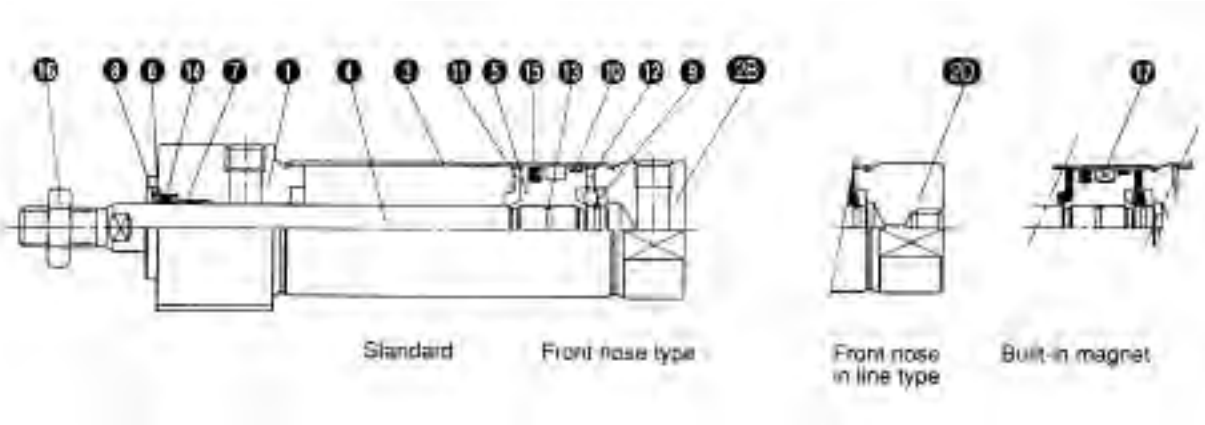
Symbol

Double Acting/Single Rod



Construction/Part list

C◯ 76R $^{A}_{B}$ 32 ~ 40



Parts List

Item	Part name	Material	Quantity	Remarks
1	Rod cover	Aluminum alloy	1	White alumite
2B	Head cover E	Aluminum alloy	1	White alumite
2D	Head cover Y	Aluminum alloy	1	White alumite
3	Cylinder tube	Stainless steel	1	
4	Piston rod	Carbon steel	1	Hard chrome plated
5	Piston	Aluminum alloy	1	Chromate
6	Plain washer	Carbon steel	1	Nickel plating
7	Bush	Sintered bronze	1	
8	Retaining ring	Carbon steel	1	Nickel plating
9	Retaining ring	Carbon steel	1	
10	Wear ring	Phenolic resin	1	

Item	Part name	Material	Quantity	Remarks
11	Bumper A	Urethane	1	
12	Bumper B	Urethane	1	
13	Piston gasket	NBR	1	
14	Rod seal	NBR	1	
15	Piston seal	NBR	1	
16	Rod end nut	Carbon steel	1	Nickel plating
17	Magnet	Magnet	1	(switch type only)

How To Order

Double acting Single rod

C D 76 R A F 32 — 100 — B

Magnet
- **Nil** — None
- **D** — Built-in magnet

Type

A	Bottom side mounting
B	Front side mounting

Mounting

Mark	Mounting
F	Front nose type
Y	Front nose in line type

Bore size (mm)	Standard stroke (mm)	Max. stroke (mm)
32	10, 25, 40, 50, 80, 100, 125, 160, 200	200
40		200

Auto switch mounting type
- **B** — Band mounted type

Parts No. of Accessories

Bore size (mm)		32	40
Accessories	Single knuckle joint	KJ10DA	KJ12DA
	Double knuckle joint	GKM10-20A	GKM12-24A
	Floating joint	JA25-10-150	JA40-12-175

Bore (mm)	Code number	Note
32	C76-32PS	Every set includes: n°1 rod packing n°1 packing retaining washer n°1 retaining ring
40	C76-40PS	

Example of How to Order

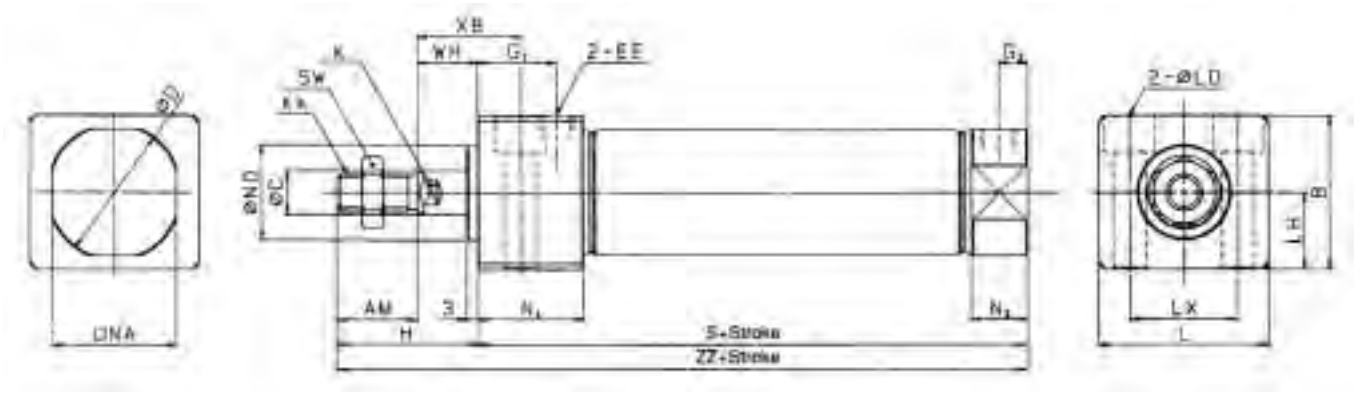
1 In case of without auto switch, bore size: 32, stroke: 100, double acting/single rod, bottom side mounting and front nose type.
C76RAF32-100 1 pc. — Cylinder

2 In case of with auto switch (band mounted type, 2 pcs.), bore size: 40, stroke: 100, double acting/single rod, front side mounting and front nose type.
CD76RBF 40-100-B 1pc. — Cylinder
D-C73L 2 pcs. — Auto switch
BM2-040 2 pcs. Switch mounting band

C◯76R Front Nose Type

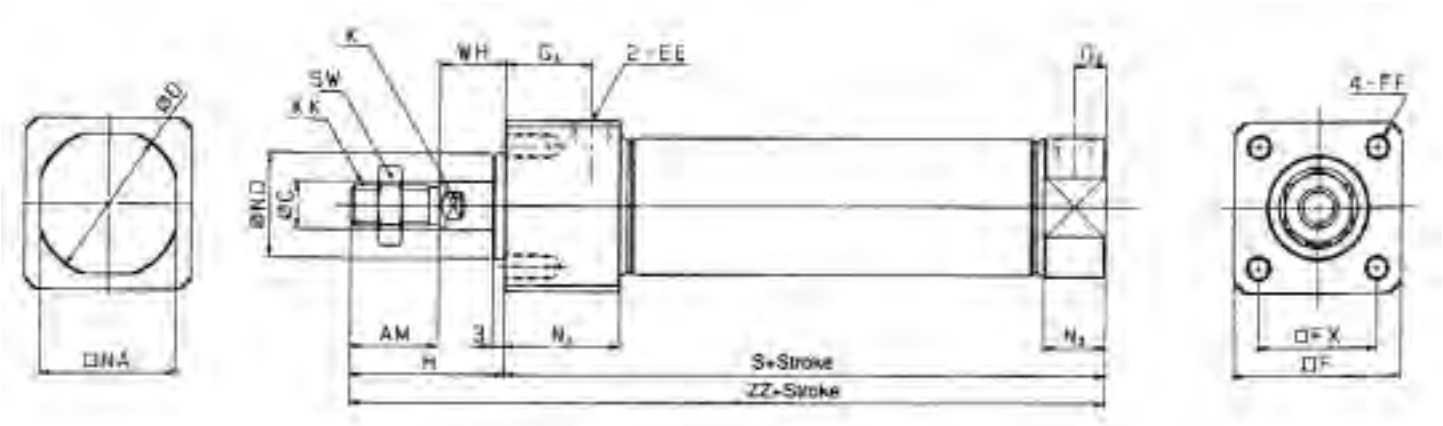
Dimensions

Rubber Cushion/C◯76 R A F Bore – Stroke – B
Without Magnet, Built-in Magnet



Bore	AM	B	ØC	ØD	EE	G1	G2	H	K	KK	L	ØLD	LH	LX	N1	N2	NA	ØND	S	SW	WH	XB	ZZ
32	20	42.3	12	37.5	G1/8	22	9	36	10	M10	47	Ø9, Ø14 depth of counter bore 10	21	30	29	17	34.5	$26^{0}_{-0.033}$	80	17	16	28	116
40	24	52.3	14	46.5	G1/4	27	12	40	12	M12	58.5	Ø11, Ø17.5 depth of counter bore 12.5	26	38	38	22	42.5	$32^{0}_{-0.039}$	105	19	16	31	145

Rubber Cushion/C◯76 R B F Bore – Stroke – B
Without Magnet, Built-in Magnet

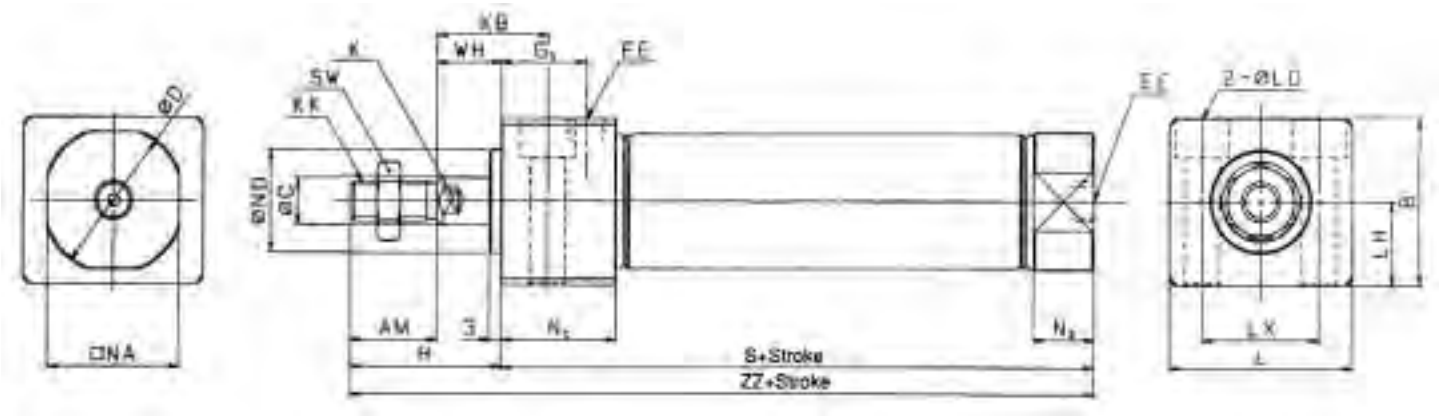


Bore	AM	ØC	ØD	EE	F	FF	FX	G1	G2	H	K	KK	N1	N2	NA	ØND	S	SW	WH	ZZ
32	20	12	37.5	G1/8	42.4	M6 Depht 11	30	22	9	36	10	M10	29	17	34.5	$26^{0}_{-0.033}$	80	17	16	116
40	24	14	46.5	G1/4	52.4	M8 Depht 14	36	27	12	40	12	M12	38	22	42.5	$32^{0}_{-0.039}$	105	19	16	145

C◯76R Front Nose In Line Type

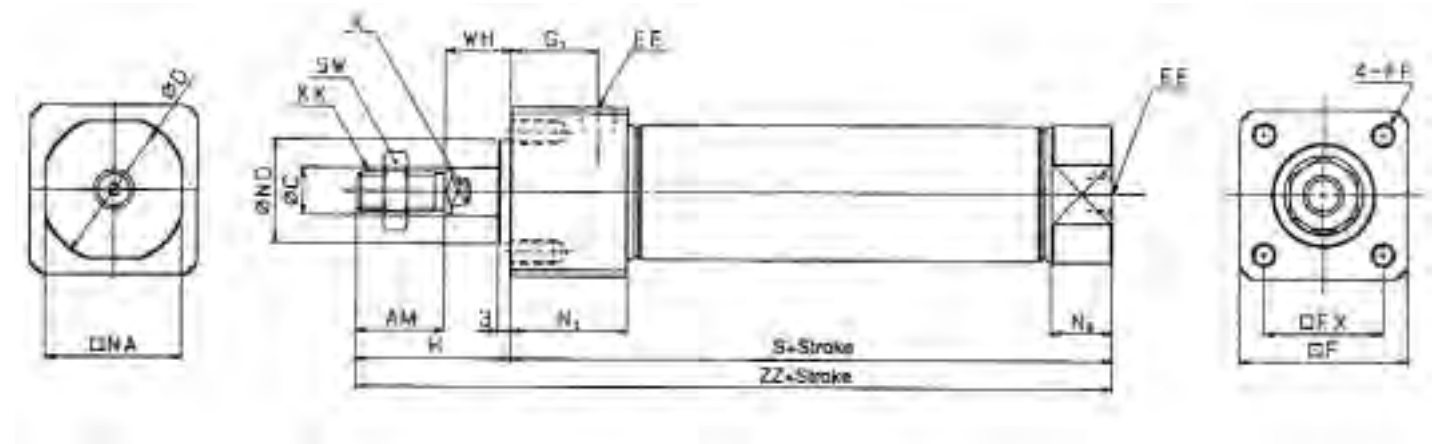
Dimensions

Rubber Cushion/C◯76 R A Y Bore – Stroke – B
Without Magnet, Built-in Magnet



Bore	AM	B	ØC	ØD	EE	G1	H	K	KK	L	ØLD	LH	LX	N1	N2	NA	ØND	S	SW	WH	XB	ZZ
32	20	42.3	12	37.5	G1/8	22	36	10	M10	47	Ø9, Ø14 depth of counter bore 1	21	30	29	17	34.5	$26^{0}_{-0.033}$	80	17	16	28	116
40	24	52.3	14	46.5	G1/4	27	40	12	M12	58.5	Ø11, Ø17.5 depth of counter bore 12.5	26	38	38	22	42.5	$32^{0}_{-0.039}$	105	19	16	31	145

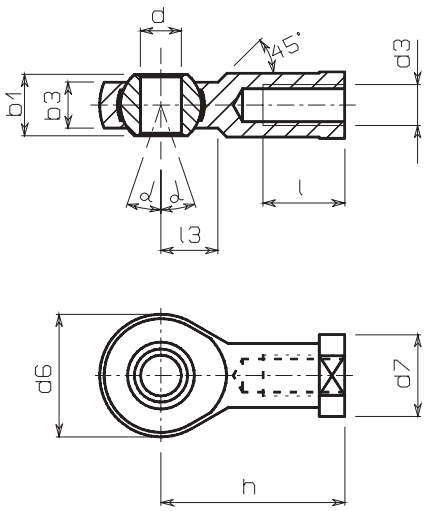
Rubber Cushion/C◯76 R B Y Bore – Stroke C – B
Without Magnet, Built-in Magnet



Bore	AM	ØC	ØD	EE	F	FF	FX	G1	H	K	KK	N1	N2	NA	ØND	S	SW	WH	ZZ
32	20	12	37.5	G1/8	42.4	M6 Depht 11	30	22	36	10	M10	29	17	34.5	$26^{0}_{-0.033}$	80	17	16	116
40	24	14	46.5	G1/4	52.4	M8 Depht 14	36	27	40	12	M12	38	22	42.5	$32^{0}_{-0.039}$	105	19	16	145

Accessories/Dimensions

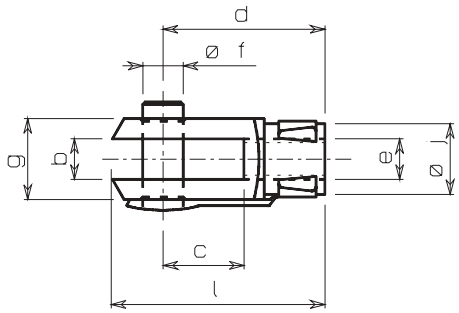
Single Knuckle Joint/DIN648



Unit: mm

Bore Size	Model	Thread d3	dH71	h	d6	b3	b1	l	d7	α°	l3
Ø32	KJ10DA	M10	10	43	20	10.5	14	20	19	13	14
Ø40	KJ12DA	M12	12	50	30	12	16	22	22	13	16

Double Knuckle Joint/DIN71751

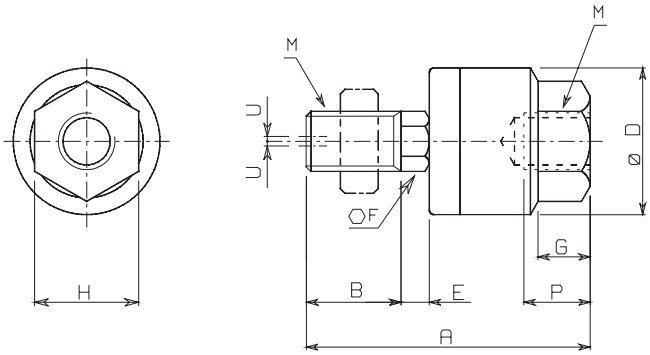


Unit: mm

Bore Size	Model	Thread e	b	d	f	g	c	j	a
ø32	GKM10-20A	M10	10	40	10	18	20	12	20
ø40	GKM12-24A	M12	12	48	12	23	24	15	24

Floating-Joint/Series JA

JA25•40



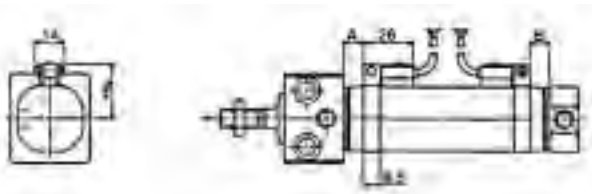
Unit: mm

Bore Size	Model	M		A	B	D	E	F	G	H	Maximum screwed depth P	Allowable eccentricity U	Max. operating tension and compression power kgf (KN)
		Nominal thread dia.	Pitch										
Ø32	JA25-10-150	10	1.5	49.5	19.5	24	5	8	8	17	9	0.5	250 (2.5)
Ø40	JA40-12-175	12	1.75	60	20	31	6	11	11	22	13	0.75	440 (4.4)

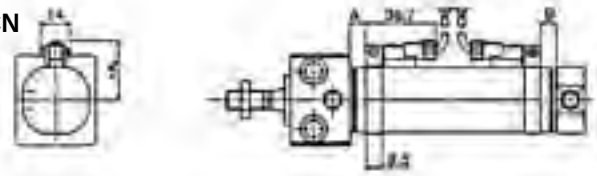
Reed Switch Setting Position (Stroke End)

(Band Mounted Type)

D-C73L
D-C80L



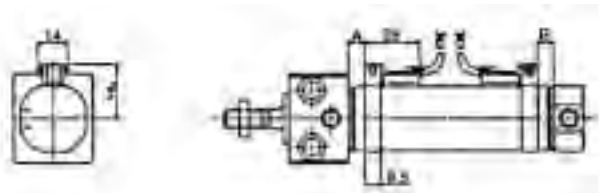
D-C73CN
D-C80CN



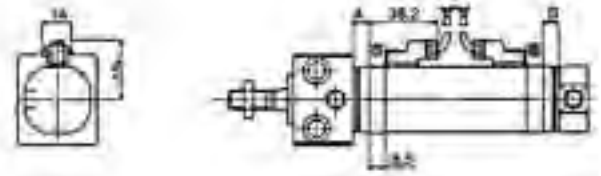
Solid State Switch Setting Position (Stroke End)

(Band Mounted Type)

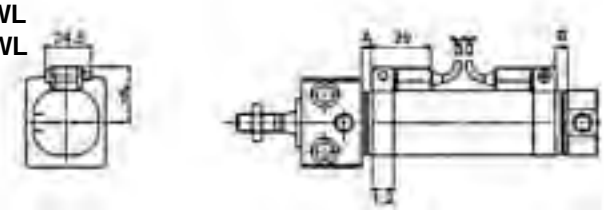
D-H7A1L
D-H7A2L
D-H7BL



D-H7CN



D-H7NWL
D-H7PWL
D-H7BWL



Auto Switch Mounting, Minimum Possible Cylinder Strokes

Unit:mm

Band Mounted Type

Auto switch model	No. of auto switches				1pc.
	2pcs.		npcs.		
	Different orientation	Same orientation	Different orientation	Same orientation	
D-C73L, D-C80L, D-H7A1L, D-H7A2L, D-H7BL	15	50	$15+45(\frac{n-2}{2})$ (n=2,4...)	50+45(n-2)	10
D-C73CN, D-C80CN, D-H7CN	15	65	$15+50(\frac{n-2}{2})$ (n=2,4...)	65+50(n-2)	10
D-H7NWL, D-H7PWL, D-H7BWL	15	75	$15+50(\frac{n-2}{2})$ (n=2,4...)	75+55(n-2)	10

Bore (mm)	**Reed type**						**Solid state type**								
	D-C73L D-C80L			**D-C73CN D-C80CN**			**D-H7A1L D-H7A2L D-H7BL**			**D-H7CN**			**D-H7NWL D-H7PWL D-H7BWL**		
	A	B	Hs	A	B	Hs	A	B	Hs	A	B	Hs	A	B	Hs
32	8	7	28.5	8	7	31	7	6	28.5	7	6	31.2	5.5	4.5	28.5
40	13	12	32.5	13	12	35	12	11	32.5	12	11	35.2	10.5	9.5	32.5

ISO Cylinder
Series CP95

ø32, ø40, ø50, ø63, ø80, ø100

Dimensions conform to ISO 6431, VDMA 24562, CETOP RP43P.

Model Selection

Execution	Model	Bore Size						Adjustable Stroke End Cushioning	Options Piston Rod			
		32	40	50	63	80	100		Standard Hard Chrome	W	R	K
Standard Type	CP95 SB	●	●	●	●	●	●	●	●	○	○	○
	CP95 SDB	●	●	●	●	●	●	●	●	○	○	○
Non-Rotating Piston Rod	CP95 KB	●	●	●	●	●	●	●	–	○	●	–
	CP95 KDB	●	●	●	●	●	●	●	–	○	●	–
With Lock	CP95 NB	●	●	●	●	●	●	●	●	○	–	–
	CP95 NDB	●	●	●	●	●	●	●	●	○	–	–
With Positioner	CP95PB	–	–	●	●	●	●	●	●	–	–	–
	CP95 PDB	–	–	●	●	●	●	●	●	–	–	–
Low Friction Cylinder	CP95 QB$^{-CA}_{-CB}$	●	●	●	●	●	●	–	●	–	○	○
	CP95 QDB$^{-CA}_{-CB}$	●	●	●	●	●	●	–	●	–	○	○

W = Double/Through Rod
R = Stainless Steel Piston Rod
K = Stainless &Acid-Proof Piston Rod & Nickel Plated Tie Rods

○ Options
● Standard

ISO Cylinder/Standard: Double Acting

Series CP95

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Standard CP95SD **B** **32** — **100** **W** — **Z76** **S**

Built-in magnet

Mounting

B	Basic/Without bracket
L	Axial foot
F	Front flange
G	Rear flange
C	Single rear clevis
D	Double rear clevis

Bore size

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

Rod Specifications

	Hard chromed rod as standard
W	Double/through rod
R	Stainless steel piston rod
K	stainless steel and acid-proof piston rod
F	Rod boot

Stroke (mm)
Refer to standard stroke table on p.5-4

Auto switch

—	Without auto switch

∗ Refer to table below for selection of applicable auto switch.

Number of auto switches

—	2
S	1
3	3
n	n

Applicable Auto Switches/Direct mounting type

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC		Load voltage AC	Auto switch model: Electrical entry direction Vertical	Auto switch model: Electrical entry direction Lateral	Lead wire length (m) Note) 0.5 (Nil)	3 (L)	5 (Z)	Applicable load		Mounting bracket
Reed switch	—	Grommet	Yes	3 wire	—	5V	—	—	**Z76**	●	●	—	IC circuit	—	BMP1-032
				2 wire	24V	—	100V	—	**Z73**	●	●	●	—	Relay PLC	
			No			5V, 12V	100V or less	—	**Z80**	●	●	—	IC circuit		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay PLC	
				3 wire (PNP)				**Y7PV**	**Y7P**	●	●	○			
				2 wire		12V		**Y69B**	**Y59B**	●	●	○	—		
	Diagnostic indication (2 colour indicator)			3 wire (NPN)		5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit		
				3 wire (PNP)				**Y7PWV**	**Y7PW**	●	●	○			
				2 wire		12V		**Y7BWV**	**Y7BW**	●	●	○	—		
	Water resistant (2 colour indicator)							—	**Y7BA**	—	●	—			
	——	Connector and Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	**M9NV**	**M9N**	●	●	○	IC circuit	Relay PLC	BMP1-032 + BMG2-012
				3 wire (PNP)				**M9PV**	**M9P**	●	●	○			
				2 wire		12V		**M9BV**	**M9B**	●	●	○			

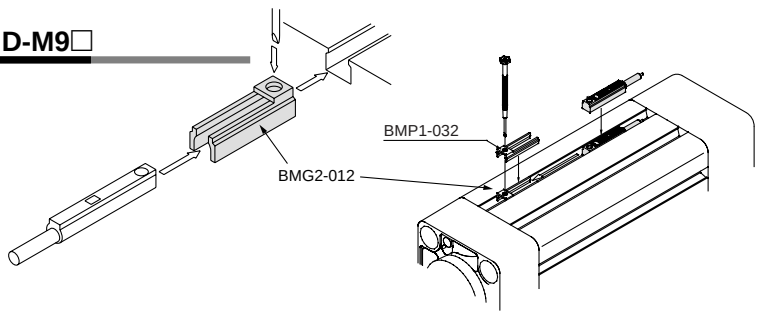
∗ Lead wire length 0.5m····· — (Example: A53)
3m····· L (Example: A53L)
5m····· Z (Example: A53Z)

○: Manufactured upon receipt of order.

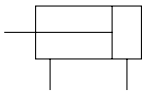
Auto Switch Mounting Accessories for D-M9□

Bore size (mm)	Order No.
ø32~ø100	**BMP1-032**
	BMG2-012

Note: For the mounting of auto switch D-M9, both BMP1-032 and BMG2-012 are necessary.



ISO Symbol
Double acting



Specifications

Bore size	ø32	ø40	ø50	ø63	ø80	ø100
Action	Double acting					
Fluid	Air					
Proof pressure	1.5MPa					
Max. operating pressure	1.0MPa					
Min. operating pressure	0.05MPa					
Ambient and fluid temperature	Without magnet –10 to 70°C (No freezing)					
	With magnet –10 to 60°C (No freezing)					
Lubrication	Not required (Non-lube)					
Operating piston speed	50 to 1000mm/s					
Allowable stroke tolerance	to 250: $^{+1.0}_{0}$, 251 to 1000: $^{+1.4}_{0}$					
Cushion	Both ends (Air cushion)					
Port size	G1/8	G1/4	G1/4	G3/8	G3/8	G1/2
Mounting	Basic, axial foot, front flange, rear flange, spherical bearing, single rear clevis, double rear clevis					

Minimum Strokes for Auto Switch Mounting

Refer to p.5-32 for "Minimum Strokes for Auto Switch Mounting".

Standard Stroke

Bore size (mm)	Standard stroke (mm)	Max. * stroke
32	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	700
40	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	800
50	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
63	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
80	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
100	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000

Intermediate strokes are available.
* Please consult with SMC for longer strokes.

Mounting Bracket, Mounting Accessories

Description	Bore size	ø32	ø40	ø50	ø63	ø80	ø100
L	**Foot**(1)	L5032	L5040	L5050	L5063	L5080	L5100
F,G	**Flange**	F5032	F5040	F5050	F5063	F5080	F5100
C	**Single rear clevis**	C5032	C5040	C5050	C5063	C5080	C5100
D	**Double rear clevis**	D5032	D5040	D5050	D5063	D5080	D5100
DS	**Double rear clevis (for ES accessory)**	DS5032	DS5040	DS5050	DS5063	DS5080	DS5100
ES	**Angled rear clevis with ball joint**	ES5032	ES5040	ES5050	ES5063	ES5080	ES5100
E	**Angled rear clevis**	E5032	E5040	E5050	E5063	E5080	E5100
GKM	**Rod clevis**	GKM10-20	GKM12-24	GKM16-32	GKM16-32	GKM20-40	GKM20-40
KJ	**Piston rod ball joint**	KJ10D	KJ12D	KJ16D	KJ16D	KJ20D	KJ20D
JA	**Floating joint**	JA30-10-125	JA40-12-125	JA50-16-150	JA50-16-150	JAH50-20-150	JAH50-20-150

Note 1) Two foot brackets required for one cylinder.
Note 2) Accessories for each mounting bracket are as follows.
Foot, Flange, Single clevis: Mounting bolts
Double rear clevis: (D,DS): Clevis pin
Note 3) GKM according to ISO 8140
Note 4) KJ according to ISO 8139
Note 5) Piston rod nut is standard

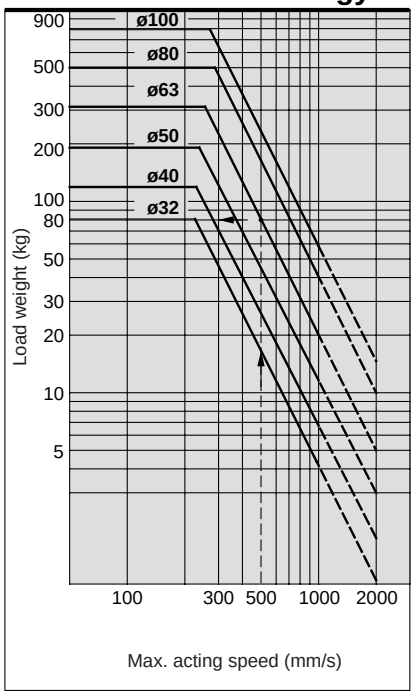
Theoretical Force

(Unit : N) OUT IN

Bore size (mm)	Rod diameter (mm)	Operating direction	Piston area (mm^2)	Operating pressure (MPa)								
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
32	12	OUT	804	161	241	322	402	482	563	643	724	804
		IN	691	138	207	276	346	415	484	553	622	691
40	16	OUT	1257	251	377	503	629	754	880	1006	1131	1257
		IN	1056	211	317	422	528	634	739	845	950	1056
50	20	OUT	1963	393	589	785	982	1178	1374	1570	1767	1963
		IN	1649	330	495	660	825	989	1154	1319	1484	1649
63	20	OUT	3117	623	935	1247	1559	1870	2182	2494	2805	3117
		IN	2803	561	841	1121	1402	1682	1962	2242	2523	2803
80	25	OUT	5027	1005	1508	2011	2514	3016	3519	4022	4524	5027
		IN	4536	907	1361	1814	2268	2722	3175	3629	4082	4536
100	30	OUT	7854	1571	2356	3142	3927	4712	5498	6283	7068	7854
		IN	7147	1429	2144	2859	3574	4288	5003	5718	6432	7147

Note) Theoretical force(N) = Pressure (MPa) X Piston area (mm^2)

Allowable Kinetic Energy



Example: Load limit at rod end when air cylinder ø63 is actuated with max. actuating speed 500mm/s. See the intersection of lateral axis 500mm/s and ø63 line, and extend the intersection to left. Thus the allowable load is 80kg.

Weight table

[kg]

Ø Bore	Mounting type	32	40	50	63	80	100
Basic weight	Basic type B	0.59	0.87	1.44	2.00	3.37	4.45
	Foot L	0.16	0.20	0.38	0.46	0.89	1.09
	Front/rear flange F	0.20	0.23	0.47	0.58	1.30	1.81
	Male rear clevis C	0.16	0.23	0.37	0.60	1.07	1.73
	Female rear clevis D	0.20	0.32	0.45	0.71	1.28	2.11
	Angled rear clevis E	0.16	0.22	0.42	0.52	0.94	1.40
	Female rear clevis DS	0.17	0.27	0.45	0.64	1.37	2.05
	Spherical bearing ES	0.18	0.27	0.46	0.55	0.97	1.33
Additional weight per 50 mm stroke		0.11	0.17	0.28	0.40	0.67	0.89
Accessories	Piston rod ball joint KJ	0.15	0.23	0.26	0.26	0.60	0.83
	Rod clevis GKM	0.22	0.37	0.43	0.43	0.87	1.27
	Floating joint JA	0.015	0.20	0.26	0.26	0.9	0.9

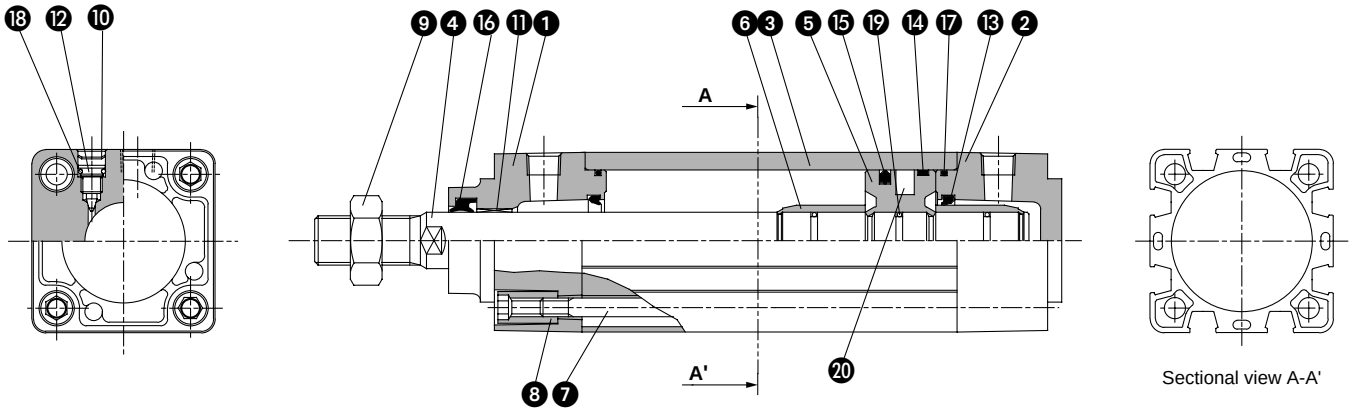
Weight calculation method

Example: CP95S32-100
(basic Ø32, 100st)

- Basic weight . . . . .0.59kg (Standard Ø32)
- Additional weight . .0.11kg/50mm stroke
- Cylinder stroke . . .100st

Cylinder weight =
0.59+(0.11 x 100/50)=0.81kg

Construction



Parts list

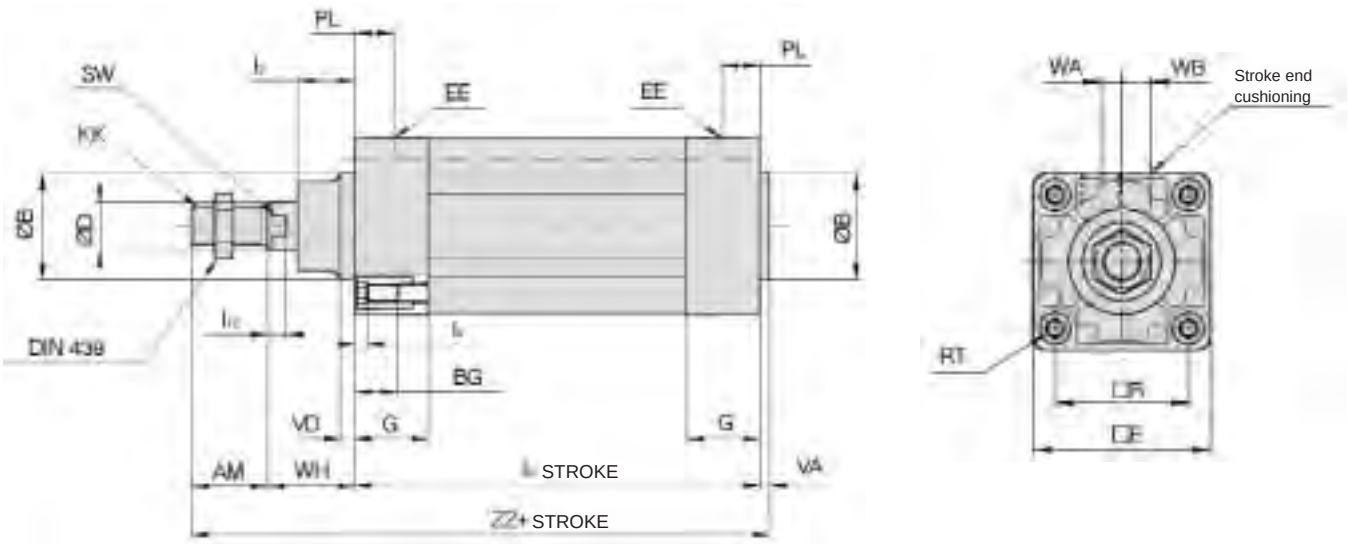
No.	Description	Material
❶	Head cover	Die-cast aluminum
❷	End cover	Die-cast aluminum
❸	Cylinder tube	Die-cast aluminum
❹	Piston rod	Hard chromed steel C45
❺	Piston	Die-cast aluminum
❻	Cushion ring	Brass
❼	Tie rod	Steel, zinc chromate plated
❽	Tie rod nut	Steel, zinc chromate plated
❾	Rod end nut	Steel, zinc chromate plated
❿	Snap ring	Steel nickel plated
⓫	Bushing	Lead-bronze casting
⓬	Cushion valve	Steel, zinc chromate plated
⓭	Cushion seal	Elastomer
⓮	Wear ring	Antifriction material
⓯	Piston seal	NBR
⓰	Rod seal	NBR
⓱	Cylinder tube gasket	NBR
⓲	Cushioning valve seal	NBR
⓳	Piston/rod gasket	NBR
⓴	Magnet ring	

Replacement parts: Seal kits
Ø32 includes order No. from ⓭ to ⓱,
Ø40 - Ø100 includes from ⓬ to ⓲

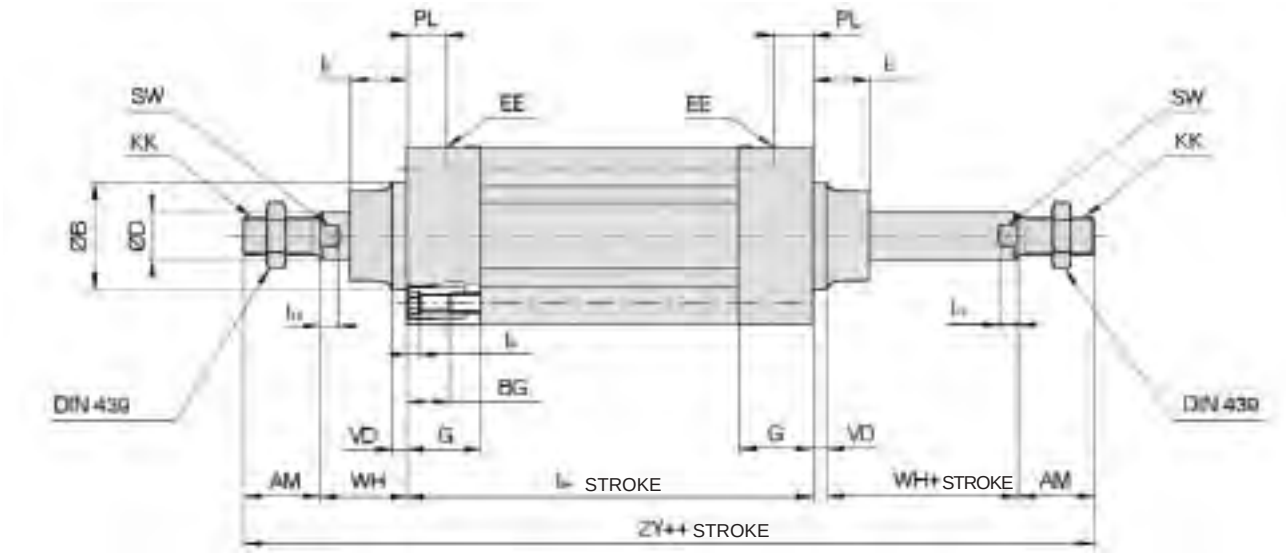
Ø	**Order No.**
32	**CS95-32**
40	**CS95-40**
50	**CS95-50**
63	**CS95-63**
80	**CS95-80**
100	**CS95-100**

Without Mounting Bracket

CP95SBø-Stroke



CP95SBø-Stroke W

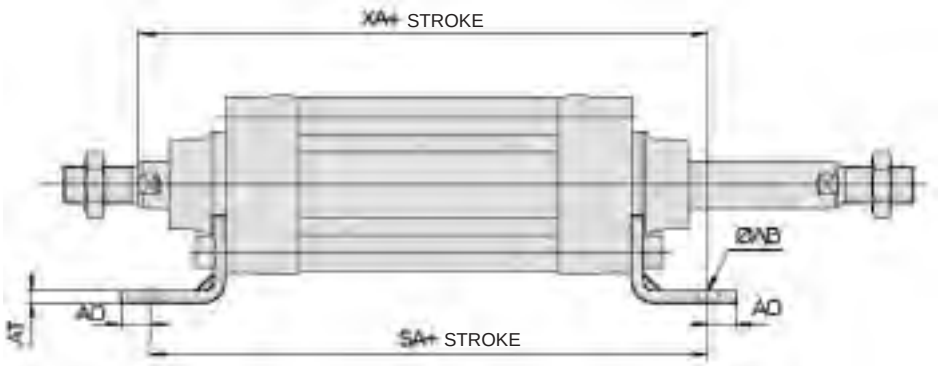


Ø Bore	AM	ØB	ØD	EE	PL	RT	l_{12}	KK	SW	G	BG	l_8	VD	VA	WA	WB	WH	ZZ	ZY	□E	□R	l_2	l_9
32	22	30	12	G1/8	13	M6	6	M10x1.25	10	27	16	94	4	4	4	6.5	26	146	190	46	32.5	15	4
40	24	35	16	G1/4	14	M6	6.5	M12x1.25	13	27	16	105	4	4	4	9	30	163	213	52	38	17	4
50	32	40	20	G1/4	15.5	M8	8	M16x1.5	16	31.5	16	106	6	4	5	10.5	37	179	244	65	46.5	24	5
63	32	45	20	G3/8	16.5	M8	8	M16x1.5	16	31.5	16	121	6	4	9	12	37	194	259	75	56.5	24	5
80	40	45	25	G3/8	19	M10	10	M20x1.5	21	38	16	128	8	4	11.5	14	46	218	300	95	72	30	5
100	40	55	30	G1/2	19	M10	10	M20x1.5	21	38	16	138	8	4	17	15	51	233	320	114	89	32	5

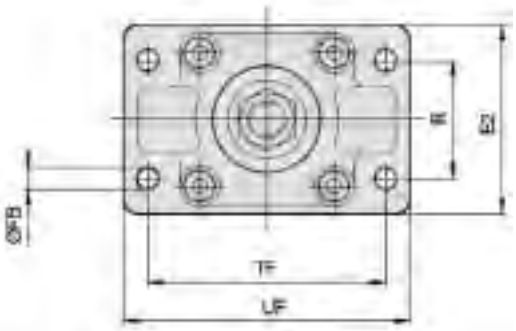
Dimensions – mounting accessories L, F, C and D

[mm]

Mounting type L

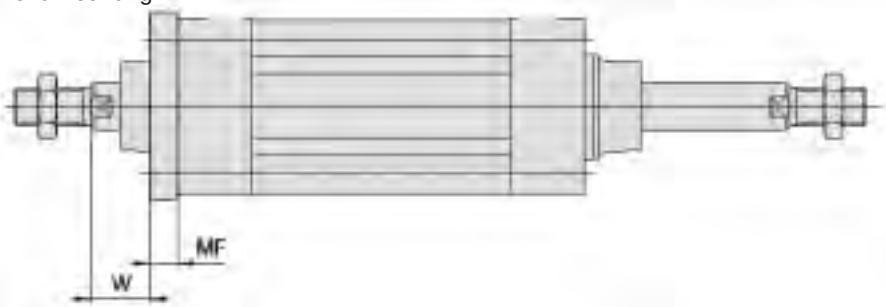


Mounting type F

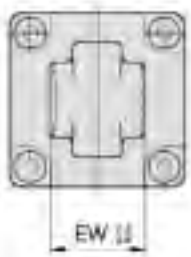


Rear mounting

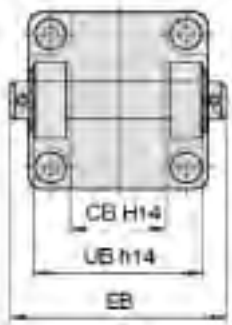
Front mounting

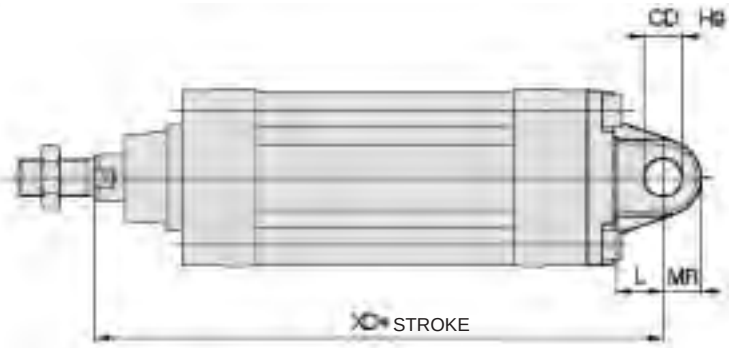


Mounting type C



Mounting type D

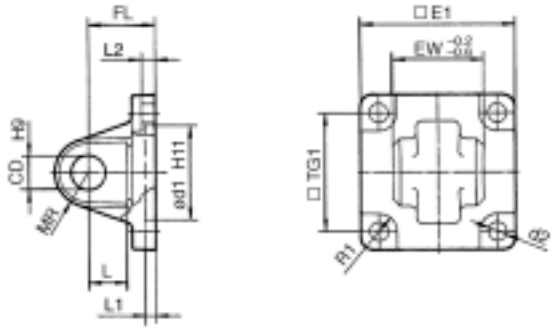




	E1	R	W	MF	ZF	ØFB	CD	ED	L	KD	UD	CD	EW	MR	TR	AO	AT	KA	SA	AH	ØAB	TF	UF	E2
32	48	32	16	10	130	7	10	65	12	142	45	26	26	9.5	32	10	4	144	142	32	7	64	78	50
40	55	36	20	10	145	9	12	75	15	160	52	28	28	12	36	11	4	163	161	36	9	72	90	55
50	66	45	25	12	155	9	12	80	15	170	60	32	32	12	45	12	5	175	170	45	9	80	110	70
63	80	50	25	12	170	9	16	90	20	190	70	40	40	16	50	12	5	186	185	50	9	100	120	80
80	100	60	30	16	190	12	16	110	20	210	80	50	50	16	60	14	6	215	210	63	12	126	150	100
100	120	75	35	16	205	14	20	140	25	230	110	60	60	20	75	16	6	230	220	71	14	150	178	120

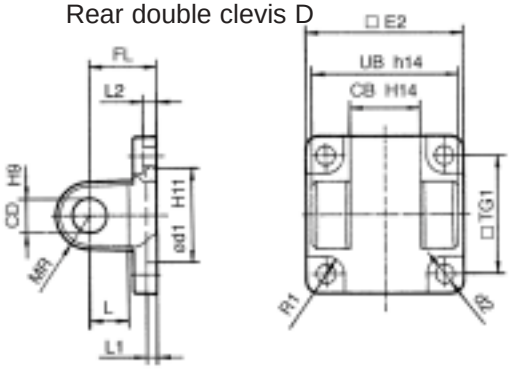
Accessories

Rear single clevis C

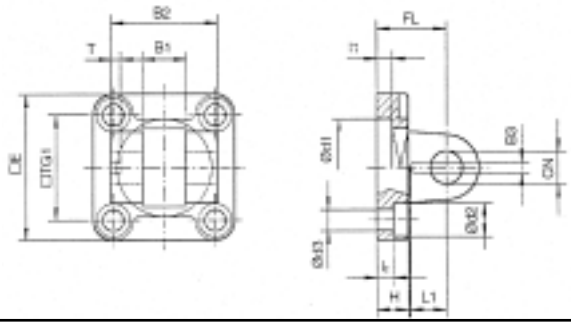


Bore (mm)	□E1	EW	□TG1	FL	L1	L	L2	ød1	CD	MR	d2	R1	□E2	UB	CB
32	45	26	32.5	22	5	12	5.5	30	10	9.5	6.6	6.5	48	45	26
40	51	28	38	25	5	15	5.5	35	12	12	6.6	6.5	56	52	28
50	64	32	46.5	27	5	15	6.5	40	12	12	9	8.5	64	60	32
63	74	40	56.5	32	5	20	6.5	45	16	16	9	8.5	75	70	40
80	94	50	72	36	5	20	10	45	16	16	11	11	95	90	50
100	113	60	89	41	5	25	10	55	20	20	11	12	115	110	60

Rear double clevis D

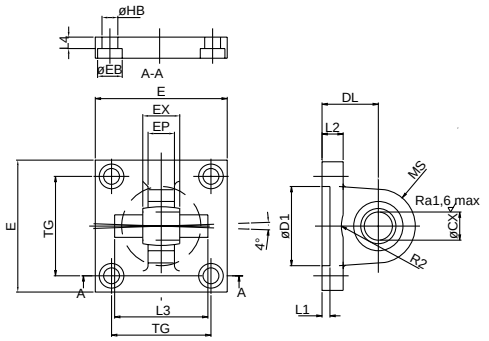


Rear Single Clevis DS



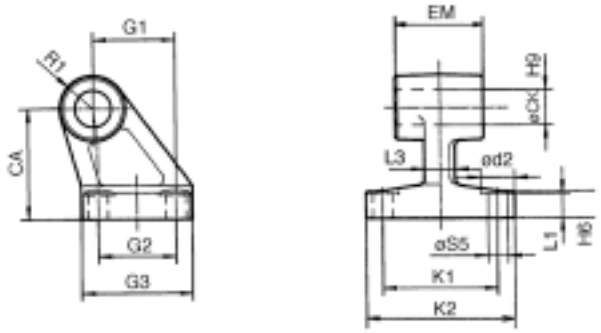
Bore (mm)	□E	B1	B2	B3	□TG1	T	L1	L3	l1	l2	FL	H	Ød1	Ød2	Ød3	CN	XD
32	45	14	34	3.3	32.5	3	11.5	41	5	5.5	22	10	30	10.5	6.6	10	142
40	55	16	40	4.3	38	4	12	48	5	5.5	25	10	35	11	6.6	12	160
50	65	21	45	4.3	46.5	4	14	54	5	6.5	27	10	40	15	9	16	170
63	75	21	51	4.3	56.5	4	14	60	5	6.5	32	12	45	15	9	16	190
80	95	25	65	4.3	72	4	16	75	5	10	36	16	45	18	11	20	210
100	115	25	75	6.3	89	4	16	85	5	10	41	16	55	18	11	20	230

Rear Single Clevis CS



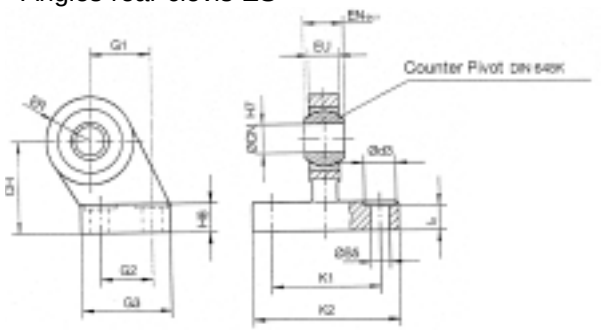
Part No.	Bore (mm)	E	TG	EX	DL	L1	L2	MS	L3	EB	HB	R2	CX	D1	L4	EP
CS5032	**32**	48	32.5	14	22	5	10	16	36	11	6.6	12.5	10	30	5.5	10
CS5040	**40**	56	38	16	25	5	10	16	42	11	6.6	14.5	12	35	5.5	11.5
CS5050	**50**	64	46.5	21	27	5	10	20	48	15	9	19.5	16	40	6.5	14.5
CS5063	**63**	75	56.5	21	32	5	12	22	55	15	9	19.5	16	45	6.5	14.5
CS5080	**80**	95	72	25	36	5	14	26	70	18	11	24.5	20	45	10	17.5
CS5100	**100**	115	89	25	41	5	16	26	80	18	11	24.5	20	55	10	17.5

Counter pivot E



Bore (mm)	ød2	øCK	øS5	K1	K2	L3	G1	L1	G2	EM	G3	CA	H6	R1
32	11	10	6.6	38	51	10	21	7	18	26	31	32	8	10
40	11	12	6.6	41	54	10	24	9	22	28	35	36	10	11
50	15	12	9	50	65	12	33	11	30	32	45	45	12	12
63	15	16	9	52	67	14	37	11	35	40	50	50	12	15
80	18	16	11	66	86	18	47	12.5	40	50	60	63	14	15
100	18	20	11	76	96	20	55	13.5	50	60	70	71	15	19

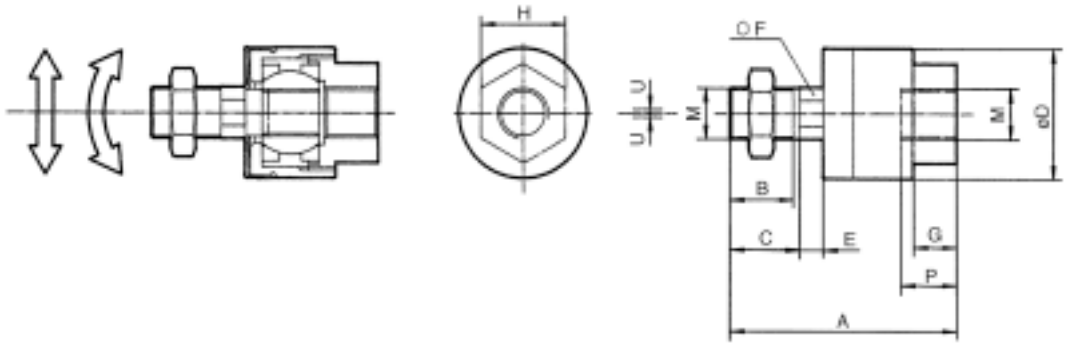
Angles rear clevis ES



Bore (mm)	Ød3	ØCN	ØS5	K1	K2	l2	G1	G2	G3	EN	EU	CH	H6	ER
32	11	10	6.6	38	51	8.5	21	18	31	14	10.5	32	10	15
40	11	12	6.6	41	54	8.5	24	22	35	16	12	36	10	18
50	15	16	9	50	65	10.5	33	30	45	21	15	45	12	20
63	15	16	9	52	67	10.5	37	35	50	21	15	50	12	23
80	18	20	11	66	86	11.5	47	40	60	25	18	63	14	27
100	18	20	11	76	96	12.5	55	50	70	25	18	71	15	30

Accessories

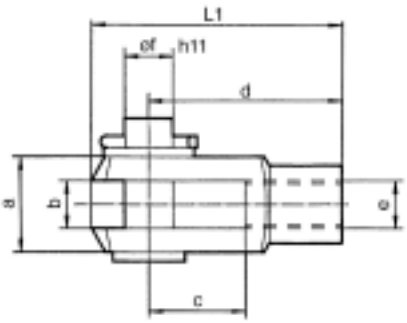
Floating joint JA
Steel, zinc chromate plated



Bore (mm)	M	A	B	C	øD	E	F	G	H	P	U	Load (kn)	Weight (g)	Radial deflection
32	M10 X 1.25	49.5	19.5	—	24	5	8	8	17	9	0.5	2.5	70	±5
40	M12 X 1.25	60	20	—	31	6	11	11	22	13	0.75	4.4	160	
50/63	M16 X 1.5	71.5	22	—	41	7.5	14	13.5	27	15	1.0	11	300	
80/100	M20 X 1.5	101	28	31	59.5	11.5	24	16	32	18	2.0	18	1080	

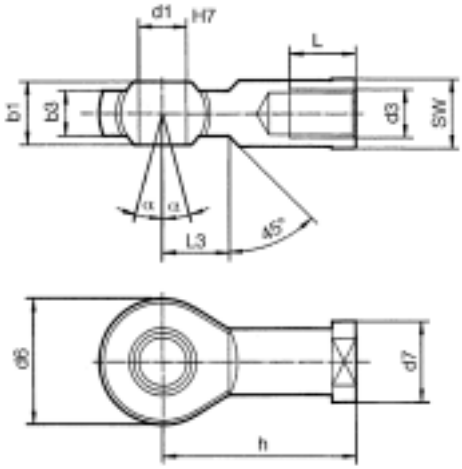
Piston rod clevis GKM (ISO 8140)
Steel, zinc chromate plated

Bore (mm)	e	b	d	øf	L1	c	a
32	M10 X 1.25	10	40	10	52	20	20
40	M12 X 1.25	12	48	12	62	24	24
50/63	M16 X 1.5	16	64	16	83	32	32
80/100	M20 X 1.5	20	80	20	105	40	40



Piston rod ball joint KJ (ISO 8139)
Steel, zinc chromate plated

Bore (mm)	d3	d1	h	d6	b3	b1	L	d7	α	L3	SW
32	M10 X 1.25	10	43	28	10.5	14	20	19	13°	14	17
40	M12 X 1.25	12	50	32	12	16	22	22	13°	16	19
50/63	M16 X 1.5	16	64	42	15	21	28	27	15°	26	32
80/100	M20 X 1.5	20	77	50	18	25	33	34	15°	26	32



ISO Cylinder: Double Acting

Series CP95K

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Standard CP95KD [B] [32] — [100] [W] — [Z76] [S]

Built-in magnet

Mounting

B	Basic/without bracket
L	Axial foot
F	Front flange
G	Rear flange
C	Single rear clevis
D	Double rear clevis

Bore size

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

Stroke (mm)
Refer to standard stroke table on p.5-12 maximum 1000mm

Rod specifications

—	Stainless steel 1.4301 standard
W	double/through rod

Auto switch

—	Without auto switch

∗ Refer to table below for selection of applicable auto switch.

Number of auto switches

—	2
S	1
3	3
n	n

Applicable Auto Switches/Direct mounting type

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage AC	Auto switch model: Electrical entry direction Vertical	Auto switch model: Electrical entry direction Lateral	Lead wire length (m) Note) 0.5 (Nil)	3 (L)	5 (Z)	Applicable load		Mounting bracket
Reed switch	—	Grommet	Yes	3 wire	— 5V	—	—	**Z76**	●	●	—	IC circuit	—	BMP1-032
				2 wire	24V —	100V	—	**Z73**	●	●	●	—	Relay PLC	
			No		5, 12V	100V or less	—	**Z80**	●	●	—	IC circuit		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V 5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay PLC	
				3 wire (PNP)			**Y7PV**	**Y7P**	●	●	○			
				2 wire	12V		**Y69B**	**Y59B**	●	●	○	—		
	Diagnostic indication (2 colour indicator)			3 wire (NPN)	5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit		
				3 wire (PNP)			**Y7PWV**	**Y7PW**	●	●	○			
				2 wire	12V		**Y7BWV**	**Y7BW**	●	●	○	—		
	Water resistant (2 colour indicator)						—	**Y7BA**	—	●	—			
	——	Connector and Grommet	Yes	3 wire (NPN)	24V 5V,12V	—	**M9NV**	**M9N**	●	●	○	IC circuit	Relay PLC	BMP1-032 + BMG2-012
				3 wire (PNP)			**M9PV**	**M9P**	●	●	○			
				2 wire	12V		**M9BV**	**M9B**	●	●	○			

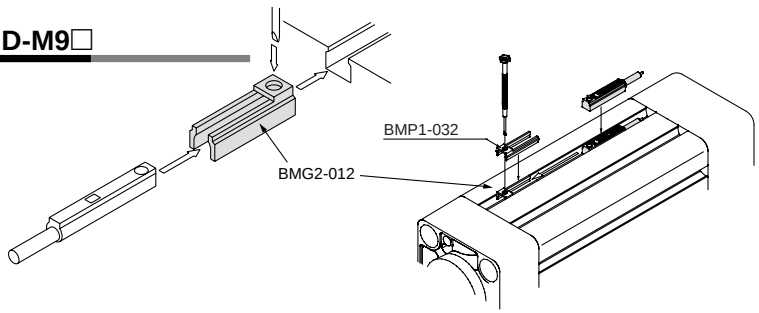
Lead wire length 0.5m····· — (Example: A53)
3m····· L (Example: A53L)
5m····· Z (Example: A53Z)

○: Manufactured upon receipt of order.

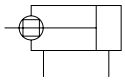
Auto Switch Mounting Accessories for D-M9□

Bore size (mm)	Order No.
ø32~ø100	**BMP1-032**
	BMG2-012

Note: For the mounting of auto switch D-M9, both BMP1-032 and BMG2-012 are necessary.



ISO Symbol
Double acting



Specifications

Bore size	ø32	ø40	ø50	ø63	ø80	ø100
Action	Double acting					
Fluid	Air					
Proof pressure	1.5MPa					
Max. operating pressure	1.0MPa					
Min. operating pressure	0.05MPa					
Ambient and fluid temperature	Without magnet –10 to 70°C (No freezing)					
	With magnet –10 to 60°C (No freezing)					
Lubrication	Not required (Non-lube)					
Operating piston speed	50 to 1000mm/s					
Allowable stroke tolerance	to 250: $^{+1.0}_{0}$, 251 to 1000: $^{+1.4}_{0}$					
Cushion	Both ends (Air cushion)(1)					
Port size	G1/8	G1/4	G1/4	G3/8	G3/8	G1/2
Mounting	Basic, axial direction foot, front flange, rear flange, single rear clevis, double rear clevis, spherical bearing					
Non-rotating accuracy	ø32, ø40	±0.5°				
	ø50, ø63	±0.5°				
	ø80, ø100	±0.3°				
Allowable rotating torque (Nm) max.	ø32	0.25	ø80	0.79		
	ø40	0.45	ø100	0.93		
	ø50, ø63	0.64	—	—		

Note 1) Absorbable kinetic energy by cushion mechanism is identical to double acting single rod.

Standard Stroke

Bore size (mm)	Standard stroke (mm)	Max. * stroke
32	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	700
40	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	800
50	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
63	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
80	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
100	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000

Intermediate strokes are available.
*Please consult SMC for longer stroke.

Weight

(kg)

Bore size (mm)		32	40	50	63	80	100
Basic weight	Basic	0.56	0.84	1.39	1.91	3.22	4.24
	Axial foot	0.16	0.20	0.38	0.46	0.89	1.09
	Flange	0.20	0.23	0.47	0.58	1.30	1.81
	Single clevis	0.16	0.23	0.37	0.60	1.07	1.73
	Double clevis	0.20	0.32	0.45	0.71	1.28	2.11
Additional weight per 50 stroke	All mounting brackets	0.11	0.16	0.26	0.27	0.42	0.56
Accessories	Single rod clevis	0.15	0.23	0.26	0.26	0.60	0.83
	Double rod clevis (with pin)	0.22	0.37	0.43	0.43	0.87	1.27

Calculation example: CP95KD40-100
- Basic weight ····· 0.84 (Basic)
- Additional weight ··· 0.16/50 stroke
- Cylinder stroke ····· 100 stroke

0.84+0.16 X 100/50+0.32=1.48kg

- Mounting ····· 0.32 (Double clevis)

Minimum Strokes for Auto Switch Mounting

Refer to p.5-32 on "Minimum Strokes for Auto Switch Mounting".

Theoretical Force

OUT side is identical to double acting single rod.
Refer to table below for IN side.

Bore size (mm)	Rod diameter (mm^2)	Bore size (mm)	Rod diameter (mm^2)
32	675	**63**	2804
40	1082	**80**	4568
50	1651	**100**	7223

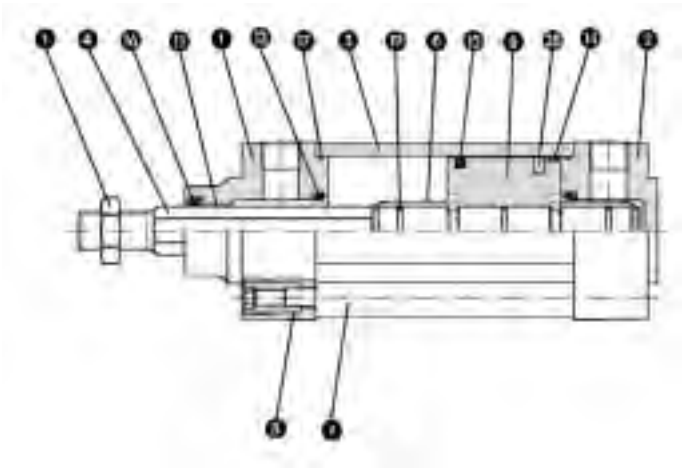
Theoretical force (N) =
Pressure (MPa) X Piston area (mm^2)

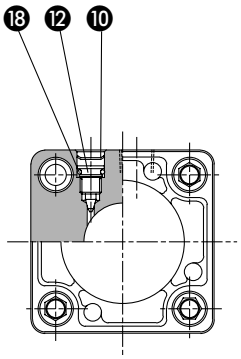
Part No: Mounting Bracket, Mounting Accessories

Description	Bore size	ø32	ø40	ø50	ø63	ø80	ø100
L	**Foot**(1)	L5032	L5040	L5050	L5063	L5080	L5100
F,G	**Flange**	F5032	F5040	F5050	F5063	F5080	F5100
C	**Single rear clevis**	C5032	C5040	C5050	C5063	C5080	C5100
D	**Double rear clevis**	D5032	D5040	D5050	D5063	D5080	D5100
DS	**Double rear clevis (for ES accessory)**	DS5032	DS5040	DS5050	DS5063	DS5080	DS5100
ES	**Angled rear clevis with ball joint**	ES5032	ES5040	ES5050	ES5063	ES5080	ES5100
E	**Angled rear clevis**	E5032	E5040	E5050	E5063	E5080	E5100
GKM	**Rod clevis**	GKM10-20	GKM12-24	GKM16-32	GKM16-32	GKM20-40	GKM20-40
KJ	**Piston rod ball joint**	KJ10D	KJ12D	KJ16D	KJ16D	KJ20D	KJ20D
JA	**Floating joint**	JA30-10-125	JA30-12-125	JA30-16-150	JA30-16-150	JA30-20-150	JA30-20-150

Note 1) Two foot brackets required for one cylinder.
Note 2) Accessories for each mounting bracket are as follows.
Foot, Flange, Single clevis: Mounting bolts
Double rear clevis: (D,DS): Clevis pin
Note 3) GKM according to ISO 8140
Note 4) KJ according to ISO 8139
Note 5) Piston rod nut is standard

Construction





Parts list

No.	Description	Material
❶	Head cover	Die-cast aluminum
❷	End cover	Die-cast aluminum
❸	Cylinder tube	Die-cast aluminum
❹	Piston rod	Stainless Steel
❺	Piston	Die-cast aluminum
❻	Cushion ring	Brass
❼	Tie rod	Steel, zinc chromate plated
❽	Tie rod nut	Steel, zinc chromate plated
❾	Rod end nut	Steel, zinc chromate plated
❿	Snap ring	Steel nickel plated
⓫	Bushing	Lead-bronze casting
⓬	Cushion valve	Steel, zinc chromate plated
⓭	Cushion seal	Elastomer
⓮	Wear ring	Antifriction material
⓯	Piston seal	NBR
⓰	Rod seal	NBR
⓱	Cylinder tube gasket	NBR
⓲	Cushioning valve seal	NBR
⓳	Piston/rod gasket	NBR
⓴	Magnet ring	

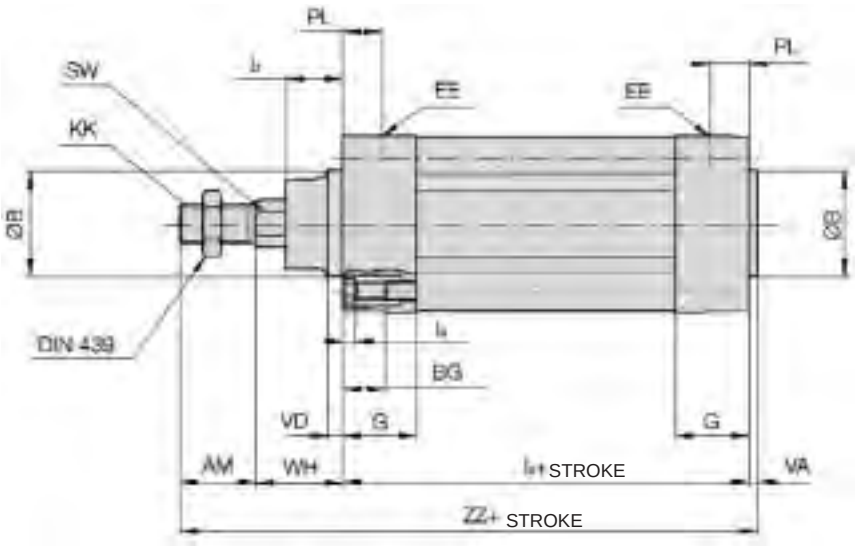
Replacement parts: Seal kits
Ø32 includes the order No. from 13 to 17,
Ø40-Ø100 includes from 12 to 18.

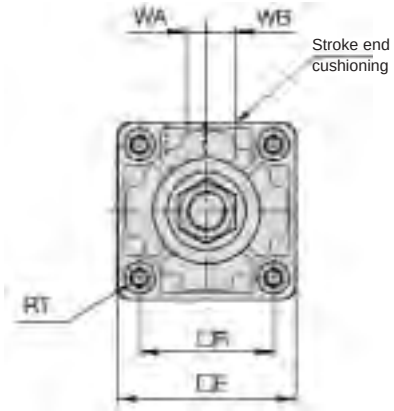
Ø Bore	**Order No.**
32	**CK95-32**
40	**CK95-40**
50	**CK95-50**
63	**CK95-63**
80	**CK95-80**
100	**CK95-100**

Dimensions – non-rotating rod specification

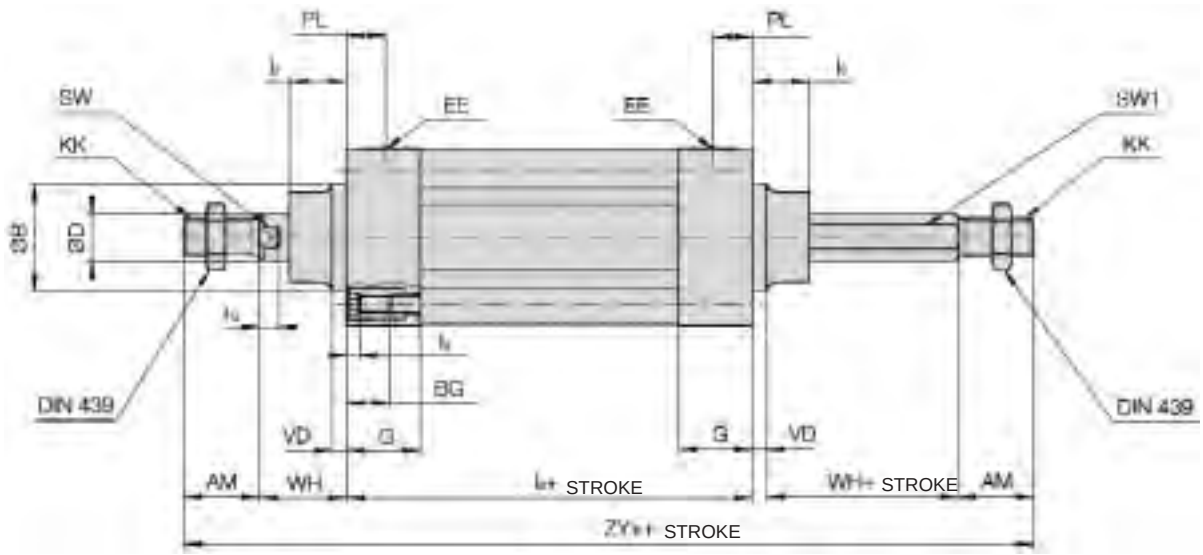
[mm]

CP95K□BØ-Stroke





CP95K□BØ-Stroke W



Ø Bore	AM	ØB	ØD	EE	PL	RT	l_{12}	KK	SW	SW1	G	BG	l_8	VD	VA	WA	WB	WH	ZZ	ZY	□E	□R	l_2	l_g
32	22	30	12	G1/8	13	M6	6	M10x1.25	10	12.2	27	16	94	4	4	4	6.5	26	146	190	46	32.5	15	4
40	24	35	16	G1/4	14	M6	6.5	M12x1.25	13	14.2	27	16	105	4	4	4	9	30	163	213	52	38	17	4
50	32	40	20	G1/4	15.5	M8	8	M16x1.5	16	19	31.5	16	106	6	4	5	10.5	37	179	244	65	46.5	24	5
63	32	45	20	G3/8	16.5	M8	8	M16x1.5	16	19	31.5	16	121	6	4	9	12	37	194	259	75	56.5	24	5
80	40	45	25	G3/8	19	M10	10	M20x1.5	21	23	38	16	128	8	4	11.5	14	46	218	300	95	72	30	5
100	40	55	30	G1/2	19	M10	10	M20x1.5	21	27	38	16	138	8	4	17	15	51	233	320	114	89	32	5

ISO Cylinder/Standard: Low Friction

Series CP95Q

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Standard CP95QD **B** **32** — **100** **R** — **CA** — **Z76** **S**

Built-in magnet

Mounting

B	Basic/without bracket
L	Axial foot
F	Front flange
G	Rear flange
C	Single rear clevis
D	Double rear clevis

Bore size

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

Auto switch

—	Without auto switch

∗ Refer to table below for selection of applicable auto switch.

Number of auto switches

—	2
S	1
3	3
n	n

Direction of low friction

CA	With pressure at head side
CB	With pressure at rod side

Rod specifications

—	Hard chrome as standard
R	Stainless steel piston rod
K	Stainless steel and acid-proof piston rod

Stroke (mm)

Refer to standard stroke table on p.5-16 maximum 1000mm

Applicable Auto Switches/Direct mounting type

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage AC	Auto switch model: Electrical entry direction Vertical	Auto switch model: Electrical entry direction Lateral	Lead wire length (m) Note) 0.5 (Nil)	3 (L)	5 (Z)	Applicable load		Mounting bracket
Reed switch	—	Grommet	Yes	3 wire	— 5V	—	—	**Z76**	●	●	—	IC circuit	—	BMP1-032
			No	2 wire	24V —	100V	—	**Z73**	●	●	●	—	Relay PLC	
					5V, 12V	100V or less	—	**Z80**	●	●	—	IC circuit		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V 5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay PLC	
				3 wire (PNP)			**Y7PV**	**Y7P**	●	●	○			
				2 wire	12V		**Y69B**	**Y59B**	●	●	○	—		
	Diagnostic indication (2 colour indicator)			3 wire (NPN)	5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit		
				3 wire (PNP)			**Y7PWV**	**Y7PW**	●	●	○			
				2 wire	12V		**Y7BWV**	**Y7BW**	●	●	○	—		
	Water resistant (2 colour indicator)						—	**Y7BA**	—	●	—			
	——	Connector and Grommet	Yes	3 wire (NPN)	24V 5V,12V	—	**M9NV**	**M9N**	●	●	○	IC circuit	Relay PLC	BMP1-032 + BMG2-012
				3 wire (PNP)			**M9PV**	**M9P**	●	●	○			
				2 wire	12V		**M9BV**	**M9B**	●	●	○			

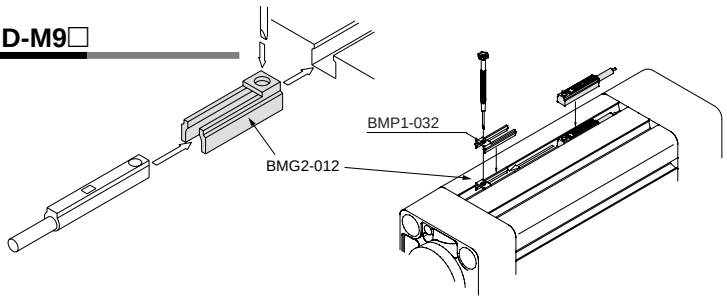
∗ Lead wire length 0.5m····· — (Example: A53)
3m····· L (Example: A53L)
5m····· Z (Example: A53Z)

○: Manufactured upon receipt of order.

Auto Switch Mounting Accessories for D-M9□

Bore size (mm)	Order No.
ø32~ø100	**BMP1-032**
	BMG2-012

Note: For the mounting of auto switch D-M9, both BMP1-032 and BMG2-012 are necessary.



Specifications

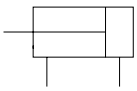
Bore size (mm)	32	40	50	63	80	100
Action	Double acting single rod					
Direction of low friction	One direction					
Fluid	Air					
Proof pressure	1.05MPa					
Max. operating pressure	0.7MPa					
Min. operating pressure	0.01MPa					
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing)					
	With auto switch: –10 to 60°C (No freezing)					
Lubrication	Not required (Non-lube)					
Cushion	None					
Port size	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8	G 1/2
Mounting	Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis, spherical bearing					

Standard Stroke

Bore size (mm)	Standard stroke (mm)	Max. * stroke
32	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	700
40	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	800
50	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
63	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
80	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
100	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000

Intermediate strokes are available.
* Please consult with SMC for longer stroke.

