



ISO/VDMA Cylinder Series C95




ø32, ø40, ø50, ø63, ø80, ø100

Conforming to ISO 6431/CETOP RP43P/VDMA 24562



CJ1
CJP
CJ2
CM2
CG1
MB
MB1
CA2
CS1
C76
C85
C95
CP95
NCM
NCA
D-
-X
20-
Data

Series Variations

Series	Action	Type		Basic	Standard variations		Option Heat resistant	Bore (mm)	Page
					Built-in magnet	Stainless steel rod			
Standard <i>Series C95</i> 	Double acting	Single rod	Non-lube	●	●	●	32, 40 50, 63 80, 100	6-12-2	
		Double rod	Non-lube	●	●	●			
Non-rotating Rod <i>Series C95K</i> 	Double acting	Single rod	Non-lube	●	●	(Standard)	32, 40 50, 63 80, 100	6-12-12	
		Double rod	Non-lube	●	●	(Standard)			
With Lock <i>Series C95N</i> 	Double acting	Single rod	Non-lube	●	●		32, 40 50, 63 80, 100	6-12-19	

ISO/VDMA Cylinder: Standard Type Double Acting, Single/Double Rod Series C95

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Without auto switch

C95S B 32 100 W

With auto switch

C95SD B 32 100 W A53 S

Built-in magnet

Mounting style

Mounting style	Description
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

Bore size	Description
32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Stroke (mm)

Refer to "Standard Stroke" on page 6-12-4.

Auto switch

Auto switch	Description
Nil	Without auto switch

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

Number of auto switches

Number of auto switches	Description
Nil	2 pcs.
S	1 pc.
3	3 pcs.
n	"n" pcs.

Rod

Rod	Description
Nil	Single rod
W	Double rod

Applicable Auto Switch/Tie-rod Mounting

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)			Applicable load						
					DC	AC	Tie-rod mounting	Band mounting	0.5 (Nil)	3 (L)	5 (Z)							
Feed switch	—	Grommet	Yes	3-wire (Equiv. to NPN)	—	5 V	—	A56	—	●	●	—	IC	—				
				2-wire	24 V	12 V	—	—	A53	—	●	●	●	—	—			
						5 V, 12 V	100 V, 200 V	A54	—	●	●	●	—	—				
						12 V	200 V or less	A67	—	●	●	—	IC	—				
				Diagnostic indication (2-color)	Grommet	No	2-wire	24 V	—	—	A64	—	●	●	—	—	—	
	—	—	A59W						—	●	●	—	—	—				
	—	Terminal conduit	Yes	No	3-wire	24 V	5 V	—	Z76	—	●	●	—	IC	—			
							12 V	AC 100	Z73	—	●	●	●	—	—			
							5 V, 12 V	100 V or less	Z80	—	●	●	—	IC	—			
							2-wire	24 V	12 V	—	A33	—	—	—	—	—	—	PLC
12 V									100 V, 200 V	A34	—	—	—	—	—	—	—	
DIN terminal	Terminal conduit	Yes	Yes	2-wire	24 V	12 V	100 V, 200 V	A44	—	—	—	—	—	—				
						12 V	100 V, 200 V	A44	—	—	—	—	—	—	—			
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	F59	—	●	●	○	IC	Relay, PLC				
				3-wire (PNP)				100 V, 200 V	F5P	—	●	●	○		—			
				2-wire	24 V	12 V	—	J51	—	●	●	○	—					
						12 V	—	J59	—	●	●	○	—					
				Diagnostic indication (2-color)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	F59W	—	●		●	○	IC	Relay, PLC
											3-wire (PNP)	100 V, 200 V	F5PW		—	●	●	
				Water resistant (2-color)	Grommet	Yes	2-wire	24 V	12 V	—	J59W	—	●		●	○	—	Relay, PLC
											12 V	—	F5BAL		—	—	●	
				Diagnostic output (2-color)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	F5NTL	—	—		●	○	IC	Relay, PLC
											4-wire (NPN)	100 V, 200 V	F59F		—	●	●	
				Strong magnetic field resistant (2 color)	Grommet	Yes	2-wire	24 V	—	—	P5DW	—	—		●	●	—	Relay, PLC
											—	—	—		—	—	—	
	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y59A	—	●	●	○	IC	Relay, PLC				
								2-wire	100 V, 200 V	Y59B	—	●	●		○	—		
	Diagnostic indication (2-color)	Grommet	Yes	3-wire (PNP)	24 V	5 V, 12 V	—	Y7P	—	●	●	○	IC	Relay, PLC				
								3-wire (NPN)	100 V, 200 V	Y7NW	—	●	●		○	—		
	Water resistant (2-color)	Grommet	Yes	3-wire (PNP)	24 V	5 V, 12 V	—	Y7PW	—	●	●	○	IC	Relay, PLC				
								2-wire	100 V, 200 V	Y7BW	—	●	●		○	—		
—	Terminal conduit	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y7BAL	—	—	●	○	—	Relay, PLC					
							2-wire	100 V, 200 V	—	—	—	—		—	—			
—	Terminal conduit	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	—	G39	—	—	—	IC	Relay, PLC					
							2-wire	100 V, 200 V	—	—	—	—		—	—			
—	Terminal conduit	Yes	2-wire	24 V	12 V	—	—	K39	—	—	—	—	Relay, PLC					
							12 V	100 V, 200 V	—	—	—	—		—	—			

* 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.

Refer to page 6-16-1 for details of applicable auto switches in addition to those listed above.

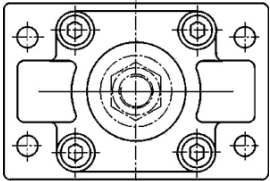
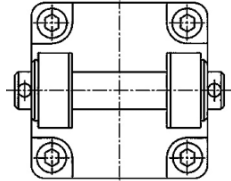
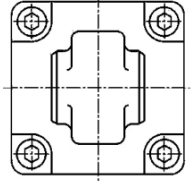
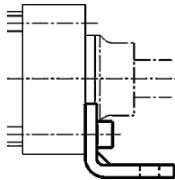
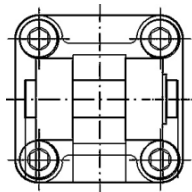
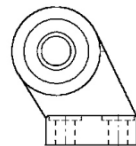
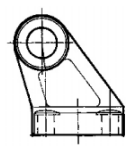
Auto Switch Mounting Bracket Part No.

Bore size (mm)	32	40	50	63	80	100
D-A3/A4/K3/G3	BMB2-032	BMB2-040	BMB1-050	BMB1-063	BMB1-080	BMB1-100
D-A5/A6/F5/J5	BT-03		BT-05		BT-06	
D-Z□/Y□	BMB4-032		BMB4-050		BMB4-063	
D-P5DWL	BMB3T-040		BMB3T-050		BMB3T-080	

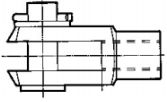
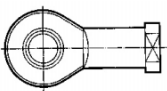
ISO/VDMA Cylinder: Standard Type Double Acting, Single/Double Rod Series C95

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	
		 <p>Supplied with 4 screws</p>	 <p>Supplied with bolt, safety device and 4 screws</p>	 <p>Supplied with 4 screws</p>
32	<u>Without lock</u>		<u>Plain</u>	
40	F5032	D5032	C5032	
50	F5040	D5040	C5040	
63	F5050	D5050	C5050	
80	F5063	D5063	C5063	
100	F5080	D5080	C5080	
	F5100	D5100	C5100	
			<u>With ball joint</u>	
			CR5032	
			CR5040	
			CR5050	
			CR6063	
			CR5080	
			CR5100	
	See page 6-12-8 and 24 for dimensions.	See pages 6-12-8, 9 and 24 for dimensions	See pages 6-12-8, 9 and 24 for dimensions. <small>Note) See page 6-12-9 for male head side clevis with swivel CR50.</small>	
Bore size (mm)	L Foot	DS Female head side clevis (for ES accessory)	ES Angled head side clevis with ball joint	E Angled head side clevis
	 <p>Supplied with two pieces Supplied with 4 screws</p>			
32	L5032	DS5032	ES5032	E5032
40	L5040	DS5040	ES5040	E5040
50	L5050	DS5050	ES5050	E5050
63	L5063	DS5063	ES5063	E5063
80	L5080	DS5080	ES5080	E5080
100	L5100	DS5100	ES5100	E5100
	See page 6-12-8 and 24 for dimensions.	See page 6-12-10 for dimensions.	See page 6-12-10 for dimensions.	See page 6-12-9 for dimensions.

Mounting Accessory, Rod

Bore size (mm)	GKM Rod clevis ISO 8140	KJ Piston rod ball joint ISO 8139	JA Floating joint
		 <p>Supplied with bolts and safety devices</p>	
32	GKM10-20	KJ10D	JA30-10-125
40	GKM12-24	KJ12D	JA40-12-125
50	GKM16-32	KJ16D	JA50-16-150
63	GKM16-32	KJ16D	JA50-16-150
80	GKM20-40	KJ20D	JAH50-20-150
100	GKM20-40	KJ20D	JAH50-20-150
	See page 6-12-11 for dimensions.	See page 6-12-11 for dimensions.	See page 6-12-11 for dimensions.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

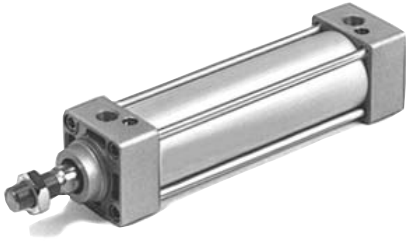
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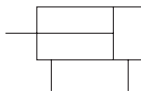
20-

Data

Series C95



JIS Symbol
Double acting



Minimum Stroke for Auto Switch Mounting

Refer to page 6-12-16 for "Minimum Stroke for Auto Switch Mounting".



Made to Order Specifications (For details, refer to page 6-17-19.)

Symbol	Specifications
-XB6	Heat resistant cylinder (150°C)
-XB13	Low speed cylinder (5 to 50 mm/s)
-XC4	With heavy duty scraper
-XC6	Piston rod and rod end nut made of stainless steel
-XC18	NPT finish piping
-XC22	Fluoro rubber seals
-XC35	With coil scraper

Specifications

Bore size (mm)	32	40	50	63	80	100
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 1000 mm/s					
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 1/8	G 1/4	G 1/4	G 3/8	G 3/8	G 1/2
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Center trunnion style					

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, 700, 800	1400
100	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600, 700, 800	1500

Intermediate strokes are available.

* Please consult with SMC for longer strokes.

Accessory

Mounting		Basic style	Foot style	Rod side flange style	Head side flange style	Single clevis style	Double clevis style	Center trunnion style
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
Option	Single clevis	●	●	●	●	●	●	●
	Double clevis (With pin)	●	●	●	●	●	●	●
	Rod boot	●	●	●	●	●	●	●

ISO/VDMA Cylinder: Standard Type Double Acting, Single/Double Rod Series C95

Theoretical Output



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 out put (N) = Pressure (MPa) x Piston area (mm²)

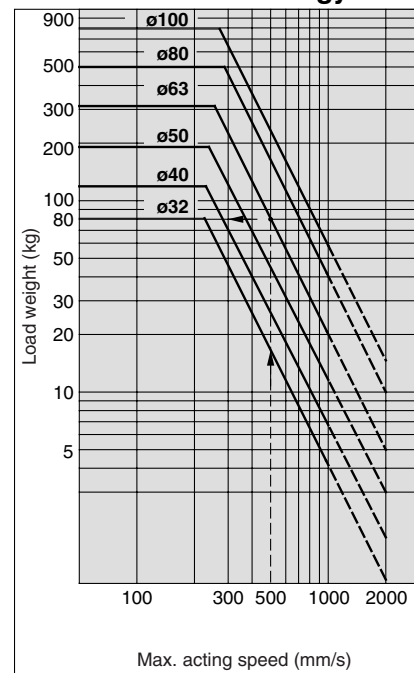
Weight/Aluminum Tube

Bore size (mm)		32	40	50	63	80	100
Basic weight	Basic style	0.56	0.84	1.39	1.91	3.22	4.24
	Foot style	0.16	0.20	0.38	0.46	0.89	1.09
	Flange style	0.20	0.23	0.47	0.58	1.30	1.81
	Single clevis style	0.16	0.23	0.37	0.60	1.07	1.73
	Double clevis style	0.20	0.32	0.45	0.71	1.28	2.11
	Trunnion style	0.71	1.10	1.73	2.48	4.25	5.95
Additional weight per each 50 mm of stroke	All mounting brackets	0.11	0.16	0.26	0.27	0.42	0.56
Accessory	Single rod clevis	0.07	0.11	0.22	0.22	0.40	0.40
	Double clevis (With pin)	0.09	0.15	0.34	0.34	0.69	0.69

Calculation: (Example) C95SD40-100

- Basic weight 0.84 (kg) (Basic, ø40) • Mounting 0.32 (kg) (Double clevis)
 - Additional weight ... 0.16 (kg/50 st)
 - Cylinder stroke 100 (st)
- 0.84 + 0.16 x 100 ÷ 50 + 0.32 = 1.48 kg

Allowable Kinetic Energy



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

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

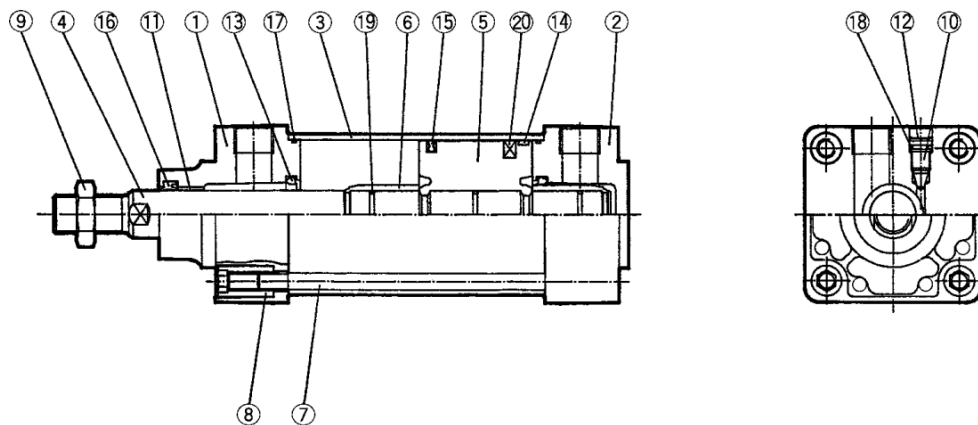
20-

Data

Series C95

Construction

[First angle projection]



Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum die-casted	
②	Head cover	Aluminum die-casted	
③	Cylinder tube	Aluminum alloy	
④	Piston rod	Carbon steel	
⑤	Piston	Aluminum alloy	
⑥	Cushion ring	Brass	
⑦	Tie-rod	Carbon steel	
⑧	Tie-rod nut	Steel	
⑨	Rod end nut	Steel	
⑩	Cushion valve	Steel wire	
⑪	Bushing	Lead-bronze casted	
⑫	Snap ring	Steel for spring	ø40 to ø100
⑬	Cushion seal	Urethan rubber	

No.	Description	Material	Note
⑭	Wearing	Resin	
⑮	Piston seal	NBR	
⑯	Rod seal	NBR	
⑰	Cylinder tube gasket	NBR	
⑱	Cushion valve seal	NBR	
⑲	Piston gasket	NBR	
⑳	Magnet		

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
32	CS95-32	Kits include items ⑬ to ⑰.
40	CS95-40	
50	CS95-50	
63	CS95-63	
80	CS95-80	
100	CS95-100	

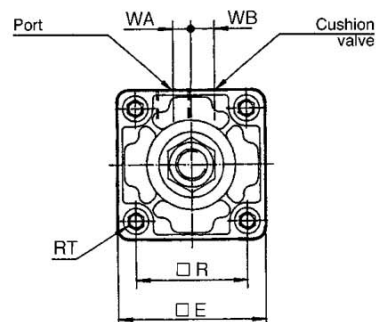
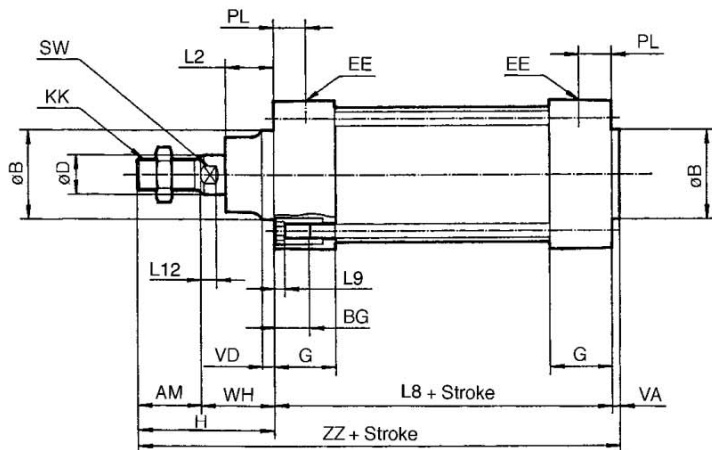
* Seal kits consist of items ⑬ to ⑰ contained in one kit, and can be ordered using the order number for each respective tube bore size.

ISO/VDMA Cylinder: Standard Type Double Acting, Single/Double Rod **Series C95**

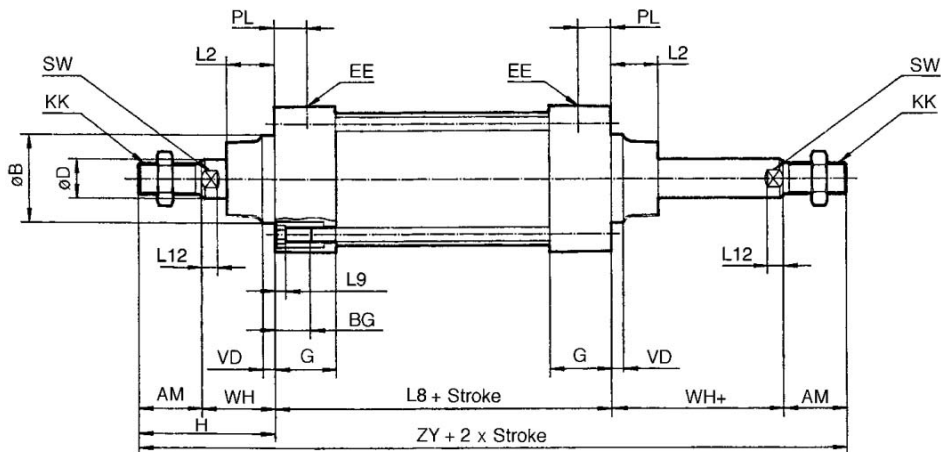
Dimensions: Without Mounting Bracket

[First angle projection]

C95SB -



C95SB - W



Bore size (mm)	AM	øB e11	øD	EE	PL	RT	L12	KK	SW	G	BG (MIN)	L8	VD	VA	WA	WB	WH	ZZ	ZY	□E	□R	L2	L9
32	22	30	12	G 1/8	13	M6 x 1	6	M10 x 1.25	10	27	16	94	4	4	4	6.5	26	146	190	46	32.5	15	4
40	24	35	16	G 1/4	14	M6 x 1	6.5	M12 x 1.25	13	27	16	105	4	4	4	9	30	163	213	52	38	17	4
50	32	40	20	G 1/4	15.5	M8 x 1.25	8	M16 x 1.5	16	31.5	16	106	6	4	5	10.5	37	179	244	65	46.5	24	5
63	32	45	20	G 3/8	16.5	M8 x 1.25	8	M16 x 1.5	16	31.5	16	121	6	4	9	12	37	194	259	75	56.5	24	5
80	40	45	25	G 3/8	19	M10 x 1.5	10	M20 x 1.5	21	38	16	128	8	4	11.5	14	46	218	300	95	72	30	5
100	40	55	30	G 1/2	19	M10 x 1.5	10	M20 x 1.5	21	38	16	138	8	4	17	15	51	233	320	114	89	32	5

CJ1

CJP

CJ2

CM2

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CS1

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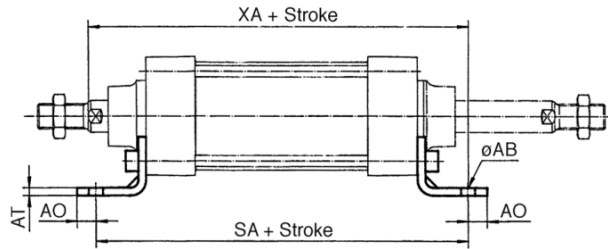
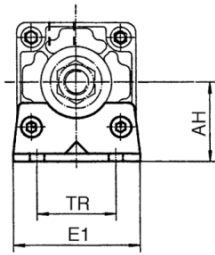
Data

Series C95

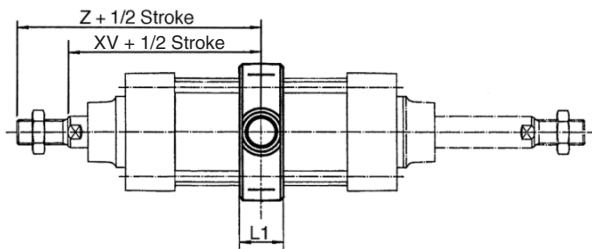
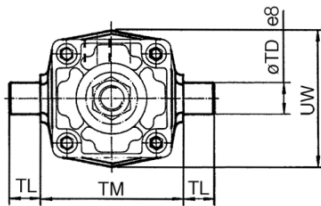
Dimensions: Cylinder Mounting Accessory

[First angle projection]

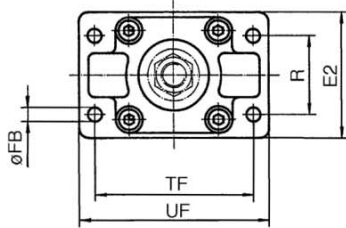
Foot style (L)



