

10 MPa

Hydraulic Cylinder (Conforms to ISO)

Series CHSD

ø40, ø50, ø63, ø80, ø100

How to Order

CHSD **SD** **B** **40** **100** **F59**

Magnet for auto switch

Nil	Without
D	Built-in

Series type

Symbol	Nominal pressure
D	10 MPa

Mounting types

B	Basic
LA	Transaxial foot type
FY	Front rectangular flange type
FZ	Rear rectangular flange type
CB	Double clevis
TA	Front trunnion

Bore size

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

Port thread type

Nil	Rc
TN	NPT
TF	GF

Stroke

Refer to the standard stroke table on the next page.

Cylinder suffix

Rod end nut	Nil	Without rod end nut
	A	With rod end nut
Presence of cushion	Nil	With cushion on both sides
	N	Without cushion
	R	With front bumper
	H	With rear bumper

Number of auto switches

Nil	2
S	1
n	n

Auto switch

Nil Without auto switch

Select an applicable auto switch model from the table below.
D-Z7□ is not mounted and are supplied loose.
(Only the switch mounting brackets for these models are mounted.)

Port position

Symbol	Position	Port and cushion valve location viewed from the side of piston rod end thread
Nil	Port on top, cushion valve on the right	
A	Port on top, cushion valve on the left	
B	Port on top, cushion valve down	
C	Port on the right, cushion valve down	
D	Port on the right, cushion valve on top	
E	Port on the right, cushion valve on the left	

Applicable Auto Switch / Refer to page 5.3-2 of Best Pneumatics Vol. 2 for detailed auto switch specifications.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage		Auto switch model	Lead wire length (m)			Pre-wired connector	Applicable load	
					DC	AC		0.5 (Nil)	3 (L)	5 (Z)			
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	Z76	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	Z73	●	●	●	—	—	Relay, PLC
Solid state switch	Diagnostic indication (2-color display)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	A54	●	●	—	—	—	—
				3-wire (PNP)	24 V	5 V, 12 V	A59W	●	●	—	—	—	—
				2-wire	—	100 V, 200 V	F59	●	●	○	○	IC circuit	—
				3-wire (NPN)	—	12 V	F5P	●	●	○	○	—	—
				3-wire (PNP)	—	12 V	J59	●	●	○	○	—	—
				2-wire	—	12 V	F59W	●	●	○	○	IC circuit	—
				3-wire (NPN)	24 V	5 V, 12 V	F5PW	●	●	○	○	—	—
				3-wire (PNP)	24 V	5 V, 12 V	J59W	●	●	○	○	—	—
				2-wire	—	12 V	F5BA	—	●	○	○	—	—
				4-wire (NPN)	—	5 V, 12 V	F59F	●	●	○	○	IC circuit	—
				—	—	—	F5LF	●	●	○	○	—	—

Lead wire length symbol 0.5 m Nil (Example) A54
3 m L (Example) A54L
5 m Z (Example) A54Z

Solid state switches marked with "○" are produced upon receipt of order.
D-A5□/A6□/A59W can not be mounted to ø40, 50.

- Besides the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 7.
- Contact SMC for detailed auto switch specifications.

↔ Piping port | Cushion valve

Note 1) Refer to table 1 for manufacturability.
Note 2) Diagrams illustrate the view from the rod on the left side of the cylinder dimensions.

Table 1 Manufacturability Check List by Mounting Type and Port Position

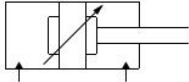
Mounting bracket	B	LA	FY-FZ	CB	TA
Port position					
Nil	○	○	○	○	—
A	○	○	○	○	—
B	○	○	○	○	○
C	Note)	—	○	○	—
D	Note)	—	○	○	—
E	Note)	—	○	○	—

○: Standard product ○: Made to order
—: Not available due to size limitation.
Note) Each of C, D, E is same as the Nil, A, B just turned.

Specifications



JIS Symbol



Model		CHSD
Action		Double Acting: Single Rod
Fluid		General mineral hydraulic fluid
Nominal pressure		10 MPa
Maximum allowable pressure		12 MPa
Proof pressure		15 MPa
Minimum operating pressure	With pressure at front side	0.25 MPa
	With pressure at rear side	0.15 MPa
Ambient and fluid temperature	Without magnet	-10 to 80°C
	Built-in magnet	-10 to 60°C
Piston speed		8 to 300 mm/s
Cushion		Cushion seal
Thread tolerance		JIS 6 g/6 H
Stroke length tolerance	100 mm or less	0 to +0.8 mm
	101 to 250 mm	0 to +1.0 mm
	251 to 630 mm	0 to +1.25 mm
	631 to 800 mm	0 to +1.4 mm

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)			
	40	50, 63	80	100
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5□W/J59W D-F5□F D-F5BAL D-F5NTL	BT-03	BT-04	BT-06	BT-12
D-Z7□/Z80	BMB4-032	BA4-040	BA4-063	BS4-125

D-A5□/A6□/A59W can not be mounted to ø40, 50.