ISO Symbol
Double acting



Part No: Mounting Bracket, Mounting Accessories

Description	Bore size	ø32	ø40	ø50	ø63	ø80	ø100
L	**Foot**(1)	L5032	L5040	L5050	L5063	L5080	L5100
F,G	**Flange**	F5032	F5040	F5050	F5063	F5080	F5100
C	**Single rear clevis**	C5032	C5040	C5050	C5063	C5080	C5100
D	**Double rear clevis**	D5032	D5040	D5050	D5063	D5080	D5100
DS	**Double rear clevis (for ES accessory)**	DS5032	DS5040	DS5050	DS5063	DS5080	DS5100
ES	**Angled rear clevis with ball joint**	ES5032	ES5040	ES5050	ES5063	ES5080	ES5100
E	**Angled rear clevis**	E5032	E5040	E5050	E5063	E5080	E5100
GKM	**Rod clevis**	GKM10-20	GKM12-24	GKM16-32	GKM16-32	GKM20-40	GKM20-40
KJ	**Piston rod ball joint**	KJ10D	KJ12D	KJ16D	KJ16D	KJ20D	KJ20D
JA	**Floating joint**	JA30-10-125	JA40-12-125	JA50-16-150	JA50-16-150	JA50-20-150	JA50-20-150

Note 1) Two foot brackets required for one cylinder.
Note 2) Accessories for each mounting bracket are as follows.
Foot, Flange, Single clevis: Mounting bolts
Double rear clevis: (D,DS): Clevis pin
Note 3) GKM according to ISO 8140
Note 4) KJ according to ISO 8139
Note 5) Piston rod nut is standard

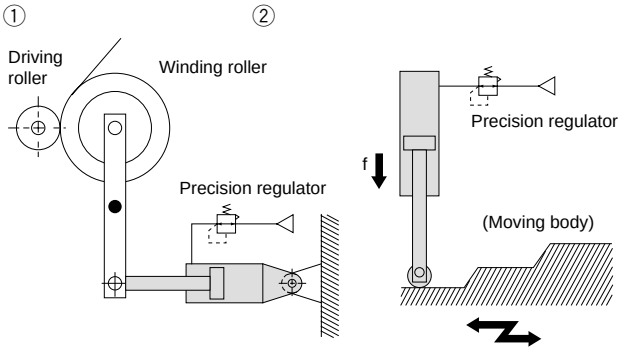
Selection Guide for the Low Friction Side

① When used as a balancer etc., follow the example of the application mentioned earlier applying pressure at one port while leaving the other port open to atmosphere.
With pressure at rod cover port
····· Low friction side CB (Example of application ①)
With pressure at head cover port
····· Low friction side CA (Example of application ②)
In both cases, as long as the outside pressure moves the piston rod, low friction can result in the direction of extension and retraction.

② When used applying pressure to both ports the same time, follow theabove mentioned guide and as in the following.
With relatively higher pressure on rod cover port
·····Use Low friction side CB
With relatively higher pressure on head cover port
·····Use Low friction side CA

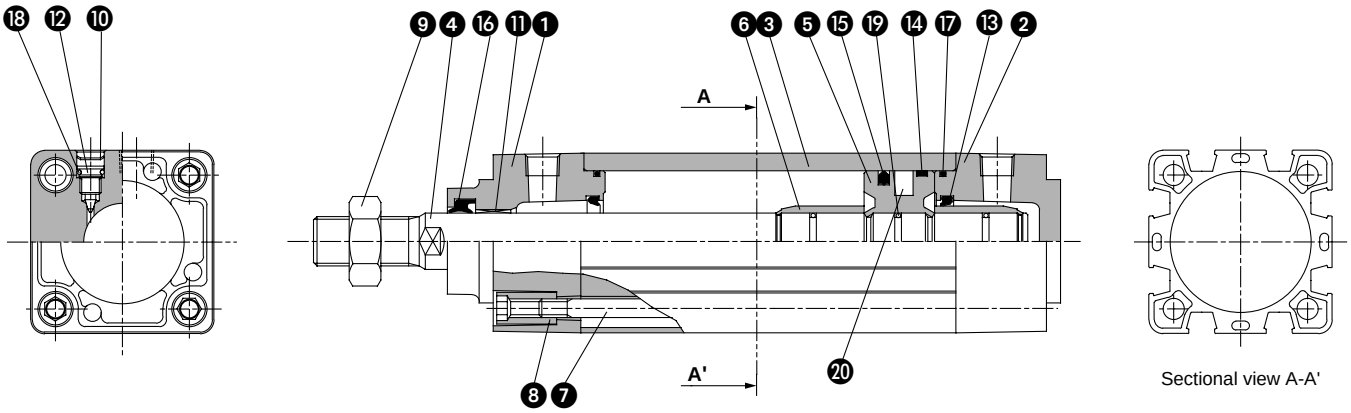
Application Example

Low friction cylinder used in combination with precision regulator (Series IR)



For Dimensions, Weight, Accessories see CP95S

Construction



Parts list

No.	Description	Material
❶	Head cover	Die-cast aluminum
❷	End cover	Die-cast aluminum
❸	Cylinder tube	Die-cast aluminum
❹	Piston rod	Hard chromed steel C45
❺	Piston	Die-cast aluminum
❻	Cushion ring	Brass
❼	Tie rod	Steel, zinc chromate plated
❽	Tie rod nut	Steel, zinc chromate plated
❾	Rod end nut	Steel, zinc chromate plated
❿	Snap ring	Steel nickel plated
⓫	Bushing	Lead-bronze casting
⓬	Cushion valve	Steel, zinc chromate plated
⓭	Cushion seal	Elastomer
⓮	Wear ring	Antifriction material
⓯	Piston seal	NBR
⓰	Rod seal	NBR
⓱	Cylinder tube gasket	NBR
⓲	Cushioning valve seal	NBR
⓳	Piston/rod gasket	NBR
⓴	Magnet ring	

Replacement parts: Seal kits
Ø32 includes order No. from ⓭ to ⓱,
Ø40 - Ø100 includes from ⓬ to ⓲

Ø	**Order No.**
32	**CQ95-32**
40	**CQ95-40**
50	**CQ95-50**
63	**CQ95-63**
80	**CQ95-80**
100	**CQ95-100**

ISO Cylinder: Double Acting with Positioner

Series CP95P

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Standard CP95PD **B** **32** — **100** — **Z76** **S**

Built-in magnet

Mounting

B	Basic/without bracket
L	Axial foot
G	Rear flange
C	Single rear clevis
D	Double rear clevis

Bore size

50	50mm
63	63mm
80	80mm
100	100mm

Auto switch

—	Without auto switch

∗ Refer to table below for selection of applicable auto switch.

Number of auto switches

—	2
S	1
3	3
n	n

Stroke (mm)
Refer to standard stroke table on p.5-4 maximum 300mm

Applicable Auto Switches/Direct mounting type

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage AC	Auto switch model: Electrical entry direction Vertical	Auto switch model: Electrical entry direction Lateral	Lead wire length (m) Note) 0.5 (Nil)	3 (L)	5 (Z)	Applicable load		Mounting bracket
Reed switch	—	Grommet	Yes	3 wire	— 5V	—	—	**Z76**	●	●	—	IC circuit	—	BMP1-032
				2 wire	24V —	100V	—	**Z73**	●	●	●	—	Relay PLC	
			No		5V, 12V	100V or less	—	**Z80**	●	●	—	IC circuit		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V 5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay PLC	
				3 wire (PNP)			**Y7PV**	**Y7P**	●	●	○			
				2 wire	12V		**Y69B**	**Y59B**	●	●	○	—		
	Diagnostic indication (2 colour indicator)			3 wire (NPN)	5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit		
				3 wire (PNP)			**Y7PWV**	**Y7PW**	●	●	○			
				2 wire	12V		**Y7BWV**	**Y7BW**	●	●	○	—		
	Water resistant (2 colour indicator)						—	**Y7BA**	—	●	—			
	——	Connector and Grommet	Yes	3 wire (NPN)	24V 5V, 12V	—	**M9NV**	**M9N**	●	●	○	IC circuit	Relay PLC	BMP1-032 + BMG2-012
				3 wire (PNP)			**M9PV**	**M9P**	●	●	○			
				2 wire	12V		**M9BV**	**M9B**	●	●	○			

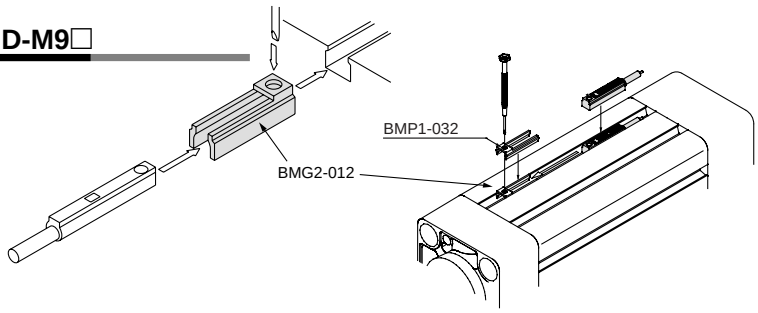
∗ Lead wire length 0.5m····· — (Example: A53)
3m····· L (Example: A53L)
5m····· Z (Example: A53Z)

○: Manufactured upon receipt of order.

Auto Switch Mounting Accessories for D-M9□

Bore size (mm)	Order No.
ø32~ø100	**BMP1-032**
	BMG2-012

Note: For the mounting of auto switch D-M9, both BMP1-032 and BMG2-012 are necessary.



Specifications

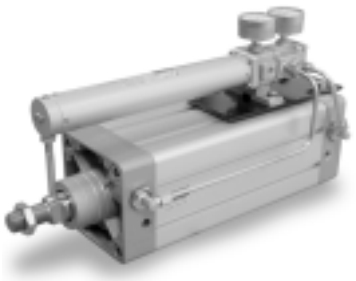
Application:
The positioner IP200 is capable of pneumatic positioning of the piston. Adjustable positions can be reached with high repeating accuracy. The piston stroke is in proportion to the air pressure input signal (0.02-0.01MPa). External forces on the position of the piston are reduced to a minimum by a special control system and an integrated function to revert the set position.
The IP200 shows excellent performance in remote control or standard control of flaps, proportioning devices, pumps, gears usw.

Specifications
- The bleed pressure acts directly onto the flapper plate. A change of the input signal will cause an instantaneous movement of the piston rod.
- easy and simple adjustment of neutral point and operation band from outside.
- Return spring is potected against accidental touches
- Positioner cylinder conforms to ISO and CETOP recommendations
- No change in dimensions with auto switch capability

Specifications

Fluid	Air 5μm filtration
Supply pressure "SUP" (MPa)	0.3 ~ 0.7
Signal pressure "SIG" (MPa)	0.02 ~ 0.1
Fluid temperature (ºC)	+5 to +60
Linearity	< 2%*
Hystereses	< 1%*
Repeatability	< 1%*
Sensitivity	< 1%*
Port size	G1/4
Gauge port	G1/8
Primary pressure	0.5% with 0.5MPa
Flow rate (l/min)	250 with 0.5MPa
Leakage	< 18 with 0.5MPa
Bore Size (mm)	40 to 100
Cylinder stroke (mm)	25 to 300
Standard stroke (mm)	50/100/150/200/250/300
Max. possible stroke (mm)	300

*different in % related to full span.



Part No: Mounting Bracket, Mounting Accessories

Description	ø50	ø63	ø80	ø100
L	L5050	L5063	L5080	L5100
G	F5050	F5063	F5080	F5100
C	C5050	C5063	C5080	C5100
D	D5050	D5063	D5080	D5100
DS	DS5050	DS5063	DS5080	DS5100
ES	ES5050	ES5063	ES5080	ES5100
E	E5050	E5063	E5080	E5100
GKM	GKM16-32	GKM16-32	GKM20-40	GKM20-40
KJ	KJ16D	KJ16D	KJ20D	KJ20D
JA	JA50-16-150	JA50-16-150	JA*50-25-150	JA*63-20-150

Note 1) Two foot brackets required for one cylinder.
Note 2) Accessories for each mounting bracket are as follows.
Foot, Flange, Single clevis: Mounting bolts
Double rear clevis: (D,DS): Clevis pin
Note 3) GKM according to ISO 8140
Note 4) KJ according to ISO 8139
Note 5) Piston rod nut is standard

Weight accessories (kg)

Ø	50	63	80	100
L	0.38	0.46	0.89	1.09
F	0.47	0.58	1.30	1.81
C	0.37	0.60	1.07	1.73
D	0.45	0.71	1.28	2.11
E	0.42	0.52	0.94	1.40

Weight Table

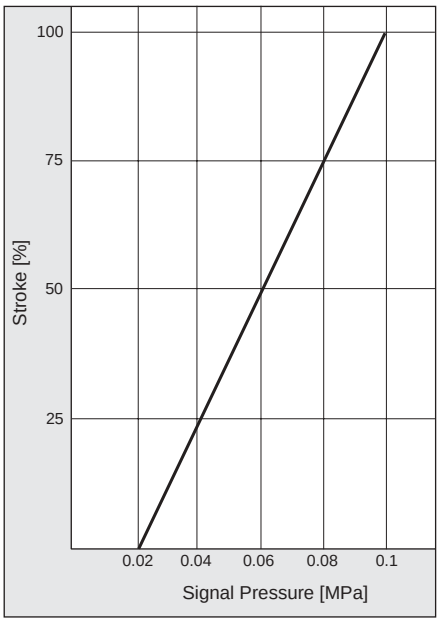
Weight (kg)					
	Ø	50	63	80	100
	B	2.27	2.79	4.11	5.13
Weight each 50mm stroke		0.32	0.33	0.48	0.62

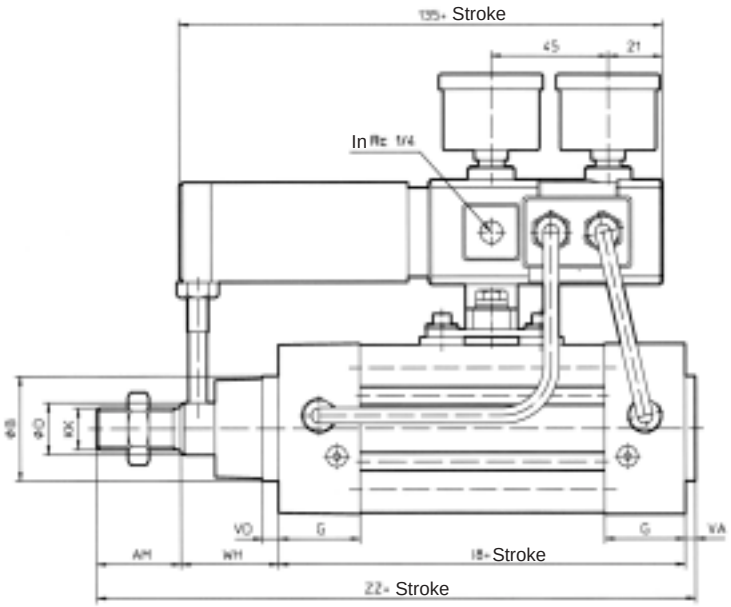
Example: CP95PDB50-200
Cylinder Ø50mm, stroke 200mm
Bracket L
Weight = 2.72kg + (0.31kg x $\frac{200}{50}$) = 3.96kg

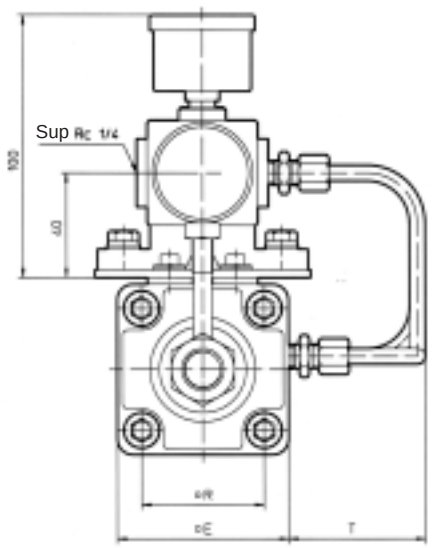
For dimensions of the brackets and accessories, please see C95S, page 5-4

Dimensions

Signal Pressure/Stroke Diagram







Ø	AM	ØB	ØD	±E	G	KK	l 8	±R	T	VA	VD	WH	ZZ
50	32	40	20	65	31.5	M16 x 1.5	106	46.5	52.1	4	6	37	179
63	32	45	20	75	31.5	M16 x 1.5	121	56.5	53.8	4	6	37	194
80	40	45	25	95	38	M20 x 1.5	128	72	53.8	4	8	46	218
100	40	55	30	114	38	M20 x 1.5	138	89	25.6	4	8	51	233

ISO Cylinder/Standard: Double Acting with Lock

Series CP95N

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Standard CP95ND **B** **32** — **100** — **W** — **Z76** **S**

Built-in magnet

Mounting

B	Basic/without bracket
L	Axial foot
F	Front flange
G	Rear flange
C	Single rear clevis
D	Double rear clevis

Bore size

50	50mm
63	63mm
80	80mm
100	100mm

Auto switch

—	Without auto switch

∗ Refer to table below for selection of applicable auto switch.

Rod specifications

—	Hard chrome as standard
W	Double/through rod

Stroke (mm)
Refer to standard stroke table on p.5-23 maximum 1000mm

Number of auto switches

—	2
S	1
3	3
n	n

Applicable Auto Switches/Direct mounting type

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch model		Lead wire length (m) Note)			Applicable load		Mounting bracket
					DC		AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)			
								Vertical	Lateral						
Reed switch	—	Grommet	Yes	3 wire	—	5V	—	—	**Z76**	●	●	—	IC circuit	—	BMP1-032
				2 wire	24V	—	100V	—	**Z73**	●	●	●	—	Relay PLC	
			No			5V, 12V	100V or less	—	**Z80**	●	●	—	IC circuit		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay PLC	
				3 wire (PNP)				**Y7PV**	**Y7P**	●	●	○			
				2 wire		12V		**Y69B**	**Y59B**	●	●	○	—		
	Diagnostic indication (2 colour indicator)			3 wire (NPN)		5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit		
				3 wire (PNP)				**Y7PWV**	**Y7PW**	●	●	○			
				2 wire		12V		**Y7BWV**	**Y7BW**	●	●	○	—		
	Water resistant (2 colour indicator)							—	**Y7BA**	—	●	—			
	——	Connector and Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	**M9NV**	**M9N**	●	●	○	IC circuit	Relay PLC	BMP1-032 + BMG2-012
				3 wire (PNP)				**M9PV**	**M9P**	●	●	○			
				2 wire		12V		**M9BV**	**M9B**	●	●	○			

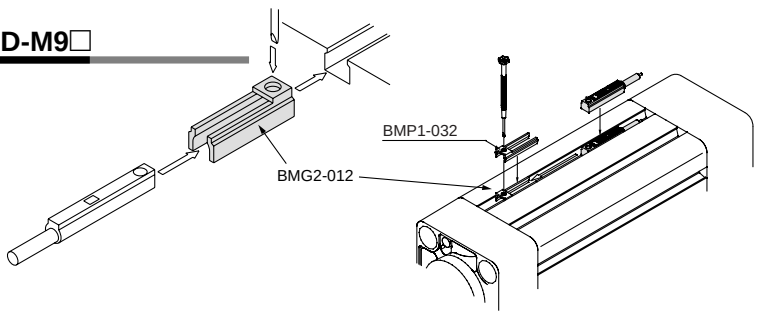
∗ Lead wire length 0.5m····· — (Example: A53)
3m····· L (Example: A53L)
5m····· Z (Example: A53Z)

○: Manufactured upon receipt of order.

Auto Switch Mounting Accessories for D-M9□

Bore size (mm)	Order No.
ø32~ø100	**BMP1-032**
	BMG2-012

Note: For the mounting of auto switch D-M9, both BMP1-032 and BMG2-012 are necessary.

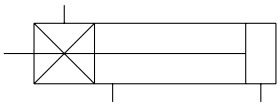


Cylinder Specifications

Bore Size [mm]	32, 40, 50, 63, 80, 100
Fluid	Air
Proof Pressure	1.5MPa
Max. operating pressure	1.0MPa
Min. operating pressure	0.08MPa
Piston speed	50 to 1000mm/s note)
Ambient and fluid temperature	Without autoswitch : -10ºC to 70ºC (without freezing) With autoswitch : -10ºC to 70ºC (without freezing)
Cushion	Double air side cushion
Stroke length tolerance	to 250: $^{+1.0}_{0}$, 251 to 1000: $^{+1.4}_{0}$
Bracket type	Basic type, Axial foot type, Front flange type, Rear flange type, Single clevis type, Double clevis type, Spherical bearing
max. possible stroke [mm]	1000

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

Cylinder with lock



Lock Specifications

Lock actuation	Spring lock (exhaust lock)
Unlocking pressure	≥ 0.25MPa
Locking pressure	≥ 0.20MPa
Max. operating pressure	1.0MPa
Locking direction	2 Two-way

Standard Stroke

Bore Size [mm]	Standard Stroke [mm]	Max. Stroke
32	25,50,75,100,125,150,175,200,250,300,350,400,450,500	700
40	25,50,75,100,125,150,175,200,250,300,350,400,450,500	800
50	25,50,75,100,125,150,175,200,250,300,350,400,450,500,600	1000
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	

Intermediate strokes are available.
* Please consult with SMC for longer stroke.

Stopping Accuracy

[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
Load weight ..... Upper limit of allowable value
Solenoid valve for locking mounted on the locking 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]	552	882	1370	2160	3430	5390

CP95N Cylinder

Part No: Mounting Bracket, Mounting Accessories

Description	Bore size	ø32	ø40	ø50	ø63	ø80	ø100
L	**Foot**(1)	L5032	L5040	L5050	L5063	L5080	L5100
F, G	**Flange**	F5032	F5040	F5050	F5063	F5080	F5100
C	**Single rear clevis**	C5032	C5040	C5050	C5063	C5080	C5100
D	**Double rear clevis**	D5032	D5040	D5050	D5063	D5080	D5100
DS	**Double rear clevis (for ES accessory)**	DS5032	DS5040	DS5050	DS5063	DS5080	DS5100
ES	**Angled rear clevis with ball joint**	ES5032	ES5040	ES5050	ES5063	ES5080	ES5100
E	**Angled rear clevis**	E5032	E5040	E5050	E5063	E5080	E5100
GKM	**Rod clevis**	GKM10-20	GKM12-24	GKM16-32	GKM16-32	GKM20-40	GKM20-40
KJ	**Piston rod ball joint**	KJ10D	KJ12D	KJ16D	KJ16D	KJ20D	KJ20D
JA	**Floating joint**	JA30-10-125	JA40-12-125	JA50-16-150	JA50-16-150	JA(H)50-20-150	JA(H)50-20-150

Note 1) Two foot brackets required for one cylinder.
Note 2) Accessories for each mounting bracket are as follows:Foot, Flange, Single clevis: Mounting bolts
Double rear clevis: (D,DS): Clevis pin
Note 3) GKM according to ISO 8140
Note 4) KJ according to ISO 8139
Note 5) Piston rod nut is standard

Single Rod Weight Table

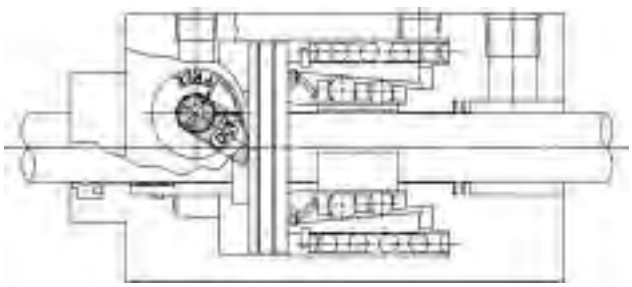
[kg]

Bore Size [mm]		32	40	50	63	80	100
Basic weight	Basic type B	1.40	2.15	3.53	5.18	8.99	12.72
Additional weight per 50mm of stroke	All mounting brackets	0.11	0.16	0.26	0.27	0.42	0.56

(Example) CP95NDB32-100 (Standard, Ø32, 100er)
•Basic weight..... 1.40 (basic type, Ø32)
•Additional weight ..... 0.11/50mm stroke
•Cylinder stroke ..... 100mm stroke
1.40 + 0.11 x 100/50 = 3.02kg

Manual override for unlocking

In case the air supply is cut off or discharged, unlocking can be performed with a commercially available tool. The fail safe mechanism locks again when manual override is released.



Weight accessories [kg]

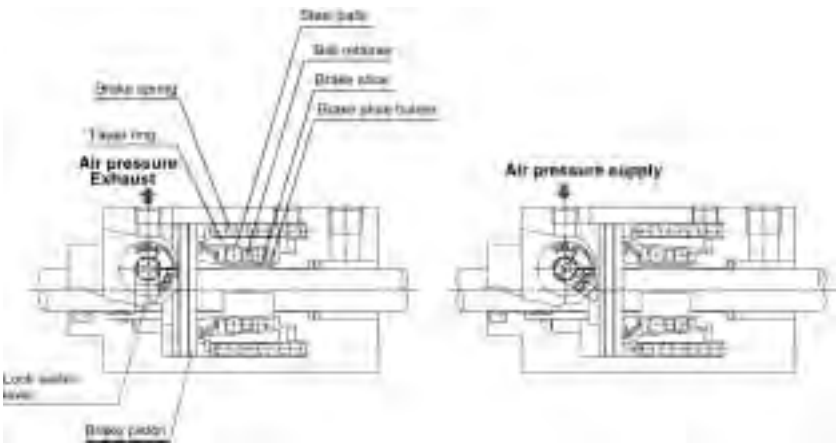
Ø	32	40	50	63	80	100
L	0.16	0.20	0.38	0.46	0.89	1.09
F	0.20	0.23	0.47	0.58	1.30	1.81
C	0.16	0.23	0.37	0.60	1.07	1.73
D	0.20	0.32	0.45	0.71	1.28	2.11

Example:

Cylinder Ø40 mm, Stroke 100 mm, bracket D

Weight = 0.84 kg + (0.16 kg x $\frac{100}{50}$) + 0.32 kg = 1.48 kg

Construction Principles



Locked condition

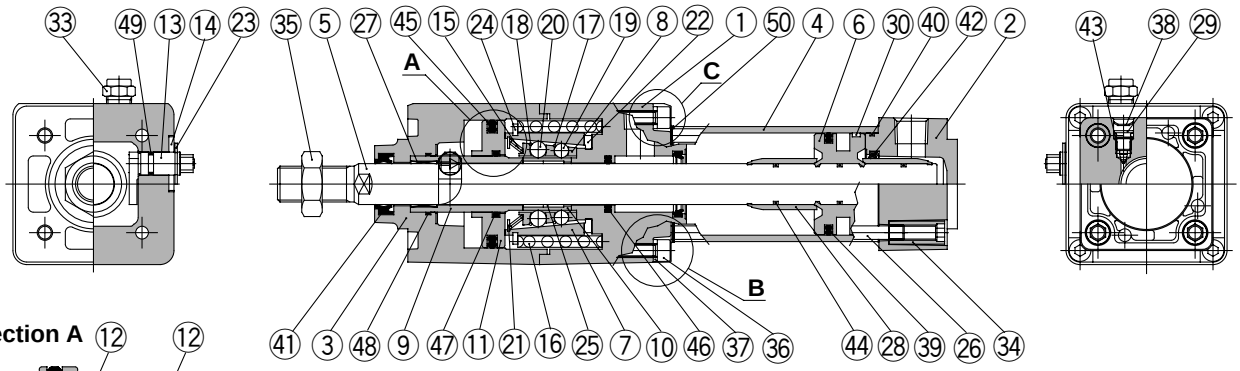
Unlocked condition

Spring lock (exhaust lock)

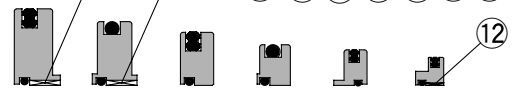
The spring force which acts upon the taper ring is magnified by a wedge effect, and is conveyed to all of the numeous steel balls which are arranged in two crcles. These act on the brake shoe holder and brake, which locks the piston rod by tightening against it with a large force.

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

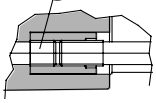


Section A



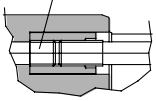
with through piston rod

Section B 31



Ø80, Ø100

Section C 32



Ø80, Ø100

Parts list

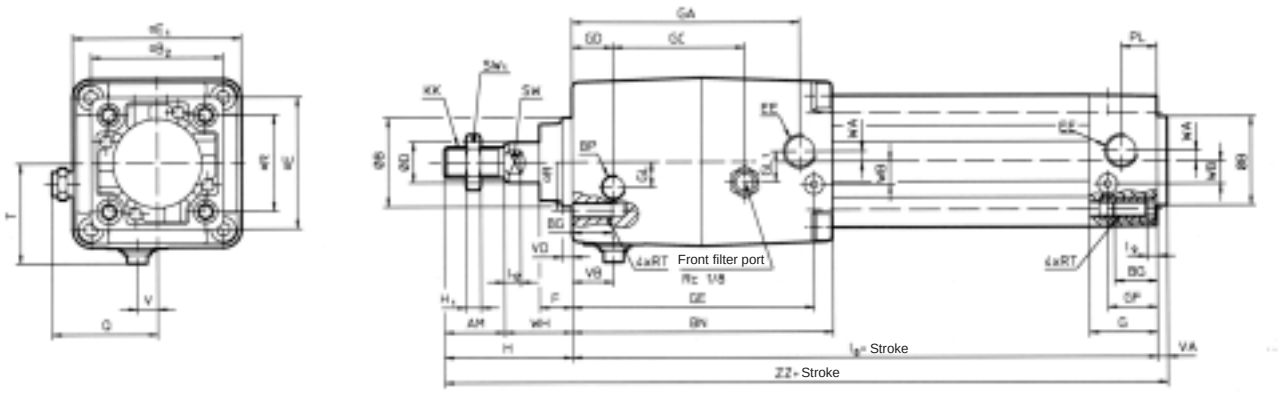
No.	Description		Material	Note
①	**Rod cover**		Aluminium alloy	Hard annodised & metallic coated
②	**Head cover**		Aluminium alloy	Chromated & metallic coated
③	**Cover**		Aluminium alloy	Hard annodised & metallic coated
④	**Cylinder tubing**		Aluminium alloy	Hard annodised
⑤	**Piston rod**		Carbon steel	Hard chrome plated
⑥	**Piston**		Aluminium 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**		Carbon steel	Heat treated
⑪	**Release piston**	Ø40	Aluminium alloy	Hard annodised
		Ø50		
		Ø63		
		Ø32	Carbon steel	Zinc chromated
		Ø80		
		Ø100		
⑫	**Release piston bushing**		Steel + special resin	Ø32, Ø80, Ø100 only
⑬	**Unlocking cam**		Carbon steel	Glossy chromated
⑭	**Washer**		Carbon steel	Black zinc chromated
⑮	**Retainer pre-load spring**		Carbon steel	Zinc chromated
⑯	**Brake spring**		Carbon steel	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	**Damper**		Polyurethane rubber	
㉓	**C type retaining ring for unlocking cam shaft**		Carbon steel	
㉔	**C type retaining ring for taper ring**		Carbon steel	
㉕	**Brake shoe**		Special friction material	
㉖	**Tie rod**		Carbon steel	Chromated
㉗	**Bushing**		Lead-bronze casting	
㉘	**Cushion ring**		Brass	

Parts list

No.	Description	Material	Note
㉙	**Cushion valve**	Carbon steel	Nickel plated
㉚	**Wear ring**	PUR	
㉛	**Unit holding tie-rod A**	Carbon steel	Chromated Ø80, Ø100 only
㉜	**Unit holding tie-rod B**	Carbon steel	Chromaed Ø80, Ø100 only
㉝	**BC element**		
㉞	**Tie-rod nut**	Carbon steel	Nickel plated
㉟	**Rod end nut**	Carbon steel	Nickel plated
㊱	**Hexagon socket head cap screw**	Carbon steel	Nickel plated Ø32, Ø63 only
㊲	**Spring washer for hex. socket head cap screw**	Carbon steel	Nickel plated Ø32, Ø63 only
㊳	**Retaining ring**	Carbon steel	
㊴	**Piston seal**	NBR	
㊵	**Cylinder tube gasket**	NBR	
㊶	**Rod seal A**	NBR	
㊷	**Cushion seal**	NBR	
㊸	**Cushion valve seal**	NBR	
㊹	**Piston gasket**	NBR	
㊺	**Release piston gasket**	NBR	
㊻	**Rod seal B**	NBR	
㊼	**Release piston gasket**	NBR	
㊽	**Piston guide gasket**	NBR	
㊾	**Unlocking cam gasket**	NBR	
㊿	**Spacer disc**	CR	

Dimensions

Basic type (B)

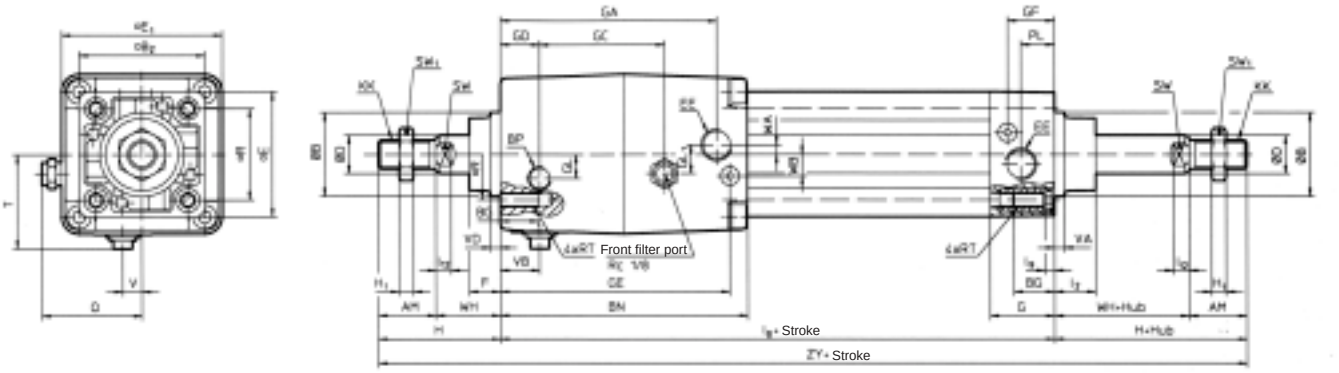


Bore size (mm)	AM	ØBe 11	□B_2	BG	BN	BP	ØD	EE	□E	□E_1	F	G	GA	GC	GD	GE	GF	GL	GL_1	H	H_1
32	22	30	46	16	97	G1/8	12	G1/8	46	54	13	27	83	45.5	13	88.5	18.3	7.5	12	48	6
40	24	35	52	16	104	G1/8	16	G1/4	52	63	13	27	91	52.5	16.5	96.5	19.5	10	12	54	8
50	32	40	65	16	120.5	G1/4	20	G1/4	65	75	14	31.5	104.5	58.5	19	111.2	22.4	11.5	15	69	11
63	32	45	75	16	134.5	G1/4	20	G3/8	75	90	14	31.5	119.5	68	23	123.5	20.7	17.5	12	69	11
80	40	45	95	16	169	G1/4	25	G3/8	95	102	20	38	150	81	33	157	26	22	18	86	13
100	40	55	114	16	189	G1/4	30	G1/2	114	116	20	38	170	96	37.5	177	26	25	20	91	16

Bore size (mm)	KK	I_8	I_9	I_{12}	PL	Q	□R	RT	SW	SW_1	T	V	VA	VB	VD	WA	WB	WH	ZZ
32	M10 x 1.25	164	4	6	13	37	32.5	M6	10	17	34	6.5	4	13	4	4	6.5	26	216
40	M12 x 1.25	182	4	6.5	14	41.5	38	M6	13	19	39.5	8	4	16.5	4	4	9	30	240
50	M16 x 1.5	195	5	8	15.5	47.5	46.5	M8	16	24	47	9	4	20	6	5	10.5	37	268
63	M16 x 1.5	224	5	8	16.5	55	56.5	M8	16	24	55.5	8.5	4	23	6	9	12	37	297
80	M20 x 1.5	259	5	10	19	61	72	M10	21	30	61.5	10.5	4	33	8	11.5	14	46	349
100	M20 x 1.5	289	5	10	19	68	89	M10	21	30	69.5	10.5	4	37.5	8	17	15	51	384

Dimensions

Double Rod (Option W)

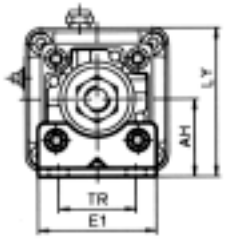


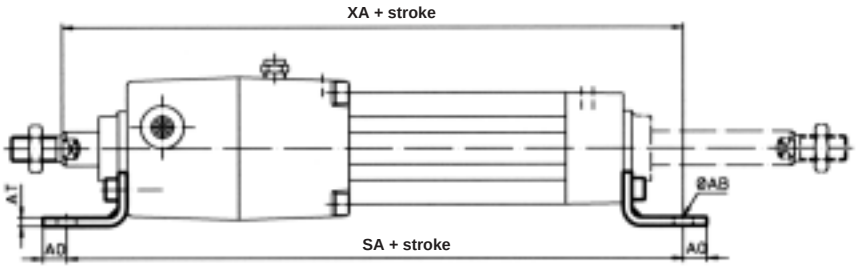
Bore size (mm)	AM	ØBe 11	□B_2	BG	BN	BP	ØD	EE	□E	□E_1	F	G	GA	GC	GD	GE	GF	GL	GL_1	H	H_1
32	22	30	46	16	97	G1/8	12	G1/8	46	54	13	27	83	45.5	13	88.5	18.3	7.5	12	48	6
40	24	35	52	16	104	G1/8	16	G1/4	52	63	13	27	91	52.5	16.5	96.5	19.5	10	12	54	8
50	32	40	65	16	120.5	G1/4	20	G1/4	65	75	14	31.5	104.5	58.5	19	111.2	22.4	11.5	15	69	11
63	32	45	75	16	134.5	G1/4	20	G3/8	75	90	14	31.5	119.5	68	23	123.5	20.7	17.5	12	69	11
80	40	45	95	16	169	G1/4	25	G3/8	95	102	20	38	150	81	33	157	26	22	18	86	13
100	40	55	114	16	189	G1/4	30	G1/2	114	116	20	38	170	96	37.5	177	26	25	20	91	16

Bore size (mm)	KK	l_2	l_8	l_9	l_{12}	PL	Q	□R	RT	SW	SW_1	T	V	VA	VB	VD	WA	WB	WH	ZY
32	M10 x 1.25	15	164	4	6	13	37	32.5	M6	10	17	34	6.5	4	13	4	4	6.5	26	260
40	M12 x 1.25	17	182	4	6.5	14	41.5	38	M6	13	19	39.5	8	4	16.5	4	4	9	30	290
50	M16 x 1.5	24	195	5	8	15.5	47.5	46.5	M8	16	24	47	9	4	20	6	5	10.5	37	333
63	M16 x 1.5	24	224	5	8	16.5	55	56.5	M8	16	24	55.5	8.5	4	23	6	9	12	37	362
80	M20 x 1.5	30	259	5	10	19	61	72	M10	21	30	61.5	10.5	4	33	8	11.5	14	46	431
100	M20 x 1.5	32	289	5	10	19	68	89	M10	21	30	69.5	10.5	4	37.5	8	17	15	51	471

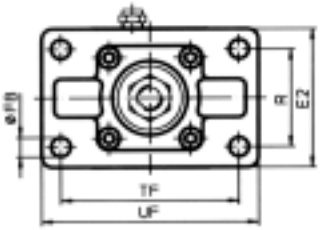
Dimensions Brackets on Cylinder

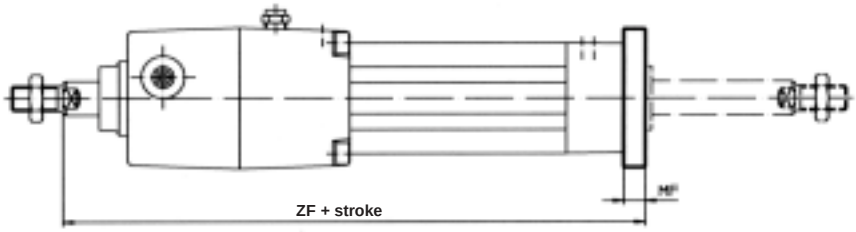
Axial Foot Type



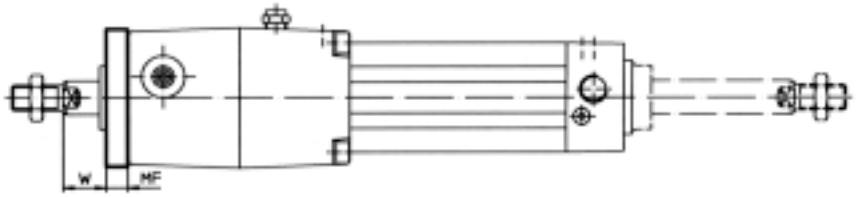


Rear Flange Type

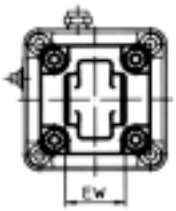




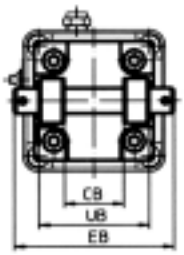
Front Flange Type

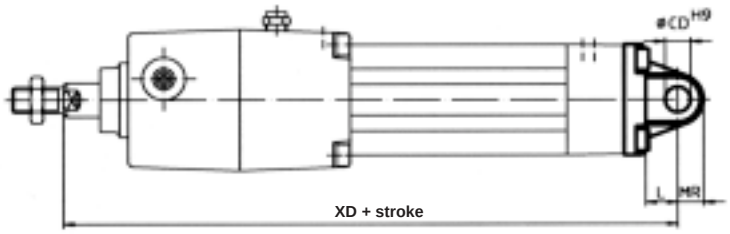


Single Clevis Type



Double Clevis Type





Bore size (mm)	Ø AB	AH	AO	AT	CB1)	ØCD H9	E1	E2	EB	EW 2)	ØFB	L	LY	MF	MR	R	SA	TF	TR	UB	UF
32	7	32	10	4	26	10	48	56	65	26	7	12	59	10	9.5	38	212	72	32	45	87
40	9	36	11	4	28	12	55	65	75	28	9	15	67.5	10	12	46	238	83	36	52	101
50	9	45	12	5	32	12	68	77	80	32	9	15	82.5	12	12	52	259	100	45	60	120
63	9	50	12	5	40	16	80	92	90	40	9	20	95	12	16	62	288	115	50	70	135
80	12	63	14	6	50	16	100	100	110	50	12	20	114	16	16	63	341	126	63	90	153
100	14	71	16	6	60	20	120	120	140	60	14	25	129	16	20	75	371	150	75	110	178

1) +0.03/+0.1 2) -0.2/-0.6

Bore size (mm)	W	XA	XD	ZF
32	16	214	212	200
40	20	240	237	222
50	25	264	259	244
63	25	293	293	273
80	30	346	341	321
100	35	381	381	356

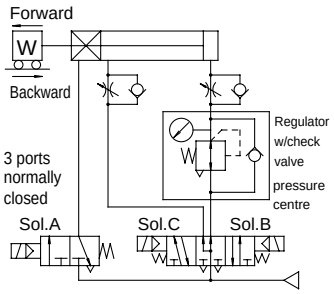
Specific Product Precaution

Air Pressure Circuits

⚠Warning

1. Basic Circuits

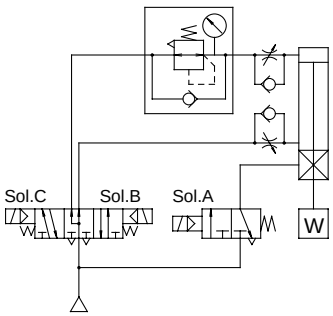
1. [Horizontal]



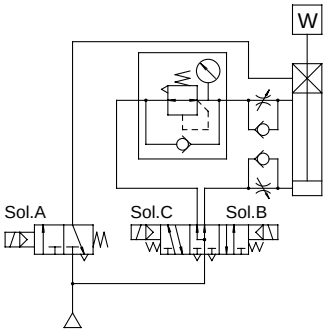
Sol.A	Sol.B	Sol.C	Action	
ON	ON	OFF	Forward	
OFF	OFF	OFF	Locked stop	0.5s or more
ON	OFF	OFF	Unlocked	0 to 0.5s
ON	ON	OFF	Forward	
ON	OFF	ON	Backward	
OFF	OFF	OFF	Locked stop	0.5s or more
ON	OFF	OFF	Unlocked	0 to 0.5s
ON	OFF	ON	Backward	

2. [Vertical]

[Load in direction of rod extension]

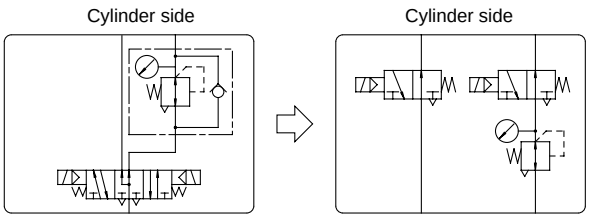


[Load in direction of rod retraction]



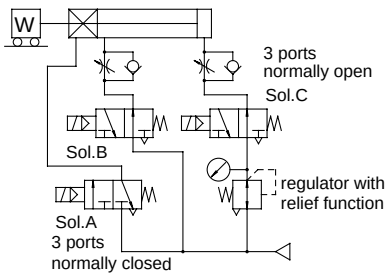
⚠Caution

1. A 3 position pressure centre solenoid valve and regulator with check valve can be replaced with two 3 port normally open valves and a regulator with relief function.



[Example]

1. [Horizontal]

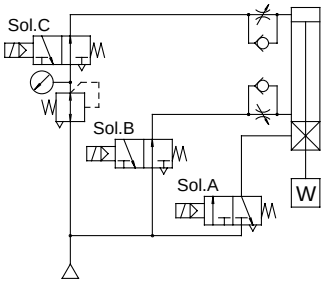


Air Pressure Circuits

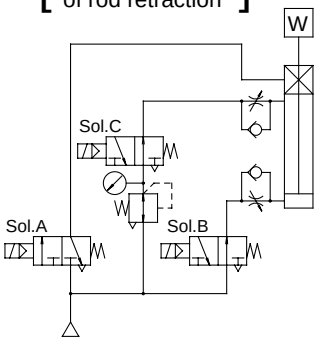
⚠Caution

2. [Vertical]

[load in direction of rod extension]



[Load in direction of rod retraction]



Manual Unlocking

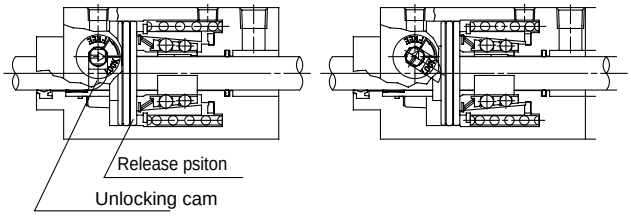
⚠Caution

1. The unlocking cam provided on the C95N Series is an emergency unlocking mechanism only.

During an emergency when the air supply is cut off, it is used to alleviate a problem by forcibly pushing the release piston back to release the lock. However, take note that the sliding resistance of the piston rod will be high compared to unlocking with air pressure.

2. When installing into equipment or machinery, etc., in cases where it will be necessary to hold an unlocked condition for an extended time, air pressure of 0.25MPa or more should be applied to the unlocking port.

3. Do not turn the unlocking cam (the arrow ◄ on the unlocking cam head) past the FREE position. If it is turned too far there is a danger of damaging the unlocking cam.



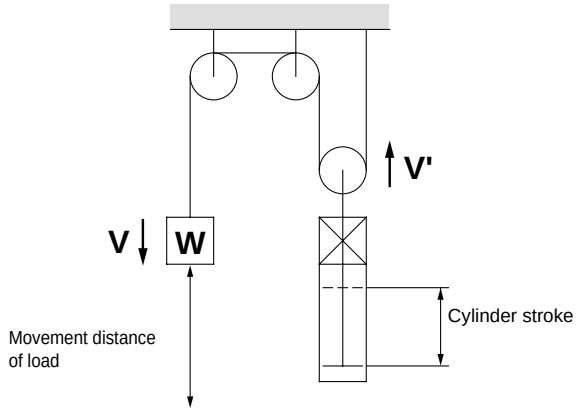
Locked condition　　Manually unlocked position

[Principle]
If the unlocking cam is turned counter clockwise with a tool such as an adjustable angle wrench, the release piston is pushed back and the lock is released. Since the lever will return to it's original position when released and become locked again, it should be held in this position for as long as unlocking is needed.

Precautions on Model Selection

⚠Caution

Example)



Selection Example

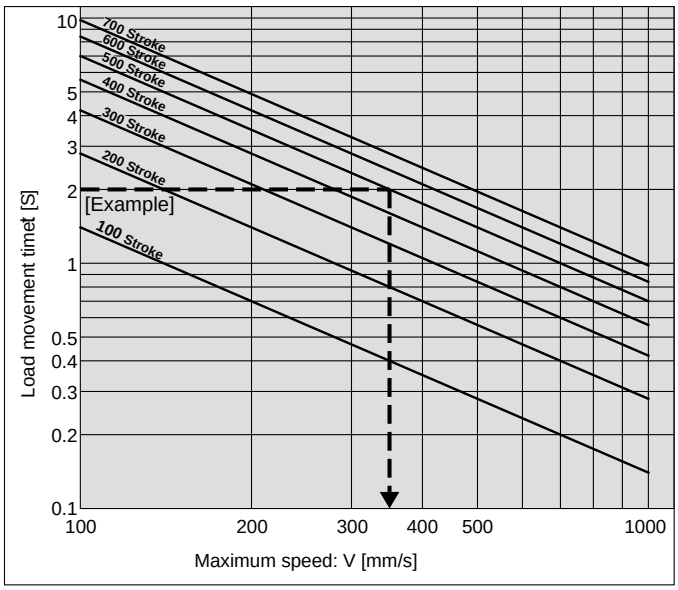
- **Load weight:** m=50kg
- **Movement distance:** Stroke=500mm
- **Movement time:** t=2s
- **Load condition:** Vertical downward=Load in direction of rod extension
- **Operating pressure:** P=0.4MPa

Step 1: From graph 1 find the maximum movement speed of the load
∴ Maximum speed V: approx 350mm/s

Step 2: Select graph 6 based upon the load condition and operating pressure, and then from the intersection of the maximum speed V=350mm/s found in step 1, and the load weight m=50kg
∴ **Ø63** →selecta C95NDB63 or larger bore size.

Step 1 Find the maximum load speed: V

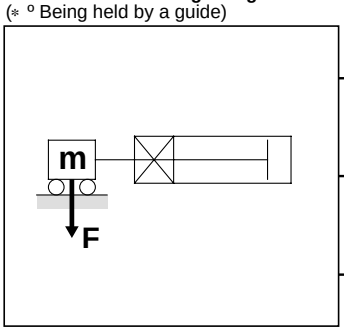
Graph 1



Step 2 Find the cylinder bore size

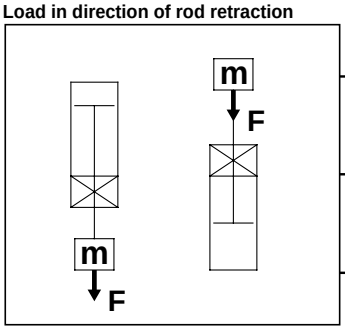
Load condition | Operating pressure

Direction of load at right angle to rod
(∗ º Being held by a guide)



- from 0.3MPa → **Graph 2**
- from 0.4MPa → **Graph 3**
- from 0.5MPa → **Graph 4**

Load in direction of rod extension
Load in direction of rod retraction

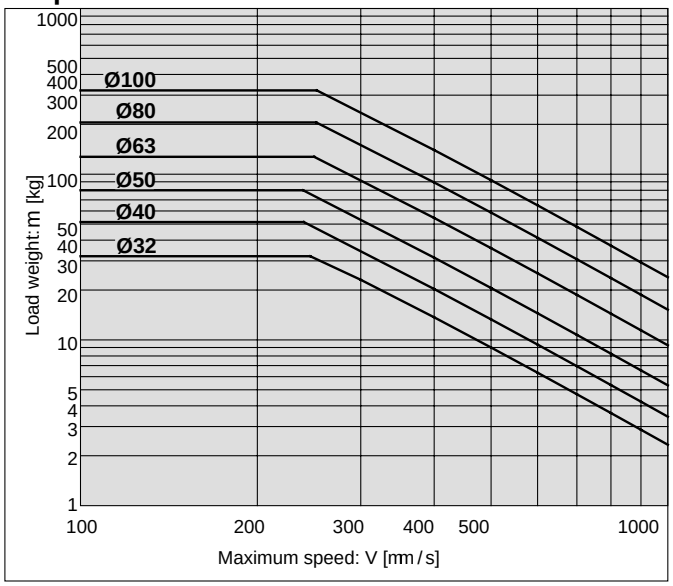


- from 0.3MPa → **Graph 5**
- from 0.4MPa → **Graph 6**
- from 0.5MPa → **Graph 7**

Selection Graphs

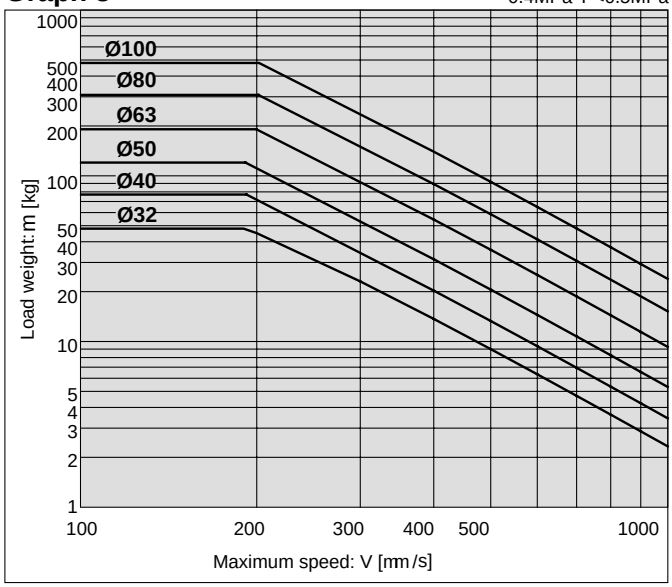
Graph 2

0.3MPa″ P<0.4MPa



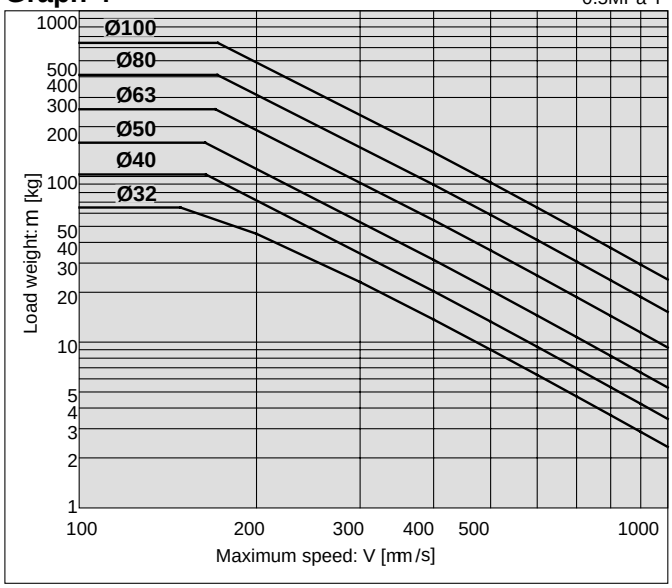
Graph 3

0.4MPa″ P<0.5MPa



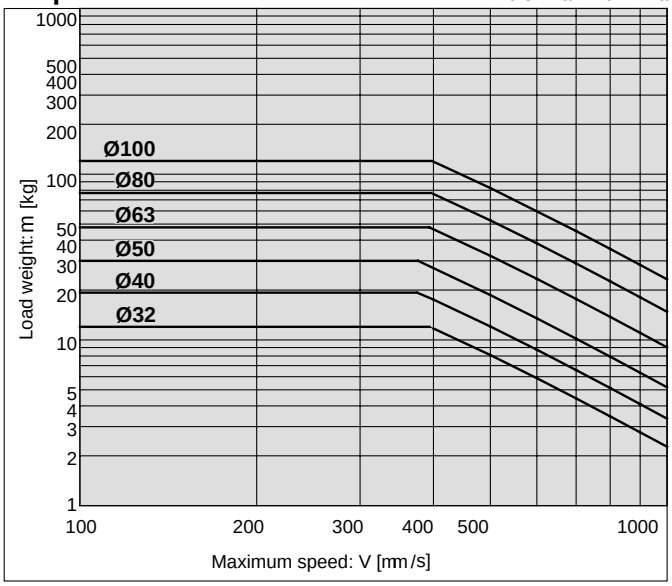
Graph 4

0.5MPa″ P



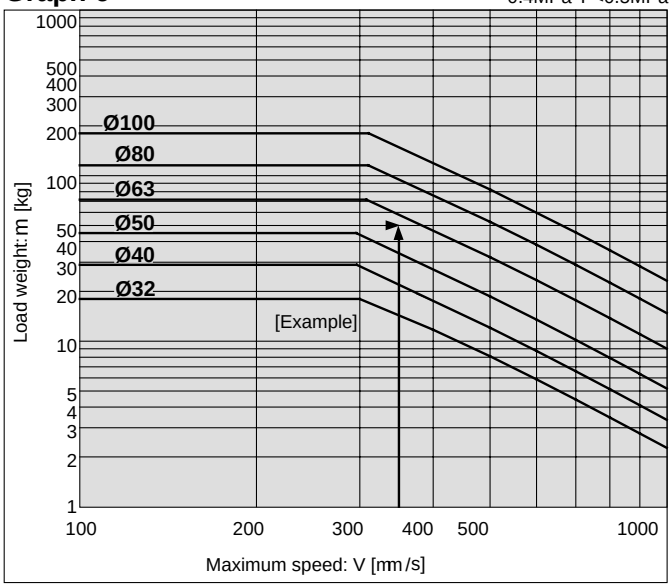
Graph 5

0.3MPa″ P<0.4MPa



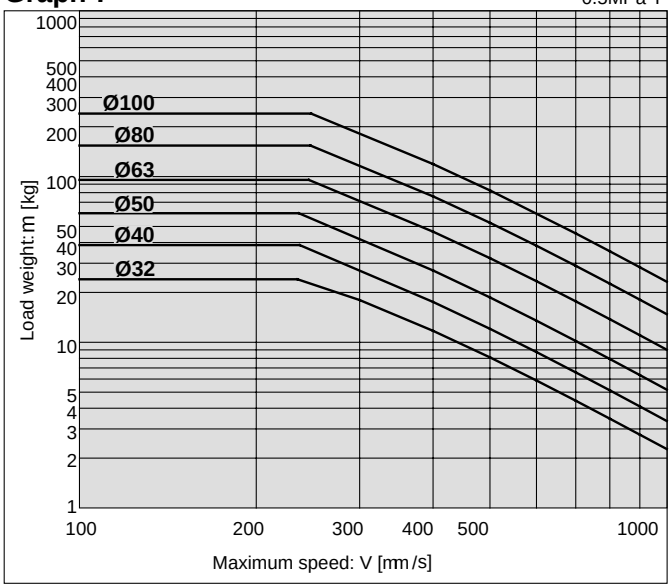
Graph 6

0.4MPa″ P<0.5MPa



Graph 7

0.5MPa″ P



Auto switch mounting

[mm]

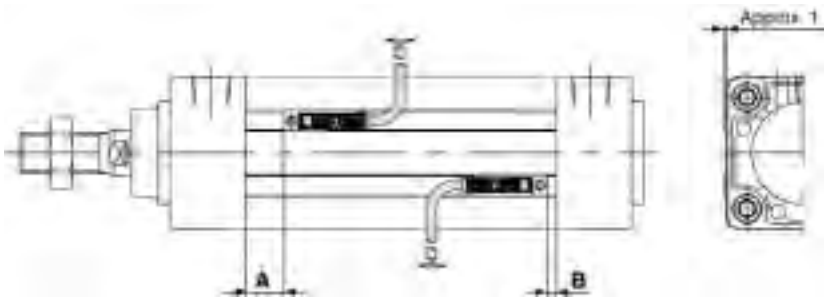
Minimum strokes for auto switches

Auto switch type	Model	Amount* of switches	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
Reed	D-Z73L	2 pcs.	25				15	
	D-Z80L	1 pcs.						
Solid state	D-Y59BL	2 pcs.	25				15	
	D-Y69BL	1 pcs.						
	D-Y7PL							

*Auto switches are mounted on the same side but in different grooves of the cylinder.

Recommended mounting position for stroke ends

[mm]

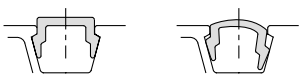


Bore (mm)	D-Z73L, D-Z80L, D-Y7PL D-Y59BL, D-Y69BL	
	A	B
32	14	1
40	25	1
50	16	2
63	31	2
80	21.5	5.5
100	31.5	5.5

Mounting of Auto Switches

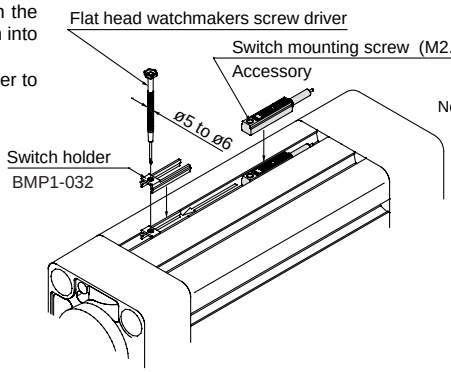
1N·m: approx. 10.2kgf·cm

When attaching an auto switch, first take a switch holder between your fingers and press it into a switch mounting groove. When doing this, confirm that it is set in the correct mounting orientation, or reattach if necessary. Next, insert an auto switch into the groove and slide it until it is positioned under the switch holder.
After establishing the mounting position, use a watchmakers flat head screw driver to tighten the switch mounting screw which is included.



Correct **Incorrect**

Switch holder: BMP1-032



Note) When tightening the auto switch mounting screw, use a watchmakers screw driver with a handle about 5 to 6mm in diameter.
Tighten to a torque of approximately 0.05 to 0.1Nm (0.51 to 1.02kgf·cm).
As a rule, it is turned about 90° past the point at which tightening can be felt.

How to order: Auto Switches, holders and Groove Covers

Auto switch holder band

Ø	Order No.	
	Auto switch	Switch holder
32	D-Z73L	**BMP1-032**
40	D-Z80L	
50	D-Y7PL	
63	D-Y59BL	
80	D-Y69BL	
100		

Groove cover of square tube

Ø	**Order No.**	Cylinder length without stroke
32	**CP95-AL**	41.5 mm
40		52.5 mm
50		44.5 mm
63		59.5 mm
80		53.5 mm
100		63.5 mm

Groove covers are available in progressive rates of 1 metre. Please, indicate round figures when ordering.

□ Write the required length of the groove cover in the box.

Order example: Groove cover for CP95SB63-160
59.5 mm + 160 mm = 239.5 x 8 grooves = 1916 mm
[Cylinder length without stroke] [Stroke] [8 grooves in the square tube]

Length to order: 1916 mm corresponds to a groove cover of 2 m for each cylinder
Order No.: **CP95-AL** 2 **length in metres**

Series CP95
Specific Product Precautions

Adjustment

⚠Warning

① **Do not open the cushion valve above the stopper.**
Cushionvalves are provided with a crimp (ø32) or a retaining ring (ø40 to ø100) as a stopping mechanism, and the cushion valve should not be opened above that point.
If air is supplied and operation started without confirming the above condition, the cushion valve may be ejected from the cover.

Bore size (mm)	Cushion valve	Width across flats	Socket wrench
32, 40, 50	MB-32-10-C1247	2.5	JIS 4648 Hex spanner wrench 2.5
63, 80, 100	MB-63-10-C1250	4	JIS 4648 Hex spanner wrench 4

②**When replacing brackets, use the hexagon wrenches shown below.**

Bore size (mm)		Bolt	Width across flats	Tightening torque (Nm)
32, 40		MB-32-48-C1247	4	4.9
50, 63		MB-50-48-C1249	5	11
80, 100	Foot	MB-80-48AC1251	6	25
	Others	MB-80-48BC1251		

With Non-rotating Rod (Double Acting: Single Rod)

Operating Precautions

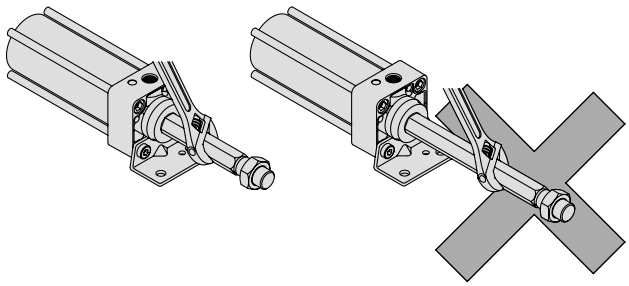
⚠Caution

① **Do not apply more than the allowable rotating torque to the piston rod.**
If more than the allowable rotating torque is applied, the non-rotating guide will be deformed and there will be a significant loss of rotational accuracy. This may cause damage to the machinery.

Mounting & Piping

⚠Caution

① **Mounting of a work piece at the rod end.**
When screwing a fitting or nut, etc. onto the threads at the end of the piston rod, push the piston rod into its fully retracted position, and grasp the protruding section with a wrench.
Furthermore, when tightening, take care that the torque is not applid to the non-rotating guide.



Made to Order Common Specifications
Standard Air Cylinder

Contact SMC for the detailed specifications, delivery and prices.

Standard Air Cylinder/Made to Order Common Specifications

Spec.	No.	Symbol	Specifications/Descriptions	Standard air cylinder									Page
				CJP	CJ2	CM2	CG1	MB	CA1	CS1	C95	CP95	
Made to order common specifications	①	-XA0 to A30	Change of rod end shape		■	■	■	■	■	■	(4)	(4)	CD
	②	-XB5	Oversized rod cylinder					■	■	■			
	③	-XB6	Heat resistant cylinder (150°C)	(1)	(2)	■	■	■	■	■	(4)	(4)	
	④	-XB7	Cold resistant cylinder	(3)	(2)	■	■						
	⑤	-XB9	Low speed cylinder (10 to 50 mm/s)	(1)	(1)	■	■						
	⑥	-XB10	Intermediate stroke (Exclusive body use)										
	⑦	-XB11	Long stroke										
	⑧	-XB12	External stainless steel			■							
	⑨	-XB13	Low speed cylinder (5 to 50 mm/s)		(1)	■	■	■					
	⑩	-XC3	Special port position		(1)	■		■	■	■			
	⑪	-XC4	With heavy duty scraper			■	■	■	■	■	■	■	
	⑫	-XC5	Heat resistant cylinder (110°C)			■		■	■	■			
	⑬	-XC6	Piston rod and rod end nut made of stainless steel			■	■	■	■	■			
	⑭	-XC7	Tie rod, cushion valve, tie rod nut, etc. made of stainless steel					■	■				
	⑮	-XC8	Adjustable stroke cylinder/Adjustable extend stroke		■	■	■	■	■	■			
	⑯	-XC9	Adjustable stroke cylinder/Adjustable retract stroke		■	■	■	■	■	■			
	⑰	-XC10	Dual stroke cylinder/Double rod		■	■	■	■	■	■			
	⑱	-XC11	Dual stroke cylinder/Single rod		■	■	■	■	■	■			
	⑲	-XC12	Tandem cylinder			■	■	■	■	■			
	⑳	-XC13	Auto switch rail mounting			■	■						
	㉑	-XC14	Change of trunnion bracket mounting position					■	■	■	■		
	㉒	-XC15	Change of tie rod length						■	■			
	㉓	-XC17	Pin cylinder with rod quenched	(3)									
	㉔	-XC18	NPT port			■	■	■	■	■			
	㉕	-XC20	Head cover axial port			■	■						
	㉖	-XC22	Fluorine rubber seals	■	■	■	■	■	■				
	㉗	-XC24	With magnet shielding plate										
	㉘	-XC25	No fixed throttle of connecting port			■							
	㉙	-XC27	Double clevis pin and double knuckle pin made of stainless steel			■			■	■			
	㉚	-XC28	Compact flange made of SS400						■				
	㉛	-XC29	Double knuckle joint with spring pin			■			■				
	㉜	-XC30	Front trunnion					■	■	■			
	㉝	-XC34	Rod does not extend beyond non-rotating plate										
	㉞	-XC35	With coil scraper			■	■	■	■	■	■	■	
	㉟	-XC36	With front guide boss										
	㊱	-XC37	Larger throttle diameter of connecting port				■						
	㊲	-XC38	Vacuum (Rod through hole)			■							
	㊳	-XC42	Built-in rear shock absorber				■						
	㊴	-XC51	With hose nipple		■								
	㊵	-XC52	Mounting nut with set screw			■							
	㊶	-XC56	With knock pin hole										
	㊷	-XC57	Rodless cylinder with floating joint										

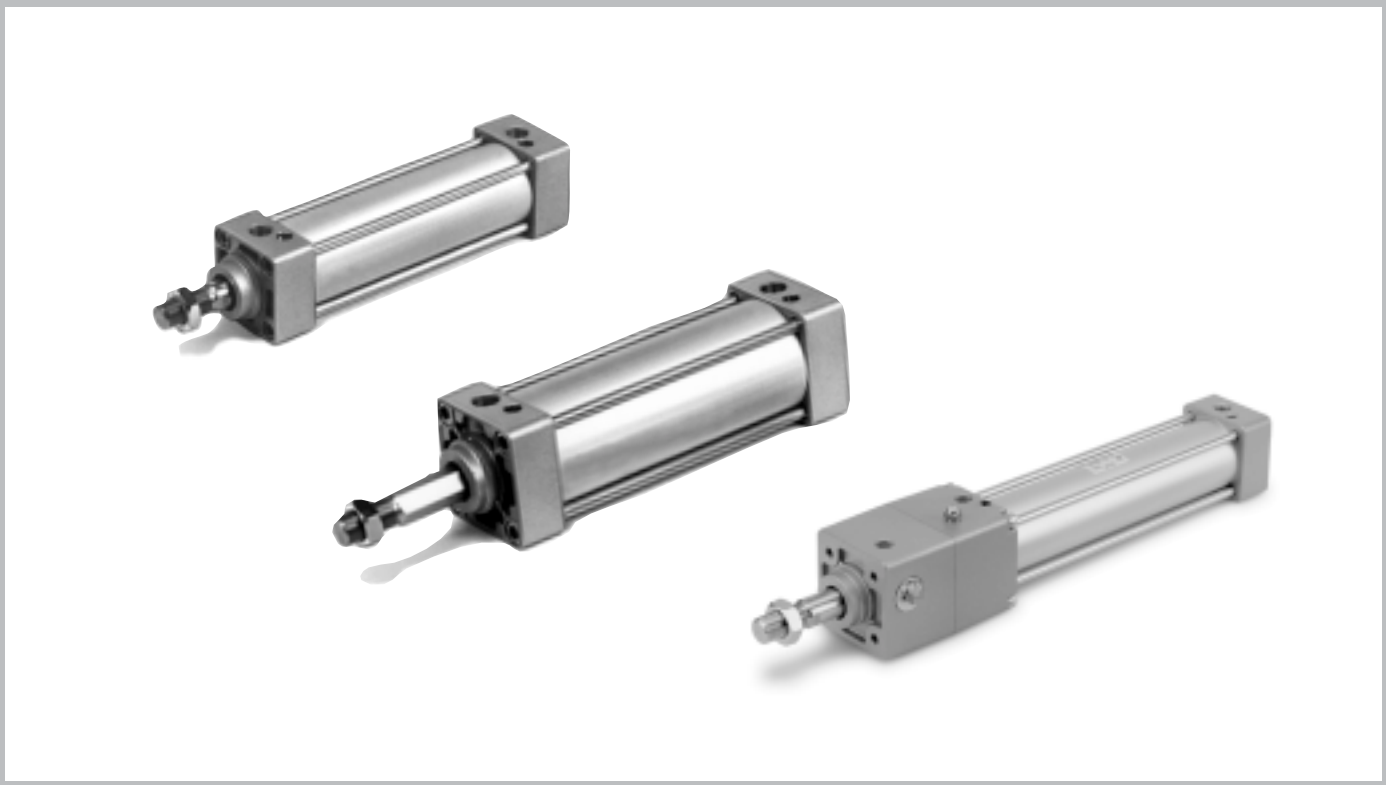
∗ Except air-hydro style for each cylinder
Note 1) Only double acting
Note 2) Only double acting (without switch)
Note 3) Only single acting
Note 4) Only for S-type

ISO/VDMA Cylinder

Series C95

ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø160, ø200, ø250

Conforming to ISO 6431/CETOP RP43P/VDMA 24562



Model Selection

Execution	Model	Bore Size						Adjustable Stroke End Cushioning	Options Piston Rod			
		32	40	50	63	80	100		Standard Hard Chrome	W	R	K
Standard Type	C95 SB	●	●	●	●	●	●	●	●	○	○	○
	C95 SDB	●	●	●	●	●	●	●	●	○	○	○
With Mounting Centre Trunnion	C95 ST	●	●	●	●	●	●	●	●	○	○	–
	C95 SDT	●	●	●	●	●	●	●	●	○	○	–
Non-Rotating Piston Rod	C95 KB	●	●	●	●	●	●	●	–	○	●	–
	C95 KDB	●	●	●	●	●	●	●	–	○	●	–
Non Rotating Piston Rod with Centre Trunnion	C95 KT	●	●	●	●	●	●	●	–	○	●	–
	C95 KDT	●	●	●	●	●	●	●	–	○	●	–
With Lock	C95 NB	●	●	●	●	●	●	●	●	○	–	–
	C95 NDB	●	●	●	●	●	●	●	●	○	–	–
Non Rotating Piston Rod with Centre Trunnion	C95 NT	●	●	●	●	●	●	●	●	○	–	–
	C95NDT	●	●	●	●	●	●	●	●	○	–	–
With Positioner	C95PB	–	–	●	●	●	●	●	●	–	–	–
	C95 PDB	–	–	●	●	●	●	●	●	–	–	–
Low Friction Cylinder	C95 QB$^{-CA}_{-CB}$	●	●	●	●	●	●	–	●	–	○	○
	C95 QDB$^{-CA}_{-CB}$	●	●	●	●	●	●	–	●	–	○	○
Low Friction Cylinder with Centre Trunnion	C95 QT$^{-CA}_{-CB}$	●	●	●	●	●	●	–	●	–	○	–
	C95 QDT$^{-CA}_{-CB}$	●	●	●	●	●	●	–	●	–	○	–

W = Double/through rod
R = Stainless Steel Piston Rod
K = Stainless &Acid-Proof Piston Rod & Nickel Plated Tie Rods

○ Options
● Standard

ISO Cylinder/Standard: Double Acting

Series C95

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Standard C95SD [B] [32] — [100] [W] — [A53] [S]

Built-in magnet

Mounting

B	Basic/Without bracket
L	Axial foot
F	Front flange
G	Rear flange
C	Single rear clevis
D	Double rear clevis
T	Centre trunnion

Bore size

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

Auto switch

—	Without auto switch

* Refer to table below for selection of applicable auto switch.

Rod Specifications

	Hard chromed rod as standard
W	Double/through rod
R	Stainless steel piston rod
K	stainless steel and acid-proof piston rod
F	Rod boot

Stroke (mm)

Refer to standard stroke table on p. 6-4

Number of auto switches

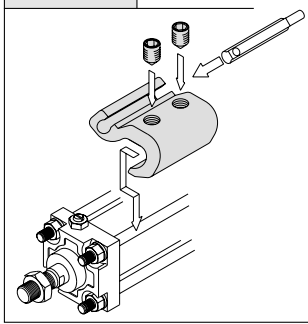
—	2
S	1
3	3
n	n

Applicable Auto Switches/Tie rod mounting

Style	Special function	Electrical entry	Indicator	Load voltage: Wiring (Output)	DC		AC	Auto switch model	Lead wire (m)* 0.5 (—)	3 (L)	5 (Z)	Applicable load		Mounting bracket
Reed switch	—	Grommet	Yes	3 wire (Equiv. to NPN)	—	5V	—	**A56**	●	●	—	IC	—	ø32,ø40 BT-03
				2 wire	24V	12V	—	**A53**	●	●	●	—	Relay PLC	
						5V,12V	100V,200V	**A54**	●	●	●			
			No			5V,12V	—	**A67**	●	●	—	IC		
						12V	200V or less	**A64**	●	●	—			
	Diagnosis indication (2 colour)		Yes			—	—	**A59W**	●	●	—	—		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	**F59**	●	●	○	IC	Relay PLC	ø50,ø63 BT-05
				3 wire (PNP)				**F5P**	●	●	○			
				2 wire	—	—	100V,200V	**J51**	●	●	○	—		
					24V	12V	—	**J59**	●	●	○			
	Diagnosis indication (2 colour)			3 wire (NPN)		5V,12V		**F59W**	●	●	○	IC		ø80,ø100 BT-06
				3 wire (PNP)				**F5PW**	●	●	○			
				2 wire		12V		**J59W**	●	●	○	—		
	Water resistant (2 colour)							**F5BA**	—	●	○			
	With timer			3 wire (NPN)		5V,12V		**F5NT**	—	●	○	IC		
	Diagnosis output (2 colour)							**F59F**	●	●	○			
	Latch diagnosis output (2 colour)			4 wire (NPN)		—		**F5LF**	●	●	○	—		

Table ①
Auto Switch Mounting Bracket for D-M9□

Bore size (mm)	Order No.
ø32, ø40	**BMB5-032**
ø50, ø63	**BA7-040**
ø80, ø100	**BA7-063**

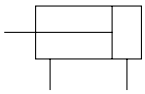


Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage: DC		AC	Auto switch model: Electrical entry direction: Vertical	Lateral	Lead wire length (m) Note): 0.5 (Nil)	3 (L)	5 (Z)	Applicable load		Mounting bracket
Reed switch	—	Grommet	Yes	3 wire	—	5V	—	—	**Z76**	●	●	—	IC circuit	—	ø32,ø40 BMB4-032
				2 wire	24V	—	100V	—	**Z73**	●	●	●	—	Relay PLC	
			No			5V, 12V	100V or less	—	**Z80**	●	●	—	IC circuit		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay PLC	ø50,ø63 BMB4-050
				3 wire (PNP)				**Y7PV**	**Y7P**	●	●	○			
				2 wire		12V		**Y69B**	**Y59B**	●	●	○	—		
	Diagnostic indication (2 colour indicator)			3 wire (NPN)		5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit		ø80,ø100 BA4-063
				3 wire (PNP)				**Y7PWV**	**Y7PW**	●	●	○			
				2 wire		12V		**Y7BWV**	**Y7BW**	●	●	○	—		
	Water resistant (2 colour indicator)							—	**Y7BA**	—	●	—			
	——	Connector and Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	**M9NV**	**M9N**	●	●	○	IC circuit	Relay PLC	See Table ①
				3 wire (PNP)				**M9PV**	**M9P**	●	●	○			
				2 wire		12V		**M9BV**	**M9B**	●	●	○			

* Lead wire length 0.5m····· — (Example: A53)
3m····· L (Example: A53L)
5m····· Z (Example: A53Z)

○: Manufactured upon receipt of order.