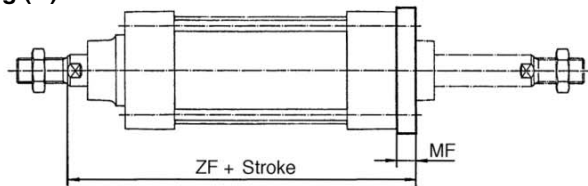
Center trunnion style (T)



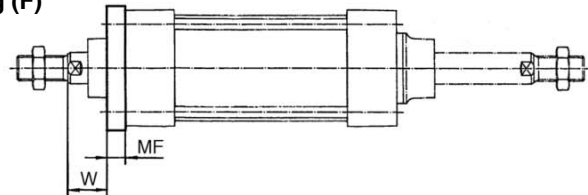
Flange style (F, G)



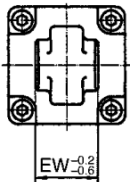
Head side mounting (G)



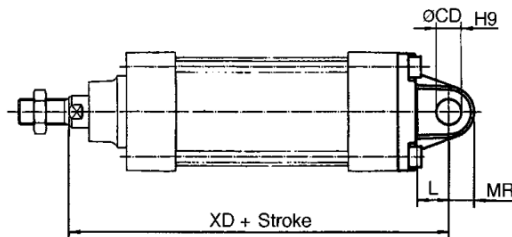
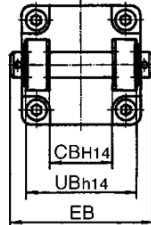
Rod side mounting (F)



Head side single clevis style (C)



Head side double clevis style (D)



Bore size (mm)	E1	R	W	MF	ZF	øFB	øCD _{H9}	EB	L	XD	UB _{h14}	CB _{H14}	EW _{-0.2/-0.6}	MR	TR	AO	AT	XA	SA	AH	øAB	L1	XV	Z	TL	øTD _{e8}	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	73	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	82.5	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	90	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	97.5	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	110	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	120	160	25	25	132	136	150	178	120

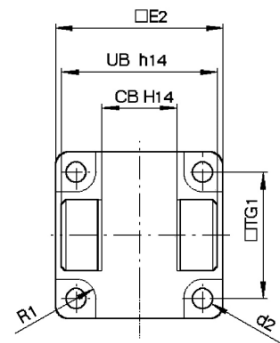
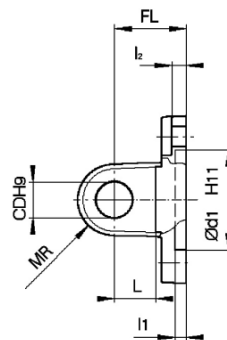
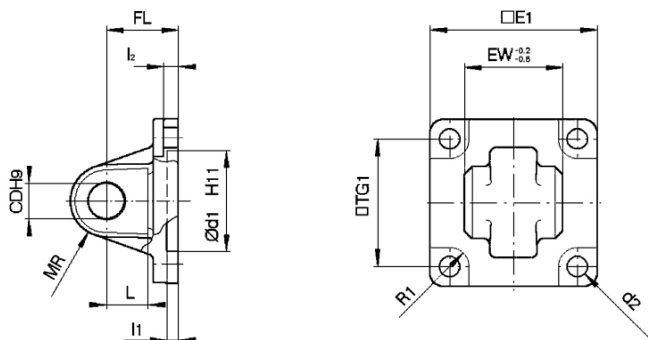
ISO/VDMA Cylinder: Standard Type Double Acting, Single/Double Rod **Series C95**

Dimensions: Cylinder Mounting Accessory C, D, E and CR

[First angle projection]

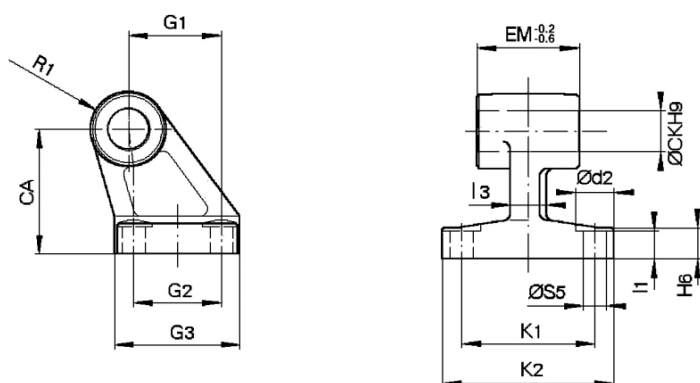
Mounting style (C)

Mounting style (D)



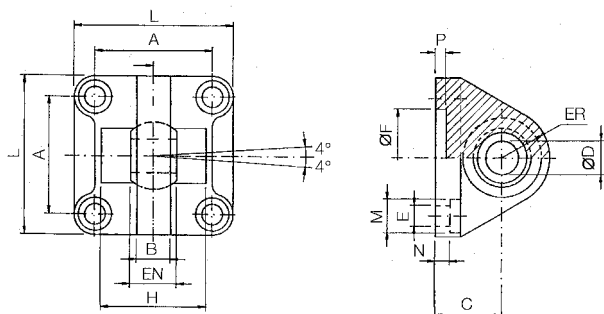
Bore size (mm)	□E1	EW	□TG1	FL	l ₁	L	l ₂	ød1	CD	MR	d2	R ₁	□E2	UB	CB
32	45	26	32.5	22	5	12	5.5	30	10	9.5	6.6	6.5	48	45	26
40	51	28	38	25	5	15	5.5	35	12	12	6.6	6.5	56	52	28
50	64	32	46.5	27	5	15	6.5	40	12	12	9	8.5	64	60	32
63	74	40	56.5	32	5	20	6.5	45	16	16	9	8.5	75	70	40
80	94	50	72	36	5	20	10	45	16	16	11	11	95	90	50
100	113	60	89	41	5	25	10	55	20	20	11	12	115	110	60

Mounting style (E)



Bore size (mm)	ød2	øCK	øS5	K ₁	K ₂	l ₃	G ₁	l ₁	G ₂	EM	G ₃	CA	H ₆	R ₁
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

Mounting style (CR): Head side clevis with ball joint



Bore size (mm)	A	B	C	D	EN	ER	F	E	L	M	N	P	H
	±0.2	max	±0.2	H7	-0.1	max	H11	H13		H13	±0.5		±0.5
32	32.5	10.5	22	10	14	15	30	6.6	45	10.5	5.5	5	—
40	38	12	25	12	16	18	35	6.6	55	11	5.5	5	—
50	46.5	15	27	16	21	20	40	9	65	15	6.5	5	51
63	56.5	15	32	16	21	23	45	9	75	15	6.5	5	—
80	72	18	36	20	25	27	45	11	95	18	10	5	—
100	89	18	41	20	25	30	55	11	115	18	10	5	—

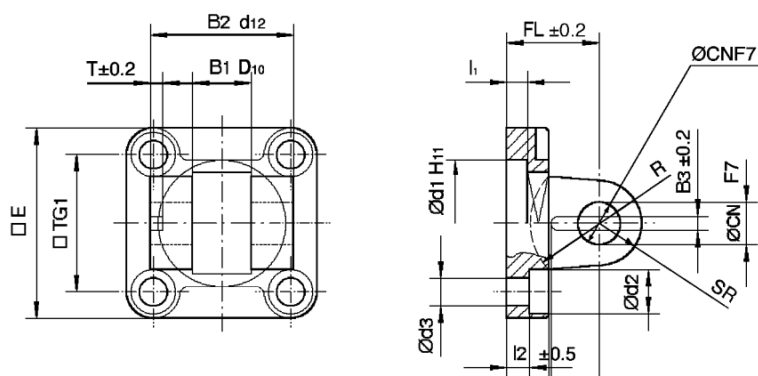
- CJ1
- CJP
- CJ2
- CM2
- CG1
- MB
- MB1
- CA2
- CS1
- C76
- C85
- C95**
- CP95
- NCM
- NCA
- D-
- X
- 20-
- Data

Series C95

Dimensions: Cylinder Mounting Accessory DS and ES

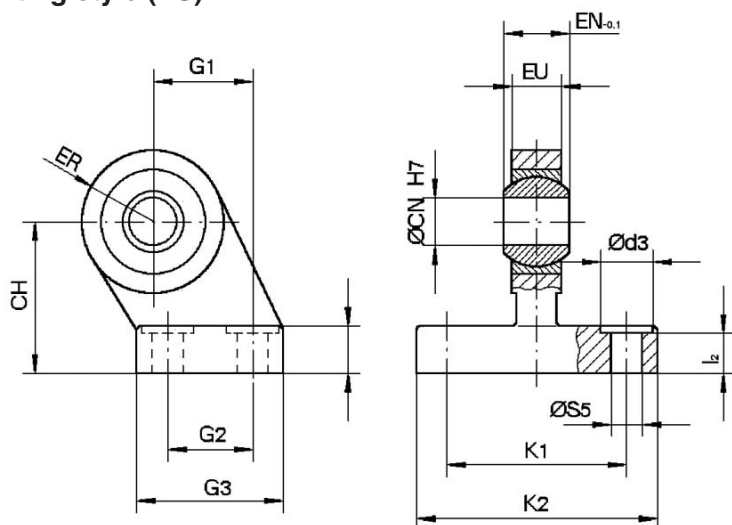
[First angle projection]

Mounting style (DS)



Bore size (mm)	□E	B ₁	B ₂	B ₃	□TG ₁	T	l ₁ (min)	l ₂	FL	H	ød ₁	ød ₂	ød ₃	CN	SR (max)	R
32	45	14	34	3.3	32.5	3	5	5.5	22	10	30	10.5	6.6	10	11	17
40	55	16	40	4.3	38	4	5	5.5	25	10	35	11	6.6	12	13	20
50	65	21	45	4.3	46.5	4	5	6.5	27	10	40	15	9	16	18	22
63	75	21	51	4.3	56.5	4	5	6.5	32	12	45	15	9	16	18	25
80	95	25	65	4.3	72	4	5	10	36	16	45	18	11	20	22	30
100	115	25	75	6.3	89	4	5	10	41	16	55	18	11	20	22	32

Mounting style (ES)



Bore size (mm)	ød ₃	øCN	øS ₅	K ₁	K ₂	l ₂	G ₁	G ₂	G ₃	EN	EU	CH	H ₆	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

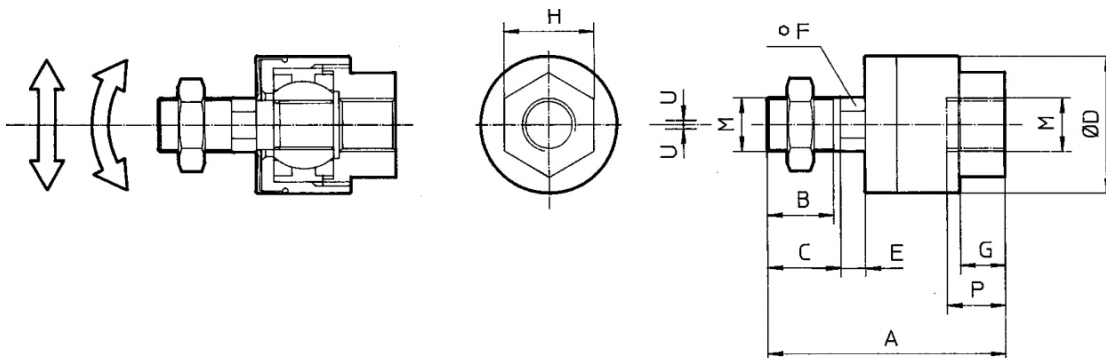
Dimensions: Piston Rod Mounting Accessory

[First angle projection]

Floating Joint JA

Steel

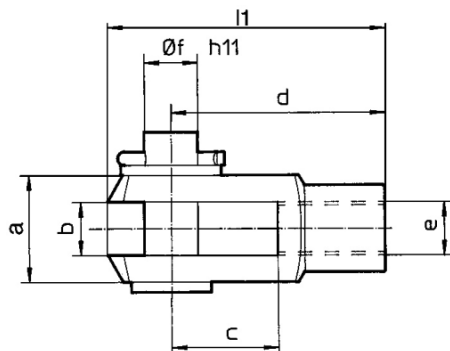
Bore size (mm)	M	Part no.	A	B	C	øD	E	F	G	H	P	U	Load (kN)	Weight (g)	Angle
32	M10 x 1.25	JA30-10-125	49.5	19.5	—	24	5	8	8	17	9	0.5	2.5	70	± 5°
40	M12 x 1.25	JA40-12-125	60	20	—	31	6	11	11	22	13	0.75	4.4	160	
50, 63	M16 x 1.5	JA50-16-150	71.5	22	—	41	7.5	14	13.5	27	15	1.0	11	300	
80, 100	M20 x 1.5	JAH50-20-150	101	28	31	59.5	11.5	24	16	32	18	2.0	18	1080	



Rod Clevis GKM (ISO 8140), Supplied with Bolt and Safety Device

Steel

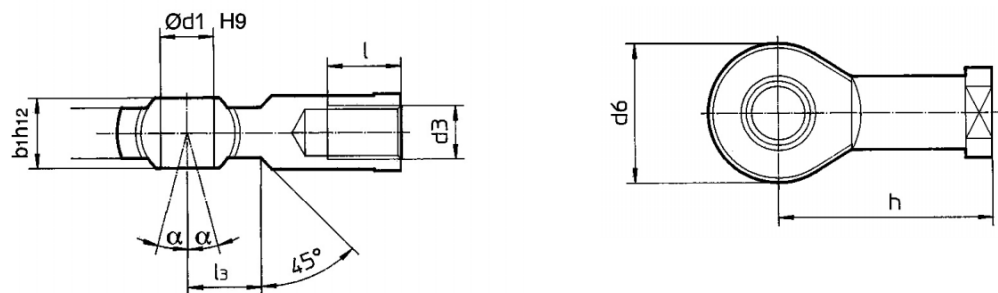
Bore size (mm)	e	Part no.	b	d	øf _{h11}	l ₁ max.	c min.	a min.
32	M10 x 1.25	GKM10-20	10 ^{+0.50 +0.15}	40	10	52	20	20
40	M12 x 1.25	GKM12-24	12 ^{+0.50 +0.15}	48	12	62	24	24
50, 63	M16 x 1.5	GKM16-32	16 ^{+0.50 +0.15}	64	16	83	32	32
80, 100	M20 x 1.5	GKM20-40	20 ^{+0.60 +0.15}	80	20	105	40	40



Piston Rod Ball Joint KJ (ISO 8139)

Steel

Bore size (mm)	d ₃	Part no.	ød _{1H9}	h	d ₆ max.	b _{1H12}	l min.	a	l ₃
32	M10 x 1.25	KJ10D	10	43	28	14	20	13°	14
40	M12 x 1.25	KJ12D	12	50	32	16	22	13°	16
50, 63	M16 x 1.5	KJ16D	16	64	42	21	28	15°	26
80, 100	M20 x 1.5	KJ20D	20	77	50	25	33	15°	26



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Made to Order Common Specifications: -XB6: Heat Resistant Cylinder (−10 to 150°C)

2 Heat Resistant Cylinder (−10 to 150°C)

Symbol

-XB6

Air cylinder which changed the seal material and grease, so that it could be used even at higher temperature up to 150 from −10°C.

Applicable Series

Series	Description	Model	Action	Note	Vol. no. (for std model)
CJP	Pin cylinder	CJP	Double acting, Single rod	Except clevis and trunnion style	6
CJ2	Air cylinder	CJ2	Double acting, Single rod	Except with air cushion	6
		CJ2W	Double acting, Double rod	Except with air cushion	
CM2	Air cylinder	CM2	Double acting, Single rod		6
		CM2W	Double acting, Double rod		
	Non-rotating rod type	CM2K	Double acting, Single rod		
		CM2KW	Double acting, Double rod		
	Direct mount type	CM2R	Double acting, Single rod		
	Non-rotating rod, Direct mount type	CM2RK	Double acting, Single rod		
Cylinder with end lock	CBM2	Double acting, Single rod			
CG1	Air cylinder	CG1	Double acting, Single rod	Except with rubber bumper	6
	Double rod type	CG1W	Double acting, Double rod	Except with rubber bumper	
	Direct mount type	CG1R	Double acting, Single rod	Except with rubber bumper	
MB	Air cylinder	MB	Double acting, Single rod	Except without air cushion	6
		MBW	Double acting, Double rod	Except without air cushion	
MB1	Air cylinder	MB1	Double acting, Single rod	Except without air cushion	6
		MB1W	Double acting, Double rod	Except without air cushion	
CA2	Air cylinder	CA2□N	Double acting, Single rod		6
		CA2W□N	Double acting, Double rod		
	Cylinder with end lock	CBA2	Double acting, Single rod		
CS1	Air cylinder	CS1□N	Double acting, Single rod	Applicable bore size (125 to 200mm)	6
		CS1W□N	Double acting, Double rod		
C76	Air cylinder	C76	Double acting, Single rod	Refer to page 6-10-46.	6
		C76W	Double acting, Double rod	Refer to page 6-10-46.	
C85	ISO cylinder	C85	Double acting, Single rod	Refer to page 6-11-47.	6
		C85W	Double acting, Double rod	Refer to page 6-11-47.	
C95	ISO cylinder	C95S	Double acting, Single rod		6
		C95S□□-□W	Double acting, Double rod		
CP95	ISO cylinder	CP95S	Double acting, Single rod		6
		C95S□□-□W	Double acting, Double rod		
CU	Free mount cylinder	CU	Double acting, Single rod		7
	Non-rotating rod type	CUK	Double acting, Single rod		
CQS	Compact cylinder	CQS	Double acting, Single rod	Except with rubber bumper	7
		CQSW	Double acting, Double rod	Except with rubber bumper	
CQ2	Compact cylinder	CQ2	Double acting, Single rod	Except with rubber bumper	7
		CQ2W	Double acting, Double rod	Except with rubber bumper	
	Axial piping type (Centralized piping type)	CQP2	Double acting, Single rod	Except with rubber bumper	
MK	Rotary clamp	MK	Double acting		10
MGP MGQ	Compact guide cylinder	MGPM	Double acting		8
		MGQ	Double acting		8
MGG MGC	Guide cylinder	MGG	Double acting	Except with shock absorber, with rubber cushion	8
		MGC	Compact type	Except with rubber bumper	8
CY1	Magnetically coupled rodless cylinder	CY1B	Basic type		8

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

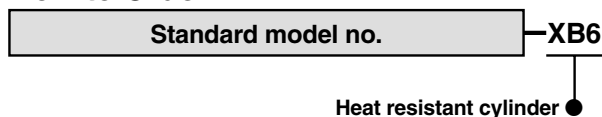
Data

Made to Order Common Specifications: -XB6: Heat Resistant Cylinder (-10 to 150°C)

2 Heat Resistant Cylinder (-10 to 150°C)

Symbol
-XB6

How to Order



Specifications

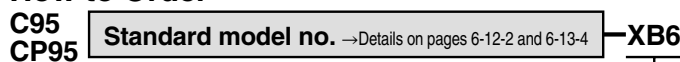
Ambient temperature range	-10 to 150°C (0 to 150°C for Series CS1)
Seals materials	Fluoro rubber
Grease	Heat resistant grease
Specifications other than above and external dimensions	Same as standard type

Warning Precautions

Be aware that smoking cigarettes, etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

- Note 1) Operate without lubrication from a pneumatic system lubricator.
 Note 2) Please contact SMC for details on the maintenance intervals for this cylinder, which differ from those of the standard cylinder.
 Note 3) In principle, it is impossible to make built-in magnet type and the one with auto switch. But, as for the one with auto switch, and the heat resistant cylinder with heat resistant auto switch, since it will be differed depending on the series, please contact SMC.
 Note 4) Piston speed is ranged from 50 to 500 mm/s. But, for MGQ□80, 100 and MGP□80, 100, it will be 50 to 400 mm/s. 50 to 200 mm/s for Series MK. Please contact SMC for operating speed of Series CY1B.
 Note 5) Please contact SMC for Series CQ2 and MGQ with rubber bumper.
 Note 6) As for the ambient temperature range of Series CY1B, since the magnetic holding force will be varied depending on the operating conditions, make sure that by referring to page 6-17-22.

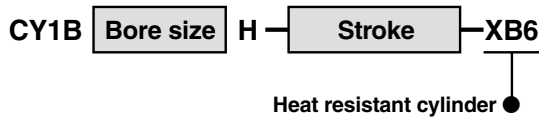
How to Order



Specifications

Applicable cylinder	Air cylinder/Standard
Series	C95/CP95
Action	Double acting/Single rod Double acting/Double rod
Bore size(mm)	32, 40, 50, 63, 80, 100
Mounting	Basic, Foot, Flange, Clevis, Trunnion
Ambient and fluid temperature	-10 to 150°C
Packing material	Fluorine rubber
Grease	Heat resistant grease

How to Order



Specifications

Applicable size	CY1B
Bore size (mm)	6 to 63
Ambient and fluid temperature	50 to 150°C*
Maximum operating pressure	0.5 MPa
Piston speed	50 to 400 mm/s*

* When using in less than 100°C range, since it could make a difference in the maintenance cycle, depending on the operating speed, use it at 200 mm/s or less.

Operating Pressure Limit for Intermediate Stop and Vertical Operation

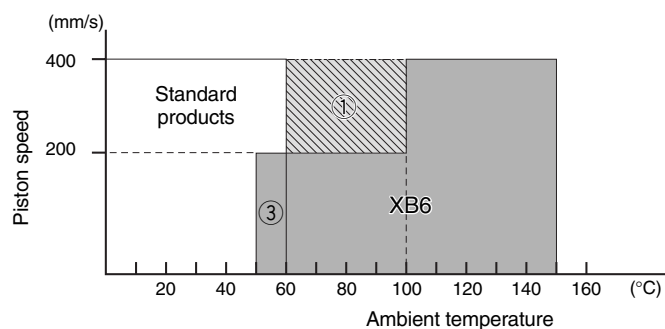
Maximum operating pressure at the intermediate stop	0.4 MPa*
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* Use caution that the magnet coupling will be removed, if it is used to stop in an intermediate stroke by an external stopper with the operating pressure over 0.4 MPa.