Standard Stroke

Bore size (mm)	Standard stroke (mm)
40	25 to 800
50	25 to 800
63	25 to 800
80	25 to 800
100	25 to 1000

Theoretical Output



Unit: N

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)		
				3.5	7	10
40	22	OUT	1256	4396	8792	12560
		IN	876	3066	6132	8760
50	28	OUT	1963	6871	13741	19630
		IN	1347	4715	9429	13470
63	36	OUT	3117	10910	21819	31170
		IN	2099	7346	14693	20990
80	45	OUT	5026	17591	35182	50260
		IN	3436	12026	24052	34360
100	56	OUT	7853	27486	57971	78530
		IN	5390	18865	37730	53900

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

Weight

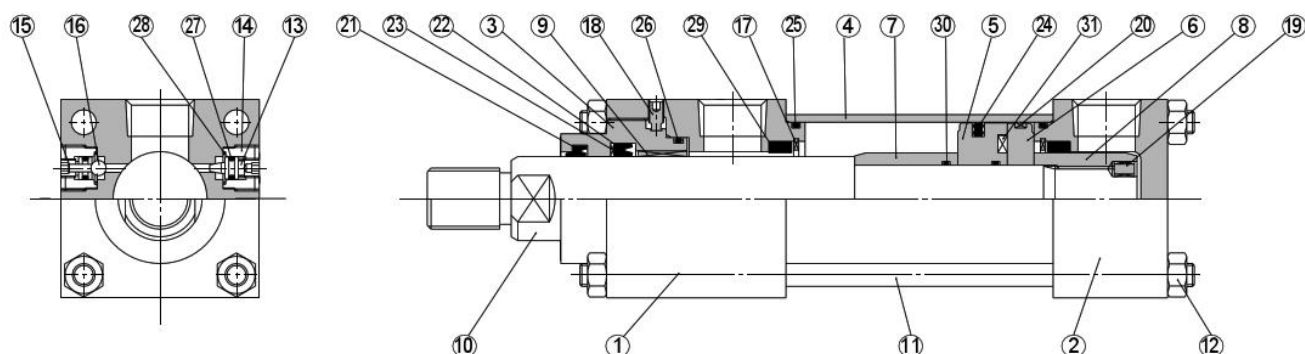
(kg)

Bore size (mm)			40	50	63	80	100
Basic weight (0 stroke)	Basic	B	2.10	3.20	5.10	8.90	14.5
	Transaxial foot	LA	2.40	3.60	5.50	9.70	16.0
	Front flange	FY	2.60	3.80	5.90	10.1	16.0
	Rear flange	FZ	2.50	3.80	6.00	10.0	16.4
	Double clevis	CB	2.30	3.50	6.10	9.90	16.2
	Front trunnion	TA	2.10	3.40	5.40	9.40	15.5
Additional weight per 10 strokes			0.06	0.09	0.13	0.21	0.32

Series CHSD

Construction

CH□SDB



Parts List

No.	Description	Material
1	Rod cover	Carbon steel
2	Head cover	Carbon steel
3	Seal holder	Carbon steel
4	Cylinder tube	Stainless steel
5	Piston	Stainless steel
6	Magnet plate	Stainless steel
7	Cushion ring	Carbon steel
8	Cushion ring nut	Carbon steel
9	Bushing	Copper alloy
10	Piston rod	Carbon steel
11	Tie-rod	Chromium molybdenum steel
12	Tie-rod nut	Carbon steel
13	Cushion valve	Alloy steel
14	Valve holder	Carbon steel
15	Air release valve	Alloy steel
16	Check ball	Bearing steel

No.	Description	Material
17	Snap ring	Carbon tool steel
18	Set screw	Alloy steel
19	Pin	Stainless steel
20	Wear ring	Resin
21	Scraper	NBR
22	Rod seal	NBR
23	Back-up ring	Resin
24	Piston seal	NBR
25	Cylinder tube gasket	NBR
26	Holder gasket	NBR
27	Valve seal	NBR
28	Valve holder gasket	NBR
29	Cushion seal	—
30	Piston gasket	NBR
31	Magnet	—

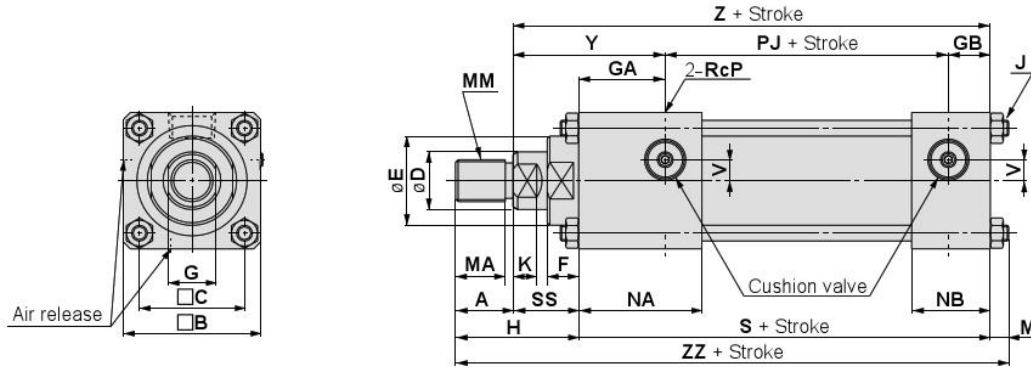
Replacement Parts / Seal Kits

Bore size (mm)	Seal kit no.
40	CHSD40-PS
50	CHSD50-PS
63	CHSD63-PS
80	CHSD80-PS
100	CHSD100-PS

Seal kits consists of item 21 to 25 and 29, and can be ordered by using the seal kit number for each bore size.