ISO Symbol
Double acting



Specifications

Bore size	ø32	ø40	ø50	ø63	ø80	ø100
Action	Double acting					
Fluid	Air					
Proof pressure	1.5MPa					
Max. operating pressure	1.0MPa					
Min. operating pressure	0.05MPa					
Ambient and fluid temperature	Without magnet –10 to 70°C (No freezing)					
	With magnet –10 to 60°C (No freezing)					
Lubrication	Not required (Non-lube)					
Operating piston speed	50 to 1000mm/s					
Allowable stroke tolerance	to 250: $^{+1.0}_{0}$, 251 to 1000: $^{+1.4}_{0}$,1001 to 1500: $^{+1.8}_{0}$					
Cushion	Both ends (Air cushion)					
Thread tolerance	JIS class 2					
Port size	G1/8	G1/4	G1/4	G3/8	G3/8	G1/2
Mounting	Basic, axial foot, front flange, rear flange, Flotating joint, single rear clevis, double rear clevis, center trunnion					

Minimum Strokes for Auto Switch Mounting

Refer to p.6-32 for "Minimum Strokes for Auto Switch Mounting".

Standard Stroke

Bore size (mm)	Standard stroke (mm)	Max. * stroke
32	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	700
40	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	800
50	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1200
63	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1200
80	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1400
100	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1500

Intermediate strokes are available.
Please consult with SMC for longer strokes.

Mounting Bracket, Mounting Accessories

Description	Bore size	ø32	ø40	ø50	ø63	ø80	ø100
L	**Foot**(1)	L5032	L5040	L5050	L5063	L5080	L5100
F,G	**Flange**	F5032	F5040	F5050	F5063	F5080	F5100
C	**Single rear clevis**	C5032	C5040	C5050	C5063	C5080	C5100
D	**Double rear clevis**	D5032	D5040	D5050	D5063	D5080	D5100
DS	**Double rear clevis (for ES accessory)**	DS5032	DS5040	DS5050	DS5063	DS5080	DS5100
ES	**Angled rear clevis with ball joint**	ES5032	ES5040	ES5050	ES5063	ES5080	ES5100
E	**Angled rear clevis**	E5032	E5040	E5050	E5063	E5080	E5100
C95-S	**Trunnion pivot bracket**	C95-S03	C95-S04	C95-S04	C95-S06	C95-S06	C95-S10
GKM	**Rod clevis**	GKM10-20	GKM12-24	GKM16-32	GKM16-32	GKM20-40	GKM20-40
KJ	**Piston rod ball joint**	KJ10D	KJ12D	KJ16D	KJ16D	KJ20D	KJ20D
JA	**Floating joint**	JA30-10-125	JA40-12-125	JA50-16-150	JA50-16-150	JAH50-20-150	JAH50-20-150

Note 1) Two foot brackets required for one cylinder.
Note 2) Accessories for each mounting bracket are as follows.
Foot, Flange, Single clevis: Mounting bolts
Double rear clevis: (D,DS): Clevis pin
Note 3) C95-S: Set of 2 pcs.
Note 4) GKM according to ISO 8140
Note 5) KJ according to ISO 8139
Note 6) Piston rod nut is standard

Theoretical Force

(Unit : N) OUT IN

Bore size (mm)	Rod diameter (mm)	Operating direction	Piston area (mm^2)	Operating pressure (MPa)								
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
32	12	OUT	804	161	241	322	402	482	563	643	724	804
		IN	691	138	207	276	346	415	484	553	622	691
40	16	OUT	1257	251	377	503	629	754	880	1006	1131	1257
		IN	1056	211	317	422	528	634	739	845	950	1056
50	20	OUT	1963	393	589	785	982	1178	1374	1570	1767	1963
		IN	1649	330	495	660	825	989	1154	1319	1484	1649
63	20	OUT	3117	623	935	1247	1559	1870	2182	2494	2805	3117
		IN	2803	561	841	1121	1402	1682	1962	2242	2523	2803
80	25	OUT	5027	1005	1508	2011	2514	3016	3519	4022	4524	5027
		IN	4536	907	1361	1814	2268	2722	3175	3629	4082	4536
100	30	OUT	7854	1571	2356	3142	3927	4712	5498	6283	7068	7854
		IN	7147	1429	2144	2859	3574	4288	5003	5718	6432	7147

Note) Theoretical force(N) = Pressure (MPa) X Piston area (mm^2)

Weight Table

(kg)

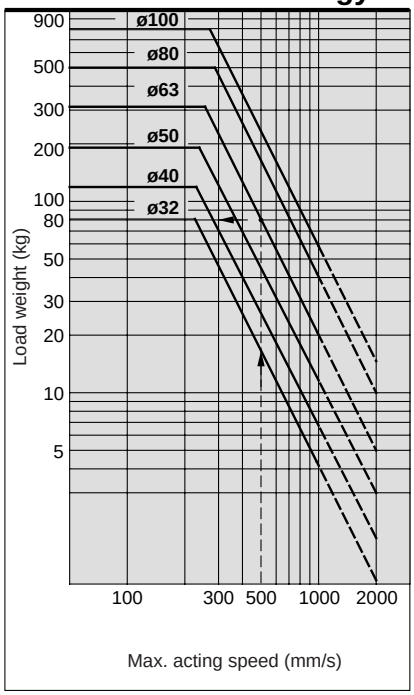
Bore size (mm)		**32**	**40**	**50**	**63**	**80**	**100**
Basic weight	Basic	0.56	0.84	1.39	1.91	3.22	4.24
	Foot	0.16	0.20	0.38	0.46	0.89	1.09
	Flange	0.20	0.23	0.47	0.58	1.30	1.81
	Single clevis	0.16	0.23	0.37	0.60	1.07	1.73
	Double clevis	0.20	0.32	0.45	0.71	1.28	2.11
	Trunnion	0.15	0.26	0.34	0.56	1.03	1.71
Additional weight per 50 stroke	All mounting brackets	0.11	0.16	0.26	0.27	0.42	0.56
Accessories	Single rod clevis	0.15	0.23	0.26	0.26	0.60	0.83
	Double rod clevis (with pin)	0.22	0.37	0.43	0.43	0.87	1.27

Calculation example: C95SD40-100

- Basic weight ····· 0.84 (Basic, ø40)
- Mounting ····· 0.32 (Double clevis)
- Additional weight ··· 0.16/50 stroke
- Cylinder stroke ····· 100 stroke

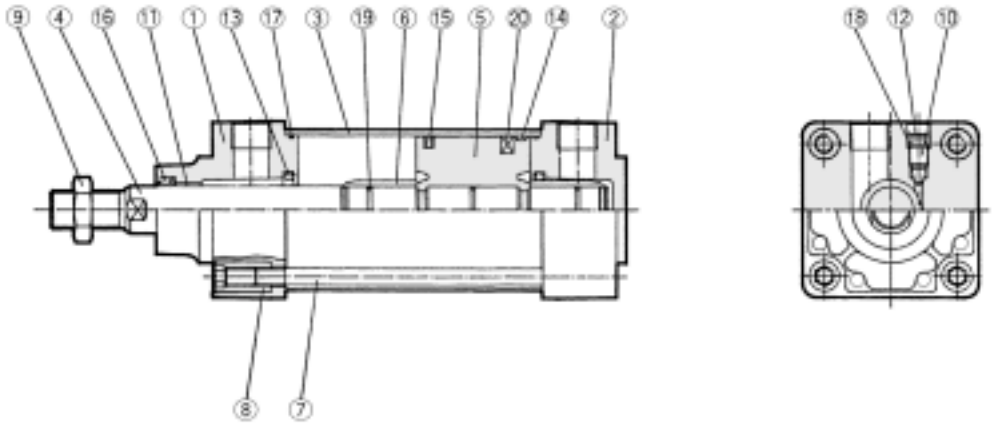
0.84+0.16 X 100/50+0.32=1.48kg

Allowable Kinetic Energy



Example: Load limit at rod end when air cylinder ø63 is actuated with max. actuating speed 500mm/s. See the intersection of lateral axis 500mm/s and ø63 line, and extend the intersection to left. Thus the allowable load is 80kg.

Construction



Component Parts

No.	Description	Material	Note
①	**Rod cover**	Aluminum die cast	
②	**Head cover**	Aluminum die cast	
③	**Cylinder tube**	Aluminum die cast	
④	**Piston rod**	C45 anodised steel	
⑤	**Piston**	Aluminum die cast	
⑥	**Cushion ring**	Brass	
⑦	**Tie rod**	Steel	(chromated)
⑧	**Tie rod nut**	Steel	(chromated)
⑨	**Mounting nut**	Steel	(chromated)
⑩	**Cushion adjustment screw**	Steel	(chromated)
⑪	**Bushing**	Bronze bush	
⑫	**Serrated washer**	Steel	(chromated)
⑬	**Cushion seal**	PUR	

No.	Description	Material	Note
⑭	**Wearing**	Resin	
⑮	**Piston seal**	NBR	
⑯	**Rod seal/Gasket**	NBR	
⑰	**Cylinder tube gasket**	NBR	
⑱	**Cushion screw seal**	NBR	
⑲	**Piston gasket**	NBR	
⑳	**Magnet ring**		

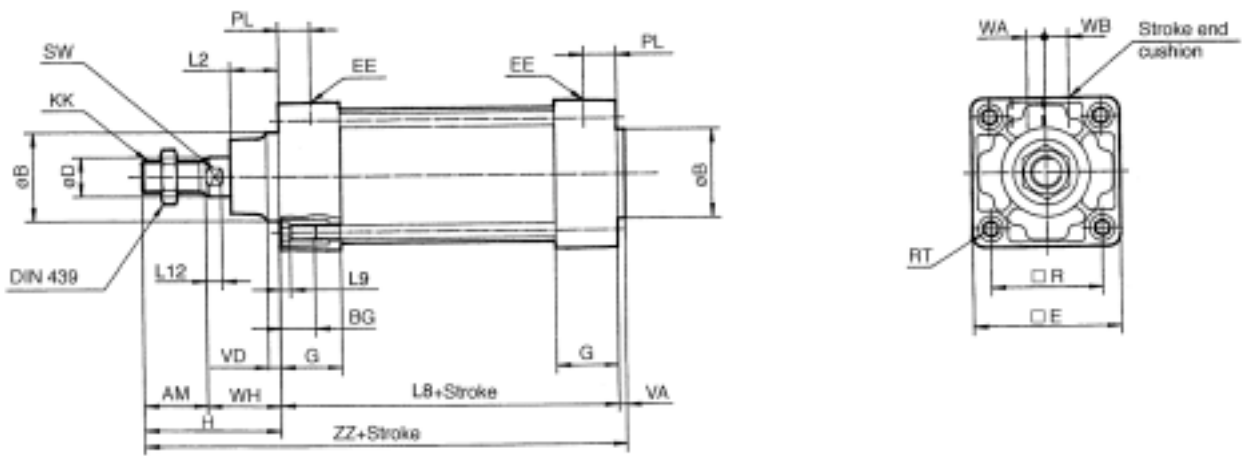
Seal Kits

Bore size (mm)	Kit No.	Contents
32	CS95-32	Kits include items 13 to 17 for ø32, 12 to 18 for ø40 to ø100 from the table above.
40	CS95-40	
50	CS95-50	
63	CS95-63	
80	CS95-80	
100	CS95-100	

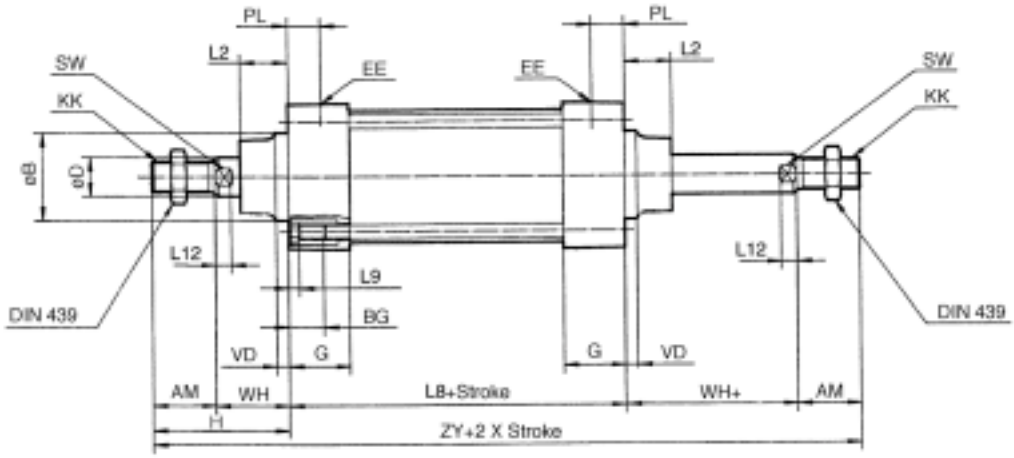
∗ Seal kits consist of items 13 to 17 for ø32, items 12 to 18 for ø40 to ø100 contained in one kit, and can be ordered using the order number for each respective tube bore size.

Without Mounting Bracket

C95SBø-Stroke



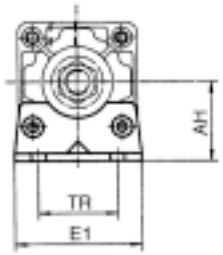
C95SBø-Stroke W

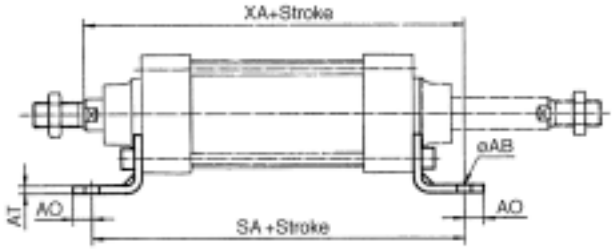


Bore (mm)	AM	øB e11	øD	EE	PL	RT	L12	KK	SW	G	BG	L8	VD	VA	WA	WB	WH	ZZ	ZY	□E	□R	L2	L9	H
32	22	30	12	G1/8	13	M6	6	M10 X 1.25	10	27	16	94	4	4	4	6.5	26	146	190	46	32.5	15	4	48
40	24	35	16	G1/4	14	M6	6.5	M12 X 1.25	13	27	16	105	4	4	4	9	30	163	213	52	38	17	4	54
50	32	40	20	G1/4	15.5	M8	8	M16 X 1.5	16	31.5	16	106	6	4	5	10.5	37	179	244	65	46.5	24	5	69
63	32	45	20	G3/8	16.5	M8	8	M16 X 1.5	16	31.5	16	121	6	4	9	12	37	194	259	75	56.5	24	5	69
80	40	45	25	G3/8	19	M10	10	M20 X 1.5	21	38	16	128	8	4	11.5	14	46	218	300	95	72	30	5	86
100	40	55	30	G1/2	19	M10	10	M20 X 1.5	21	38	16	138	8	4	17	15	51	233	320	114	89	32	5	91

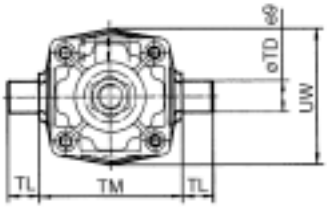
With Mounting Bracket

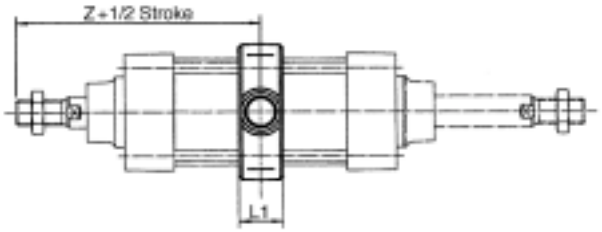
Foot L



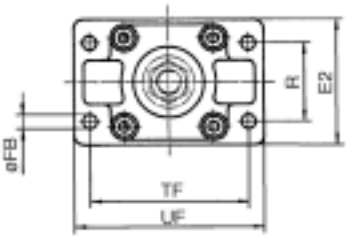


Centre Trunnion T

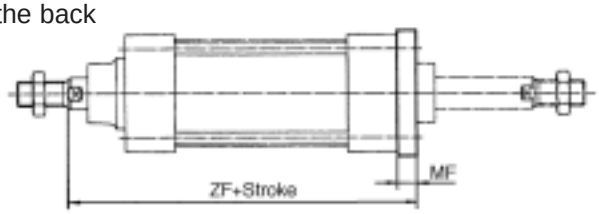




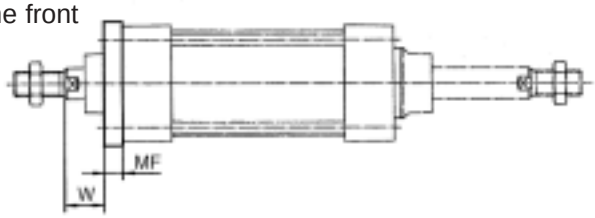
Flange F



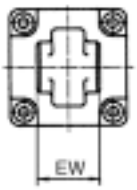
Mounting at the back

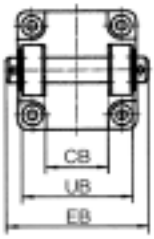


Mounting at the front



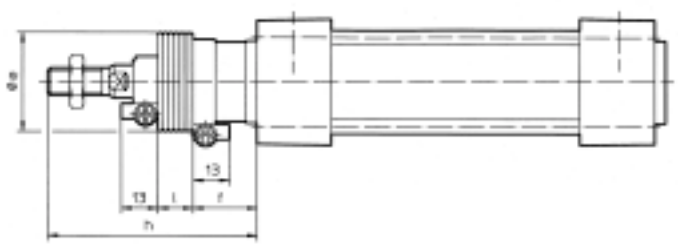
Rear single clevis C Rear double clevis D





Bore (mm)	E1	R	W	MF	ZF	øFB	CD	EB	L	XD	UB	CB	EW	MR	TR	AO	AT	XA	SA	AH	øAB	L1	Z	TL	øTD	TM	UW	TF	UF	E2
32	48	32	16	10	130	7	10	65	12	142	45	26	26	9.5	32	10	4.5	144	142	32	7	17	95	12	12	50	49	64	79	50
40	55	36	20	10	145	9	12	75	15	160	52	28	28	12	36	11	4.5	163	161	36	10	22	106.5	16	16	63	58	72	90	55
50	68	45	25	12	155	9	12	80	15	170	60	32	32	12	45	12	5.5	175	170	45	10	22	122	16	16	75	71	90	110	70
63	80	50	25	12	170	9	16	90	20	190	70	40	40	16	50	12	5.5	190	185	50	10	28	129.5	20	20	90	87	100	120	80
80	100	63	30	16	190	12	16	110	20	210	90	50	50	16	63	14	6.5	215	210	63	12	34	150	20	20	110	110	126	153	100
100	120	75	35	16	205	14	20	140	25	230	110	60	60	20	75	16	6.5	230	220	71	14.5	40	160	25	25	132	136	150	178	120

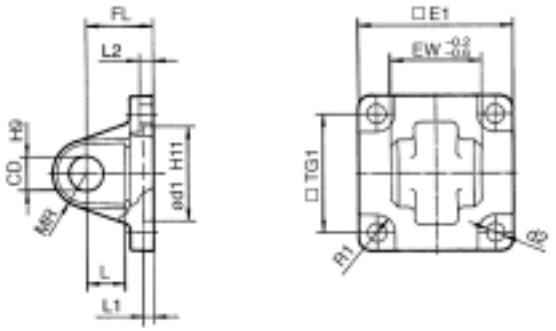
Rod boot (gaiter)



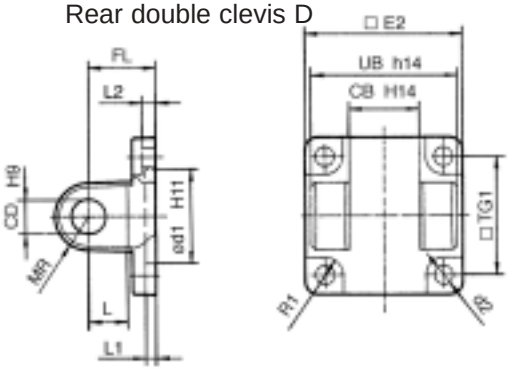
Bore (mm)	e max	f	l					h				
			Stroke 1-50	Stroke 51-100	Stroke 101-150	Stroke 151-200	Stroke 201-300	Stroke 1-50	Stroke 51-100	Stroke 101-150	Stroke 151-200	Stroke 201-300
32	42	23	12.5	25	37.5	50	75	75	88	100	113	138
40	43	23	12.5	25	37.5	50	75	75	88	100	113	138
50	52	25	12.5	25	37.5	50	75	87	100	112	125	150
63	52	25	12.5	25	37.5	50	75	87	100	112	125	150
80	58	29	12.5	25	37.5	50	75	103	116	128	141	166
100	65	29	12.5	25	37.5	50	75	103	116	128	141	166

Accessories

Rear single clevis C

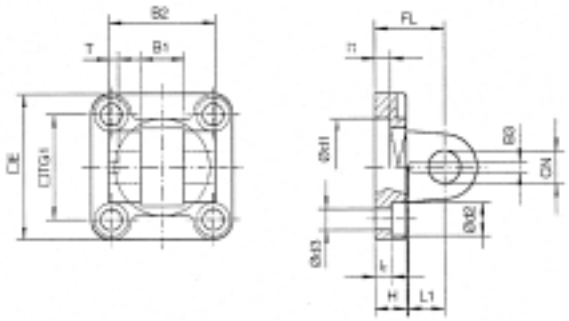


Rear double clevis D



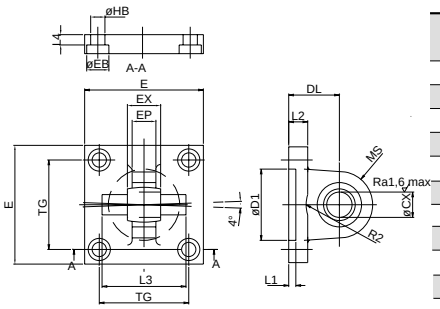
Bore (mm)	□E1	EW	□TG1	FL	L1	L	L2	ød1	CD	MR	d2	R1	□E2	UB	CB
32	45	26	32.5	22	5	12	5.5	30	10	9.5	6.6	6.5	48	45	26
40	51	28	38	25	5	15	5.5	35	12	12	6.6	6.5	56	52	28
50	64	32	46.5	27	5	15	6.5	40	12	12	9	8.5	64	60	32
63	74	40	56.5	32	5	20	6.5	45	16	16	9	8.5	75	70	40
80	94	50	72	36	5	20	10	45	16	16	11	11	95	90	50
100	113	60	89	41	5	25	10	55	20	20	11	12	115	110	60

Rear Sngle Clevis DS



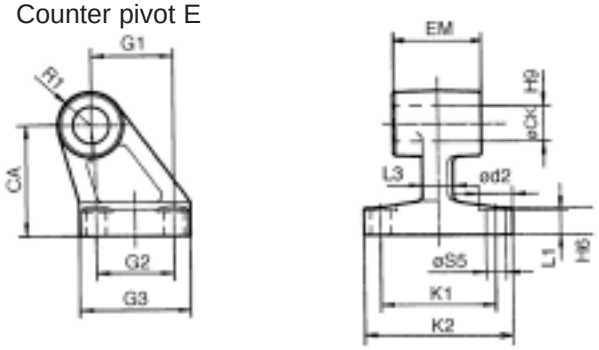
Bore (mm)	□E	B1	B2	B3	□TG1	T	L1	L3	l1	l2	FL	H	Ød1	Ød2	Ød3	CN	XD
32	45	14	34	3.3	32.5	3	11.5	41	5	5.5	22	10	30	10.5	6.6	10	142
40	55	16	40	4.3	38	4	12	48	5	5.5	25	10	35	11	6.6	12	160
50	65	21	45	4.3	46.5	4	14	54	5	6.5	27	10	40	15	9	16	170
63	75	21	51	4.3	56.5	4	14	60	5	6.5	32	12	45	15	9	16	190
80	95	25	65	4.3	72	4	16	75	5	10	36	16	45	18	11	20	210
100	115	25	75	6.3	89	4	16	85	5	10	41	16	55	18	11	20	230

Rear Sngle Clevis CS



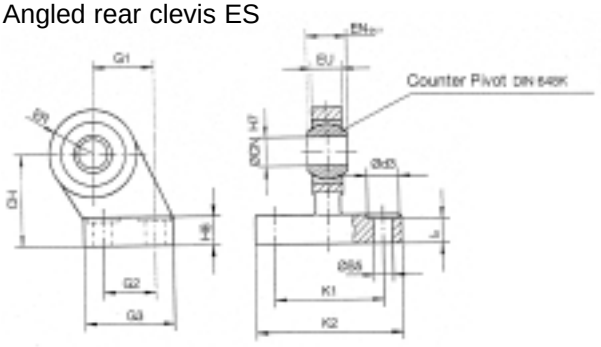
Part No.	Bore (mm)	E	TG	EX	DL	L1	L2	MS	L3	EB	HB	R2	CX	D1	L4	EP
CS5032	**32**	48	32.5	14	22	5	10	16	36	11	6.6	12.5	10	30	5.5	10
CS5040	**40**	56	38	16	25	5	10	16	42	11	6.6	14.5	12	35	5.5	11.5
CS5050	**50**	64	46.5	21	27	5	10	20	48	15	9	19.5	16	40	6.5	14.5
CS5063	**63**	75	56.5	21	32	5	12	22	55	15	9	19.5	16	45	6.5	14.5
CS5080	**80**	95	72	25	36	5	14	26	70	18	11	24.5	20	45	10	17.5
CS5100	**100**	115	89	25	41	5	16	26	80	18	11	24.5	20	55	10	17.5
CS5125	**125**	140	110	37	50	7.5	20	38	100	20	13.5	32.5	30	60	10	24.5
CS5160	**160**	178	140	43	55	7.5	20	40	125	25	17.5	38.5	35	65	10	29.5
CS5200	**200**	225	175	43	60	7.5	25	42	125	25	17.5	40.5	35	75	11	29.5
CS5250	**250**	282	220	49	70	11.5	25	50	130	31	22	44.5	40	90	11	34.5

Counter pivot E



Bore (mm)	ød2	øCK	øS5	K1	K2	L3	G1	L1	G2	EM	G3	CA	H6	R1
32	11	10	6.6	38	51	10	21	7	18	26	31	32	8	10
40	11	12	6.6	41	54	10	24	9	22	28	35	36	10	11
50	15	12	9	50	65	12	33	11	30	32	45	45	12	12
63	15	16	9	52	67	14	37	11	35	40	50	50	12	15
80	18	16	11	66	86	18	47	12.5	40	50	60	63	14	15
100	18	20	11	76	96	20	55	13.5	50	60	70	71	15	19

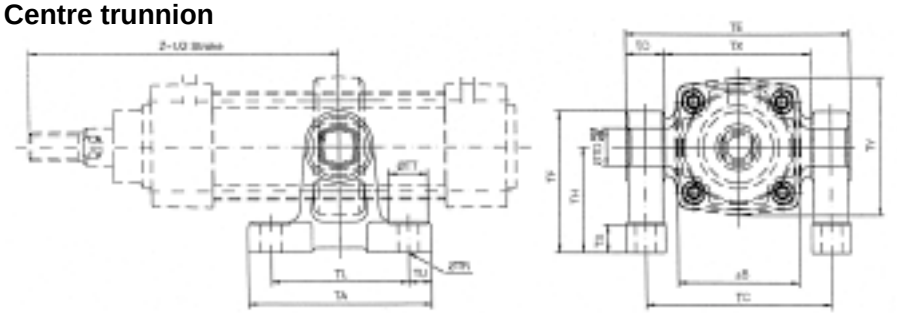
Angled rear clevis ES



Bore (mm)	Ød3	ØCN	ØS5	K1	K2	l2	G1	G2	G3□	EN	EU	CH	H6	ER
32	11	10	6.6	38	51	8.5	21	18	31	14	10.5	32	10	15
40	11	12	6.6	41	54	8.5	24	22	35	16	12	36	10	18
50	15	16	9	50	65	10.5	33	30	45	21	15	45	12	20
63	15	16	9	52	67	10.5	37	35	50	21	15	50	12	23
80	18	20	11	66	86	11.5	47	40	60	25	18	63	14	27
100	18	20	11	76	96	12.5	55	50	70	25	18	71	15	30

Accessories

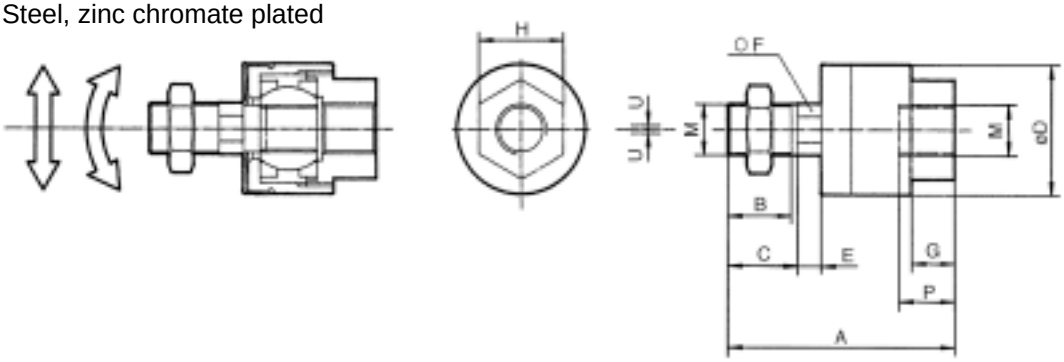
Centre trunnion



Part No.	Bore (mm)	±B	TA	TC	ØTD	TE	TF	TH	TL	TO	ØTR	TS	ØTT	TU	TX	TY	Z
C95-S03	**32**	46	62	62	12	74	47	35	45	12	7	10	13	8.5	50	49	95
C95-S04	**40**	52	80	80	16	97	60	45	60	17	9	12	17	10	63	58	106.5
	50	65	80	92	16	109	60	45	60	17	9	12	17	10	75	71	122
C95-S06	**63**	75	100	110	20	130	80	60	70	20	11	14	22	15	90	87	129.5
	80	95	100	130	20	150	80	60	70	20	11	14	22	15	110	110	150
C95-S10	**100**	114	120	158	25	184	100	75	90	26	13.5	17	24	15	132	136	160

Floating joint JA

Steel, zinc chromate plated

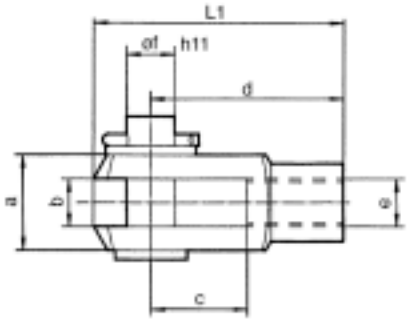


Bore (mm)	M	A	B	C	øD	E	F	G	H	P	U	Load (kn)	Weight (g)	Radial deflection
32	M10 X 1.25	49.5	19.5	—	24	5	8	8	17	9	0.5	2.5	70	±5
40	M12 X 1.25	60	20	—	31	6	11	11	22	13	0.75	4.4	160	
50/63	M16 X 1.5	71.5	22	—	41	7.5	14	13.5	27	15	1.0	11	300	
80/100	M20 X 1.5	101	28	31	59.5	11.5	24	16	32	18	2.0	18	1080	

Piston rod clevis GKM (ISO 8140)

Steel, zinc chromate plated

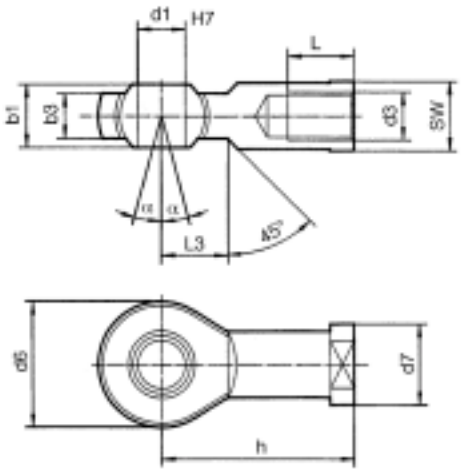
Bore (mm)	e	b	d	øf	L1	c	a
32	M10 X 1.25	10	40	10	52	20	20
40	M12 X 1.25	12	48	12	62	24	24
50/63	M16 X 1.5	16	64	16	83	32	32
80/100	M20 X 1.5	20	80	20	105	40	40



Piston rod ball joint KJ (ISO 8139)

Steel, zinc chromate plated

Bore (mm)	d3	d1	h	d6	b3	b1	L	d7	α	L3	SW
32	M10 X 1.25	10	43	28	10.5	14	20	19	13°	14	17
40	M12 X 1.25	12	50	32	12	16	22	22	13°	16	19
50/63	M16 X 1.5	16	64	42	15	21	28	27	15°	26	32
80/100	M20 X 1.5	20	77	50	18	25	33	34	15°	26	32



ISO Cylinder/Standard: Double Acting

Series C95K

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Standard C95KD [B] [32] — [100] [W] — [A53] [S]

Built-in magnet

Mounting

B	Basic/without bracket
L	Axial foot
F	Front flange
G	Rear flange
C	Single rear clevis
D	Double rear clevis
T	Centre trunnion

Bore size

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

Stroke (mm)
Refer to standard stroke table on p.6-12

Rod specifications

—	Stainless steel 1.4301 standard
W	double/through rod

Auto switch

—	Without auto switch

∗ Refer to table below for selection of applicable auto switch.

Number of auto switches

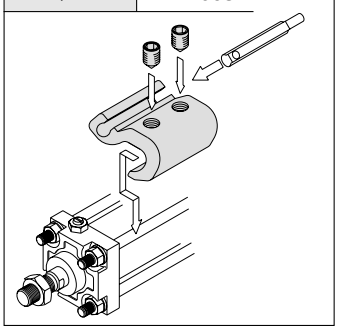
—	2
S	1
3	3
n	n

Applicable Auto Switches/Tie rod mounting

Style	Special function	Electrical entry	Indicator	Load voltage: Wiring (Output)	DC		AC	Auto switch model	Lead wire (m)∗: 0.5 (—)	3 (L)	5 (Z)	Applicable load		Mounting bracket
Reed switch	—	Grommet	Yes	3 wire (Equiv. to NPN)	—	5V	—	**A56**	●	●	—	IC	—	ø32,ø40 BT-03
				2 wire	24V	12V	—	**A53**	●	●	●	—	Relay PLC	
						5V,12V	100V,200V	**A54**	●	●	●			
			No			5V,12V	—	**A67**	●	●	—	IC		
						12V	200V or less	**A64**	●	●	—			
	Diagnosis indication (2 colour)		Yes			—	—	**A59W**	●	●	—	—		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	**F59**	●	●	○	IC	Relay PLC	ø50,ø63 BT-05
				3 wire (PNP)				**F5P**	●	●	○			
				2 wire	—	—	100V,200V	**J51**	●	●	○	—		
					24V	12V	—	**J59**	●	●	○			
	Diagnosis indication (2 colour)			3 wire (NPN)		5V,12V		**F59W**	●	●	○	IC		ø80,ø100 BT-06
				3 wire (PNP)				**F5PW**	●	●	○			
				2 wire		12V		**J59W**	●	●	○	—		
	Water resistant (2 colour)							**F5BA**	—	●	○			
	With timer			3 wire (NPN)		5V,12V		**F5NT**	—	●	○	IC		
	Diagnosis output (2 colour)			4 wire (NPN)				**F59F**	●	●	○			
	Latch diagnosis output (2 colour)					—		**F5LF**	●	●	○	—		

Table ①
Auto Switch Mounting Bracket for D-M9□

Bore size (mm)	Order No.
ø32, ø40	**BMB5-032**
ø50, ø63	**BA7-040**
ø80, ø100	**BA7-063**

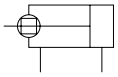


Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage: DC		AC	Auto switch model: Electrical entry direction: Vertical	Lateral	Lead wire length (m) Note): 0.5 (Nil)	3 (L)	5 (Z)	Applicable load		Mounting bracket
Reed switch	—	Grommet	Yes	3 wire	—	5V	—	—	**Z76**	●	●	—	IC circuit	—	ø32,ø40 BMB4-032
				2 wire	24V	—	100V	—	**Z73**	●	●	●	—	Relay PLC	
			No			5V, 12V	100V or less	—	**Z80**	●	●	—	IC circuit		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay PLC	ø50,ø63 BMB4-050
				3 wire (PNP)				**Y7PV**	**Y7P**	●	●	○			
				2 wire		12V		**Y69B**	**Y59B**	●	●	○	—		
	Diagnostic indication (2 colour indicator)			3 wire (NPN)		5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit		ø80,ø100 BA4-063
				3 wire (PNP)				**Y7PWV**	**Y7PW**	●	●	○			
				2 wire		12V		**Y7BWV**	**Y7BW**	●	●	○	—		
	Water resistant (2 colour indicator)							—	**Y7BA**	—	●	—			
	——	Connector and Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	**M9NV**	**M9N**	●	●	○	IC circuit	Relay PLC	See Table ①
				3 wire (PNP)				**M9PV**	**M9P**	●	●	○			
				2 wire		12V		**M9BV**	**M9B**	●	●	○			

∗ Lead wire length 0.5m····· — (Example: A53)
3m····· L (Example: A53L)
5m····· Z (Example: A53Z)

○: Manufactured upon receipt of order.

ISO Symbol
Double acting



Specifications

Bore size	ø32	ø40	ø50	ø63	ø80	ø100
Action	Double acting					
Fluid	Air					
Proof pressure	1.5MPa					
Max. operating pressure	1.0MPa					
Min. operating pressure	0.05MPa					
Ambient and fluid temperature	Without magnet –10 to 70°C (No freezing)					
	With magnet –10 to 60°C (No freezing)					
Lubrication	Not required (Non-lube)					
Operating piston speed	50 to 1000mm/s					
Allowable stroke tolerance	to 250: $^{+1.0}_{0}$, 251 to 1000: $^{+1.4}_{0}$					
Cushion	Both ends (Air cushion)(1)					
Thread tolerance	JIS class 2					
Port size	G1/8	G1/4	G1/4	G3/8	G3/8	G1/2
Mounting	Basic, axial direction foot, front flange, rear flange, single rear clevis, double rear clevis, centre trunnion, spherical bearing					

Non-rotating accuracy	ø32, ø40	±0.5°
	ø50, ø63	±0.5°
	ø80, ø100	±0.3°

Allowable rotating torque (Nm) max.	ø32	0.25	ø80	0.79
	ø40	0.45	ø100	0.93
	ø50, ø63	0.64	—	—

Note 1) Absorbable kinetic energy by cushion mechanism is identical to double acting single rod.

Minimum Strokes for Auto Switch Mounting

Refer to p.6-32 on "Minimum Strokes for Auto Switch Mounting".

Theoretical Force

OUT side is identical to double acting single rod.
Refer to table below for IN side.

Bore size (mm)	Rod diameter (mm^2)	Bore size (mm)	Rod diameter (mm^2)
32	675	**63**	2804
40	1082	**80**	4568
50	1651	**100**	7223

Theoretical force (N) =
Pressure (MPa) X Piston area (mm^2)

Standard Stroke

Bore size (mm)	Standard stroke (mm)	Max. * stroke
32	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	700
40	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	800
50	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
63	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
80	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
100	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000

Intermediate strokes are available.
* Please consult with SMC for longer strokes.

Weight

(kg)

Bore size (mm)		32	40	50	63	80	100
Basic weight	Basic	0.56	0.84	1.39	1.91	3.22	4.24
	Axial foot	0.16	0.20	0.38	0.46	0.89	1.09
	Flange	0.20	0.23	0.47	0.58	1.30	1.81
	Single clevis	0.16	0.23	0.37	0.60	1.07	1.73
	Double clevis	0.20	0.32	0.45	0.71	1.28	2.11
	Center trunnion	0.15	0.26	0.34	0.57	1.03	1.71
Additional weight per 50 stroke	All mounting brackets	0.11	0.16	0.26	0.27	0.42	0.56
Accessories	Single rod clevis	0.15	0.23	0.26	0.26	0.60	0.83
	Double rod clevis (with pin)	0.22	0.37	0.43	0.43	0.87	1.27

Calculation example: C95KD40-100
- Basic weight ····· 0.84 (Basic)
- Additional weight ··· 0.16/50 stroke
- Cylinder stroke ····· 100 stroke
- Mounting ····· 0.32 (Double clevis)

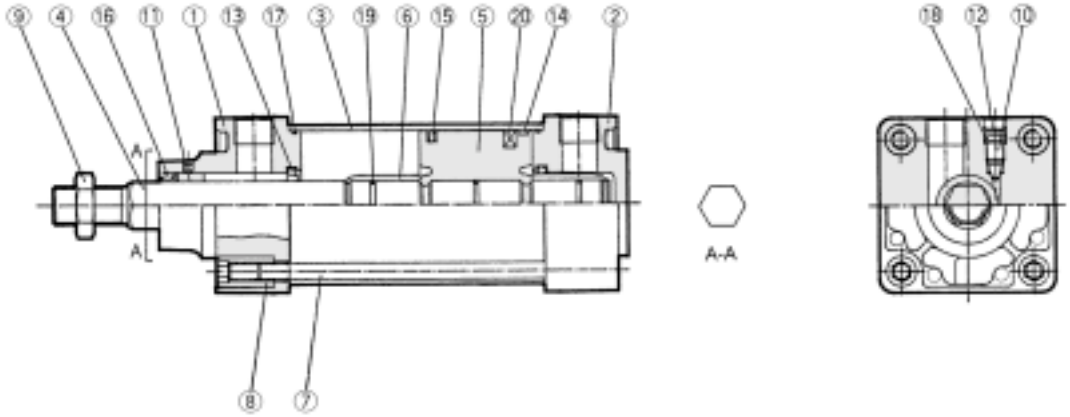
0.84+0.16 X 100/50+0.32=1.48kg

Part No: Mounting Bracket, Mounting Accessories

Description	Bore size	ø32	ø40	ø50	ø63	ø80	ø100
L	**Foot**(1)	L5032	L5040	L5050	L5063	L5080	L5100
F,G	**Flange**	F5032	F5040	F5050	F5063	F5080	F5100
C	**Single rear clevis**	C5032	C5040	C5050	C5063	C5080	C5100
D	**Double rear clevis**	D5032	D5040	D5050	D5063	D5080	D5100
DS	**Double rear clevis (for ES accessory)**	DS5032	DS5040	DS5050	DS5063	DS5080	DS5100
ES	**Angled rear clevis with ball joint**	ES5032	ES5040	ES5050	ES5063	ES5080	ES5100
E	**Angled rear clevis**	E5032	E5040	E5050	E5063	E5080	E5100
C95-S	**Trunnion pivot bracket**	C95-S03	C95-S04	C95-S04	C95-S06	C95-S06	C95-S10
GKM	**Rod clevis**	GKM12-20	GKM12-24	GKM16-32	GKM16-32	GKM20-40	GKM20-40
KJ	**Piston rod ball joint**	KJ10D	KJ12D	KJ16D	KJ16D	KJ20D	KJ20D
JA	**Floating joint**	JA30-10-125	JA40-12-125	JA40-16-150	JA50-16-150	JA80-20-150	JA100-20-150

Note 1) Two foot brackets required for one cylinder.
Note 2) Accessories for each mounting bracket are as follows.
Foot, Flange, Single clevis: Mounting bolts
Double rear clevis: (D,DS): Clevis pin
Note 3) C95-S: Set of 2 pcs.
Note 4) GKM according to ISO 8140
Note 5) KJ according to ISO 8139
Note 6) Piston rod nut is standard

Construction



Component Parts

No.	Description	Material	Note
①	**Rod cover**	Aluminum die cast	
②	**Head cover**	Aluminum die cast	
③	**Cylinder tube**	Aluminum die cast	
④	**Piston rod**	C45 anodised steel	
⑤	**Piston**	Aluminum die cast	
⑥	**Cushion ring**	Brass	
⑦	**Tie rod**	Steel	(chromated)
⑧	**Tie rod nut**	Steel	(chromated)
⑨	**Mounting nut**	Steel	(chromated)
⑩	**Cushion adjustment screw**	Steel	(chromated)
⑪	**Bushing**	Bronze bush	
⑫	**Serrated washer**	Steel	(chromated)
⑬	**Cushion seal**	PUR	

No.	Description	Material	Note
⑭	**Wearing**	Resin	
⑮	**Piston seal**	NBR	
⑯	**Rod seal/Gasket**	NBR	
⑰	**Cylinder tube gasket**	NBR	
⑱	**Cushion screw seal**	NBR	
⑲	**Piston gasket**	NBR	
⑳	**Magnet ring**		

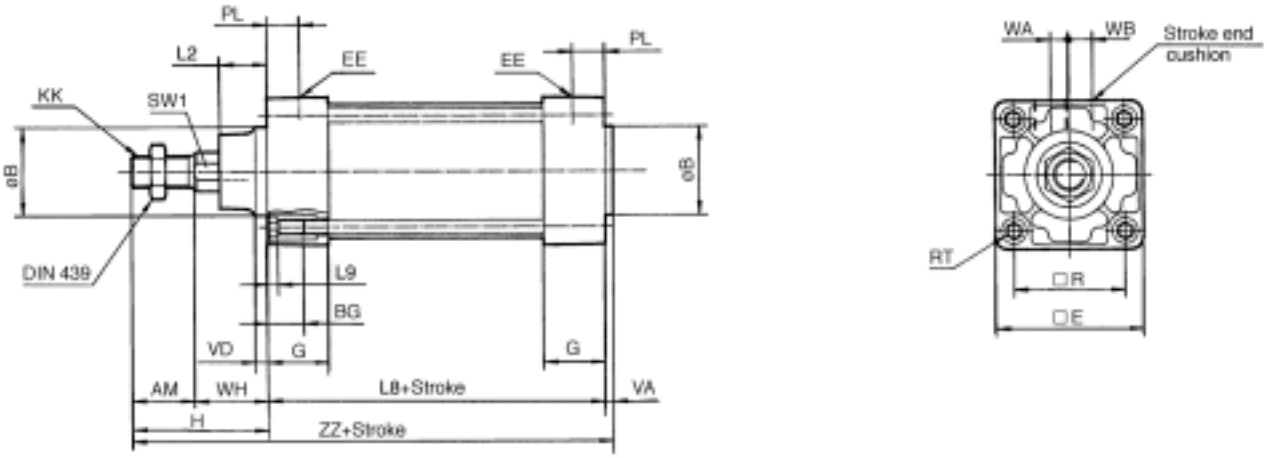
Seal Kits

Bore size (mm)	Kit No.	Contents
32	CS95-32	Kits include items 13 to 17 for ø32, 12 to 18 for ø40 to ø100 from the table above.
40	CS95-40	
50	CS95-50	
63	CS95-63	
80	CS95-80	
100	CS95-100	

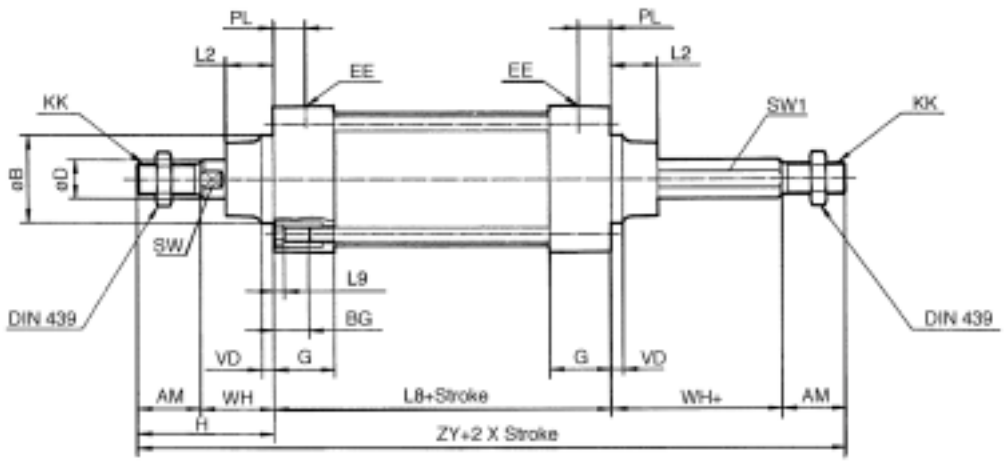
∗ Seal kits consist of items 13 to 17 for ø32, items 12 to 18 for ø40 to ø100 contained in one kit, and can be ordered using the order number for each respective tube bore size.

Without Mounting Bracket

C95KBø-Stroke



C95KBø-Stroke W



Bore size (mm)	AM	øB e11	øD	EE	PL	RT	KK	SW1	SW	G	BG	L8	VD	VA	WA	WB	WH	ZZ	ZY	□E	□R	L2	L9	H
32	22	30	12	G1/8	13	M6	M10 X 1.25	12.2	10	27	16	94	4	4	4	6.5	26	146	190	46	32.5	15	4	48
40	24	35	16	G1/4	14	M6	M12 X 1.25	14.2	13	27	16	105	4	4	4	9	30	163	213	52	38	17	4	54
50	32	40	20	G1/4	15.5	M8	M16 X 1.5	19	16	31.5	16	106	6	4	5	10.5	37	179	244	65	46.5	24	5	69
63	32	45	20	G3/8	16.5	M8	M16 X 1.5	19	16	31.5	16	121	6	4	9	12	37	194	259	75	56.5	24	5	69
80	40	45	25	G3/8	19	M10	M20 X 1.5	23	21	38	16	128	8	4	11.5	14	46	218	300	95	72	30	5	86
100	40	55	30	G1/2	19	M10	M20 X 1.5	27	21	38	16	138	8	4	17	15	51	233	320	114	89	32	5	91

∗ Refer to p.6-8 through 6-10 for dimensions with mounting bracket and accessories.

ISO Cylinder/Standard: Double Acting, Low Friction

Series C95Q

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Standard C95QD **B** **32** — **100** **R** **CA** — **A53** **S**

Built-in magnet

Mounting

B	Basic/without bracket
L	Axial foot
F	Front flange
G	Rear flange
C	Single rear clevis
D	Double rear clevis
T	Centre trunnion

Bore size

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

Stroke (mm)
Refer to standard stroke table on p.6-16

Rod specifications

—	Hard chrome as standard
R	Stainless steel piston rod
K	Stainless steel and acid-proof piston rod

Direction of low friction

CA	With pressure at head side
CB	With pressure at rod side

Auto switch

—	Without auto switch

∗ Refer to table below for selection of applicable auto switch.

Number of auto switches

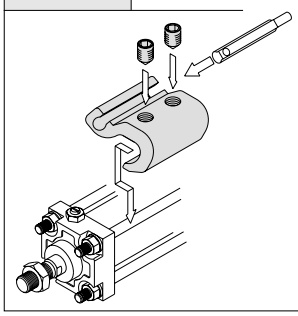
—	2
S	1
3	3
n	n

Applicable Auto Switches/Tie rod mounting

Style	Special function	Electrical entry	Indicator	Load voltage: Wiring (Output)	DC		AC	Auto switch model	Lead wire (m)∗ 0.5 (—)	3 (L)	5 (Z)	Applicable load		Mounting bracket
Reed switch	—	Grommet	Yes	3 wire (Equiv. to NPN)	—	5V	—	**A56**	●	●	—	IC	—	ø32,ø40 BT-03
				2 wire	24V	12V	—	**A53**	●	●	●	—	Relay PLC	
						5V,12V	100V,200V	**A54**	●	●	●			
			No			5V,12V	—	**A67**	●	●	—	IC		
						12V	200V or less	**A64**	●	●	—			
	Diagnosis indication (2 colour)		Yes			—	—	**A59W**	●	●	—	—		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	**F59**	●	●	○	IC	Relay PLC	ø50,ø63 BT-05
				3 wire (PNP)				**F5P**	●	●	○			
				2 wire	—	—	100V,200V	**J51**	●	●	○	—		
					24V	12V	—	**J59**	●	●	○			
	Diagnosis indication (2 colour)			3 wire (NPN)		5V,12V		**F59W**	●	●	○	IC		ø80,ø100 BT-06
				3 wire (PNP)				**F5PW**	●	●	○			
				2 wire		12V		**J59W**	●	●	○	—		
	Water resistant (2 colour)							**F5BA**	—	●	○			
	With timer			3 wire (NPN)		5V,12V		**F5NT**	—	●	○	IC		
	Diagnosis output (2 colour)							**F59F**	●	●	○			
	Latch diagnosis output (2 colour)			4 wire (NPN)		—		**F5LF**	●	●	○	—		

Table ①
Auto Switch Mounting Bracket for D-M9□

Bore size (mm)	Order No.
ø32, ø40	**BMB5-032**
ø50, ø63	**BA7-040**
ø80, ø100	**BA7-063**



Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage: DC		AC	Auto switch model: Electrical entry direction: Vertical	Lateral	Lead wire length (m) Note): 0.5 (Nil)	3 (L)	5 (Z)	Applicable load		Mounting bracket
Reed switch	—	Grommet	Yes	3 wire	—	5V	—	—	**Z76**	●	●	—	IC circuit	—	ø32,ø40 BMB4-032
				2 wire	24V	—	100V	—	**Z73**	●	●	●	—	Relay PLC	
			No			5V, 12V	100V or less	—	**Z80**	●	●	—	IC circuit		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay PLC	ø50,ø63 BMB4-050
				3 wire (PNP)				**Y7PV**	**Y7P**	●	●	○			
				2 wire		12V		**Y69B**	**Y59B**	●	●	○	—		
	Diagnostic indication (2 colour indicator)			3 wire (NPN)		5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit		ø80,ø100 BA4-063
				3 wire (PNP)				**Y7PWV**	**Y7PW**	●	●	○			
				2 wire		12V		**Y7BWV**	**Y7BW**	●	●	○	—		
	Water resistant (2 colour indicator)							—	**Y7BA**	—	●	—			
	——	Connector and Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	**M9NV**	**M9N**	●	●	○	IC circuit	Relay PLC	See Table ①
				3 wire (PNP)				**M9PV**	**M9P**	●	●	○			
				2 wire		12V		**M9BV**	**M9B**	●	●	○			

∗ Lead wire length 0.5m····· — (Example: A53)
3m····· L (Example: A53L)
5m····· Z (Example: A53Z)

○: Manufactured upon receipt of order.

Specifications

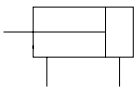
Bore size (mm)	32	40	50	63	80	100
Action	Double acting single rod					
Direction of low friction	One direction					
Fluid	Air					
Proof pressure	1.05MPa					
Max. operating pressure	0.7MPa					
Min. operating pressure	0.01MPa					
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing)					
	With auto switch: –10 to 60°C (No freezing)					
Lubrication	Not required (Non-lube)					
Cushion	None					
Port size	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8	G 1/2
Mounting	Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis, Centre trunnion, spherical bearing					

Standard Stroke

Bore size (mm)	Standard stroke (mm)	Max. * stroke
32	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	700
40	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	800
50	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
63	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
80	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000
100	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1000

Intermediate strokes are available.
* Please consult with SMC for longer strokes.

ISO Symbol
Double acting



Part No: Mounting Bracket, Mounting Accessories

Description	Bore size	ø32	ø40	ø50	ø63	ø80	ø100
L	**Foot**(1)	L5032	L5040	L5050	L5063	L5080	L5100
F,G	**Flange**	F5032	F5040	F5050	F5063	F5080	F5100
C	**Single rear clevis**	C5032	C5040	C5050	C5063	C5080	C5100
D	**Double rear clevis**	D5032	D5040	D5050	D5063	D5080	D5100
DS	**Double rear clevis (for ES accessory)**	DS5032	DS5040	DS5050	DS5063	DS5080	DS5100
ES	**Angled rear clevis with ball joint**	ES5032	ES5040	ES5050	ES5063	ES5080	ES5100
E	**Angled rear clevis**	E5032	E5040	E5050	E5063	E5080	E5100
C95-S	**Trunnion pivot bracket**	C95-S03	C95-S04	C95-S04	C95-S06	C95-S08	C95-S10
GKM	**Rod clevis**	GKM10-20	GKM12-24	GKM16-32	GKM16-32	GKM20-40	GKM20-40
KJ	**Piston rod ball joint**	KJ10D	KJ12D	KJ16D	KJ16D	KJ20D	KJ20D
JA	**Floating joint**	JA30-10-125	JA40-12-125	JA80-16-150	JA50-16-150	JAH50-20-150	JAH80-20-150

Note 1) Two foot brackets required for one cylinder.
Note 2) Accessories for each mounting bracket are as follows.
Foot, Flange, Single clevis: Mounting bolts
Double rear clevis: (D,DS): Clevis pin
Note 3) C95-S: Set of 2 pcs.
Note 4) GKM according to ISO 8140
Note 5) KJ according to ISO 8139
Note 6) Piston rod nut is standard

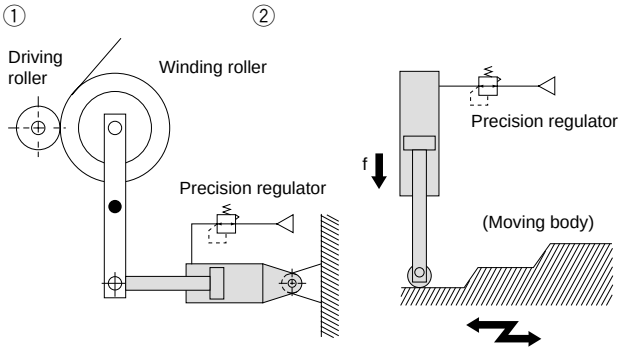
Selection Guide for the Low Friction Side

① When used as a balancer etc., follow the example of the application mentioned earlier applying pressure at one port while leaving the other port open to atmosphere.
With pressure at rod cover port
····· Low friction side CB (Example of application ①)
With pressure at head cover port
····· Low friction side CA (Example of application ②)
In both cases, as long as the outside pressure moves the piston rod, low friction can result in the direction of extension and retraction.

② When used applying pressure to both ports the same time, follow theabove mentioned guide and as in the following.
With relatively higher pressure on rod cover port
·····Use Low friction side CB
With relatively higher pressure on head cover port
·····Use Low friction side CA

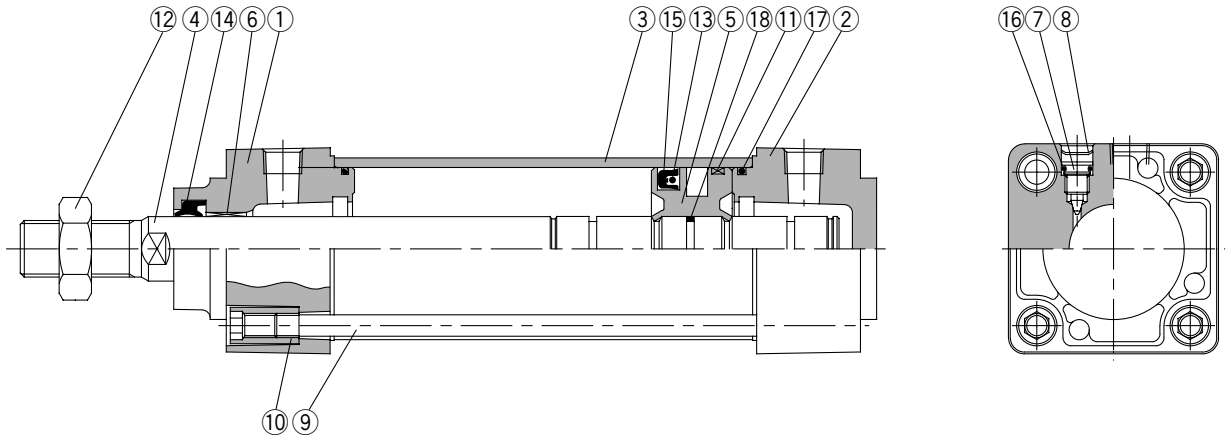
Application Example

Low friction cylinder used in combination with precision regulator (Series IR)



For Dimensions, Weight, Accessories see C95S

Construction



Component Parts

No.	Description	Material	Note
①	**Rod cover**	Aluminum die-cast	Metallic painted
②	**Head cover**	Aluminum die-cast	Metallic painted
③	**Cylinder tube**	Aluminum alloy	Hard anodized
④	**Piston rod**	Carbon steel	Hard chrome plated
⑤	**Piston**	Aluminum alloy	Chromated
⑥	**Bushing**	Lead bronze cast	
⑦	**Cushion valve**	Steel wire	Nickel plated
⑧	**Snap ring**	Steel for spring	ø40 to ø100
⑨	**Tie rod**	Carbon steel	Uni-chromated
⑩	**Tie rod nut**	Carbon steel	Nickel plated
⑪	**Wear rod**	Resin	
⑫	**Rod end nut**	Carbon steel	Nickel plated
⑬ *	**Back up O ring**	NBR	
⑭ *	**Rod seal**	NBR	
⑮ *	**Piston seal**	NBR	
⑯	**Cushion valve seal**	NBR	
⑰ *	**Cylinder tube gasket**	NBR	
⑱	**Piston gasket**	NBR	

Replacement Parts: Seal Kits

Bore (mm)	Kit No.	Contents
32	CQ95-32	Set of the No. ⑬, ⑭, ⑮, and ⑰.
40	CQ95-40	
50	CQ95-50	
63	CQ95-63	
80	CQ95-80	
100	CQ95-100	

∗ The seal kit includes 1 rod seal, 1 piston seal, and 2 tube gaskets.

Series C95P

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Standard C95PD [B] [32] — [100] — [A53] [S]

Built-in magnet

Mounting

B	Basic/without bracket
L	Axial foot
G	Rear flange
C	Single rear clevis
D	Double rear clevis

Bore size

50	50mm
63	63mm
80	80mm
100	100mm

Stroke (mm)
Refer to standard stroke table on p.6-4 maximum 300mm

Auto switch

—	Without auto switch

∗ Refer to table below for selection of applicable auto switch.

Number of auto switches

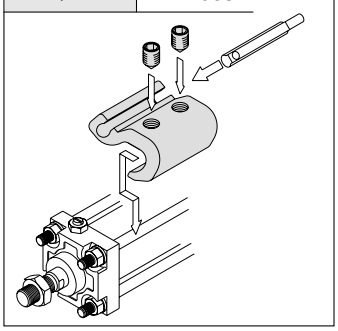
—	2
S	1
3	3
n	n

Applicable Auto Switches/Tie rod mounting

Style	Special function	Electrical entry	Indicator	Load voltage: Wiring (Output)	DC		AC	Auto switch model	Lead wire (m)∗: 0.5 (—)	3 (L)	5 (Z)	Applicable load		Mounting bracket
Reed switch	—	Grommet	Yes	3 wire (Equiv. to NPN)	—	5V	—	**A56**	●	●	—	IC	—	ø32,ø40 BT-03
				2 wire	24V	12V	—	**A53**	●	●	●	—	Relay PLC	
						5V,12V	100V,200V	**A54**	●	●	●			
			No			5V,12V	—	**A67**	●	●	—	IC		
						12V	200V or less	**A64**	●	●	—			
	Diagnosis indication (2 colour)		Yes			—	—	**A59W**	●	●	—	—		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	**F59**	●	●	○	IC	Relay PLC	ø50,ø63 BT-05
				3 wire (PNP)				**F5P**	●	●	○			
				2 wire	—	—	100V,200V	**J51**	●	●	○	—		
	Diagnosis indication (2 colour)				24V	12V	—	**J59**	●	●	○			ø80,ø100 BT-06
				3 wire (NPN)		5V,12V		**F59W**	●	●	○	IC		
				3 wire (PNP)				**F5PW**	●	●	○			
	Water resistant (2 colour)			2 wire		12V		**J59W**	●	●	○	—		
	With timer							**F5BA**	—	●	○			
	Diagnosis output (2 colour)			3 wire (NPN)		5V,12V		**F5NT**	—	●	○	IC		
	Latch diagnosis output (2 colour)			4 wire (NPN)		—		**F59F**	●	●	○			
								F5LF	●	●	○	—		

Table ①
Auto Switch Mounting Bracket for D-M9□

Bore size (mm)	Order No.
ø32, ø40	**BMB5-032**
ø50, ø63	**BA7-040**
ø80, ø100	**BA7-063**



Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage: DC		AC	Auto switch model: Electrical entry direction: Vertical	Lateral	Lead wire length (m) Note): 0.5 (Nil)	3 (L)	5 (Z)	Applicable load		Mounting bracket
Reed switch	—	Grommet	Yes	3 wire	—	5V	—	—	**Z76**	●	●	—	IC circuit	—	ø32,ø40 BMB4-032
				2 wire	24V	—	100V	—	**Z73**	●	●	●	—	Relay PLC	
			No			5V, 12V	100V or less	—	**Z80**	●	●	—	IC circuit		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay PLC	ø50,ø63 BMB4-050
				3 wire (PNP)				**Y7PV**	**Y7P**	●	●	○			
				2 wire		12V		**Y69B**	**Y59B**	●	●	○	—		
	Diagnostic indication (2 colour indicator)			3 wire (NPN)		5V, 12V	—	**Y7NWV**	**Y7NW**	●	●	○	IC circuit		ø80,ø100 BA4-063
				3 wire (PNP)				**Y7PWV**	**Y7PW**	●	●	○			
				2 wire		12V		**Y7BWV**	**Y7BW**	●	●	○	—		
	Water resistant (2 colour indicator)							—	**Y7BA**	—	●	—			
	——	Connector and Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	**M9NV**	**M9N**	●	●	○	IC circuit	Relay PLC	See Table ①
				3 wire (PNP)				**M9PV**	**M9P**	●	●	○			
				2 wire		12V		**M9BV**	**M9B**	●	●	○			

∗ Lead wire length 0.5m····· — (Example: A53)
3m····· L (Example: A53L)
5m····· Z (Example: A53Z)

○: Manufactured upon receipt of order.

Specifications

Application:
The positioner IP200 is capable of pneumatic positioning of the piston. Adjustable positions can be reached with high repeating accuracy. The piston stroke is in proportion to the air pressure input signal (0.02-0.01MPa). External forces on the position of the piston are reduced to a minimum by a special control system and an integrated function to revert the set position.
The IP200 shows excellent performance in remote control or standard control of flaps, proportioning devices, pumps, gears usw.

Specifications
- The bleed pressure acts directly onto the flapper plate. A change of the input signal will cause an instantaneous movement of the piston rod.
- easy and simple adjustment of neutral point and operation band from outside.
- Return spring is potected against accidental touches
- Positioner cylinder conforms to ISO and CETOP recommendations
- No change in dimensions with auto switch capability

Specifications

Fluid	Air 5μm filtration
Supply pressure "SUP" (MPa)	0.3 ~ 0.7
Signal pressure "SIG" (MPa)	0.02 ~ 0.1
Fluid temperature (ºC)	+5 to +60
Linearity	< 2%*
Hystereses	< 1%*
Repeatability	< 1%*
Sensitivity	< 1%*
Port size	G1/4
Gauge port	G1/8
Primary pressure	0.5% with 0.5MPa
Flow rate (l/min)	250 with 0.5MPa
Leakage	< 18 with 0.5MPa
Bore Size (mm)	40 to 100
Cylinder stroke (mm)	25 to 300
Standard stroke (mm)	50/100/150/200/250/300
Max. possible stroke (mm)	300

*different in % related to full span.

Part No: Mounting Bracket, Mounting Accessories

Description	ø50	ø63	ø80	ø100
L	L5050	L5063	L5080	L5100
F,G	F5050	F5063	F5080	F5100
C	C5050	C5063	C5080	C5100
D	D5050	D5063	D5080	D5100
DS	DS5050	DS5063	DS5080	DS5100
ES	ES5050	ES5063	ES5080	ES5100
E	E5050	E5063	E5080	E5100
GKM	GKM16-32	GKM16-32	GKM20-40	GKM20-40
KJ	KJ16D	KJ16D	KJ20D	KJ20D
JA	JA50-16-150	JA50-16-150	JAH50-20-150	JAH50-20-150

Note 1) Two foot brackets required for one cylinder.
Note 2) Accessories for each mounting bracket are as follows.
Foot, Flange, Single clevis: Mounting bolts
Double rear clevis: (D,DS): Clevis pin
Note 3) GKM according to ISO 8140
Note 4) KJ according to ISO 8139
Note 5) Piston rod nut is standard

Weight accessories (kg)

Ø	50	63	80	100
L	0.38	0.46	0.89	1.09
F	0.47	0.58	1.30	1.81
C	0.37	0.60	1.07	1.73
D	0.45	0.71	1.28	2.11
E	0.42	0.52	0.94	1.40

Weight Table

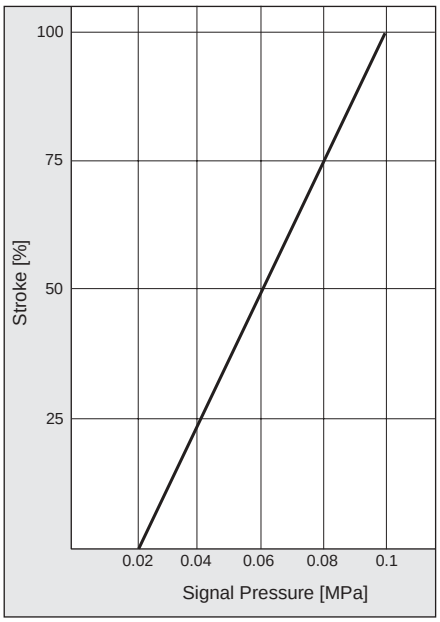
Weight (kg)					
	Ø	50	63	80	100
	B	2.27	2.79	4.11	5.13
Weight each 50mm stroke		0.32	0.33	0.48	0.62

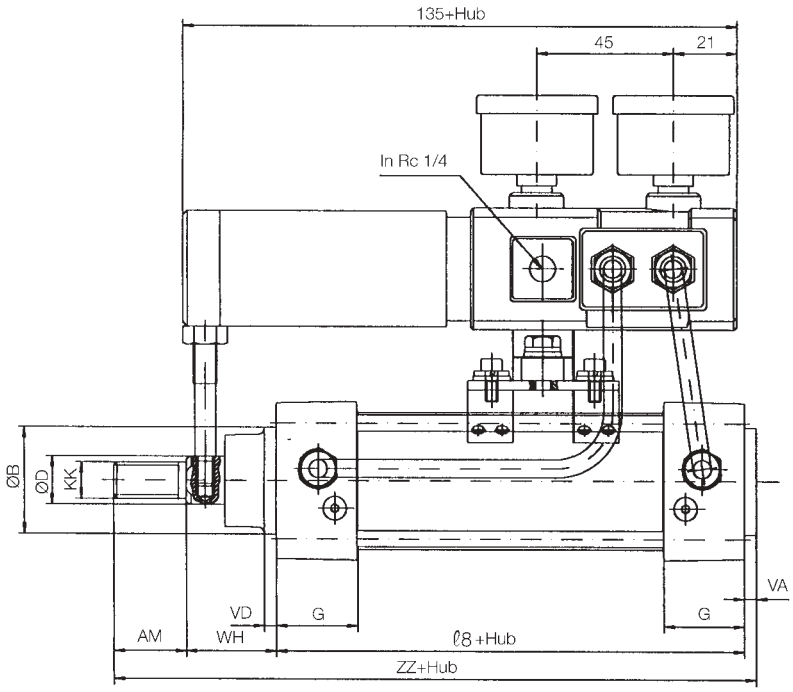
Example: C95PDB50-200
Cylinder Ø50mm, stroke 200mm
Bracket L
Weight = 2.72kg + (0.31kg x $\frac{200}{50}$) = 3.96kg

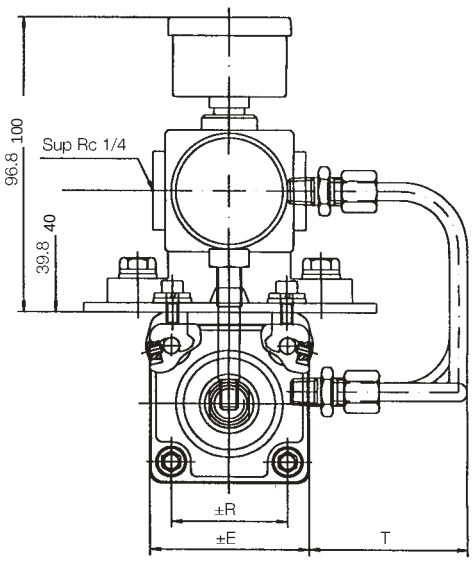
For dimensions of the brackets and accessories, please see C95S, page 1-206

Dimensions

Signal Pressure/Stroke Diagram







Ø	AM	ØB	ØD	±E	G	KK	l 8	±R	T	VA	VD	WH	ZZ
50	32	40	20	65	31.5	M16 x 1.5	106	46.5	53	4	6	37	179
63	32	45	20	75	31.5	M16 x 1.5	121	56.5	54	4	6	37	194
80	40	45	25	95	38	M20 x 1.5	128	72	54	4	8	46	218
100	40	55	30	114	38	M20 x 1.5	138	89	26	4	8	51	233

ISO Cylinder/Standard: Double Acting with Lock

Series C95N

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Standard C95ND [B] [32] — [100] [W] — [A53] [S]

Built-in magnet

Mounting

B	Basic/without bracket
L	Axial foot
G	Rear flange
C	Single rear clevis
D	Double rear clevis
T	Trunion

Bore size

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

Stroke (mm)
Refer to standard stroke table on p.6-23.

Rod specifications

—	Hard chrome as standard
W	Double/through rod

Auto switch

—	Without auto switch

∗ Refer to table below for selection of applicable auto switch.

Number of auto switches

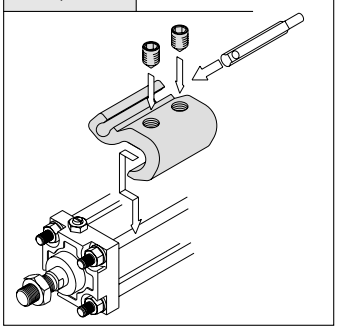
—	2
S	1
3	3
n	n

Applicable Auto Switches/Tie rod mounting

Style	Special function	Electrical entry	Indicator	Load voltage: Wiring (Output)	DC		AC	Auto switch model	Lead wire (m)∗: 0.5 (—)	3 (L)	5 (Z)	Applicable load		Mounting bracket
Reed switch	—	Grommet	Yes	3 wire (Equiv. to NPN)	—	5V	—	**A56**	●	●	—	IC	—	ø32,ø40 BT-03
				2 wire	24V	12V	—	**A53**	●	●	●	—	Relay PLC	
						5V,12V	100V,200V	**A54**	●	●	●			
			No			5V,12V	—	**A67**	●	●	—	IC		
						12V	200V or less	**A64**	●	●	—			
	Diagnosis indication (2 colour)		Yes			—	—	**A59W**	●	●	—	—		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	**F59**	●	●	○	IC	Relay PLC	ø50,ø63 BT-05
				3 wire (PNP)				**F5P**	●	●	○			
				2 wire	—	—	100V,200V	**J51**	●	●	○	—		
					24V	12V	—	**J59**	●	●	○			
	Diagnosis indication (2 colour)			3 wire (NPN)		5V,12V		**F59W**	●	●	○	IC		ø80,ø100 BT-06
				3 wire (PNP)				**F5PW**	●	●	○			
				2 wire		12V		**J59W**	●	●	○	—		
	Water resistant (2 colour)							**F5BA**	—	●	○			
	With timer			3 wire (NPN)		5V,12V		**F5NT**	—	●	○	IC		
	Diagnosis output (2 colour)			4 wire (NPN)				**F59F**	●	●	○			
	Latch diagnosis output (2 colour)					—		**F5LF**	●	●	○	—		

Table ①
Auto Switch Mounting Bracket for D-M9□

Bore size (mm)	Order No.
ø32, ø40	**BMB5-032**
ø50, ø63	**BA7-040**
ø80, ø100	**BA7-063**



Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage: DC		AC	Auto switch model: Electrical entry direction: Vertical	Lateral	Lead wire length (m) Note): 0.5 (Nil)	3 (L)	5 (Z)	Applicable load		Mounting bracket
Reed switch	—	Grommet	Yes	3 wire	—	5V	—	—	**Z76**	●	●	—	IC circuit	—	ø32,ø40 BMB4-032
				2 wire	24V	—	100V	—	**Z73**	●	●	●	—	Relay PLC	
			No			5V, 12V	100V or less	—	**Z80**	●	●	—	IC circuit		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay PLC	ø50,ø63 BMB4-050
				3 wire (PNP)				**Y7PV**	**Y7P**	●	●	○			
				2 wire		12V		**Y69B**	**Y59B**	●	●	○	—		
	Diagnostic indication (2 colour indicator)			3 wire (NPN)		5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit		ø80,ø100 BA4-063
				3 wire (PNP)				**Y7PWV**	**Y7PW**	●	●	○			
				2 wire		12V		**Y7BWV**	**Y7BW**	●	●	○	—		
	Water resistant (2 colour indicator)							—	**Y7BA**	—	●	—			
	——	Connector and Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	**M9NV**	**M9N**	●	●	○	IC circuit	Relay PLC	See Table ①
				3 wire (PNP)				**M9PV**	**M9P**	●	●	○			
				2 wire		12V		**M9BV**	**M9B**	●	●	○			

∗ Lead wire length 0.5m····· — (Example: A53)
3m····· L (Example: A53L)
5m····· Z (Example: A53Z)

○: Manufactured upon receipt of order.