Magnetic Holding Force

Bore size (mm)	(N)								
	6	10	15	20	25	32	40	50	63
Holding force (at 150°C)	14.4	40.0	90.1	160	250	410	641	1000	1590
Holding force (at 100°C)	17.2	47.9	107	192	299	490	766	1190	1900

Temperature Range for Operating Cylinder and Piston Speed



- When using with the operating temperature from 60 up to 100°C, and the piston speed of more than 200 mm/s, please consult with SMC separately.
- When using with the operating temperature from 50 up to 100°C, and the piston speed of less than 200 mm/s, XB6 specifications can be used.
- As for XB6, regarding the temperature range (over 50 to 60°C) which overlaps the one of standard products, consider the tendency of operating temperature (upper, lower limits), then choose a model.

When using with the operating temperature fluctuated between 50°C or less and 100°C or more, the operating speed, etc. will be largely restricted by the durability. Prior to use, please contact SMC.

<Reference>

Maintenance cycle for XB6 could vary substantially, depending on the operating condition and the ambient temperature. Even if using in our recommended range, as a guide, conduct it in around 1/2 intervals, compared to the standard products.

Made to Order Common Specifications: -XC18: NPT Finish Piping Port

23 NPT Finish Piping Port

Symbol

-XC18

Air cylinder which piping port Rc threads were changed to NPT threads.

Applicable Series

Series	Description	Model	Action	Note	Vol. no. (for std model)	
CM2	Air cylinder	CM2	Double acting, Single rod		6	
			Single acting (Spring return/extend)			
	CM2W	Double acting, Double rod				
	Non-rotating rod type	CM2K	Double acting, Single rod			
			Single acting (Spring return/extend)			
CM2KW	Double acting, Double rod					
CG1	Air cylinder	CG1	Double acting		6	
			Single acting (Spring return/extend)			
MB	Air cylinder	MB	Double acting, Single rod		6	
			Double acting, Double rod			
	Non-rotating rod type	MBK	Double acting, Single rod			
	Low friction type	MB□Q	Double acting, Single rod			
MB1	Air cylinder	MB1	Double acting, Single rod		6	
			Double acting, Double rod			
	Non-rotating rod type	MB1K	Double acting, Single rod			
CS1	Air cylinder	CS1	Double acting, Single rod		6	
C95	ISO cylinder	C95S	Double acting, Single rod		6	
CU	Free mount cylinder	CU	Double acting, Single rod	Applicable to ø32 only	7	
				Single acting (Spring return/extend)		Applicable to ø32 only
	Non-rotating rod type	CUK	Double acting, Single rod	Applicable to ø32 only		
				Single acting (Spring return/extend)		Applicable to ø32 only
CQ2	Compact cylinder	CQ2	Double acting, Single rod	Applicable to ø32 to 100	7	
				Single acting (Spring return/extend)		Applicable to ø32 to 50
	Non-rotating rod type	CQ2W	Double acting, Double rod	Applicable to ø32 to 100		
				Double acting, Single rod		Applicable to ø32 to 63
	Large bore size	CQ2 (125, 140, 160)	Double acting, Single rod			
				Double acting, Double rod		
Long stroke	CQ2	Double acting, Single rod	Applicable to ø32 to 100			
RSQ	Stopper cylinder	RSQ	Double acting		10	
				Double acting with spring type		
				Single acting		
CL	Locked-up cylinder	CL1	Double acting, Single rod	Applicable to ø125 to 160	9	
CXW	Slide unit	CXWM	Slide bearing	Applicable to ø25, ø32	8	
		CXWL	Ball bushing bearing	Applicable to ø25, ø32		
MGQ	Compact guide cylinder	MGQ	Double acting		8	
MGG	Guide cylinder	MGG	Standard type		8	
MGC		MGC	Compact type		8	
CY1	Magnetic rodless cylinder	CY1B	Basic type		8	
		CY1S	Slide bearing			
MY1	Mechanically jointed rodless cylinder	MY1B	Double acting	Applicable to ø25 to 100	8	
		MY1M	Double acting	Applicable to ø25 to 63		
		MY1C	Double acting	Applicable to ø25 to 63		
		MY1H	Double acting	Applicable to ø25 to 40		
		MY1HT	Double acting	Applicable to ø50, ø63		
CE2	Stroke reading cylinder	CE2	Double acting, Single rod		10	

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

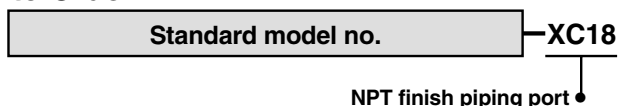
Data

Made to Order Common Specifications: -XC18: NPT Finish Piping Port

23 NPT Finish Piping Port

Symbol
-XC18

How to Order



Specifications: Same as standard type.

Dimensions (Connection port size) (Dimensions other than below are the same as standard type.)

Series CS1

Bore size (mm)	Port size
125	NPT 1/2
140	
160	
180	NPT 3/4
200	
250	NPT 1
300	

Series MB, Series MB1

Bore size (mm)	Port size
32	NPT 1/2
40, 50	NPT 3/4
63, 80	NPT 3/8
100	NPT 1/2

Series MGG

Bore size (mm)	Port size
20	NPT 1/8
25	
32	
40	
50	NPT 1/4
63	
80	NPT 3/8
100	NPT 1/2

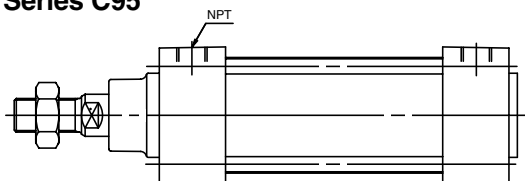
How to Order



Specifications

Applicable cylinder	Air cylinder/Standard
Series	C95
Action	Double acting/Single rod
Bore size(mm)	32, 40, 50, 63, 80, 100
Cushion	Air cushion
Auto switch	Available for mounting
Mounting	Basic, Foot, Flange, Clevis, Trunnion

Series C95



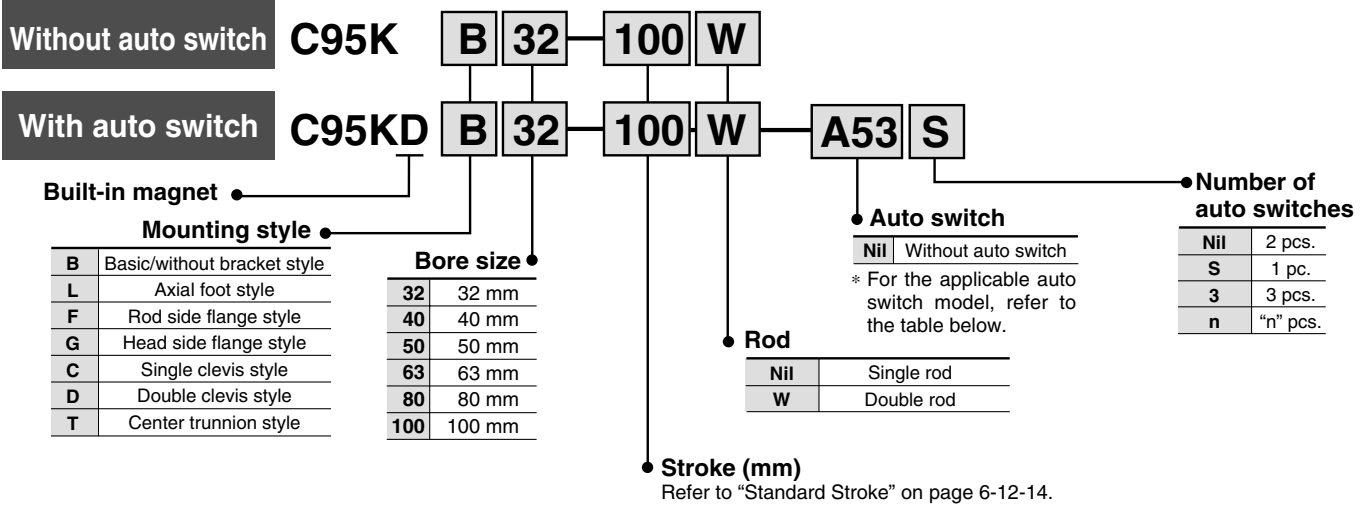
Bore size (mm)	Port size
32	NPT 1/8
40/50	NPT 1/4
63/80	NPT 3/8
100	NPT 1/2

ISO/VDMA Cylinder: Non-rotating Rod Type Double Acting, Single/Double Rod

Series C95K

ø32, ø40, ø50, ø63, ø80, ø100

How to Order



Applicable Auto Switch/Tie-rod Mounting

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage			Auto switch model		Lead wire length (m)			Applicable load					
					DC	AC	Tie-rod mounting	Band mounting	0.5 (Nil)	3 (L)	5 (Z)							
Reed switch	—	Grommet	Yes	3-wire (NPN)	—	5 V	—	A56	—	●	●	—	IC	—				
				2-wire	24 V	12 V	—	—	A53	—	●	●	●	—	—			
						5 V, 12 V	100 V, 200 V	A54	—	●	●	●	—	—				
						12 V	200 V or less	A67	—	●	●	—	IC	Relay, PLC				
				Diagnostic indication (2-color)	Grommet	No	—	—	—	A64	—	●	●	—	—	—		
	—	—	—				A59W	—	●	●	—	—						
	—	Terminal conduit DIN terminal	Yes	No	3-wire	24 V	5 V	—	—	Z76	—	●	●	—	IC	—		
							12 V	AC 100	Z73	—	●	●	●	—	—			
							5 V, 12 V	100 V or less	Z80	—	●	●	—	IC	Relay, PLC			
					2-wire	24 V	12 V	—	—	A33	—	—	—	—	—	—		
—							100 V, 200 V	A34	—	—	—	—	—	—	—			
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	F59	—	●	●	○	IC	Relay, PLC				
				3-wire (PNP)				F5P	—	●	●	○	—					
				2-wire	24 V	12 V	100 V, 200 V	J51	—	●	●	○	—					
						—	—	J59	—	●	●	○	—					
				Diagnostic indication (2-color)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	F59W	—	●		●	○	IC	Relay, PLC
							3-wire (PNP)				F5PW	—	●		●	○	—	
				Water resistant (2-color) With timer	Grommet	Yes	2-wire	24 V	12 V	—	J59W	—	●		●	○	—	Relay, PLC
							—				F5BAL	—	—		●	○	—	
				Diagnostic output (2-color) Strong magnetic field resistant (2 color)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	F5NTL	—	—		●	○	IC	Relay, PLC
							4-wire (NPN)				F59F	—	●		●	○	—	
	—	Terminal conduit	Yes	2-wire	24 V	—	—	P5DW	—	—	●	●	—	Relay, PLC				
				3-wire (NPN)				Y59A	—	●	●	○	IC					
	Diagnostic indication (2-color)	Terminal conduit	Yes	2-wire	24 V	—	—	Y59B	—	●	●	○	—	Relay, PLC				
				3-wire (PNP)				Y7P	—	●	●	○	—					
	Water resistant (2-color)	Terminal conduit	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y7NW	—	●	●	○	IC	Relay, PLC				
				3-wire (PNP)				Y7PW	—	●	●	○	—					
	—	Terminal conduit	Yes	2-wire	24 V	—	—	Y7BW	—	●	●	○	—	Relay, PLC				
				3-wire (NPN)				Y7BAL	—	—	●	○	—					
—	Terminal conduit	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	—	G39	—	—	—	IC	Relay, PLC					
			2-wire				—	K39	—	—	—	—						

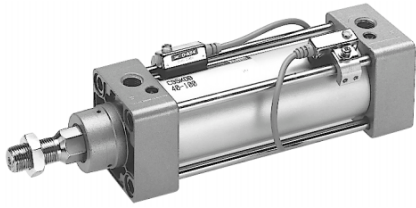
* Lead wire length symbols: 0.5 m Nil (Example) A53
 3 m L (Example) A53L
 5 m Z (Example) A53Z

○: Manufactured upon receipt of order.
 Refer to page 6-16-1 for details of applicable auto switches in addition to those listed above.

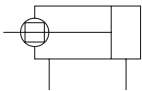
Auto Switch Mounting Bracket Part No.

Bore size (mm)	32	40	50	63	80	100
D-A3/A4/K3/G3	BMB2-032	BMB2-040	BMB1-050	BMB1-063	BMB1-080	BMB1-100
D-A5/A6/F5/J5	BT-03		BT-05		BT-06	
D-Z□/Y□	BMB4-032		BMB4-050		BMB4-063	
D-P5DWL	BMB3T-040		BMB3T-050		BMB3T-080	

ISO/VDMA Cylinder: Non-rotating Rod Type Double Acting, Single/Double Rod Series C95K



JIS Symbol
Double acting



Specifications

Bore size (mm)	32	40	50	63	80	100
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 1000 mm/s					
Allowable stroke tolerance	Up to 250: $^{+1.0}_0$, 251 to 1000: $^{+1.4}_0$, 1001 to 1500: $^{+1.8}_0$					
Cushion (Note)	Both ends (Air cushion)					
Thread tolerance	JIS Class 2					
Port size	G 1/8	G 1/4	G 1/4	G 3/8	G 3/8	G 1/2
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Center trunnion style					
Non-rotating accuracy	ø32, ø40	±0.5°				
	ø50, ø63	±0.5°				
	ø80, ø100	±0.3°				
Allowable rotating torque (N·m) max.	ø32	0.25	ø80		0.79	
	ø40	0.45	ø100		0.93	
	ø50, ø63	0.64	—		—	

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

Accessory

Mounting		Basic style	Foot style	Rod side frange style	Head side frange style	Single clevis style	Double clevis style	Center trunnion style
Standard	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	●	—
Option	Single rod clevis	●	●	●	●	●	●	●
	Double rod clevis (With pin)	●	●	●	●	●	●	●
	Rod boot	●	●	●	●	●	●	●

Weight/Aluminum Tube

Bore size (mm)		32	40	50	63	80	100
Basic weight	Basic style	0.56	0.84	1.39	1.91	3.22	4.24
	Axial foot style	0.16	0.20	0.38	0.46	0.89	1.09
	Flange style	0.20	0.23	0.47	0.58	1.30	1.81
	Single clevis style	0.16	0.23	0.37	0.60	1.07	1.73
	Double clevis style	0.20	0.32	0.45	0.71	1.28	2.11
	Center trunnion style	0.71	1.10	1.73	2.48	4.25	5.95
Additional weight per each 50 mm of stroke	All mounting brackets	0.11	0.16	0.26	0.27	0.42	0.56
Accessory	Single rod clevis	0.07	0.11	0.22	0.22	0.40	0.40
	Double clevis (With pin)	0.09	0.15	0.34	0.34	0.69	0.69

Calculation: (Example) C95KD40-100

- Basic weight 0.84 (kg) (Basic)
- Additional weight ... 0.16 (kg/50 st)
- Cylinder stroke 100 (st)
- Mounting 0.32 (kg) (Double clevis)

$$0.84 + 0.16 \times 100 \div 50 + 0.32 = 1.48 \text{ kg}$$

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C95K

Standard Stroke

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

Intermediate strokes are available.

Minimum Stroke for Auto Switch Mounting

Refer to page 6-12-16 on "Minimum Strokes for Auto Switch Mounting".

Theoretical Output

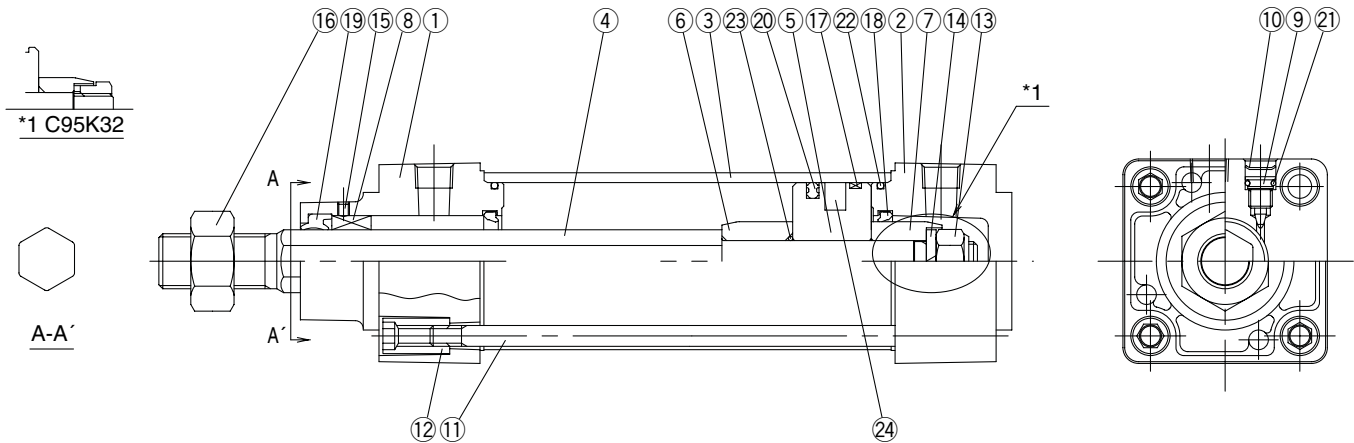
OUT side is identical to double acting single rod. Refer to table below for IN side.

Bore size (mm)	Piston area (mm ²)	Bore size (mm)	Piston area (mm ²)
32	675	63	2804
40	1082	80	4568
50	1651	100	7223

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

Construction

[First angle projection]



Component Parts

No.	Description	Material
①	Rod cover	Aluminum die-casted
②	Head cover	Aluminum die-casted
③	Cylinder tube	Aluminum alloy
④	Piston rod	Stainless steel
⑤	Piston	Aluminum alloy
⑥	Cushion ring A	Rolled steel
⑦	Cushion ring B	Rolled steel
⑧	Bushing	Oil impregnated sintered alloy
⑨	Cushion valve	Steel
⑩	Snap ring	Steel for spring
⑪	Tie-rod	Carbon Steel
⑫	Tie-rod nut	Steel
⑬	Piston nut	Steel

No.	Description	Material
⑭	Spring washer	Steel wire
⑮	Set screw	Chrome-molybdenum steel
⑯	Rod end nut	Steel
⑰	Wear ring	Resin
⑱	Cushion seal	Urethan rubber
⑲	Rod seal	NBR
⑳	Piston seal	NBR
㉑	Cushion valve seal	NBR
㉒	Cylinder tube gasket	NBR
㉓	Piston gasket	NBR
㉔	Magnet	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
32	CK95-32	Kits include items ⑰ to ㉓ and ㉔.
40	CK95-40	
50	CK95-50	
63	CK95-63	
80	CK95-80	
100	CK95-100	

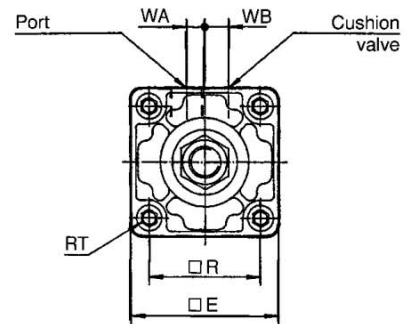
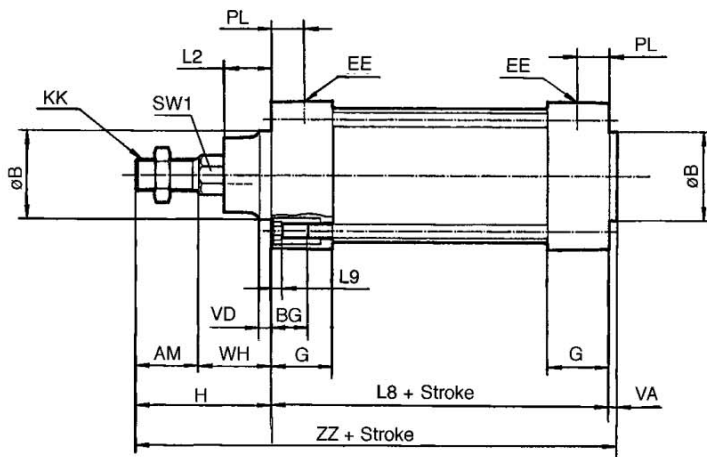
* Seal kits consist of items ⑰ to ㉓ and ㉔ contained in one kit, and can be ordered using the order number for each respective tube bore size.