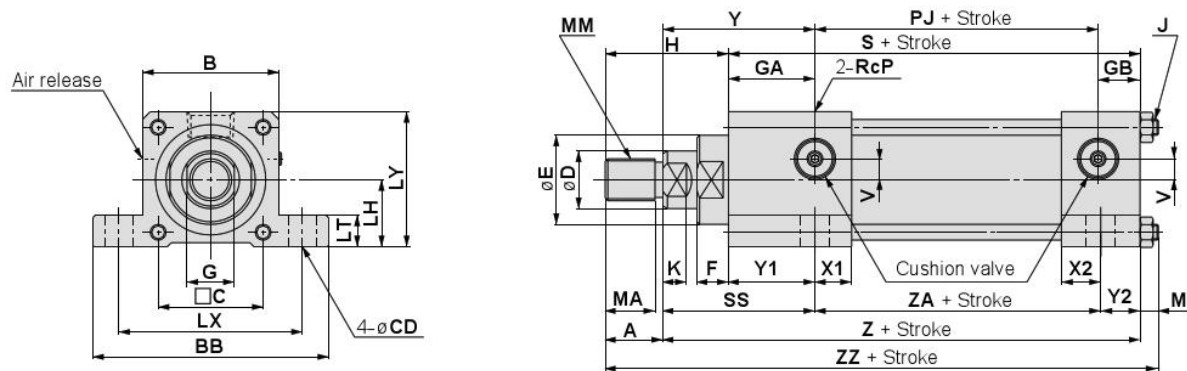
Dimensions

Basic / CHSDB



Bore size (mm)	Stroke range	A	B	C	D	E	F	G	GA	GB	H	J	K	M	MA	MM	NA	NB	P	PJ	S	SS	V	Y	Z	ZZ
40	25 to 800	22	52	40	22	34	12	19	33	16	47	M6 · 1	8	7.5	19	M16 · 1.5	46	29	3/8	58	107	25	6.5	58	132	161.5
50	25 to 800	28	65	50	28	42	15	24	34	16	59	M8 · 1	11	9	25	M20 · 1.5	46.5	28.5	3/8	58	108	31	8	65	139	176
63	25 to 800	36	77	58	36	50	19	30	31	18	74	M8 · 1	13	9	32	M27 · 2	46	33	1/2	66	115	38	12	69	153	198
80	25 to 800	45	96	75	45	60	13	41	42	17	80	M10 · 1.25	17	10.5	41	M33 · 2	57	32	1/2	74	133	35	15	77	168	223.5
100	25 to 1000	56	115	90	56	72	16	50	38	22	97	M14 · 1.5	19	14.5	52	M42 · 2	58	42	3/4	86	146	41	15	79	187	257.5

Transaxial Foot Type / CHSDLA



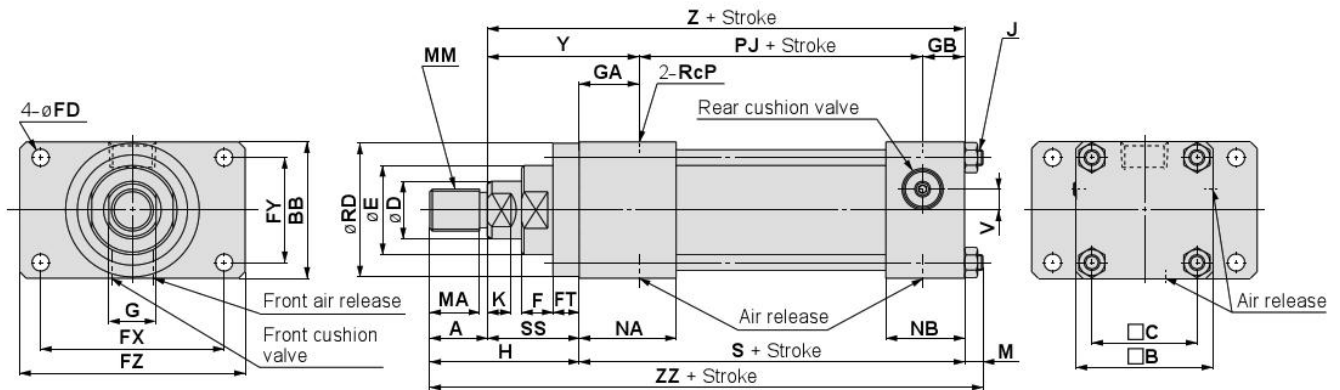
Bore size (mm)	Stroke range	A	B	BB	C	CD	D	E	F	G	GA	GB	H	J	K	LH	LT	LX	LY	M	MA	MM	P	PJ	S	SS
40	25 to 800	22	52	90	40	11	22	34	12	19	33	16	47	M6 · 1	8	25.5	12	70	51.5	7.5	19	M16 · 1.5	3/8	58	107	58
50	25 to 800	28	65	103	50	11	28	42	15	24	34	16	59	M8 · 1	11	32	12	83	64.5	9	25	M20 · 1.5	3/8	58	108	65
63	25 to 800	36	77	115	58	11	36	50	19	30	31	18	74	M8 · 1	13	38	12	95	76.5	9	32	M27 · 2	1/2	66	115	68
80	25 to 800	45	96	147	75	14	45	60	13	41	42	17	80	M10 · 1.25	17	47.5	18	121	95.5	10.5	41	M33 · 2	1/2	74	133	77
100	25 to 1000	56	115	179	90	18	56	72	16	50	38	22	97	M14 · 1.5	19	57	25	145	114.5	14.5	52	M42 · 2	3/4	86	146	79

Bore size (mm)	V	X1	X2	Y1	Y2	ZA	Z	ZZ
40	6.5	13	14	33	15	59	132	161.5
50	8	12.5	13.5	34	15	59	139	176
63	12	16	16	30	17	68	153	198
80	15	15	15	42	17	74	168	223.5
100	15	20	20	38	22	86	187	257.5