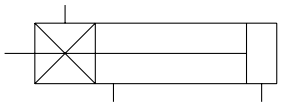
Series C95N
with lock

Cylinder Specifications

Bore Size [mm]	32, 40, 50, 63, 80, 100
Fluid	Air
Proof Pressure	1.5MPa
Max. operating pressure	1.0MPa
Min. operating pressure	0.08MPa
Piston speed	50 to 1000mm/s note)
Ambient and fluid temperature	Without autoswitch : -10ºC to 70ºC (without freezing) With autoswitch : -10ºC to 70ºC (without freezing)
Cushion	Double air side cushion
Stroke length tolerance	to 250: $^{+1.0}_{0}$, 251 to 1000: $^{+1.4}_{0}$
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.

Cylinder with lock



Lock Specifications

Lock actuation	Spring lock (exhaust lock)
Unlocking pressure	≥0.25MPa
Locking pressure	≥0.20MPa
Max. operating pressure	1.0MPa
Locking direction	2 Two-way

Standard Stroke

Bore Size [mm]	Standard Stroke [mm]	Max. Stroke*
32	25,50,75,100,125,150,175,200,250,300,350,400,450,500	700
40	25,50,75,100,125,150,175,200,250,300,350,400,450,500	800
50	25,50,75,100,125,150,175,200,250,300,350,400,450,500,600	1000
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	

Intermediate strokes are available.
* Please consult with SMC for longer strokes.

Stopping Accuracy

[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
Load weight ..... Upper limit of allowable value
Solenoid valve for locking mounted on the locking por
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]	552	882	1370	2160	3430	5390

C95N Cylinder

Part No: Mounting Bracket, Mounting Accessories

Description	Bore size	ø32	ø40	ø50	ø63	ø80	ø100
L	Foot(1)	L5032	L5040	L5050	L5063	L5080	L5100
F, G	Flange	F5032	F5040	F5050	F5063	F5080	F5100
C	Single rear clevis	C5032	C5040	C5050	C5063	C5080	C5100
D	Double rear clevis	D5032	D5040	D5050	D5063	D5080	D5100
DS	Double rear clevis (for ES accessory)	DS5032	DS5040	DS5050	DS5063	DS5080	DS5100
ES	Angled rear clevis with ball joint	ES5032	ES5040	ES5050	ES5063	ES5080	ES5100
E	Angled rear clevis	E5032	E5040	E5050	E5063	E5080	E5100
C95-S	Trunnion pivot bracket	C95-S03	C95-S04	C95-S04	C95-S06	C95-S06	C95-S10
GKM	Rod clevis	GKM10-20	GKM12-24	GKM16-32	GKM16-32	GKM20-40	GKM20-40
KJ	Piston rod ball joint	KJ10D	KJ12D	KJ16D	KJ16D	KJ20D	KJ20D
JA	Floating joint	JA30-10-125	JA40-12-125	JA50-16-150	JA50-16-150	JA#50-20-150	JA#50-20-150

Note 1) Two foot brackets required for one cylinder.
Note 2) Accessories for each mounting bracket are as follows:Foot, Flange, Single clevis: Mounting bolts
Double rear clevis: (D,DS): Clevis pin
Note 3) C95-S: Set of 2 pcs.
Note 4) GKM according to ISO 8140
Note 5) KJ according to ISO 8139
Note 6) Piston rod nut is standard

Single Rod Weight Table

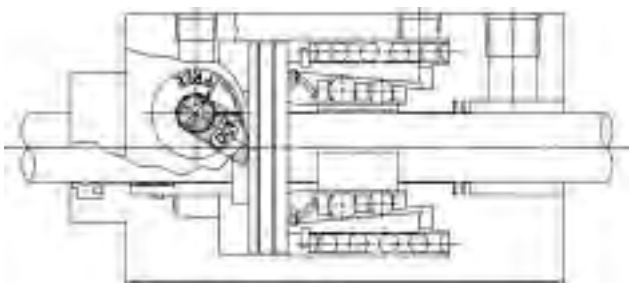
[kg]

Bore Size [mm]		32	40	50	63	80	100
Basic weight	Basic type B	1.40	2.15	3.53	5.18	8.99	12.72
	Trunnion T	0.15	0.26	0.34	0.57	1.03	1.71
Additional weight per 50mm of stroke	All mounting brackets	0.11	0.16	0.26	0.27	0.42	0.56

(Example) C95NDB32-100 (Standard, Ø32, 100er)
•Basic weight..... 1.40 (basic type, Ø32)
•Additional weight ..... 0.11/50mm stroke
•Cylinder stroke ..... 100mm stroke
1.40 + 0.11 x 100/50 = 3.02kg

Manual override for unlocking

In case the air supply is cut off or discharged, unlocking can be performed with a commercially available tool. The fail safe mechanism locks again when manual override is released.



Weight accessories [kg]

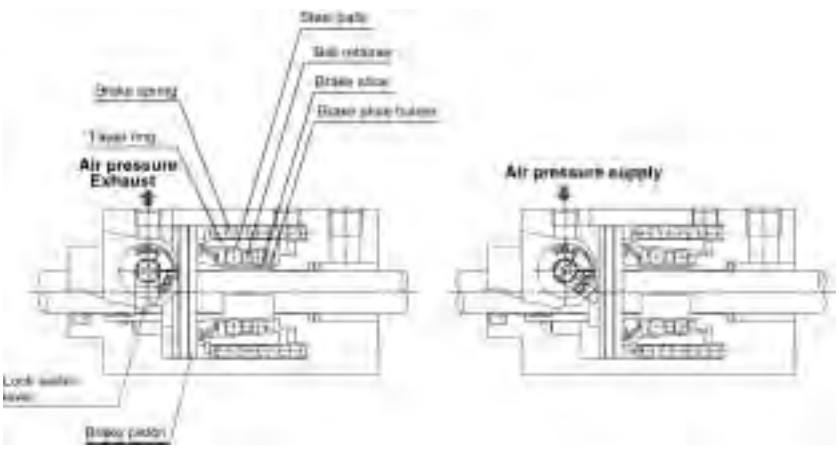
Ø	32	40	50	63	80	100
L	0.16	0.20	0.38	0.46	0.89	1.09
F	0.20	0.23	0.47	0.58	1.30	1.81
C	0.16	0.23	0.37	0.60	1.07	1.73
D	0.20	0.32	0.45	0.71	1.28	2.11

Example:

Cylinder Ø40 mm, Stroke 100 mm, bracket D

Weight = 0.84 kg + (0.16 kg x $\frac{100}{50}$) + 0.32 kg = 1.48 kg

Construction Principles



Locked condition

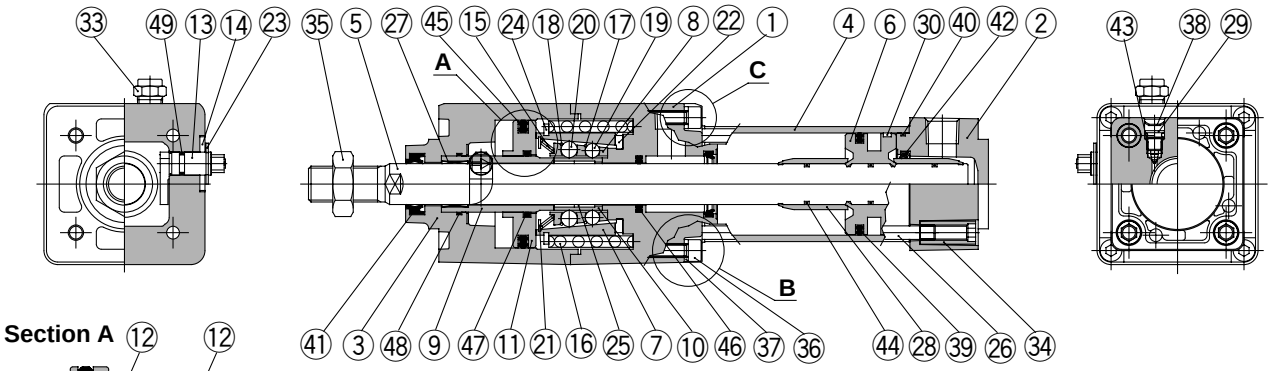
Unlocked condition

Spring lock (exhaust lock)

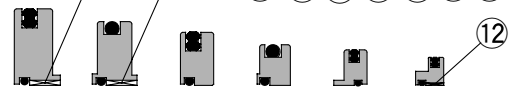
The spring force which acts upon the taper ring is magnified by a wedge effect, and is conveyed to all of the numeous steel balls which are arranged in two crcles. These act on the brake shoe holder and brake, which locks the piston rod by tightening against it with a large force.

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



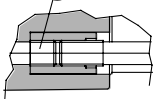
Section A 12 12



Ø100 Ø80 Ø63 Ø50 Ø40 Ø32

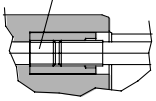
with through piston rod

Section B 31



Ø80, Ø100

Section C 32



Ø80, Ø100

Parts list

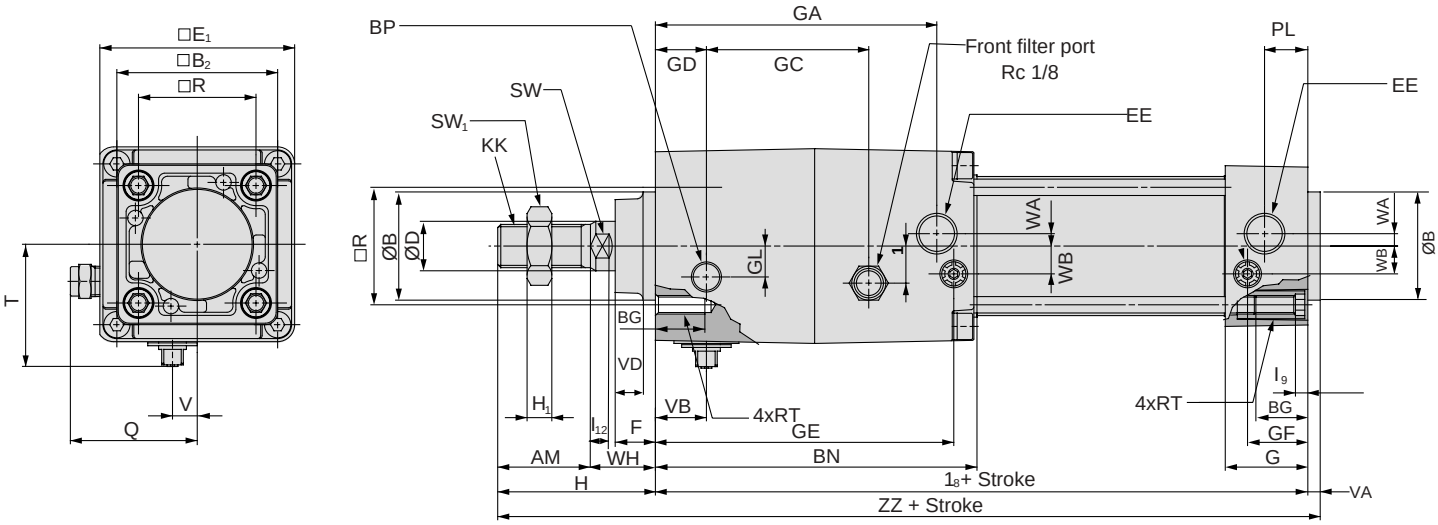
No.	Description		Material	Note
①	**Rod cover**		Aluminium alloy	Hard annodised & metallic coated
②	**Head cover**		Aluminium alloy	Chromated & metallic coated
③	**Cover**		Aluminium alloy	Hard annodised & metallic coated
④	**Cylinder tubing**		Aluminium alloy	Hard annodised
⑤	**Piston rod**		Carbon steel	Hard chrome plated
⑥	**Piston**		Aluminium 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**		Carbon steel	Heat treated
⑪	**Release piston**	Ø40	Aluminium alloy	Hard annodised
		Ø50		
		Ø63		
		Ø32	Carbon steel	Zinc chromated
		Ø80		
		Ø100		
⑫	**Release piston bushing**		Steel + special resin	Ø32, Ø80, Ø100 only
⑬	**Unlocking cam**		Carbon steel	Glossy chromated
⑭	**Washer**		Carbon steel	Black zinc chromated
⑮	**Retainer pre-load spring**		Carbon steel	Zinc chromated
⑯	**Brake spring**		Carbon steel	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	**Damper**		Polyurethane rubber	
㉓	**C type retaining ring for unlocking cam shaft**		Carbon steel	
㉔	**C type retaining ring for taper ring**		Carbon steel	
㉕	**Brake shoe**		Special friction material	
㉖	**Tie rod**		Carbon steel	Chromated
㉗	**Bushing**		Lead-bronze casting	
㉘	**Cushion ring**		Brass	

Parts list

No.	Description	Material	Note
㉙	**Cushion valve**	Carbon steel	Nickel plated
㉚	**Wear ring**	PUR	
㉛	**Unit holding tie-rod A**	Carbon steel	Chromated Ø80, Ø100 only
㉜	**Unit holding tie-rod B**	Carbon steel	Chromaed Ø80, Ø100 only
㉝	**BC element**		
㉞	**Tie-rod nut**	Carbon steel	Nickel plated
㉟	**Rod end nut**	Carbon steel	Nickel plated
㊱	**Hexagon socket head cap screw**	Carbon steel	Nickel plated Ø32, Ø63 only
㊲	**Spring washer for hex. socket head cap screw**	Carbon steel	Nickel plated Ø32, Ø63 only
㊳	**Retaining ring**	Carbon steel	
㊴	**Piston seal**	NBR	
㊵	**Cylinder tube gasket**	NBR	
㊶	**Rod seal A**	NBR	
㊷	**Cushion seal**	NBR	
㊸	**Cushion valve seal**	NBR	
㊹	**Piston gasket**	NBR	
㊺	**Release piston gasket**	NBR	
㊻	**Rod seal B**	NBR	
㊼	**Release piston gasket**	NBR	
㊽	**Piston guide gasket**	NBR	
㊾	**Unlocking cam gasket**	NBR	

Dimensions

Basic type (B)

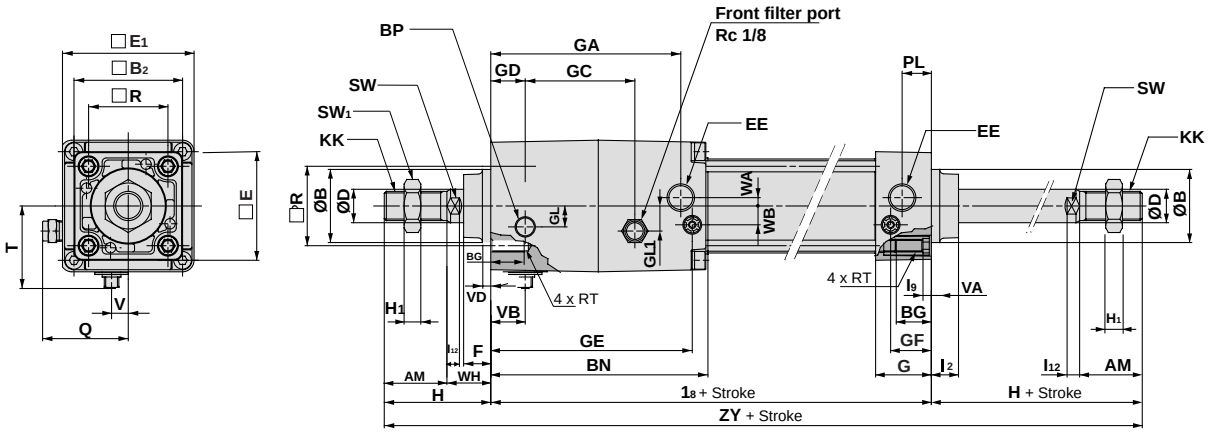


Bore size (mm)	AM	ØBe 11	□B2	BG	BN	BP	ØD	EE	□E	□E1	F	G	GA	GC	GD	GE	GF	GL	GL1	H	H1
32	22	30	46	16	97	G1/8	12	G1/8	46	54	13	27	83	45.5	13	88.5	18.3	7.5	12	48	6
40	24	35	52	16	104	G1/8	16	G1/4	52	63	13	27	91	52.5	16.5	96.5	19.5	10	12	54	8
50	32	40	65	16	120.5	G1/4	20	G1/4	65	75	14	31.5	104.5	58.5	19	111.2	22.4	11.5	15	69	11
63	32	45	75	16	134.5	G1/4	20	G3/8	75	90	14	31.5	119.5	68	23	123.5	20.7	17.5	12	69	11
80	40	45	95	16	169	G1/4	25	G3/8	95	102	20	38	150	81	33	157	26	22	18	86	13
100	40	55	114	16	189	G1/4	30	G1/2	114	116	20	38	170	96	37.5	177	26	25	20	91	16

Bore size (mm)	KK	I8	I9	I12	PL	Q	□R	RT	SW	SW1	T	V	VA	VB	VD	WA	WB	WH	ZZ
32	M10 x 1.25	164	4	6	13	37	32.5	M6	10	17	34	6.5	4	13	4	4	6.5	26	216
40	M12 x 1.25	182	4	6.5	14	41.5	38	M6	13	19	39.5	8	4	16.5	4	4	9	30	240
50	M16 x 1.5	195	5	8	15.5	47.5	46.5	M8	16	24	47	9	4	20	6	5	10.5	37	268
63	M16 x 1.5	224	5	8	16.5	55	56.5	M8	16	24	55.5	8.5	4	23	6	9	12	37	297
80	M20 x 1.5	259	5	10	19	61	72	M10	21	30	61.5	10.5	4	33	8	11.5	14	46	349
100	M20 x 1.5	289	5	10	19	68	89	M10	21	30	69.5	10.5	4	37.5	8	17	15	51	384

Dimensions

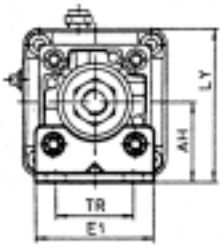
Double Rod (Option W)



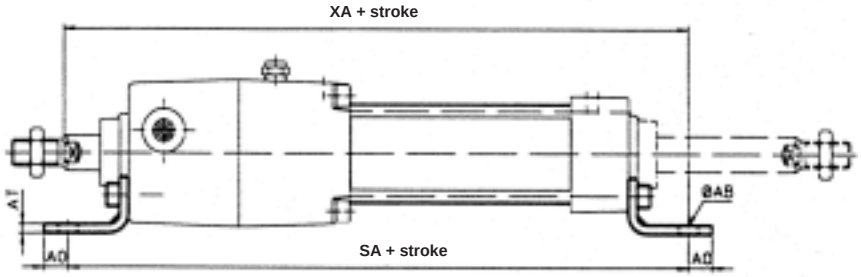
Bore size (mm)	AM	ØBe 11	□B_2	BG	BN	BP	ØD	EE	□E	□E_1	F	G	GA	GC	GD	GE	GF	GL	GL_1	H	H_1
32	22	30	46	16	97	G1/8	12	G1/8	46	54	13	27	83	45.5	13	88.5	18.3	7.5	12	48	6
40	24	35	52	16	104	G1/8	16	G1/4	52	63	13	27	91	52.5	16.5	96.5	19.5	10	12	54	8
50	32	40	65	16	120.5	G1/4	20	G1/4	65	75	14	31.5	104.5	58.5	19	111.2	22.4	11.5	15	69	11
63	32	45	75	16	134.5	G1/4	20	G3/8	75	90	14	31.5	119.5	68	23	123.5	20.7	17.5	12	69	11
80	40	45	95	16	169	G1/4	25	G3/8	95	102	20	38	150	81	33	157	26	22	18	86	13
100	40	55	114	16	189	G1/4	30	G1/2	114	116	20	38	170	96	37.5	177	26	25	20	91	16

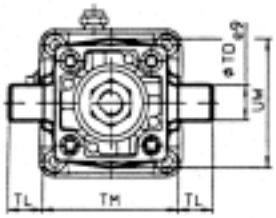
Bore size (mm)	KK	I_2	I_8	I_9	I_{12}	PL	Q	□R	RT	SW	SW_1	T	V	VA	VB	VD	WA	WB	WH	ZY
32	M10 x 1.25	15	164	4	6	13	37	32.5	M6	10	17	34	6.5	4	13	4	4	6.5	26	260
40	M12 x 1.25	17	182	4	6.5	14	41.5	38	M6	13	19	39.5	8	4	16.5	4	4	9	30	290
50	M16 x 1.5	24	195	5	8	15.5	47.5	46.5	M8	16	24	47	9	4	20	6	5	10.5	37	333
63	M16 x 1.5	24	224	5	8	16.5	55	56.5	M8	16	24	55.5	8.5	4	23	6	9	12	37	362
80	M20 x 1.5	30	259	5	10	19	61	72	M10	21	30	61.5	10.5	4	33	8	11.5	14	46	431
100	M20 x 1.5	32	289	5	10	19	68	89	M10	21	30	69.5	10.5	4	37.5	8	17	15	51	471

Dimensions Brackets on Cylinder

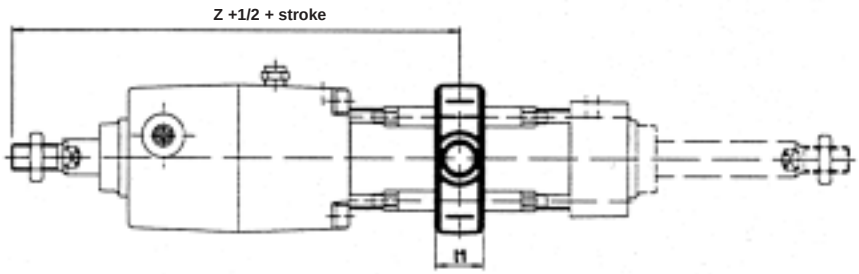


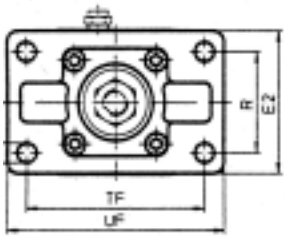
Axial Foot Type



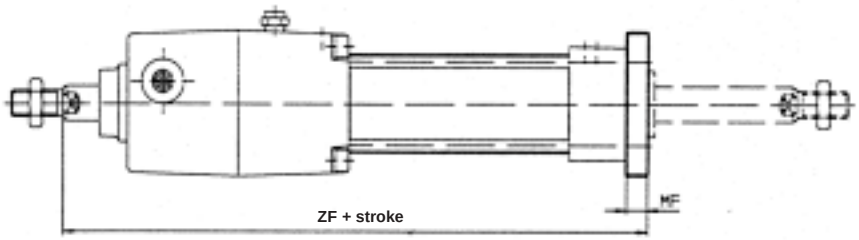


Trunnion Type

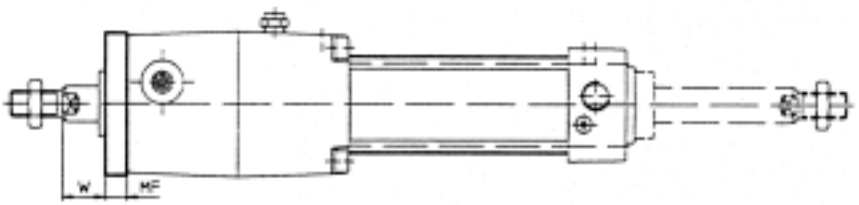




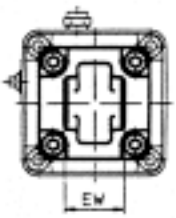
Rear Flange Type



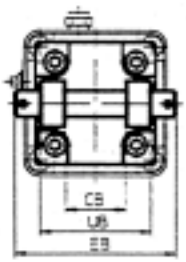
Front Flange Type

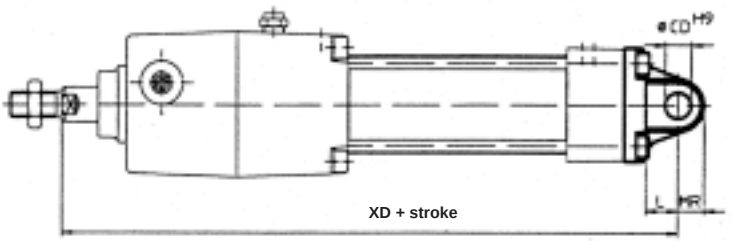


Single Clevis Type



Double Clevis Type





Bore size (mm)	Ø AB	AH	AD	AT	CB1)	ØCD H9	E1	E2	EB	EW 2)	ØFB	L	LY	MF	MR	R	SA	ØTD e9	TF	TL	TM
32	7	32	10	4	26	10	48	56	65	26	7	12	59	10	9.5	38	212	12	72	12	50
40	9	36	11	4	28	12	55	65	75	28	9	15	67.5	10	12	46	238	16	83	16	63
50	9	45	12	5	32	12	68	77	80	32	9	15	82.5	12	12	52	259	16	100	16	75
63	9	50	12	5	40	16	80	92	90	40	9	20	95	12	16	62	288	20	115	20	90
80	12	63	14	6	50	16	100	100	110	50	12	20	114	16	16	63	341	20	126	20	110
100	14	71	16	6	60	20	120	120	140	60	14	25	129	16	20	75	371	25	150	25	132

1) +0.03/+0.1 2) -0.2/-0.6

Bore size (mm)	TR	UB	UF	UW	W	XA	XD	Z	ZF	I1
32	32	45	87	49	16	214	212	165	200	18
40	36	52	101	58	20	240	237	183.5	222	22
50	45	60	120	71	25	264	259	211	244	24
63	50	70	135	87	25	293	293	232.5	273	28
80	63	90	153	110	30	346	341	281	321	34
100	75	110	178	136	35	381	381	311	356	40

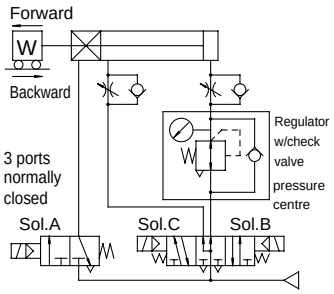
Specific Product Precaution

Air Pressure Circuits

⚠Warning

1. Basic Circuits

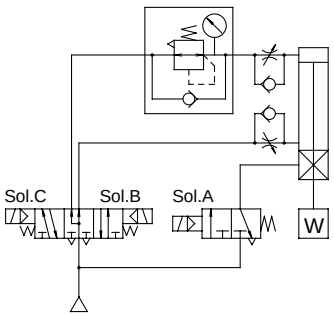
1. [Horizontal]



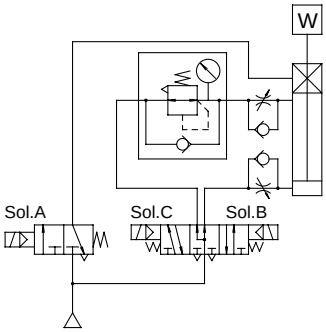
Sol.A	Sol.B	Sol.C	Action	
ON	ON	OFF	Forward	
OFF	OFF	OFF	Locked stop	0.5s or more
ON	OFF	OFF	Unlocked	0 to 0.5s
ON	ON	OFF	Forward	
ON	OFF	ON	Backward	
OFF	OFF	OFF	Locked stop	0.5s or more
ON	OFF	OFF	Unlocked	0 to 0.5s
ON	OFF	ON	Backward	

2. [Vertical]

[Load in direction of rod extension]

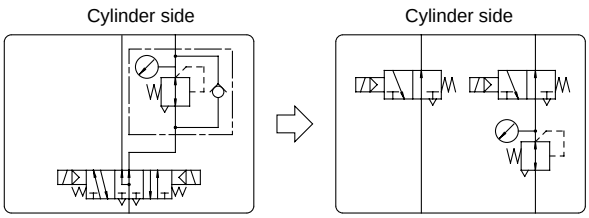


[Load in direction of rod retraction]



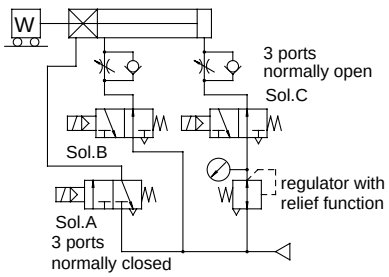
⚠Caution

1. A 3 position pressure centre solenoid valve and regulator with check valve can be replaced with two 3 port normally open valves and a regulator with relief function.



[Example]

1. [Horizontal]

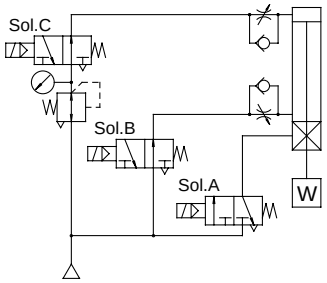


Air Pressure Circuits

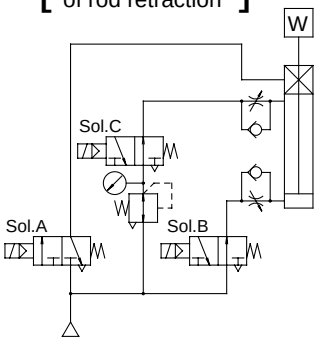
⚠Caution

2. [Vertical]

[load in direction of rod extension]



[Load in direction of rod retraction]



Manual Unlocking

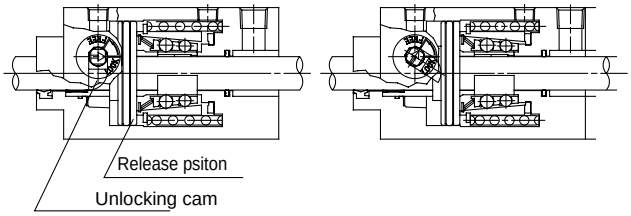
⚠Caution

1. The unlocking cam provided on the C95N Series is an emergency unlocking mechanism only.

During an emergency when the air supply is cut off, it is used to alleviate a problem by forcibly pushing the release piston back to release the lock. However, take note that the sliding resistance of the piston rod will be high compared to unlocking with air pressure.

2. When installing into equipment or machinery, etc., in cases where it will be necessary to hold an unlocked condition for an extended time, air pressure of 0.25MPa or more should be applied to the unlocking port.

3. Do not turn the unlocking cam (the arrow ⇐ on the unlocking cam head) past the FREE position. If it is turned too far there is a danger of damaging the unlocking cam.



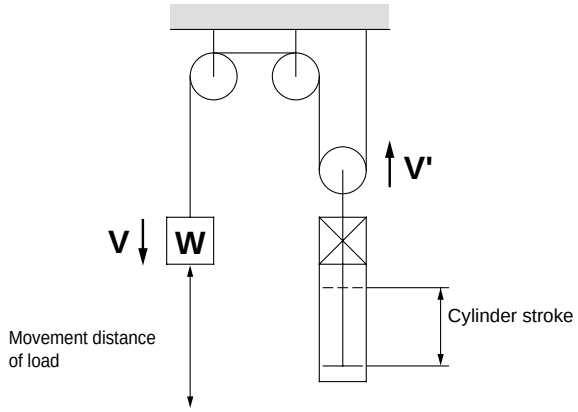
Locked condition　　Manually unlocked position

[Principle]
If the unlocking cam is turned counter clockwise with a tool such as an adjustable angle wrench, the release piston is pushed back and the lock is released. Since the lever will return to it's original position when released and become locked again, it should be held in this position for as long as unlocking is needed.

Precautions on Model Selection

⚠Caution

Example)



Selection Example

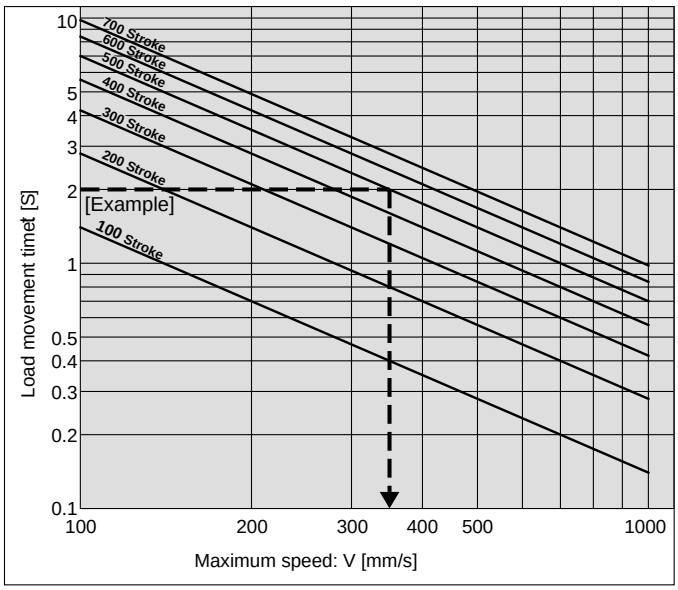
- **Load weight:** m=50kg
- **Movement distance:** Stroke=500mm
- **Movement time:** t=2s
- **Load condition:** Vertical downward=Load in direction of rod extension
- **Operating pressure:** P=0.4MPa

Step 1: From graph 1 find the maximum movement speed of the load
∴ Maximum speed V: approx 350mm/s

Step 2: Select graph 6 based upon the load condition and operating pressure, and then from the intersection of the maximum speed V=350mm/s found in step 1, and the load weight m=50kg
∴ **Ø63** →selecta C95NDB63 or larger bore size.

Step 1 Find the maximum load speed: V

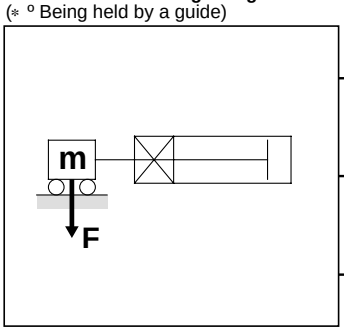
Graph 1



Step 2 Find the cylinder bore size

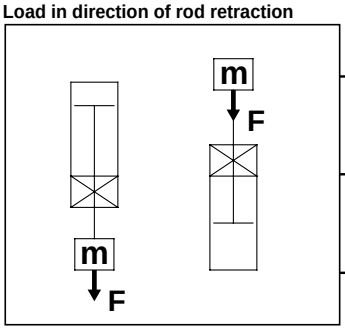
Load condition | Operating pressure

Direction of load at right angle to rod
(∗ º Being held by a guide)



- from 0.3MPa → **Graph 2**
- from 0.4MPa → **Graph 3**
- from 0.5MPa → **Graph 4**

Load in direction of rod extension
Load in direction of rod retraction

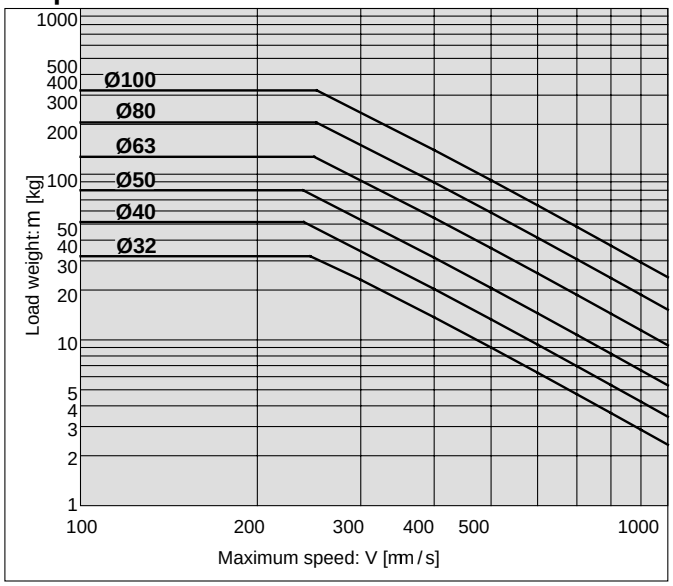


- from 0.3MPa → **Graph 5**
- from 0.4MPa → **Graph 6**
- from 0.5MPa → **Graph 7**

Selection Graphs

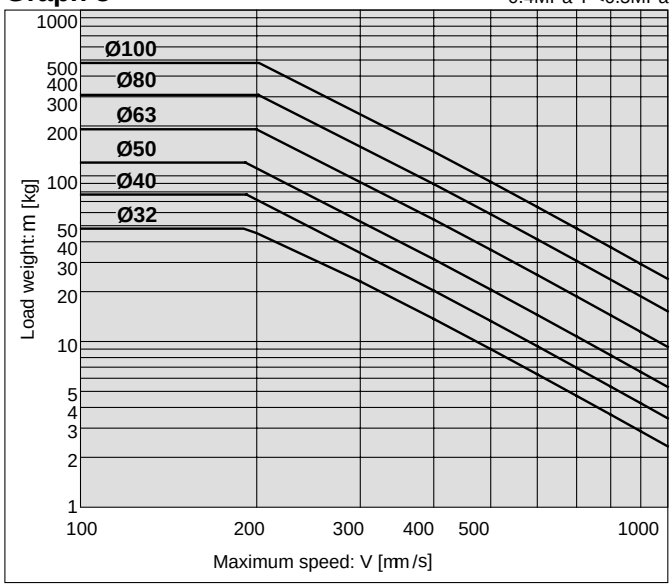
Graph 2

0.3MPa″ P<0.4MPa



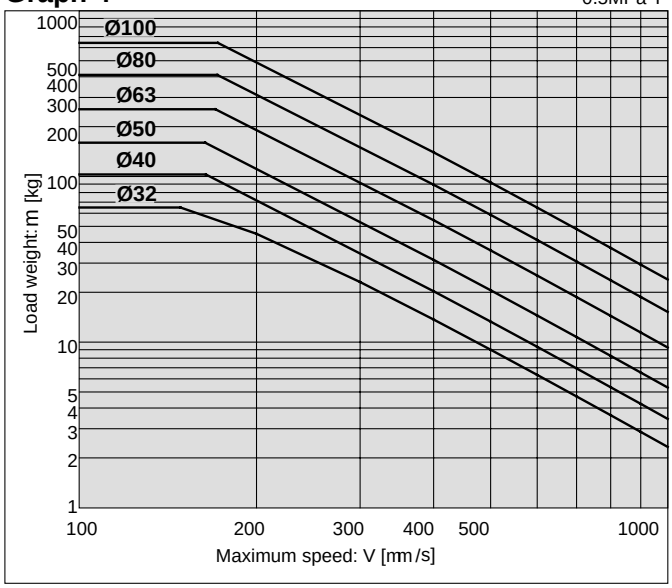
Graph 3

0.4MPa″ P<0.5MPa



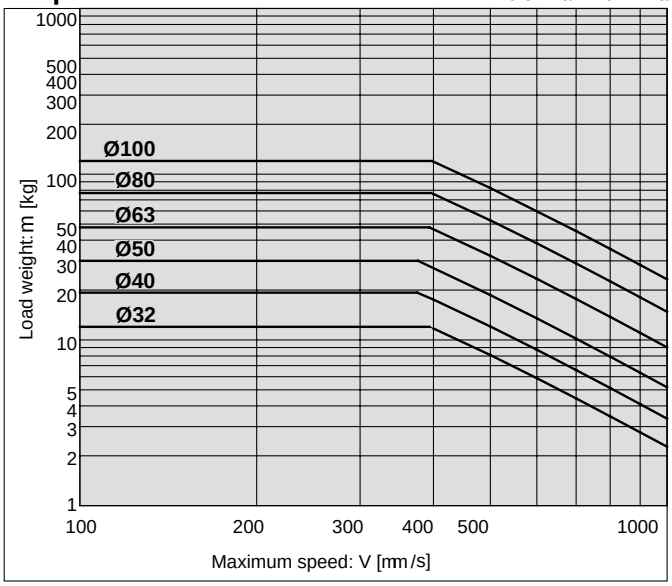
Graph 4

0.5MPa″ P



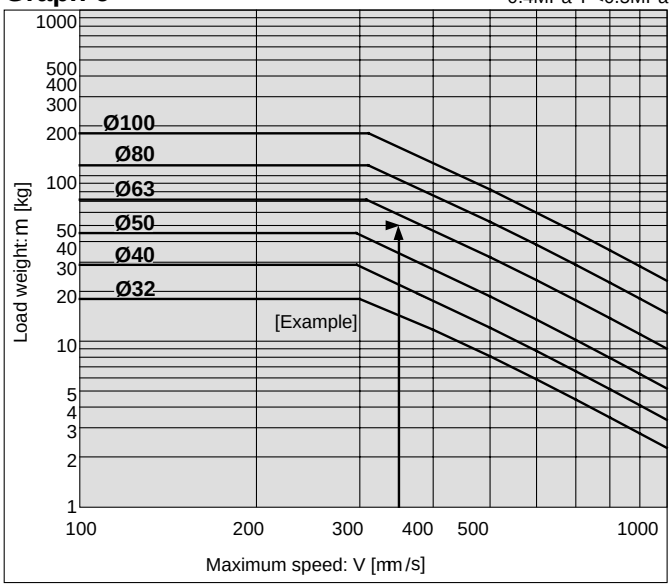
Graph 5

0.3MPa″ P<0.4MPa



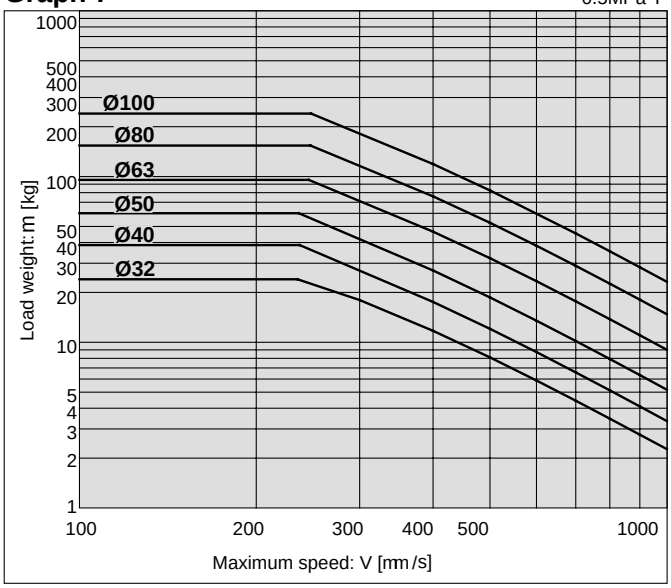
Graph 6

0.4MPa″ P<0.5MPa



Graph 7

0.5MPa″ P



Series C95
Auto Switch Specifications

Applicable Auto Switch

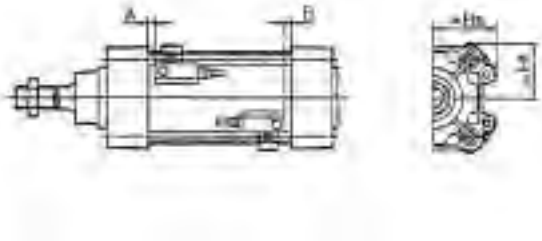
Style	Auto switch model	Electrical entry (function)
Reed switch	**D-A5□/A6**	Grommet
	D-A59W	Grommet (2 color indication)
Solid state switch	**D-F5□/J5**	Grommet
	D-F5□W/J59W	Grommet (2 color indication)
	D-F5BAL	Grommet (2 color indication, Water resistant)
	D-F5□F	Grommet (2 color indication, diagnostic output)
	D-F5NTL	Grommet (Timer)

Minimum Strokes for Auto Switch Mounting

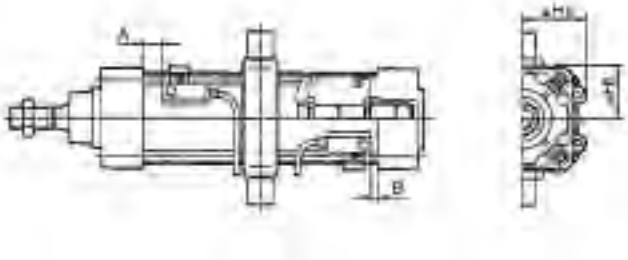
Style	Auto switch model	No. of auto switches	Support bracket except center trunnion						Center trunnion					
			ø32	**ø40**	**ø50**	**ø63**	**ø80**	**ø100**	**ø32**	**ø40**	**ø50**	**ø63**	**ø80**	**ø100**
Reed switch	**D-A5, D-A6**	2 (On different faces or same face)	15				20		60		80	105	110	115
		1												
	D-A59W	2 (On different faces or same face)	20				25		60	70	85	110	115	120
		1	15											
Solid state switch	**D-F5/J5**	2 (On different faces or same face)	15				25		60	70	85	110	115	120
		1	10											
	D-F5NTL	2 (On different faces or same face)	15				25		70	75	95	120	125	130
		1	10											
	D-F5□W D-J59W D-F5BAL D-F5□F D-F5LF	2 (On different faces or same face)	15				25		70	75	90	120	125	130
		1	10											

Auto Switch Mounting Position and Mounting Height

Reed switch



Solid state switch



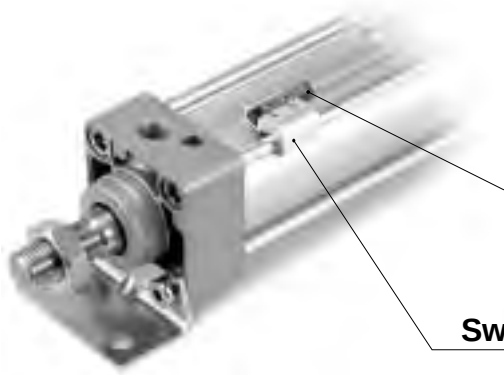
Auto Switch Mounting Position

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**
ø32	10.5	0	14.5	2	17	4.5	21	8.5	22	9.5
ø40	21.5	0	25.5	2	28	4.5	32	8.5	33	9.5
ø50	23	0	27	2.5	29.5	5	33.5	9	34.5	10
ø63	28	0	32	2.5	34.5	5	38.5	9	39.5	10
ø80	28	2.5	22	6.5	24.5	9	28.5	13	29.5	14
ø100	28	2.5	32	6.5	34.5	9	38.5	13	39.5	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**
ø32	24.5	35	25	32.5
ø40	27.5	38.5	27.5	36.5
ø50	34.5	43.5	34	41
ø63	39.5	48.5	39	46
ø80	46.5	55	46.5	52.5
ø100	55	62	55	59.5

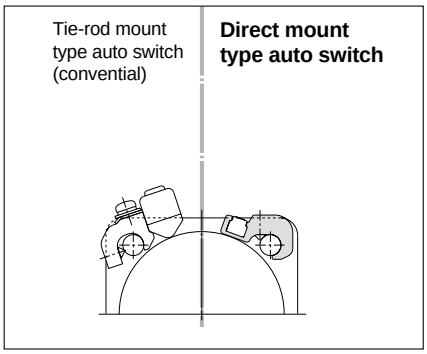
Direct mount auto switches can be installed on tie-rod type cylinders



Direct mount type auto switches can now be attached to the tie-rods by using a special switch mounting bracket.

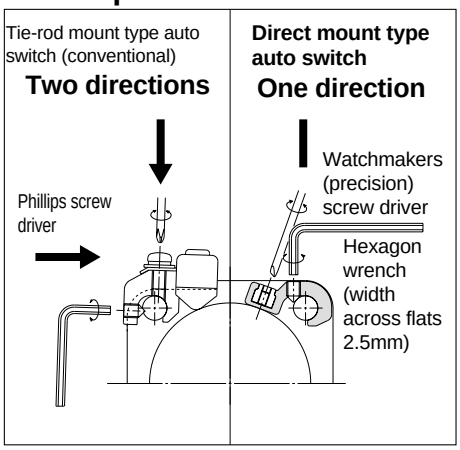
Smaller size

Protrusion of auto switches has been reduced



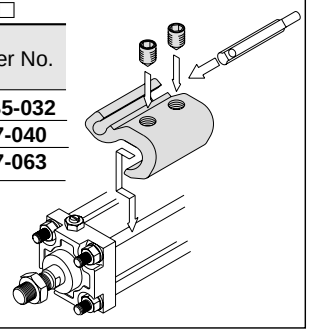
Easier handling

Auto switch mounting and positioning can be performed from one direction



Auto Switch Mounting Bracket for D-M9□

Bore size (mm)	Order No.
ø32, ø40	**BMB5-032**
ø50, ø63	**BA7-040**
ø80, ø100	**BA7-063**



Switch Mounting Bracket Models

Bore size [mm]	Mounting bracket model	Accessory	Auto switch
32, 40	**BMB4-032**	Screw (M4 x 6L) 2 pcs.	Reed-Switch D-Z7 D-Z80
50, 63	**BMB4-050**		Solid state D-Y5 D-Y6 D-Y7
80, 100	**BA4-063**		

Applicable Auto Switches

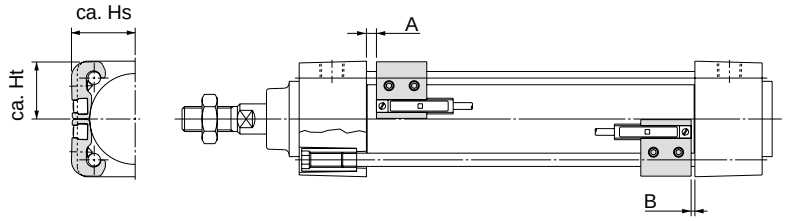
auto switch models		Model	Special function	Electrical Entry	Indicator light	Wiring (output)	Load voltage			Lead wire length [m]			Applicable loads	
Electrical entry direction							DC		AC	0.5 (–)	3 (L)	5 (Z)		
Vertical	In-line													
—	**Z76**	**Reed-Switch**	—	Grommet	Yes	3-wire	—	5V	—	●	●	—	IC	—
—	**Z73**					2-wire	24V	12V	100V	●	●	●	—	Relay, PLC
—	**Z80**				No			5V, 12V	100V	●	●	—	IC	
Y69A	**Y59A**	**Solid state Switch**	—	Grommet	Yes	3-wire (NPN)	24V	5V	—	●	●	○	IC	Relay, PLC
Y7PV	**Y7P**					3-wire (PNP)		12V		●	●	○		
Y69B	**Y59B**					2-wire		12V		●	●	○	—	
Y7NWV	**Y7NW**		Diagnostic indication (2-colour indicator)			3-wire (NPN)		5V		●	●	○	IC	
Y7PWV	**Y7PW**					3-wire (PNP)		12V		●	●	○		
Y7BWV	**Y7BW**					2-wire		12V		●	●	○	—	
—	**Y7BA**		Water resistant (2colour indicator)							—	●	—		
M9NV	**M9N**	**Solid state Switch**	—	Connector and Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	●	●	○	IC circuit	Relay PLC
M9PV	**M9P**					3 wire (PNP)				●	●	○		
M9BV	**M9B**					2 wire		12V		●	●	○		

∗ Lead wire length 0.5m····· — (Example: A53)
3m····· L (Example: A53L)
5m····· Z (Example: A53Z)

○: Manufactured upon receipt of order.

Auto Switches

How to install auto switches



Auto Switch mounting positions and dimensions [mm]

Bore Size [mm]	All models		D-Z7/Z8, D-Y5/Y7 (W)		D-Y6, D-Y7 (W) V		D-Y7BA	
	A	B	Hs	Ht	Hs	Ht	Hs	Ht
32	14	1.5	25.5	23	26.5	23	30	23
40	25	1.5	29.5	26	30	26	34	26
50	26.5	2	33.5	31	34.5	31	38	31
63	31.5	2	39	36	40	36	43	36
80	31.5	6	47.5	45	48.5	45	52	45
100	31.5	6	55.5	53.5	56.5	53.5	60	53.5

Auto switch operating ranges [mm]

Bore Size [mm]	D-Z7 D-Z8	D-Y5/Y7 (W) D-Y6/Y7 (W) V	D-Y7BA
32	7.5	5.5	3.5
40	8.5	5.5	3.5
50	7.5	7	3.5
63	9.5	7.5	4
80	9.5	6.5	4.5
100	10.5	5.5	5

Note) This is a standard including hysteresis, and is not guaranteed. (variations as much as 30%)
There may be large changes depending on the ambient environment.

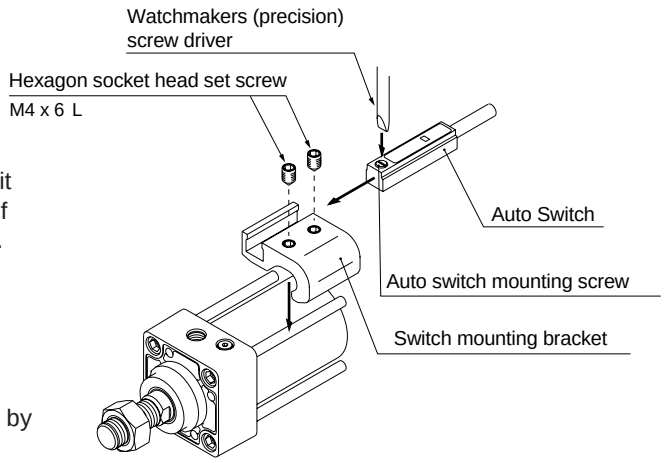
Minimum length [mm]

Auto Switch	with bracket T					
	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
D-Z7/Z8, D-Y5/Y7 (W)	80	85	90	90	95	100
D-Y6/Y7 (W) V	60	85	65	70	75	85
D-Y7BA	55	90	90	100	105	110

Mounting and Movement of Auto Switches

Caution!

When tightening the auto switch mounting screw, use a watchmakers screw driver with a handle diameter of about 5 to 6mm.
Furthermore, use a tightening torque of 0.05 to 0.1 Nm. As a rule, it should be turned about 90º from the point at which tightening can be felt. Use a tightening torque of 1 to 1.2 Nm for the hexagon socket head set screws (M4 x 0.7).



1. Place the mounting bracket on the cylinder tie-rod, and secure it in the detection position with the set screw so that the bottom of the mounting bracket makes firm contact with the cylinder tube. (Use a hexagon wrench)
2. Insert an auto switch into the switch mounting groove of the mounting bracket, and place it in the approximate auto switch mounting position.
3. After confirming the detection position, secure the auto switch by tightening the mounting screw which is included with it.
4. Return to step 2 to change the detection position.

Note) In order to protect the auto switch, install it so that its body is housed at least 15mm inside the switch mounting groove.

Series C95
Specific Product Precautions

Adjustment

⚠ Warning

① **Do not open the cushion valve above the stopper.**
Cushionvalves are provided with a crimp (ø32) or a retaining ring (ø40 to ø100) as a stopping mechanism, and the cushion valve should not be opened above that point.
If air is supplied and operation started without confirming the above condition, the cushion valve may be ejected from the cover.

Bore size (mm)	Cushion valve	Width across flats	Socket wrench
32, 40, 50	MB-32-10-C1247	2.5	JIS 4648 Hex spanner wrench 2.5
63, 80, 100	MB-63-10-C1250	4	JIS 4648 Hex spanner wrench 4

②**When replacing brackets, use the hexagon wrenches shown below.**

Bore size (mm)		Bolt	Width across flats	Tightening torque (Nm)
32, 40		MB-32-48-C1247	4	4.9
50, 63		MB-50-48-C1249	5	11
80, 100	Foot	MB-80-48AC1251	6	25
	Others	MB-80-48BC1251		

With Non-rotating Rod (Double Acting: Single Rod)

Operating Precautions

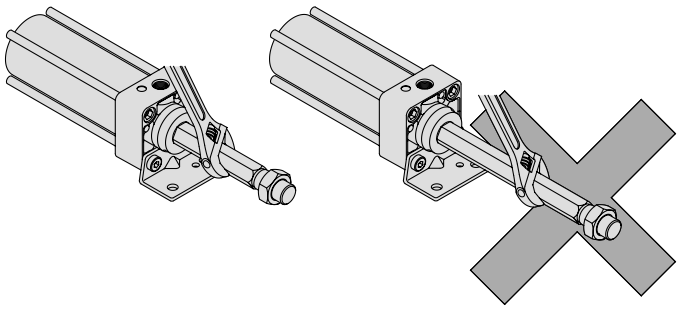
⚠ Caution

① **Do not apply more than the allowable rotating torque to the piston rod.**
If more than the allowable rotating torque is applied, the non-rotating guide will be deformed and there will be a significant loss of rotational accuracy. This may cause damage to the machinery.

Mounting & Piping

⚠ Caution

① **Mounting of a work piece at the rod end.**
When screwing a fitting or nut, etc. onto the threads at the end of the piston rod, push the piston rod into its fully retracted position, and grasp the protruding section with a wrench.
Furthermore, when tightening, take care that the torque is not applid to the non-rotating guide.



Made to Order Common Specifications
Standard Air Cylinder

Contact SMC for the detailed specifications, delivery and prices.

Standard Air Cylinder/Made to Order Common Specifications

Spec.	No.	Symbol	Specifications/Descriptions	Standard air cylinder									Page
				CJP	CJ2	CM2	CG1	MB	CA1	CS1	C95	CP95	
Made to order common specifications	①	-XA0 to A30	Change of rod end shape		■	■	■	■	■	■	(4)	(4)	CD
	②	-XB5	Oversized rod cylinder					■	■	■			
	③	-XB6	Heat resistant cylinder (150°C)	(1)	(2)	■	■	■	■	■	(4)	(4)	
	④	-XB7	Cold resistant cylinder	(3)	(2)	■	■						
	⑤	-XB9	Low speed cylinder (10 to 50 mm/s)	(1)	(1)	■	■						
	⑥	-XB10	Intermediate stroke (Exclusive body use)										
	⑦	-XB11	Long stroke										
	⑧	-XB12	External stainless steel			■							
	⑨	-XB13	Low speed cylinder (5 to 50 mm/s)		(1)	■	■	■					
	⑩	-XC3	Special port position		(1)	■		■	■	■			
	⑪	-XC4	With heavy duty scraper			■	■	■	■	■	■	■	
	⑫	-XC5	Heat resistant cylinder (110°C)			■		■	■	■			
	⑬	-XC6	Piston rod and rod end nut made of stainless steel			■	■	■	■	■			
	⑭	-XC7	Tie rod, cushion valve, tie rod nut, etc. made of stainless steel					■	■				
	⑮	-XC8	Adjustable stroke cylinder/Adjustable extend stroke		■	■	■	■	■	■			
	⑯	-XC9	Adjustable stroke cylinder/Adjustable retract stroke		■	■	■	■	■	■			
	⑰	-XC10	Dual stroke cylinder/Double rod		■	■	■	■	■	■			
	⑱	-XC11	Dual stroke cylinder/Single rod		■	■	■	■	■	■			
	⑲	-XC12	Tandem cylinder			■	■	■	■	■			
	⑳	-XC13	Auto switch rail mounting			■	■						
	㉑	-XC14	Change of trunnion bracket mounting position					■	■	■	■		
	㉒	-XC15	Change of tie rod length						■	■			
	㉓	-XC17	Pin cylinder with rod quenched	(3)									
	㉔	-XC18	NPT port			■	■	■	■	■			
	㉕	-XC20	Head cover axial port			■	■						
	㉖	-XC22	Fluorine rubber seals	■	■	■	■	■	■				
	㉗	-XC24	With magnet shielding plate										
	㉘	-XC25	Without Air cushion valve			■							
	㉙	-XC27	Double clevis pin and double knuckle pin made of stainless steel			■			■	■			
	㉚	-XC28	Compact flange made of SS400						■				
	㉛	-XC29	Double knuckle joint with spring pin			■			■				
	㉜	-XC30	Front trunnion					■	■	■			
	㉝	-XC34	Rod does not extend beyond non-rotating plate										
	㉞	-XC35	With coil scraper			■	■	■	■	■	■	■	
	㉟	-XC36	With front guide boss										
	㊱	-XC37	Larger throttle diameter of connecting port				■						
	㊲	-XC38	Vacuum (Rod through hole)			■							
	㊳	-XC42	Built-in rear shock absorber				■						
	㊴	-XC51	With hose nipple		■								
	㊵	-XC52	Mounting nut with set screw			■							
	㊶	-XC56	With knock pin hole										
	㊷	-XC57	Rodless cylinder with floating joint										

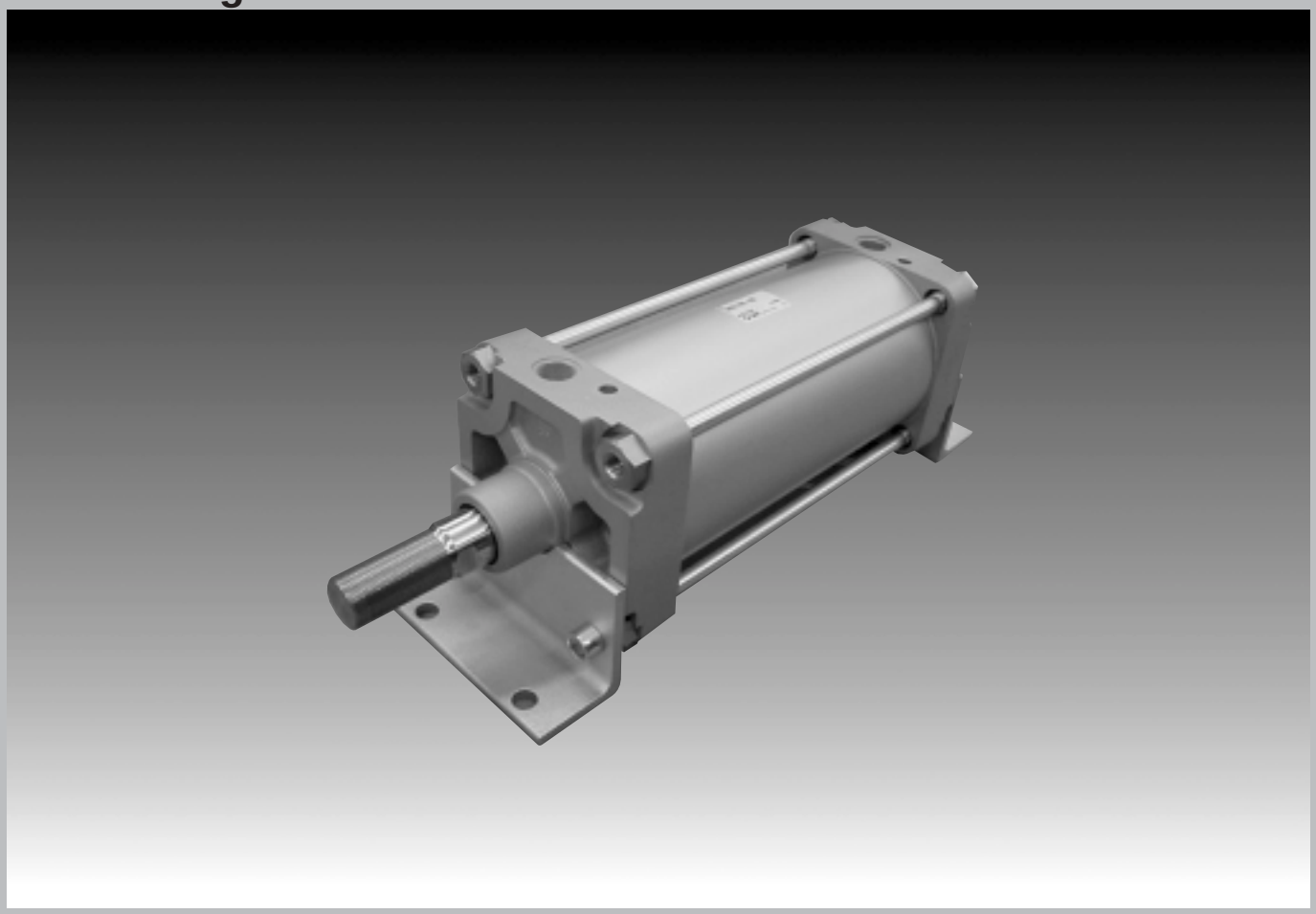
∗ Except air-hydro style for each cylinder
Note 1) Only double acting
Note 2) Only double acting (without switch)
Note 3) Only single acting
Note 4) Only for C95S-type

ISO/VDMA Cylinder: Large Bore Size Type

Series C95

ø125, ø160, ø200, ø250

Conforming to ISO 6431/CETOP RP43P/VDMA 24562



Series Variations

Series	Action	Type		Basic	Standard variations: Built-in magnet	Standard variations: Stainless steel rod	Option: Heat resistant	Bore (mm)	Page
Large Bore Size *Series C95* 	Double acting	Single rod	Non -lube	●	●	○	○	125 160 200 250	6-38

ISO/VDMA Cylinder: Large Bore Size Type
Double Acting, Single Rod
Series C95
ø125, ø160, ø200, ø250

How to Order

Without auto switch **C95S** **B** **125** – **100**

With auto switch **C95SD** **B** **125** – **100** – **A53** **S**

Built-in magnet

Mounting style

B	Basic/without bracket style
L	Axial foot style
F	Rod side flange style
G	Head side flange style
C	Single clevis style
D	Double clevis style
T	Center trunnion style

Bore size

125	125 mm
160	160 mm
200	200 mm
250	250 mm

Stroke (mm)
Refer to "Standard Stroke" on page 6-40.

Auto switch

Nil	Without auto switch

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

Number of auto switches

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

Applicable Auto Switch/Tie-rod Mounting

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)	3 (L)	5 (Z)	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (Equiv. to NPN)	—	5 V	—	**A56**	—	●	●	—	IC	—
				2-wire	24 V	12 V	—	**A53**	—	●	●	●	—	Relay, PLC
							100 V, 200 V	**A54**	—	●	●	●		
			No			5 V, 12 V	—	**A67**	—	●	●	—	IC	
						12 V	200 V or less	**A64**	—	●	●	—	—	
	Diagnostic indication (2-color)					—	—	**A59W**	—	●	●	—		
	—		Yes	3-wire	—	5 V	—	**Z76**	—	●	●	—	IC	— Note)
				2-wire	24 V	12 V	AC 100	**Z73**	—	●	●	●	—	Relay, PLC Note)
			No			5 V, 12 V	100 V or less	**Z80**	—	●	●	—	IC	
		Terminal conduit	Yes			12 V	—	—	**A33**	—	—	—	—	PLC Note)
							100 V, 200 V	—	**A34**	—	—	—	—	Relay, PLC Note)
		DIN terminal						—	**A44**	—	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**F59**	—	●	●	○	IC	Relay, PLC
				3-wire (PNP)				**F5P**	—	●	●	○		
				2-wire	—	—	100 V, 200 V	**J51**	—	●	●	○	—	
					24 V	12 V	—	**J59**	—	●	●	○		
	Diagnostic indication (2-color)			3-wire (NPN)		5 V, 12 V		**F59W**	—	●	●	○	IC	
				3-wire (PNP)				**F5PW**	—	●	●	○		
	Water resistant (2-color)			2-wire		12 V		**J59W**	—	●	●	○	—	
								F5BAL	—	—	●	○		
	With timer			3-wire (NPN)		5 V, 12 V		**F5NTL**	—	—	●	○	IC	
	Diagnostic output (2-color)			4-wire (NPN)				**F59F**	—	●	●	○		
	—			3-wire (NPN)	24 V	5 V, 12 V	—	**Y59A**	—	●	●	○	IC	
				2-wire		12 V		**Y59B**	—	●	●	○	—	
				3-wire (PNP)		5 V, 12 V		**Y7P**	—	●	●	○	IC	Relay, PLC Note)
	Diagnostic indication (2-color)			3-wire (NPN)				**Y7NW**	—	●	●	○		
				3-wire (PNP)				**Y7PW**	—	●	●	○		
	Water resistant (2-color)			2-wire		12 V		**Y7BW**	—	●	●	○	—	
								Y7BAL	—	—	●	○		
	—	Terminal conduit		3-wire (NPN)		5 V, 12 V		—	**G39**	—	—	—	IC	
				2-wire		12 V		—	**K39**	—	—	—	—	
	——	Grommet	Yes	3 wire (NPN)	24V	5V,12V	—	**M9NV**	**M9N**	●	●	○	IC	Note) Relay PLC
				3 wire (PNP)				**M9PV**	**M9P**	●	●	○		
				2 wire		12V		**M9BV**	**M9B**	●	●	○		

∗ Lead wire length symbols: 0.5 m ····· Nil (Example) A53
3 m ····· L (Example) A53L
5 m ····· Z (Example) A53Z

○: Manufactured upon receipt of order.
Note) Switch can not be mounted on ø250

Mounting Bracket Part No.

Bore size (mm)	125	160	200	250
Foot (1)	L5125	L5160	L5200	L5250
Flange	F5125	F5160	F5200	F5250
Single clevis	C5125	C5160	C5200	C5250
Double clevis	D5125	D5160	D5200	D5250

Note 1) Two foot brackets and mounting bolts (4 pieces) are included in this no. (ø125 to ø250)
Note 2) Accessories for mounting brackets are as follows
Foot, Flange, Single clevis: Mounting bolts
Double clevis : Clevis pin, Retaining rings, Mounting bolts

Auto Switch Mounting Bracket Part No.

Bore size (mm)	125	160	200	250
D-A3/A4/K3/G3	BS1-125	BS1-160	BS1-200	—
D-A5/A6/F5/J5	BT-08	BT-16	BT-16	BT-20
D-Z□/Y□	BA4-080	BS4-160	BS4-160	—
D-M9□	BA7-080	BS5-160	BS5-160	—

Accessory

Mounting Accessory, Cylinder

Bore size (mm)	**F** Rod/Head side flange	**D** Female head side clevis (Corresponds to E accessories)	**C** Male head side clevis
	Supplied with 4 screws	Supplied with bolt, safety device and 4 screws	Supplied with 4 screws
125	F5125	D5125	C5125
160	F5160	D5160	C5160
200	F5200	D5200	C5200
250	F5250	D5250	C5250
	See page 6-43 for dimensions.	See page 6-43 for dimensions	See page 6-44 for dimensions.

Bore size (mm)	**L** Foot
	Supplied with two pieces Supplied with 4 screws
125	L5125
160	L5160
200	L5200
250	L5250
	See page 6-43 for dimensions.

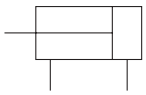
Mounting Accessory, Rod

Bore size (mm)	**GKM** Rod clevis ISO 8140	**KJ** Piston rod ball joint ISO 8139	**JA** Floating joint
	Supplied with bolts and safety devices		
125	GKM30-54	KJ27D	JA125-27-200
160	GKM35-54	KJ36D	JA160-36-200
200	GKM35-54	KJ36D	JA160-36-200
250	GKM40-84	KJ42D	
	See page 6-45 for dimensions.	See page 6-45 for dimensions.	See page 6-45 for dimensions.

Specifications

Bore size (mm)	125	160	200	250
Action	Double acting			
Fluid	Air			
Proof pressure	1.5 MPa			
Max. operating pressure	1.0 MPa			
Min. operating pressure	0.05 MPa			
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)			
Lubrication	Not required (Non-lube)			
Operating piston speed	50 to 700 mm/sec	50 to 500 mm/sec		
Allowable stroke tolerance	Up to 250: $^{+1.0}_{0}$, 251 to 1000: $^{+1.4}_{0}$, 1001 to 1500: $^{+1.8}_{0}$			
Cushion	Both ends (Air cushion)			
Thread tolerance	JIS Class 2			
Port size	G 1/2	G 3/4		G 1
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Center trunnion style			

JIS Symbol
Double acting



Minimum Stroke for Auto Switch Mounting

Refer to page 12 for “Minimum Stroke for Auto Switch Mounting”.

Standard Stroke

Bore size (mm)	Max. * stroke
125	1600
160	1600
200	2000
250	2400

Intermediate strokes are available.
* Please consult with SMC for longer strokes.

Theoretical Output

(N) OUT IN

Bore size (mm)	Rod diameter (mm)	Operating direction	Piston area (mm^2)	Operating pressure (MPa)								
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
125	32	OUT	12272	2454	3682	4909	6136	7363	8590	9818	11045	12272
		IN	11468	2294	3440	4587	5734	6881	8028	9174	10321	11468
160	40	OUT	20106	4021	6032	8042	10053	12064	14074	16085	18095	20106
		IN	18850	3770	5655	7540	9425	11310	13195	15080	16965	18850
200	40	OUT	31416	6283	9425	12566	15708	18850	21991	25133	28274	31416
		IN	30159	6032	9048	12064	15080	18095	21111	24127	27143	30159
250	50	OUT	49087	9817	14726	19635	24544	29452	34361	39270	44178	49087
		IN	47124	9425	14137	18850	23562	28274	32987	37699	42412	47124

Note) Theoretical force (N) = Pressure (MPa) x Piston area (mm^2)

Weight/Aluminum Tube

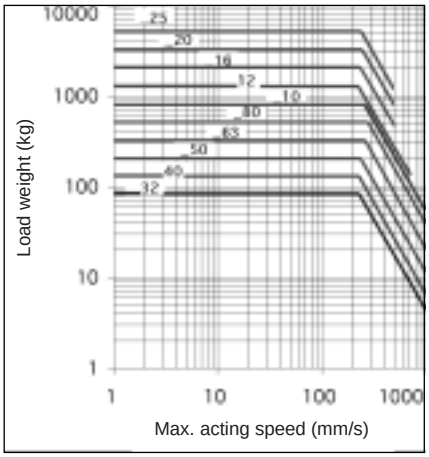
(kg)

Bore size (mm)		125	160	200	250
Basic weight	Basic style	7.45	14.54	20.20	37.17
	Foot style	2.60	4.90	7.76	15.00
	Flange style	4.10	2.45	11.75	20.29
	Single clevis style	4.15	6.90	9.10	18.60
	Double clevis style	4.25	6.30	9.25	18.46
	Trunnion style	2.98	4.50	7.23	14.40
Additional weight per each 50 mm of stroke	All mounting brackets	0.54	0.83	0.90	1.60
Accessory	Single rod clevis	1.20	1.62	1.62	2.76
	Double clevis (With pin)	1.84	3.92	3.92	6.69

Calculation: (Example) CP95SD160-100
- Basic weight ····· 14.54 (kg) (Basic, ø160)
- Mounting ····· 6.30 (kg) (Double clevis)
- Additional weight ··· 0.83 (kg/50 st)
- Cylinder stroke ····· 100 (st)

14.54 + 0.83 x 100 ÷ 50 + 6.30 = 22.50 kg

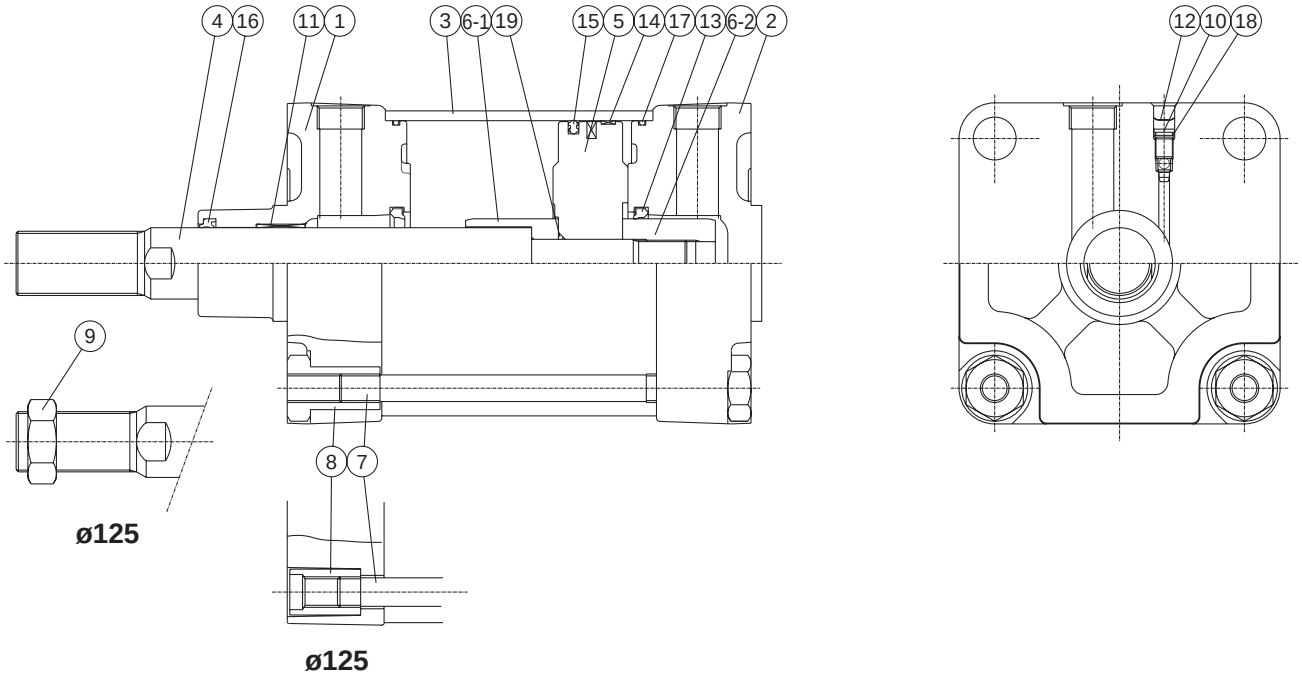
Allowable Kinetic Energy



Example: Load limit at rod end when air cylinder ø200 is actuated with max. actuating speed 500 mm/s. See the intersection of lateral axis 500 mm/s and ø200 line, and extend the intersection to left.
Thus the allowable load is 800 kg.