ISO/VDMA Cylinder: Non-rotating Rod Type Double Acting, Single/Double Rod Series C95K

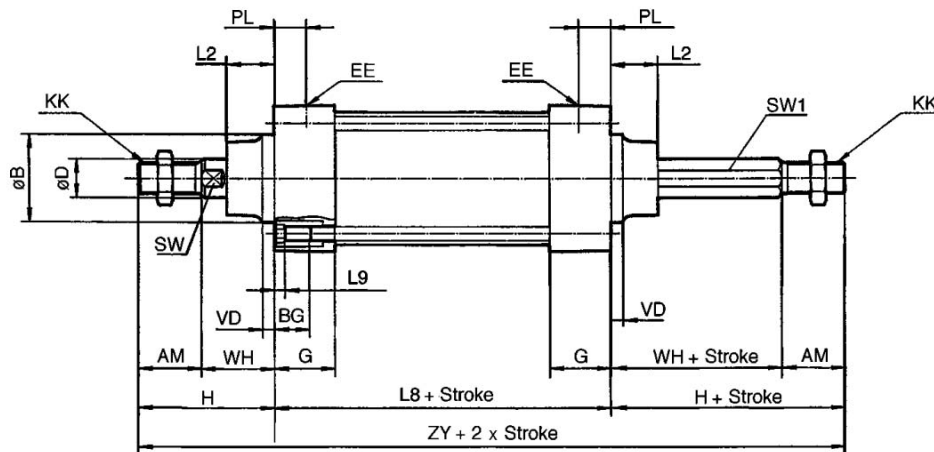
Dimensions: Without Mounting Bracket

[First angle projection]

C95KB Bore size - Stroke



C95KB Bore size - Stroke W



Bore size (mm)	AM	ϕB e11	ϕD	EE	PL	RT	KK	SW1	SW	G	BG	L8	VD	VA	WA	WB	WH	ZZ	ZY	$\square E$	$\square R$	L2	L9
32	22	30	12	G 1/8	13	M6 x 1.0	M10 x 1.25	12.2	10	27	16	94	4	4	4	6.5	26	146	190	46	32.5	15	4
40	24	35	16	G 1/4	14	M6 x 1.0	M12 x 1.25	14.2	13	27	16	105	4	4	4	9	30	163	213	52	38	17	4
50	32	40	20	G 1/4	15.5	M8 x 1.25	M16 x 1.5	19	16	31.5	16	106	6	4	5	10.5	37	179	244	65	46.5	24	5
63	32	45	20	G 3/8	16.5	M8 x 1.25	M16 x 1.5	19	16	31.5	16	121	6	4	9	12	37	194	259	75	56.5	24	5
80	40	45	25	G 3/8	19	M10 x 1.5	M20 x 1.5	23	21	38	16	128	8	4	11.5	14	46	218	300	95	72	30	5
100	40	55	30	G 1/2	19	M10 x 1.5	M20 x 1.5	27	21	38	16	138	8	4	17	15	51	233	320	114	89	32	5

* Refer to pages 6-12-8 to 6-12-11 for dimensions with mounting bracket and accessories.

- CJ1
- CJP
- CJ2
- CM2
- CG1
- MB
- MB1
- CA2
- CS1
- C76
- C85
- C95
- CP95
- NCM
- NCA
- D-
- X
- 20-
- Data



Series C95/C95K

Auto Switch Specifications



Applicable Auto Switch

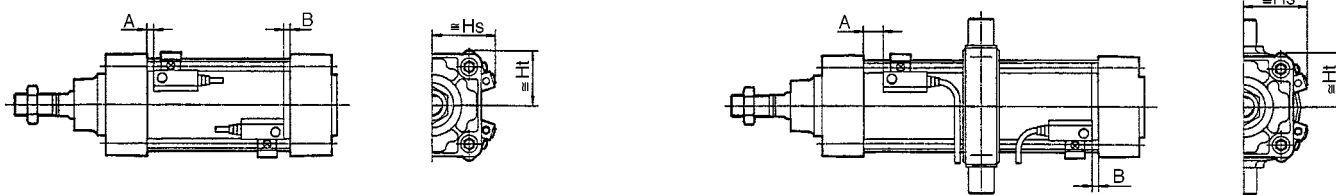
Type	Auto switch model	Electrical entry (Function)
Reed switch	D-A5□/A6□	Grommet
	D-A59W	Grommet (2-color indication)
	D-Z7□/Z80	Grommet
	D-A3□	Terminal conduit
	D-A44	DIN terminal
Solid state switch	D-F5□/J5□	Grommet
	D-F5□W/J59W	Grommet (2-color indication)
	D-F5BAL	Grommet (2-color indication, Water 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 Strokes for Auto Switch Mounting

Auto switch model	Number of auto switch mounted	Support bracket except center trunnion		Center trunnion					
		ø32 to ø63	ø80, ø100	ø32	ø40	ø50	ø63	ø80	ø100
A5□ A6□	1, 2	15	20	60	60	80	105	110	115
	n	15 + 55 (n - 2)/2 n = 2, 4, 6, 8...	20 + 55 (n - 2)/2 n = 2, 4, 6, 8...	60 + 55 (n - 4)/2 n = 4, 8, 12, 16...	60 + 55 (n - 4)/2 n = 4, 8, 12, 16...	80 + 55 (n - 4)/2 n = 4, 8, 12, 16...	105 + 55 (n - 4)/2 n = 4, 8, 12, 16...	110 + 55 (n - 4)/2 n = 4, 8, 12, 16...	115 + 55 (n - 4)/2 n = 4, 8, 12, 16...
A59W	2	15	20	60	70	85	110	115	120
	n	20 + 55 (n - 2)/2 n = 2, 4, 6, 8...	25 + 55 (n - 2)/2 n = 2, 4, 6, 8...	65 + 55 (n - 4)/2 n = 4, 8, 12, 16...	70 + 55 (n - 4)/2 n = 4, 8, 12, 16...	85 + 55 (n - 4)/2 n = 4, 8, 12, 16...	110 + 55 (n - 4)/2 n = 4, 8, 12, 16...	115 + 55 (n - 4)/2 n = 4, 8, 12, 16...	120 + 55 (n - 4)/2 n = 4, 8, 12, 16...
F5□(W)/J5□ J59W F5BAL/F59F	1	15	25	60	70	85	110	115	120
	n	15 + 55 (n - 2)/2 n = 2, 4, 6, 8...	25 + 55 (n - 2)/2 n = 2, 4, 6, 8...	90 + 55 (n - 4)/2 n = 4, 8, 12, 16...	95 + 55 (n - 4)/2 n = 4, 8, 12, 16...	95 + 55 (n - 4)/2 n = 4, 8, 12, 16...	110 + 55 (n - 4)/2 n = 4, 8, 12, 16...	115 + 55 (n - 4)/2 n = 4, 8, 12, 16...	120 + 55 (n - 4)/2 n = 4, 8, 12, 16...
F5NTL	1, 2	15	25	100	105	125	120	125	130
	n	15 + 55 (n - 2)/2 n = 2, 4, 6, 8...	25 + 55 (n - 2)/2 n = 2, 4, 6, 8...	100 + 55 (n - 4)/2 n = 4, 8, 12, 16...	105 + 55 (n - 4)/2 n = 4, 8, 12, 16...	105 + 55 (n - 4)/2 n = 4, 8, 12, 16...	120 + 55 (n - 4)/2 n = 4, 8, 12, 16...	125 + 55 (n - 4)/2 n = 4, 8, 12, 16...	130 + 55 (n - 4)/2 n = 4, 8, 12, 16...
A3□ K3□ G3□	1	10	10	60	65	65	75	80	85
	2 (Same side) 2 (Different sides)	100 35	100 35	90 60	95 65	95 65	100 75	105 80	110 85
A44	n (Same side)	100 + 100 (n - 2) n = 2, 4, 6, 8...	100 + 100 (n - 2) n = 2, 4, 6, 8...	90 + 100 (n - 2) n = 4, 8, 12, 16...	95 + 100 (n - 2) n = 4, 8, 12, 16...	95 + 100 (n - 2) n = 4, 8, 12, 16...	100 + 100 (n - 2) n = 4, 8, 12, 16...	105 + 100 (n - 2) n = 4, 8, 12, 16...	110 + 100 (n - 2) n = 4, 8, 12, 16...
	n (Different sides)	35 + 30 (n - 2) n = 2, 4, 6, 8...	35 + 30 (n - 2) n = 2, 4, 6, 8...	60 + 30 (n - 2) n = 4, 8, 12, 16...	65 + 30 (n - 2) n = 4, 8, 12, 16...	65 + 30 (n - 2) n = 4, 8, 12, 16...	75 + 30 (n - 2) n = 4, 8, 12, 16...	80 + 30 (n - 2) n = 4, 8, 12, 16...	85 + 30 (n - 2) n = 4, 8, 12, 16...
Z7□ Z80	1	10	10	70	75	75	80	80	85
	2 (Same side) 2 (Different sides)	55 35	55 35	70 70	75 75	75 75	80 80	80 80	85 85
Y59□ Y7P Y7□W Y69□	n (Same side)	55 + 50 (n - 2) n = 2, 4, 6, 8...	55 + 50 (n - 2) n = 2, 4, 6, 8...	70 + 50 (n - 2) n = 4, 8, 12, 16...	75 + 50 (n - 2) n = 4, 8, 12, 16...	75 + 50 (n - 2) n = 4, 8, 12, 16...	80 + 50 (n - 2) n = 4, 8, 12, 16...	80 + 50 (n - 2) n = 4, 8, 12, 16...	85 + 50 (n - 2) n = 4, 8, 12, 16...
	n (Different sides)	35 + 30 (n - 2) n = 2, 4, 6, 8...	35 + 30 (n - 2) n = 2, 4, 6, 8...	70 + 30 (n - 2) n = 4, 8, 12, 16...	75 + 30 (n - 2) n = 4, 8, 12, 16...	75 + 30 (n - 2) n = 4, 8, 12, 16...	80 + 30 (n - 2) n = 4, 8, 12, 16...	80 + 30 (n - 2) n = 4, 8, 12, 16...	85 + 30 (n - 2) n = 4, 8, 12, 16...
Y7PV Y7□WV	1, 2	15	15	80	85	90	90	95	100
	n	15 + 40 (n - 2)/2 n = 2, 4, 6, 8...	15 + 40 (n - 2)/2 n = 2, 4, 6, 8...	80 + 40 (n - 4)/2 n = 4, 8, 12, 16...	85 + 40 (n - 4)/2 n = 4, 8, 12, 16...	90 + 40 (n - 4)/2 n = 4, 8, 12, 16...	90 + 40 (n - 4)/2 n = 4, 8, 12, 16...	95 + 40 (n - 4)/2 n = 4, 8, 12, 16...	100 + 40 (n - 4)/2 n = 4, 8, 12, 16...
Y7BAL	1, 2	15	15	60	65	65	70	75	85
	n	10 + 30 (n - 2)/2 n = 2, 4, 6, 8...	10 + 30 (n - 2)/2 n = 2, 4, 6, 8...	60 + 30 (n - 4)/2 n = 4, 8, 12, 16...	65 + 30 (n - 4)/2 n = 4, 8, 12, 16...	65 + 30 (n - 4)/2 n = 4, 8, 12, 16...	70 + 30 (n - 4)/2 n = 4, 8, 12, 16...	75 + 30 (n - 4)/2 n = 4, 8, 12, 16...	85 + 30 (n - 4)/2 n = 4, 8, 12, 16...
P5DWL	1, 2	20	20	85	90	90	100	105	110
	n	20 + 45 (n - 2)/2 n = 2, 4, 6, 8...	20 + 45 (n - 2)/2 n = 2, 4, 6, 8...	85 + 45 (n - 4)/2 n = 4, 8, 12, 16...	90 + 45 (n - 4)/2 n = 4, 8, 12, 16...	90 + 45 (n - 4)/2 n = 4, 8, 12, 16...	100 + 45 (n - 4)/2 n = 4, 8, 12, 16...	105 + 45 (n - 4)/2 n = 4, 8, 12, 16...	110 + 45 (n - 4)/2 n = 4, 8, 12, 16...
P5DWL	1, 2	15	20	120	120	130	130	140	140
	n	15 + 65 (n - 2)/2 n = 2, 4, 6, 8...	20 + 65 (n - 2)/2 n = 2, 4, 6, 8...	120 + 65 (n - 4)/2 n = 4, 8, 12, 16...	120 + 65 (n - 4)/2 n = 4, 8, 12, 16...	130 + 65 (n - 4)/2 n = 4, 8, 12, 16...	130 + 65 (n - 4)/2 n = 4, 8, 12, 16...	140 + 65 (n - 4)/2 n = 4, 8, 12, 16...	140 + 65 (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-Y7□W(V) D-Y7P(V)		D-A3□, D-G39 D-A44, D-K39		D-P5DWL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
32	10.5	0	14.5	2	17	4.5	22	9.5	14	1.5	10.5	0	13.5	1
40	21.5	0	25.5	2	28	4.5	33	9.5	25	1.5	21.5	0	24.5	1
50	23	0	27	2.5	29.5	5	34.5	10	26.5	2	23	0	26	1.5
63	28	0	32	2.5	34.5	5	39.5	10	31.5	2	28	0	31	1.5
80	28	2.5	22	6.5	24.5	9	29.5	14	21.5	6	28	2.5	31	5.5
100	28	2.2	32	6.5	34.5	9	39.5	14	31.5	6	28	2.5	31	5.5

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 D-F59F		D-A3□, D-K39 D-G39		D-A44		D-Z7□, D-Z80 D-Y59□, Y7P D-Y7□W		D-Y69□, D-Y7PV D-Y7□WV		D-Y7BAL		D-P5DWL	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht
32	35	24.5	32.5	25	67	27.5	77	27.5	25.5	23	26.5	23	30	23	38	31
40	38.5	27.5	36.5	27.5	71.5	27.5	81.5	27.5	29.5	26	30	26	34	26	42	33
50	43.5	34.5	41	34	77	—	87	—	33.5	31	34.5	31	38	31	46.5	39
63	48.5	39.5	46	39	83.5	—	93.5	—	39	36	40	36	43	36	51.5	44
80	55	46.5	52.5	46.5	92.5	—	103	—	47.5	45	48.5	45	52	45	58	51.5
100	62	55	59.5	55	103	—	113.5	—	55.5	53.5	56.5	53.5	60	53.5	65.5	60.5

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted. For detailed specifications, refer to page 6-16-1.

Type	Model	Electrical entry (Fetching direction)	Features
Reed switch	D-A53/A56	Grommet (In-line)	—
Solid state switch	D-F59/F5P/J59	Grommet (In-line)	—
	D-F59W/F5PW/J59W		2-color indication type
	D-F5BAL		2-color indication type, Water resistant
	D-F5NTL		With timer
	D-G5NTL	Grommet (Perpendicular)	—
	D-Y69A/Y69B/Y7PV		2-color indication type
	D-Y7NWV/Y7PWV/Y7BWV		

* With pre-wire connector is available for solid state auto switches. For details, refer to page 6-16-60.

* Normally closed (NC = b contact), solid state switch (D-Y7G/Y7H type) are also available. For details, refer to page 6-16-39.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data



Series C95/C95K

Specific Product Precautions

Be sure to read before handling.

Adjustment

⚠ Warning

- Do not open the cushion valve above the stopper.**
Cushion valves are provided with a crimp ($\phi 32$) or a retaining ring ($\phi 40$ to $\phi 100$) 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.
- 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 assembly will be damaged.
- When replacing brackets, use the hexagon wrenches shown below.**

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

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

Operating Precautions

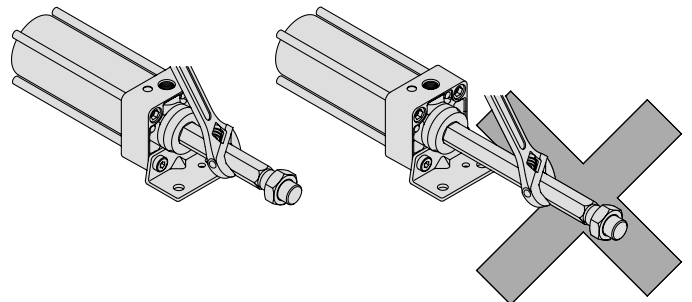
⚠ Caution

- 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

- Mounting of a workpiece 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 applied to the non-rotating guide.



ISO/VDMA Cylinder: With Lock Type Double Acting, Single Rod Series **C95N** ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Without auto switch

C95N **B** **32** **100** **D**

With auto switch

C95ND **B** **32** **100** **D** **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

Bore size

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

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.
n	"n" pcs.

Lock direction

D Both direction

Stroke (mm)

Refer to "Standard Stroke" on page 6-12-20.

Applicable Auto Switch/Tie-rod Mounting

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage			Auto switch model		Lead wire length (m)			Applicable load				
					DC	AC		Tie-rod mounting	Band mounting	0.5 (Nil)	3 (L)	5 (Z)					
Reed switch	—	Grommet	Yes	3-wire (Equiv. to NPN)	—	5 V	—	A56	—	●	●	—	IC	—			
				2-wire	24 V	12 V	—	A53	—	●	●	●	—	—	Relay, PLC		
						5 V, 12 V	100 V, 200 V	A54	—	●	●	●	—				
						12 V	200 V or less	A67	—	●	●	—	—				
				Diagnostic indication (2-color)	Grommet	No	3-wire	—	5 V	—	Z76	—	●	●	—	IC	—
	12 V	AC 100	Z73								—	●	●	●	—	—	
	—	Terminal conduit DIN terminal	Yes	2-wire	24 V	12 V	100 V, 200 V	—	A33	—	—	—	—	—	PLC		
								—	A34	—	—	—	—	—	—	—	
								—	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	—	12 V	100 V, 200 V	J51	—	●	●	○	—				
								J59	—	●	●	○	—				
				3-wire (NPN)	—	5 V, 12 V	—	F59W	—	●	●	○	IC				
								F5PW	—	●	●	○	—				
				3-wire (PNP)	—	12 V	—	J59W	—	●	●	○	—				
								F5BAL	—	—	●	○	—				
				2-wire	—	5 V, 12 V	—	F5NTL	—	—	●	○	IC				
								F59F	—	●	●	○	—				
	Diagnostic indication (2-color) Water resistant (2-color) With timer Diagnostic output (2-color) Strong magnetic field resistant (2 color)	Terminal conduit	No	2-wire	24 V	—	—	P5DW	—	—	●	●	—	—			
								3-wire (NPN)	—	5 V, 12 V	—	Y59A	—	●	●	○	IC
												Y59B	—	●	●	○	—
								2-wire	—	—	—	Y7P	—	●	●	○	—
												Y7NW	—	●	●	○	IC
								3-wire (PNP)	—	5 V, 12 V	—	Y7PW	—	●	●	○	—
												Y7BW	—	●	●	○	—
								3-wire (NPN)	—	—	—	Y7BW	—	●	●	○	—
Y7BAL	—	—	●	○	—												
Diagnostic indication (2-color) Water resistant (2-color)	Terminal conduit	No	3-wire (NPN)	—	5 V, 12 V	—	—	G39	—	—	—	IC	Relay, PLC				
							2-wire	—	K39	—	—	—		—			

* 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.

Refer to page 6-16-1 for details of applicable auto switches in addition to those listed above.

Auto Switch Mounting Bracket Part No.

Bore size (mm)	32	40	50	63	80	100
D-A3/A4/K3/G3	BMB2-032	BMB2-040	BMB1-050	BMB1-063	BMB1-080	BMB1-100
D-A5/A6/F5/J5	BT-03		BT-05		BT-06	
D-Z□/Y□	BMB4-032		BMB4-050		BMB4-063	
D-P5DWL	BMB3T-040		BMB3T-050		BMB3T-080	

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Series C95N



JIS Symbol
Cylinder with lock



Specifications

Bore size (mm)	32, 40, 50, 63, 80, 100
Model	Non-lube
Fluid	Air
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.08 MPa
Piston speed	50 to 1000 mm/s ^{Note)}
Ambient and fluid temperature	Without auto switch: -10°C to 70°C (No freezing) With auto switch: -10°C to 60°C (No freezing)
Cushion	Double side air cushion
Stroke length tolerance	Up to 250: $^{+1.0}_0$, 251 to 1000: $^{+1.4}_0$
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style

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

Lock Specifications

Lock actuation	Spring lock (Exhaust lock)
Unlocking pressure	0.25 MPa or more
Locking pressure	0.20 MPa or less
Maximum operating pressure	1.0 MPa
Locking direction	Two-way

Standard Stroke

For cases with auto switches, refer to the table of minimum strokes for mounting of auto switches on page 6-12-25.

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

Stopping Accuracy

(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 = 0.5 MPa

Load weight.....Upper limit of allowable value

Solenoid valve for locking mounted on the unlocking port

Maximum value of stopping position dispersion from 100 measurements

Spring Lock Holding Power (Maximum static load)

Bore size (mm)	32	40	50	63	80	100
Holding power N	552	882	1370	2160	3430	5390

ISO/VDMA Cylinder: With Lock Type Double Acting, Single Rod Series C95N

Weight/Aluminum Tube

(kg)

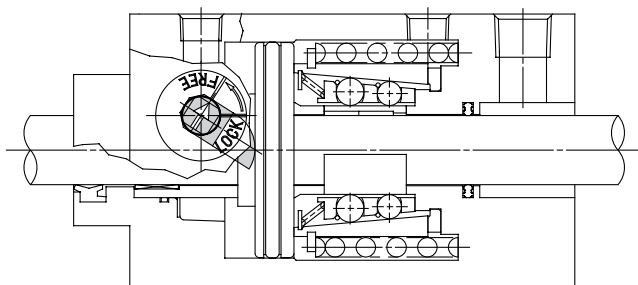
Bore size (mm)		32	40	50	63	80	100
Basic weight	Basic style	1.26	1.87	2.97	4.50	7.34	10.80
	Foot style	0.16	0.20	0.38	0.46	0.89	1.09
	Flange style	0.20	0.23	0.47	0.58	1.30	1.81
	Single clevis style	0.16	0.23	0.37	0.60	1.07	1.73
	Double clevis style	0.20	0.32	0.45	0.71	1.28	2.11
Additional weight per each 50 mm of stroke	All mounting brackets	0.11	0.16	0.26	0.27	0.42	0.56
	Single rod clevis	0.07	0.11	0.22	0.22	0.40	0.40
Accessory	Double clevis (With pin)	0.09	0.15	0.34	0.34	0.69	0.69

Calculation: (Example) C95ND40-100

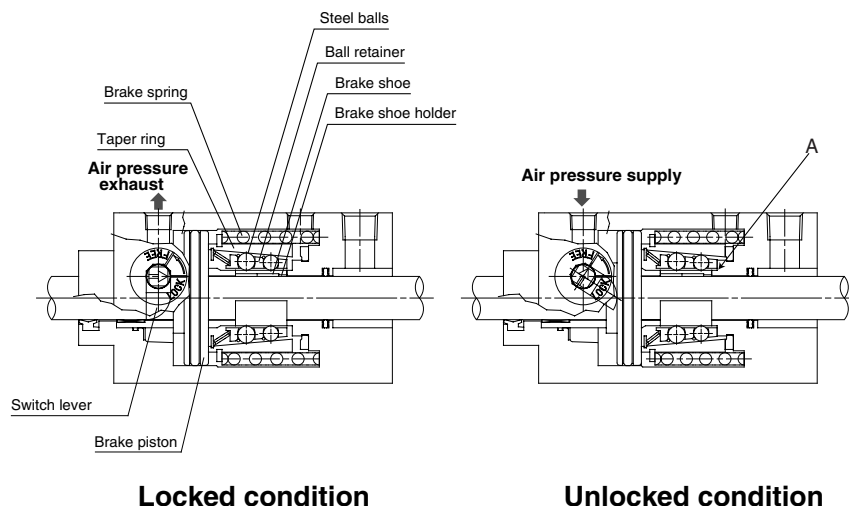
- Basic weight 1.87 (kg) (Basic, ø40)
 - Additional weight 0.16 (kg/50 st)
 - Cylinder stroke 100 (st)
- $$1.87 + 0.16 \times 100/50 + 0.32 = 2.51 \text{ kg}$$

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.