Series CHSD

Dimensions

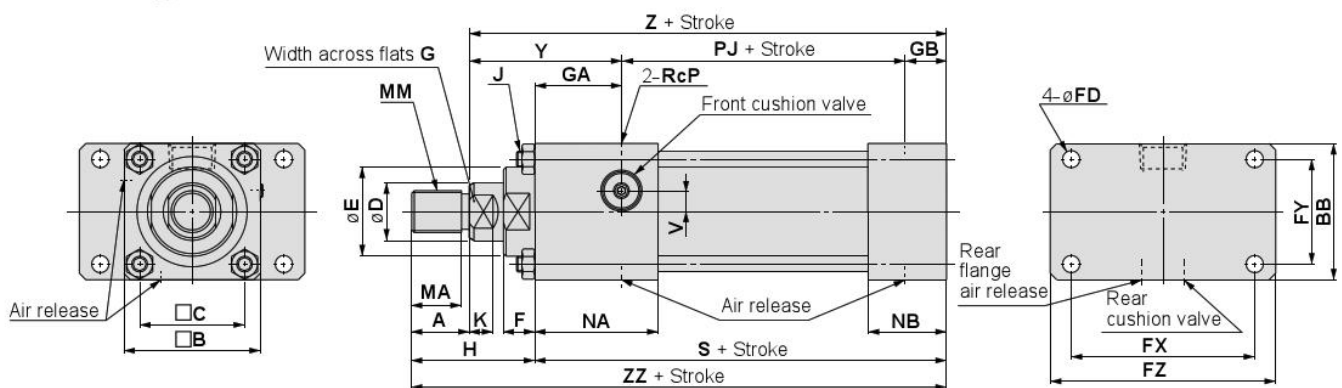
Front Flange / CHSDFY



Bore size (mm)	Stroke range	A	B	BB	C	D	E	F	FD	FT	FX	FY	FZ	G	GA	GB	H	J	K	M	MA	MM	NA	NB	P	PJ
40	25 to 800	22	52	52	40	22	34	12	6.6	10	70	40	86	19	23	16	57	M6 - 1	8	7.5	19	M16 - 1.5	36	29	3/8	58
50	25 to 800	28	65	65	50	28	42	15	9	10	86	50	105	24	24	16	69	M8 - 1	11	9	25	M20 - 1.5	36.5	28.5	3/8	58
63	25 to 800	36	77	77	58	36	50	19	9	10	98	56	118	30	21	18	84	M8 - 1	13	9	32	M27 - 2	36	33	1/2	66
80	25 to 800	45	96	96	75	45	60	13	11	16	119	70	143	41	26	17	96	M10 - 1.25	17	10.5	41	M33 - 2	41	32	1/2	74
100	25 to 1000	56	115	115	90	56	72	16	13.5	16	138	90	162	50	22	22	113	M14 - 1.5	19	14.5	52	M42 - 2	42	42	3/4	86

Bore size (mm)	RD	S	SS	V	Y	Z	ZZ
40	51		97	35	6.5	58	132
50	62	-0.030 -0.076	98	41	8	65	139
63	72		105	48	12	69	153
80	92	-0.036 -0.090	117	51	15	77	168
100	110		130	57	15	79	187

Rear Flange / CHSDFZ



Bore size (mm)	Stroke range	A	B	BB	C	D	E	F	FD	FX	FY	FZ	G	GA	GB	H	J	K	MA	MM	NA	NB	P	PJ	S	V	Y	Z	ZZ
40	25 to 800	22	52	52	40	22	34	12	6.6	70	40	86	19	33	16	47	M6 - 1	8	19	M16 - 1.5	46	29	3/8	58	107	6.5	58	132	154
50	25 to 800	28	65	65	50	28	42	15	9	86	50	105	24	34	16	59	M8 - 1	11	25	M20 - 1.5	46.5	28.5	3/8	58	108	8	65	139	167
63	25 to 800	36	77	77	58	36	50	19	9	98	56	118	30	31	18	74	M8 - 1	13	32	M27 - 2	46	33	1/2	66	115	12	69	153	189
80	25 to 800	45	96	96	75	45	60	13	11	119	70	143	41	42	17	80	M10 - 1.25	17	41	M33 - 2	57	32	1/2	74	133	15	77	168	213
100	25 to 1000	56	115	115	90	56	72	16	13.5	138	90	162	50	38	22	97	M14 - 1.5	19	52	M42 - 2	58	42	3/4	86	148	15	79	187	243

Double Clevis / CHSDCB



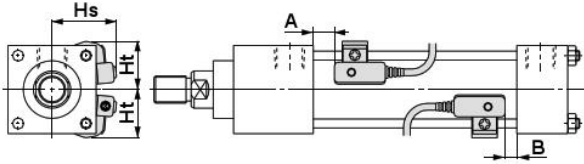
Front Trunnion / CHSDTA



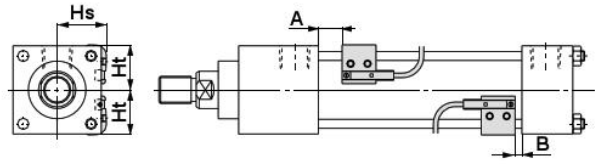
Series CHSD

Proper Auto Switch Mounting Position for Stroke End Detection and Mounting Height

D-A5□/A6□
D-F5□(W)/J5□(W)/F5BAL



D-Z7□/Z80



Proper Auto Switch Mounting Position

Bore size (mm)	D-A5□/A6□		D-A59W		D-F5□/J5□ D-F5□W/J59W D-F59F D-F5BAL		D-F5LF		D-F5NTL		D-Z7□/Z80	
	A	B	A	B	A	B	A	B	A	B	A	B
40	—	—	—	—	8	5	12	9	13	10	5	2
50	—	—	—	—	9.5	4.5	13.5	8.5	14.5	9.5	6.5	1.5
63	4.5	0	8.5	3.5	11	6	15	10	16	11	8	3
80	8.5	3.5	12.5	7.5	15	10	19	14	20	15	12	7
100	8.5	6	12.5	10	15	12.5	19	16.5	20	17.5	12	9.5