Construction

[First angle projection]



Component Parts

No.	Description	Material	Qty.	Note
①	Rod cover	Aluminum die-casted	1	Only ø125
②	Head cover	Aluminum die-casted	1	Only ø125
③	Cylinder tube	Aluminum alloy	1	
④	Piston rod	Carbon steel	1	
⑤	Piston	Aluminum alloy	1	
⑥-1	Cushion ring A	Rolled steel	1	
⑥-2	Cushion ring B	Rolled steel	1	
⑦	Tie-rod	Carbon steel	4	
⑧	Tie-rod nut	Steel	8	
⑨	Rod end nut	Steel	1	Only ø125
⑩	Cushion valve	Steel wire	2	
⑪	Bushing	Lead-bronze casted	1	
⑫	Snap ring	Steel for spring	2	
⑬	Cushion seal	Urethane	2	
⑭	Wear ring	Resin	1	
⑮	Piston seal	NBR	1	
⑯	Rod seal	NBR	1	
⑰	Cylinder tube gasket	NBR	2	
⑱	Cushion valve seal	NBR	2	
⑲	Piston gasket	NBR	1	
⑳	Magnet ring		1	

ø160 to ø250

No.	Description	Material	Qty.	Note
①	Rod cover	Aluminum casted	1	
②	Head cover	Aluminum casted	1	

Replacement Parts: Seal Kit

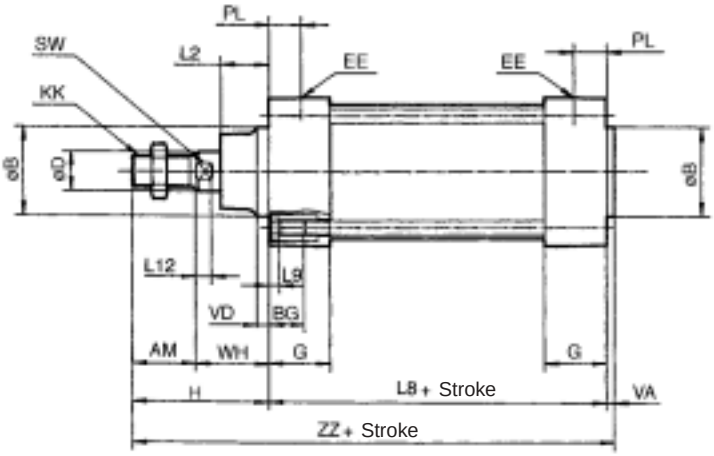
Bore size (mm)	Kit no.	Contents
125	CS95-125	Kits include items ⑬ to ⑰ from the table above.
160	CS95-160	
200	CS95-200	
250	CS95-250	

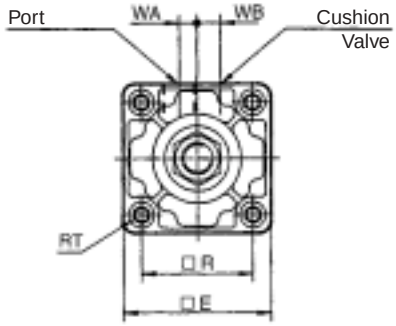
∗ Seal kits consist of items ⑬ to ⑰ contained in one kit, and can be ordered using the order number for each respective tube bore size.

Dimensions: Without Mounting Bracket

[First angle projection]

C95SB Bore size - Stroke



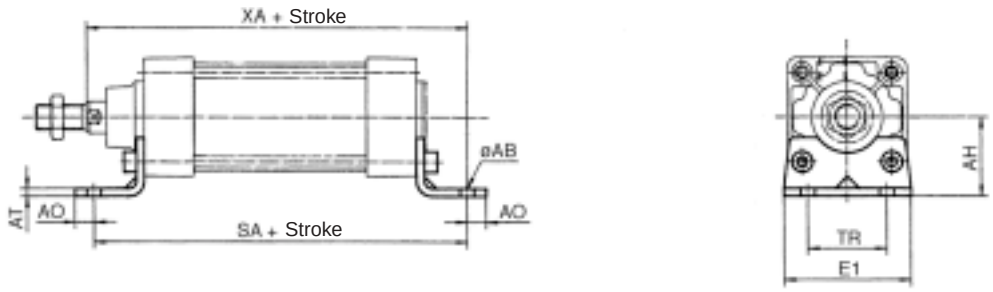


Bore size (mm)	AM	øB e11	øD	EE	PL	RT	L12	KK	SW	G	BG (Min.)	L8	VD	VA	WA	WB	WH	ZZ	□E	□R	L2	L9
125	54	60	32	G 1/2	19	M12 x 1.75	13	M27 x 2	27	38	20	160	10	6	17	15	65	285	136	110	40	6
160	72	65	40	G 3/4	30	M16 x 2	15	M36 x 2	36	55	27	180	8	6	15	25	80	338	180	140	50	0
200	72	75	40	G 3/4	35	M16 x 2	15	M36 x 2	36	57	27	180	15	6	18	25	95	353	220	175	55	0
250	84	90	50	G 1	31	M20 x 2.5	20	M42 x 2	46	59	29	200	20	10	20	28	105	399	270	220	65	0

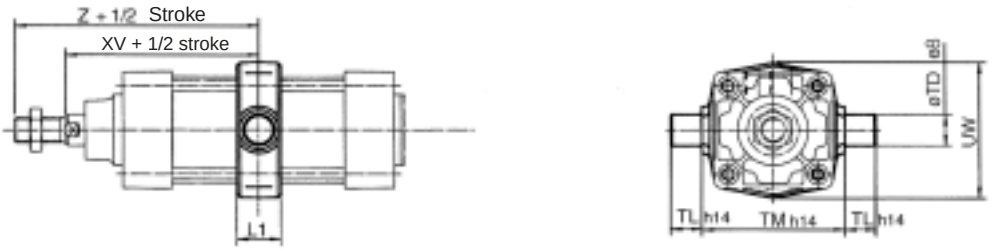
Dimensions: Cylinder Mounting Accessory

[First angle projection]

Foot style (L)

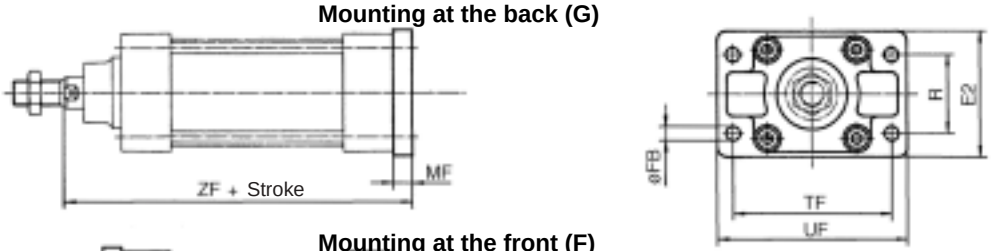


Center trunnion style (T)

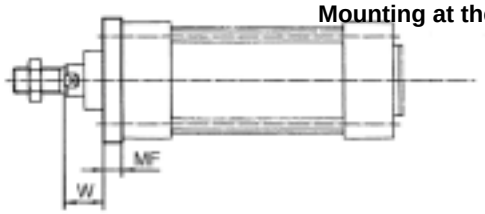


Flange style (F, G)

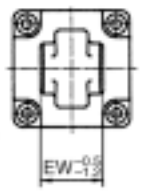
Mounting at the back (G)



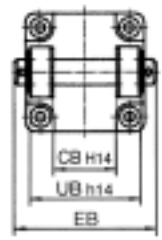
Mounting at the front (F)

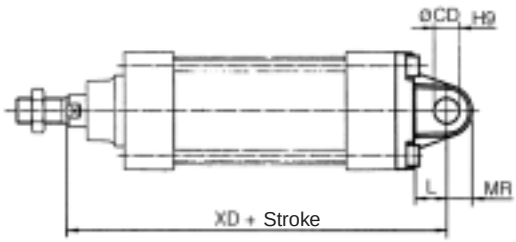


Head side single clevis style (C)



Head side double clevis style (D)



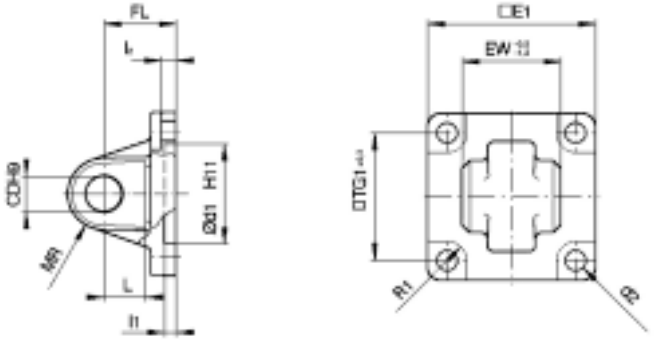


Bore (mm)	E1	R	W	MF	ZF	øFB	øCD H9	EB	L	XD	UB h14	CB H14	EW -0.5 -1.2	MR	TR	AO	AT	XA	SA	AH	øAB	L1	XV	Z	TL h14	øTD e8	TM h14	UW	TF	UF	E2
125	Max. 157	90	45	20	245	16	25	Max. 157	Min. 30	275	130	70	70	Max. 26	90	Max. 25	8	270	250	90	16	Max. 50	145	199	25	25	160	Max. 160	180	Max. 224	Max. 157
160	Max. 195	115	60	20	280	18	30	Max. 209	Min. 35	315	170	90	90	Max. 31	115	Max. 25	9	320	300	115	18	Max. 50	170	242	32	32	200	Max. 220	230	Max. 280	Max. 195
200	Max. 238	135	70	25	300	22	30	Max. 209	Min. 35	335	170	90	90	Max. 31	135	Max. 35	12	345	320	135	22	Max. 50	185	257	32	32	250	Max. 260	270	Max. 320	Max. 238
250	Max. 290	165	80	25	330	26	40	Max. 249	Min. 45	375	200	110	110	Max. 41	165	Max. 40	14.5	380	350	165	26	Max. 60	205	289	40	40	320	Max. 320	330	Max. 395	Max. 290

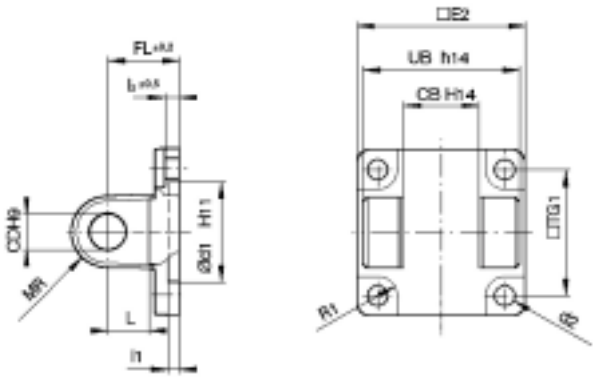
Dimensions: Cylinder Mounting Accessory C, D, E and CR

[First angle projection]

Mounting style (C)



Mounting style (D)



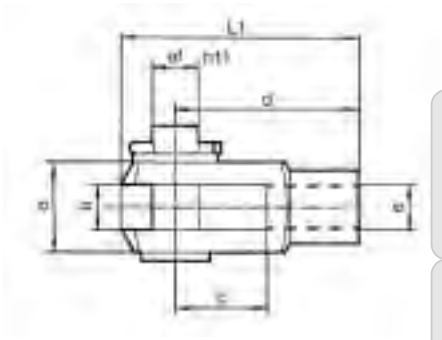
Bore size (mm)	□E1	EW	□TG1	FL	l1	l2	ød1	CD	MR	d2	R1	□E2	UB	CB
125	140	70	110	50	7	10	60	25	25	13.5	10	140	130	70
160	180	90	140	55	7	10	65	30	25	18	13	180	170	90
200	220	90	175	60	7	11	75	30	25	18	13	220	170	90
250	270	110	220	70	11	11	90	40	40	22	16.5	270	200	110

Dimensions: Piston Rod Mounting Accessory

[First angle projection]

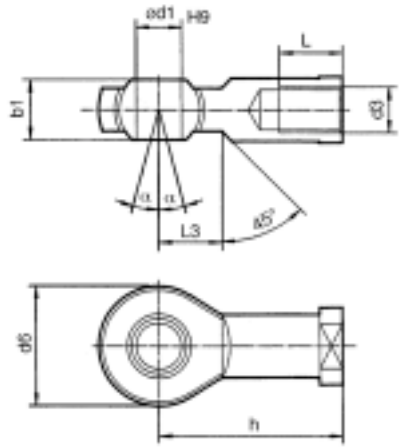
Piston Rod Clevis (ISO 8140)
Steel, Zinc Chromate Plated

Part no.	Bore size (mm)	e	b		d	øf h11	L1 max.	c min.	a max.	L min.
GKM30-54	**125**	M27 x 2	30	+0.60 +0.15	110	30	155	54	55	45
GKM35-54	**160/200**	M36 x 2	35	+0.60 +0.15	144	35	201	54	70	57
GKM40-84	**250**	M42 x 2	40	+0.60 +0.15	168	40	245	84	85	77



Piston Rod Ball Joint (ISO 8139)
Steel, Zinc Chromate Plated

Part no.	Bore size (mm)	d3	d1 H9	h	d6 max.	b1 h12	L min.	α	L3
KJ27D	**125**	M27 x 2	30	110	70	37	51	15°	35
KJ36D	**160/200**	M36 x 2	35	125	80	43	56	16°	55
KJ42D	**250**	M42 x 2	40	142	90	49	60	4°	46

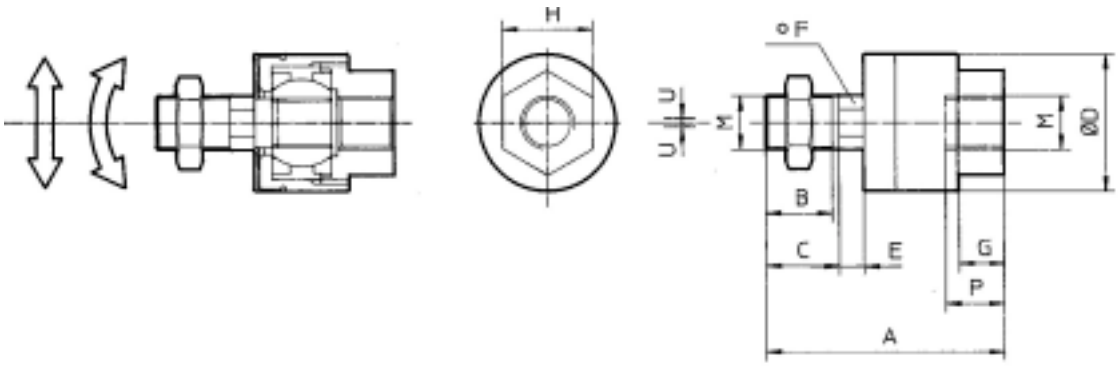


Dimensions: Piston Rod Mounting Accessory

[First angle projection]

Floating Joint JA
Steel

Bore size (mm)	M	Part no.	A	B	C	øD	E	F	G	H	P	U	Load (kN)	Weight (g)	Angle
125	M27 x 2	**JA125-27-200**	123	34	38	66	13	24	20	41	24	2	28	1500	± 5°
160, 200	M36 x 2	**JA160-36-200**	178	51	55	96	16	55	24	55	42	3	71	4700	



Auto Switch Specifications

Applicable Auto Switch

Type	Auto switch model	Electrical entry (Function)
Reed switch	**D-A5□/A6□**	Grommet
	D-A59W	Grommet (2-color indication)
	D-Z7□/Z80	Grommet
	D-A3□	Terminal conduit
	D-A44	DIN terminal
Solid state switch	**D-F5□/J5□**	Grommet
	D-F5□W/J59W	Grommet (2-color indication)
	D-F5BAL	Grommet (2-color indication, Water resistant)
	D-F59F	Grommet (2-color indication, Diagnostic output)
	D-F5NTL	Grommet (With timer)
	D-Y59□	Grommet (In-line)
	D-Y69□	Grommet (Perpendicular)
	D-Y7P	Grommet (In-line)
	D-Y7PV	Grommet (Perpendicular)
	D-Y7□W	Grommet (2-color indication, In-line)
	D-Y7□WV	Grommet (2-color indication, Perpendicular)
	D-Y7BAL	Grommet (Water resistant, In-line)
	D-G39/K39	Terminal conduit

Minimum Stroke for Auto Switch Mounting

Auto switch model	No. of auto switches	Support bracket except center trunnion				Center trunnion			
		ø125	**ø160**	**ø200**	**ø250**	**ø125**	**ø160**	**ø200**	**ø250**
A5□ **A6□**	1, 2	15	10	10	10	165	125	125	145
	n	15 + 55(n-2)/2 n = 2, 4, 6, 8···	10 + 55(n-2)/2 n = 2, 4, 6, 8···	←	←	165 + 55(n-4)/2 n = 4, 8, 12, 16···	125 + 55(n-4)/2 n = 4, 8, 12, 16···	125 + 55(n-4)/2 n = 4, 8, 12, 16···	145 + 55(n-4)/2 n = 4, 8, 12, 16···
A59W	2	20	←	←	←	175	135	135	155
	n	20 + 55(n-2)/2 n = 2, 4, 6, 8···	←	←	←	175 + 55(n-4)/2 n = 4, 8, 12, 16···	135 + 55(n-4)/2 n = 4, 8, 12, 16···	135 + 55(n-4)/2 n = 4, 8, 12, 16···	155 + 55(n-4)/2 n = 4, 8, 12, 16···
	1	20	15	15	15	175	135	135	155
F5□(W)/J5□/J59W **F5BAL/F59F**	1, 2	20	10	←	←	170	135	135	155
	n	20 + 55(n-2)/2 n = 2, 4, 6, 8···	10 + 55(n-2)/2 n = 2, 4, 6, 8···	←	←	175 + 55(n-4)/2 n = 4, 8, 12, 16···	135 + 55(n-4)/2 n = 4, 8, 12, 16···	135 + 55(n-4)/2 n = 4, 8, 12, 16···	155 + 55(n-4)/2 n = 4, 8, 12, 16···
F5NTL	1, 2	25	15	15	15	185	150	145	165
	n	25 + 55(n-2)/2 n = 2, 4, 6, 8···	15 + 55(n-2)/2 n = 2, 4, 6, 8···	←	←	185 + 55(n-4)/2 n = 4, 8, 12, 16···	150 + 55(n-4)/2 n = 4, 8, 12, 16···	145 + 55(n-4)/2 n = 4, 8, 12, 16···	165 + 55(n-4)/2 n = 4, 8, 12, 16...
A3□ **K3□** **G3□**	1	10	10	10	—	130	140	140	—
	2 (Same side)	100	100	100	—	130	140	140	—
	2 (Different sides)	35	35	35	—	130	140	140	—
	n (Same side)	100 + 100(n-2) n = 2, 3, 4, 5···	←	←	—	130 + 100(n-2) n = 2, 4, 6, 8···	140 + 100(n-2) n = 2, 4, 6, 8···	140 + 100(n-2) n = 2, 4, 6, 8···	—
	n (Different sides)	35 + 30(n-2) n = 2, 3, 4, 5···	←	←	—	130 + 100(n-2) n = 2, 4, 6, 8···	140 + 100(n-2) n = 2, 4, 6, 8···	140 + 100(n-2) n = 2, 4, 6, 8···	—
A44	1	10	10	10	—	135	100	100	—
	2 (Same side)	55	55	55	—	135	100	100	—
	2 (Different sides)	35	35	35	—	135	100	100	—
	n (Same side)	55 + 55(n-2) n = 2, 3, 4, 5···	←	←	—	135 + 100(n-2) n = 2, 4, 6, 8···	100 + 100(n-2) n = 2, 4, 6, 8···	100 + 100(n-2) n = 2, 4, 6, 8···	—
	n (Different sides)	35 + 30(n-2) n = 2, 3, 4, 5···	←	←	—	135 + 100(n-2) n = 2, 4, 6, 8···	100 + 100(n-2) n = 2, 4, 6, 8···	100 + 100(n-2) n = 2, 4, 6, 8···	—
Z7□/Z80	1, 2	10	10	10	—	150	120	110	—
	n	10 + 40(n-2)/2 n = 2, 4, 6, 8···	←	←	—	150 + 55(n-4)/2 n = 4, 8, 12, 16···	120 + 55(n-4)/2 n = 4, 8, 12, 16···	110 + 55(n-4)/2 n = 4, 8, 12, 16···	—
Y59□/Y7P **Y7□W**	1, 2	10	10	10	—	150	110	110	—
	n	10 + 40(n-2)/2 n = 2, 4, 6, 8···	←	←	—	150 + 55(n-4)/2 n = 4, 8, 12, 16···	110 + 55(n-4)/2 n = 4, 8, 12, 16···	110 + 55(n-4)/2 n = 4, 8, 12, 16···	—
Y69□/Y7PV **Y7□WV**	1, 2	10	10	10	—	120	85	80	—
	n	10 + 30(n-2)/2 n = 2, 4, 6, 8···	←	←	—	120 + 55(n-4)/2 n = 4, 8, 12, 16···	85 + 55(n-4)/2 n = 4, 8, 12, 16···	80 + 55(n-4)/2 n = 4, 8, 12, 16···	—
Y7BAL	1, 2	15	10	10	—	160	120	120	—
	n	10 + 45(n-2)/2 n = 2, 4, 6, 8···	←	←	—	160 + 55(n-4)/2 n = 4, 8, 12, 16···	120 + 55(n-4)/2 n = 4, 8, 12, 16···	120 + 55(n-4)/2 n = 4, 8, 12, 16···	—

Auto Switch Mounting Position and Mounting Height

[First angle projection]

Auto Switch Mounting Position

Bore size (mm)	D-A5□ D-A6□		D-A59W		D-F5□, D-F5□W D-J5□, D-J59W D-F59F, D-F5BAL		D-F5NTL		D-Z7□, D-Y59□, D-Y7BAL D-Z80, D-Y69□ D-Y7P(V), D-Y7□W(V)		D-A3□, D-G39 D-A44, D-K39	
	A	B	A	B	A	B	A	B	A	B	A	B
125	45.5	6.5	49.5	10.5	52	13	57	18	49	10	45.5	6.5
160	19.5	18.5	23.5	22.5	26	25	31	30	23	22	19.5	18.5
200	17	17	21	21	23.5	23.5	28.5	28.5	20.5	20.5	17	17
250	20	30	24	34	26.5	36.5	31.5	41.5	—	—	—	—

Auto Switch Mounting Height

Bore size (mm)	D-A5□ D-A6□ D-A59W		D-F5□, D-F5□W, D-F5NTL D-J5□, D-J59W D-F59F, D-F5BAL		D-A3□, D-G39 D-K39		D-A44		D-Z7□, D-Y59□ D-Z80, D-Y7P D-Y7□W		D-Y69□ D-Y7PV D-Y7□WV		D-Y7BAL	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht
125	71.5	66.5	70.5	66.5	116	—	126	—	67.5	65	68.5	65	72	65
160	90	86	89	86	134.5	—	144.5	—	84.5	83	84.5	83	89.5	83
200	102.5	104	102	104	154	—	164	—	100.5	100.5	100.5	100.5	103	100.5
250	127	128	127	128	—	—	—	—	—	—	—	—	—	—

Switch Hysteresis

Bore size (mm)	ON-OFF switch hysteresis	
	Reed switch	Solid state switch
125 to 200	≤ 2 mm	≤ 1 mm
250	≤ 3 mm	≤ 1 mm

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted. For detailed specifications, refer to page 8-1.

Type	Model	Electrical entry	Features
Solid state switch	D-F5NTL	Grommet (In-line)	With timer
	D-Y69A/Y69B/Y7PV	Grommet (Perpendicular)	—
	D-Y7NWV/Y7PWV/Y7BWV		2-color indication

∗ With pre-wire connector is available for solid state auto switches. For details, refer to page 8-1.
∗ Normally closed (NC = b contact), solid state switch (D-Y7G/Y7H type) are also available. For details, refer to page 8-1.

Specific Product Precautions

Be sure to read before handling.

Adjustment

⚠Warning

1. Do not open the cushion valve above the stopper.

Cushion valves are provided with a retaining ring (ø125 to ø250) as a stopping mechanism, and the cushion valve should not be opened above that point.

If air is supplied and operation started without confirming the above condition, the cushion valve may be ejected from the cover.

Bore size (mm)	Cushion valve	Width across flats	Socket wrench
125, 160, 200, 250	MB-A2-10-EA064	4	JIS 4648 Hex spanner wrench 4

2. Be certain to activate the air cushion at the stroke end.

When it is intended to use the cushion valve in the fully opened position, select a style with a damper. If this is not done, the tie-rods or piston rod assembley will be damaged.

3. When replaceing brackets, use the hexagon wrench shown below.

Bore size (mm)		Bolt	Width across flats	Tightening torque (Nm)
125		M12 x 1.75 x 25ℓ	10	30.1
160, 200		M16 x 2 x 30ℓ	14	99
250	Foot	M20 x 2.5 x 35ℓ	17	193.5
	Others	M20 x 2.5 x 30ℓ	17	

Made to Order
Common Specifications

Spec.	No.	Symbol	Specifications/Descriptions	Standard air cylinder				Page
				C95	CP95	C85	C76	
Made to order common specifications	①	-XA0 to A30	Change of rod end shape					7-2
	②	-XB6	Heat resistant cylinder (150°C)	(3)				7-4
	③	-XB7	Cold resistant cylinder	(3)		(2)	(2)	7-5
	④	-XB9	Low speed cylinder (10 to 50 mm/s)			(2)	(2)	7-6
	⑤	-XB13	Low speed cylinder (5 to 50 mm/s)			(1)	(1)	7-7
	⑥	-XC4	With heavy duty scraper	(3)				7-8
	⑦	-XC6	Piston rod and rod end nut made of stainless steel	(3)				7-9
	⑧	-XC7	Tie rod, cushion valve, tie rod nut, etc. made of stainless steel					7-10
	⑨	-XC10	Dual stroke cylinder/Double rod	(3)				7-11
	⑩	-XC11	Dual stroke cylinder/Single rod	(3)				7-12
	⑪	-XC12	Tandem cylinder	(3)				7-13
	⑫	-XC14	Change of trunnion bracket mounting position	(3)				7-14
	⑬	-XC18	NPT port	(3)				7-15
	⑭	-XC22	Fluorine rubber seals	(3)				7-16
	⑮	-XC35	With coil scraper	(3)				7-17

Note 1) Only double acting
Note 2) Only double acting (without switch)
Note 3) Up to ø100 bore

Please use the ISO/VDMA configurator CD for ordering

Made to Order Common Specifications
-XA0 to -XA30: Change of Rod End Shape

Order Made

1 Change of Rod End Shape

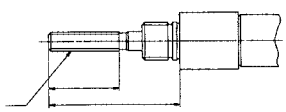
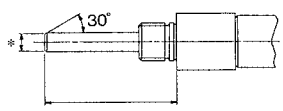
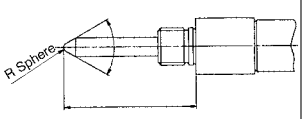
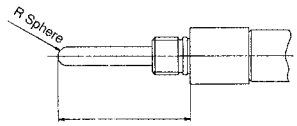
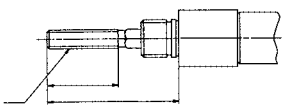
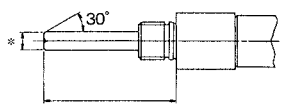
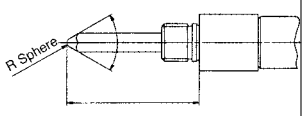
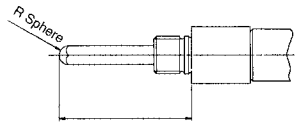
Series C85, C76: Change of Rod End Shape — **-XA0, -XA1, -XA10, -XA11**

C85
C76 | **Standard model no.→Refer to chapter C85, C76** — **X** | **A0**

Symbol of rod end shape

Rod End Shape

- SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are given in the diagram.
- Subtract 1mm from the rod diameter for the dimension marked "∗". Enter any special dimension you desire.

Applicable cylinder	Change of rod end shape/Symbol			
C85 **C76**	Symbol: **A0** 	Symbol: **A1** 	Symbol: **A10** 	Symbol: **A11** 
Non-rotating rod cylinder **C85K** **C76K**	Symbol: **A0** 	Symbol: **A1** 	Symbol: **A10** 	Symbol: **A11** 

SMC

Symbol

-XA0 to XA30

Series C85, C76, C95, CP95: Change of Rod End Shape

-XA0 to XA30

C85 Standard model no. → Details on chapter C85 —X **A1**

C76 Standard model no. → Details on chapter C76 —X **A1**

Symbol of rod end shape

C95 Standard model no. → Details on chapter C95 —X **A1**

CP95 Standard model no. → Details on chapter CP95 —X **A1**

Symbol of rod end shape

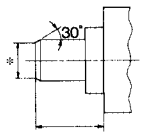
Rod End Shape

- SMC will make appropriate arrangements if no dimensional, tolerance, or finish instructions are given in the diagram.
- Dimensions of rod diameter "D" marked "*" is $\frac{D \leq 25.2mm}{D > 25.4mm}$. Enter any special dimension you desire.

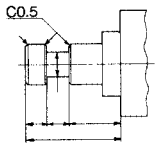
Note) A24 and A25 for series CQ2 compact cylinder are not available. Contact SMC for bore size ø12 to ø25.

Symbol: A0 Give H, A-dimensions in case rod end shape is the same as standard shape and only H, A-dimensions are different from standard dimensions.

Symbol: A1



Symbol: A2



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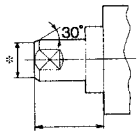
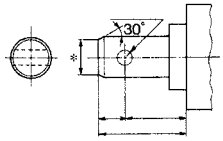
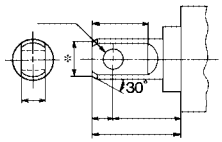


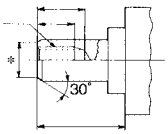
Symbol: A4



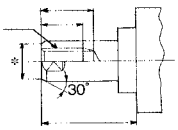
Symbol: A5



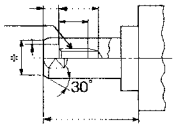
Symbol: A6



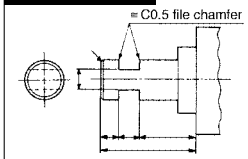
Symbol: A7



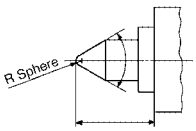
Symbol: A8



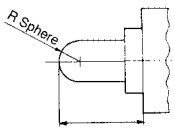
Symbol: A9



Symbol: A10



Symbol: A11



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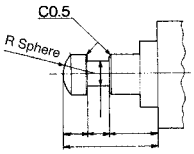
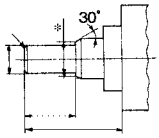
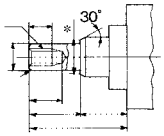


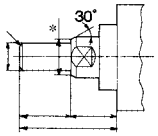
Symbol: A13



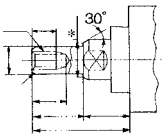
Symbol: A14



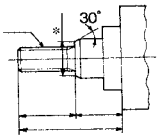
Symbol: A15



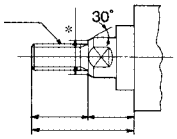
Symbol: A16



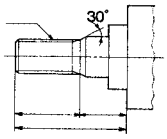
Symbol: A17



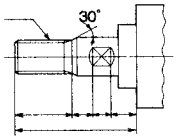
Symbol: A18



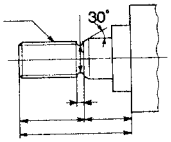
Symbol: A19



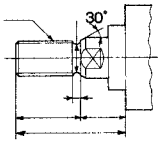
Symbol: A20



Symbol: A21



Symbol: A22



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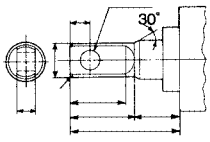
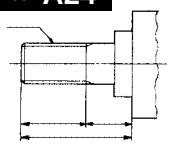
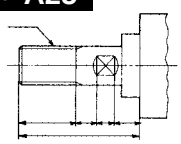


Symbol: A24



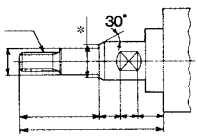
Note) Series CQ2 is not available.

Symbol: A25



Note) Series CQ2 is not available.

Symbol: A26



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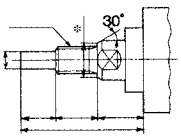

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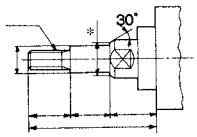
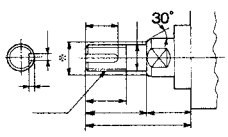
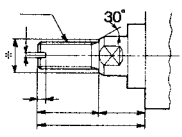


Symbol: A29



Symbol: A30



Made to Order Common Specifications -XB6: Heat Resistant Cylinder (150°C)

Order Made

2 Heat Resistant Cylinder (150°C)

Symbol: -XB6

C85 Standard model no.→Details on chapter C85 — **XB6**

C76 Standard model no.→Details on chapter C76 — **XB6**

Heat resistant cylinder

C95 Standard model no.→Details on chapter C95 — **XB6**

CP95 Standard model no.→Details on chapter CP95 — **XB6**

Heat resistant cylinder

An air cylinder in which the materials of the seals and the grease have been changed so that the cylinder can be operated at high ambient temperatures of up to 150°C.

Note 1) Make sure to use without lubrication.

Note 2) Contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.

Note 3) It is not possible to manufacture this cylinder with an auto switch.

⚠ Warning

Precaution

Be aware that smoking cigarettes, etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

Specifications

Applicable cylinder	Air cylinder/Standard			
Series	**C85**	**C76**	**C95**	**CP95**
	C85, C85W C85R, C85K	C76, C76W C76R, C76K	C95, C95W	CP95, CP95W
Action	Double acting single rod/double rod			
Bore size (mm)	8, 10, 12, 16, 20, 25	32, 40	32, 40, 50, 63, 80, 100	32, 40, 50, 63, 80, 100
Range of ambient temp.	–10°C to +150°C (CS1: 0°C to +150°C)			
Packing material	Fluorine rubber			
Grease	Heat resistant grease			
Additional specifications and dimensions, refer to	Details on chapter C85	Details on chapter C76	Details on chapter C95	Details on chapter CP95

Made to Order Common Specifications -XB7: Cold Resistant Cylinder

Order Made

3 Cold Resistant Cylinder

Symbol -XB7

C85
C76
Mounting | Bore size | Stroke — XB7

Cold resistant cylinder

An air cylinder in which the materials of the seals and the grease have been changed so that the cylinder can be operated at ambient temperatures as low as −40°C.

Note 1) Make sure to use without lubrication.

Note 2) To prevent the moisture from freezing, use dry air such as by using a heatless air dryer.

Note 3) Contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.

Note 4) It is not possible to manufacture this cylinder with an auto switch.

Specifications

Applicable cylinder	Air cylinder/Standard		Direct mount
Series	**C85, C76**	**C85W, C76W**	**C□R**
Action	Double acting single rod	Double acting double rod	Double acting single rod
Bore size (mm)	C85 (8, 10, 12, 16, 20, 25); C76 (32, 40)		
Ambient temp.	–40°C to +70°C		
Material	Packing, Bumper - Low nitrile rubber Wearing-Resin		
Grease	Fluorine resin grease		
Auto switch	Unavailable for mounting		
Mounting	Basic Foot Flange Trunnion Clevis	Basic Foot Flange Trunnion	Bottom mount Front mount
Dimensions, refer to	Details on chapter C85, 76	Details on chapter C□W	Details on chapter C□R
Additional specifications, refer to	Details on chapter C85, 76	Details on chapter C□W	Details on chapter C□R

Made to Order Common Specifications -XB9: Low Speed Cylinder

Order Made

4 Low Speed Cylinder

Symbol -XB9

C85
C76

Mounting — **Bore size** — **Stroke** — **XB9**

Low speed cylinder

* Operates smoothly without sticking or slipping even at low speeds of 10 to 50mm/s.

Note 1) Do not lubricate this cylinder.

Specifications

Applicable cylinder	Air cylinder/Standard
Series	**C85, C76**
Action	Double acting single rod
Bore size	C85: (8, 10, 12, 16, 20, 25) C76: (32, 40)
Piston speed	10 to 50mm/s
Cushion	Rubber bumper
Auto switch	Available for mounting
Mounting	Basic, Foot Flange Trunnion Clevis
Dimensions, refer to	Details on chapter C85, C76
Additional specifications, refer to	Details on chapter C85, C76

⚠ Warning

Precaution

Be aware that smoking cigarettes, etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

Made to Order Common Specifications -XB13: Low Speed Cylinder

Order Made

5 Low Speed Cylinder

Symbol: -XB13

C95
CP95
Standard model no.→Details on chapter C95, CP95 — XB13

Low speed cylinder

Operates smoothly without sticking or slipping even at low speeds of **5 to 50mm/s**.
Note 1) Do not lubricate this cylinder.

Note 2) Use the speed controller for low speed regulation (Series AS-FM, AS-M).

Specifications

Applicable cylinder	Air cylinder/Standard
Series	**C95, CP95**
Action	Double acting/single rod
Bore size (mm)	32, 40 50, 63 80, 100
Piston speed	5 to 50mm/s
Cushion	With both-side air cushion
Auto switch	Available for mounting
Mounting	Basic Foot Flange Clevis Trunnion
Dimensions, refer to	Details on chapter C95, CP95
Additional specifications, refer to	Details on chapter C95, CP95

Made to Order Common Specifications -XC4: With Heavy Duty Scraper

Order Made

6 **With Heavy Duty Scraper**

Symbol **-XC4**

C95
CP95

Standard model no. → Details on chapter C95, CP95 — **XC4**

With heavy duty scraper

As it uses a powerful scraper for the wiper ring, this cylinder is suitable for use in an area that is dusty, or in an environment in which mud splashes on the cylinder, such as when operating casting equipment, construction equipment, or an industrial vehicle.

Specifications

Applicable cylinder	Air cylinder/Standard
	C95, CP95
Series	C95, CP95, C95W, CP95W
Action	Double acting single rod/double rod
Bore size (mm)	32, 40, 50, 63, 80, 100
Wiper ring	SCB scraper
Cushion	Air cushion
Auto switch	Available for mounting (Bore size 200mm or less)
Additional specifications, refer to	Refer to chapter C95, CP95

⚠ Cautions

Heavy duty scraper should not be changed.

- Change not only the cover but also the rod cover assembly since heavy duty scraper is pressed in.

Made to Order Common Specifications -XC6: Piston Rod and Rod End Nut Made of Stainless Steel

Order Made

7 Piston Rod and Rod End Nut Made of Stainless Steel

Symbol -XC6

C95
CP95

Standard model no. →Details on chapter C95, CP95 — **XC6**

- **Piston rod and rod end nut made of stainless steel**

It is used in case there is the risk of rust or corrosion, such as when the end of the piston rod becomes immersed in water as it moves forward.

Specifications

Applicable cylinder	Air cylinder/Standard
Applicable series	**C95, CP95**
	C95, CP95 C95W, CP95W
Action	Double acting
Bore size (mm)	32, 40, 50, 63, 80, 100 (125, 160, 200, 250, only for C95)
Cushion	Air cushion
Auto switch	Available for mounting (Bore size 200mm or less)
Mounting	Basic, Axial foot, Front flange, Rear flange, Single clevis, Double clevis, Center trunnion
Add'l specifications, refer to (Common for each series)	Refer to chapter C95, CP95

Made to Order Common Specifications -XC7: Tie Rod, Cushion Valve, Tie Rod Nut, etc. Made of Stainless Steel

Order Made

8 **Tie Rod, Cushion Valve, Tie Rod Nut, etc. Made of Stainless Steel**

Symbol **-XC7**

C95
CP95

Standard model no. →Details on chapter C95, CP95 — **XC7**

Stainless steel of tie rod, cushion valve, tie rod nut, etc.

A portion of the materials of the standard parts has been changed to stainless steel to enable the cylinder to be used in an area that poses the risk of rust or corrosion.

Specifications

Applicable cylinder	Air cylinder/Standard
Series	**C95, CP95**
Action	Double acting single rod
Bore size (mm)	32, 40, 50, 63, 80, 100
Parts changed to stainless steel	Tie rod, Tie rod nut, Bracket mounting nut, Spring washer, Cushion valve, Lock nut
Auto switch	Available for mounting (Contact SMC for series CS1.)
Mounting	Basic, Foot, Front/rear flange, Single/double clevis, Centre trunnion
Add'l specifications, refer to	Details on chapter C95, CP95
Dimensions, refer to	

Made to Order Common Specifications -XC10: Dual Stroke Cylinder/ Double Rod

Order Made

9 Dual Stroke Cylinder/Double Rod

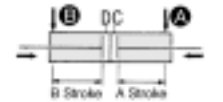
Symbol: -XC10

C95
CP95

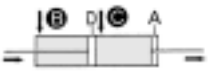
Mounting	Bore size	Stroke A	Additional symbol	+	Stroke B	Additional symbol	XC10

XC10: Dual stroke cylinder

Two cylinders are constructed as one cylinder in a back-to-back configuration allowing the cylinder stroke to be controlled in three steps.



When air pressure is supplied to ports A and B, both A and B strokes extend.



When air pressure is supplied to ports B and C, A out strokes.

When air pressure is supplied to ports A and D, B out strokes.

When air pressure is supplied to ports C and D, both strokes A and B out strokes.

Made to Order Common Specifications
-XC11: Dual Stroke Cylinder/Single Rod

Order Made

10 **Dual Stroke Cylinder/Single Rod**

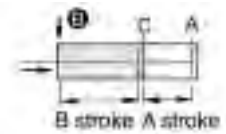
Symbol **-XC11**

C95
CP95

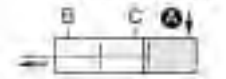
Mounting	Style	Bore size	—	Stroke A	Add'l symbol	+	Stroke B-A	Add'l symbol	—	XC11

Dual stroke cylinder/Single rod

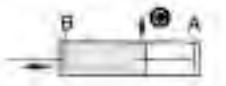
Two cylinders can be integrated by connecting them in line, and the cylinder stroke can be controlled in two stages in both directions.



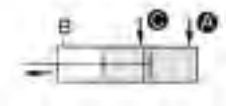
When air pressure is supplied to the B port, both A and B stokes extend.



When air pressure is supplied to the A port, the rod out by the A stroke length.



When air pressure is supplied to the C port, the rod out by the B stroke length.



When air pressure is supplied to both ports A and C, double output force is obtainable in the range of the A stroke length.

⚠ Precaution

1. Do not supply air until the cylinder is fixed with the attached bolt.
2. If air is supplied without securing the cylinder, the cylinder could lurch, posing the risk of injury to personnel or damage to the peripheral equipment.

Made to Order Common Specifications -XC12: Tandem Cylinder

Order Made

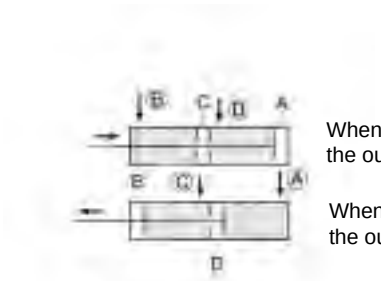
11 Tandem Cylinder | **Symbol -XC12**

C95
CP95

Standard model no. →Details on chapter C95, CP95 — **XC12**

Tandem cylinder

This is a cylinder produced with two air cylinders in line allowing double the output force.



When air pressure is supplied to ports B and D, the output force is doubled in the extend stroke.

When air pressure is supplied to ports A and C, the output force in doubled in the out stroke.

Specifications

Applicable cylinder	Air cylinder/Standard
Series	**C95, CP95**
Action	Double acting single rod
Bore size (mm)	32, 40, 50, 63, 80, 100
Min. operating pressure	0.1MPa
Cushion	Air cushion
Auto switch	Available for mounting
Mounting	Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis
Additional specifications, refer to	Details on chapter C95, CP95

Made to Order Common Specifications -XC14: Change of Trunnion Bracket Mounting Position

Order Made

12 Change of Trunnion Bracket Mounting Position

Symbol: -XC14

C95 | Standard model no. → Details on chapter C95 | **XC14** | **A**

Trunnion mounting position

—	Between front cover and rear cover
A	Front trunnion
B	Rear trunnion

Note) In case of W rod, there is no symbol 'B' (XC14B).

Change of trunnion bracket mounting position

Specifications

Applicable cylinder	Air cylinder/Standard
Series	**C95**
Action	Double acting single rod
Bore size (mm)	32, 40, 50, 63, 80, 100
Min. operating press.	0.05MPa
Auto switch	Available for mounting*
Mounting	Only trunnion style
Additional specifications, refer to	Details on chapter C95

* Contact SMC when one of the auto switches cannot be mounted because of trunnion mounting position.

Made to Order Common Specifications
-XC18: NPT Port

Order Made

13 **NPT Port**

Symbol **-XC18**

C95
CP95 | **Standard model no. →Details on chapter C95, CP95** | **XC18**

NPT port

Port RC(PT) of air cylinder is changed to NPT.

Specifications

Cylinder	Air cylinder/Standard
Series	**C95, CP95**
Action	Double acting single rod
Bore size (mm)	20, 25, 32, 40
Cushion	Rubber bumper
Auto switch	Available for mounting
Mounting	Basic, Axial foot, Front flange, Rear flange, Single clevis, Double clevis, Front trunnion, Rear trunnion, Integral clevis, Boss-cut
Additional specifications, refer to	Details on chapter C95, CP95

Made to Order Common Specifications -XC22: Fluorine Rubber Seals

Order Made

14 **Fluorine Rubber Seals**

Symbol **-XC22**

C95
CP95

Standard model no. →Details on chapter C95, CP95 — **XC22**

Fluorine Rubber Seals

Material for seals is changed to fluorine rubber excellent in chemical resistance.

Note 1) It might not be possible to use this material depending on the chemicals or operating temperatures to which it will be exposed. Therefore, contact SMC before use.

Note 2) Although we can manufacture cylinders with auto switches, the parts that are related to the auto switches (the auto switches themselves, mounting brackets, and built-in magnets) are identical to the standard products. Therefore, before using them, contact SMC regarding their compatibility with the operating environment.

Specifications

Applicable series	Air cylinder/Standard **C95, CP95**
Series variation	**C95, CP95** (Standard) **C95W, CP95W** (Double rod)
Bore size (mm)	32, 40, 50, 63, 80, 100
Action	Double acting
Ambient temperature	(1) Without auto switch: −10°C to +70°C (No condensation) With auto switch : −10°C to +60°C
Cushion	Air cushion
Auto switch	Available for mounting
Mounting	Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis, Center trunnion
Additional specifications, refer to	Details on chapter C95, CP95

Made to Order Common Specifications -XC35: With Coil Scraper

Order Made

15 **With Coil Scraper**

Symbol **-XC35**

C95
CP95

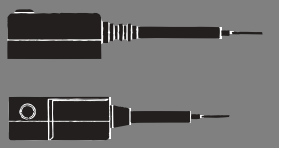
Standard model no. →Details on chapter C95, CP95 — **XC35**

With coil scraper

Scraper removes frost, weld spatter, cutting dust, and etc., and it protects the seals.

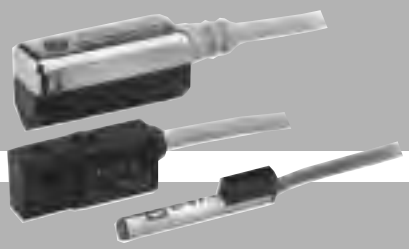
Specifications

Applicable series	**C95, CP95**
Action	Double acting single rod
Bore size (mm)	32, 40, 50, 63, 80, 100
Max. operating pressure	1.0MPa
Min. operating pressure	0.05MPa
Cushion	Air cushion, Rubber bumper
Scraper	Coil scraper (Metal)
Auto switch	Available for mounting (Bore size 200mm or less)
Mounting	Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis, Soft trunnion
Add'l specifications, refer to	Details on chapter C95, CP95



Auto Switch Guide

Reed Switch
Solid State Switch



Reed Switch

P 8-7

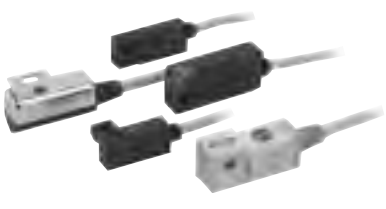
Solid State Switch

P 8-21

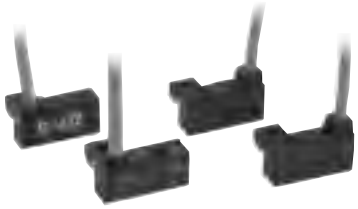
SMC Auto Switch Variations

Function	Style	Mounting method	Electrical entry	Auto switch model No.	Page
General purpose auto switch	Reed switch	Band	Grommet	D-C73/C76/C80	8-8
			Connector	D-C73C/C80C	8-9
			Terminal conduit	D-A33/A34	8-10
				D-A33A/A34A	8-10
			DIN terminal	D-A44	8-11
				D-A44A	8-11
		Rail	Grommet	D-A72/A73/A80	8-12
				D-A72H/A73H/A76H/A80H	8-13
			Connector	D-A73C/A80C	8-14
		Tie-rod	Grommet	D-A53/A54/A56/A64/A67	8-15
		Direct	Grommet	D-A90/A93/A96	8-16
				D-A90V/A93V/A96V	8-17
				D-Z73/Z76/Z80	8-18
	Solid state switch	Band	Grommet	D-H7A1/H7A2/H7B	8-22
			Connector	D-H7C	8-23
			Terminal conduit	D-G39/K39	8-24
				D-G39A/K39A	8-25
		Rail	Grommet	D-F79/F7P/J79	8-26
				D-F7NV/F7PV/F7BV	8-27
			Connector	D-J79C	8-28
		Tie-rod	Grommet	D-F59/F5P/J59/J51	8-29
		Direct	Grommet	D-M9N/M9P/M9B D-M9NV/M9PV/M9BV	8-30
				D-Y59A/Y7P/Y59B D-Y69A/Y7PV/Y69B	8-31

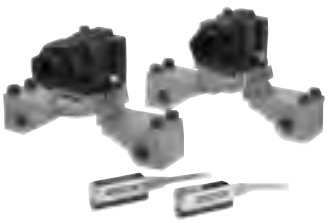
General purpose auto switch



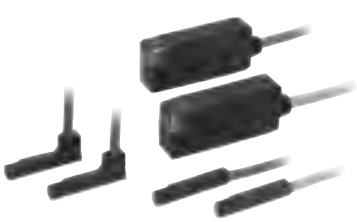
Band mounting



Rail mounting



Tie-rod mounting

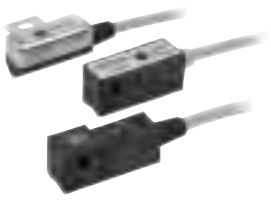


Direct mounting

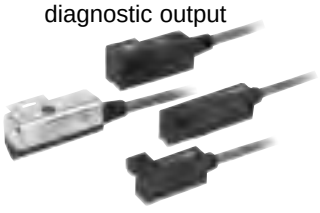
SMC Auto Switch Variations

Function	Style	Mounting method	Electrical entry	Auto switch model No.	Page
The suitable operating point can be indicated with green light. (Red→Green←Red)					
2 colour indication style	Reed switch	Rail	Grommet	**D-A79W**	8-19
		Tie-rod	Grommet	**D-A59W**	8-20
	Solid state switch	Band	Grommet	**D-H7NW/H7PW/H7BW**	8-32
		Rail	Grommet	**D-F79W/F7PW/J79W**	8-33
				D-F7NWV/F7BWV	8-34
		Tie-rod	Grommet	**D-F59W/F5PW/J59W**	8-35
		Direct	Grommet	**D-Y7NW/Y7PW/Y7BW**	8-36
				D-Y7NWV/Y7PWV/Y7BWV	
The output signal can be detected in an unsteady detecting area.					
2 colour indication style with diagnostic output	Solid state switch	Band	Grommet	**D-H7LF (Latching style)**	8-37
				D-H7NF	8-38
		Rail	Grommet	**D-F7LF (Latching style)**	8-39
				D-F79F	8-40
		Tie-rod	Grommet	**D-F5LF (Latching style)**	8-49
				D-F59F	8-41
Water (coolant) resistant performance					
Water resistant 2 colour indication	Solid state switch	Band	Grommet	**D-H7BAL**	8-42
		Rail	Grommet	**D-F7BAL**	8-43
		Tie-rod	Grommet	**D-F5BAL**	8-44
		Direct	Grommet	**D-Y7BAL**	8-47
With built-in OFF-delay timer (200ms)					
With timer	Solid state switch	Rail	Grommet	**D-F7NTL**	8-45
		Tie-rod	Grommet	**D-F5NTL**	8-46
Possible to use in an environment where disturbance magnetic fields are generated.					
Strong magnetic field resistant	Solid state switch	Rail	Grommet	**D-P5DWL**	8-48
With Prewiered Connector M8, M12					
With prewiered connectoer	Solid state switch	Band	With connector	**D-□□□PC**	8-50
		Rail			
		Direct			

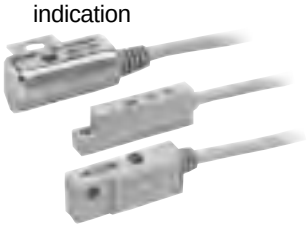
2 colour indication



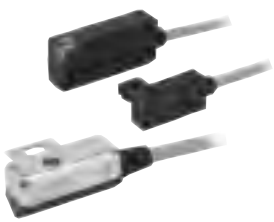
2 colour indication with diagnostic output



Water resistant 2 colour indication



With timer



Prior to Use
Auto Switch Specifications

⚠ Precautions

Auto Switch Common Specifications

Auto switch style	Reed switch	Solid state switch
Current leakage	None	3 wire: 100 μA or less, 2 wire: 1mA or less
Operating time	1.2ms	1ms or less (3)
Shock resistance	300m/s^2	1000m/s^2
Insulation resistance	50 M Ω or more at 500MV DC (between lead wire and the case)	
Withstand voltage	1500V AC/min. (between lead wire and the case) (1)	1000V AC/min. (between lead wire and the case)
Ambient temperature	–10 to 60˚C	
Protective construction	IEC529 Standard IP67, Waterproof construction (JISC0920) (2)	

Note 1) Connector style (D-A73C/A80C/C73C/C80C) and D-9/9□A/A9/A9□V style: 1000V AC/min. (between lead wire and the case)
Note 2) IEC529 Standard IP63, Rainproof construction (JISC0920) for Terminal conduit style (D-A3/A3□A/A3□C/G39/G39A/G39C/K39/K39A/K39C) and DIN teminal style (D-A44/A44A/A44C).
Note 3) Except solid state switch with timer (D-M5□TL, G5NTL, F7NTL, F5NTL) and **Auto switch for strong magnetic field resistance (D-P5DWL).** D-J51: 5ms or less

Lead Wire Length

How to Order
Ex.)

D-A73 L

Lead wire length

—	0.5m
L	3m
Z	5m
N*	None

∗ Applicable for the connector style (D- ∗∗ C) only

Note 1) Applicable auto switch with 5 meter lead wire ("Z")
Reed switch: D-B53/B54, D-C73 (C)/C80C,D-A73(C)(H)/A80C
D-A53/A54, D-Z73, D-90/97/90A/93A
Solid state switch: Manufactured upon receipt of order as standard (Except D-F9/F9□V)
Note 2) The standard lead wire length of solid state switch with timer or with water resistant 2 colour indication is 3 meters. (Not available 0.5m)
Note 3) The standard lead wire length of strong magnetic field resistant solid state switch is 3 or 5 meters. (Not available 0.5m.)

Part No. of lead wire with connector
(Available for connector style only.)

Part No.	Lead wire length
D-LC05	0.5m
D-LC30	3m
D-LC50	5m

Change of Lead Wire Colour

Lead wire colours of SMC auto switches have been changed in order to meet Nippon Electric Control Equipment Industries Association Standard No. 402.

2 wire auto switch

	Old	New
Output (+)	Red	Brown
Output (–)	Black	Blue

3 wire auto switch

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black

Solid state auto switch with diagnostic output

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black
Diagnositc output	Yellow	Orange

Solid state auto switch with latching style diagnostic output

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black
Latching style diagnostic outout	Yellow	Orange

Prior to Use
Auto Switch Hysteresis/Contact Protection Box

Contact Protection Box/CD-P11, CD-P12

1

The following auto switches are not incorporated with the contact protection box.

D-A7/A8, D-A7□H/A80H, D-A73C, A80C, D-C7/C8, D-C73C/C80C, D-E7□A, E80A, D-Z7/Z8, D-9/9□A, D-A9/A9□V, and D-A79W type

Use an auto switch with a contact protection box in any case listed below. Unless using a contact protection box, the contact life may be shortened.

(Due to permanent energizing conditions.)

D-A72(H) must be used with the contact protection box regardless of load styles and lead wire length.

①Operating load is an inductive load.

②The wiring length to load is more than 5m.

③The load voltage is 100 or 200 V AC.

2

Contact SMC when using built-in contact protection circuit style (D-A34[A] [C], D-A44[A] [C], D-A54/A64, D-B54/B64, D-A59W, D-B59W) **in the following conditions:**

① The wiring length to load is more than 30m.

② When using PLC with large flow current

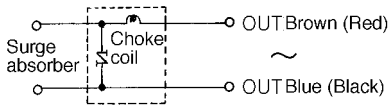
Contact Protection Box/Specifications

Part No.	CD-P11		CD-P12
Load voltage	100V AC max.	200V AC	24V DC
Max. load current	25mA	12.5mA	50mA

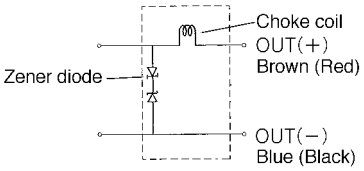
Lead wire length - Switch connecting side 0.5m
Load connecting side 0.5m

Contact Protection Box/Internal Circuit
( ): If applicable for IEC Standard

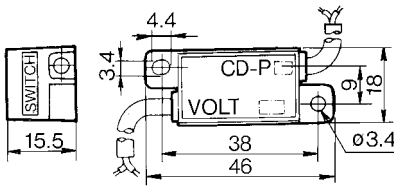
CD-P11



CD-P12

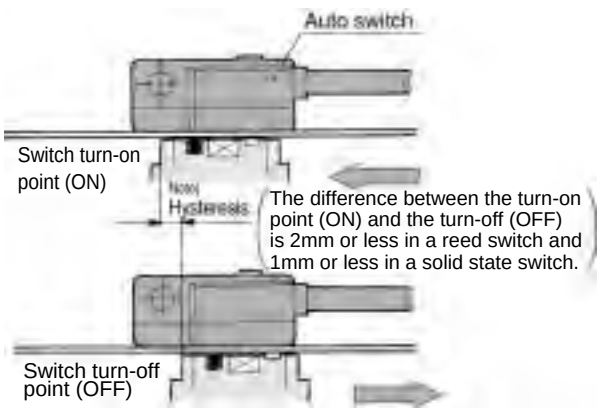


Contact Protection Box/Dimensions



Auto Switch Hysteresis

The distance between the turn-on point (ON) of the switch by moving of the piston to the turn-off point (OFF) is called "Hysteresis". This hysteresis is included as part of the operating range (one side).



Note) Hysteresis may fluctuate due to the operating environment. Contact SMC if the hysteresis causes a problem.

Contact Protection Box/Connection Method

For connection of the switch body and the contact protection box, connect the lead wire in the side indicated as "SWITCH" on the contact protection box to the lead wire from the switch body. The length of lead wire between the switch body and the contact protection box should be within 1m and they should be set as close together as possible.

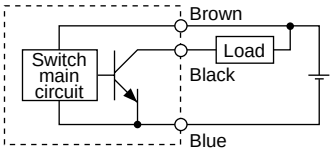
Prior to Use

Auto Switch Connection Method/Connection Example

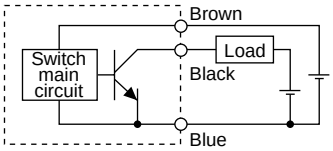
Basic Wiring

• Solid state switch

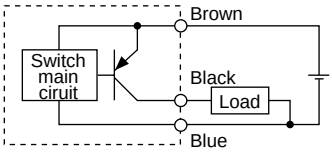
3 wire NPN



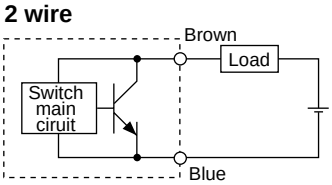
(When power source for switch and load is not common.)

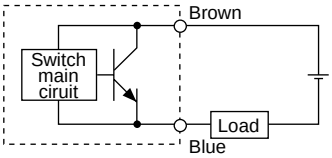


3 wire PNP



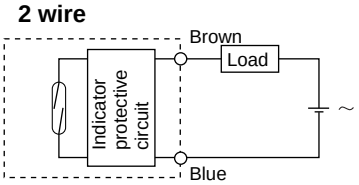
2 wire

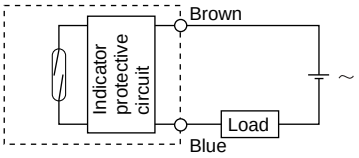




• Reed switch

2 wire

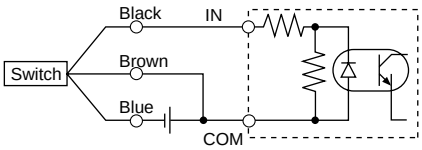




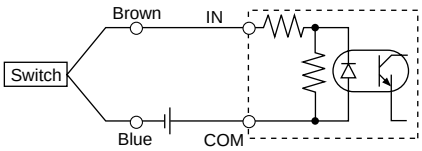
Typical PLC (Programmable Logic Controller) Connection Circuits

• Sink input

3 wire NPN

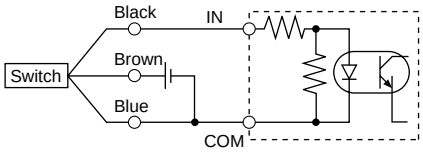


2 wire

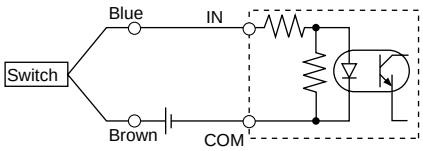


• Source input

3 wire PNP



2 wire

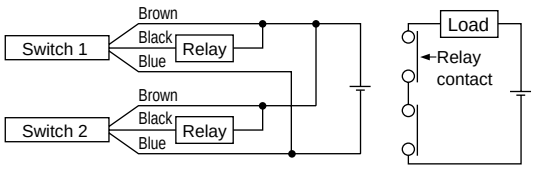


Connect according to the input specification of PLC because the connection method varies with the input specification of PLC.

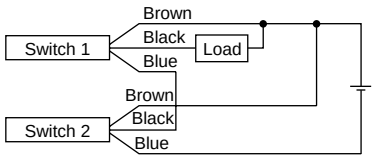
AND (Serial), OR (Parallel) Connection Examples

• 3 wire

NPN/AND connection (with relay)

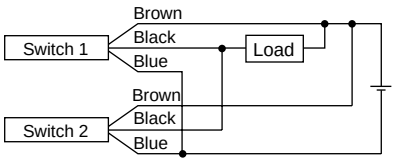


NPN/AND connection (with switch)



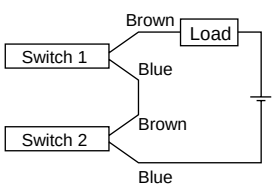
Indication lights up when both switches are ON.

NPN/OR connection



• 2 wire (2 pcs.)

AND connection

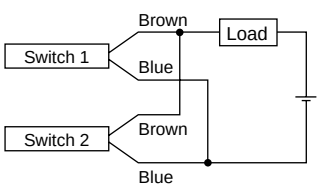


When 2 switches are connected by AND, load voltage will decrease at ON and these connections may cause malfunction of load.
Indication lights up when both switches are ON.

Load voltage at ON=Supply voltage-Internal drop voltage X 2 pcs.
=24V-4V X 2 pcs.
=16V

Example) Supply voltage 24V DC, switch internal drop voltage 4V

OR connection



[Solid state switch]
When 2 switches are connected by OR, load voltage will increase at OFF and these connections may cause malfunction.
[Reed switch]
There is no current leakage so that load voltage does not increase at OFF.
The flowing current is broken up into the ON-state switches, so indicator light becomes dark or may not turn ON due to the lack of the current.

Load voltage at OFF=Leakage current X 2 pcs. X Load impedance
=1mA X 2 pcs. X 3kΩ
=6V

Example) Load impedance 3kΩ, switch leakage current 1mA

Reed Switch

General Purpose Auto Switch
2 colour Indication Style

Reed Switch/Band Mounting
D-C73/D-C76/D-C80

Grommet

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controller

D-C7 (With indicator light)			
Auto switch model number	**D-C73**		**D-C76**
Application	Relay/PLC		IC circuit
Load voltage	24V DC	100V AC	4 to 8V DC
Max. load current and range	5 to 40mA	5 to 20mA	20mA
Contact protection circuit	None		
Internal voltage drop	≤ 2.4V		≤ 0.8V
Indicator light	ON: When red light emitting diode		

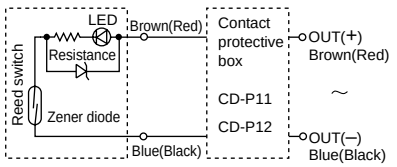
D-C8 (Without indicator light)			
Auto switch model number	**D-C80**		
Application	Relay/PLC/IC circuit		
Load voltage	24V AC/DC or less	48V AC/DC	100V AC/DC
Max. load current	50mA	40mA	20mA
Contact protection circuit	None		
Internal resistance	1Ω or less (Including 3m lead wire)		

Lead wire - Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

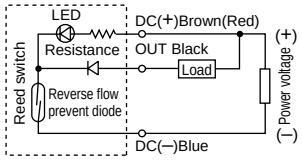
Internal Circuit

( ): If not applicable for IEC Standard

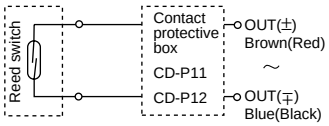
D-C73



D-C76

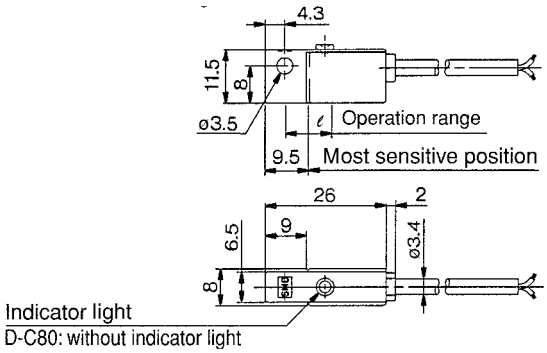


D-C80



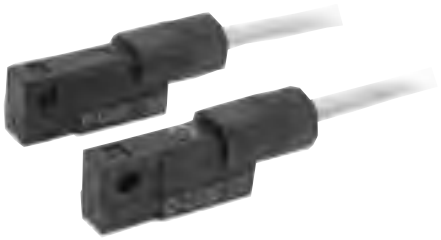
Note) ① In the case operation load is an inductive load.
② In the case the wiring length to load is more than 5m.
③ In the case the load voltage is 100V AC.
Be sure to use the auto switch with the contact protection box in any case mentioned above. Refer to p.8-5 for the details of contact protection box.

Dimensions



Reed Switch/Band Mounting
D-C73C/D-C80C

Connector



Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controller

D-C73C (With indicator light)	
Auto switch model number	**D-C73C**
Application	Relay/PLC
Load voltage	24V DC
Load current range	5 to 40mA
Contact protection circuit	None
Internal voltage drop	≤ 2.4V
Indicator light	ON: When red light emitting diode

D-C80C (Without indicator light)	
Auto switch model number	**D-C80C**
Application	Relay/PLC
Load voltage	≤ 24V AC/DC
Max. load current	50mA
Contact protection circuit	None
Internal resistance	≤ 1Ω (Including 3m lead wire)

● Lead wire — Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on p. 8-4
Note 2) Refer to p. 8-4 for lead wire length.
Note 3) Lead wire with connector may be shipped with switch.

⚠ Caution

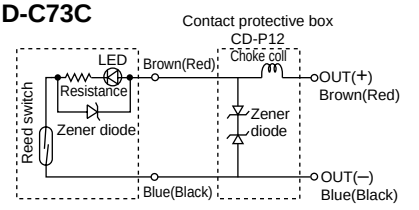
Precautions

①Confirm that the connector is appropriately tightened. If tightened insufficiently, the water resistant performance will deteriorate.

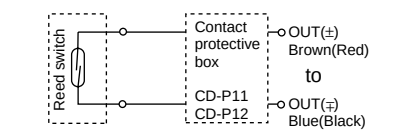
Internal Circuit

( ): If not applicable for IEC Standard

D-C73C

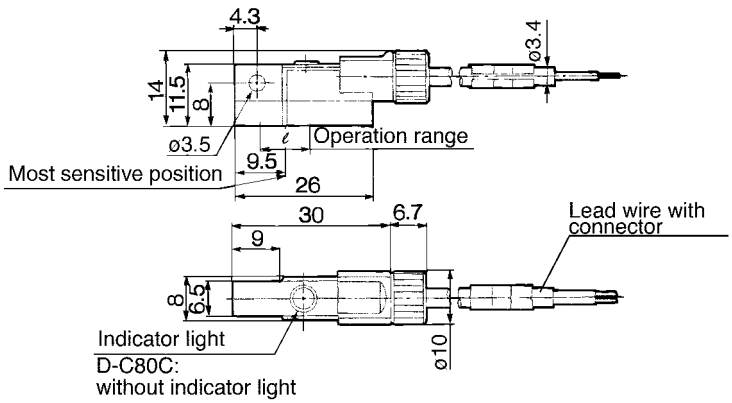


D-C80C



Note) ①In the case operation load is an inductive load.
②In the case the wiring length to load is > 5m.
Be sure to use the auto switch with the contact protection box in any case mentioned above. Refer to p.8-5 for the details of contact protection box.

Dimensions



Reed Switch/Band Mounting
D-A33/D-A34/D-A44

Terminal conduit: D-A3
DIN terminal: D-A4

Applicable Actuator Series

Series	Bore size (mm)
C95	ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø160 ø200, ø250

Specifications

PLC: Programmable Logic Controller

D-A3 (With indicator light) Terminal conduit				
Auto switch model number	**D-A33**	**D-A34**		
Application	PLC	Relay/PLC		
Load voltage	24V DC	24V DC	100V AC	200V AC
Load current range	5 to 50mA	5 to 50mA	5 to 25mA	5 to12.5mA
Contact protection circuit	None	Built-in		
Internal voltage drop	≤ 2.4V			
Indicator light	ON: When red light emitting diode			

D-A44 (With indicator light) DIN terminal			
Auto switch model number	**D-A44**		
Application	Relay/PLC		
Load voltage	24V DC	100V AC	200V AC
Load current range	5 to 50mA	5 to 25mA	5 to 12.5mA
Contact protection circuit	Built-in		
Internal voltage drop	≤ 2.4V		
Indicator light	ON: When red light emitting diode		

Note) Refer to common specifications on p.8-4.

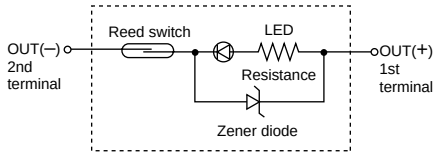
⚠ Caution

Precautions

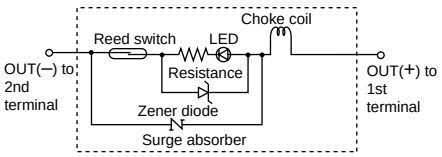
①Use cable whose O. D. is within the size in the figure to maintain water resistant performance.
②After wiring, confirm that tightening gland and all screws are tightened.

Internal Circuit

D-A33

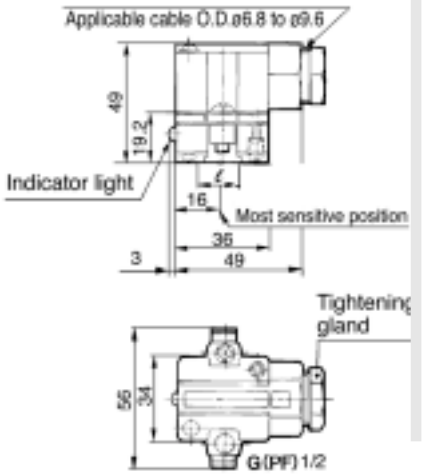


D-A34, D-A44

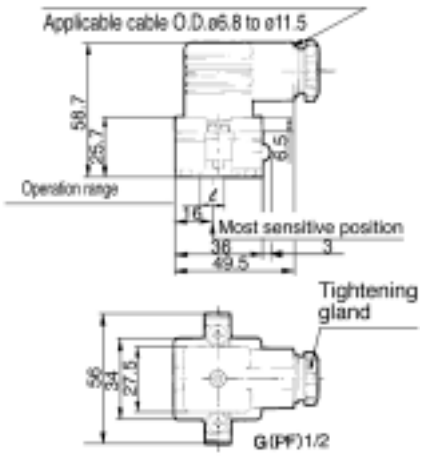


Dimensions

D-A3

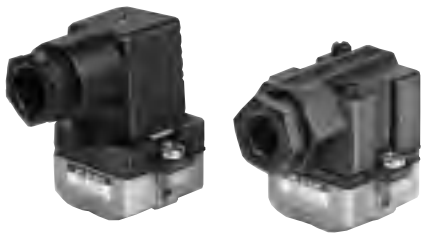


D-A44



Reed Switch/Band Mounting
D-A33A/D-A34A/D-A44A

Terminal conduit: D-A3□A
DIN terminal: D-A44A



Applicable Actuator Series

Series	Bore size (mm)
C95	ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø160, ø200, ø250

Specifications

PLC: Programmable Logic Controller

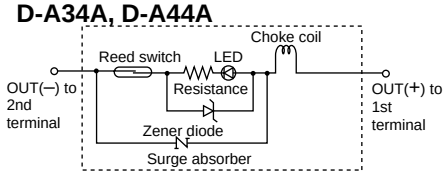
D-A3□A (With indicator light) Terminal conduit				
Auto switch model number	**D-A34A**			**D-A33A**
Application	Relay/PLC			PLC
Load voltage	24V DC	100V AC	200V AC	24V DC
Load current range	5 to 50mA	5 to 25mA	5 to12.5mA	5 to 50mA
Contact protection circuit	Built-in			None
Internal voltage drop	≤ 2.4V			
Indicator light	ON: When red light emitting diode			

D-A44A (With indicator light) DIN terminal			
Auto switch model number	**D-A44A**		
Application	Relay/PLC		
Load voltage	24V DC	100V AC	200V AC
Load current range	5 to 50mA	5 to 25mA	5 to12.5mA
Contact protection circuit	Built-in		
Internal voltage drop	≤ 2.4V		
Indicator light	ON: When red light emitting diode		

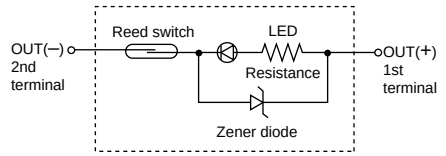
Note) Refer to common specifications on p.8-4.

Internal Circuit

D-A34A, D-A44A



D-A33A



⚠ Caution

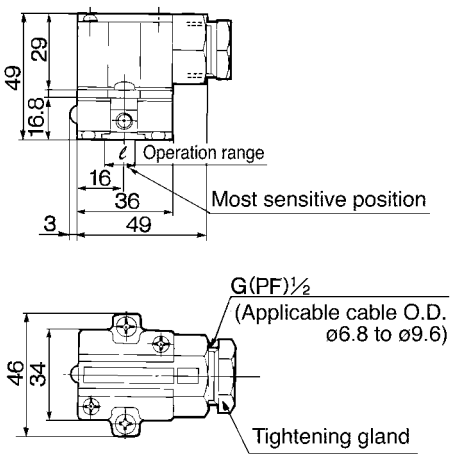
Precautions

①Use cable whose O. D. is within the size in the figure to maintain water resistant performance.

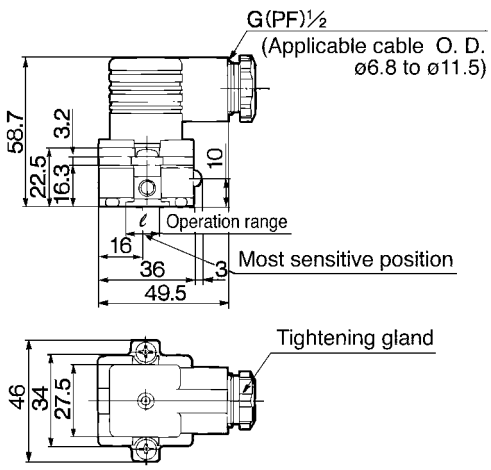
②After wiring, confirm that tightening gland and all screws are tightened.

Dimensions

D-A3□A



D-A44A



Reed Switch/Rail Mounting
D-A72/D-A73/D-A80

Grommet
Electrical entry : Perpendicular

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10,ø12, ø16, ø20, ø25
CD76	ø32, ø40

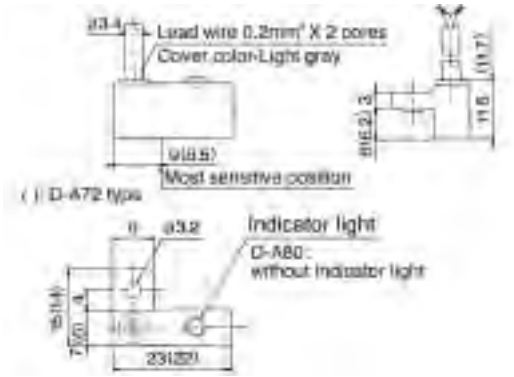
Specifications

PLC: Programmable Logic Controller

D-A7 (With indicator light)			
Auto switch model number	**D-A72**	**D-A73**	
Application	Relay/PLC	Relay/PLC	
Load voltage	200V AC	24V DC	100V AC
Load current range	5 to 10mA	5 to 40mA	5 to 20mA
Contact protection circuit	None		
Internal voltage drop	≤ 2.4V		
Indicator light	ON: When red light emitting diode		
D-A8 (Without indicator light)			
Auto switch model number	D-A80		
Application	Relay/IC circuit/PLC		
Load voltage	24V AC/DC or less	48V AC/DC	100V AC/DC
Max. load current	50mA	40mA	20mA
Contact protection circuit	None		
Internal resistance	1Ω or less (Including 3m lead wire)		

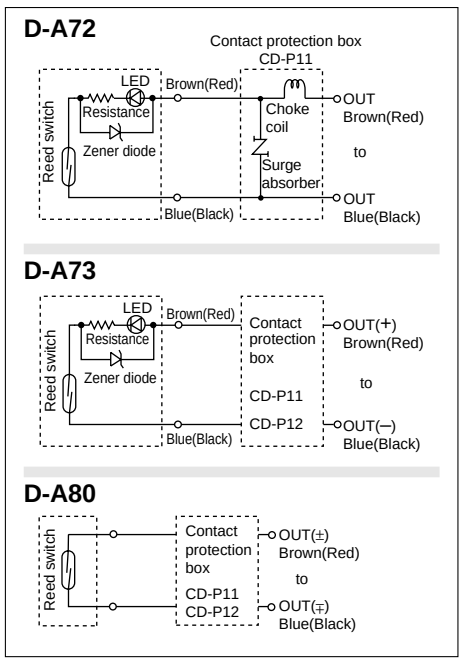
● Lead wire — Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on the p. 8-4.
Note 2) Refer to the p.8-4 for lead wire length.