Construction Principle



Spring lock (Exhaust lock)

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

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

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

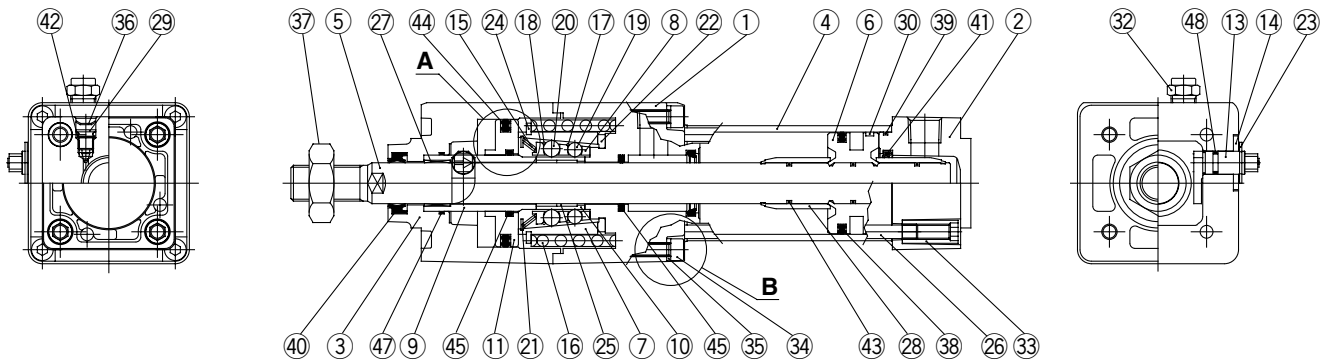
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Data

Series C95N

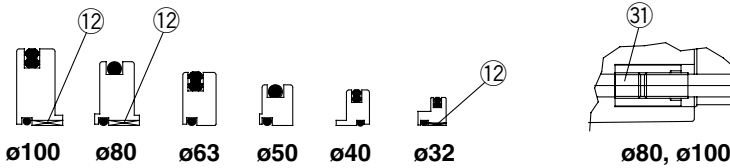
Construction

[First angle projection]



Section A
(Release piston bushing)

Section B
(Tie-rod for unit attachment)



Component Parts

No.	Description	Material	Qty.	Note
①	Rod cover	Aluminum alloy	1	
②	Head cover	Aluminum die-casted	1	
③	Cover	Aluminum alloy	1	
④	Cylinder tube	Aluminum alloy	1	
⑤	Piston rod	Carbon steel	1	
⑥	Piston	Aluminum alloy	1	
⑦	Taper ring	Carbon steel	1	
⑧	Ball retainer	Special resin	1	
⑨	Piston guide	Carbon steel	1	
⑩	Brake shoe holder	Special steel	1	
⑪	Brake release piston	32, 80, 100	Carbon steel	1
		40, 50, 63	Aluminum alloy	1
⑫	Brake release piston bushing	Steel + Special resin	1	32, 80, 100 only
⑬	Cam for lock release	Chrome molybdenum steel	1	
⑭	Washer	Carbon steel	1	
⑮	Spring for retainer pre-load	Stainless wire	1	
⑯	Brake spring	Stainless wire	1	
⑰	Clip A	Stainless steel	1	
⑱	Clip B	Stainless steel	1	
⑲	Steel ball A	Carbon steel	32 to 50	10
		63 to 100	9	

No.	Description	Material	Qty.	Note
⑳	Steel ball B	Carbon steel	32 to 50	10
		63 to 100	9	
㉑	Tooth ring	Stainless steel	1	
㉒	Damper	Polyurethane rubber	1	
㉓	Snap ring for release cam ㉔	Carbon steel	1	
㉔	Snap ring for taper ring	Carbon steel	1	
㉕	Brake shoe	Special friction material	2	
㉖	Tie-rod	Carbon steel	4	
㉗	Bushing	Lead bronze casting	1	
㉘	Cushion ring	Brass	2	
㉙	Cushion valve	Steel wire	2	
㉚	Wear ring	Resin	1	
㉛	Tie-rod for unit attachment	Carbon steel	2	
㉜	BC element	Bronze + Brass	1	
㉝	Tie-rod nut	Carbon steel	32 to 63	4
		80, 100	8	
㉞	Cap screw	Chrome molybdenum steel	4	
㉟	Spring washer	Steel wire	4	
㊱	Snap ring	Steel for spring	2	40 to 100
㊲	Rod end nut	Steel	1	

No.	Description	Material	Qty.
㉞	Piston seal	NBR	1
㉟	Tube gasket	NBR	2
㊱	Rod seal A	NBR	1
㊲	Cushion seal	NBR	2
㊳	Cushion seal valve	NBR	2
㊴	Piston gasket	NBR	3
㊵	Release piston seal	NBR	1
㊶	Road seal B	NBR	1
㊷	Gasket for release piston	NBR	1
㊸	Gasket for release guide	NBR	1
㊹	Gasket for release cam	NBR	1

Replacement Parts: Seal Kit

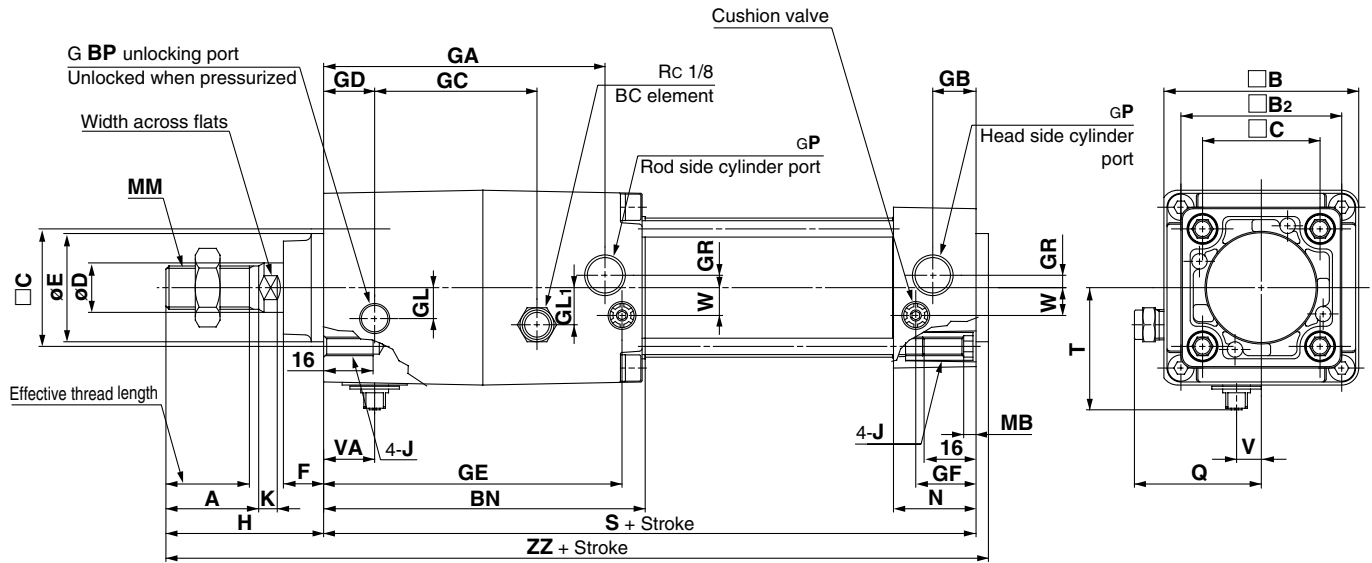
Bore size (mm)	Kit no.	Contents
32	CS95-32	Kits include items ㉞ and ㉟ to ㊱.
40	CS95-40	
50	CS95-50	
63	CS95-63	
80	CS95-80	
100	CS95-100	

* Seal kits consist of items ㉞ and ㉟ to ㊱ contained in one kit, and can be ordered using the order number for each respective tube bore size.

ISO/VDMA Cylinder: With Lock Type Double Acting, Single Rod Series C95N

Dimensions

Basic style (B): C95NB



Bore size (mm)	Effective thread length (mm)	Width across flats	A	B	B ₂	BN	BP	C	D	Ee ₁₁	F	GA	GB	GC	GD	GL	GL ₁
32	19.5	10	22	54	46	97	G 1/8	32.5	12	30	13	83	13	45.5	13	7.5	12
40	21	13	24	63	52	104	G 1/8	38	16	35	13	91	14	52.5	16.5	10	12
50	29	16	32	75	65	120.5	G 1/4	46.5	20	40	14	104.5	15.5	58.5	19	11.5	15
63	29	16	32	90	75	134.5	G 1/4	56.5	20	45	14	119.5	16.5	68	23	17.5	12
80	37	21	40	102	95	169	G 1/4	72	25	45	20	150	19	81	33	22	18
100	37	21	40	116	114	189	G 1/4	89	30	55	20	170	19	96	37.5	25	20

Bore size (mm)	GR	GE	GF	J	MB	K	MM	N	P	Q	H	S	T	V	VA	W	ZZ
32	4	88.5	18.3	M6 x 1	4	6	M10 x 1.25	27	G 1/8	37	48	164	34	6.5	13	6.5	216
40	4	96.5	19.5	M6 x 1	4	6.5	M12 x 1.25	27	G 1/4	41.5	54	182	39.5	8	16.5	9	240
50	5	111.2	22.4	M8 x 1.25	5	8	M16 x 1.5	31.5	G 1/4	47.5	69	195	47	9	20	10.5	268
63	9	123.5	20.7	M8 x 1.25	5	8	M16 x 1.5	31.5	G 3/8	55	69	224	55.5	8.5	23	12	297
80	11.5	157	26	M10 x 1.5	5	10	M20 x 1.5	38	G 3/8	61	86	259	61.5	10.5	33	14	349
100	17	177	26	M10 x 1.5	5	10	M20 x 1.5	38	G 1/2	68	91	289	69.5	10.5	37.5	15	384

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

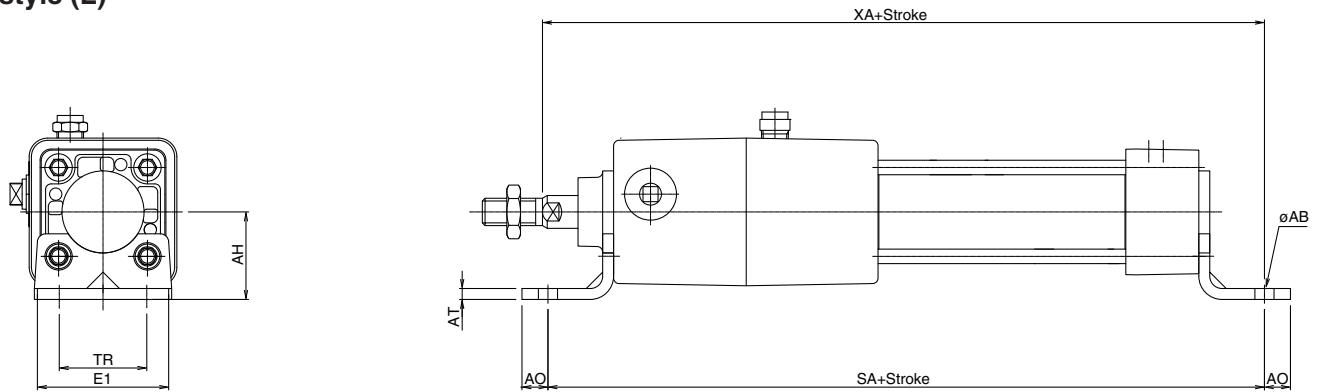
Data

Series C95N

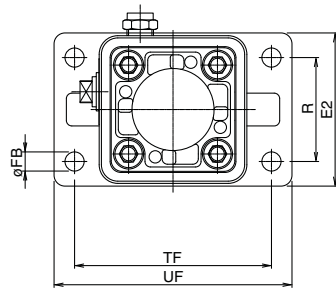
Dimensions: Cylinder Mounting Accessory

[First angle projection]

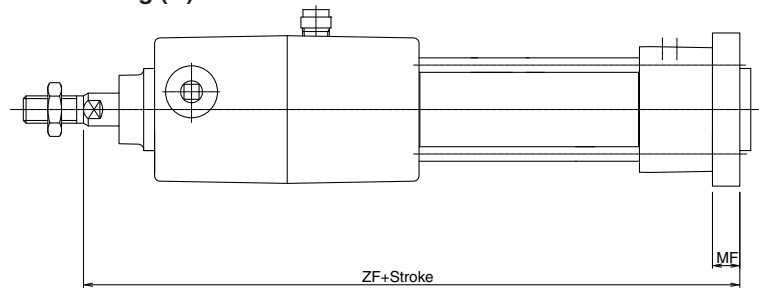
Foot style (L)



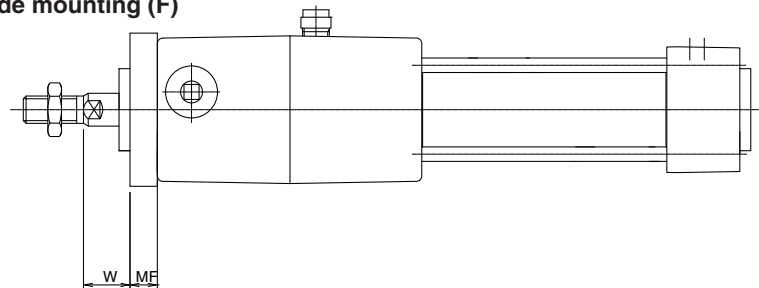
Flange style (F, G)



Head side mounting (G)

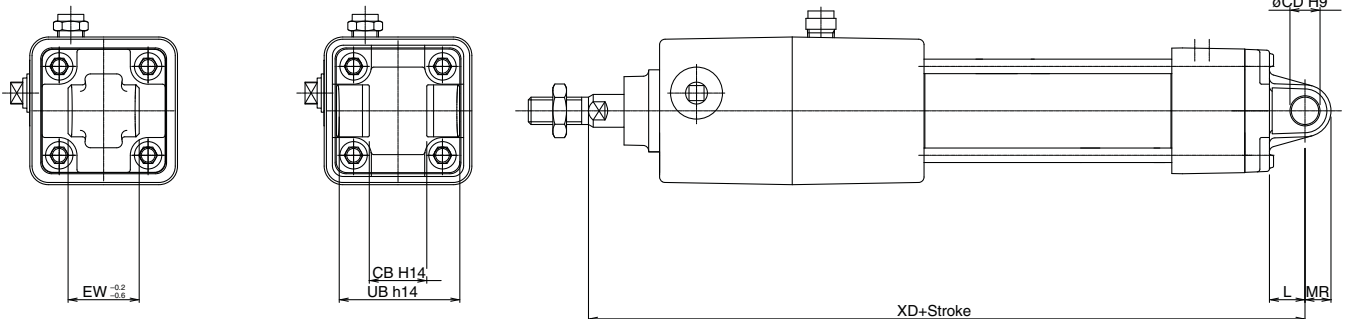


Rod side mounting (F)



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 ^{+0.2} / _{-0.6}	MR	TR	AO	AT	XA	SA	AH	øAB	TF	UF	E2
32	48	38	16	10	200	7	10	65	12	212	45	26	26	9.5	32	10	4.5	214	212	32	7	72	87	56
40	55	46	20	10	222	9	12	75	15	237	52	28	28	12	36	11	4.5	240	238	36	10	83	101	65
50	67	52	25	12	244	9	12	80	15	259	60	32	32	12	45	12	5.5	264	259	45	10	100	120	77
63	80	62	25	12	273	9	16	90	20	293	70	40	40	16	50	12	5.5	293	288	50	10	115	135	92
80	100	63	30	16	321	12	16	110	20	341	90	50	50	16	63	14	6.5	346	341	63	12	126	153	100
100	120	75	35	16	356	14	20	140	25	381	110	60	60	20	75	16	6.5	381	371	71	14.5	150	178	120



Series C95N

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

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

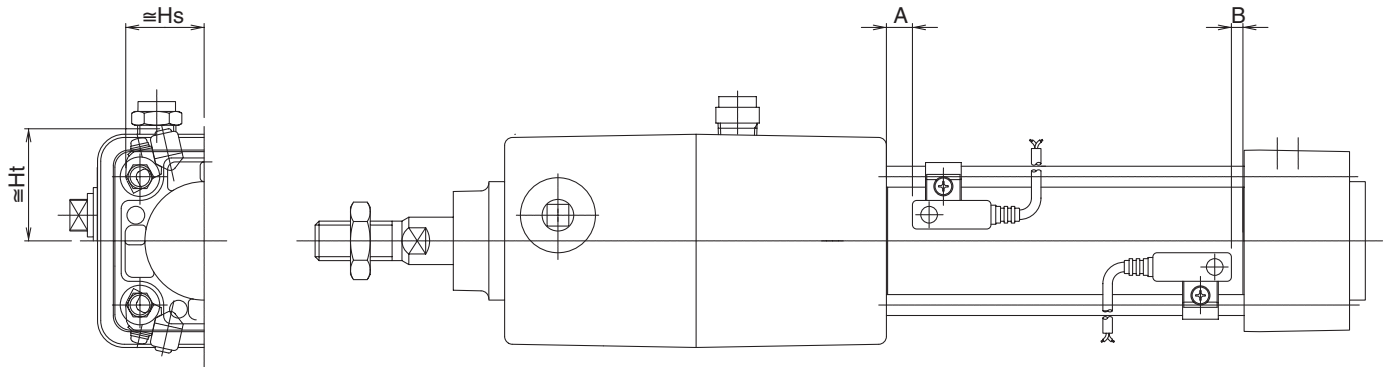
Minimum Strokes for Auto Switch Mounting

Auto switch model	Number of auto switch mounted	ø32 to ø63	ø80, ø100
A5□ A6□	1, 2	15	20
	n	$15 + 55(n - 2)/2$ n = 2, 4, 6, 8...	$20 + 55(n - 2)/2$ n = 2, 4, 6, 8...
A59W	2	15	20
	n	$20 + 55(n - 2)/2$ n = 2, 4, 6, 8...	$25 + 55(n - 2)/2$ n = 2, 4, 6, 8...
F5□(W)/J5□J 59W F5BAL/F59F	1	15	25
	1, 2	15	25
F5NTL	n	$15 + 55(n - 2)/2$ n = 2, 4, 6, 8...	$25 + 55(n - 2)/2$ n = 2, 4, 6, 8...
	1	10	10
A3□ K3□ G3□	2 (Same side)	100	100
	2 (Different sides)	35	35
A3□ K3□ G3□	n (Same side)	$100 + 100(n - 2)$ n = 2, 4, 6, 8...	$100 + 100(n - 2)$ n = 2, 4, 6, 8...
	n (Different sides)	$35 + 30(n - 2)$ n = 2, 4, 6, 8...	$35 + 30(n - 2)$ n = 2, 4, 6, 8...
A44	1	10	10
	2 (Same side)	55	55
	2 (Different sides)	35	35
	n (Same side)	$55 + 50(n - 2)$ n = 2, 4, 6, 8...	$55 + 50(n - 2)$ n = 2, 4, 6, 8...
	n (Different sides)	$35 + 30(n - 2)$ n = 2, 4, 6, 8...	$35 + 30(n - 2)$ n = 2, 4, 6, 8...
Z7□ Z80	1, 2	15	15
	n	$15 + 40(n - 2)/2$ n = 2, 4, 6, 8...	$15 + 40(n - 2)/2$ n = 2, 4, 6, 8...
Y59□ Y7P Y7□W	1, 2	15	15
	n	$15 + 40(n - 2)/2$ n = 2, 4, 6, 8...	$15 + 40(n - 2)/2$ n = 2, 4, 6, 8...
Y69□ Y7PV Y7□WV	1, 2	10	10
	n	$10 + 30(n - 2)/2$ n = 2, 4, 6, 8...	$10 + 30(n - 2)/2$ n = 2, 4, 6, 8...
Y7BAL	1, 2	20	20
	n	$20 + 45(n - 2)/2$ n = 2, 4, 6, 8...	$20 + 45(n - 2)/2$ n = 2, 4, 6, 8...
P5DWL	1, 2	15	20
	n	$15 + 65(n - 2)/2$ n = 2, 4, 6, 8...	$20 + 65(n - 2)/2$ n = 2, 4, 6, 8...