Auto Switch Mounting Height

Bore size (mm)	D-A5□/A6□ D-A59W		D-F5□/J5□ D-F5□W/J59W D-F59F D-F5BAL D-F5NTL		D-F5LF		D-Z7□/Z80	
	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs
40	—	—	28.5	35.5	28.5	36.5	27	29
50	—	—	34.5	39.5	34.5	40.5	33	33
63	38.5	47.5	38.5	45	38.5	46	37	38
80	48	54	48	51	48	52	46	46.5
100	58	66.5	58	63.5	58	64.5	57	59

Operating Range

Auto switch model	Bore size (mm)				
	40	50	63	80	100
D-A5□/A6□	—	—	10.5	12	14.5
D-A59W	—	—	14	16	18
D-Z7□/Z80	8	9	10	12	14.5
D-F5□/J5□ D-F5□W/J59W D-F5BAL/F5NTL D-F59F	4	4.5	4.5	5.5	5.5
D-F5LF	5	5.5	5.5	6.5	6.5

Minimum Auto Switch Mounting Stroke

Auto switch model	2 (Different side and same side), 1	n
D-A5□/A6□ D-F5□/J5□ D-F5□W/J59W D-F5BAL D-F5□F/F5NTL	20	$20+55 \frac{(n-2)}{2}$ $n = 2, 4, 6, 8 \dots$
D-A59W	30	$30+55 \frac{(n-2)}{2}$ $n = 2, 4, 6, 8 \dots$
D-Z7□/Z80	20	$20+40 \frac{(n-2)}{2}$ $n = 2, 4, 6, 8 \dots$

Besides the models listed in "How to Order," the following auto switches are applicable.
Refer to page 5.3-2 of Best Pneumatics Vol. 2 for detailed auto switch specifications.

Auto switch type	Part no.	Electrical entry	Features
Reed	D-A53, A56	Grommet (in-line)	—
	D-A64, A67		Without indicator light
	D-Z80		Without indicator light
Solid state	D-F5NTL	Grommet (in-line)	With timer

Solid state switches are also available with pre-wired connector. Contact SMC for detailed auto switch specifications.

Hydraulic Cylinder (Conforms to ISO)

Series CHSG

16 MPa

ø32, ø40, ø50, ø63, ø80, ø100

How to Order

CH D SG B 40 100 F59

Magnet for auto switch

Nil	Without
D	Built-in

Series type

Symbol	Nominal pressure
G	16 MPa

Mounting types

B	Basic
LA	Transaxial foot type
FY	Front rectangular flange type
FZ	Rear rectangular flange type
CA	Single clevis
CB	Double clevis
TA	Front trunnion
TC	Center trunnion

Bore size

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

Port thread type

Nil	Rc
TN	NPT
TF	GF

Stroke

Refer to the standard stroke table on the next page.

Cylinder suffix

Rod end nut	Nil	Without rod end nut
Presence of cushion	A	With rod end nut
	Nil	With cushion on both sides
	N	Without cushion
	R	With front bumper
	H	With rear bumper

Note) When more than one symbol is to be specified, indicate them in alphabetical order.

Number of auto switches

Nil	2
S	1
n	n

Auto switch

Nil Without auto switch

Select an applicable auto switch model from the table below.
D-Z□ is not mounted and are supplied loose.
(Only the switch mounting brackets for these models are mounted.)

Port position

Symbol	Position	Port and cushion valve location viewed from the side of piston rod end thread
Nil	Port on top, cushion valve on the right	
A	Port on top, cushion valve on the left	
B	Port on top, cushion valve down	
C	Port on the right, cushion valve down	
D	Port on the right, cushion valve on top	
E	Port on the right, cushion valve on the left	

Applicable Auto Switch / Refer to page 5.3-2 of Best Pneumatics Vol. 2 for detailed auto switch specifications.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage		Auto switch model	Lead wire length (m)			Pre-wired connector	Applicable load
					DC	AC		0.5 (Nil)	3 (L)	5 (Z)		
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	Z76	●	●	—	—	IC circuit
				2-wire	24 V	12 V	Z73	●	●	●	—	Relay, PLC
					—	100 V, 200 V	A54	●	●	●	—	
					—	—	A59W	●	●	—	—	
					—	—	F59	●	●	○	○	IC circuit
	Diagnostic indication (2-color display)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	F5P	●	●	○	○	IC circuit
				3-wire (PNP)	—	—	J51	●	●	○	—	—
				2-wire	—	100 V, 200 V	F59	●	●	○	○	IC circuit
				3-wire (NPN)	—	—	F59W	●	●	○	○	IC circuit
				3-wire (PNP)	—	—	F5PW	●	●	○	○	IC circuit
Solid state switch	Diagnostic indication (2-color display)	Grommet	Yes	2-wire	24 V	12 V	J59W	●	●	○	○	—
					—	—	F5BA	—	●	○	○	—
					—	—	F59F	●	●	○	○	IC circuit
					—	—	F5LF	●	●	○	○	—
				4-wire (NPN)	—	—						—

Lead wire length symbol

0.5 m Nil (Example) A54

3 m L (Example) A54L

5 m Z (Example) A54Z

Solid state switches marked with "○" are produced upon receipt of order.
D-A5□/A6□/A59W/Z7□/Z80 can not be mounted to ø32.

- Besides the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 16.
- Contact SMC for detailed auto switch specifications.

↔ Piping port | Cushion valve

Note 1) Refer to table 1 for manufacturability.

Note 2) Diagrams illustrate the view from the rod on the left side of the cylinder dimensions.