Dimensions



Internal Circuit

( ): If not applicable for IEC Standard



Note) ①In the case operation load is an inductive load.
②In the case the wiring length to load is ">" 5m.
③In the case the load voltage is 100 or 200V AC.
Be sure to use the auto switch with the contact protection box in any case mentioned above.
D-A72 must be used with contact protection box.
Refer to p.8-5 for the details of contact protection box.

Reed Switch/Rail Mounting
D-A7□H/D-A80H

Grommet
Electrical entry : In-line

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controller

D-A7□H (With indicator light)

Auto switch model number	**D-A72H**	**D-A73H**		**D-A76H**
Application	Relay/PLC	Relay/PLC		IC circuit
Load voltage	200V AC	24V DC	100V AC	4 to 8V DC
Max. load current and range	5 to 10mA	5 to 40mA	5 to 20mA	20mA
Contact protection circuit	None			
Internal voltage drop	≤ 2.4V			0.8V or less
Indicator light	ON: When red light emitting diode			

D-A80H (Without indicator light)

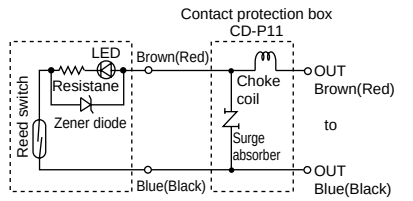
Auto switch model number	**D-A80H**		
Applications	Relay/IC circuit/PLC		
Load voltage	24V AC/DC or less	48V AC/DC	100V AC/DC
Max. load current	50mA	40mA	20mA
Contact protection circuit	None		
Internal resistance	1Ω or less (Including 3m lead wire)		

● Lead wire — Oilproof vinyl heavy insulation cable, 0.2mm², 2 cores (Brown, Blue), 3 cores (Brown, Black, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

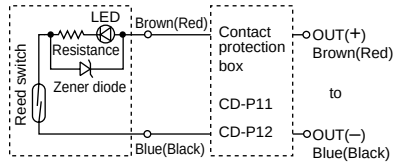
Internal Circuit

( ): If not applicable for IEC Standard

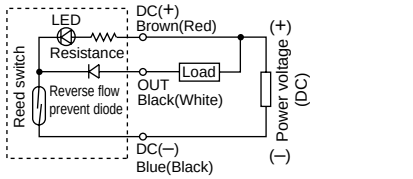
D-A72H



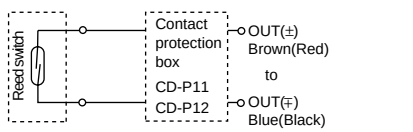
D-A73H



D-A76H

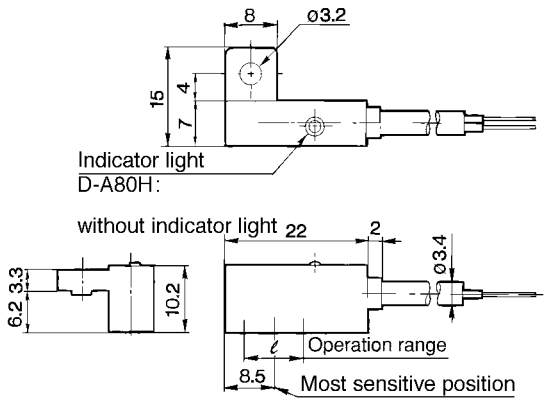


D-A80H



Note) ①In the case operation load is an inductive load.
②In the case the wiring length to load is "＞" 5m.
③In the case the load voltage is 100 or 200V AC.
Be sure to use the auto switch with the contact protection box in any case mentioned above.
D-A72H must be used with contact protection box.
Refer to p.8-5 for the details of contact protection box.

Dimensions



Reed Switch/Rail Mounting
D-A73C/D-A80C

Connector

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controller

D-A73C (With indicator light)	
Auto switch model number	**D-A73C**
Application	Relay/PLC
Load voltage	24V DC
Load current range	5 to 40mA
Contact protection circuit	None
Internal voltage drop	≤ 2.4V
Indicator light	ON: When red light emitting diode
D-A80C (Without indicator light)	
Auto switch model number	**D-A80C**
Application	Relay/IC circuit/PLC
Load voltage	24V $^{AC}_{DC}$
Max. load current	50mA
Contact protection circuit	None
Internal resistance	1Ω or less (Including 3m lead wire)

● Lead wire —— Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.
Note 3) Lead wire with connector may be shipped with switch.

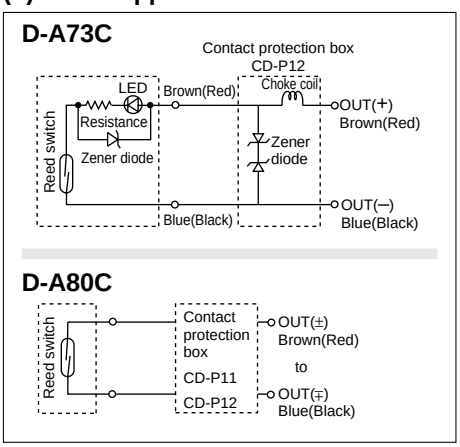
⚠ Caution

Precautions

①Confirm that the connector is appropriately tightened. If tightened insufficiently, the water resistant performance will deteriorate.
②Refer to p.8-52 for the details.

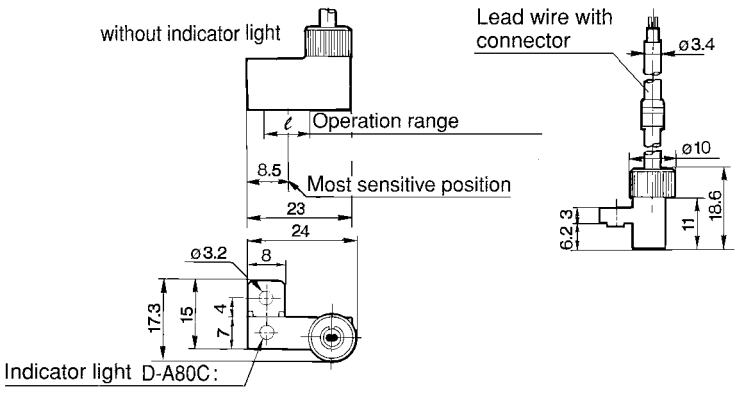
Internal Circuit

( ): If not applicable for IEC Standard



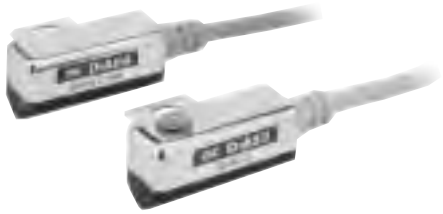
Note) ①In the case operation load is an inductive load.
②In the case the wiring length to load is "≥" 5m.
Be sure to use the auto switch with the contact protection box in any case mentioned above. Refer to p.8-5 for the details of contact protection box.

Dimensions



Reed Switch/Tie-rod Mounting
D-A5 □/D-A6 □

Grommet



Applicable Actuator Series

Series	Bore size (mm)
C95	ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø160, ø200, ø250

Specifications

PLC: Programmable Logic Controllar

D-A5 (With indicator light)

Auto switch model number	D-A53	D-A54			D-A56
Application	PLC	Relay/PLC			IC circuit
Load voltage	24V DC	24V DC	100V AC	200V AC	4 to 8V DC
Max. load current and range	5 to 50mA	5 to 50mA	5 to 25mA	5 to 12.5mA	20mA
Contact protection circuit	None	Built-in			None
Internal voltage drop	2.4V				0.8V or less
Indicator light	ON: When red light emitting diode				

D-A6 (Without indicator light)

Auto switch model number	D-A64			D-A67
Application	Relay/PLC			PLC/IC circuit
Load voltage	≤ 24V AC/DC	100V AC	200V AC	MAX. 24V DC
Max. load current	50mA	25mA	12.5mA	30mA
Contact protection circuit	Built-in			None
Internal resistance	≤ 10Ω			≤ 1Ω (Including 3m lead wire)

● Lead wire — Oilproof vinyl heavy insulation cable, ø4, 0.3mm², 2 cores (Brown, Blue), 0.5m or ø4, 0.2mm², 3 cores (Brown, Black, Blue), 0.5m

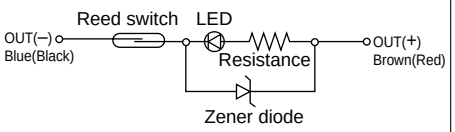
Note 1) Refer to common specifications on p.8-4.

Note 2) Refer to p.8-4 for lead wire length.

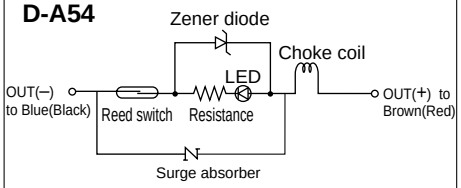
Internal Circuit

( ): If not applicable for IEC Standard

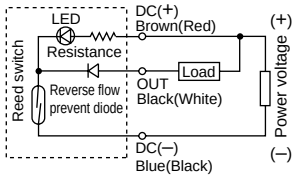
D-A53



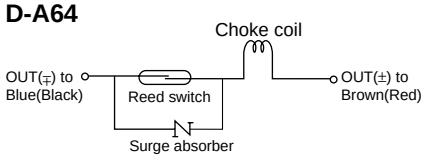
D-A54



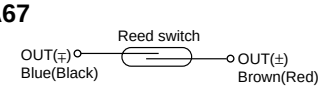
D-A56



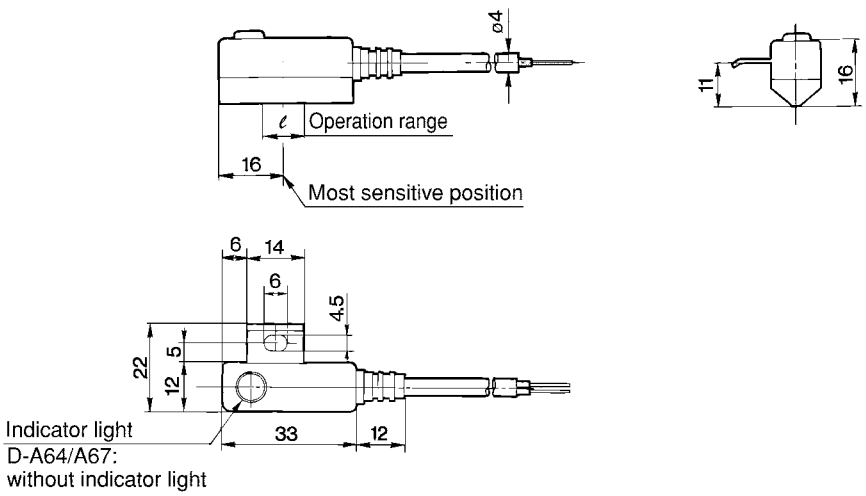
D-A64



D-A67



Dimensions



Reed Switch/Direct Mounting
D-A90/D-A93/D-A96

Grommet
Electrical entry: In-line

Applicable Actuator Series

Series	Bore size (mm)
C55	ø20, ø25

Specifications

PLC: Programmable Logic Controller

D-A90 (Without indicator light)

Auto swich modle number	D-A90		
Application	IC circuit/Relay/PLC		
Load voltage	24V AC/DC or less	48V AC/DC or less	100V AC/DC or less
Max. load current	50mA	40mA	20mA
Contact protection circuit	None		
Internal resistance	1Ω or less (Including 3m lead wire)		

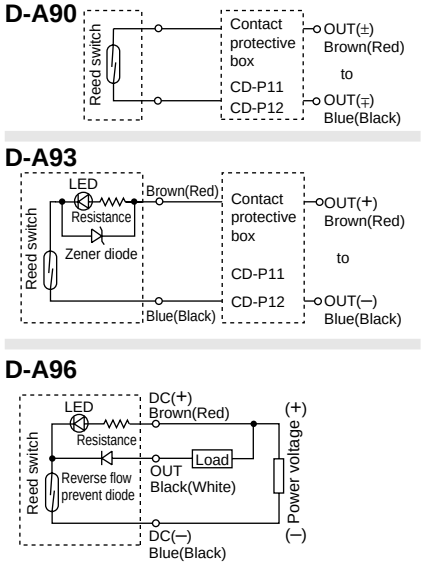
D-A93/D-A96 (With indicator light)

Auto switch model number	D-A93		D-A96
Application	Relay/PLC		IC circuit
Load voltage	24V DC	100V AC	4 to 8V DC
Max. load current and load current range	5 to 40mA	5 to 20mA	20mA
Contact protection circuit	None		
Internal voltage drop	≤ 2.4V (up to 20mA)/≤ 3V (up to 40mA)		≤ 0.8V
Indicator light	ON: When red light emitting diode		

● Lead wire
D-A90/D-A93 —— Oilproof vinyl heavy insulation cable, ø2.7, 0.18mm² X 2cores (Brown, Blue), 0.5m
D-A96 ———— Oilproof vinyl heavy insulation cable, ø2.7, 0.15mm² X 3cores (Brown, Black, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

Internal Circuit

( ): If not applicable for IEC Standard



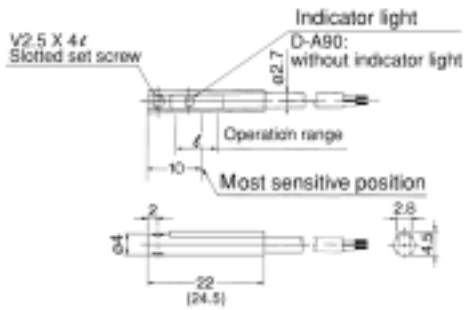
Note) ①In the case operation load is an inductive load.
②In the case the wiring length to load is ">" 5m.
③In the case the load voltage is 100V AC.
Be sure to use the auto switch with the contact protection box in any case mentioned above. Refer to p.8-5 for the details of contact protection box.

⚠ Caution

Precautions

①Fix the switch with appropriate screw installed on the switch body. If using other screws, switch may be damaged.

Dimensions



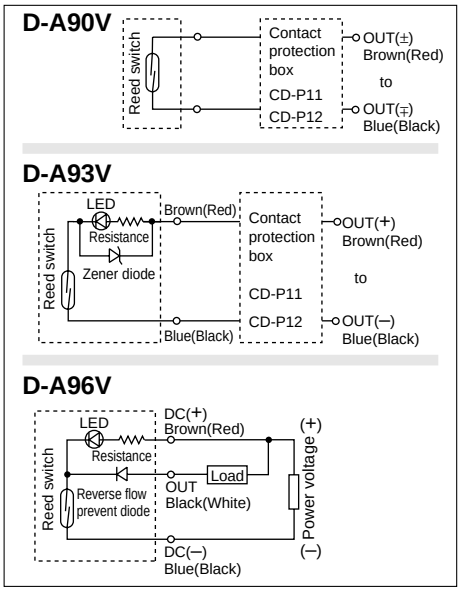
( ): D-A93

Reed Switch/Direct Mounting
D-A90V/D-A93V/D-A96V

Grommet
Electrical entry: Perpendicular

Internal Circuit

( ): If not applicable for IEC Standard



Note) ①In the case operation load is an inductive load.
②In the case the wiring length to load is "> " 5m.
③In the case the load voltage is 100V AC.
Be sure to use the auto switch with the contact protection box in any case mentioned above. Refer to p.8-5 for the details of contact protection box.

Applicable Actuator Series

Series	Bore size (mm)
C55	ø20, ø25

Specifications

PLC: Programmable Logic Controller

D-A90V (Without indicator light)			
Auto swich model number	**D-A90V**		
Application	IC circuit/Relay/PLC		
Load voltage	24V AC/DC or less	48V AC/DC or less	100V AC/DC or less
Max. load current	50mA	40mA	20mA
Contact protection circuit	None		
Internal resistance	1Ω or less (Including 3m lead wire)		

D-A93V/D-A96V (With indicator light)			
Auto switch model number	**D-A93V**		**D-A96V**
Application	Relay/PLC		IC circuit
Load voltag	24V DC	100V AC	4 to 8V DC
Max. load current and load current range	5 to 40mA	5 to 20mA	20mA
Contact protection circuit	None		
Internal voltage drop	2.7V or less		0.8V or less
Indicator light	ON: When red light emitting diode		

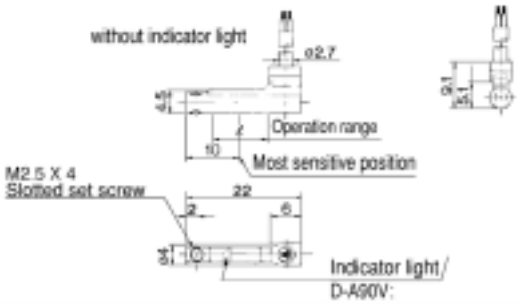
● Lead wire
D-A90V/D-A93V —— Oilproof vinyl heavy insulation cable, ø2.7, 0.18mm² X 2cores (Brown, Blue), 0.5m
D-A96V —————— Oilproof vinyl heavy insulation cable, ø2.7, 0.15mm² X 3cores (Brown, Black, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

⚠ Caution

Precautions

①Fix the switch with appropriate screw installed on the switch body. If using other screws, switch may be damaged.

Dimensions



Reed Switch/Direct Mounting
D-Z73/D-Z76/D-Z80

Grommet

Applicable Actuator Series

Series	Bore size (mm)
CP95	ø32, ø40, ø50, ø63, ø80, ø100

Specifications

PLC: Programmable Logic Controller

D-Z7 (With indicator light)			
Auto swich model number	**D-Z73**		**D-Z76**
Application	Relay/PLC		IC circuit
Load voltage	24V DC	100V AC	4 to 8V DC
Max. load current and load current range	5 to 40mA	5 to 20mA	20mA
Contact protection circuit	None		
Internal voltage drop	≤ 2.4V (up to 20mA)/≤ 3V (up to 30mA)		≤ 0.8V
Indicator light	ON: When red light emitting diode		

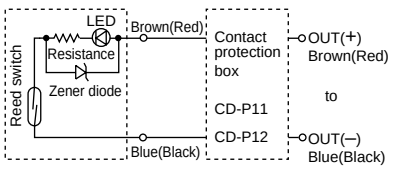
D-Z8 (Without indicator light)			
Auto switch model number	**D-Z80**		
Application	Relay/PLC/IC circuit		
Load voltage	24V AC/DC or less	48V AC/DC or less	100V AC/DC or less
Max. load current	50mA	40mA	20mA
Contact protection circuit	None		
Internal resistance	1Ω or less (Including 3m lead wire)		

● Lead wire – Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

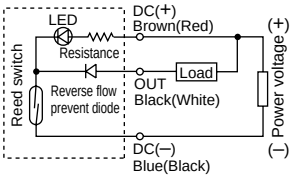
Internal Circuit

( ): If not applicable for IEC Standard

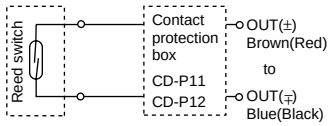
D-Z73



D-Z76



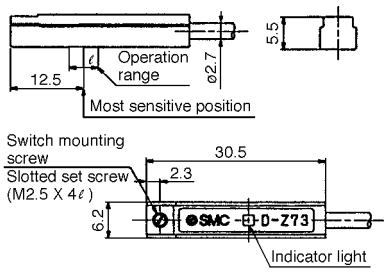
D-Z80



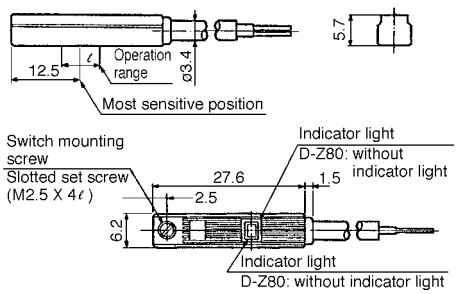
Note) ①In the case operation load is an inductive load.
②In the case the wiring length to ">" 5m.
③In the case the load voltage is 100V AC.
Be sure to use the auto switch with the contact protection box in any case mentioned above. Refer to the p.8-5 for the details of contact protection box.

Dimensions

D-Z73



D-Z76, Z80



2 Colour Indication Style Reed Switch/Rail Mounting
D-A79W

Grommet

The suitable operating point can be indicated with a green light. (Red → Green ← Red)

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controller

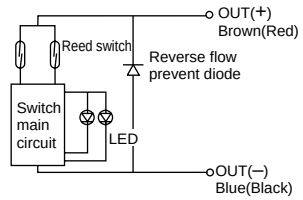
D-A79W (With indicator light)	
Auto switch model number	**D-A79W**
Application	Relay/PLC
Load voltage	24V DC
Load current range	5 to 40mA
Contact protection circuit	None
Internal voltage drop	≤ 4V
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode

●Lead wire —— Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on the p.8-4.
Note 2) Refer to the p.8-4 for lead wire length.

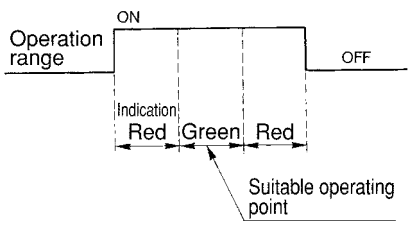
Internal Circuit

( ): If not applicable for IEC Standard

D-A79W

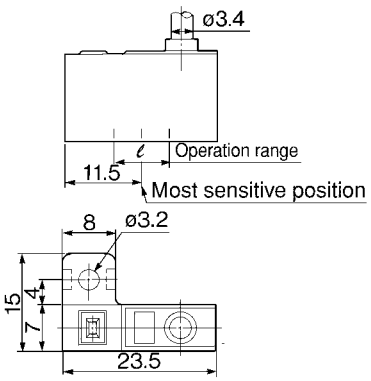


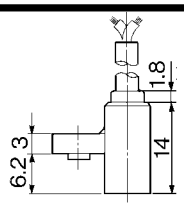
Indicator light/Operation



Note) ①In the case operation load is an inductive load.
②In the case the wiring length to load is more than 5m.
Be sure to use the auto switch with the contact protection box in any case mentioned above. Refer to the p.8-5 for the details of contact protection box.

Dimensions





2 Colour Indication Style Reed Switch/Tie-rod Mounting
D-A59W

Grommet

The suitable operating point can be indicated with a green light. (Red → Green ← Red)

Applicable Actuator Series

Series	Bore size (mm)
C95	ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø160, ø200, ø250

Specifications

PLC: Programmable Logic Controller

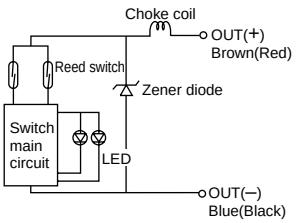
D-A59W (With indicator light)	
Auto switch model number	**D-A59W**
Application	Relay/PLC
Load voltage	24V DC
Load current range	5 to 40mA
Contact protection circuit	Built-in
Internal voltage drop	≤ 4V
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode

● Lead wire — Oilproof vinyl heavy insulation cable, ø4, 0.3mm², 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

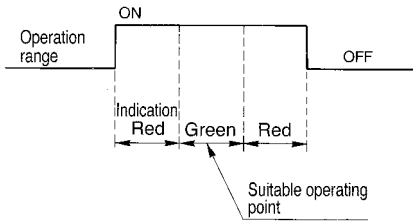
Internal Circuit

( ): If not applicable for IEC Standard

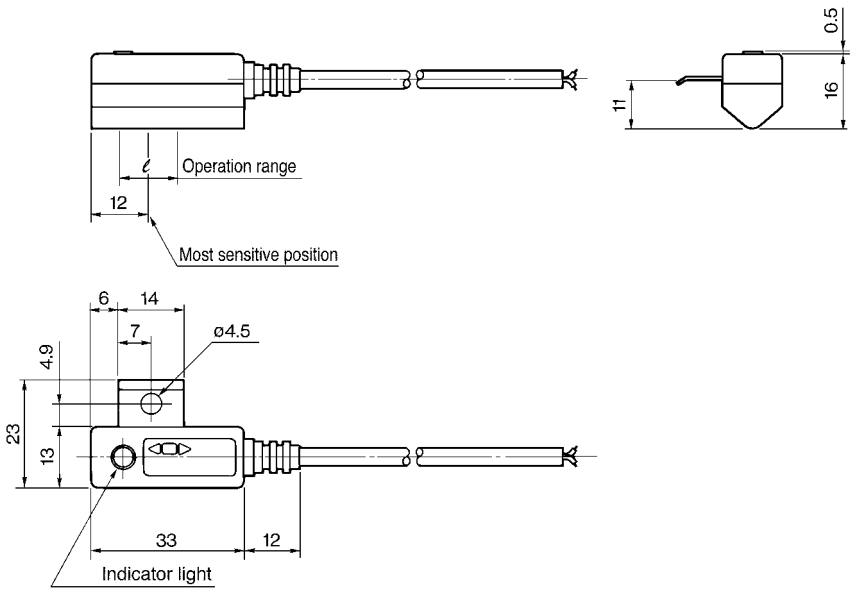
D-A59W



Indicator light/Operation



Dimensions



Solid State Switch

General Purpose Auto Switch, 2 Colour Indication Style, 2 Colour Indication Style with Diagnostic Output, Water Resistant 2 Colour Indication Style, With Timer, Strong Magnetic Field Resistant Style

Solid State Switch/Band Mounting
D-H7A1/D-H7A2/D-H7B

Grommet

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controller

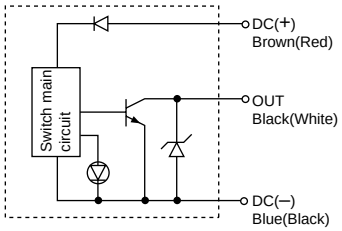
D-H7 (With indicator light)			
Auto switch model number	**D-H7A1**	**D-H7A2**	**D-H7B**
Wiring	3 wire		2 wire
Output	NPN	PNP	—
Application	IC circuit/Relay/PLC		24V DC Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)		—
Current consumption	10mA or less		—
Load voltage	28V DC or less	—	24V DC (10 to 28V DC)
Load current	40mA or less	80mA or less	5 to 40mA
Internal voltage drop	≤ 1.5V (≤ 0.8V at 10mA of load current)	0.8V or less	4V or less
Current leakage	≤ 100μA at 24V DC		≤ 0.8mA at 24V DC
Indicator light	ON: When red light emitting diode		

● Lead wire — Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

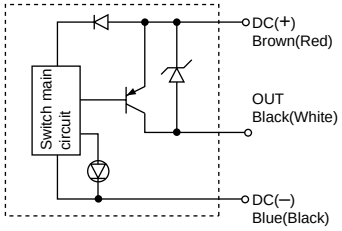
Internal Circuit

( ): If not applicable for IEC Standard

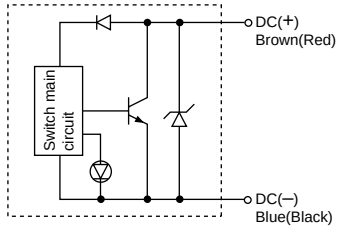
D-H7A1



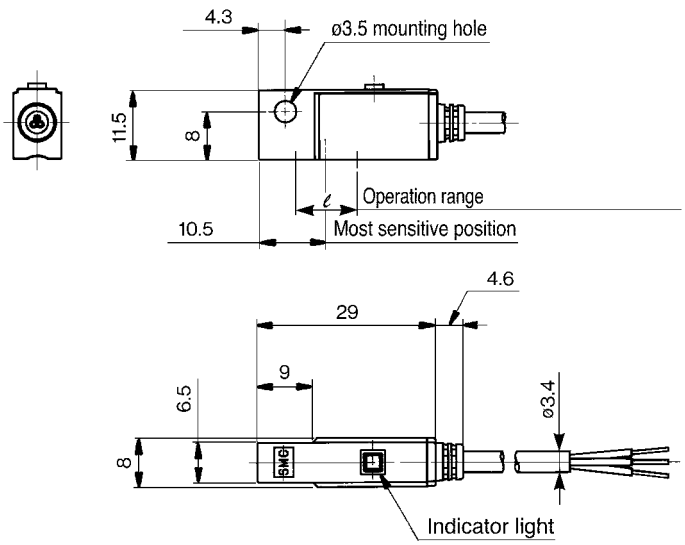
D-H7A2



D-H7B



Dimensions



Solid State Switch/Band Mounting
D-H7C

Connector

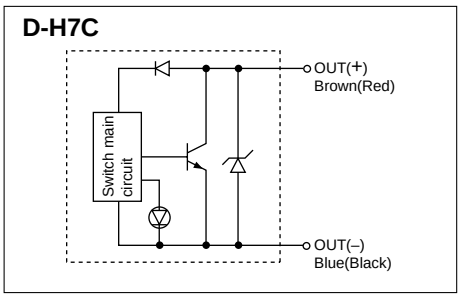
⚠ Caution

Precautions

①Confirm that the connector is appropriately tightened. If tightened insufficiently, the water resistant performance will deteriorate.
②Refer to p.8-52 for the details.

Internal Circuit

( ): If not applicable for IEC Standard



Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

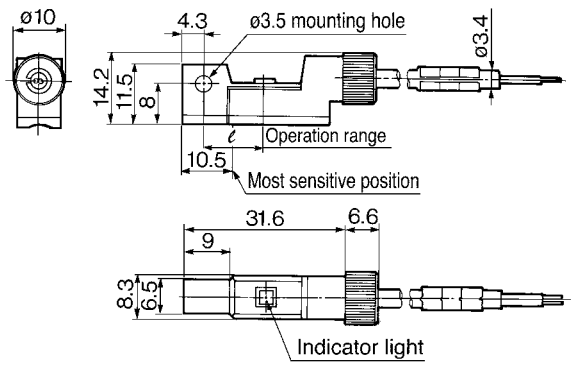
Specifications

PLC: Programmable Logic Controller

D-H7C (With indicator light)	
Auto switch model number	**D-H7C**
Wiring	2 wire
Output	—
Application	24V DC Relay/PLC
Power voltage	—
Current consumption	—
Load voltage	24V DC (10 to 28V DC)
Load current	5 to 40mA
Internal voltage drop	≤ 4V
Current leakage	≤ 0.8mA at 24V DC
Indicator light	ON: When red light emitting diode

●Lead wire—Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm^2, 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

Dimensions



Solid State Switch/Band Mounting
D-G39/D-K39

Terminal conduit

Applicable Actuator Series

Series	Bore size (mm)
C95	ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø140, ø160 ø200, ø250

Specifications

PLC: Programmable Logic Controller

D-G39/D-K39 (With indicator light)		
Auto switch model number	**D-G39**	**D-K39**
Wiring	3 wire	2 wire
Output	NPN	—
Application	IC circuit/Relay/PLC	24V DC Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)	—
Current consumption	≤ 10mA	—
Load voltage	≤ 28V DC	24V DC (10 to 28V DC)
Load current	≤ 40mA	5 to 40mA
Internal voltage drop	≤ 1.5V (0.8V or less at 10mA of load current)	≤ 4V
Current leakage	100μA or less at 24V DC	0.8mA or less at 24V DC
Indicator light	ON: When red light emitting diode	

Note) Refer to common specifications on p.8-4.

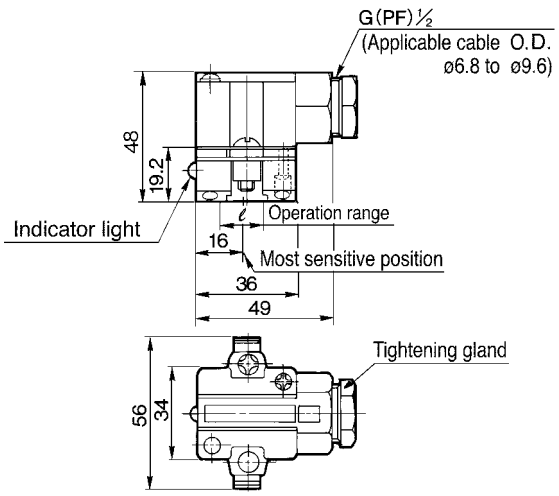
⚠ Caution

Precautions

①Use cable whose O. D. is within the size in the figure to maintain water resistant performance.

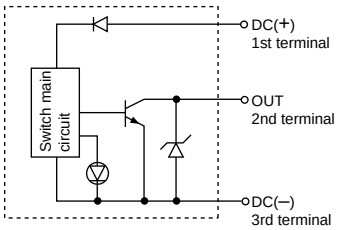
②After wiring, confirm that tightening gland and all screws are tightened.

Dimensions

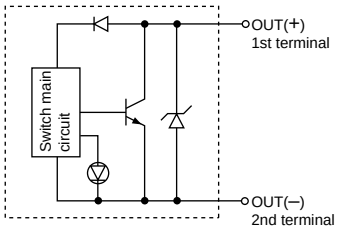


Internal Circuit

D-G39



D-K39



Solid State Switch/Band Mounting
D-G39A/D-K39A

Terminal conduit

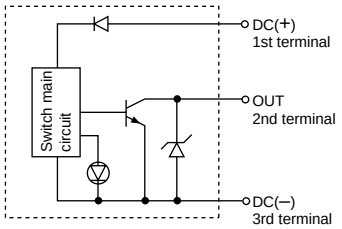
⚠ Caution

Precautions

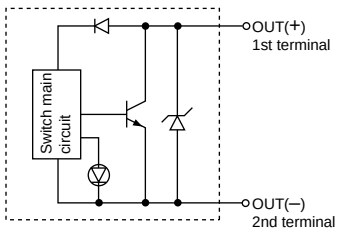
①Use cable whose O. D. is within the size in the figure to maintain water resistant performance.
②After wiring, confirm that tightening gland and all screws are tightened.

Internal Circuit

D-G39A



D-K39A



Applicable Actuator Series

Series	Bore size (mm)
C95	ø32, ø40, ø50, ø63. ø80, ø100, ø125, ø160, ø200, ø250

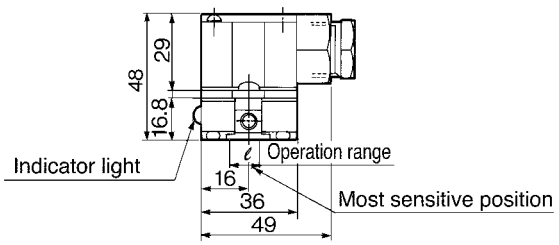
Specifications

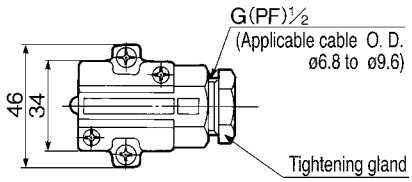
PLC: Programmable Logic Controller

D-G39A/D-K39A		
Auto switch model number	**D-G39A**	**D-K39A**
Wiring	3 wire	2 wire
Output	NPN	—
Application	IC circuit/Relay/PLC	24V DC Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)	—
Current consumption	≤ 10mA	—
Load voltage	≤ 28V DC	24V DC (10 to 28V DC)
Load current	≤ 40mA	5 to 40mA
Internal voltage drop	1.5V or less (0.8V or less at 10mA of load current)	4V or less
Current leakage	100μA or less at 24V DC	0.8mA or less at 24V DC
Indicator light	ON: When red light emitting diode	

Note) Refer to common specifications on p.8-4.

Dimensions





Solid State Switch/Rail Mounting
D-F79/D-F7P/D-J79

Grommet

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controller

D-F7□/D-J79 (With indicator light)

Auto switch model number	D-F79	D-F7P	D-J79
Wiring	3 wire		2 wire
Output	NPN	PNP	—
Application	IC circuit/Relay/PLC		24V DC Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)		—
Current consumption	≤ 10mA		—
Load voltage	≤ 28V DC	—	24V DC (10 to 28V DC)
Load current	≤ 40mA	80mA or less	5 to 40mA
Internal voltage drop	1.5V or less (0.8V or less at 10mA of load current)	0.8V or less	4V or less
Current leakage	≤ 100μA at 24V DC		≤ 0.8mA at 24V DC
Indicator light	ON: When red light emitting diode		

● Lead wire —Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue), 0.5m

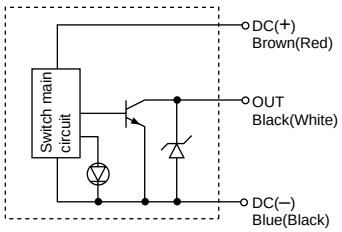
Note 1) Refer to common specifications on p.8-4.

Note 2) Refer to p.8-4 for lead wire length.

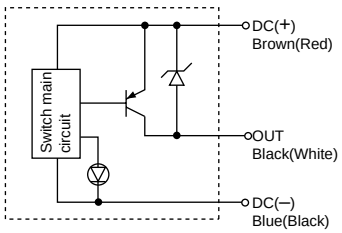
Internal Circuit

( ): If not applicable for IEC Standard

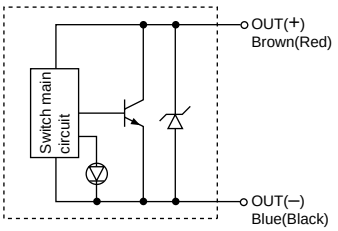
D-F79



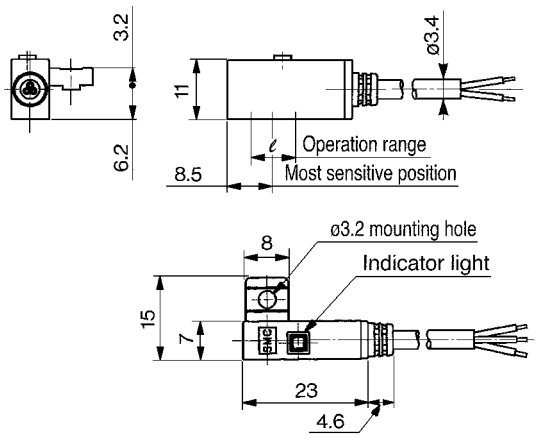
D-F7P



D-J79



Dimensions



Solid State Switch/Rail Mounting
D-F7NV/D-F7PV/D-F7BV

Grommet
Electrical entry: Perpendicular

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controlle

D-F7□V (With indicator light)

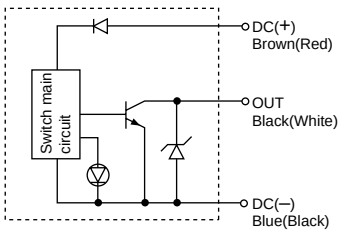
Auto switch model number	D-F7NV	D-F7PV	D-F7BV
Wiring	3 wire		2 wire
Output	NPN	PNP	—
Application	IC circuit/Relay/PLC		24V DC Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)		—
Current consumption	≤ 10mA		—
Load voltage	≤ 28V DC	—	24V DC (10 to 28V DC)
Load current	≤ 40mA	≤ 80mA	5 to 40mA
Internal voltage drop	1.5V or less (0.8V or less at 10mA of load current)	0.8V or less	4V or less
Current leakage	≤ 100μA at 24V DC		≤ 0.8mA at 24V DC
Indicator light	ON: When red light emitting diode		

● Lead wire — Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

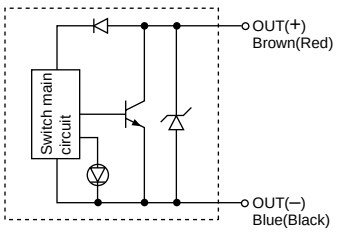
Internal Circuit

( ): If not applicable for IEC Standard

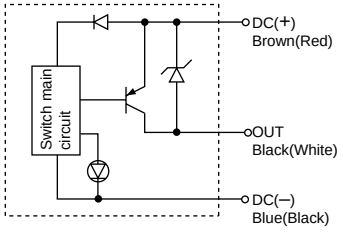
D-F7NV



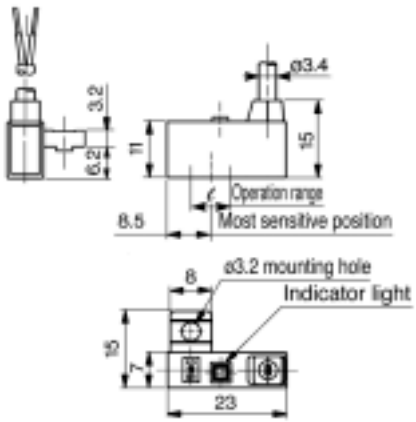
D-F7PV



D-F7BV



Dimensions



Solid State Switch/Rail Mounting
D-J79C

Connector

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controller

D-J79C	
Auto switch model number	**D-J79C**
Wiring	2 wire
Output	—
Application	24V DC Relay/PLC
Power voltage	—
Current consumption	—
Load voltage	24V DC (10 to 28V DC)
Load current	5 to 40mA
Internal voltage drop	≤ 4V
Current leakage	≤ 0.8mA at 24V DC
Indicator light	ON: When red light emitting diode

● Lead wire — Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

⚠ Caution

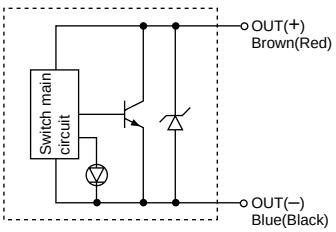
Precautions

①Confirm that the connector is appropriately tightened. If tightened insufficiently, the waterproof performance will deteriorate.
②Refer to p.8-52 for the details.

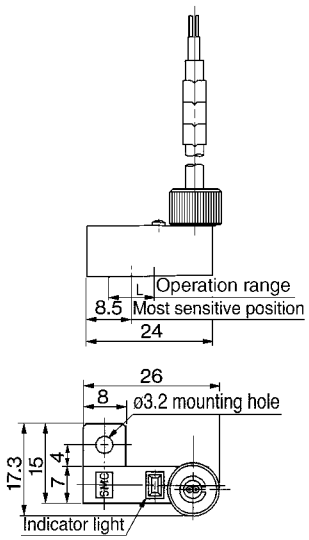
Internal Circuit

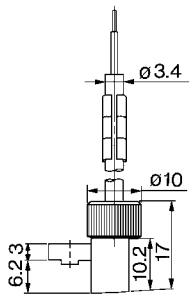
( ): If not applicable for IEC Standard

D-J79C



Dimensions



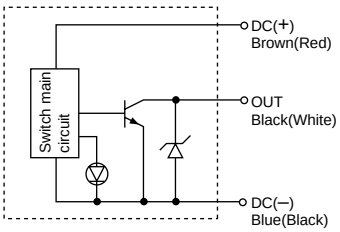


Solid State Switch/Tie-rod Mounting
D-F5□/D-J5□

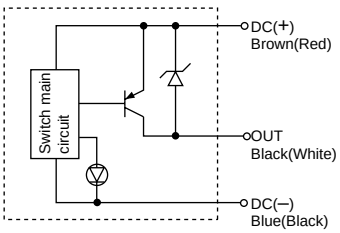
Grommet

Internal Circuit
( ): If not applicable for IEC Standard

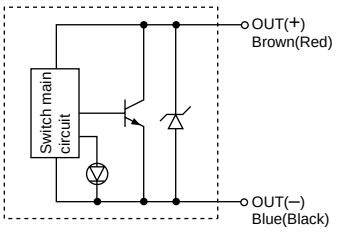
D-F59



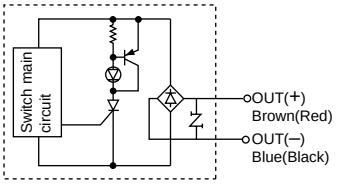
D-F5P



D-J59



D-J51



Applicable Actuator Series

Series	Bore size (mm)
C95	ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø160, ø200, ø250

Specifications

PLC: Programmable Logic Controller

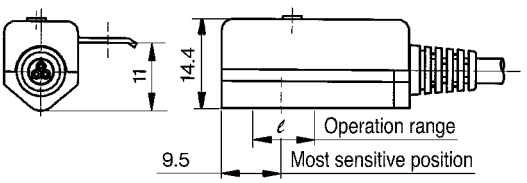
D-F5□/D-J5□

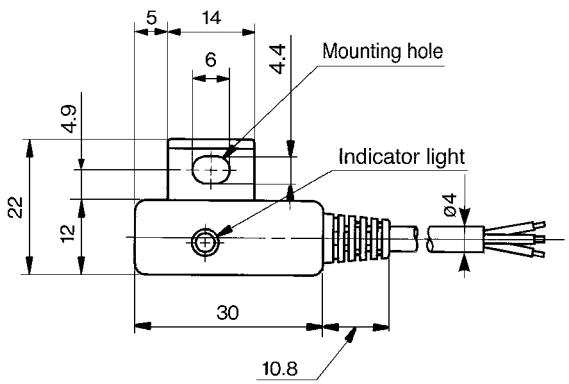
Auto switch model number	D-F59	D-F5P	D-J59	D-J51
Wiring	3 wire		2 wire	
Output	NPN	PNP	—	—
Application	IC circuit/Relay/PLC		24V DC Relay/PLC	AC Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)		—	—
Current consumption	≤ 10mA		—	—
Load voltage	≤ 28V DC	—	24V DC (10 to 28V DC)	80 to 260V AC
Load current	≤ 40mA	≤ 80mA	5 to 40mA	5 to 80mA
Internal voltage drop	1.5V or less (0.8V or less at 10mA of load current)	0.8V or less	4V or less	14V or less
Current leakage	≤ 100μA at 24V DC		≤ 0.8mA at 24V DC	≤ 1mA at 100 V DC ≤ 1.5mA at 200V DC
Indicator light	ON: When red light emitting diode			

● Lead wire — Oilproof vinyl heavy insulation cable, ø4, 0.3mm², 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on the p.8-4.
Note 2) Refer to the p.8-4 for lead wire length.

Dimensions

∗D-J51 differs in the shape, most sensitive position and operation range from other switches. Contact SMC for the details.

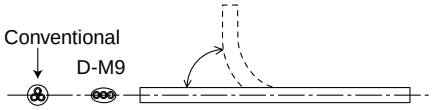


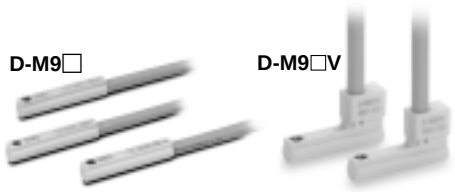


Solid State Switches: Direct Mounting Type
D-M9N(V), D-M9P(V), D-M9B(V)

Grommet

- **2-wire load current is reduced (2.5 to 40 mA).**
- **Lead-free**
- **Use of lead wire compliant with UL standards (style 2844)**
- **1.5 times the flexibility compared with conventional products (comparison with other SMC products)**

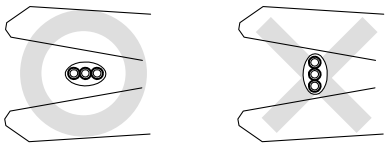




⚠Caution

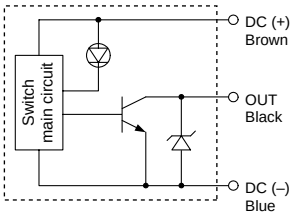
Operating Precautions

When the cable sheath is stripped, confirm the stripping direction.
The insulator may be split or damaged depending on the direction.

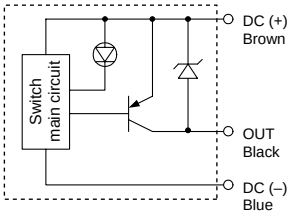


Auto Switch Internal Circuit

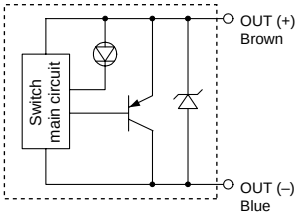
D-M9N, D-M9NV



D-M9P, D-M9PV



D-M9B, D-M9BV



Auto Switch Specifications

Refer to www.smcworld.com for details of products compatible with overseas standards.

PLC: Programable Logic Controller

D-M9□ (with indicator light)			
Switch model	D-M9N	D-M9P	D-M9B
Wiring type	3-wire		2-wire
Output type	NPN	PNP	—
Applicable load	IC circuit, Relay, PLC		24 VDC relay, PLC
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)		—
Current consumption	10 mA or less		—
Load voltage	28 VDC or less	—	24 VDC (10 to 28 VDC)
Load current	40 mA or less		2.5 to 40 mA
Internal voltage drop	0.8 V or less		4 V or less
Leakage current	100 μA or less at 24 VDC		0.8 mA or less
Indicator light	Red LED lights when ON		

● Lead wire ····· Oil proof heavy duty vinyl cord: 2.7 × 3.2 ellipse
D-M9B 0.15 mm² × 2 cores
D-M9N, D-M9P 0.15 mm² × 3 cores

Note 1) Refer to page 8-4 for solid state auto switch common specifications and lead wire length.

Weight

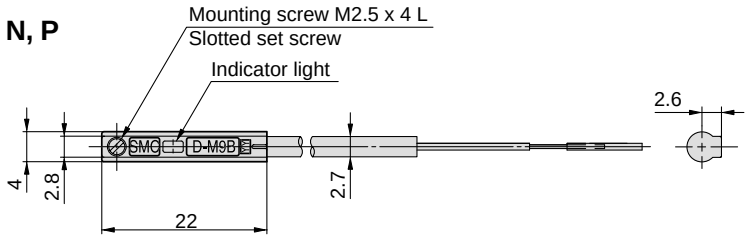
Unit: g

Auto switch model		D-M9N(V)	D-M9P(V)	D-M9B(V)
Lead wire length m	0.5	8	8	7
	3	41	41	38

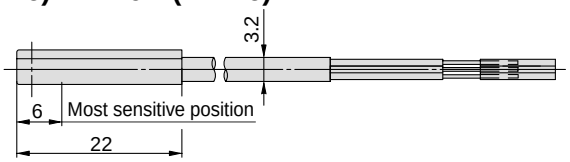
Dimensions

D-M9□

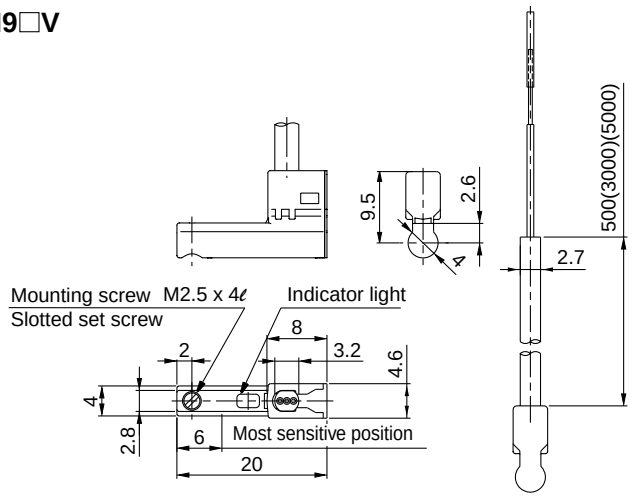
D-M9B, N, P



D-M9N, P (3-wire) - D-M9B (2-wire)



D-M9□V



Solid State Switch/Direct Mounting
D-Y59 A/B /D-Y69 A/B /D-Y7P(V)

Grommet

Applicable Actuator Series

Series	Bore size (mm)
C95	ø32, ø40, ø50, ø63, ø80, ø100 , ø125, ø160, ø200, ø250
CP95	ø32, ø40, ø50, ø63, ø80, ø100

Specifications

PLC: Programmable Logic Controller

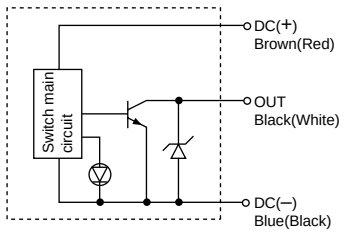
D-Y5/D-Y6/D-Y7P/D-Y7PV (With indicator light)						
Auto switch model number	**D-Y59A**	**D-Y69A**	**D-Y7P**	**D-Y7PV**	**D-Y59B**	**D-Y69B**
Electrical entry	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring	3 wire				2 wire	
Output	NPN		PNP		—	
Application	IC circuit/Relay/PLC				24V DC Relay/PLC	
Power voltage	5/12/24V DC (4.5 to 28V DC)				—	
Current consumption	≤ 10mA				—	
Load voltage	≤ 28V DC		—		24V DC (10 to 28V DC)	
Load current	≤ 40mA		80mA or less		5 to 40mA	
Internal voltage drop	1.5V or less (0.8V or less at 10mA of load current		0.8V or less		4V or less	
Current leakage	100μA or less at 24V DC				0.8mA or less at 24V DC	
Indicator light	ON: When red light emitting diode					

● Lead wire — Oilproof vinyl heavy insulation cable, ø3.4, 0.15mm², 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

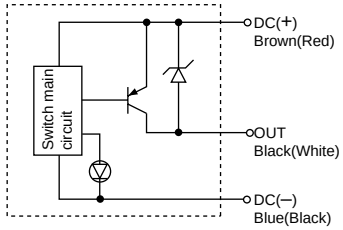
Internal Circuit

( ): If not applicable for IEC Standard

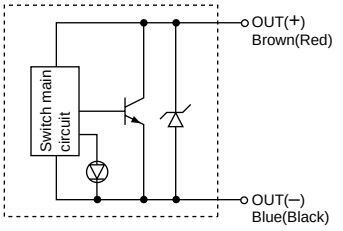
D-Y59A, D-Y69A



D-Y7P(V)

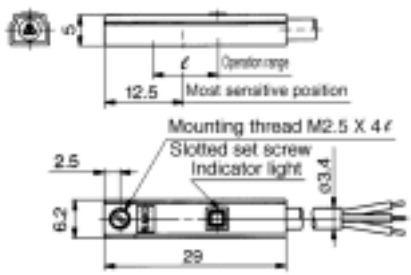


D-Y59B, D-Y69B

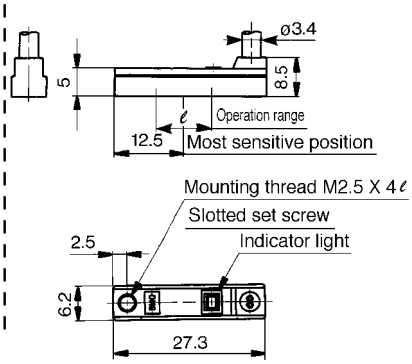


Dimensions

D-Y59A, D-Y7P, D-Y59B



D-Y69A, D-Y7PV, D-Y69B



2 Colour Indication Style Solid State Switch/Band Mounting
D-H7NW/D-H7PW/D-H7BW

Grommet

The suitable operating point can be indicated with a green light. (Red → Green ← Red)

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controller

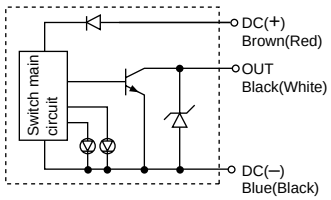
D-H7□W(With indicator light)			
Auto switch model number	**D-H7NW**	**D-H7PW**	**D-H7BW**
Wiring	3 wire		2 wire
Output	NPN	PNP	—
Application	IC circuit/Relay/PLC		24V DC Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)		—
Current consumption	≤ 10mA		—
Load voltage	≤ 28V DC	—	24V DC (10 to 28V DC)
Load current	≤ 40mA	≤ 80mA	5 to 40mA
Internal voltage drop	1.5V or less (0.8V or less at 10mA of load current)	0.8V or less	4V or less
Current leakage	100μA or less at 24V DC		0.8mA or less at 24V DC
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode		

● Lead wire — Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

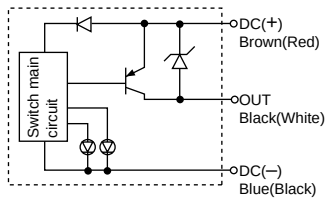
Internal Circuit

( ): If not applicable for IEC Standard

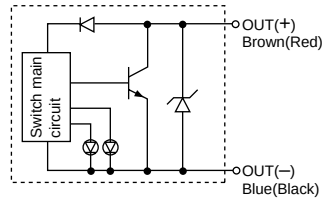
D-H7NW



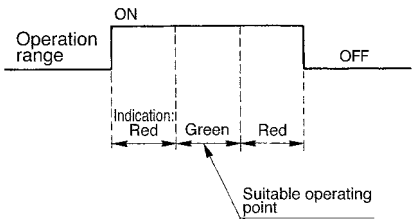
D-H7PW



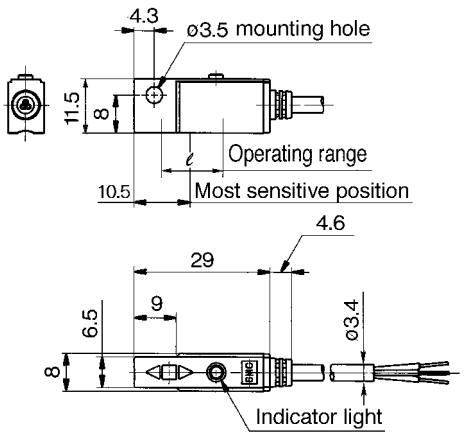
D-H7BW



Indicator light/Operation



Dimensions



2 Colour Indication Style Solid State Switch/Rail Mounting
D-F79W/D-F7PW/D-J79W

Grommet

The suitable operating point can be indicated with a green light. (Red→Green←Red)

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controller

D-F7□W/D-J79W			
Auto switch model number	**D-F79W**	**D-F7PW**	**D-J79W**
Wiring	3 wire		2 wire
Output	NPN	PNP	—
Application	IC circuit/Relay/PLC		24V DC Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)		—
Current consumption	≤ 10mA		—
Load voltage	≤ 28V DC	—	24V DC (10 to 28V DC)
Load current	≤ 40mA	≤ 80mA	5 to 40mA
Internal voltage drop	≤ 1.5V (≤ 0.8V at 10mA load current)	≤ 0.8V	≤ 4V
Current leakage	≤ 100μA at 24V DC		≤ 0.8mA at 24V DC
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode		

●Lead wire—— Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue), 0.5m

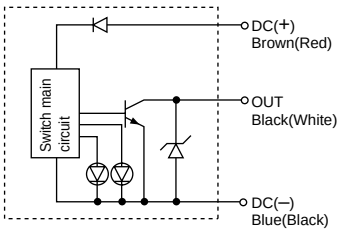
Note 1) Refer to common specifications on p.8-4.

Note 2) Refer to p.8-4 for lead wire length.

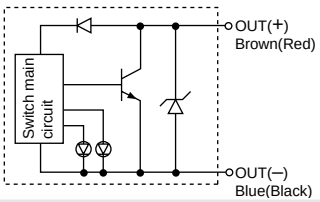
Internal Circuit

( ): If not applicable for IEC Standard

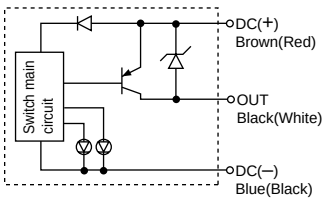
D-F79W



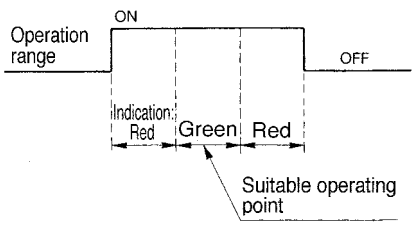
D-F7PW



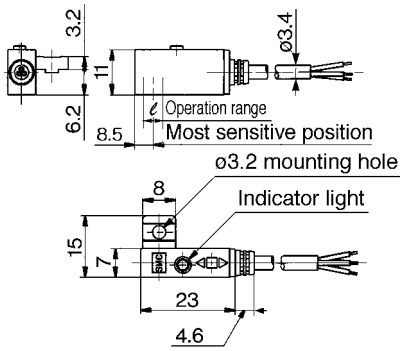
D-J79W



Indicator light/Operation



Dimensions



2 Colour Indication Style Solid State Switch/Rail Mounting
D-F7NWV/D-F7BWV

Grommet
Electrical entry: Perpendicular

The suitable operating point can be indicated with a green light. (Red→Green←Red)

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controller

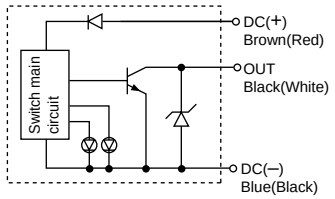
D-F7□WV (With indicator light)		
Auto switch model number	**D-F7NWV**	**D-F7BWV**
Wiring	3 wire	2 wire
Output	NPN	—
Application	IC circuit/Relay/PLC	24V DC Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)	—
Current consumption	≤ 10mA	—
Load voltage	≤ 28V DC	24V DC (10 to 28V DC)
Load current	≤ 40mA	5 to 40mA
Internal voltage drop	≤ 1.5V (≤ 0.8V at 10mA load current)	≤ 4V
Current leakage	100μA or less at 24V DC	0.8mA or less at 24V DC
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode	

●Lead wire —— Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

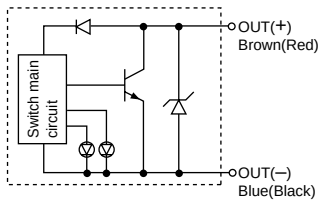
Internal Circuit

( ): If not applicable for IEC Standard

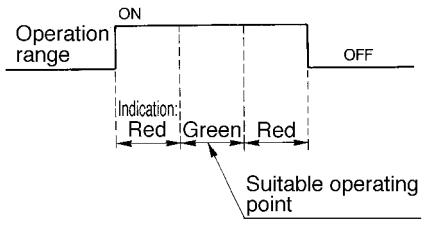
D-F7NWV



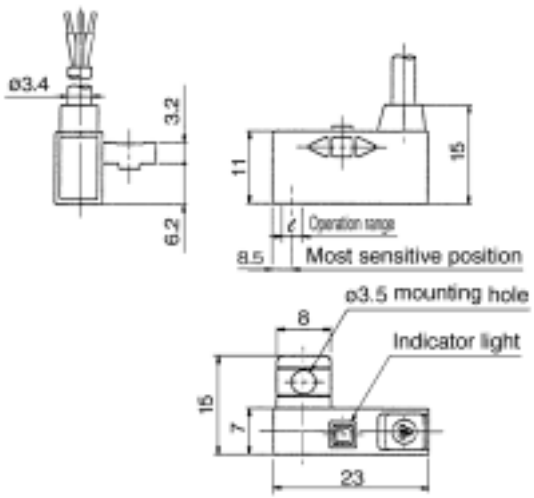
D-F7BWV



Indicator light/Operation



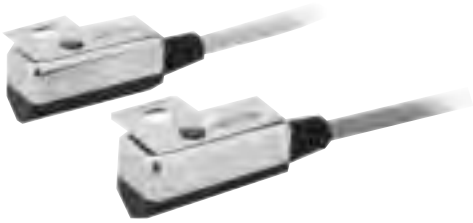
Dimensions



2 Colour Indication Style Solid State Switch/Tie-rod Mounting
D-F59W/D-F5PW/D-J59W

Grommet

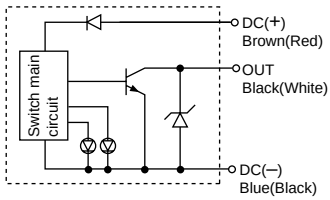
The suitable operating point can be indicated with a green light. (Red→Green←Red)



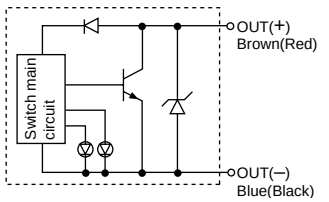
Internal Circuit

( ): If not applicable for IEC Standard

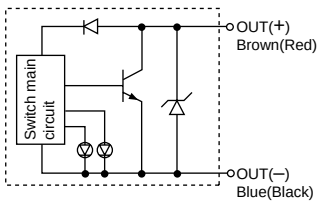
D-F59W



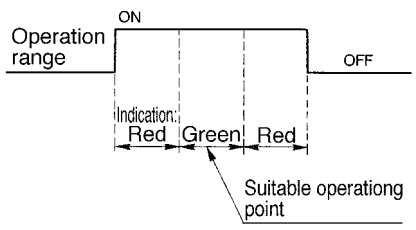
D-F5PW



D-J59W



Indicator light/Operation



Applicable Actuator Series

Series	Bore size (mm)
C95	ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø160, ø200, ø250

Specifications

PLC: Programmable Logic Controller

D-F5□W/D-J59W (With indicator light)

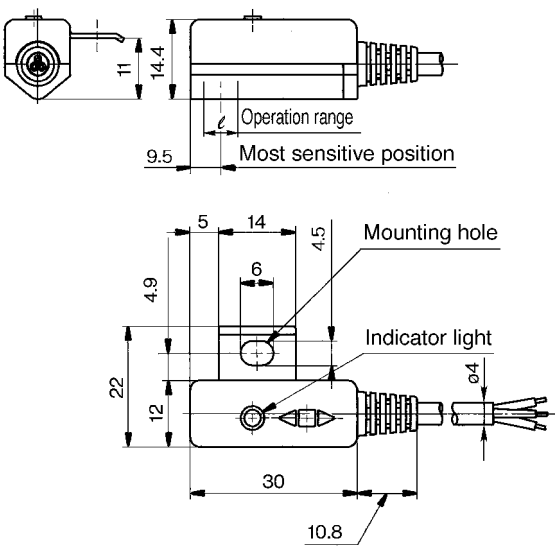
Auto switch model number	D-F59W	D-F5PW	D-J59W
Wiring	3 wire		2 wire
Output	NPN	PNP	—
Application	IC circuit/Relay/PLC		24V DC Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)		—
Current consumption	10mA		—
Load voltage	≤ 28V DC	—	24V DC (10 to 28V DC)
Load current	≤ 40mA	≤ 80mA	5 to 40mA
Internal voltage drop	≤ 1.5V (≤ 0.8V at 10mA load current)	≤ 0.8V	≤ 4V
Current leakage	≤ 100μA at 24V DC		≤ 0.8mA at 24V DC
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode		

●Lead wire —— Oilproof vinyl heavy insulation cable, ø4, 0.3mm², 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue), 0.5m

Note 1) Refer to common specifications on p.8-4.

Note 2) Refer to p.8-4 for lead wire length.

Dimensions



2 Colour Indication Style Solid State Switch/Direct Mounting

D-Y7NW(V)/D-Y7PW(V)/D-Y7BW(V)

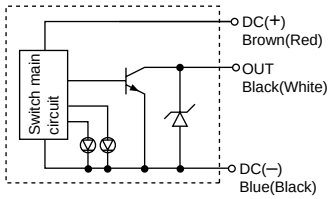
Grommet

The suitable operating point can be indicated with a green light. (Red→Green←Red)

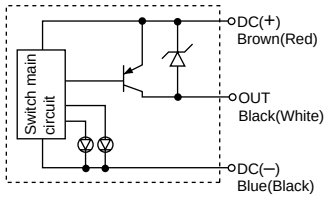
Internal Circuit

( ): If not applicable for IEC Standard

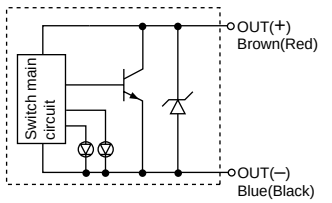
D-Y7NW(V)



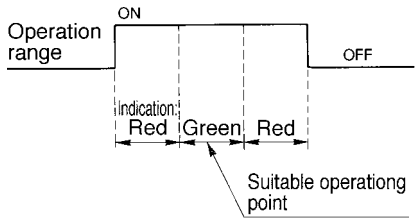
D-Y7PW(V)



D-Y7BW(V)



Indicator light/Operation



Applicable Actuator Series

Series	Bore size (mm)
CP95	ø20, ø32, ø40, ø50, ø63, ø80, ø100

Specifications

PLC: Programmable Logic Controller

D-Y7□W/D-Y7□WV (With indicator light)

Auto switch model number	D-Y7NW	D-Y7NWV	D-Y7PW	D-Y7PWV	D-Y7BW	D-Y7BWV
Electrical entry	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring	3 wire				2 wire	
Output	NPN		PNP		—	
Application	IC circuit/Relay/PLC				24V DC Relay/PLC	
Power voltage	5/12/24V DC (4.5 to 28V DC)				—	
Current consumption	10mA or less				—	
Load voltage	28V DC or less		—		24V DC (10 to 28V DC)	
Load current	40mA or less		80mA or less		5 to 40mA	
Internal voltage drop	≤1.5V (≤ 0.8V at 10mA load current)		≤ 0.8V		≤ 4V	
Current leakage	100μA or less at 24V DC				0.8mA or less at 24V DC	
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode					

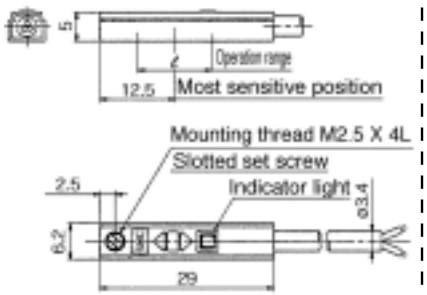
●Lead wire —— Oilproof vinyl heavy insulation cable, ø3.4, 0.15mm², 3 cores (Brown, Black, Blue), 2 cores (Brown, Blue), 0.5m

Note 1) Refer to common specifications on p.8-4.

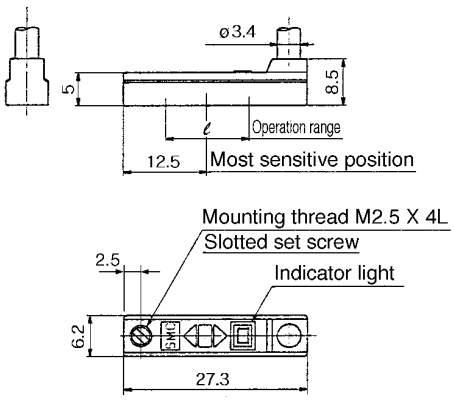
Note 2) Refer to p.8-4 for lead wire length.

Dimensions

D-Y7□W



D-Y7□WV



SMC

D-H7LF (Latching Style)

Grommet

The output signal can be detected in an unsteady detecting area.

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

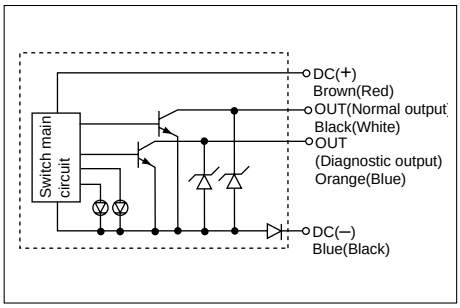
PLC: Programmable Logic Controller

D-H7LF (With indicator light)	
Auto switch model number	**D-H7LF**
Wiring	4 wire
Output	NPN
Diagnostic output	Latching operation
Application	24V DC Relay/PLC
Power voltage	24V DC (20 to 26V DC)
Current consumption	≤ 20mA
Load voltage	≤ 26V DC
Load current	≤ 40mA
Internal voltage drop	≤ 0.8V
Current leakage	≤ 100μA at 24V DC
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode Orange colour indicator lights on when diagnostic output is ON.

●Lead wire —— Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 4 cores (Brown, Black, Orange, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

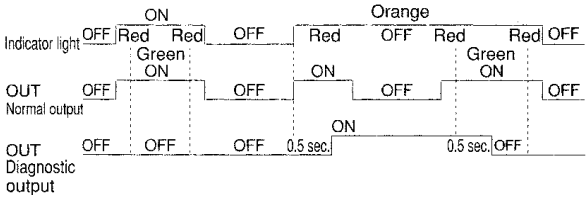
Internal Circuit

( ): If not applicable for IEC Standard

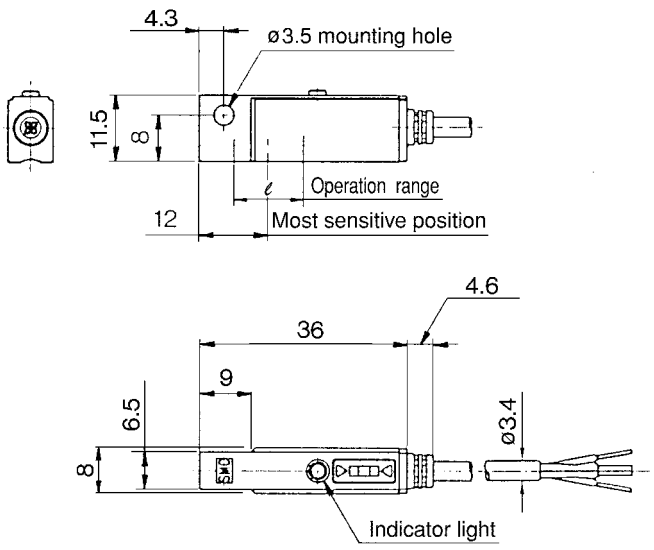


Diagnostic Output Operation

The diagnostic signal is output when detecting position remains within unsteady area (where indicator light is Red.) for more than 0.5 sec. This signal keeps outputting even after normal output goes to OFF. The diagnostic output becomes OFF when detecting position remains within the most suitable operating range (where indicator light is Green.) for more than 0.5 sec.



Dimensions



2 Colour Indication Style with Diagnostic Output Solid State Switch/Band Mounting

D-H7NF

Grommet

The output signal can be detected in an unsteady detecting area.

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controller

D-H7NF (With indicator light)	
Auto switch model number	**D-H7NF**
Wiring	4 wire
Output	NPN
Diagnostic output	Normal operation
Application	IC circuit/Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)
Current consumption	≤ 10mA
Load voltage	≤ 28V DC
Load current	≤ 40mA
Internal voltage drop	≤ 1.5V (≤ 0.8V at 10mA)
Current leakage	≤ 100μA at 24V DC
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode

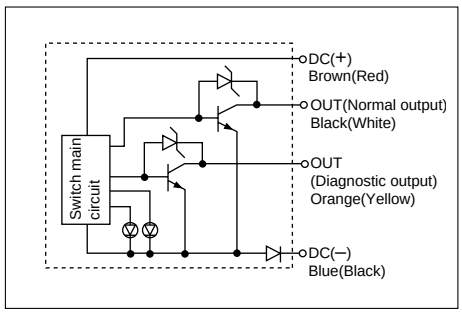
●Lead wire — Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 4 cores (Brown, Black, Orange, Blue), 0.5m

Note 1) Refer to common specifications on p.8-4.

Note 2) Refer to p.8-4 for lead wire length.

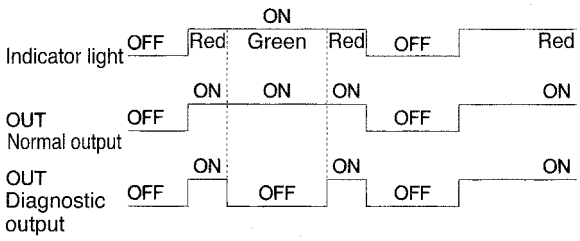
Internal Circuit

( ): If not applicable for IEC Standard

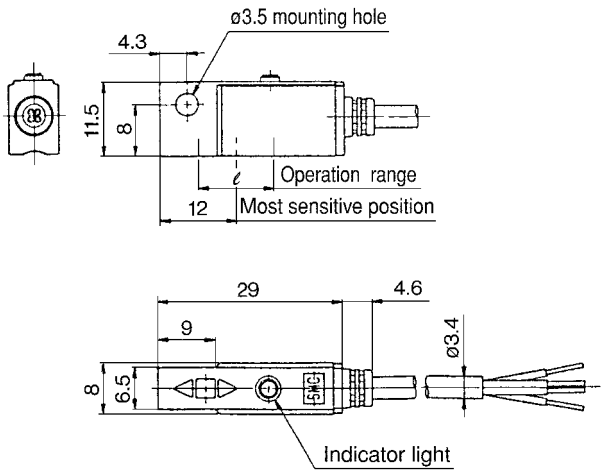


Diagnostic Output Operation

The diagnostic output is detected when detecting position remains at unsteady area only, not available at the most suitable operating area, thus diagnostic signal can be output only when the detecting position is far from the suitable position for normal operation.



Dimensions



SMC

D-F7LF (Latching Style)

Grommet

The output signal can be detected in an unsteady detecting area.

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

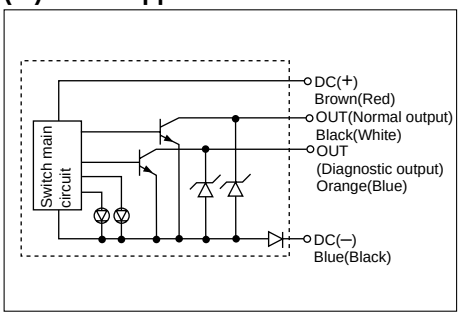
PLC: Programmable Logic Controller

D-F7LF (With indicator light)	
Auto switch model number	**D-F7LF**
Wiring	4 wire
Output	NPN
Diagnostic output	Latching operation
Application	24V DC Relay/PLC
Power voltage	24V DC (20 to 26V DC)
Current consumption	≤ 20mA
Load voltage	≤ 26V DC
Load current	≤ 40mA
Internal voltage drop	≤ 0.8V
Current leakage	≤ 100μA at 24V DC
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode Orange colour indicator lights on when diagnostic output is ON.