Series C95N

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-Y7□W(V) D-Y7P(V)		D-A3□, D-G39 D-A44, D-K39		D-P5DWL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
32	10.5	0	14.5	2	17	4.5	22	9.5	14	1.5	10.5	0	13.5	1
40	21.5	0	25.5	2	28	4.5	33	9.5	25	1.5	21.5	0	24.5	1
50	23	0	27	2.5	29.5	5	34.5	10	26.5	2	23	0	26	1.5
63	28	0	32	2.5	34.5	5	39.5	10	31.5	2	28	0	31	1.5
80	28	2.5	22	6.5	24.5	9	29.5	14	21.5	6	28	2.5	31	5.5
100	28	2.2	32	6.5	34.5	9	39.5	14	31.5	6	28	2.5	31	5.5

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 D-F59F		D-A3□, D-K39 D-G39		D-A44		D-Z7□, D-Z80 D-Y59□, Y7P D-Y7□W		D-Y69□, D-Y7PV D-Y7□WV		D-Y7BAL		D-P5DWL	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Ht
32	35	24.5	32.5	25	67	27.5	77	27.5	25.5	23	26.5	23	30	23	38	31
40	38.5	27.5	36.5	27.5	71.5	27.5	81.5	27.5	29.5	26	30	26	34	26	42	33
50	43.5	34.5	41	34	77	—	87	—	33.5	31	34.5	31	38	31	46.5	39
63	48.5	39.5	46	39	83.5	—	93.5	—	39	36	40	36	43	36	51.5	44
80	55	46.5	52.5	46.5	92.5	—	103	—	47.5	45	48.5	45	52	45	58	51.5
100	62	55	59.5	55	103	—	113.5	—	55.5	53.5	56.5	53.5	60	53.5	65.5	60.5

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted. For detailed specifications, refer to page 6-16-1.

Type	Model	Electrical entry (Fetching direction)	Features
Reed switch	D-A53/A56	Grommet (In-line)	—
Solid state switch	D-F59/F5P/J59	Grommet (In-line)	—
	D-F59W/F5PW/J59W		2-color indication type
	D-F5BAL		2-color indication type, Water resistant
	D-F5NTL		With timer
	D-G5NTL		
	D-Y69A/Y69B/Y7PV	Grommet (Perpendicular)	—
	D-Y7NWV/Y7PWV/Y7BWV		2-color indication type

* With pre-wire connector is available for solid state auto switches. For details, refer to page 6-16-60.

* Normally closed (NC = b contact), solid state switch (D-Y7G/Y7H type) are also available. For details, refer to page 6-16-39.

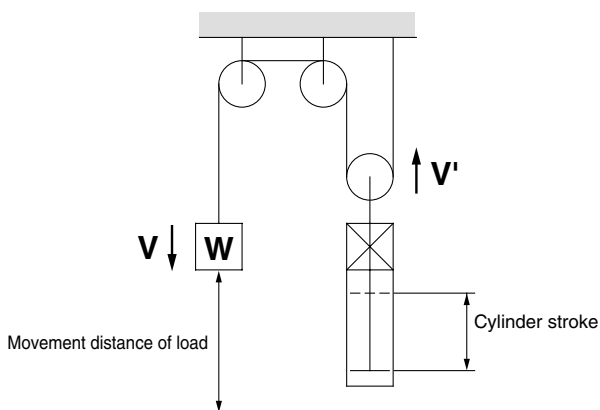
Series C95N Model Selection

Precautions on Model Selection

⚠ Caution

- In order that the originally selected maximum speed is not exceeded, be certain to use a speed controller to adjust the total movement distance of the load so that movement takes place in no less than the applicable movement time.
The movement time is the time that is necessary for the load to travel the total movement distance from the start without any intermediate stops.
- In cases where the cylinder stroke and the movement distance of the load are different (double speed mechanism, etc.), use the movement distance of the load for selection purposes.

Example)



Selection Example

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

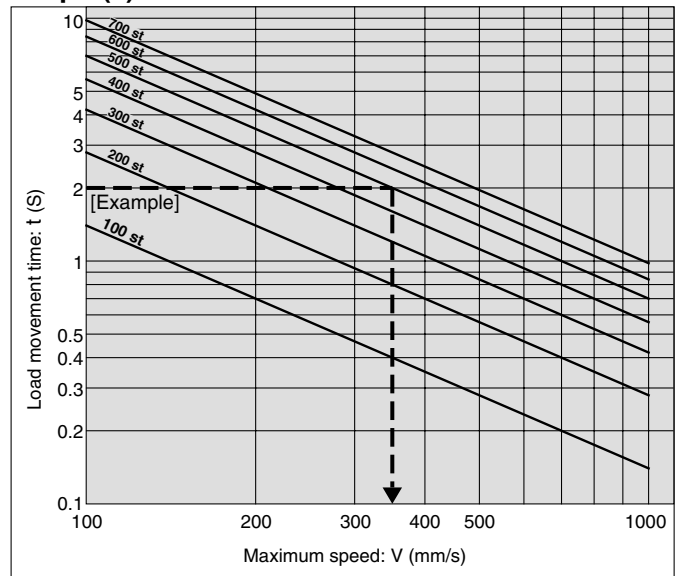
Step 1: From graph 1 find the maximum movement speed of the load
 \therefore Maximum speed V : approx. 350 mm/s

Step 2: Select Graph (6) based upon the load condition and operating pressure, and then from the intersection of the maximum speed $V = 350 \text{ mm/s}$ found in Step 1, and the load weight $m = 50 \text{ kg}$
 $\therefore \phi 63 \rightarrow$ Select a MNB63 or larger bore size.

Step 1 Find the Maximum Load Speed: V

Find the maximum load speed: V (mm/s) from the load movement time: t (s) and the movement distance: st (mm).

Graph (1)



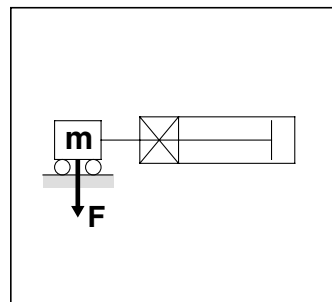
Step 2 Find the Cylinder Bore Size.

Select a graph based upon the load condition and operating pressure, and then find the point of intersection for the maximum speed found in Step 1 and the load weight. Select the bore size on the line above the point of intersection.

Load Condition

Operating pressure

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

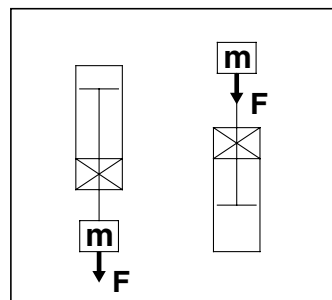


From 0.3 MPa \rightarrow Graph (2)

From 0.4 MPa \rightarrow Graph (3)

From 0.5 MPa \rightarrow Graph (4)

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



From 0.3 MPa \rightarrow Graph (5)

From 0.4 MPa \rightarrow Graph (6)

From 0.5MPa \rightarrow Graph (7)

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

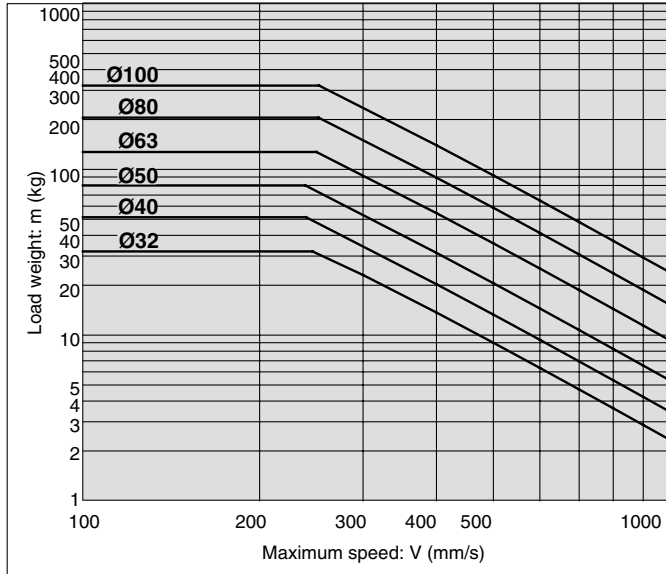
Data

Series C95N

Selection Graph

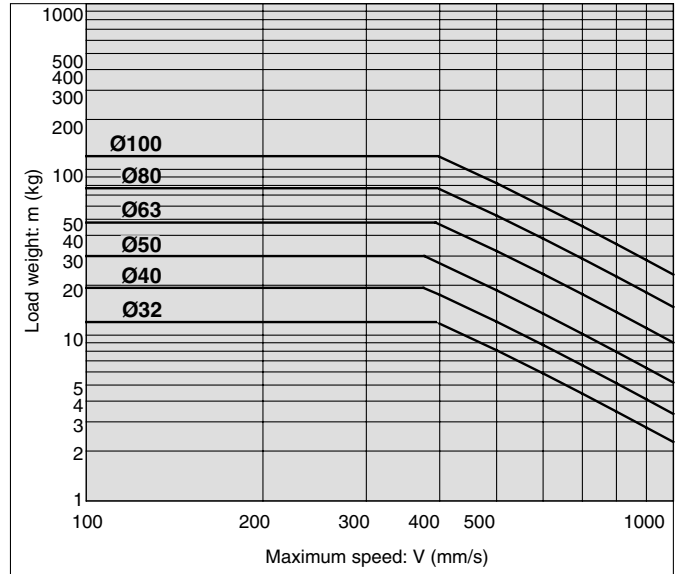
Graph (2)

$0.3 \text{ MPa} \leq P < 0.4 \text{ MPa}$



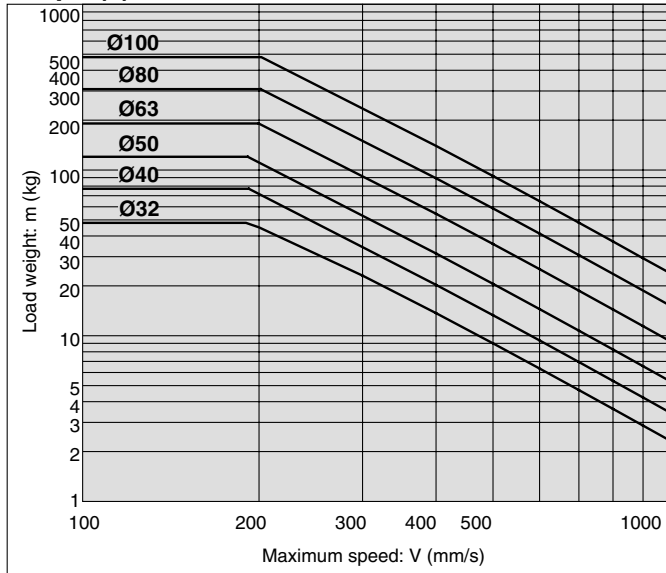
Graph (5)

$0.3 \text{ MPa} \leq P < 0.4 \text{ MPa}$



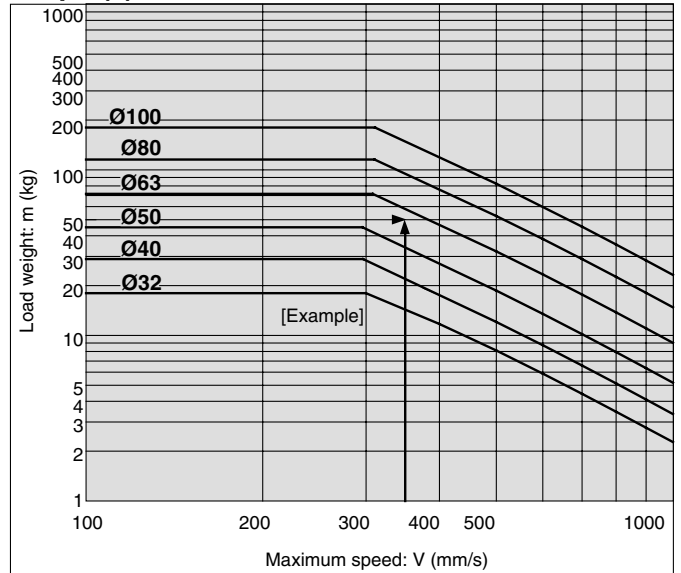
Graph (3)

$0.4 \text{ MPa} \leq P < 0.5 \text{ MPa}$



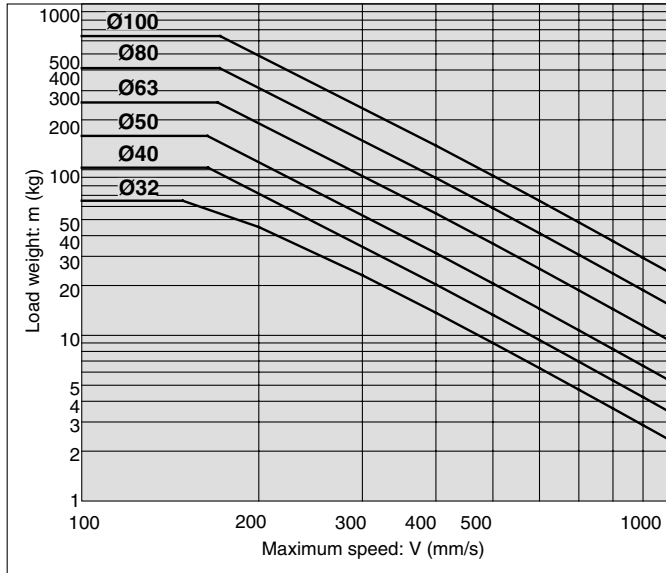
Graph (6)

$0.4 \text{ MPa} \leq P < 0.5 \text{ MPa}$



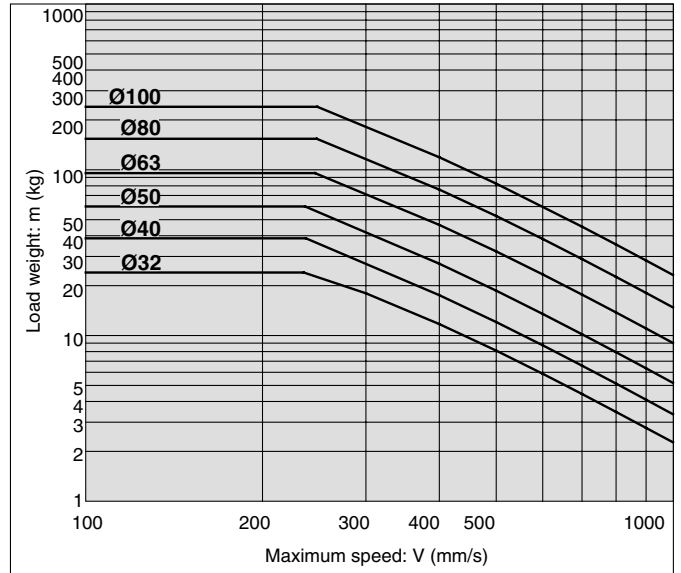
Graph (4)

$0.5 \text{ MPa} \leq P$



Graph (7)

$0.5 \text{ MPa} \leq P$





Be sure to read before handling.

Design of Equipment & Machinery

Warning

1. Construct so that the human body will not come into direct contact with driven objects or the moving parts of the cylinders with lock.

Devise a safe structure by attaching protective covers that prevent direct contact with the human body, or in cases where there is a danger of contact, provide sensors or other devices to perform an emergency stop, etc. before contact occurs.

2. Use a balance circuit, taking cylinder lurching into consideration.

In cases such as an intermediate stop, where a lock is operated at a desired position within the stroke and air pressure is applied from only one side of the cylinder, the piston will lurch at high speed when the lock is released. In such situations, there is a danger of causing human injury by having hands or feet, etc. caught, and also a danger of causing damage to the equipment. In order to prevent this lurching, a balance circuit such as the recommended pneumatic circuits (6-12-30 to 31) should be used.

Selection

Warning

1. When in a locked condition, do not apply a load accompanied by an impact shock, strong vibration or turning force, etc.

Use caution, because an external action such as an impacting load, strong vibration or turning force, may damage the locking mechanism or reduce its life.

Selection

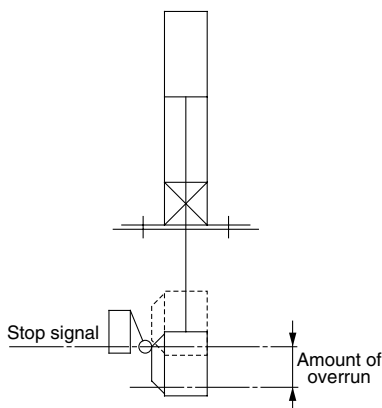
Warning

2. Consider stopping accuracy and the amount of overrun when an intermediate stop is performed.

Due to the nature of a mechanical lock, there is a momentary lag with respect to the stop signal, and a time delay occurs before stopping. The cylinder stroke resulting from this delay is the overrun amount. The difference between the maximum and minimum overrun amounts is the stopping accuracy.

- Place a limit switch before the desired stopping position, at a distance equal to the overrun amount.
 - The limit switch must have a detection length (dog length) of the overrun amount + a.
 - SMC's auto switches have operating ranges from 8 to 14 mm (depending on the switch model).
- When the overrun amount exceeds this range, self-holding of the contact should be performed at the switch load side.

* Refer to page 6-12-20 regarding stopping accuracy.



Selection

Warning

3. In order to further improve stopping accuracy, the time from the stop signal to the operation of the lock should be shortened as much as possible.

To accomplish this, use a device such as a highly responsive electric control circuit or solenoid valve driven by direct current, and place the solenoid valve as close as possible to the cylinder.

4. Note that stopping accuracy will be influenced by changes in piston speed.

When piston speed changes during the course of the cylinder stroke due to variations in the load or disturbances, etc., the dispersion of stopping positions will increase. Therefore, consideration should be given to establishing a standard speed for the piston just before it reaches the stopping position.

Moreover, the dispersion of stopping positions will increase during the cushioned portion of the stroke and during the accelerating portion of the stroke after the start of operation, due to the large changes in piston speed.

Mounting

Warning

1. Be certain to connect the rod end to the load with the lock released.

• If connected when in the locked condition, a load greater than the turning force or holding force, etc. may operate on the piston rod and cause damage to the lock mechanism. The C95N series is equipped with an emergency unlocking mechanism, however, when connecting the rod end to the load this should be done with the lock released. This can be accomplished by simply connecting an air line to the unlocking port and supplying air pressure of 0.25 MPa or more.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data



Series C95N

Specific Product Precautions 2

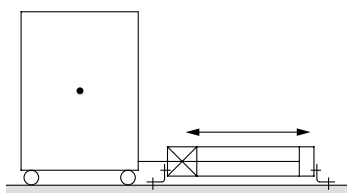
Be sure to read before handling.

Mounting

⚠ Warning

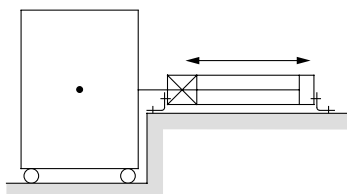
2. Do not apply an offset load to the piston rod.

Particular care should be taken to match the load's center of gravity with the center of the cylinder shaft. When there is a large discrepancy, the piston rod may be subjected to uneven wear or damage due to the inertial moment during locking stops.



X Load center of gravity and cylinder shaft center are not matched.

Note) Can be used if all of the generated moment is absorbed by an effective guide.



O Load center of gravity and cylinder shaft center are matched.

⚠ Caution

1. Use the hexagon wrenches shown below when replacing brackets.

Bore size (mm)	Bolt	Width across flats	Torque (N·m)
32, 40	MB-32-48-C1247	4	6.9
50, 63	MB-50-48-C1249	5	11
80, 100	Foot MB-80-48-AC1251	6	25
	Other MB-80-48-BC1251		

Adjustment

⚠ Warning

1. Do not open the cushion valve beyond the stopper.

As a retaining mechanism for the cushion valve, a crimped section ($\phi 32$ head cover) or retaining ring is installed ($\phi 40$ to $\phi 100$), and the cushion valve should not be opened beyond that point.

If not operated in accordance with the above precautions, the cushion valve may be ejected from the cover when air pressure is supplied.

2. Be certain to use an air cushion at the end of the cylinder stroke.

If this is not done, the tie-rod or piston assembly will be damaged.

⚠ Caution

1. Adjust the cylinder's air balance.

Balance the load by adjusting the air pressure in the front and rear sides of the cylinder with the load connected to the cylinder and the lock released. Lurching of the cylinder when unlocked can be prevented by carefully adjusting this air balance.

2. Adjust the mounting positions of the detectors on auto switches, etc.

When intermediate stops are to be performed, adjust the mounting positions of detectors on auto switches, etc., taking into consideration the overrun amount with respect to the desired stopping positions.

Pneumatic Circuit

⚠ Warning

1. Be certain to use an air pressure circuit which will apply balancing pressure to both sides of the piston when in a locked stop.

In order to prevent cylinder lurching after a locked stop, when restarting or when manually unlocking, a circuit should be used which will apply balancing pressure to both sides of the piston, thereby canceling the force generated by the load in the direction of piston movement.

2. Use a solenoid valve for unlocking which has a large effective sectional area, as a rule 50% or more of the effective sectional area of the cylinder drive solenoid valve.

The larger the effective sectional area is, the shorter the locking time will be (the overrun amount will be shorter), and stopping accuracy will be improved.

3. Place the solenoid valve for unlocking close to the cylinder, and no farther than the cylinder drive solenoid valve.

The less distance there is from the cylinder (the shorter the piping), the shorter the overrun amount will be, and stopping accuracy will be improved.

4. Allow at least 0.5 second from a locked stop (intermediate stop of the cylinder) until release of the lock.

When the locked stop time is too short, the piston rod (and load) may lurch at a speed greater than the control speed of the speed controller.

5. When restarting, control the switching signal for the unlocking solenoid valve so that it acts before or at the same time as the cylinder drive solenoid valve.

If the signal is delayed, the piston rod (and load) may lurch at a speed greater than the control speed of the speed controller.



Be sure to read before handing.