Table 1 Manufacturability Check List by Mounting Type and Port Position

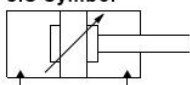
Port position	B	LA	FY/FZ	CB	TA	TC
Nil	○	○	○	○	—	○
A	○	○	○	○	—	○
B	○	○	○	○	○	○
C	Note)	—	○	○	—	○
D	Note)	—	○	○	—	○
E	Note)	—	○	○	—	○

○: Standard product ○: Made to order
—: Not available due to size limitation.
Note) Each of C, D, E is same as the Nil, A, B just turned.

Specifications



JIS Symbol



Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)			
	32	40	50, 63	80, 100
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5□W/J59W D-F5□F D-F5BAL D-F5NTL	BT-03	BT-04	BT-08	BT-16
D-Z7□/Z80	—	BMB4-050	BA4-080	BS4-160

D-A5□/A6□/A59W/Z7□/Z80 can not be mounted to ø32.

Standard Stroke

Bore size (mm)	Standard stroke (mm)
32	25 to 800
40	25 to 800
50	25 to 800
63	25 to 800
80	25 to 800
100	25 to 1000

Theoretical Output



Unit: N

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)			
				3.5	7	10	16
32	18	OUT	804	2814	5628	8040	12864
		IN	549	1922	3843	5490	8784
40	22	OUT	1256	4396	8792	12560	20096
		IN	876	3066	6132	8760	14016
50	28	OUT	1963	6871	13741	19630	31408
		IN	1347	4715	9429	13470	21552
63	36	OUT	3117	10910	21819	31170	49872
		IN	2099	7346	14693	20990	33584
80	45	OUT	5026	17591	35182	50260	80416
		IN	3436	12026	24052	34360	54976
100	56	OUT	7853	27486	54971	78530	125648
		IN	5390	18865	37730	53900	86240

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

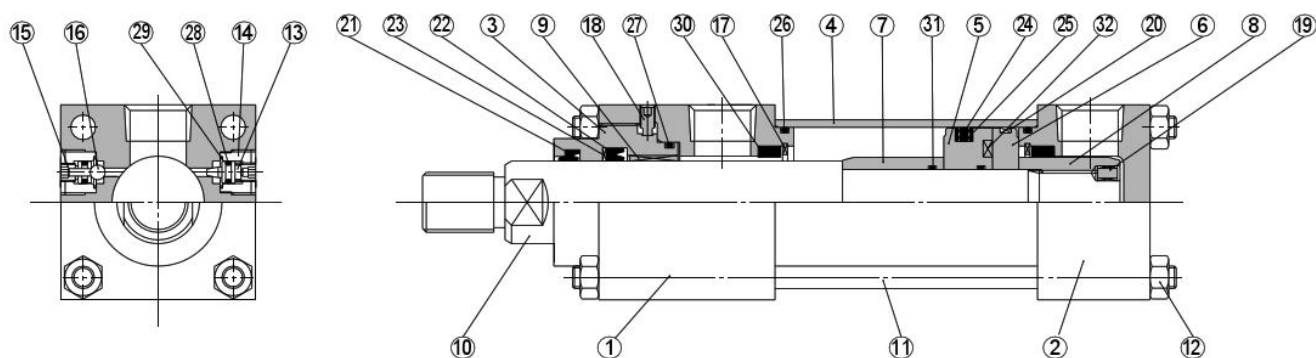
Weight

Bore size (mm)			32	40	50	63	80	100
Basic weight (0 stroke)	Basic	B	1.60	3.20	4.70	7.80	14.7	20.8
	Transaxial foot	LA	1.80	4.00	5.70	8.65	17.0	23.3
	Front flange	FY	1.90	4.10	6.00	9.10	16.7	22.9
	Rear flange	FZ	1.70	3.90	5.60	8.20	16.4	24.8
	Single clevis	CA	1.60	3.40	5.60	8.20	16.4	24.8
	Double clevis	CB	1.60	3.40	5.60	8.20	16.4	24.8
	Front trunnion	TA	1.70	3.40	5.20	8.40	15.9	22.5
	Center trunnion	TC	1.90	3.90	5.80	9.40	18.2	25.4
Additional weight per 10 strokes			0.05	0.07	0.12	0.18	0.28	0.42

Series CHSG

Construction

CH□SGB



Parts List

No.	Description	Material
1	Rod cover	Carbon steel
2	Head cover	Carbon steel
3	Seal holder	Carbon steel
4	Cylinder tube	Stainless steel
5	Piston	Stainless steel
6	Magnet plate	Stainless steel
7	Cushion ring	Carbon steel
8	Cushion ring nut	Carbon steel
9	Bushing	Copper alloy
10	Piston rod	Carbon steel
11	Tie-rod	Chromium molybdenum steel
12	Tie-rod nut	Carbon steel
13	Cushion valve	Alloy steel
14	Valve holder	Carbon steel
15	Air release valve	Alloy steel
16	Check ball	Bearing steel

No.	Description	Material
17	Snap ring	Carbon tool steel
18	Set screw	Alloy steel
19	Pin	Stainless steel
20	Wear ring	Resin
21	Scraper	NBR
22	Rod seal	NBR
23	Back-up ring	Resin
24	Piston seal	NBR
25	Back-up ring	Resin
26	Cylinder tube gasket	NBR
27	Holder gasket	NBR
28	Valve seal	NBR
29	Valve holder gasket	NBR
30	Cushion seal	—
31	Piston gasket	NBR
32	Magnet	—