●Lead wire —— Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 4 cores (Brown,Black, Orange, Blue), 0.5m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

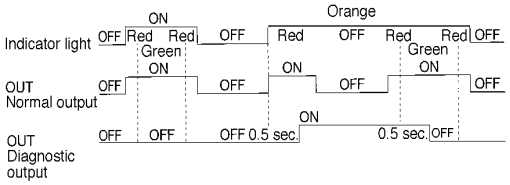
Internal Circuit

( ): If not applicable for IEC Standard

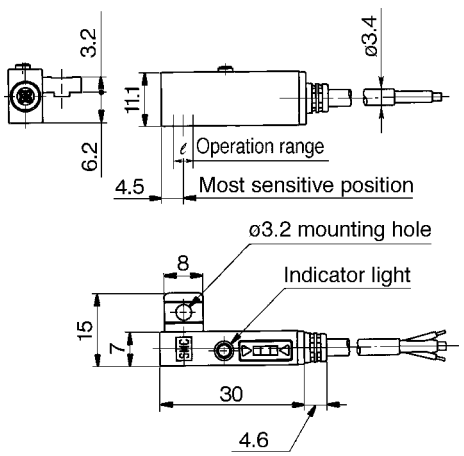


Diagnostic Output Operation

The diagnostic signal is output when detecting position remains within unsteady area (where indicator light is Red.) for more than 0.5 sec. This signal keeps outputting even after normal output goes to OFF. The diagnostic output becomes OFF when detecting position remains within the most suitable operating range (where indicator light is Green.) for more than 0.5 sec.



Dimensions

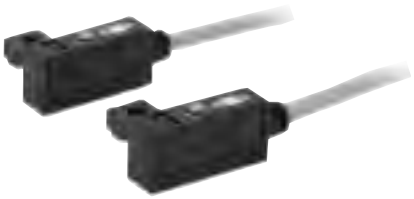


2 Colour Indication Style with Diagnostic Output Solid State Switch/Rail Mounting

D-F79F

Grommet

The output signal can be detected in an unsteady detecting area.



Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controller

D-F79F (With indicator light)	
Auto switch model number	**D-F79F**
Wiring	4 wire
Output	NPN
Diagnostic output	Normal operation
Application	IC circuit/Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)
Current consumption	≤ 10mA
Load voltage	≤ 28V DC
Load current	≤ 40mA
Internal voltage drop	≤ 1.5V (0.8V at 10mA)
Current leakage	≤ 100μ A at 24V DC
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode

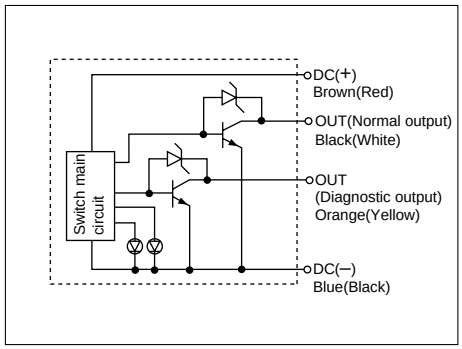
●Lead wire —— Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 4 cores (Brown, Black, Orange, Blue), 0.5m

Note 1) Refer to common specifications on p.8-4.

Note 2) Refer to p.8-4 for lead wire length.

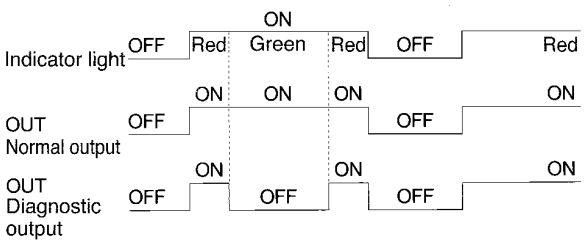
Internal Circuit

( ): If not applicable for IEC Standard

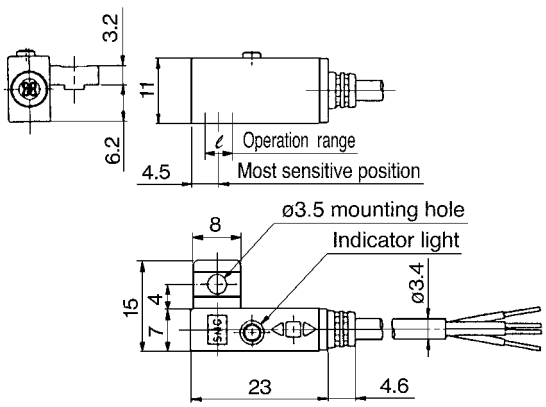


Diagnostic Output Operation

The diagnostic output is detected when detecting position remains at unsteady area only, not available at the most suitable operating area, that is to say, diagnostic signal can be output only when the detecting position is far from the suitable position for normal operation.



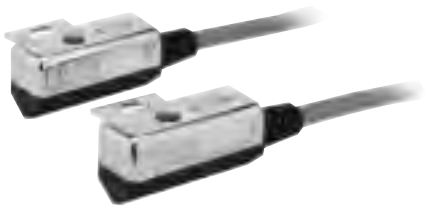
Dimensions



D-F59F

Grommet

The output signal can be detected in an unsteady detecting area.



Applicable Actuator Series

Series	Bore size (mm)
C95	ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø160, ø200, ø250

Specifications

PLC: Programmable Logic Controller

D-F59F	
Auto switch model number	**D-F59F**
Wiring	4 wire
Output	NPN
Diagnostic output	Normal operation
Application	IC circuit/Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)
Current consumption	≤ 10mA
Load voltage	≤ 28V DC
Load current	≤ 40mA
Internal voltage drop	≤ 1.5V (≤ 0.8V at 10mA)
Current leakage	≤ 100μA at 24V DC
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode

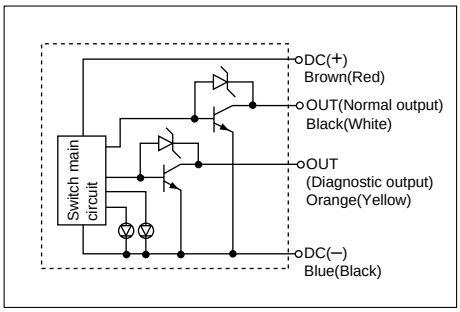
●Lead wire —— Oilproof vinyl heavy insulation cable, ø4, 0.2mm², 4 cores (Brown, Black, Orange, Blue), 0.5m

Note 1) Refer to common specifications on p.8-4.

Note 2) Refer to p.8-4 for lead wire length.

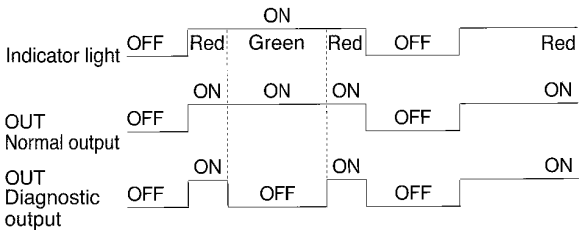
Internal Circuit

( ): If not applicable for IEC Standard

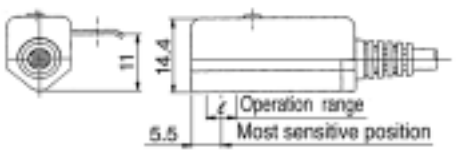


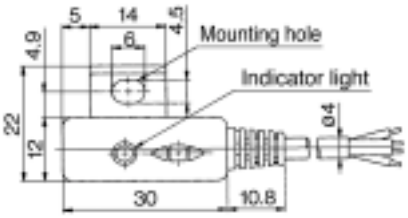
Diagnostic Output Operation

The diagnostic output is detected when detecting position remains at unsteady area only, not available at the most suitable operating area, that is to say, diagnostic signal can be output only when the detecting position is far from the suitable position for normal operation.



Dimensions





D-H7BAL

Grommet

Water (coolant) resistant performance

⚠ Caution

Precautions

Consult SMC if using coolant liquid other than water based solution.

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

PLC: Programmable Logic Controller

D-H7BAL (With indicator light)	
Auto switch model number	**D-H7BAL**
Wiring	2 wire
Output	–
Application	24V DC Relay/PLC
Power voltage	–
Current consumption	–
Load voltage	24V DC (10 to 28V DC)
Load current	≤ 5 to 40mA
Internal voltage drop	≤ 4V
Current leakage	≤ 0.8mA at 24V DC
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode

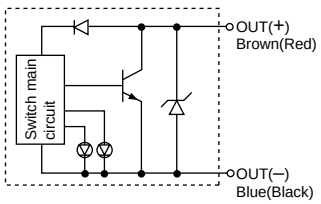
●Lead wire —— Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm^2, 2 cores (Brown, Blue), 3m (Standard)

Note 1) Refer to common specifications on p.8-4.

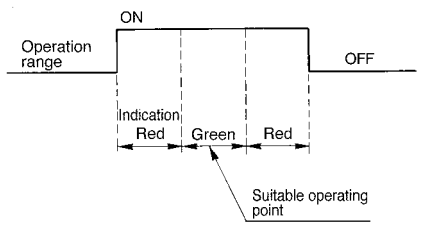
Note 2) Refer to p.8-4 for lead wire length.

Internal Circuit

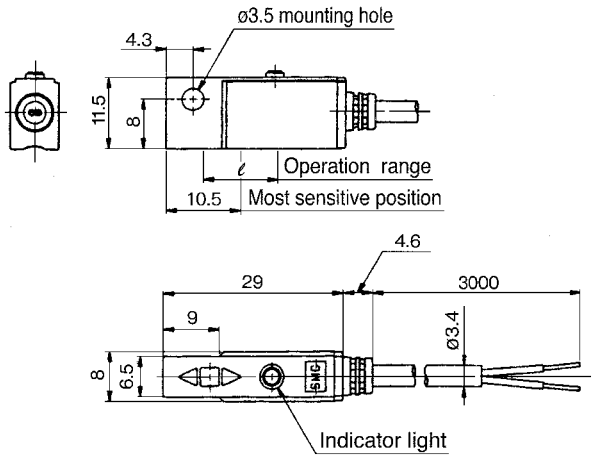
( ): If not applicable for IEC Standard



Indicator light/Operation



Dimensions



D-F7BAL

Grommet

Water (coolant) resistant performance

⚠ Caution

Precautions

Consult SMC if using coolant liquid other than water based solution.

Applicable Actuator Series

Series	Bore size (mm)
CD85	ø8, ø10, ø12, ø16, ø20, ø25,
CD76	ø32, ø40

Specifications

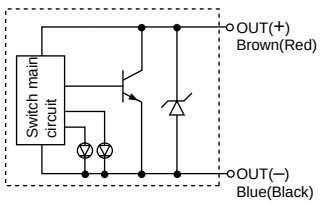
PLC: Programmable Logic Controlle

D-F7BAL (With indicator light)	
Auto switch model number	**D-F7BAL**
Wiring	2 wire
Output	–
Application	24V DC Relay/PLC
Power voltage	–
Current consumption	–
Load voltage	24V DC (10 to 28V DC)
Load current	≤ 5 to 40mA
Internal voltage drop	≤ 4V
Current leakage	≤ 0.8mA at 24V DC
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode

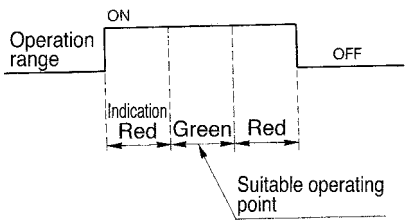
●Lead wire —— Oilproof vinyl heavy insulation cable, ø4, 0.3mm², 2 cores (Brown, Blue), 3m (Standard)
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

Internal Circuit

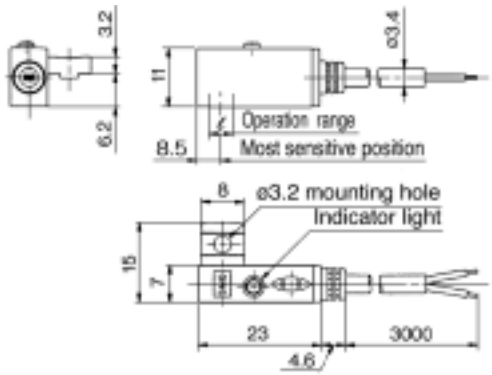
( ): If not applicable for IEC Standard



Indicator light/Operation



Dimensions



Water Resistant 2 Colour Indication Style Solid State Switch/Tie-rod Mounting

D-F5BAL

Grommet

Water (coolant) resistant performance

⚠Caution

Precautions

Consult SMC if using coolant liquid other than water based solution.

Applicable Actuator Series

Series	Bore size (mm)
C95	ø32, ø40, ø63, ø80, ø100, ø125, ø160, ø200, ø250

Specifications

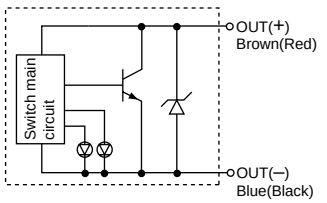
PLC: Programmable Logic Controller

D-F5BAL (With indicator light)	
Auto switch model number	**D-F5BAL**
Wiring	2 wire
Output	–
Application	24V DC Relay/PLC
Power voltage	–
Current consumption	–
Load voltage	24V DC (10 to 28V DC)
Load current	≤ 5 to 40mA
Internal voltage drop	≤ 4V
Current leakage	≤ 0.8mA at 24V DC
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode

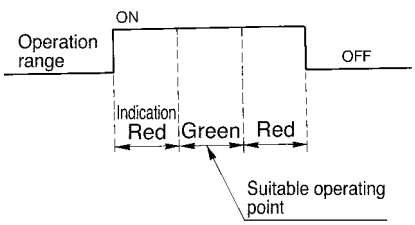
●Lead wire —— Oilproof vinyl heavy insulation cable, ø4, 0.3mm², 2 cores (Brown, Blue), 3m (Standard)
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

Internal Circuit

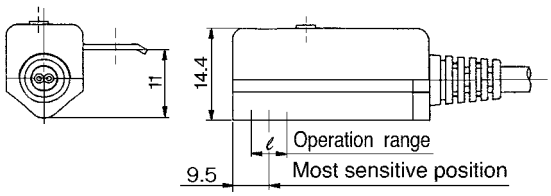
( ): If not applicable for IEC Standard

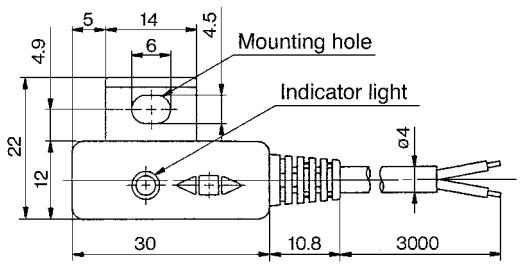


Indicator light/Operation



Dimensions

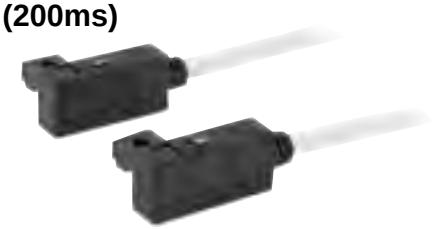




Solid State Switch with Timer/Rail Mounting
D-F7NTL

Grommet

With built-in OFF-delay timer (200ms)



Applicable Actuator Series

Series	Bore size (mm)
C85	ø8, ø10, ø12, ø16, ø20, ø25

Specifications

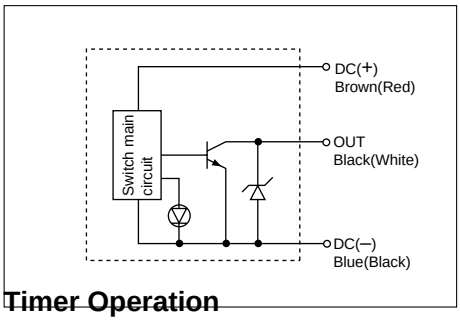
PLC: Programmable Logic Controller

D-F7NTL (With indicator light)	
Auto switch model number	**D-F7NTL**
Wiring	3 wire
Output	NPN
Output operation	Off-delay
Operation time	≤ 1ms
Off-delay time	200±50ms
Application	IC circuit/Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)
Current consumption	≤ 10mA
Load voltage	≤ 28V DC
Load current	≤ 80mA
Internal voltage drop	≤ 1.5V (≤0.8V at 10mA)
Current leakage	≤ 100μ A at 24V DC
Indicator light	ON: When red light emitting diode

●Lead wire —— Oilproof vinyl heavy insulation cable, ø3.4, 0.2mm², 3 cores (Brown, Black, Blue), 3m (Standard)
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

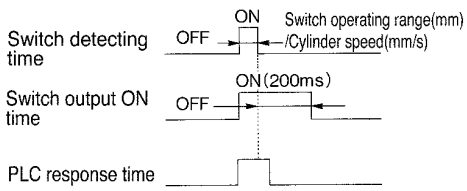
Internal Circuit

( ): If not applicable for IEC Standard

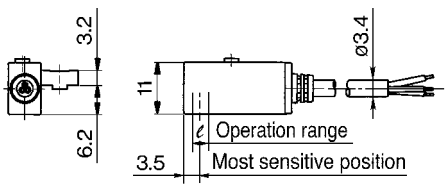


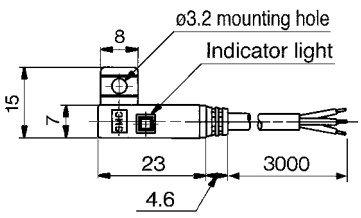
Timer Operation

Detection of immediate positioning for high-speed cylinder
Detecting point dispersion occurs due to response time of PLC (sequencer); e. g. scanning.
Ex.) Cylinder speed-1000 mm/sec.
Sequencer response time-0.1 sec.
Detecting point despersion-Within 100mm (=1000mm/sec. X 0.1sec.)
Take PLC response time into consideration when using.



Dimensions

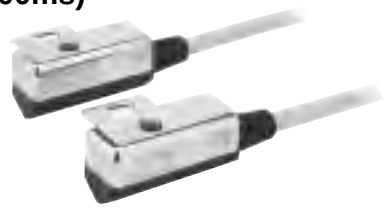




Solid State Switch with Timer/Tie-rod Mounting
D-F5NTL

Grommet

With built-in OFF-delay timer (200ms)

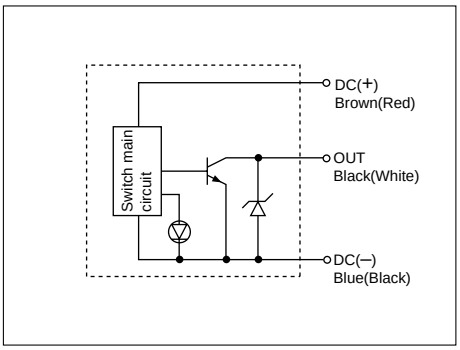


Applicable Actuator Series

Series	Bore size (mm)
C95	ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø160, ø200, ø250

Internal Circuit

( ): If not applicable for IEC Standard



Specifications

PLC: Programmable Logic Controller

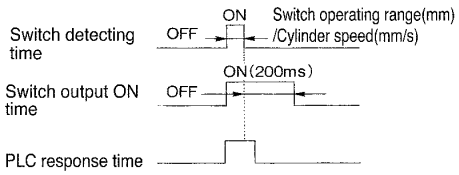
D-F5NTL (With indicator light)	
Auto switch model number	**D-F5NTL**
Wiring	3 wire
Output	NPN
Output operation	Off-delay
Operation time	≤ 1ms
Off-delay time	200±50ms
Application	IC circuit/Relay/PLC
Power voltage	5/12/24V DC (4.5 to 28V DC)
Current consumption	≤ 10mA
Load voltage	≤ 28V DC
Load current	≤ 80mA
Internal voltage drop	≤ 1.5V (≤ 0.8V at 10mA)
Current leakage	≤ 100μA at 24V DC
Indicator light	ON: When red light emitting diode

●Lead wire —— Oilproof vinyl heavy insulation cable, ø4, 0.3mm², 3 cores (Brown, Black, Blue), 3m (Standard)
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

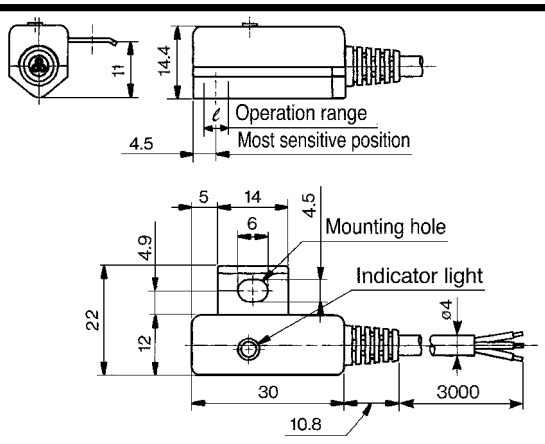
Timer Operation

Detection of immediate positioning for high-speed cylinder

Detecting point dispersion occurs due to response time of PLC (sequencer); e. g. scanning.
Ex.) Cylinder speed-1000 mm/sec.
Sequencer response time-0.1 sec.
Detecting point despersion-Within 100mm (=1000mm/sec. X 0.1sec.)
Take PLC response time into consideration when using.



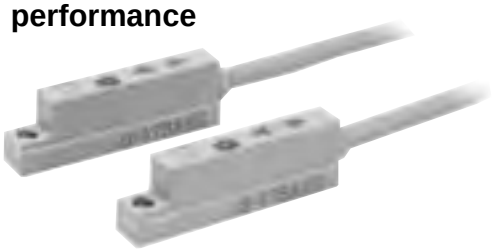
Dimensions



D-Y7BAL

Grommet

Improved coolant-resistant performance



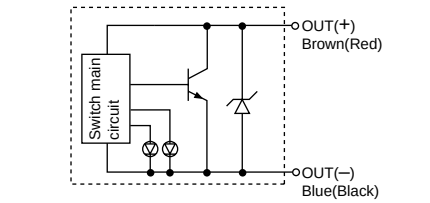
⚠ Caution

Precautions

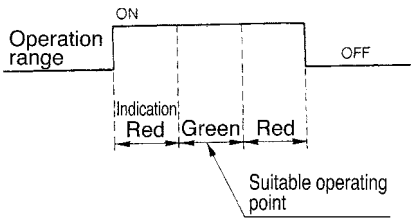
Consult SMC if using coolant liquid other than water based solution.

Internal Circuit

( ): If not applicable for IEC Standard



Indicator light/Operation



Applicable Actuator Series

Series	Bore size (mm)
CP95	ø32, ø40, ø50, ø63, ø80, ø100

Specifications

PLC: Programmable Logic Controller

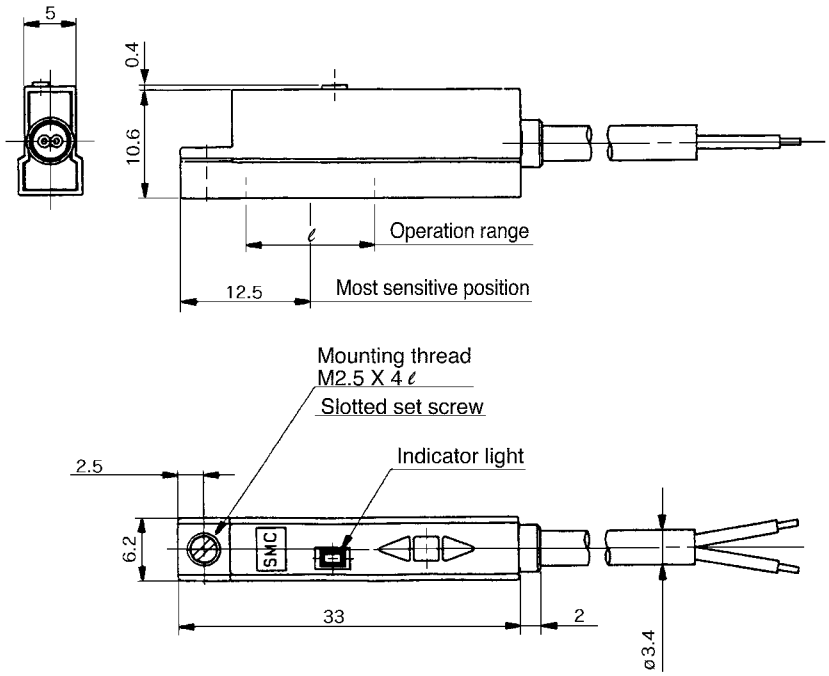
D-Y7BAL (With indicator light)	
Auto switch model number	**D-Y7BAL**
Wiring	2 wire
Application	24V DC Relay/PLC
Load voltage	24V DC (10 to 28V DC)
Load current	≤ 5 to 40mA
Internal voltage drop	≤ 4V
Current leakage	≤ 0.8mA at 24V DC
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode

●Lead wire —— Oilproof vinyl heavy insulation cable, ø3.4, 0.15mm², 2 cores (Brown, Blue), 3m (Standard)

Note 1) Refer to common specifications on p.8-4.

Note 2) Refer to p.8-4 for lead wire length.

Dimensions



D-P5DWL

Grommet

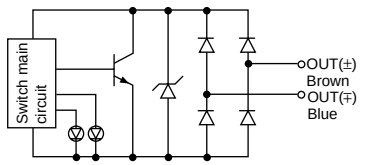
Possible to use in an environment where disturbance magnetic field is generated.

⚠ Caution

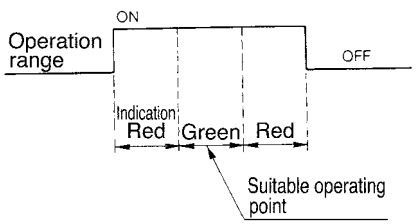
Precautions

Monophase current welding. Not applicable for DC inverter welding, arc welding nor capacitor welding.

Internal Circuit



Indicator light/Operation



Applicable Actuator Series

Series	Bore size(mm)
C95	ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø160, ø200, ø250

Specifications

PLC: Programmable Logic Controller

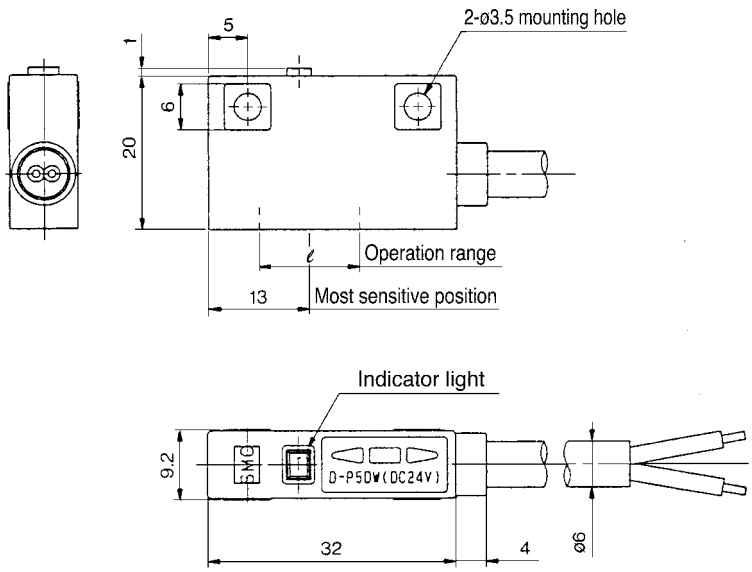
D-P5DW (With indicator light)	
Auto switch model number	**D-P5DWL**
Wiring	2 wire (Non-polar)
Application	24V DC Relay/PLC
Load voltage	24V DC (20 to 28V DC)
Load current	6 to 40mA
Internal voltage drop	≤ 5V
Current leakage	≤ 1mA at 24V DC
Operation time	≤ 40ms
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode

●Lead wire —— Oilproof vinyl heavy insulation cable, ø6, 0.5mm², 2 cores (Brown, Blue), 3m
Note 1) Refer to common specifications on p.8-4.
Note 2) Refer to p.8-4 for lead wire length.

Strong Magnetic Field Resistance

It is possible to use switches next to welding conductor (gun cable) in case that A. C. welding current is ≤ 16,000A. Consult SMC if exceeding 16,000A.

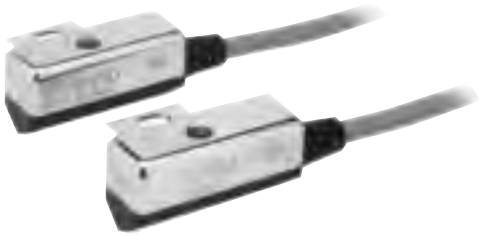
Dimensions



D-F5LF (Latching Style)

Grommet

The output signal can be detected in an unsteady detecting area.



Applicable Actuator Series

Series	Bore size(mm)
C95	ø32, ø40, ø50, ø63, ø80, ø100, ø125, ø160, ø200, ø250

Specifications

PLC: Programmable Logic Controller

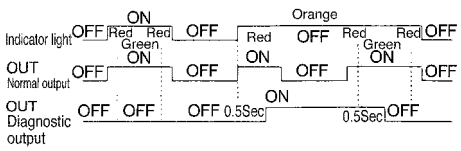
D-F5LF (With indicator light)	
Auto switch model number	**D-F5LF**
Wiring	4 wire
Output	NPN
Diagnostic output	Latching operation
Application	24V DC Relay/PLC
Power voltage	24V DC (10 to 26V DC)
Current consumption	20mA
Load voltage	≤ 26V DC
Load current	≤ 40mA
Internal voltage drop	≤ 0.8V
Current leakage	≤ 100μA at 24V DC
Indicator light	Operating point: Red light emitting diode Suitable operating point: Green light emitting diode Orange colour indicator lights on when diagnostic output is ON.

●Lead wire —— Oilproof vinyl heavy insulation cable, ø4, 0.2mm², 4 cores (Brown, Black, Orange, Blue), 0.5m

Note 1) Refer to common specifications on p.8-4. Note 2) Refer to p.8-4 for lead wire length.

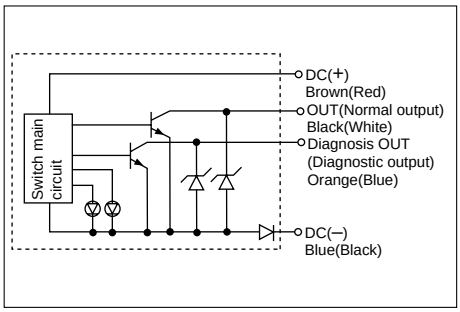
Diagnostic Output Operation (Latching Style)

The diagnostic signal is output when detecting position remains within unsteady area (where indicator light is Red.) for more than 0.5 sec. This signal keeps outputting even after normal output goes to OFF. The diagnostic output becomes OFF when detecting position remains within the most suitable operating range (where indicator light is Green.) for more than 0.5 sec.

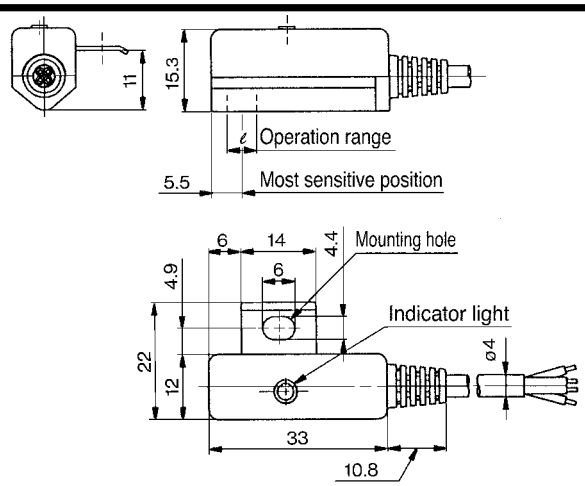


Internal Circuit

( ): If not applicable for IEC Standard



Dimensions



Solid State Switch with Prewired Connector
D-□□□PC

Eliminates troublesome connections

Harnessing work is reduced by the cable with connector specifications

Employs international standard (IEC947-5-2) connector

IP67 construction

How to Order

D — M9N S A PC

Solid state switch standard part number
∗ Refer to the table below for applicable auto switch part numbers.

Cord length

S	0.5m
M	1.0m
L	3.0m

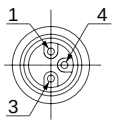
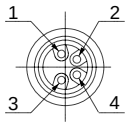
Note) L is available for series D-P5DW only.

Connector type

A	M8–3 pin
B	M8–4 pin
D	M12–4 pin

Note) Series D-P5DW is available with type D only.

Connector specifications

Connector type	M8–3 pin	M8–4 pin	M12–4 pin
Pin arrangement			
Applicable standards	JIS C 4524, JIS C 4525, IEC 947-5-2, NECA 0402		
Impact resistance	300m/s² {30, 6G}		
Enclosure	IP-67 (standard IEC529)		
Insulation resistance	100MΩ or more at 500VDC		
Withstand voltage	1500VAC for 1 min. (between connectors), leakage current 1mA or less		

Applicable Auto Switches

Mounting	Function	Electrical entry	Applicable model number	Lead wire length (m) 0.5	1.0	3.0
Rail mount	—	Grommet in-line	**F79, F7P, J79**	●	●	–
		Grommet perpendicular	**F7NV, F7PV, F7BV**	●	●	–
	2 color indicator	Grommet in-line	**F79W, F7PW, J79W**	●	●	–
		Grommet perpendicular	**F7NWV, F7BWV**	●	●	–
	With diagnostic output	Grommet in-line	**F7LF, F79F**	●	●	–
	Water resistant		**F7BA**	●	●	–
	With timer		**F7NT**	●	●	–
	Magnetic field resistant		**P5DW**	●	●	●
Band mount	—		**H7A1, H7A2, H7B**	●	●	–
			G59, G5P, K59	●	●	–
	2 color indicator		**H7NW, H7PW, H7BW**	●	●	–
			G59W, G5PW, K59W	●	●	–
	Diagnostic output		**H7LF, H7NF, G59F**	●	●	–
	Water resistant		**H7BA, G5BA**	●	●	–
	With timer		**G5NT**	●	●	–
	Wide area detection		**G5NB**	●	●	–
Tie-rod mount	—		**F59, F5P, J59**	●	●	–
	2 color indicator		**F59W, F5PW, J59W**	●	●	–
	Diagnostic output		**F5LF, F59F**	●	●	–
	Water resistant		**F5BA**	●	●	–
	With timer		**F5NT**	●	●	–

Mounting	Function	Electrical entry	Applicable model number	Lead wire length (m) 0.5	1.0	3.0
Direct mount	—	Grommet in-line	**M5N, M5P, M5B**	●	●	–
			Y59A, Y7P, Y59B	●	●	–
		Grommet perpendicular	**Y69A, Y7PV, Y69B**	●	●	–
		Grommet in-line	**M9N, M9P, M9B**	●	●	–
		Grommet perpendicular	**M9NV, M9PV, M9BV**	●	●	–
	2 color indicator	Grommet in-line	**M5NW, M5PW, M5BW**	●	●	–
			Y7NW, Y7PW, Y7BW	●	●	–
		Grommet perpendicular	**Y7NWV, Y7PWV, Y7BWV**	●	●	–
		Grommet in-line	**F9NW, F9PW, F9BW**	●	●	–
		Grommet perpendicular	**F9NWV, F9PWV, F9BWV**	●	●	–
	Water resistant	Grommet in-line	**Y7BA, F9BA**	●	●	–
	With timer		**M5NT, M5PT**	●	●	–
Rotary actuator	—	Grommet in-line	**S791/2, S7P1/2, T791/2**	●	●	–
			S991/2, S9P1/2, T991/2	●	●	–
		Grommet perpendicular	**S99V1/2, T99V1/2**	●	●	–

Connector Pin Layout

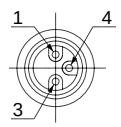
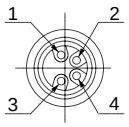
M8–3 pin

M8–4 pin

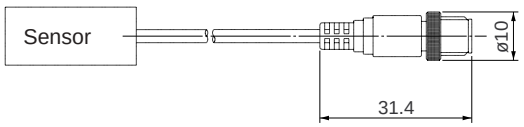
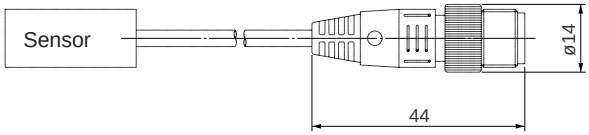
M12–4 pin

Sensor configuration	Lead wire colors				Connector number designations			
	1 pin	2 pin	3 pin	4 pin	1 pin	2 pin	3 pin	4 pin
DC 2 wire	Brown	–	–	Blue	OUT (+)	–	–	OUT (–)
DC 2 wire non-polar	–	–	Brown	Blue	–	–	OUT (±)	OUT (∓)
DC 3 wire	Brown	–	Blue	Black	DC (+)	–	DC (–)	OUT
DC 4 wire	Brown	Orange	Blue	Black	DC (+)	Diagnostic output	DC (–)	OUT

Connector specifications

Connector type	M8–3 pin	M8–4 pin	M12–4 pin
Pin arrangement			
Applicable standards	JIS C 4524, JIS C 4525, IEC 947-5-2, NECA 0402		
Impact resistance	300m/s² {30, 6G}		
Enclosure	IP67 (standard IEC529)		
Insulation resistance	100MΩ or more at 500VDC		
Withstand voltage	1500VAC for 1 min. (between connectors), leakage current 1mA or less		

Dimensions

Connector type	
M8–3 pin 4 pin	
M12–4 pin	

Matching (Female) Connector Cables

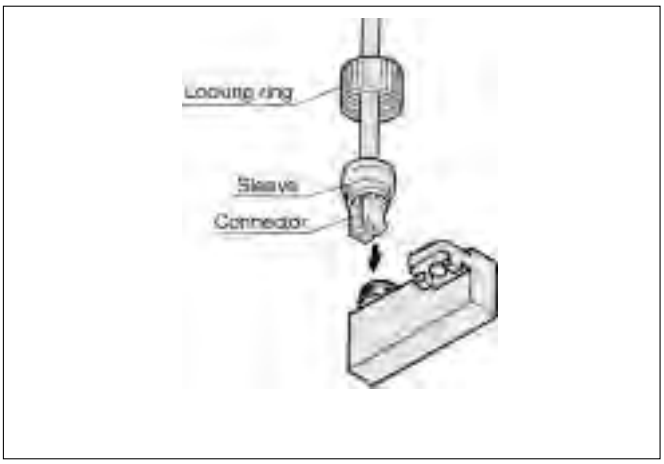
Since these are not supplied by SMC, refer to the table below for applicable examples.
(Contact the respective manufacturers for catalogs or other details.)

Connector size	Number of pins	Manufacturer	Applicable series example
M8	3	Hirschmann	ELKA-KV 3308
		BRAD HARRISON	45310
		Lumberg	RKMV 3
		TURCK	PKGM 3
	4	Hirschmann	ELKA-KV 4408
		BRAD HARRISON	45410
		Lumberg	RKMV 4
		TURCK	PKGM 4
		OMRON	XS3
M12		Hirschmann	ELKA-KV 4412
		BRAD HARRISON	80456
		Lumberg	RKT 4-633
		TURCK	RK 4.4T
		OMRON	XS2

Information ❶
Plug-in Connector Assembly/How to Use DIN Terminal

Plug-in Connector Assembly

D-A73C, D-A80C, D-J79C
D-C73C, D-C80C, D-H7C



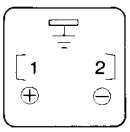
With the convex port of the connector, insert the connector into the auto switch into the sleeve. Screw the locking ring onto the switch. (Do not tighten with pliers.)

How to Use DIN Terminal/D-A44/A44A/A44C

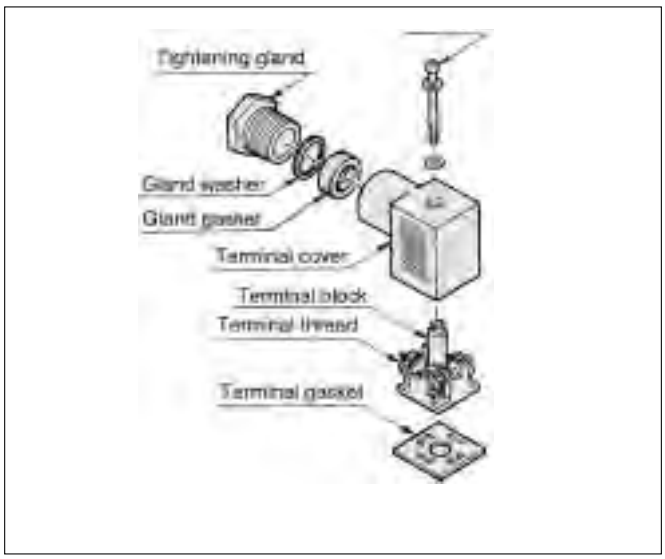
Connection

①Loosen the set screw and pull out the connector from the pin plug.
②Be sure to remove the set screw first and then insert a screw driver into a recessed groove under the terminal block to separate the terminal cover from the terminal block.
③Follow the procedures and connect wires securely to specified terminals.
④In standard cases, crimp-style terminals are used to connect wires. Please select proper crimp-style terminals so that the wire can be properly connected to terminal fittings.

Method of connection



AC: Connect to terminal No.1 and No.2
DC: Connect (+) to No.1 terminal and (–) to No.2 terminal.



How to change position of electrical entry

After separating the terminal block from the terminal cover, change the position of the terminal cover to any desired direction (4 directions at every 90˚) to change the position of electrical entry.

Caution

When taking in or out the connector pin to or from the pin plug, hold the connector as perpendicular as possible.

Applicable cable (heavy insulation cable)

Applicable to cable O. D. of ø6.8 to ø11.5.

Applicable crimp-style terminal

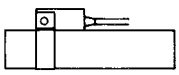
1.25Y-3L, 1.25-3.5S, 1.25-4M

Information ❷
How to Mount and Move the Auto Switch

Mounting Bracket **Band mounting**

⚠ Caution

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



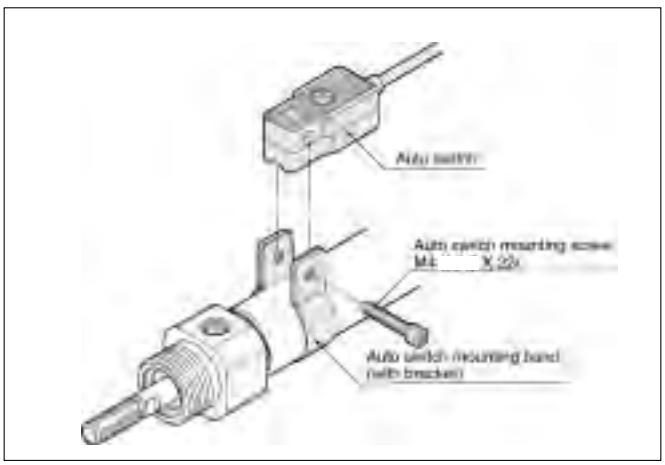
Correct mounting

Wrong mounting

<Applicable auto switch>

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

How to mount and move the auto switch



①Put a mounting band on the cylinder tube and set it at the auto switch mounting position.
②Put the mounting section of the auto switch between the band mounting holes, then adjust the position of mounting holes of switch to those of mounting band.
③Lightly thread the auto switch mounting screw through the mounting hole into the thread part of band fitting.
④After setting the whole body to the detecting position by sliding, tighten the mounting screw to secure the auto switch. (The tightening torque of M4 screw should be about 1 to 1.2Nm.)
⑤Modification of the detection position should be made in the condition of ③.

Part No. of auto switch mounting bracket (including band and screw)

Cylinder series	Bore size (mm)							
	20	25	32	40	50	63	80	100
CDM2, CDBM2 CDVM3, 5, CDLM2	BA2 -020	BA2 -025	BA2 -032	BA2 -040	–	–	–	–
CDG1, MGG	BA -01	BA -02	BA -32	BA -04	BA -05	BA-06	BA-08	BA-10
MGC					–	–	–	–
CDLG1					–	–	–	–
CDA1, CDBA1, CDV3, CNA CDVS, CDLA, CDL1, CE2	–	–	–		BA -05	BA -06	BA -08	BA -10
RHC, MLGC, REC	BA-01	BA-02	BA-32		–	–	–	–

Mounting screw set (Stainless steel specification)
Use the following mounting screw set (Set screw included.) according to the required operating conditions. (Mounting band is not included.)

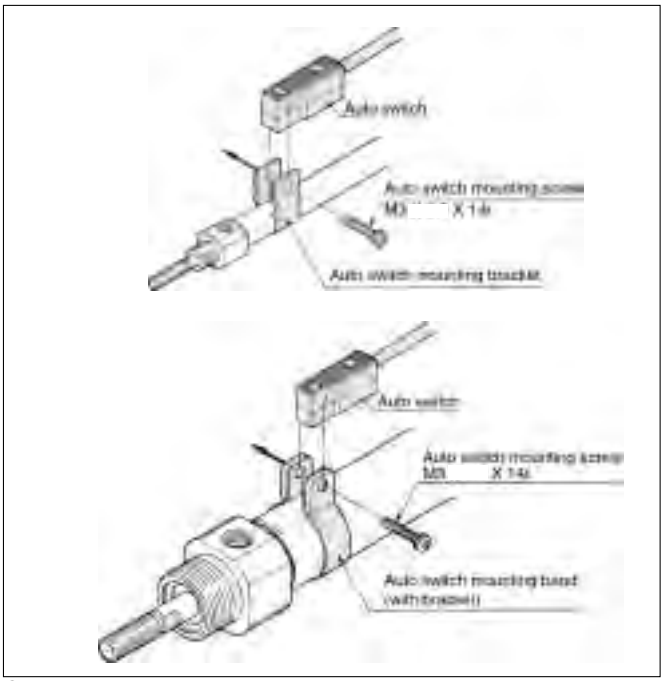
BBA3: For D-B5/B6/G5/K5

D-G5BAL is mounted on the cylinder with the above stainless steel screw BBA3 before shipment or BBA3 is enclosed with D-G5BAL when shipped without cylinder.

<Applicable auto switch>

Reed switch ····· D-C73, D-C76, D-C80
D-C73C, D-C80C
Solid state switch ····· D-H7A1, D-H7A2, D-H7B, D-H7BAL
D-H7C
D-H7NF, D-H7LF
D-H7NW, D-H7PW, D-H7BW

How to mount and move the auto switch



①For series CDJ2/Put a mounting bracket on the cylinder tube. For series CDM2/Put a mounting band on the cylinder tube and set it at the auto switch mounting position.
②Put the mounting part of auto switch in the interval of stationary fitting to fit the mounting hole to the hole of stationary fitting.
③Screw lightly the auto switch mounting screw through the mounting hole into the thread part of band fitting.
④After setting the whole body to the detecting position by sliding, tighten the mounting screw to secure the auto switch. (The tightening torque of M3 screw should be about 0.8 to 1Nm.)
⑤Modification of the detection position should be made in the condition of ③.

Part No. of auto switch mounting bracket (including band and screw)

Cylinder series	Bore size (mm)									
	6	10	15	16	20	25	32	40	50	63
CDJ2	BJ2-006	BJ2 -010	–	BJ2 -016	–	–	–	–	–	–
CDVJ3, 5	–		–		–	–	–	–	–	–
CDLJ2	–	–	–		–	–	–	–	–	–
CDM2, CDBM2 CDVM3, 5, CDLM2	–	–	–	–	BM2 -020	BM2 -025	BM2 -032	BM2 -040	–	–
CDG1, MGG	–	–	–	–	BMA2 -020	BMA2 -025	BMA2 -032	BMA2 -040	BMA2 -050	BMA2 -063
CDLG1	–	–	–	–					–	–
MGC	–	–	–	–					BMA2 -050	–
RHC, MLGC, REC	–	–	–	–					–	–
RSDG	–	–	–	–	–	–	–		BMA2 -050	–

Mounting screw set (Stainless steel specification)
Use the following mounting screw set according to the required operating conditions. (Mounting band is not included.)

BBA4: For D-C7/C8/H7

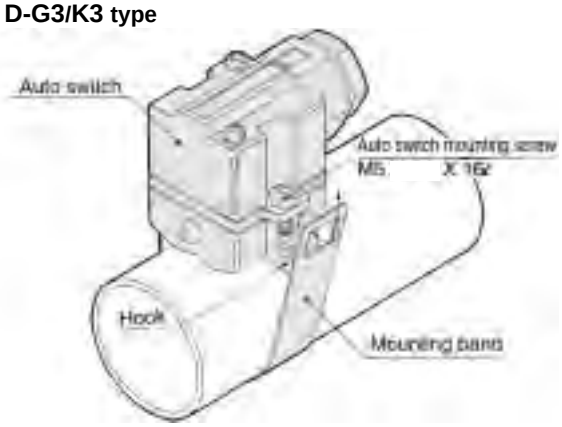
D-H7BAL is mounted on the cylinder with the above stainless steel screw BBA4 before shipment or BBA4 is enclosed with D-H7BAL when shipped without cylinder.

Information ❷
How to Mount and Move the Auto Switch

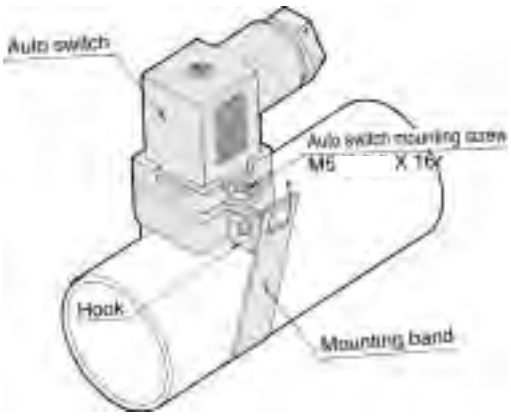
Mounting Bracket **Band mounting**

<Applicable auto switch>
Reed switch ·····Ð-A33, D-A34, D-A44
Solid state switch ·····D-G39, D-K39

D-A3, D-G3/K3 type



D-A4 type

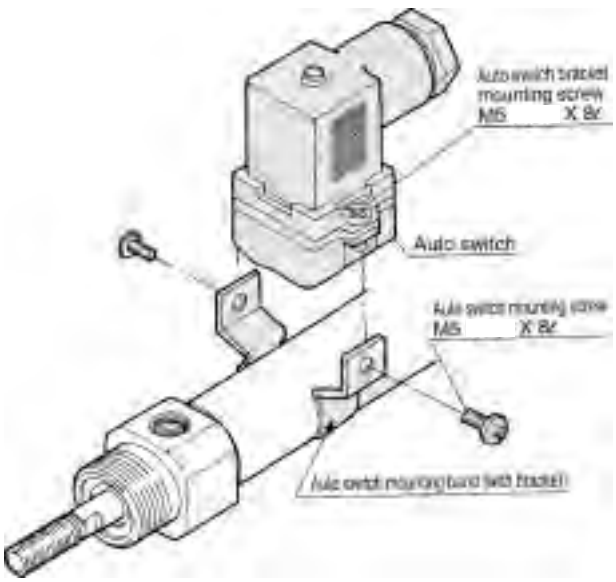


①Loosen the auto switch mounting screws at both sides to pull down the hook.
②Put a mounting band on the cylinder tube and set it at the auto switch mounting position, and then hook the band.
③Screw lightly the auto switch mounting screw.
④Set the whole body to the detecting position by sliding, tighten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

Part No. of auto switch mounting band

Cylinder series	Bore size (mm)												
	20	25	32	40	50	63	80	100	125	140	160	180	200
CDA1, CDBA1, CDV3 CDVS, CDLA, CE2, CNA	—	—	—	BD1 -04M	BD1 -05M	BD1 -06M	BD1 -08M	BD1 -10M	—	—	—	—	—
CDL1									BS1 -125	BS1 -140	BS1 -160	—	—
CDS1	—	—	—	—	—	—	—	—				BS1 -180	BS1 -200
RHC	BD1 -01M	BD1 -02M	BD1 -02	BD1 -04M	—	—	—	—	—	—	—	—	—

<Applicable auto switch>
Reed switch ·····Ð-A33A, D-A34A, D-A44A
Solid state switch ·····D-G39A, D-K39A



①Tighten completely the switch mounting screw on the switch body side.
②Put a mounting band on the cylinder tube and set it at the auto switch mounting position. Put the mounting section of auto switch between the interval of mounting band, then adjust the position of mounting holes of switch to those of mounting band.
③Lightly thread the auto switch mounting screw through the mounting hole into the thread part of band fitting.
④After reconfirming the detecting position, tighten the mounting screw to secure the auto switch. (The tightening torque of M5 screw should be about 2 to 3Nm.)
⑤Modification of the detecting position should be made in the condition of ③.

Part No. of auto switch mounting bracket (including band and screw)

Cylinder series	Bore size (mm)			
	20	25	32	40
CDM2, CDBM2 CDLM2	BM3−020	BM3−025	BM3−032	BM3−040

Information ❷
How to Mount and Move the Auto Switch

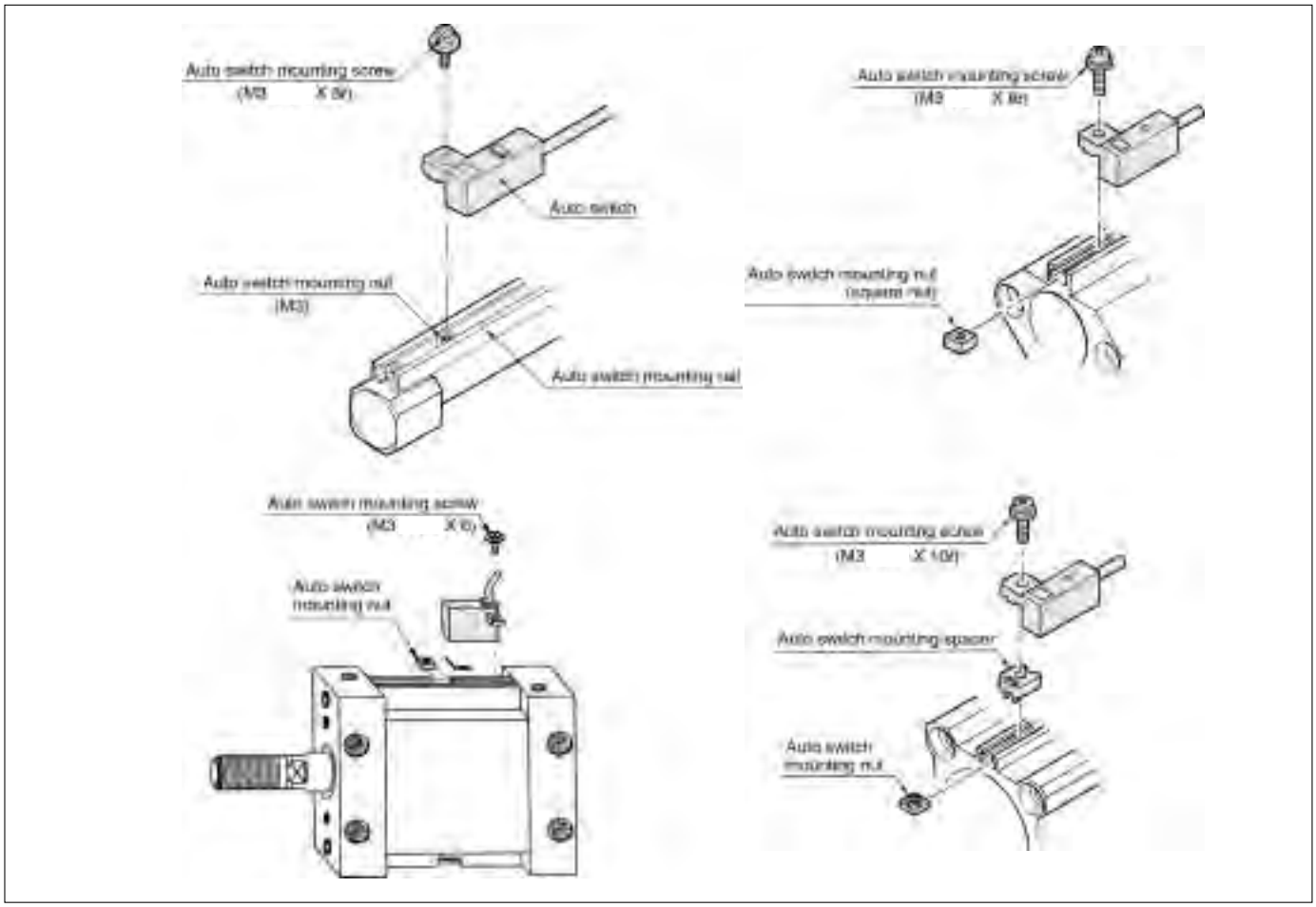
Mounting Bracket **Rail mounting**

<Applicable auto switch>

Reed switch ·····D-A72, D-A73, D-A80, D-A72H, D-A73H, D-A76H, D-A80H
D-A73C, D-A80C, D-A79W

Solid state switch ·····D-F79, D-F7P, D-J79, D-F7NV, D-F7PV, D-F7BV, D-J79C
D-F79W, D-F7PW, D-J79W, D-F7NWV, D-F7BWV
D-F79F, D-F7LF, D-F7BAL, D-F7NTL

How to mount and move the auto switch



①Slide the auto switch mounting nut inserted into the mounting rail and set it at the auto switch mounting position.
②Fit the convex part of auto switch mounting arm into the concave part of auto switch mounting rail. Then slide the switch over the nut.
(CDQ2 series: Fit the convex part of auto switch mounting arm through the auto switch spacer into the concave part of auto switch mounting rail.)
③Push the auto switch mounting screw lightly into the mounting nut through the hole of auto switch mounting arm.
④After reconfirming detection position, tighten the mounting screw to secure the auto switch. (Tightening torque of M3 screw should be 0.5 to 0.7Nm.)
⑤Modification of the detecting position should be made in the condition of ③.

Part No. of auto switch mounting bracket (including nut, screw and spacer)

Cylinder series	Bore size (mm)												
	12	16	20	25	32	40	50	63	80	100	125	140	160
CDQ2	BQ-1	BQ-1	BQ-1	BQ-1	BQ-2	BQ-2	BQ-2	BQ-2	BQ-2	BQ-2	BQ-2	BQ-2	BQ-2
MDU	–	–	–	BMU1-025	BMU1-025	BMU1-025	BMU1-025	BMU1-025	–	–	–	–	–
RSDQ	–	–	BQ-1	BQ-1	BQ-2	BQ-2	BQ-2	–	–	–	–	–	–
MK, MK2	–	–						BQ-2	–	–	–	–	–
CE1	BQ-1	–		–					–	–	–	–	–
CXT	–	–	–	–			–	–	–	–	–	–	–

Mounting screw set (Stainless steel specification)
Use the following mounting screw set (Nut included.) according to the required operating conditions. (Auto switch spacer is not included.)

BBA2: For D-A7/A8/F7/J7

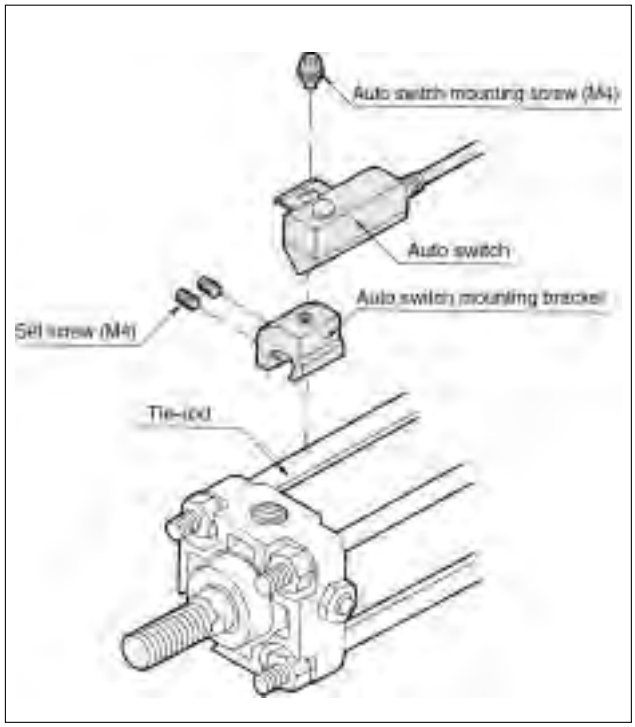
D-F7BAL is mounted on the cylinder with the above stainless steel screw BBA2 before shipment of BBA2 is enclosed with D-F7BAL when shipped without cylinder.

Information ❷
How to Mount and Move the Auto Switch

Mounting Bracket **Tie-rod mounting**

<Applicable auto switch>
Reed switch ·····D-A53, D-A54, D-A56, D-A64, D-A67
D-A59W
Solid state switch ·····D-F59, D-F5P
D-J59, D-J51, D-F5BAL
D-F59W, D-F5PW, D-J59W
D-F59F, D-F5LF
D-F5NTL

How to mount and move the auto switch



①Fix the auto switch on the auto switch mounting bracket with the mounting screw (M4) and install the set screw.
②Fit the mounting bracket into the cylinder tie-rod and then fix the auto switch at the detecting position with the hexagonal wrench. (Be sure to put the auto switch on the surface of cylinder tube.)
③When changing the detecting position, loosen the set screw to move the auto switch and then re-fix the auto switch on the cylinder tube. (Tightening torque of M4 screw should be 1 to 1.2 Nm.)

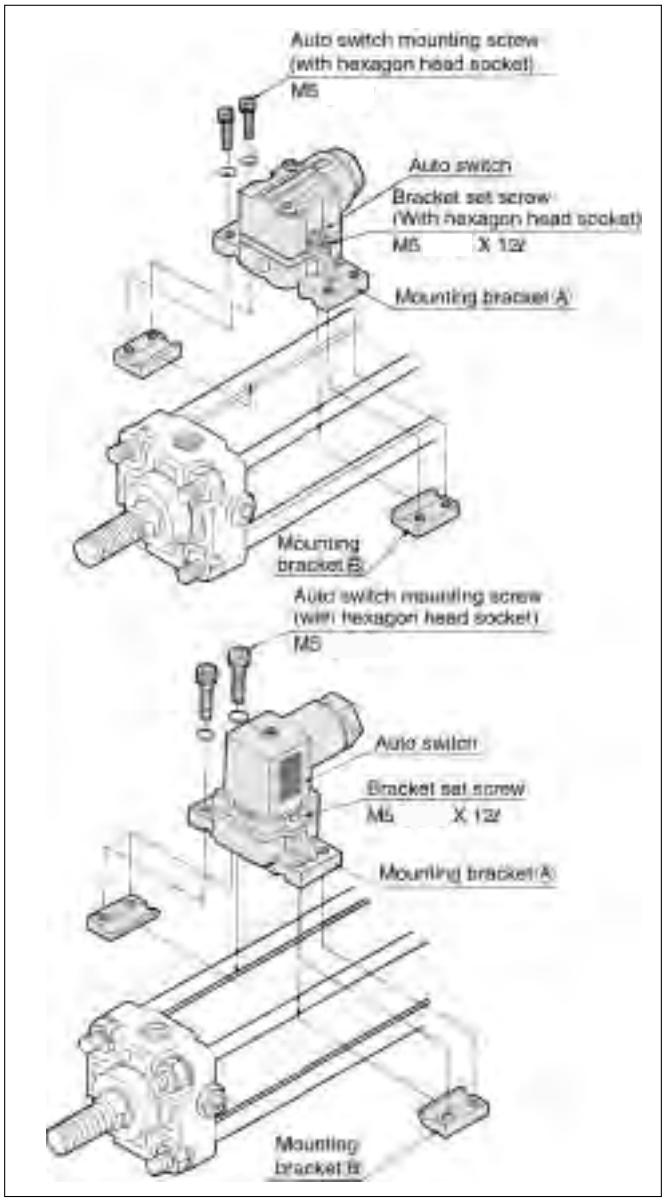
Part No. of auto switch mounting bracket (including bracket, mounting screw and set screw)

Cylinder series	Bore size (mm)										
	32	40	50	63	80	100	125	140	160	180	200
CDA1, CDBA1, CDV3 CDVS, CDLA, CE2, CNA	–	BT -04	BT -04	BT -06	BT -08	BT -08	–	–	–	–	–
CDL1	–						BT -12	BT -12	BT -16	–	–
CDS1	–	–	–	–	–	–				BT -18A	BT -20
MDB/MDBB	BT–03	BT–03	BT–05	BT–05	BT–06	BT–06	–	–	–	–	–

Mounting screw set (Stainless steel specification)
Use the following mounting screw set (Set screw included.) according to the required operating conditions. (Mounting bracket is not included.)
BBA1: For D-A5/A6/F5/J5
D-F5BAL is mounted on the cylinder with the above stainless steel screw BBA1 before shipment or BBA1 is enclosed with D-F5BAL when shipped without cylinder.

<Applicable auto switch>
Reed switch ·····D-A33C, D-A34C, D-A44C
Solid state switch ·····D-G39C, D-K39C

How to mount and move the auto switch



①Fix the mounting bracket A on the auto switch with the set screw.
②Fit the convex part of mounting bracket into tie-rod and set the auto switch at the mounting position.
③Insert the mounting bracket B from the underneath and put lightly in the tie-rod with the mounting screw.
④Set the whole body to the detecting position by sliding, tighten the mounting screw to secure the auto switch. (Tightening torque of M5 screw should be 2 to 3Nm.)
⑤Modification of the detecting position should be made in the condition of ③.

Part No. of auto switch mounting bracket (including bracket and screw)

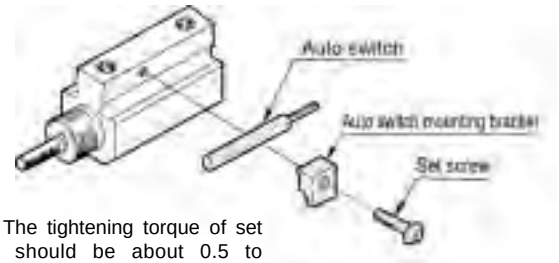
Cylinder series	Bore size (mm)				
	40	50	63	80	100
CDA1, CDBA1 CDV3, CDVS, CDL1, CE2, CNA	BA3 -040	BA3 -050	BA3 -063	BA3 -080	BA3 -100

Information ❷
How to Mount and Move the Auto Switch

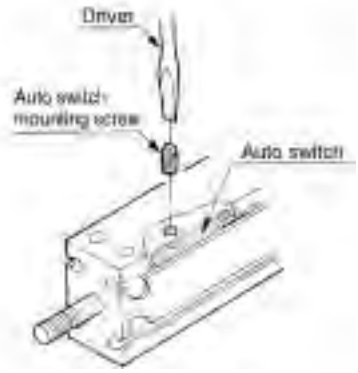
Mounting Bracket **Direct mounting**

<Applicable auto switch>
Reed switch ·····Ð-90/97, D-90A/93A

How to mount and move the auto switch



Note) The tightening torque of set screw should be about 0.5 to 0.6Nm.



Note) Use the driver which grip dia. is 5 to 6mm when tightening the auto switch mounting screw. The tightening torque should be about 0.1 to 0.2Nm.

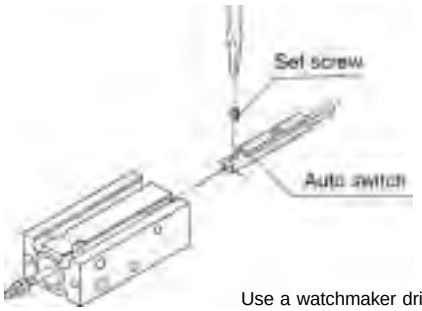
Use the slotted head set screw with urethane damper as auto switch mounting screw.

Part No. of auto switch mounting bracket (including bracket and screw)

Cylinder series	Bore size (mm)						
	6	10	15	16	20	25	32
CDJP-□D	BP-1	BP-1	BP-1	—	—	—	—
CDU	BU-1	BU-1	—	BU-1	BU-1	BU-1	BU-1

<Applicable auto switch>
Reed switch ·····Ð-A90(V)/A93(V)/A96(V)
Solid state switch ····· D-F9N(V)/F9P(V)/F9B(V)/F9NW(V)/ F9PW(V)/F9BW(V)/F9BAL

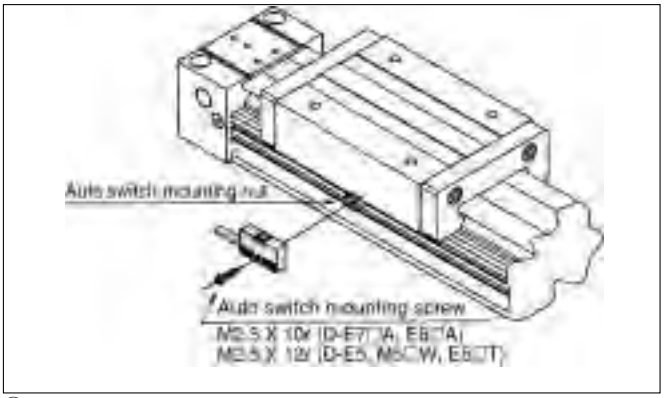
How to mount and move the auto switch



Use a watchmaker driver whose grip dia. is 5 to 6mm when tightening the auto switch mounting screw. The tightening torque should be about 0.1 to 0.2Nm.

<Applicable auto switch>
Reed switch ·····Ð-E73A/E76A/E80A
Solid state switch ····· D-M5N/M5P/M5B
D-M5NW/M5PW/M5BW
D-M5NTL/M5PTL

How to mount and move the auto switch



①Insert the auto switch mounting nut into the auto switch mounting groove and then set the switch at the mounting position by sliding.
②Put the convex part of auto switch into the mounting groove and slide it over the nut.
③Push the auto switch mounting screw lightly into the mounting nut through the mounting hole.
④After reconfirming detecting position, tighten the mounting screw to secure the auto switch. (Tightening torque of M2.5 screw should be 0.1 to 0.2Nm.)

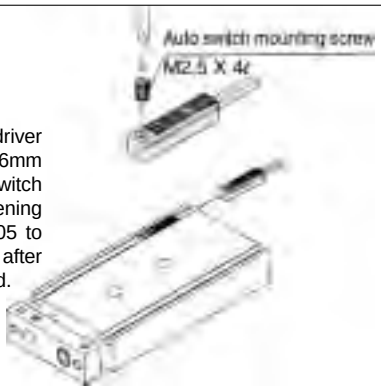
Part No. of auto switch mounting bracket (including nut and screw)

Cylinder series		Bore size (mm)		
		25	32	40
ML1	M2.5 X 12 ℓ	BMY2-025	BMY2-025	BMY2-025

<Applicable auto switch>
Reed switch ·····Ð-Z73/Z76/Z80
Solid state switch ·····D-Y59$^{A}_{B}$/Y69$^{A}_{B}$/D-Y7P(V)
D-Y7NW(V)/Y7PW(V)/Y7BW(V)
D-Y7BAL

How to mount and move the auto switch

Note) Use a watchmaker driver whose grip dia. is 5 to 6mm when tightening the auto switch mounting screw. The tightening torque should be about 0.05 to 0.1Nm. Tighten 90° more after you find the screw tightened.



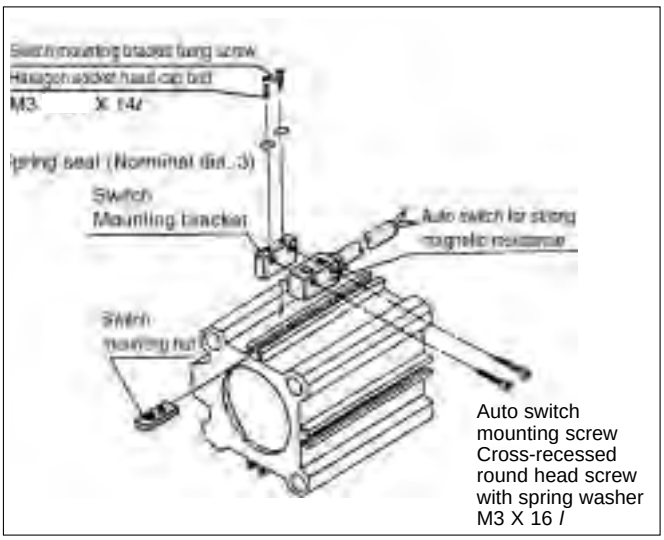
①Insert the auto switch into the mounting groove and set it at the auto switch mounting position.
②After confirming the detecting position, tighten the mounting screw to secure the auto switch.
③Modification of the detecting position should be made in step ①.

Information ❷
How to Mount and Move the Auto Switch

Mounting Bracket **Direct mounting**

<Applicable auto switch>
Solid state switch ·····D-P5DWL

How to mount and move the auto switch



Auto switch mounting screw
Cross-recessed round head screw with spring washer
M3 X 16 *ℓ*

①Mount the mounting bracket onto the mounting nut by tightening bracket fixing screw lightly through the mounting hole on the top of bracket.
②Insert the mounting bracket assembly (bracket+nut) into the mounting groove and set it at the auto switch mounting position.
③Push the auto switch mounting screw lightly into the auto switch through the mounting hole to secure.
④After reconfirming detection position, tighten the mounting screw to secure the auto switch. (Tightening torque should be 0.5 to 0.7Nm.)

Part No. of auto switch mounting bracket (including bracket and screw)

Cylinder series	Bore size (mm)		
	40	50	63
MK, MK2	BQP1-050	BQP1-050	BQP1-050

Auto Switch Weight (Single Unit)

Band mounting

(g)

Applicable auto switch	Model		Lead wire length 0.5m	3m	None
Reed switch	D-C7 D-C8	2 wire	9	46	–
		3 wire	10	50	
	D-C73C D-C80C		14	53	–
	D-B5 D-B6		22	78	–
	D-B59W		20	76	–
	D-A3		–	–	116
	D-A4		–	–	114
	D-A3□A D-A44A		–	–	110
Solid state switch	D-H7	2 wire	11	50	–
		3 wire	13	57	–
		4 wire	13	56	–
	D-K5	2 wire	18	68	–
	D-G5	3 wire	20	78	–
		4 wire	20	74	–
	D-□39		–	–	116
	D-□39A		–	–	110
	D-H7C		15	54	

Tie-rod mounting

(g)

Applicable auto switch	Model		Lead wire length 0.5m	3m	None
Reed switch	D-A5 D-A6	2 wire	24	80	–
		3 wire			
	D-A59W		25	80	–
	D-A3□C	ø40	–	–	162
		ø50	–	–	166
		ø63	–	–	184
		ø80	–	–	210
		ø100	–	–	232
	D-A44C	ø40	–	–	160
		ø50	–	–	164
		ø63	–	–	182
		ø80	–	–	208
		ø100	–	–	230
Solid state switch	D-J5	2 wire	21	71	–
	D-F5	3 wire	23	81	–
		4 wire	22	77	–

Rail mounting

(g)

Applicable auto switch	Model		Lead wire length 0.5m	3m
Reed switch	D-A7/A7□H D-A8/A80H	2 wire	10	47
		3 wire	11	52
	D-A73C D-A80C		12	54
	D-A79W		11	53
Solid state switch	D-J7	2 wire	11	50
	D-F7	3 wire	13	57
		4 wire	13	56
	D-J79C		13	52

Direct mounting

(g)

Applicable auto switch	Model			Lead wire length 0.5m	3m
Reed switch	D-A9/A9□V		2 wire	7	35
			3 wire	8	41
	D-9			5	23
	D-9□A			9	47
	D-E7□A D-E8□A		2 wire	10	47
			3 wire	11	55
	D-Z7 D-Z8		2 wire	9	49
			3 wire	10	55
Solid state switch	D-Y□	1 colour	2 wire	9	50
			3 wire	10	53
		2 colour	2 wire	11	54
			3 wire	11	54
	D-M5		2 wire	14	53
			3 wire	16	60
	D-Y7BA			–	54

Model Selection Procedures

Air Cylinder Model Selection Procedures

Step **1** **Obtain the bore of the cylinder tube. → Refer to Graphs 1 and 2.**

①Determine the load factor in accordance with the purpose.

Purpose of operation		Load factor η
Static operation (clamping, low speed vise crimping, etc.)		0.7 or less (70% or less)
Dynamic operation	Horizontal movement of load on guide	1 or less (100% or less)
	Vertical and horizontal movement of the load	0.5 or less (50% or less)(1)

Note 1) If it is particularly necessary to operate at high speeds, the load rate must be reduced further. (In the graph, it is possible to select a load rate of 0.4, 0.3, 0.2, or less.)

②Determine the operating pressure.

Generally, set the regulator to 85% of the source air pressure.

(In the graph, a selection between 0.2MPa and 0.8MPa is possible.)

③Determine the direction in which the cylinder force will be used.

Extending side → Refer to Graph 1.

Retracting side → Refer to Graph 2.

Note: If the same load is applied both for pushing and pulling in a horizontal operation, set the direction to the pulling side.

Step **2** **Take the impact at the stroke end into consideration.**

①When an external stopper (shock absorber, etc.) is provided to absorb the impact, select a stopper with sufficient absorption capacity.

②Stopping the piston with the cylinder without a stopper:

Verify in Graphs 3 to 7 the absorption capacity of the cushion that is enclosed in the cylinder.

1) Rubber bumper: ····· Urethane rubber is used for preventing metal-to-metal contact between the piston and the cover.

2) Air cushion: ····· The air in the exhaust side is compressed slightly before the stroke end, and its reaction force absorbs the kinetic energy of the load, thus enabling the piston to stop quietly.

Step **3** **The aspects indicated below may need to be taken into consideration, depending on how the cylinder is operated.**

①If a lateral load is applied to the piston rod:

Verify in Graphs 8 to 11 whether the lateral load is within an allowable range.

②When using a cylinder with a relatively long stroke, if a buckling force acts on the piston rod or the cylinder tube, verify in the table whether the stroke or the operating pressure is within a safe range.