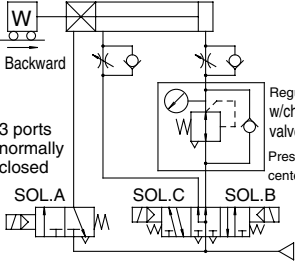
Pneumatic Circuit

Warning

6. Basic circuit

1. [Horizontal]

Forward



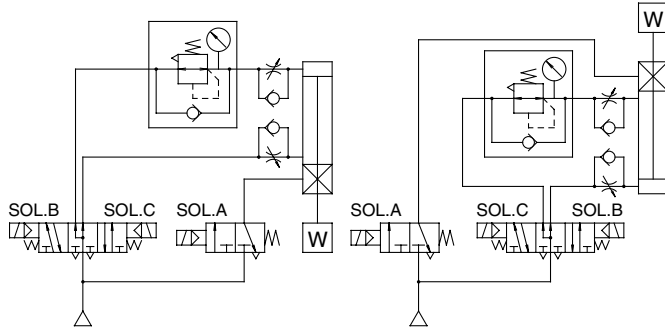
SOL.A	SOL.B	SOL.C	Action
ON	ON	OFF	Forward
OFF	OFF	OFF	Locked stop
ON	OFF	OFF	Unlocked
ON	ON	ON	Backward
OFF	OFF	OFF	Locked stop
ON	OFF	OFF	Unlocked
ON	ON	ON	Backward

0.5s or more
0 to 0.5s

2. [Vertical]

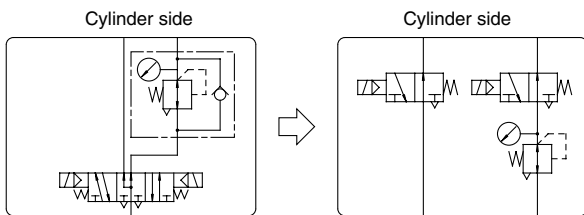
[Load in direction of rod extension]

[Load in direction of rod retraction]



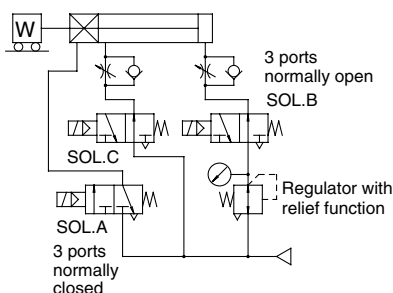
Caution

1. A 3 position pressure center 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]

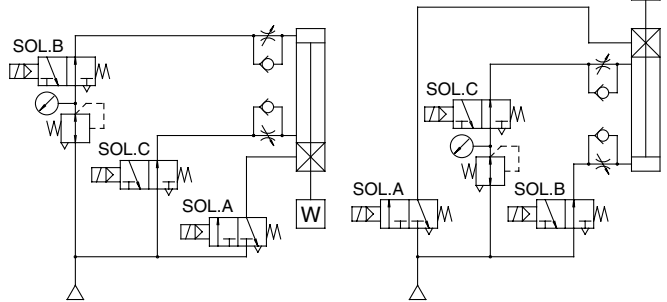


Pneumatic Circuit

2. [Vertical]

[Load in direction of rod extension]

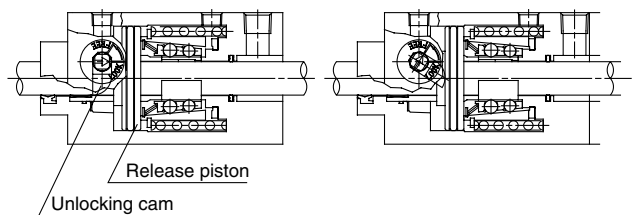
[Load in direction of rod retraction]



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 0.25 MPa 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 condition

[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 its original position when released and become locked again, it should be held in this position for as long as unlocking is needed.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data



Series C95N

Specific Product Precautions 4

Be sure to read before handling.

Maintenance

⚠ Caution

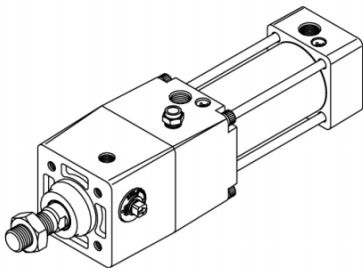
- 1. The lock units for the C95N series are replaceable.**
To order replacement lock units for the C95N series use the order numbers given in the table below.

Bore size (mm)	Lock unit part no.
32	C95N32D-UA
40	C95N40D-UA
50	C95N50D-UA
63	C95N63D-UA
80	C95N80D-UA
100	C95N100D-UA

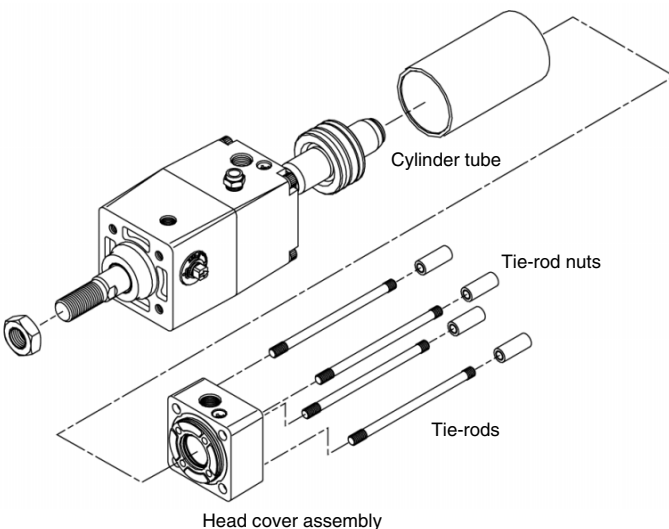
2. Replacement of lock units.

- 1) Loosen the tie-rod nuts (4 pcs.) on the cylinder head cover using a hexagon wrench. Refer to the table below for the applicable hexagon wrench.

Bore size (mm)	Tie-rod nut socket width across flats (mm)
32, 40	6
50, 63	8
80, 100	10

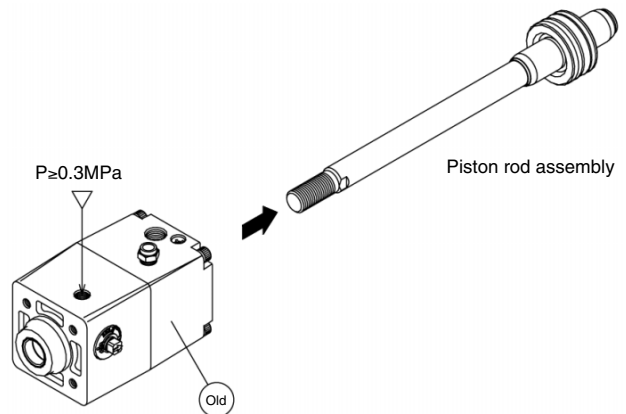


- 2) Remove the tie-rods, head cover and cylinder tube.

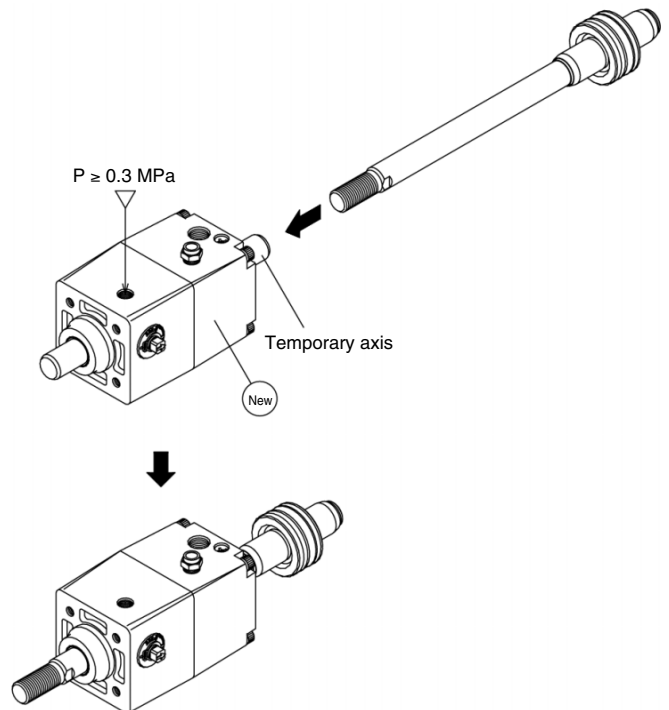


⚠ Caution

- 3) Apply 0.3 MPa or more of compressed air to the unlocking port, and pull out the piston rod assembly.



- 4) Similarly, apply 0.3 MPa or more of compressed air to the unlocking port of the new lock unit, and replace the symposium with the previously mentioned piston rod assembly.



- 5) Reassemble in reverse order from steps 2) and 1).

ISO/VDMA Cylinder: Large Bore Size Type

Series C95

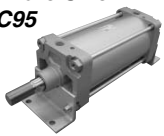
ø125, ø160, ø200, ø250

Conforming to ISO 6431/CETOP RP43P/VDMA 24562



CJ1
CJP
CJ2
CM2
CG1
MB
MB1
CA2
CS1
C76
C85
C95
CP95
NCM
NCA
D-
-X
20-
Data

Series Variations

Series	Action	Type	Basic	Standard variations		Option	Bore (mm)	Page
				Built-in magnet	Stainless steel rod			
Large Bore Size Series C95 	Double acting	Single rod	Non-lube	•	•	Heat resistant	125 160 200 250	6-12-34

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

Refer to "Standard Stroke" on page 6-12-35.

Stroke (mm) ●

Number of auto switches

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

Auto switch

Nil	Without auto switch
------------	---------------------

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

Applicable Auto Switch/Tie-rod Mounting

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)			Applicable load						
					DC	AC	Tie-rod mounting	Band mounting	0.5 (Nil)	3 (L)	5 (Z)							
Reed switch	—	Grommet	Yes	3-wire (Equiv. to NPN)	24 V	5 V	—	A56	—	●	●	—	IC	—				
						12 V	—	A53	—	●	●	●	—	—				
				2-wire	5 V, 12 V	100 V, 200 V	A54	—	●	●	●	—	—					
					12 V	200 V or less	A67	—	●	●	—	—	IC					
	Diagnostic indication (2-color)	Grommet	No	2-wire	24 V	—	—	A64	—	●	●	—	—	—				
						—	—	A59W	—	●	●	—	—					
	—	Terminal conduit	Yes	3-wire	24 V	5 V	—	Z76	—	●	●	—	IC	—	Note)			
						12 V	AC 100	Z73	—	●	●	●	—	—	Relay, PLC	Note)		
				2-wire	5 V, 12 V	100 V or less	Z80	—	●	●	—	—	IC	—	—			
					12 V	100 V, 200 V	—	A33	—	—	—	—	—	—	PLC	Note)		
—				DIN terminal	Yes	2-wire	24 V	12 V	100 V, 200 V	—	A34	—	—	—	—	—	Relay, PLC	Note)
											—	A44	—	—	—	—	—	—
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	F59	—	●	●	○	IC	Relay, PLC				
								3-wire (PNP)	—	100 V, 200 V	F5P	—	●		●	○	—	
				2-wire	24 V	12 V	—				J51	—	●		●	○	—	
								3-wire (NPN)	5 V, 12 V	—	J59	—	●		●	○	—	
	3-wire (PNP)			5 V, 12 V	—	F59W	—				●	●	○		IC			
						2-wire	24 V	12 V	—	F5PW	—	●	●		○	—		
	3-wire (NPN)			5 V, 12 V	—					J59W	—	●	●		○	—		
						4-wire (NPN)	5 V, 12 V	—	F5BAL	—	—	●	○		—			
	3-wire (NPN)	5 V, 12 V	—	F5NTL	—				—	●	○	IC						
				2-wire	24 V	12 V	—	F59F	—	●	●	○	—					
	3-wire (PNP)	5 V, 12 V	—					Y59A	—	●	●	○	IC					
				3-wire (NPN)	5 V, 12 V	—	Y59B	—	●	●	○	—						
	3-wire (PNP)	5 V, 12 V	—				Y7P	—	●	●	○	—						
				3-wire (NPN)	5 V, 12 V	—	Y7NW	—	●	●	○	IC						
	3-wire (PNP)	5 V, 12 V	—				Y7PW	—	●	●	○	—						
				2-wire	24 V	12 V	—	Y7BW	—	●	●	○	—					
3-wire (NPN)	5 V, 12 V	—	Y7BAL					—	—	●	○	—						
			2-wire	24 V	12 V	—	—	G39	—	—	—	IC						
—	Terminal conduit	Yes					2-wire	24 V	12 V	—	—	K39	—	—	—	—		

* 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
 Refer to page 6-16-1 for details of applicable auto switches in addition to those listed above.

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

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	—

Note 1) Two foot brackets and mounting bolts (4 pieces) are included in this no. (ø125 to ø250)

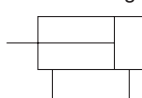
Note 2) Accessories for mounting brackets are as follows
 Foot, Flange, Single clevis: Mounting bolts
 Double clevis : Clevis pin, Retaining rings, Mounting bolts

ISO/VDMA Cylinder: Large Bore Size Type Double Acting, Single Rod **Series C95**

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 6-12-40 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

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 (mm²)

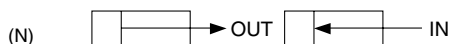
Weight/Aluminum Tube

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

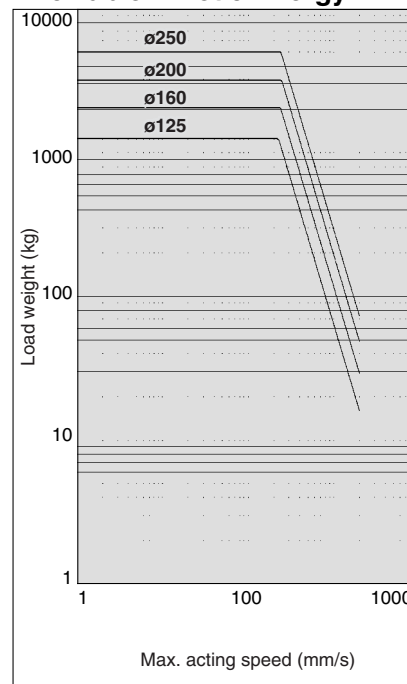
Calculation: (Example) CP95SD160-100

- Basic weight 14.54 (kg) (Basic, ø160)
- Mounting 6.30 (kg) (Double clevis)
- Additional weight ... 0.83 (kg/50 st)
- Cylinder stroke 100 (st)

$$14.54 + 0.83 \times 100 \div 50 + 6.30 = 22.50 \text{ kg}$$



Allowable Kinetic Energy



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

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

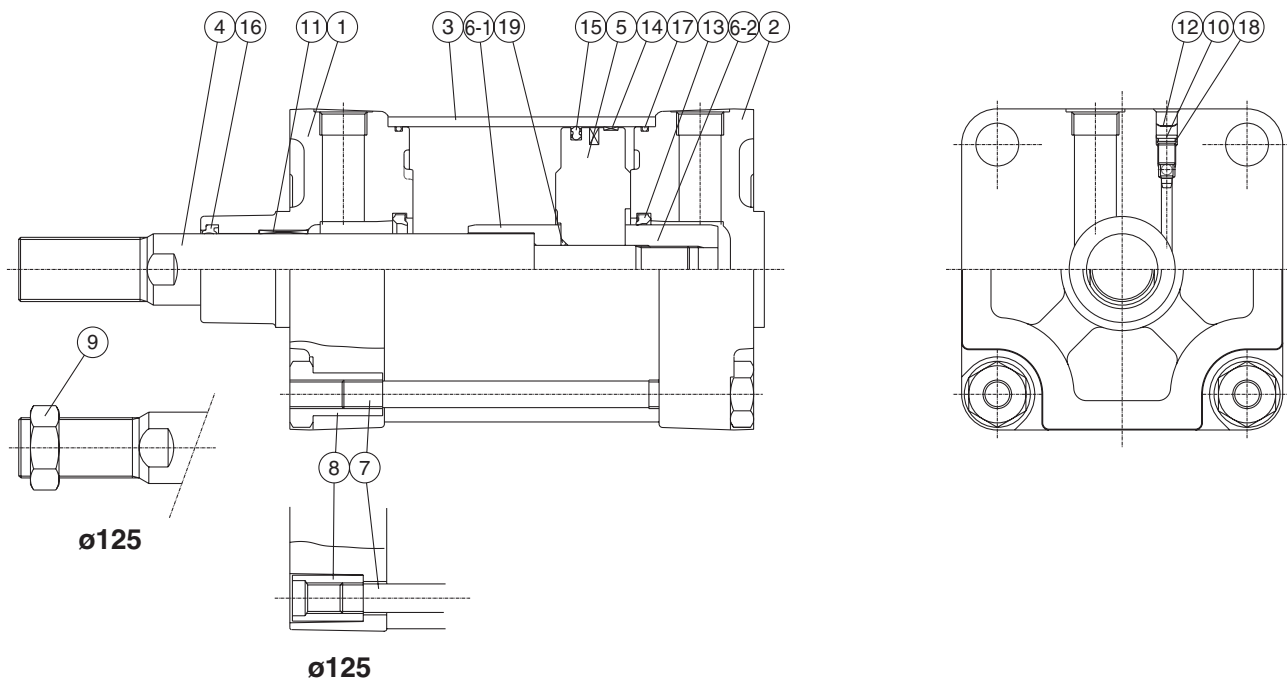
20-

Data

Series C95

Construction

[First angle projection]



Component Parts

No.	Description	Material	Qty.	Note
①	Rod cover	Aluminum die-casted	1	Only $\phi 125$
②	Head cover	Aluminum die-casted	1	Only $\phi 125$
③	Cylinder tube	Aluminum alloy	1	
④	Piston rod	Carbon steel	1	
⑤	Piston	Aluminum alloy	1	
⑥	Cushion ring A	Rolled steel	1	
⑥	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 $\phi 125$
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	

$\phi 160$ to $\phi 250$

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	

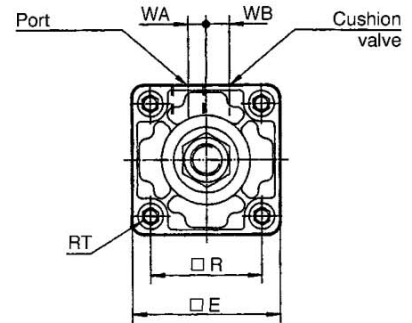
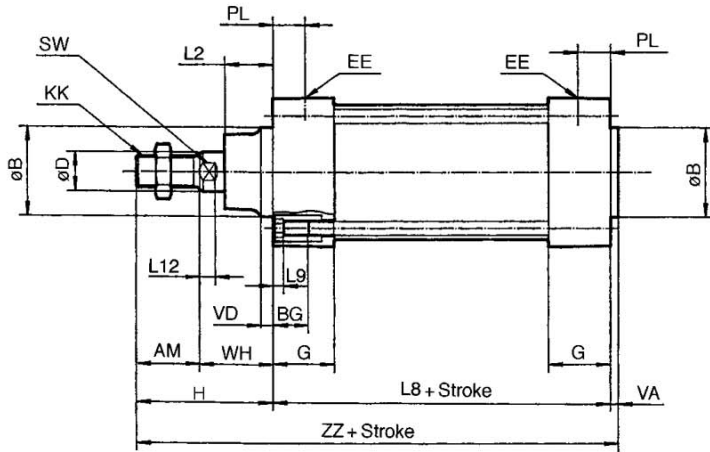
* Seal kits consist of items ⑬ to ⑰ contained in one kit, and can be ordered using the order number for each respective tube bore size.