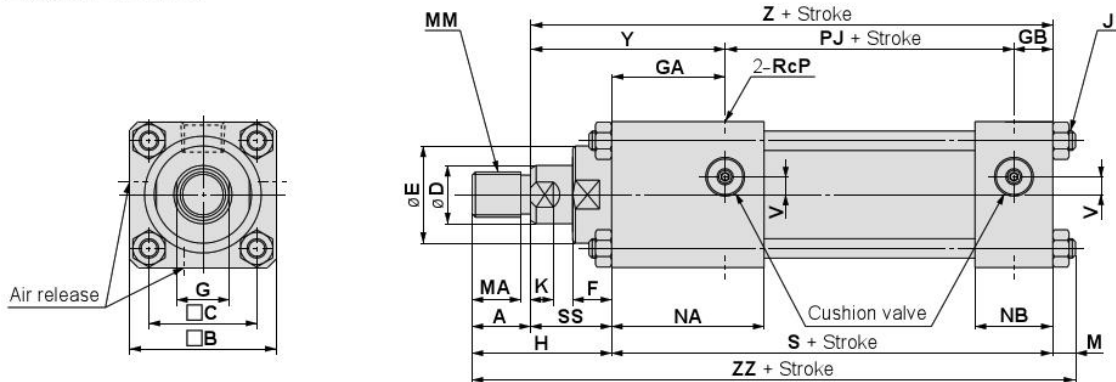
Replacement Parts / Seal Kits

Bore size (mm)	Seal kit no.
32	CHSG32-PS
40	CHSG40-PS
50	CHSG50-PS
63	CHSG63-PS
80	CHSG80-PS
100	CHSG100-PS

Seal kits consists of item 21 to 26 and 30, and can be ordered by using the seal kit number for each bore size.

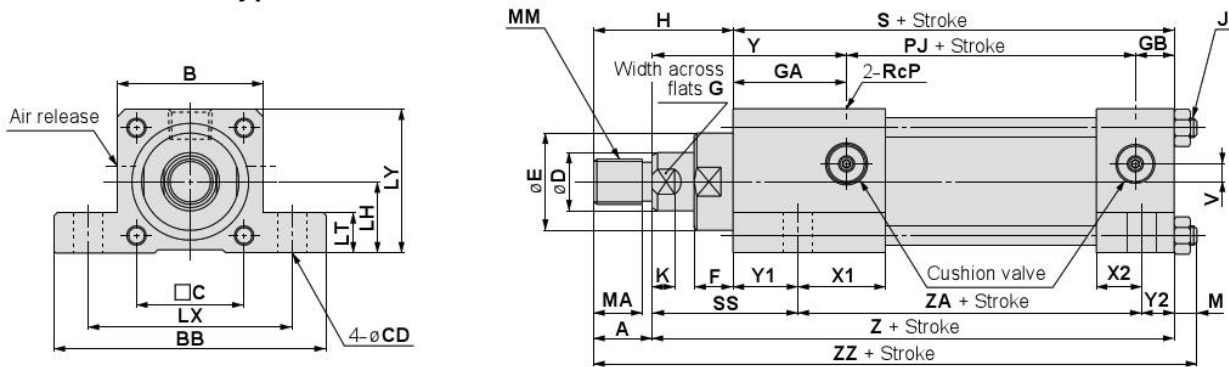
Dimensions

Basic / CHSGB



Bore size (mm)	Stroke range	A	B	C	D	E	F	G	GA	GB	H	J	K	M	MA	MM	NA	NB	P	PJ	S	SS	V	Y	Z	ZZ
32	25 to 800	18	45	33.2	18	30	12	14	35	12	43	M6 - 1	7	7.5	15	M14 - 1.5	46	23	1/4	56	103	25	5.5	60	128	153.5
40	25 to 800	22	63	41.7	22	34	12	19	37	18	47	M8 - 1	9	10	19	M16 - 1.5	51	32	3/8	73	128	25	6.5	62	153	185
50	25 to 800	28	75	52.3	28	42	9	24	42	18	53	M12 - 1.25	11	12	25	M20 - 1.5	57	33	1/2	74	134	25	7	67	159	199
63	25 to 800	36	90	64.3	36	50	13	30	39	17	68	M12 - 1.25	13	12	32	M27 - 2	55	33	1/2	80	136	32	12	71	168	216
80	25 to 800	45	115	82.7	45	60	9	41	46	20	76	M16 - 1.5	17	16	41	M33 - 2	66	40	3/4	93	159	31	15	77	190	251
100	25 to 1000	56	130	96.9	56	72	10	50	47	20	91	M16 - 1.5	19	16	52	M42 - 2	67	40	3/4	101	168	35	15	82	203	275