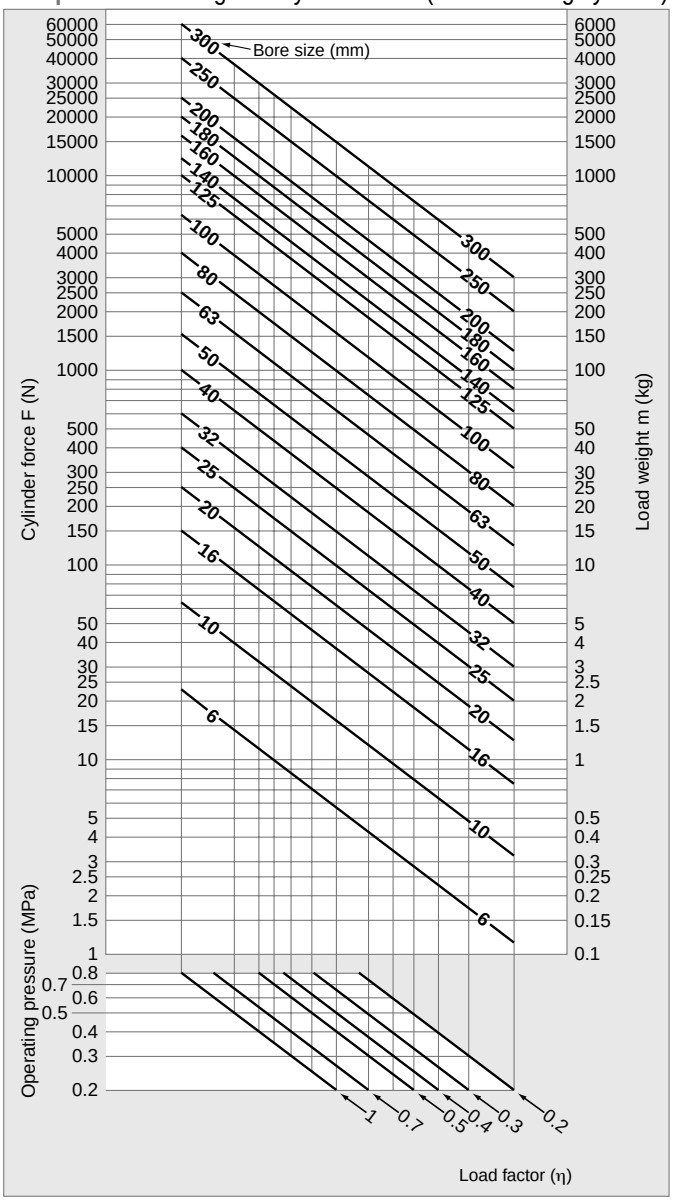
Step **4** **Obtain the cylinder's air consumption and required air volume.**

Obtain the air consumption (Graphs 12, 13) that is necessary for selecting a compressor and for calculating the running cost and the required air volume (Graph 14) that is necessary for selecting equipment such as an air filter or a regulator, or the size of the piping upstream.

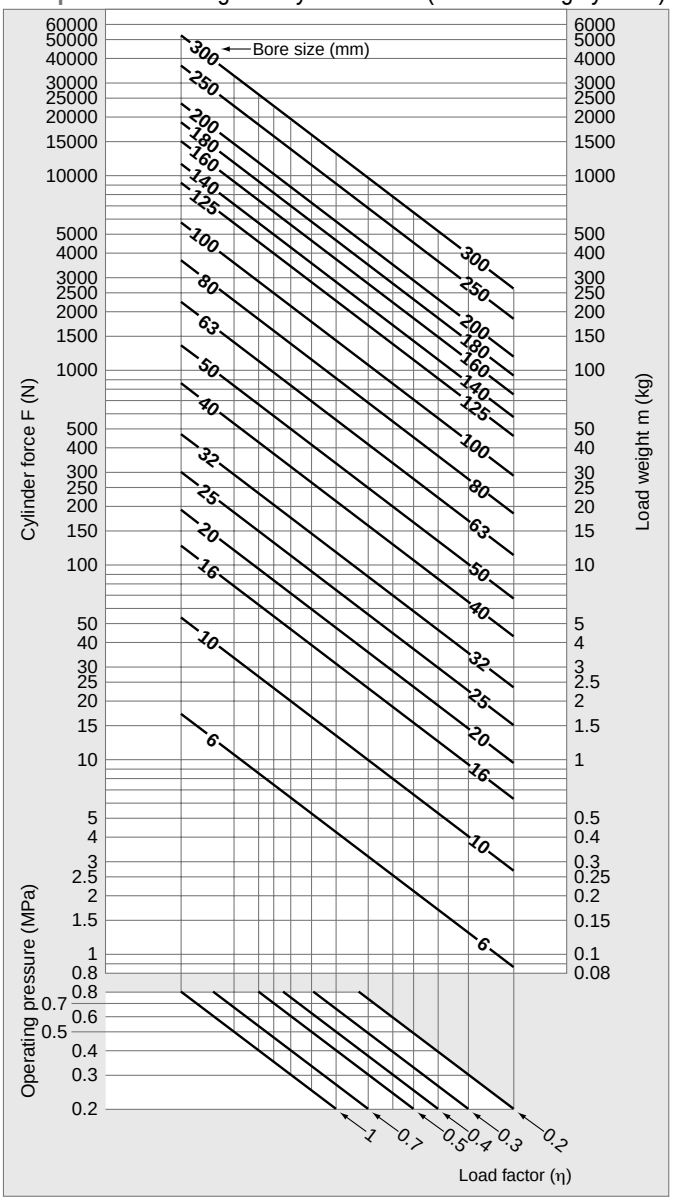
Step **1**

Obtain the bore of the cylinder tube. → Refer to Graphs 1 and 2.

<Graph 1> Extending side cylinder force (Double acting cylinder)



<Graph 2> Retracting side cylinder force (Double acting cylinder)



Example:

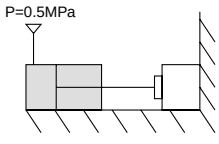


Fig. 1

Example 1: If a minimum force of 1000N is necessary to keep the workpiece pressed as shown in Fig. 1, because this is the extending side, use Graph 1 to determine the load factor of 0.7 and the operating pressure of 0.5MPa. Then, seek the point at which the cylinder force of 1000N intersects, and this will result in a bore size of 63mm.

Conversion to gravitational units

1MPa ≅ 10.2kgf/cm^2	1N ≅ 0.102kgf
1kgf/cm^2 ≅ 0.098MPa	1kgf ≅ 9.8N

Example:

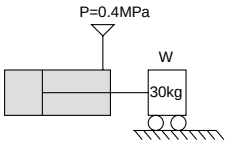


Fig. 2

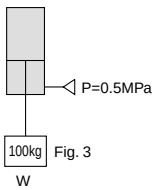


Fig. 3

Example 2: To move a load with a 30kg weight horizontally on a guide as shown in Fig. 2, because the load is the same for both the pushing and retracting sides, use Graph 2, which is the retracting side with a smaller force. Determine the load factor of 1, and the operating pressure of 0.4MPa. Then, seek the point at which it intersects with the load weight of 30kg, and this will result in a bore size of 40mm.

Example 3: To pull a load with a 100kg weight vertically upward as shown in Fig. 3, use Graph 2 to determine the load factor of 0.5 and the operating pressure of 0.5MPa. Then, seek the point at which it intersects with the load weight of 100kg, and this will result in a bore size of 80mm.

Air Cylinder Model Selection Procedures

Step **2**

Take the impact at the stroke end into consideration.

How to view the Graphs

Example 1: According to Graph 3, to move a load weight of 50kg using CM2-40A, it is necessary to set the maximum speed at 300mm/s or less, considering the capacity of the air cushion.

Cylinder with an air cushion

CJ2

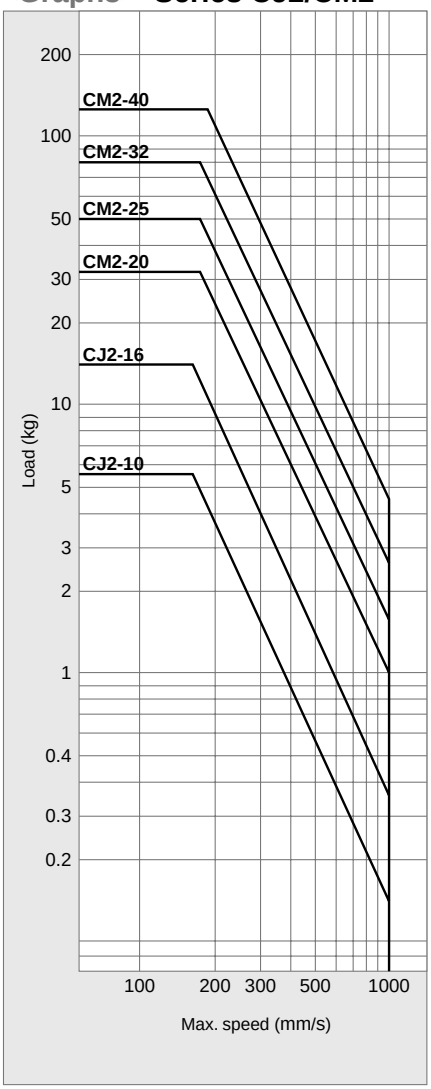
CM2

CG1

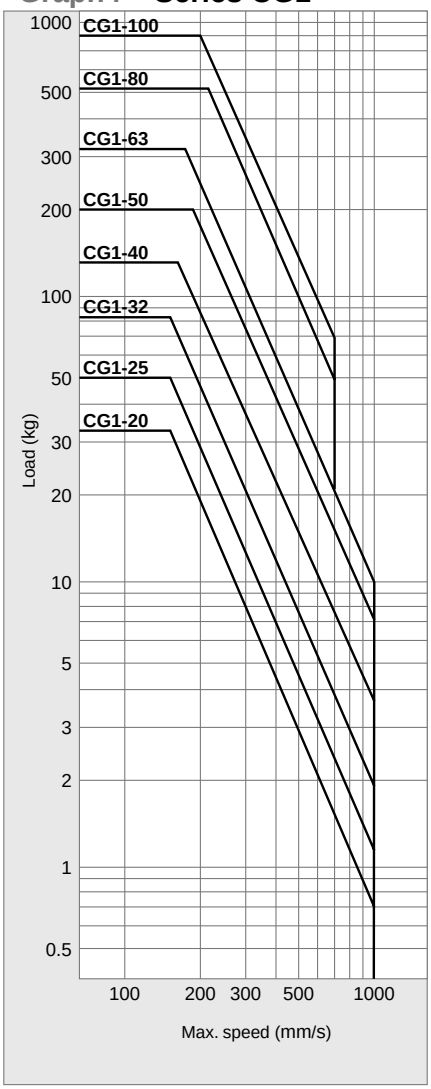
CA1

CS1

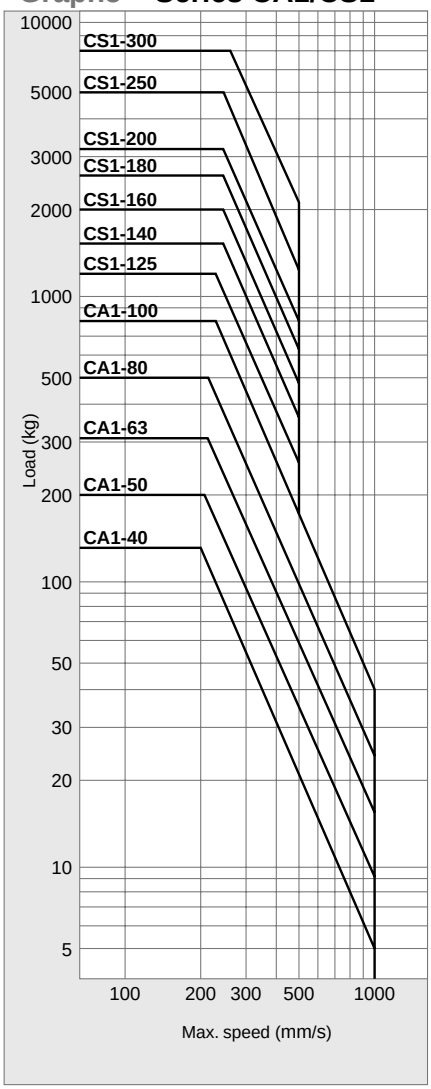
<Graph3> Series CJ2/CM2



<Graph4> Series CG1



<Graph5> Series CA1/CS1



How to view the Graphs

Example 2: According to Graph 7, to move a load weight of 50kg at a maximum speed of 500mm/s, in the CG1 series, a bore size of ø80 can be selected.

Cylinder with a rubber bumper

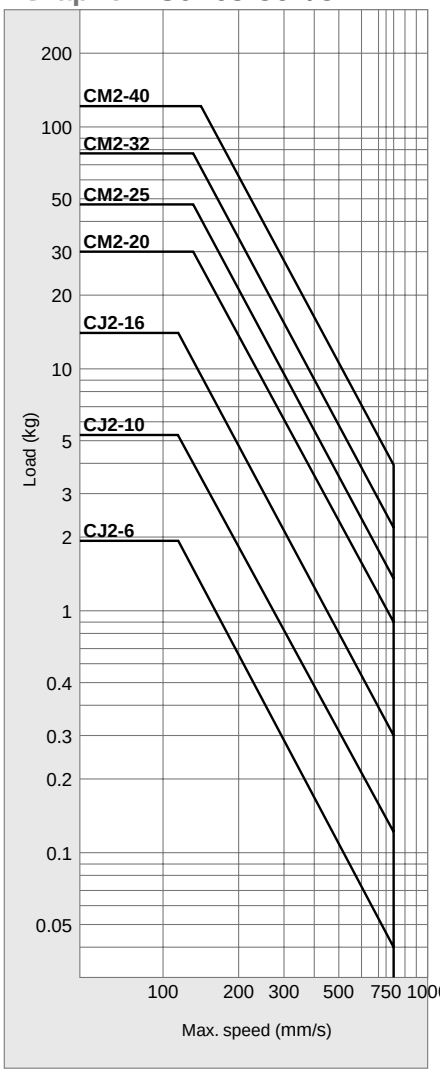
CJ2

CM2

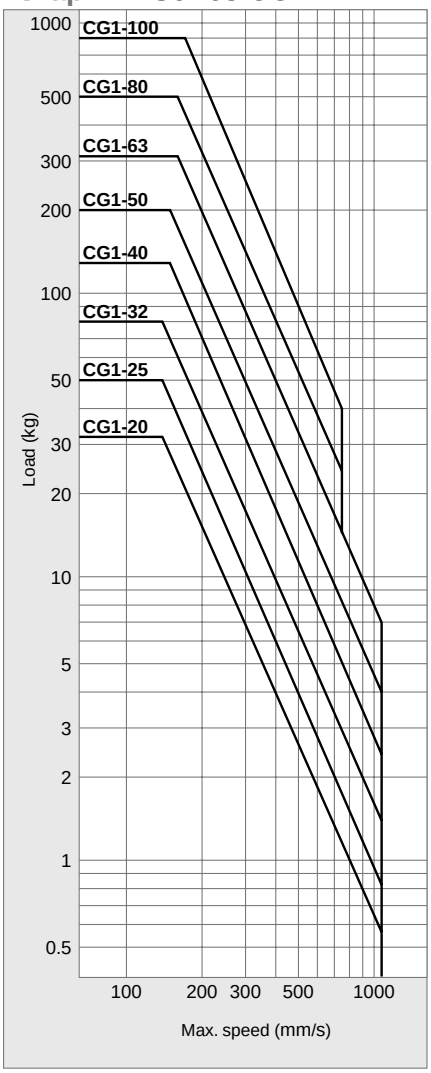
CG1

MB

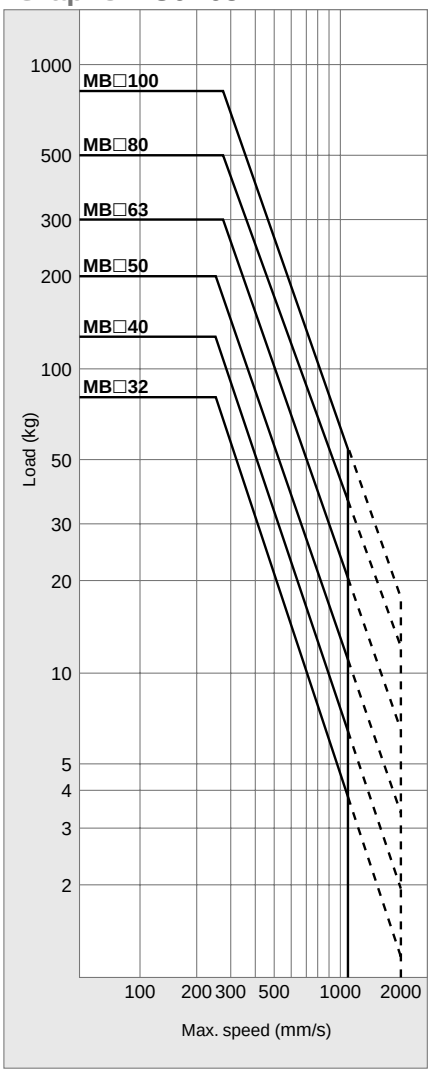
<Graph6> Series CJ2/CM2



<Graph7> Series CG1



<Graph8> Series MB

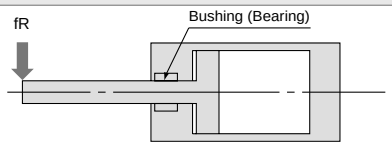


Air Cylinder Model Selection Procedures

Step **3**

The aspects indicated below may need to be taken into consideration, depending on how the cylinder is operated.

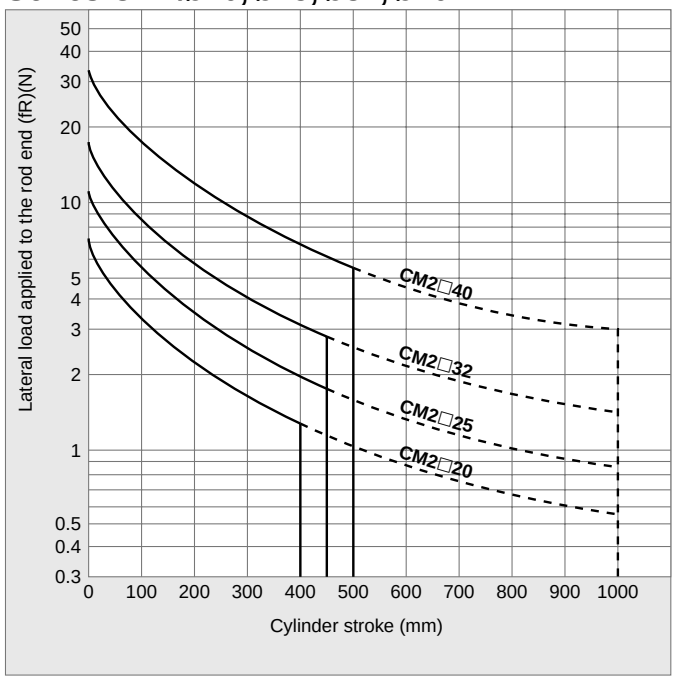
①The maximum stroke at which the cylinder can be operated under a lateral load.



The region that does not exceed the bold solid line represents the allowable lateral load in relation to the cylinder of a given stroke length. In the graph, the range of the broken line shows that the long stroke limit has been exceeded. In this region, as a rule, operate the cylinder by providing a guide along the direction of movement.

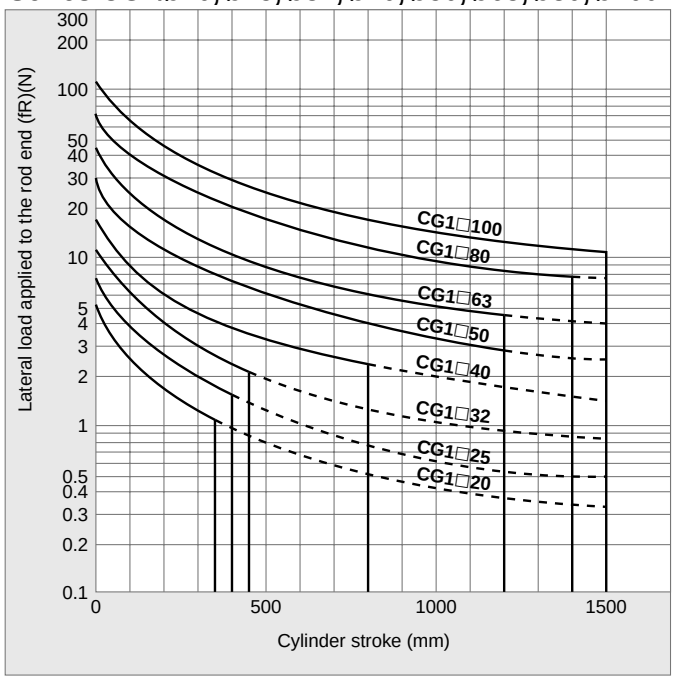
<Graph8>

Series CM2/ø20, ø25, ø32, ø40



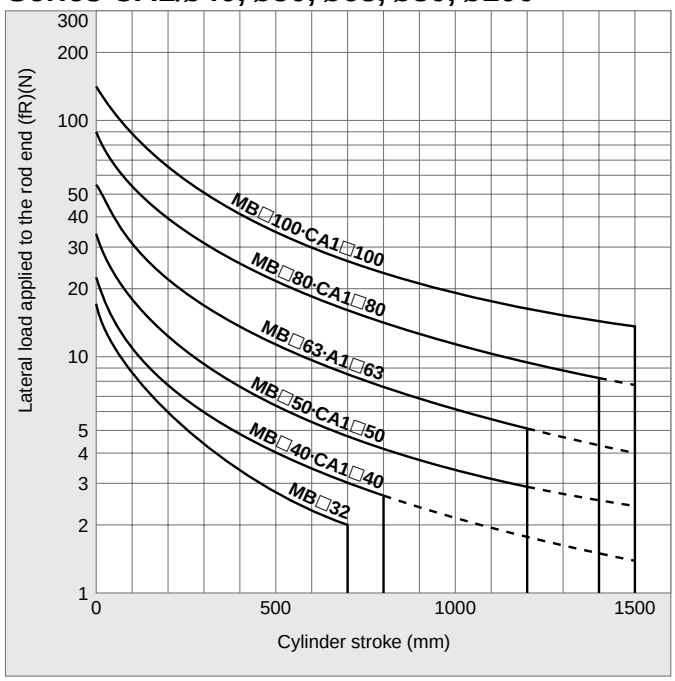
<Graph9>

Series CG1/ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100



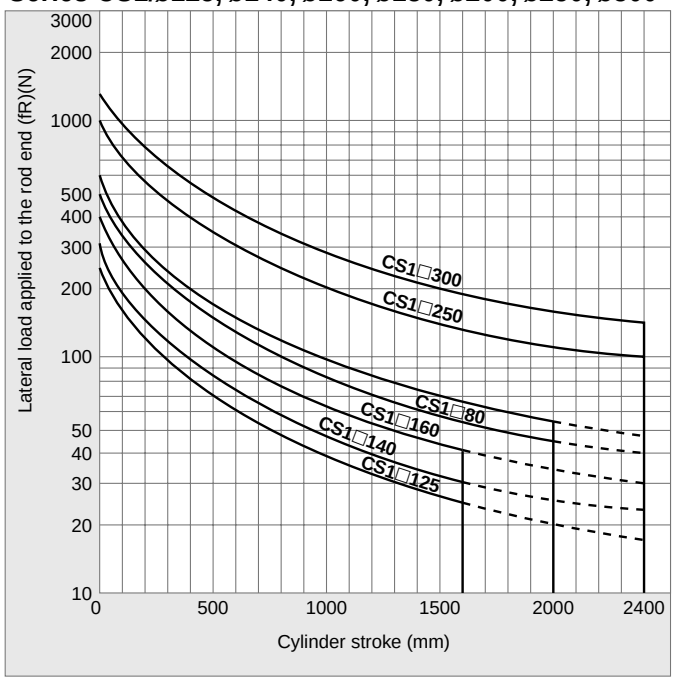
<Graph10>

Series MB/ø32, ø40, ø50, ø63, ø80, ø100
Series CA1/ø40, ø50, ø63, ø80, ø100

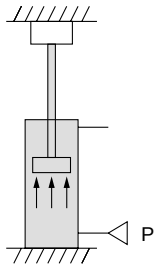


<Graph11>

Series CS1/ø125, ø140, ø160, ø180, ø200, ø250, ø300



②The relationship between the cylinder size and the maximum stroke depending on the mounting style



Assuming that the force that is generated by the cylinder itself acts as a buckling force on the piston rod or on the piston rod and the cylinder tube, the table below indicates in centimeters the maximum stroke that can be used, which was obtained through calculation.
Therefore, it is possible to find the maximum stroke that can be used with each cylinder size according to the relationship between the level of the operating pressure and the type of cylinder mounting, regardless of the load factor.
Reference: Even under a light load, if the piston rod has been stopped by an external stopper at the extending side of the cylinder, the maximum force generated by the cylinder will act upon the cylinder itself.

(cm)

Mounting style			Operating pressure	Maximum stroke that can be used according to buckling strength																								
Mounting bracket diagram		Symbol		CM2				CG1								MB	MB/CA1					CS1						
			MPa	ø20	ø25	ø32	ø40	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100	ø32	ø40	ø50	ø63	ø80	ø100	ø125	ø140	ø160	ø180	ø200	ø250	ø300
Foot: L	Front flange: F / Rear flange: G	L F G	0.3	39	49	56	61	38	49	55	80	100	78	96	112	71	81	102	79	98	114	131	117	126	141	158	182	206
			0.5	29	37	42	46	29	36	42	60	76	59	73	85	56	63	78	61	75	88	101	89	96	108	121	140	158
			0.7	24	31	35	38	24	30	34	50	63	49	60	71	46	52	65	50	62	73	84	74	80	89	101	115	131
			0.3	16	20	24	25	15	21	24	36	45	34	42	50	31	35	46	34	42	50	57	49	53	60	68	79	90
			0.5	11	14	17	17	11	14	17	26	33	25	31	37	23	26	34	25	31	37	42	35	38	44	50	58	66
			0.7	8	11	13	13	8	11	13	21	27	20	24	29	19	21	27	19	24	29	34	28	30	34	40	45	53
Clevis: C, D	Front trunnion: U	C D U	0.3	36	46	53	56	37	47	53	78	98	76	94	109	67	76	96	73	91	105	122	106	118	130	146	167	190
			0.5	26	34	39	42	27	35	40	59	74	57	70	82	50	57	72	54	68	78	91	78	85	96	109	124	141
			0.7	21	28	32	34	22	28	32	48	61	46	58	68	41	46	60	44	55	64	75	64	69	78	89	101	115
			0.3	82	103	116	126	81	102	115	165	207	163	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
			0.5	62	79	89	97	61	78	88	126	159	124	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
			0.7	52	66	75	81	51	65	73	106	133	104	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rear trunnion: U	Center trunnion: U / CA1/CS1 only		0.3	37	47	54	58	38	48	55	79	100	78	—	—	93	105	134	103	128	149	171	151	163	183	206	235	267
			0.5	27	35	40	43	28	36	41	60	76	59	—	—	71	80	102	78	97	113	129	113	123	139	156	178	203
			0.7	22	29	33	35	23	30	34	50	63	48	—	—	58	66	85	65	81	93	107	94	101	115	129	147	168
Foot: L	Front flange: F / Rear flange: G	L F G	0.3	118	147	166	181	117	147	166	237	296	234	288	333	206	234	295	231	287	330	382	339	366	412	459	527	598
			0.5	90	113	128	139	89	112	127	182	228	180	221	256	158	179	226	177	219	253	293	263	281	315	252	403	458
			0.7	76	95	107	117	75	94	107	153	192	151	186	215	132	150	190	148	184	212	245	218	235	265	296	339	385
			0.3	55	69	79	85	55	70	79	114	143	112	138	161	99	112	142	116	136	158	183	160	173	196	218	251	286
			0.5	41	52	60	64	41	52	60	87	109	85	105	122	75	85	108	83	102	119	138	120	131	147	165	189	216
			0.7	34	43	49	53	34	43	50	72	91	71	87	102	62	70	90	68	85	99	114	99	108	122	137	157	179
Foot: L	Front flange: F / Rear flange: G	L F G	0.3	168	210	237	258	167	210	236	337	422	334	411	474	280	318	423	313	412	476	549	489	528	594	661	762	863
			0.5	129	162	183	199	128	161	182	260	325	257	316	366	234	266	339	257	317	367	423	377	407	457	509	587	665
			0.7	109	136	154	167	108	135	153	219	274	216	266	308	194	220	275	216	267	309	356	317	343	385	429	494	561
			0.3	80	101	114	123	80	101	114	164	206	162	200	231	136	154	206	151	199	231	266	235	254	287	320	369	419
			0.5	61	77	87	94	61	77	87	126	158	124	152	177	110	125	158	123	152	176	203	179	194	218	244	281	320
			0.7	50	64	72	78	50	64	73	105	132	103	127	148	93	105	132	102	127	147	170	149	144	182	204	235	268

Air Cylinder Model Selection Procedures

Step **4**

Obtain the cylinder's air consumption and its required air volume.

Cylinder's air consumption and its required air volume

In equipment that uses a cylinder, air consumption is the volume of air that is consumed in the cylinder, or in the piping between the cylinder and the switching valve, every time the switching valve operates. This is necessary for selecting a compressor and for calculating the running cost. The required air volume is the volume of air that is necessary for operating a specified load at a specified speed, and it is necessary for selecting the F.R.L. equipment or the size of the upstream piping.

How to obtain the air consumption/How to view Graphs 12, 13

Step 1 Using Graph 12, obtain the air consumption of the air cylinder.
①Seek the point at which the operating pressure (diagonal line) intersects with the cylinder stroke, and from that point, perpendicularly extend a vertical line upward.
②From the point at which it intersects with the bore size (diagonal line) of the cylinder to be used, look sideways (either to the right or left) to obtain the air consumption that is required by one cycle of the air cylinder.

Step 2 Using Graph 13, obtain the air consumption of the tube or steel pipe in the same way as in step 1.

Step 3 Obtain the total air consumption per minute as described below. (air consumption of air cylinder + air consumption of tube or steel pipe) X number of cycles per minute X number of cylinders being used = total air consumption [unit: L/min (ANR)]

Note: In selecting a compressor, the temperature drop, leakage, and consumption by the intermediary equipment must be taken into consideration. Thus, select one with a generous capacity, with a discharge that exceeds the total air consumption indicated above. (Reference: At a minimum, select one with 1.4 times the volume; select one with a higher volume as needed.)

Example: When 10 air cylinders with a 50mm bore size and a 600mm stroke are used at a pressure of 0.5MPa, what is the air consumption of their 5 cycles per minute?
(A 2m tube with a 6mm bore is used for piping between the cylinders and the switching valve.)
1. Operating pressure 0.5MPa → cylinder stroke 600mm → bore size 50mm → air consumption volume ≅ 13 *l* (ANR)
2. Operating pressure 0.5MPa → piping length 2m → bore 6mm → air consumption ≅ 0.56 *l* (ANR)
3. Total air consumption = (13 + 0.56) X 10 X 5 = 678 *l*/min (ANR)

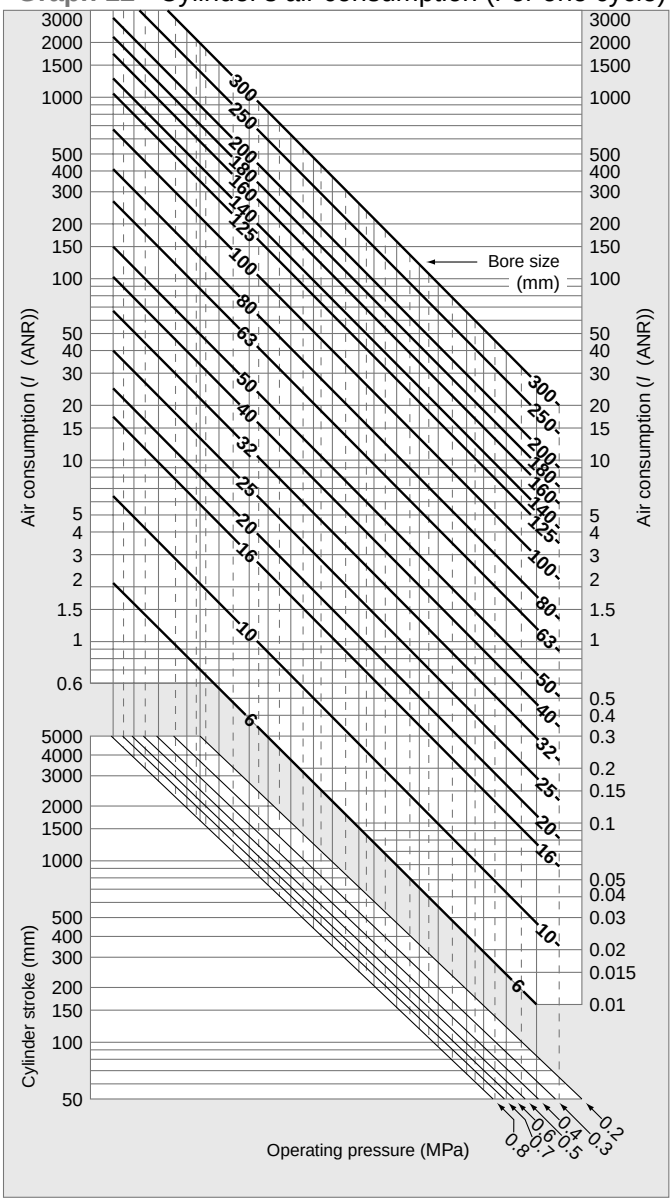
How to obtain the required air volume/How to view Graph 14

Step 3 Using Graph 14, obtain the air cylinder's required air volume.
①Seek the point at which the operating pressure (diagonal line) intersects with the maximum piston speed, and from that point, perpendicularly extend a vertical line upward.
②From the point at which it intersects with the bore size (diagonal line) of the cylinder to be used, look sideways (either to the right or left) to obtain the required air consumption.

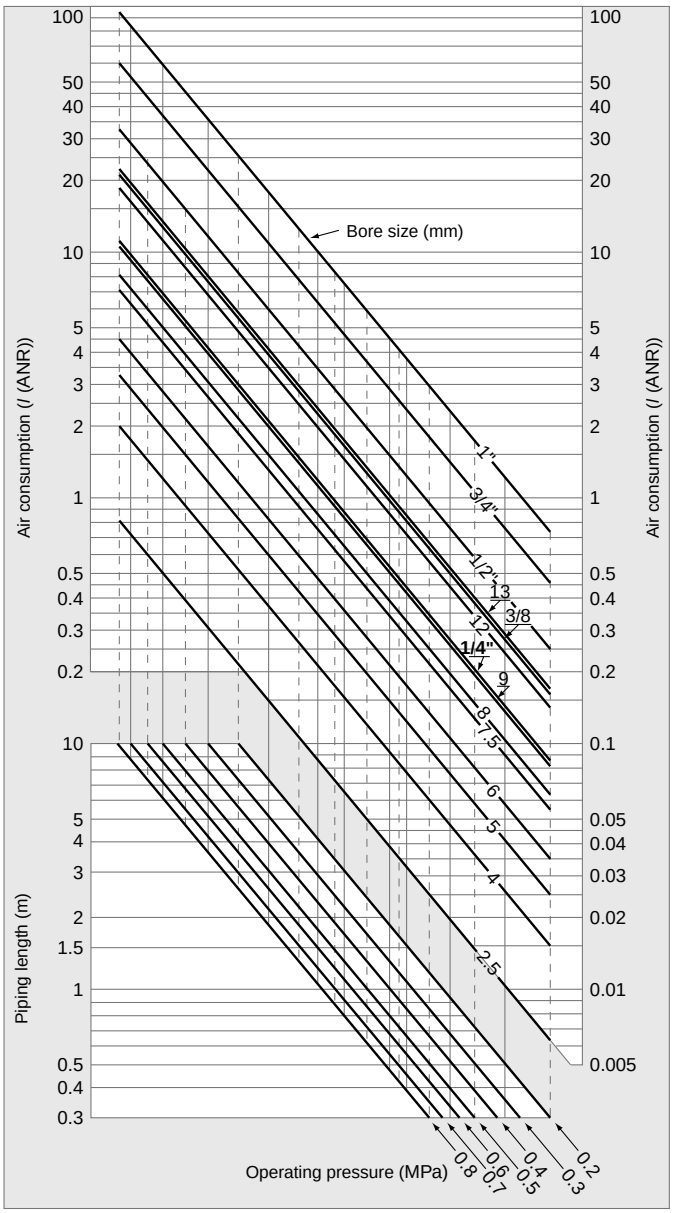
Example: What is the required air volume for operating a cylinder with a bore size of 50mm, at a pressure of 0.5MPa, and at a speed of 500mm/s?

How to: view: Operating pressure 0.5MPa → maximum piston speed 500mm/s → bore size 50mm → then, a required air volume 350 *l*/min (ANR) can be obtained.

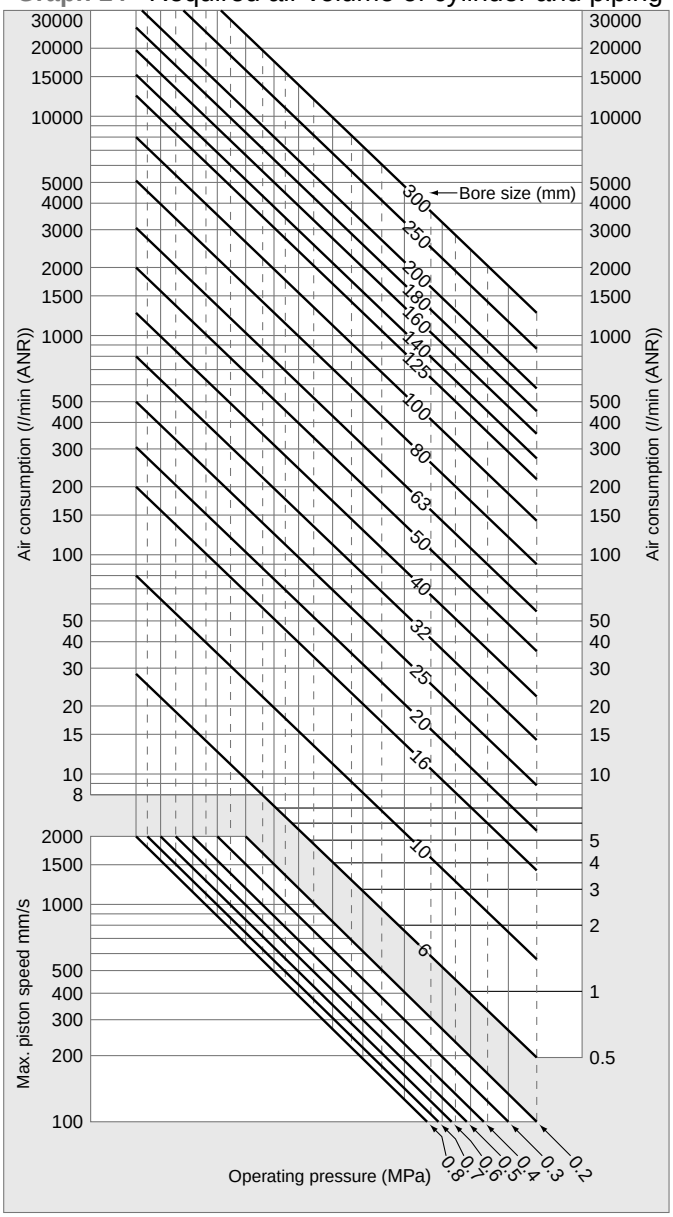
<Graph 12> Cylinder's air consumption (For one cycle)



<Graph 13> Air consumption of tube or steel pipe (For one cycle)



<Graph 14> Required air volume of cylinder and piping



∗ The piping length is the length of the steel pipe or tube that connects the cylinder with the switching valve (solenoid valve, etc.).

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard by labeling **"Caution"**, **"Warning" or "Danger"**. To ensure safety, be sure to observe ISO4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠ **Caution:** Operator error could result in injury or equipment damage.

⚠ **Warning:** Operator error could result in serious injury or loss of life.

⚠ **Danger:** In extreme conditions, there is a possibility of serious injury or loss of life.

Note 1) ISO4414: Pneumatic fluid power - Recommendations for the application of equipment to transmission and control systems.
Note 2) JIS B 8370: Pneumatic system axiom.

⚠Warning

❶The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility with the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements.

❷Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

❸Do not service machinery/equipment or attempt to remove components until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for the equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is re-started, take measures to prevent quick extensions of the cylinder piston rod etc. (Bleed air into the system gradually to create back-pressure.)

❹Contact SMC if the product is to be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverage, recreation equipment, emergency stop circuits, press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals,

Actuator Precautions①

Be sure to read before handling.
Refer to main text for detailed precautions on every series.

Design

⚠Warning

❶There is a possibility of dangerous sudden action by air cylinders if sliding parts of machinery are twisted due to external forces, etc.

In such cases, human injury may occur; e.g., by catching hands or feet in the machinery, or damage to the machinery itself may occur. Therefore, the machine should be designed to avoid such dangers.

❷A protective cover is recommended to minimize the risk of personal injury.

If a stationary object and moving parts of a cylinder are in close proximity, personal injury may occur. Design the structure to avoid contact with the human body.

❸Securely tighten all stationary parts and connected parts so that they will not become loose.

When a cylinder operates with high frequency or a cylinder is installed where there is a lot of vibration, ensure that all parts remain secure.

❹A deceleration circuit or shock absorber, etc., may be required.

When a driven object is operated at high speeds or the load is heavy, a cylinder's cushion will not be sufficient to absorb the shock. Install a deceleration circuit to reduce the speed before cushioning, or install an external shock absorber to relieve the shock. In this case, the rigidity of the machinery should also be examined.

❺Consider a possible drop in operating pressure due to a power outage, etc.

When a cylinder is used in a clamping mechanism, there is a danger of work dropping if there is a drop in circuit pressure caused by a power outage, etc.
Therefore, safety equipment should be installed to prevent damage to machinery and human injury. Suspension mechanisms and lifting devices also require consideration for drop prevention.

❻Consider a possible loss of power source.

Measures should be taken to protect against human injury and equipment damage in the event that there is a loss of power to equipment controlled by air pressure, electricity or hydraulics, etc.

❼Design circuitry to prevent sudden lurching of driven objects.

When a cylinder is driven by an exhaust center directional control valve or when starting up after residual pressure is exhausted from the circuit, etc., the piston and its driven object will lurch at high speeds if pressure is applied to one side of the cylinder because of the absence of air pressure inside the cylinder.
Therefore, equipment should be selected and circuits designed to prevent sudden lurching, because there is a danger of human injury and/or damage to equipment when this occurs.

❽Consider emergency stops.

Design so that human injury and/or damage to machinery and equipment will not be caused when machinery is stopped by a safety device under abnormal conditions, a power outage or a manual emergency stop.

❾Consider the action when operation is restarted after an emergency stop or abnormal stop.

Design the machinery so that human injury or equipment damage will not occur upon restart of operation. When the cylinder has to be reset at the starting position, install manual safety equipment.

Selection

⚠Warning

❶Check the specifications.

The products advertised in this catalog are designed according to use in industrial compressed air systems. If the products are used in conditions where pressure, temperature, etc., are out of specification, damage and/or malfunction may be caused. Do not use under these conditions.
Consult SMC if you use a fluid other than compressed air.

❷Intermediate stops.

When intermediate stopping of a cylinder piston is performed with a 3 position closed center directional control valve, it is difficult to achieve stopping positions as accurate and minute as with hydraulic pressure, due to the compressibility of air.
Furthermore, since valves and cylinders, etc. are not guaranteed for zero air leakage, it may not be possible to hold a stopped position for an extended period of time. Contact SMC in case it is necessary to hold a stopped position for an extended period.

⚠Caution

❶Operate within the limits of the maximum usable stroke.

Refer to the selection procedures for the air cylinder to be used for the maximum usable stroke.

❷Operate the piston within a range such that collision damage will not occur at the end of the stroke.

Operate within a range such that damage will not occur when the piston having inertial force stops by striking the cover at the stroke end. Refer to the cylinder selection procedures for the range within which damage will not occur.

❸Use a speed controller to adjust the cylinder drive speed, gradually increasing from a low speed to the desired speed setting.

❹Provide an intermediate support for a cylinder with a long stroke.

If the cylinder has a long stroke, provide an intermediate support to prevent the rod from sagging and the tube from flexing, as well as to prevent damage to the rod due to vibrations or external loads.

Actuator Precautions②

Be sure to read before handling.
Refer to main text for detailed precautions on every series.

Mounting

⚠Caution

❶Make sure to connect the rod and the load so that their axial center and movement directions match.

If they do not match, stress could be applied to the rod and the tube, causing the inner surface of the tube, the bushing, the rod surface, and the seals to wear and to become damaged.

❷When an external guide is used, connect the external slider and the load in such a way that there is no interference at any point within the stroke.

❸Do not scratch or gouge the sliding portion of the cylinder tube or the piston rod by striking it with an object, or squeezing it.

The tube bore is manufactured under precise tolerances. Thus, even a slight deformation could lead to a malfunction. Furthermore, any scratches or gouges on the sliding portion of the piston rod could damage the seals, which could lead to air leakage.

❹Prevent the rotating parts from seizing.

Apply grease to the rotating parts (such as the pin) to prevent them from seizing.

❺Do not use until you verify that the equipment can operate properly.

After mounting, repair or modification, etc., connect the air supply and electric power, and then confirm proper mounting by means of appropriate function and leak inspections.

❻Instruction manual.

The product should be mounted and operated after thoroughly reading the manual and understanding its contents.
Keep the instruction manual where it can be referred to as needed.

Piping

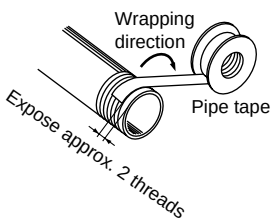
⚠Caution

❶Preparation before piping.

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove cutting chips, cutting oil and other debris from inside the pipe.

❷Wrapping of sealant tape.

When connecting pipes and fittings, etc., be certain that cutting chips from the pipe threads and sealing material do not get inside the piping.
Also, when sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the pipe/fitting.



Cushion

⚠Caution

❶Readjust with the cushion needle.

The cushion has been adjusted at the time of shipment. However, before operating the actuator, readjust the cushion needle that is provided on the cover, according to the size of the load and the operating speed. Turn the cushion needle clockwise to restrict the flow, which increases the cushioning effect. After completing the adjustment, securely tighten the lock nut.

❷Do not operate the actuator with the cushion needle fully closed.

This could damage the seals.

Lubrication

⚠Caution

❶Lubricating the lube style cylinder

Install a lubricator in the circuit, and use class 1 turbine oil (non-additive) ISO VG32. Do not use machine oil or spindle oil.

❷Lubrication of cylinder.

The cylinder has been lubricated for life at the factory and can be used without any further lubrication.
However, in the event that it will be lubricated, use class 1 turbine oil (with no additives) ISO VG32.
Stopping lubrication later may lead to malfunction due to the loss of the original lubricant. Therefore, lubrication must be continued once it has been started.

Air Supply

⚠Warning

❶Use clean air.

If compressed air includes chemicals, synthetic oils containing organic solvents, salt or corrosive gases, etc., it can cause damage or malfunction.

⚠Caution

❶Install air filters.

Install air filters at the upstream side of valves. The filtration degree should be 5μm or less.

❷Install an air dryer, after cooler, etc.

Air that includes excessive condensate may cause malfunction of valves and other pneumatic equipment. To prevent this, install an air dryer, after cooler, etc.

❸Use the product within the specified range of fluid and ambient temperature.

Take measures to prevent freezing, since moisture in circuits will be frozen under 5°C, and this may cause damage to seals and lead to malfunction.
Refer to SMC's "Air Cleaning Equipment" catalog for further details on compressed air quality.

Actuator Precautions③

Be sure to read before handling.
Refer to main text for detailed precautions on every series.

Operating Environment

⚠Warning

❶Do not use in environments where there is a danger of corrosion.

Refer to the construction drawings regarding cylinder materials.

❷Install a cover over the rod if it is used in an area that is dusty, or in an environment in which water or oil splashes on the cylinder.

If the area is very dusty, use the type with a heavy duty scraper (-XC4). If fluids splash on the cylinder, use a cylinder with improved water resistance.

❸If auto switches will be used, do not use them in an environment in which strong magnetic fields are present.

Maintenance

⚠Warning

❶Maintenance should be done according to the procedures indicated in the operating manual.

If handled improperly, malfunction and damage of machinery or equipment may occur.

❷Machine maintenance, and supply and exhaust of compressed air.

When machinery is serviced, first check measures to prevent dropping of driven objects and run-away of equipment, etc. Then cut off the supply pressure and electric power, and exhaust all compressed air from the system.
When machinery is restarted, check that operation is normal with actuators in the proper positions.

⚠Caution

❶Drain flushing.

Remove condensate from air filters regularly.

Actuator Precautions④

Be sure to read before handling.
Refer to main text for detailed precautions on every series.

Air-hydro Cylinder

Design

⚠Warning

❶Do not use an air-hydro cylinder near flames, or in equipment or machinery that exceeds an ambient temperatures of 60°C.

Failure to observe this precaution could result in a fire, because an air hydro-cylinder uses hydraulic oil that is flammable.

⚠Caution

❶Do not use it in an environment, equipment, or machine that is not compatible with oil mist.

As an air-hydro cylinder generates oil mist during operation, it could affect the environment.

❷Make sure to install an exhaust cleaner on the directional control valve for the air-hydro cylinder.

An air-hydro cylinder discharges a small amount of hydraulic oil through the exhaust port of the directional control valve, which could contaminate the surroundings.

❸Install an air hydro cylinder in a location in which it can be serviced easily.

Provide space for servicing the air-hydro cylinder, as it requires maintenance such as replenishing it with hydraulic fluid and bleeding of air.

Selection

⚠Caution

❶Select an air-hydro cylinder in combination with an air-hydro unit.

Because an air-hydro cylinder operates most favorably when it is combined with an air-hydro unit, select an appropriate air-hydro unit.

❷Set the load of the air-hydro cylinder to be 50% or less of the theoretical force.

The load must be set to 50% or less in order for the air hydro cylinder to achieve the level of performance that is close to that of a hydraulic cylinder, such as constant speed operation and stopping accuracy.

Piping

⚠Caution

❶For air-hydro cylinder piping, use self-aligning fittings.

Do not use One-touch fittings for air-hydro cylinder piping, as they could lead to oil leakage.

❷For air-hydro cylinder piping, use hard nylon tubing or copper piping.

Similar to a hydraulic circuit, a high surge pressure could be created in air hydro cylinder piping, depending on the operating pressure. Therefore, use piping materials that provide a higher level of safety.

Lubrication

⚠Warning

❶Make sure to completely discharge the compressed air in the system before filling the air-hydro unit with hydraulic oil.

Before filling the air-hydro unit with hydraulic oil, verify that proper measures are taken to prevent the driven objects from falling and that safety measures are taken to prevent the clamped objects from becoming detached. Then, shut off the air supply, turn off the power supply to the equipment, and discharge the compressed air.
It would be dangerous to open the oil inlet on the air hydro unit while compressed air remains in the air-hydro system because the hydraulic oil could spray out.

Maintenance

⚠Caution

❶Bleed air from the air-hydro cylinder on a regular basis.

Because pockets of air could be created in the air-hydro cylinder, bleed air from it periodically, such as at the beginning of work. Bleed air at the air hydro cylinder or at the air bleeder valve that is provided on the pipe.

❷Verify the oil level of the air hydro system on a regular basis.

Because a small amount of hydraulic oil is discharged from the air-hydro cylinder and the air-hydro unit circuit, the oil level decreases gradually. Therefore, check the oil level and replenish the system with oil if necessary.
The oil level can be checked with a level gauge in the air-hydro converter.

Auto Switch Precautions①

Be sure to read before handling.
Refer to main text for detailed precautions on every series.

Design & Selection

⚠Warning

❶Confirm the specifications.

Read the specifications carefully and use this product appropriately. The product may be damaged or malfunction if it is used outside the range of specifications of current load, voltage, temperature or impact.

❷Take precautions when multiple cylinders are used close together.

When multiple auto switch cylinders are used in close proximity, magnetic field interference may cause the switches to malfunction. Maintain a minimum cylinder separation of 40mm. (When the allowable separation is indicated for each cylinder series, use the specified value.)

❸Pay attention to the length of time that a switch is ON at an intermediate stroke position.

When an auto switch is placed at an intermediate position of the stroke and a load is driven at the time the piston passes, the auto switch will operate, but if the speed is too great the operating time will be shortened and the load may not operate properly. The maximum detectable piston speed is:

$$V\ (mm/s) = \frac{\text{Auto switch operating range (mm)}}{\text{Time load applied (ms)}} \times 1000$$

In cases of high piston speed, the use of an auto switch (D-F5NT, F7NT, G5NT and M5lT) with a built-in OFF delay timer (approx. 200ms) makes it possible to extend the load operating time.

❹Wiring should be kept as short as possible.

<Reed switch>
As the length of the wiring to a load gets longer, the rush current at switching ON becomes greater, and this may shorten the product's life. (The switch will stay ON all the time.)

1) For an auto switch without a connect protection circuit, use a contact protection box when the wire length is 5m or longer.
2) Even if an auto switch has a built-in contact protection circuit, when the wiring is more than 30m long, it is not able to adequately absorb the rush current and its life may be reduced. It is again necessary to connect a contact protection box in order to extend its life. Please contact SMC in this case.

<Solid state switch>

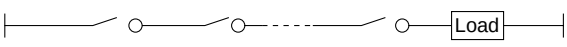
3) Although wire length should not affect switch function, use a wire 100m or shorter.

❺Take precautions for the internal voltage drop of the switch.

<Reed switch>

1) Switches with an indicator light Except (D-A56, A76H, A96, A96V, C76 and E76A)

● If auto switches are connected in series as shown below, take note that there will be a large voltage drop because of internal resistance in the light emitting diode. (Refer to internal voltage drop in the auto switch specifications.)
[The voltage drop will be "n" times larger when "n" auto switches are connected.]
Even though an auto switch operates normally, the load may not operate.



● In the same way, when operating under a specified voltage, although an auto switch may operate normally, the load may not operate. Therefore, the formula below should be satisfied after confirming the minimum operating voltage of the load.

$$\text{Supply voltage} - \text{Internal voltage drop of switch} > \text{Minimum operating voltage of load}$$

2) If the internal resistance of a light emitting diode causes a problem, select a switch without an indicator for right (MODEL D-A6□, A-80, A80H, A90, A90V, C80, R80, 90, E80A and Z80)

<Solid state switch>

3) Generally, the internal voltage drop will be greater with a 2 wire solid state auto switch than with a reed switch. Take the same precautions as in 1).
Also, note that a 12VDC relay is not applicable.

❻Pay attention to leakage current.

<Solid state switch>
With a 2 wire solid state auto switch, current (leakage current) flows to the load to operate the internal circuit even when in the OFF state.

Operating current of load (OFF condition) > Leakage current

If the criteria given in the above formula are not met, it will not reset correctly (stays ON). Use a 3 wire switch if this specification will not be satisfied.
Moreover, leakage current flow to the load will be "n" times larger when "n" auto switches are connected in parallel.

❼Do not use a load that generates surge voltage.

<Reed switch>
If driving a load such as a relay that generates a surge voltage, use a switch with a built-in contact protection circuit or use a contact protection box.

<Solid state switch>
Although a zener diode for surge protection is connected at the, output side of a solid state auto switch, damage may still occur if the surge is applied repeatedly. When a load, such as a relay or solenoid, which generates surge is directly driven, use a switch with a built-in surge absorbing element.

❽Cautions for use in an interlock circuit.

When an auto switch is used for an interlock signal requiring high reliability, devise a double interlock system to avoid trouble by providing a mechanical protection function, or by also using another switch (sensor) together with the auto switch. Also perform periodic maintenance and confirm proper operation.

❾Ensure sufficient clearance for maintenance activities.

When designing an application, be sure to allow sufficient clearance for maintenance and inspections.

Auto Switch Precautions②

Be sure to read before handling.
Refer to main text for detailed precautions on every series.

Mounting & Adjustment

⚠Warning

❶Do not drop or bump.

Do not drop, bump or apply excessive impacts (300m/s^2 or more for reed switches and 1000m/s^2 or more for solid state switches) while handling.
Although the body of the switch may not be damaged, the inside of the switch could be damaged and cause a malfunction.

❷Do not carry a cylinder by the auto switch lead wires.

Never carry a cylinder by its lead wires. This may not break the lead wires, but it may cause internal elements of the switch to be damaged by the stress.

❸Mount switches using the proper fastening torque.

When a switch is tightened beyond the range of fastening torque, the mounting screws, mounting bracket or switch may be damaged. On the other hand, tightening below the range of fastening torque may allow the switch to slip out of position. (Refer to switch mounting for each series regarding switch mounting, moving, and fastening torque, etc..)

❹Mount a switch at the center of the operating range.

Adjust the mounting position of an auto switch so that the piston stops at the center of the operating range (the range in which a switch is ON). (The mounting position shown in a catalog indicates the optimum, position at stroke end.) If mounted at the end of the operating range (around the borderline of ON and OFF), operation will be unstable.

Wiring

⚠Warning

❶Avoid repeatedly bending or stretching lead wires.

Broken lead wires will result from applying bending stress or stretching forces to the lead wires.

❷Be sure to connect the load before power is applied.

<2 wire type>
If the power is turned ON when an auto switch is not connected to a load, the switch will be instantly damaged because of excess current.

❸Confirm proper insulation of wiring.

Be certain that there is no faulty wiring insulation (contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

❹Do not wire with power lines or high voltage lines.

Wire separately from power lines or high voltage lines, avoiding parallel wiring or wiring in the same conduit with these lines. Control circuits, including auto switches, may malfunction due to noise from these other lines.

❺Do not allow short circuit of loads.

<Reed switch>
If the power is turned ON with a load in a short circuit condition, the switch will be instantly damaged because of excess current flow into the switch.

<Solid state switch>
Model D-F9□(Y), F9□W(V), J51, G5NB and all models of PNP output switches do not have built-in short circuit prevention circuits. If loads are short circuited, the switches will be instantly damaged.
Take special care to avoid reverse wiring with the brown (red) power supply line and the black (white) output line on 3 wire type switches.

❻Avoid incorrect wiring.

<Reed switch>
A 241V DC switch with indicator light has polarity. The brown lead wire or terminal No.1 is (+), and the blue lead wire or terminal No.2 is (–).
[In the case of model D-97, the side without indicator is (+), and the black line side is (–).]

1) If connections are reversed, a switch will operate, however, the light emitting diode will not light up.
   Also note that a current greater than that specified will damage a light emitting diode and it will no longer operate.
   Applicable models:
   D-A73, A73H, A73C, C73, C73C, E73A, Z73, R73
   D-97, 93A, A93, A93V
   D-A33, A34, A33A, A34A, A44, A44A
   D-A53, A54, B53, B54
2) However, when using a two color indication auto switch (D-A79W, A59W, B59W), be aware that the switch will constantly remain ON if the connections are reversed.

<Solid state switch>

1) If connections are reversed on a 2 wire type switch, the switch will not be damaged if protected by a protection circuit, but the switch will always stay in an ON state. However, it is still necessary to avoid reversed connections, since the switch could be damaged by a load short circuit in this condition.
2) If connections are reversed (power supply line + and power supply line –) on a 3 wire type switch, the switch will be protected by a protection circuit. However, if the power supply line (+) is connected to the blue (black) wire and the power supply line (–) is connected to the black (white) wire, the switch will be damaged.

∗ Lead wire color changes

Lead wire colors of SMC switches and related products have been changed in order to meet NECA (Nippon Electric Control Equipment Industries Association) Standard 0402 for production beginning September, 1996 and thereafter. Please refer to the tables provided. Special care should be taken regarding wire polarity during the time that the old colors still coexist with the new colors.

2 wire

	Old	New
Output (+)	Red	Brown
Output (–)	Black	Blue

Solid state with diagnostic output

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black
Diagnostic output	Yellow	Orange

3 wire

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black

Solid state with latch diagnostic output

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black
Latch diagnostic output	Yellow	Orange

Auto Switch Precautions③

Be sure to read before handling.
Refer to main text for detailed precautions on every series.

Operating Environment

⚠Warning

❶Never use in an atmosphere with explosive gases.

The structure of auto switches is not designed to prevent explosion. Never use in an atmosphere with an explosive gas since this may cause a serious explosion.

❷Do not use in an area where a magnetic field is generated.

Auto switches will malfunction or magnets inside cylinders will become demagnetized. (Consult SMC regarding the availability of a magnetic field resistant auto switch.)

❸Do not use in an environment where the auto switch will be continually exposed to water.

Although switches except D-A3□/A44□/G39□/K39□ satisfy the IEC standard IP67 structure (JIS C 0920: anti-immersion structure), do not use switches in applications where continually exposed to water splash or spray. Poor insulation or swelling of the potting resin inside switches may cause malfunction.

❹Do not use in an environment with oil or chemicals.

Consult SMC if auto switches will be used in an environment with coolant, cleaning solvent, various oils or chemicals. If auto switches are used under these conditions for even a short time, they may be adversely affected by improper insulation, malfunction due to swelling of the potting resin, or hardening of the lead wires.

❺Do not use in an environment with temperature cycles.

Consult SMC if switches are used where there are temperature cycles other than normal temperature changes, as they may be adversely affected.

❻Do not use in an environment where there is excessive impact shock.

<Reed switch>
When excessive impact (300m/s^2 or more) is applied to a reed switch during operation, the contact point will malfunction and generate or cut off a signal momentarily (1ms or less). Consult SMC regarding the need to use a solid state switch depending upon the environment.

❼Do not use in an area where surges are generated.

<Solid state switch>
When there are units (solenoid lifter, high frequency induction furnace, motor, etc.) which generate a large amount of surge in the area around cylinders with solid state auto switches, this may deteriorate or damage to the switch. Avoid sources of surge generation and disorganized lines.

❽Avoid accumulation of iron powder or close contact with magnetic substances.

When a large amount of ferrous powder such as machining chips or spatter is accumulated, or a magnetic substance is brought into close proximity with an auto switch cylinder, it may cause the auto switch to malfunction due to a loss of the magnetic force inside the cylinder.

Maintenance

⚠Warning

❶Perform the following maintenance periodically in order to prevent possible danger due to unexpected auto switch malfunction.

1) Secure and tighten switch mounting screws.
   If screws become loose or the mounting, position is dislocated, retighten them after readjusting the mounting position.
2) Confirm that there is no damage to lead wires.
   To prevent faulty insulation, replace switches or repair lead wires, etc., if damage is discovered.
3) Confirm the lighting of the green light on the 2 color indicator switch.
   Confirm that the green LED is on when stopped at the established position. If the red LED is on, the mounting position is not appropriate. Readjust the mounting position until the green LED lights up.

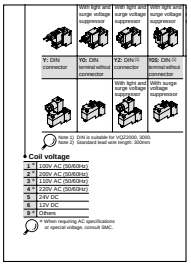
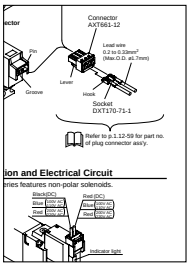
Other

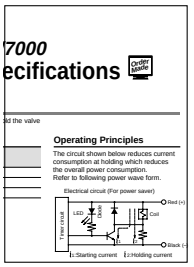
⚠Warning

❶Consult SMC concerning water resistance, elasticity of lead wires, and usage at welding sites, etc.

How to Utilize Icons (Marks)

Each heading is shown with marks in order to make it easier to see.

Mark	Meaning	Indication example
	**Precautions to be read before handling.**	
	**Reference pages**	

Mark	Meaning	Indication example
	**Introducing "Made to Order Specifications"**	

International Unit Systems (SI Units)

This catalog is written with SI units.
Refer to the tables below for specifications and calculations.

Major SI Units

No	Description	Symbol	Conventional unit→SI unit	SI unit→Conventional unit
1	Pressure	MPa	1kgf/cm^2 ≅ 0.098MPa	1MPa ≅ 10.2kgf/cm^2
2	Force/Load	N	1kgf ≅ 9.8N	1N ≅ 0.102kgf
3	Moment of force	Nm	1kgfm ≅ 9.8Nm	1Nm ≅ 0.102kgfm
4	Vacuum pressure	–kPa	–1mmHg ≅ –0.133kPa	–1kPa ≅ –7.5mmHg
5	Moment of inertia	kgm^2	1kgfcmS^2 ≅ 0.098kgm^2	1kgm^2 ≅ 10.2kgfcmS^2
6	Kinetic energy	J	1kgfcm ≅ 0.098J	1J ≅ 10.2kgfcm

①Pressure MPa→kgf/cm^2 (1MPa ≅ 10.2kg/cm^2)

MPa	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.01	0.011	0.012	0.013	0.014	0.015	0.016	0.017	0.018	0.019
kgf/cm^2	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19
MPa	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.2
kgf/cm^2	0.2	0.31	0.41	0.51	0.61	0.71	0.82	0.92	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
MPa	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.5
kgf/cm^2	3.1	4.1	5.1	6.1	7.1	8.2	9.2	10.2	11.2	12.2	13.3	14.3	15.3	16.3	17.3	18.4	19.4	20.4	25.5
MPa	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.9	10	20	30	40	50
kgf/cm^2	30.6	35.7	40.8	45.9	51.0	56.1	61.2	66.3	71.4	76.5	81.6	86.7	91.8	101.0	102	204	306	408	510

②Force/Load N→kgf (1N ≅ 0.102kgf)

N	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
kgf	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19
N	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
kgf	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
N	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	250
kgf	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	25
N	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	2000	3000	4000	5000
kgf	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	200	300	400	500

Pneumatics Symbols

DIN ISO1219-1, 03/96. Graphic symbols for pneumatic equipment.

Circuit symbols are used through this catalogue and on the labels of most SMC Pneumatic products.

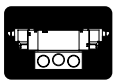
There are several symbol systems and conventions in use around the world, most officially recognised by standards bodies. Commonly used is ISO1219-1.

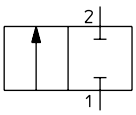
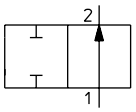
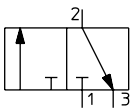
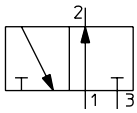
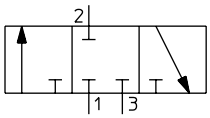
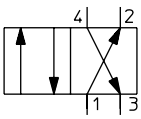
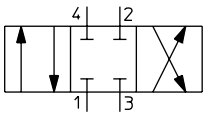
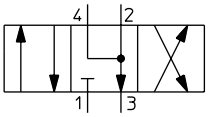
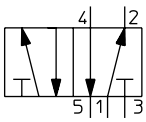
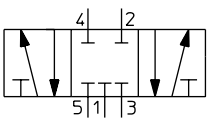
The symbols found in this catalogue generally conform to the Japanese Industrial Standard (JIS) in many cases, there is no difference between JIS and ISO circuit symbols.

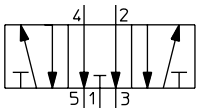
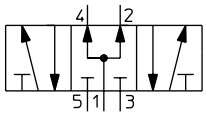
The situation also occurs when SMC develop new product systems for which an ISO or JIS symbol does not exit. Examples include the MGZ high power cylinder or the AV series air operated soft start / release valve. In this situation either a composite symbol showing a representative circuit is used, or the nearest standard symbol is modified by SMC.

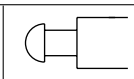
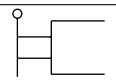
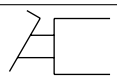
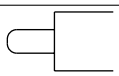
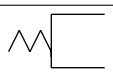
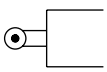
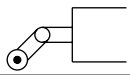
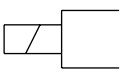
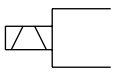
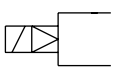
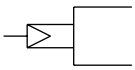
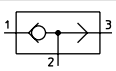
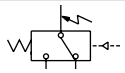
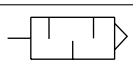
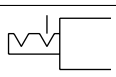
For assistance a table below shows both ISO symbols, which may differ from JIS symbols in this catalogue, and common ISO/JIS/SMC Symbols.

Volume 1



Symbol	Description
	Directional control valve 2/2-way valve, closed normal position
	Directional control valve 2/2-way valve, open normal position
	Directional control valve 3/2-way valve, closed normal position
	Directional control valve 3/2-way valve, open normal position
	Directional control valve 3/3-way valve, closed neutral position
	Directional control valve 4/2-way valve
	Directional control valve 4/2-way valve, closed neutral position
	Directional control valve 4/2-way valve, exhaust neutral position
	Directional control valve 5/2-way valve
	Directional control valve 5/3-way valve, closed neutral position

Symbol	Description
	Directional control valve 5/3-way valve, exhaust neutral position
	Directional control valve 5/3-way valve, open neutral position

		Manual Control General	Manual Control Button
		Manual Control Lever	Manual Control Pedal
		Mechanical Control Plunger	Mechanical Control Spring
		Mechanical Control Roller	Mechanical Control Roller with idle return
		Solenoid with one effective winding	Solenoid with two windings acting in opposition
		Combined Control by solenoid and pilot valve	Pressure Control
		Shuttle valve	Pneumatic-Electric-Relay
		Pneumatic indicator	Silencer
		Pressure Control Valve Air operated	Mechanical Component Detent

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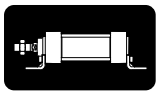
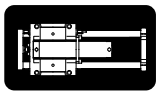
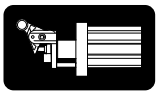
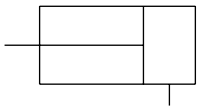
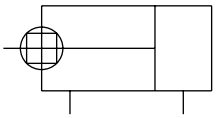
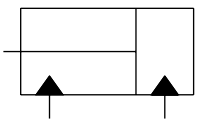
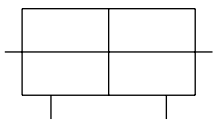
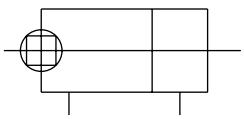
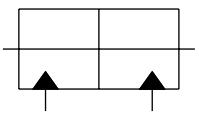
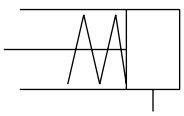
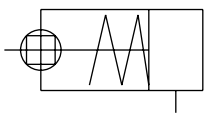
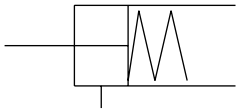
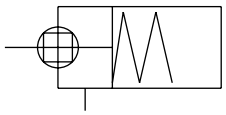
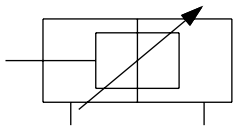
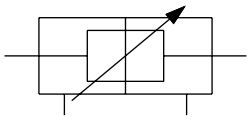
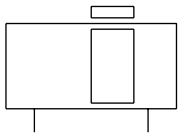
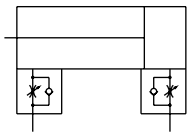
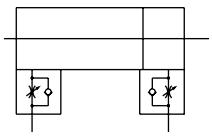
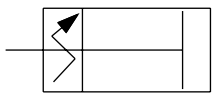
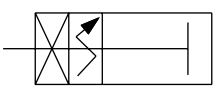
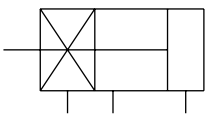




Symbol	Description
	Single-acting cylinder, single piston rod, return stroke by external force
	Double-acting cylinder, single piston rod
	Double-acting cylinder, non-rotating single piston rod
	Double-acting cylinder, rear boss mount, single piston rod
	Double-acting air-hydro cylinder, single piston rod
	Double-acting cylinder with double piston rod
	Double-acting cylinder with double non rotating piston rod
	Double-acting air-hydro cylinder with double piston rod
	Single-acting cylinder, single piston rod, return stroke by spring
	Single-acting cylinder, non rotating single piston rod, return stroke by spring

Symbol	Description
	Single-acting cylinder, single piston rod, stroke by spring, return stroke by air pressure
	Single-acting cylinder, non rotating single piston rod, stroke by spring, return stroke by air pressure
	Double-acting cylinder with cushioning adjustable at both ends, single piston rod
	Double-acting cylinder with cushioning adjustable at both ends, double piston rod
	Magnetically coupled rodless cylinder
	Double-acting cylinder, single piston rod, with built in speed controller
	Double-acting cylinder, double piston rod, with built in speed controller
	Stroke reading cylinder, single piston rod
	Stroke reading cylinder with brake, single piston rod
	Double-acting cylinder with lock, single piston rod

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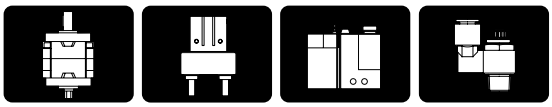
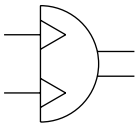
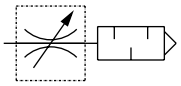
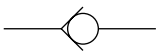
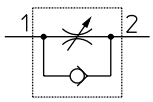
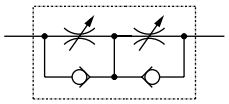
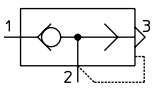
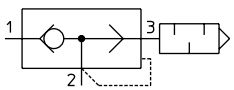
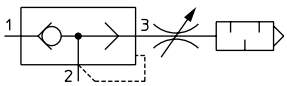
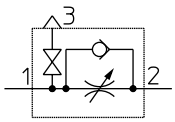
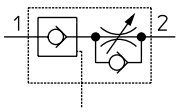
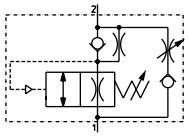
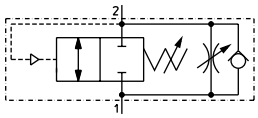
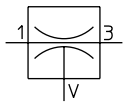
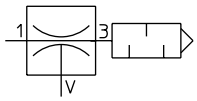
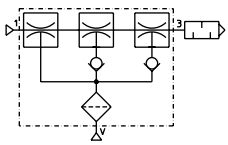
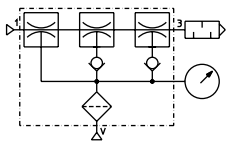
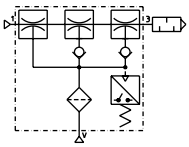
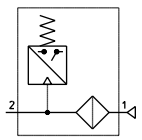
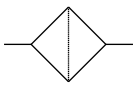
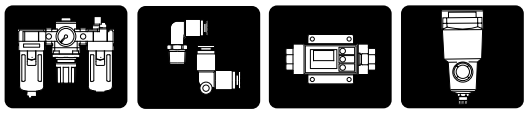


Symbol	Description
	Semi-rotary actuator, double acting
	Flow control valve. Throttle valve, adjustable, with silencer
	Non-return valve, without spring
	One way flow control valve, adjustable
	Non-return valve, dual speed controller with one-touch fittings
	Quick exhaust valve
	Quick exhaust valve with silencer
	Quick exhaust valve with speed exhaust controller and silencer
	Speed controller with residual pressure release valve
	Speed controller with pilot check valve

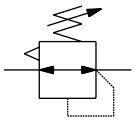
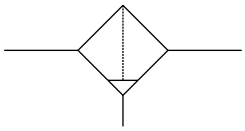
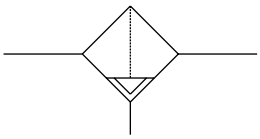
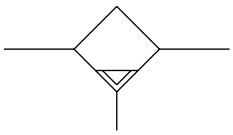
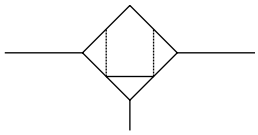
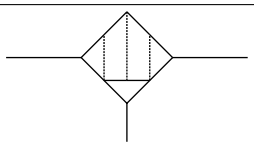
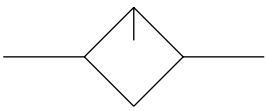
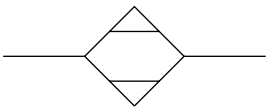
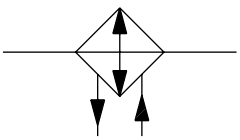
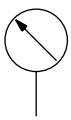
Symbol	Description
	Safety speed control valve. Meter-out control style: A control valve with cylinder speed control function, fixed throttle, rapid air supply function
	Safety speed control valve. Meter-in control style: A control valve with cylinder speed function and rapid air supply function
	Vacuum ejector
	Vacuum ejector, with built-in silencer
	Multistage vacuum ejector, with filter and built-in silencer
	Multistage vacuum ejector, with filter, built-in silencer and vacuum pressure gauge
	Multistage vacuum ejector, with filter, built-in silencer and vacuum pressure switch
	Vacuum pressure switch unit
	Energy Transmission Filter

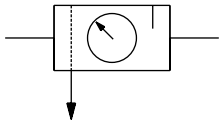
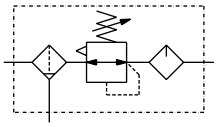
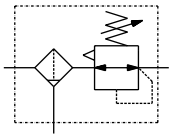
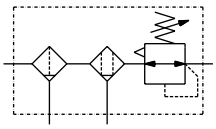
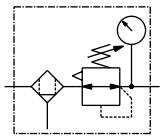
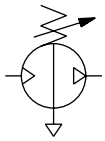
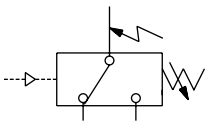
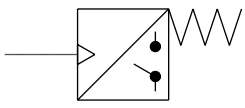
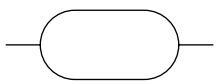
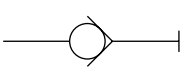
Pneumatics Symbols

DIN ISO1219-1, 03/96. Graphic symbols for pneumatic equipment.



Volume 4

Symbol	Description
	Pressure control valve, relieving pressure regulator, adjustable
	Filter with water trap
	Filter with water trap, automatic
	Water trap with automatic drain
	Mist separator
	Micro mist separator
	Lubricator
	Dryer
	Cooler
	Pneumatic pressure gauge

Symbol	Description
	Air preparator, Service unit (simplified graph)
	Air combination, Air filter, regulator and Lubricator
	Air combination, Air filter and regulator
	Air combination, Air filter, mist separator and regulator
	Air combination, Mist separator, regulator and pressure gauge
	Pneumatic booster regulator, handle operated
	Adjustable pressure switch
	Non adjustable pressure switch
	Pneumatic capacitor
	Non-return valve, without spring

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