ISO/VDMA Cylinder: Large Bore Size Type
 Double Acting, Single Rod **Series C95**

Dimensions: Without Mounting Bracket

[First angle projection]

C95SB Bore size - Stroke



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

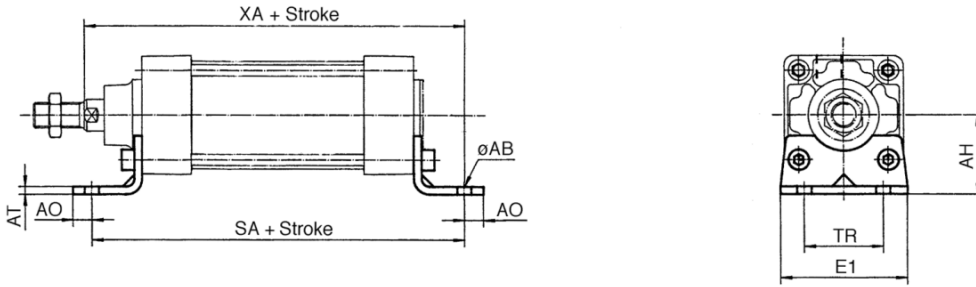
Bore size (mm)	AM	øB e11	øD	EE	PL	RT	L12	KK	SW	G	BG (Min.)	L8	VD	VA	WA	WB	WH	ZZ	□E	□R	L2	L9
125	54	60	32	G 1/2	19	M12 x 1.75	13	M27 x 2	27	38	20	160	10	6	17	15	65	285	136	110	40	6
160	72	65	40	G 3/4	30	M16 x 2	15	M36 x 2	36	55	27	180	8	6	15	25	80	338	180	140	50	0
200	72	75	40	G 3/4	35	M16 x 2	15	M36 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

Series C95

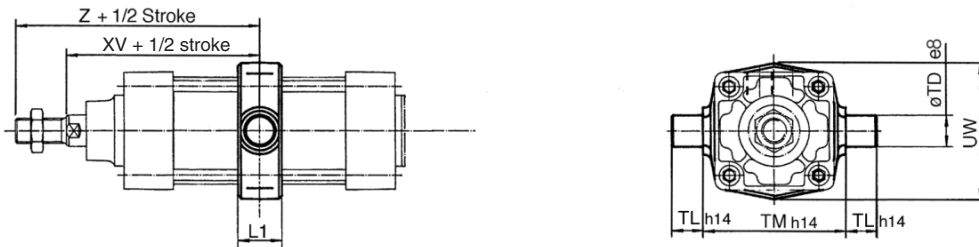
Dimensions: Cylinder Mounting Accessory

[First angle projection]

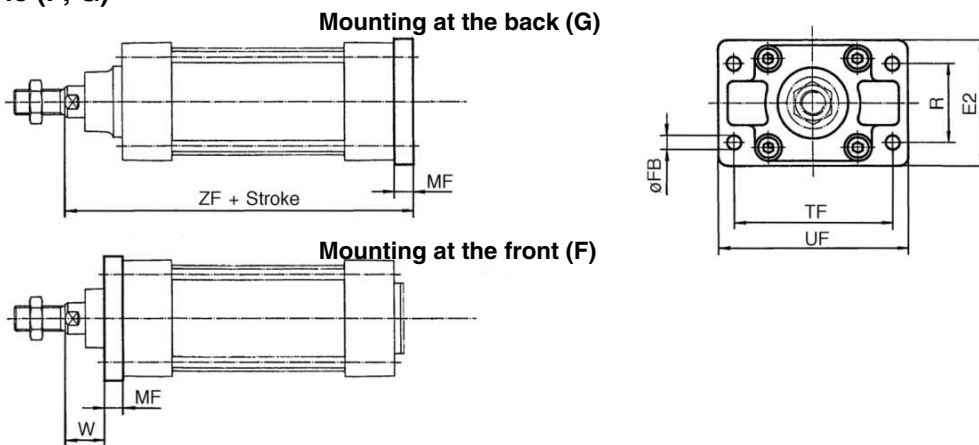
Foot style (L)



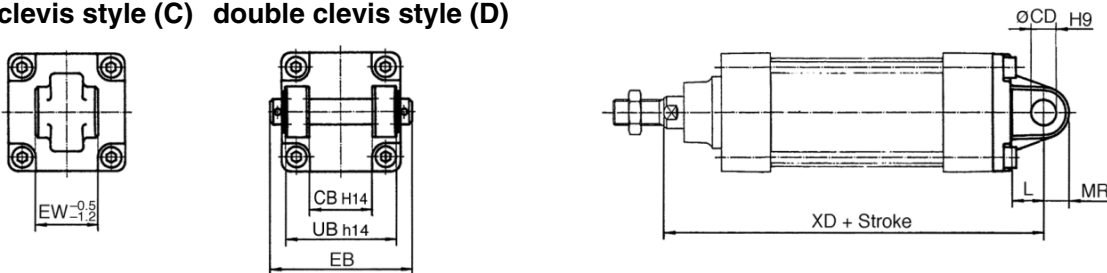
Center trunnion style (T)



Flange style (F, G)



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 +0.2	MR	TR	AO	AT	XA	SA	AH	øAB	L1	XV	Z	TL h14	øTD ø8	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

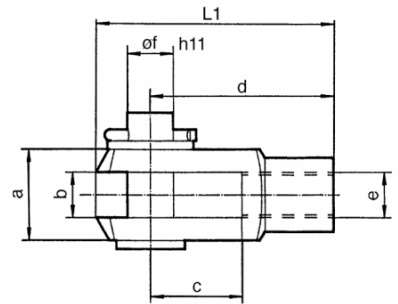
ISO/VDMA Cylinder: Large Bore Size Type
Double Acting, Single Rod Series C95

Dimensions: Piston Rod Mounting Accessory

[First angle projection]

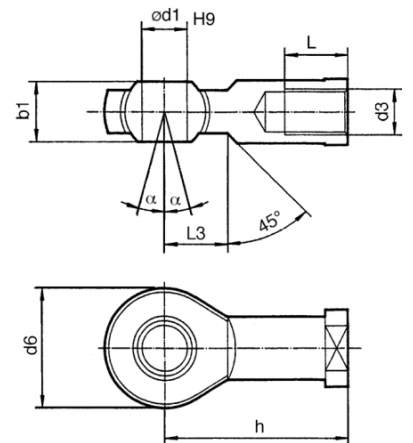
Piston Rod Clevis (ISO 8140)
Steel, Zinc Chromate Plated

Part no.	Bore size (mm)	e	b	d	øf h11	L1 max.	c min.	a max.	L min.
GKM30-55	125	M27 x 2	30 ^{+0.60} / _{+0.15}	110	30	155	54	55	45
GKM35-70	160/200	M36 x 2	35 ^{+0.60} / _{+0.15}	144	35	201	72	70	57
GKM40-85	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
KJ30D	125	M27 x 2	30	110	70	37	51	4°	36
KJ35D	160/200	M36 x 2	35	125	80	43	56	4°	41
KJ40D	250	M42 x 2	40	142	90	49	60	4°	46



CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data



Series C95

Auto Switch Specifications



Applicable Auto Switch

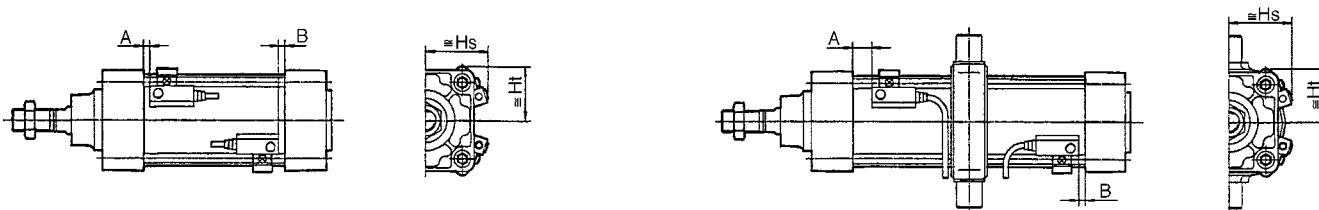
Type	Auto switch model	Electrical entry (Function)
Reed switch	D-A5□/A6□	Grommet
	D-A59W	Grommet (2-color indication)
	D-Z7□/Z80	Grommet
	D-A3□	Terminal conduit
	D-A44	DIN terminal
Solid state switch	D-F5□/J5□	Grommet
	D-F5□W/J59W	Grommet (2-color indication)
	D-F5BAL	Grommet (2-color indication, Water 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...
F5□(W)/J5□/J59W F5BAL/F59F	1	20	15	15	15	175	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...	—
A44	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...	—
	1	10	10	10	—	135	100	100	—
Z7□/Z80	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...	—
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 6-16-1.

Type	Model	Electrical entry	Features
Solid state switch	D-F5NTL	Grommet (In-line)	With timer
	D-Y69A/Y69B/Y7PV	Grommet (Perpendicular)	—
	D-Y7NWW/Y7PWW/Y7BWW		2-color indication

- * With pre-wire connector is available for solid state auto switches. For details, refer to page 6-16-60.
- * Normally closed (NC = b contact), solid state switch (D-Y7G/Y7H type) are also available. For details, refer to page 6-16-39.

- CJ1
- CJP
- CJ2
- CM2
- CG1
- MB
- MB1
- CA2
- CS1
- C76
- C85
- C95**
- CP95
- NCM
- NCA
- D-
- X
- 20-
- Data



Series C95

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 assembly will be damaged.

3. When replacing 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
	Others	M20 x 2.5 x 30ℓ	

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

Auto switch

—	Without auto switch
---	---------------------

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

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.1.11-16 maximum 1000mm

Number of auto switches

—	2
S	1
3	3
n	n

- CJ1
- CJP
- CJ2
- CM2
- C85
- C76
- CG1
- MB
- MB1
- CP95
- C95
- C92
- CA1
- CS1

Applicable Auto Switches/Tie rod mounting

Style	Special function	Electrical entry	Indicator	Load voltage			Auto switch model	Lead wire (m)*			Applicable load	Mounting bracket	
				Wiring (Output)	DC	AC		0.5 (—)	3 (L)	5 (Z)			
Reed switch	—	Grommet	Yes	3 wire (Output) (Equiv. to NPN)	—	5V	—	A56	●	●	—	IC	ø32,ø40 BT-03
					—	12V	—	A53	●	●	●	—	
					—	5V,12V	100V,200V	A54	●	●	●	—	
					24V	5V,12V	—	A67	●	●	—	IC	
					—	12V	200V or less	A64	●	●	—	IC	
Solid state switch	—	Grommet	Yes	3 wire (NPN) 3 wire (PNP)	—	5V,12V	—	F59	●	●	○	IC	ø50,ø63 BT-05
					—	—	100V,200V	J51	●	●	○	—	
					—	12V	—	J59	●	●	○	—	
					—	5V,12V	—	F59W	●	●	○	IC	
					—	5V,12V	—	F5PW	●	●	○	IC	
					24V	12V	—	J59W	●	●	○	—	
					—	—	—	F5BA	—	●	○	—	
					—	5V,12V	—	F5NT	—	●	○	IC	
					—	5V,12V	—	F59F	●	●	○	IC	
					—	—	—	F5LF	●	●	○	—	

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)				
Reed switch	—	Grommet	Yes	3 wire	—	5V	—	—	Z76	●	●	—	IC circuit	ø32,ø40 BMB4-032	
				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	—	Vertical	Y69A	Y59A	●	●	○	IC circuit	ø50,ø63 BMB4-050
				3 wire (PNP)		12V		Vertical	Y7PV	Y7P	●	●	○	—	
				2 wire		5V, 12V		Lateral	Y69B	Y59B	●	●	○	—	
				3 wire (NPN)		5V, 12V		Vertical	Y7NWV	Y7NW	●	●	○	IC circuit	
				3 wire (PNP)		5V, 12V		Lateral	Y7PWV	Y7PW	●	●	○	—	
				2 wire		12V		Vertical	Y7BWV	Y7BW	●	●	○	—	
				—		—		Lateral	—	Y7BA	—	●	—	—	

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

○: Manufactured upon receipt of order.

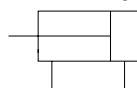


Specifications

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	Rc(PT)1/8	Rc(PT)1/4	Rc(PT)1/4	Rc(PT)3/8	Rc(PT)3/8	Rc(PT)1/2
Mounting	Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis, Centre trunnion, spherical bearing					

Standard Stroke

ISO Symbol
Double acting



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

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	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

For Dimensions, Weight, Accessories see C95S, page xxxx

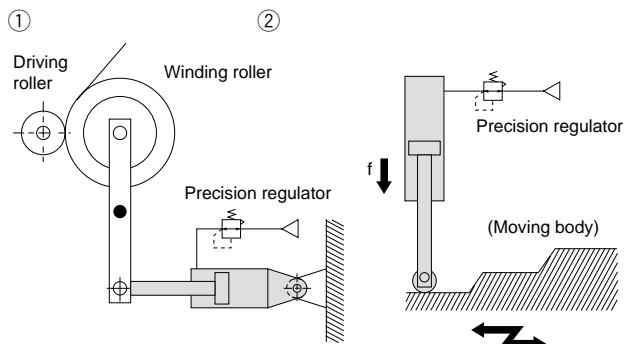
Selection Guide for the Low Friction Side

- 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 the above 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)



CJ1

CJP

CJ2

CM2

C85

C76

CG1

MB

MB1

CP95

C95

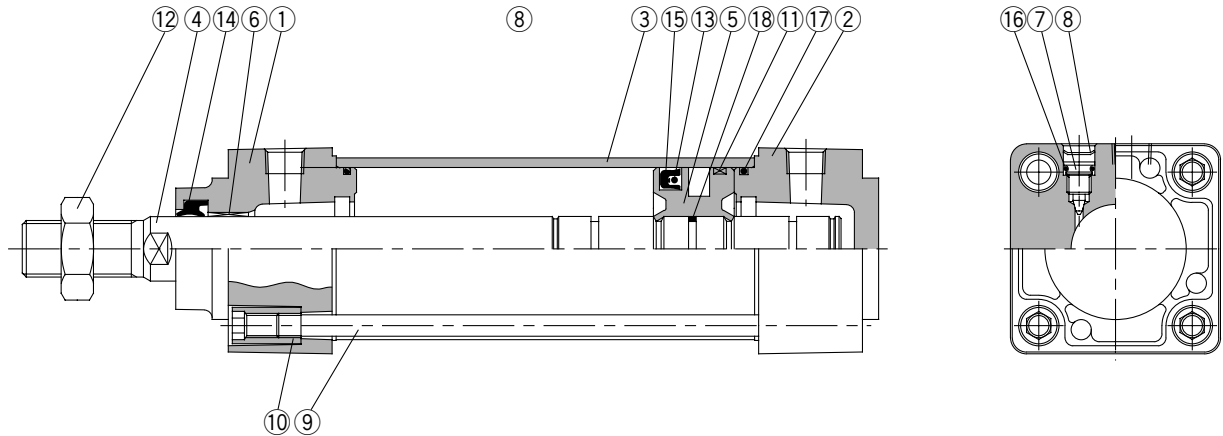
C92

CA1

CS1

Series C95Q

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.

ISO 15552 / VDMA Cylinder: (GM CC-001)

Double Acting, Single Rod

Series C95M

ø40, ø50, ø63, ø80, ø100 (With Metallic Rod Scraper)

How to Order

C95MD **B** **40** — **100**

Built-in magnet ●

Mounting style ●

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

Bore size ●

Bore size	mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Port Thread Type ●

Nil	G (STD)
TN	NPT

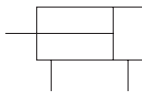
Stroke (mm) ●

Refer to "Standard Stroke" Table

*For center trunnion locations other than standard location, add -X46US-XX to end of cylinder model number (XX = trunnion location in mm) (See page 3 for standard trunnion location)



Symbol
Double acting



Specifications

Bore size (mm)	40	50	63	80	100
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	-10 to 60° C (No freezing)				
Lubrication	Not required (Non-lube)				
Operating piston speed	50 to 1000 mm/s				
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 (see How to Order)	1/4	1/4	3/8	3/8	1/2
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Double clevis style, Center trunnion style				

Standard Stroke (see GM UG Library)

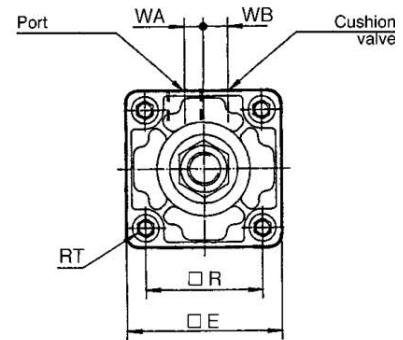
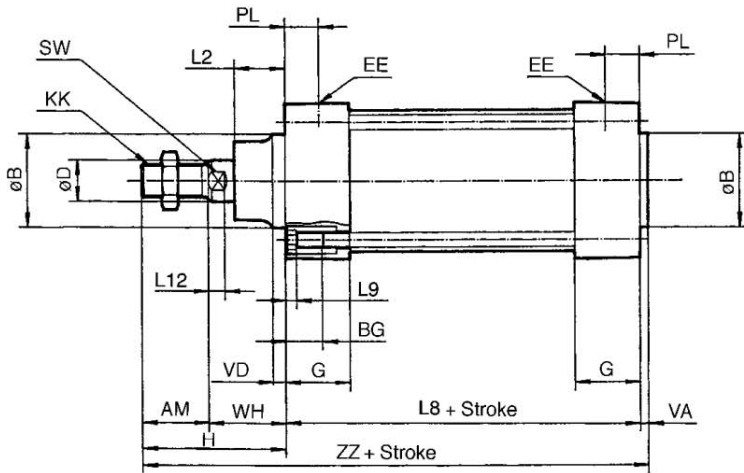
Bore size (mm)	Standard stroke (mm)	Max. stroke
40	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500	800
50	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1200
63	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600	1200
80	25, 50, 80, 100, 125, 160, 200, 250, 320, 400, 500, 600, 700, 800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

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

Dimensions: Without Mounting Bracket

[First angle projection]

C95M



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
40	24	35	16	1/4	14	M6 x 1	6.5	M12 x 1.25	13	27	16	105	4	4	4	9	30	163	52	38	17	4
50	32	40	20	1/4	15.5	M8 x 1.25	8	M16 x 1.5	16	31.5	16	106	6	4	5	10.5	37	179	65	46.5	24	5
63	32	45	20	3/8	16.5	M8 x 1.25	8	M16 x 1.5	16	31.5	16	121	6	4	9	12	37	194	75	56.5	24	5
80	40	45	25	3/8	19	M10 x 1.5	10	M20 x 1.5	21	38	16	128	8	4	11.5	14	46	218	95	72	30	5
100	40	55	30	1/2	19	M10 x 1.5	10	M20 x 1.5	21	38	16	138	8	4	17	15	51	233	114	89	32	5

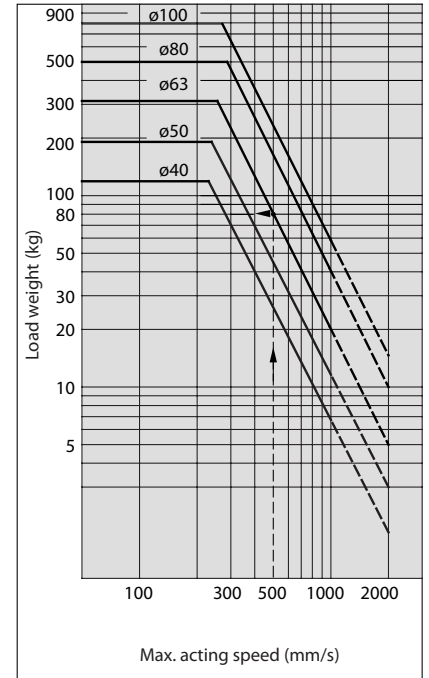
Theoretical Output



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										
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 out put (N) = Pressure (MPa) x Piston area (mm²)

Allowable Kinetic Energy



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

Weight/Aluminum Tube

Bore size (mm)		40	50	63	80	100
Basic weight	Basic style	0.84	1.39	1.91	3.22	4.24
	Foot style	0.20	0.38	0.46	0.89	1.09
	Flange style	0.23	0.47	0.58	1.30	1.81
	Single clevis style	0.23	0.37	0.60	1.07	1.73
	Double clevis style	0.32	0.45	0.71	1.28	2.11
	Trunnion style	1.10	1.73	2.48	4.25	5.95
Additional weight per each 50 mm of stroke	All mounting brackets	0.16	0.26	0.27	0.42	0.56
Accessory	Single rod clevis	0.11	0.22	0.22	0.40	0.40
	Double clevis (With pin)	0.15	0.34	0.34	0.69	0.69

Calculation: (Example) C95MD40-100

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

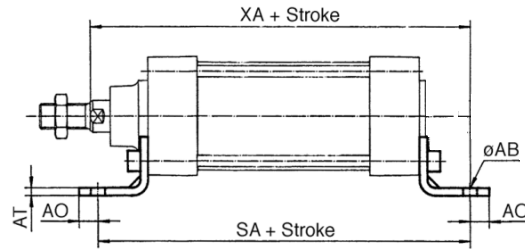
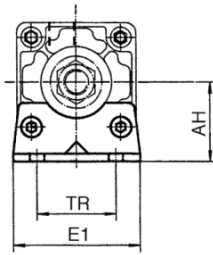
0.84 + 0.16 x 100 ÷ 50 + 0.32 = 1.48 kg

Series C95M

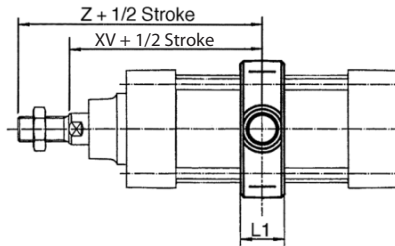
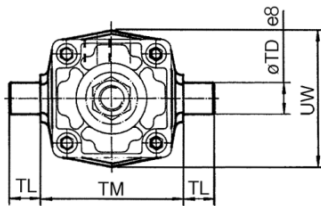
Dimensions: Cylinder Mounting Accessory

[First angle projection]

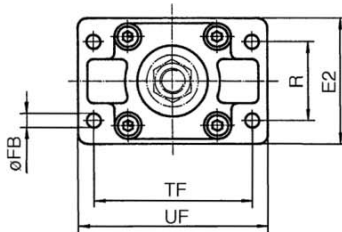
Foot style (L)



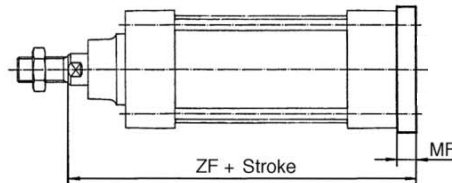
Center trunnion style (T)



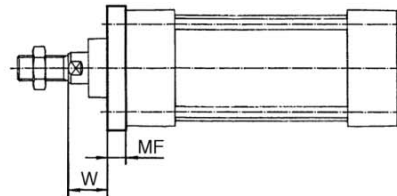
Flange style (F, G)



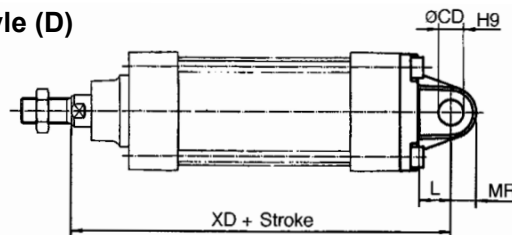
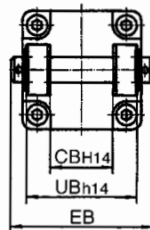
Head side mounting (G)



Rod side mounting (F)



Head side double clevis style (D)



Bore size (mm)	E1	R	W	MF	ZF	øFB	øCD _{H9}	EB	L	XD	UB _{H14}	CB _{H14}	MR	TR	AO	AT	XA	SA	AH	øAB	L1	XV	Z	TL	øTD _{e8}	TM	UW	TF	UF	E2
40	55	36	20	10	145	9	12	75	15	160	52	28	12	36	11	4.5	163	161	36	10	22	82.5	106.5	16	16	63	58	72	90	55
50	68	45	25	12	155	9	12	80	15	170	60	32	12	45	12	5.5	175	170	45	10	22	90	122	16	16	75	71	90	110	70
63	80	50	25	12	170	9	16	90	20	190	70	40	16	50	12	5.5	190	185	50	10	28	97.5	129.5	20	20	90	87	100	120	80
80	100	63	30	16	190	12	16	110	20	210	90	50	16	63	14	6.5	215	210	63	12	34	110	150	20	20	110	110	126	153	100
100	120	75	35	16	205	14	20	140	25	230	110	60	20	75	16	6.5	230	220	71	14.5	40	120	160	25	25	132	136	150	178	120