Transaxial Foot Type / CHSGLA



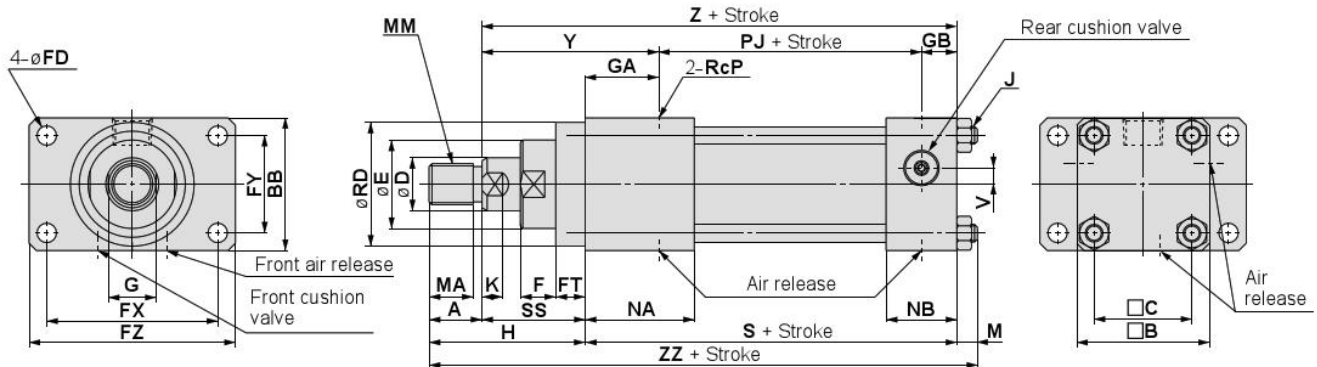
Bore size (mm)	Stroke range	A	B	BB	C	CD	D	E	F	G	GA	GB	H	J	K	LH	LT	LX	LY	M	MA	MM	P	PJ	S	SS
32	25 to 800	18	45	84	33.2	9	18	30	12	14	35	12	43	M6 - 1	7	22	12.5	63	44.5	7.5	15	M14 - 1.5	1/4	56	103	45
40	25 to 800	22	63	103	41.7	11	22	34	12	19	37	18	47	M8 - 1	9	31	12.5	83	62.5	10	19	M16 - 1.5	3/8	73	128	45
50	25 to 800	28	75	127	52.3	14	28	42	9	24	42	18	53	M12 - 1.25	11	37	19	102	74.5	12	25	M20 - 1.5	1/2	74	134	54
63	25 to 800	36	90	161	64.3	18	36	50	13	30	39	17	68	M12 - 1.25	13	44	26	124	89	12	32	M27 - 2	1/2	80	136	65
80	25 to 800	45	115	186	82.7	18	45	60	9	41	46	20	76	M16 - 1.5	17	57	26	149	114.5	16	41	M33 - 2	3/4	93	159	68
100	25 to 1000	56	130	216	96.9	26	56	72	10	50	47	20	91	M16 - 1.5	19	63	32	172	128	16	52	M42 - 2	3/4	101	168	79

Bore size (mm)	V	X1	X2	Y	Y1	Y2	ZA	Z	ZZ
32	5.5	26	13	60	20	10	73	128	153.5
40	6.5	31	22	62	20	10	98	153	185
50	7	28	20	67	29	13	92	159	199
63	12	22	16	71	33	17	86	168	216
80	15	29	23	77	37	17	105	190	251
100	15	23	18	82	44	22	102	203	275

Series CHSG

Dimensions

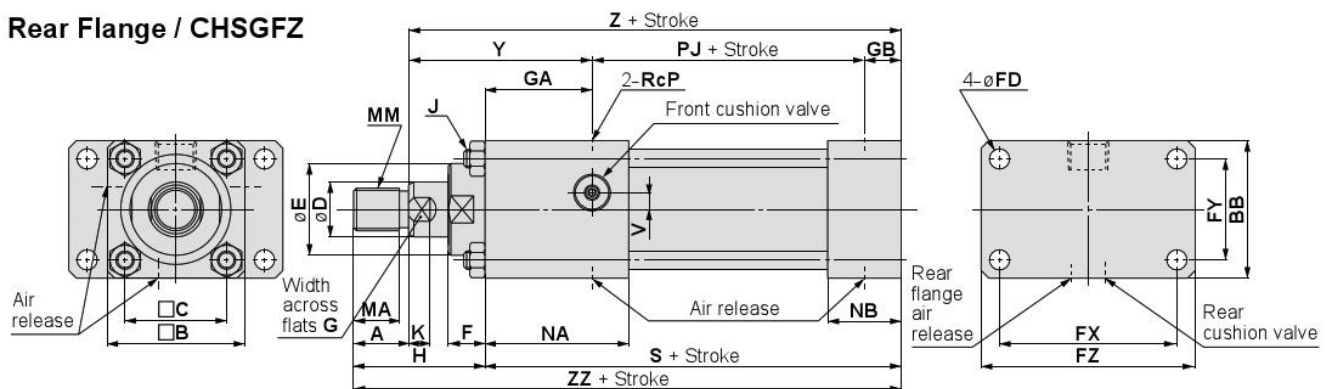
Front Flange / CHSGFY



Bore size (mm)	Stroke range	A	B	BB	C	D	E	F	FD	FT	FX	FY	FZ	G	GA	GB	H	J	K	M	MA	MM	NA	NB	P	PJ
32	25 to 800	18	45	45	33.2	18	30	12	6.6	10	58	33	70	14	25	12	53	M6 - 1	7	7.5	15	M14 - 1.5	36	23	1/4	56
40	25 to 800	22	63	63	41.7	22	34	12	11	10	87	41	110	19	27	18	57	M8 - 1	9	10	19	M16 - 1.5	41	32	3/8	73
50	25 to 800	28	75	75	52.3	28	42	9	14	16	105	52	130	24	26	18	69	M12 - 1.25	11	12	25	M20 - 1.5	41	33	1/2	74
63	25 to 800	36	90	90	64.3	36	50	13	14	16	117	65	145	30	23	17	84	M12 - 1.25	13	12	32	M27 - 2	39	33	1/2	80
80	25 to 800	45	115	115	82.7	45	60	9	18	20	149	83	180	41	26	20	96	M16 - 1.5	17	16	41	M33 - 2	46	40	3/4	93
100	25 to 1000	56	130	130	96.9	56	72	10	18	22	162	97	200	50	25	20	113	M16 - 1.5	19	16	52	M42 - 2	45	40	3/4	101

Bore size (mm)	RD	S	SS	V	Y	Z	ZZ
32	42	-0.025 -0.064	93	35	5.5	60	128 153.5
40	62	-0.030 -0.076	118	35	6.5	62	153 185
50	74		118	41	7	67	159 199
63	82		120	48	12	71	168 216
80	92	-0.036 -0.090	139	51	15	77	190 251
100	105		146	57	15	82	203 275

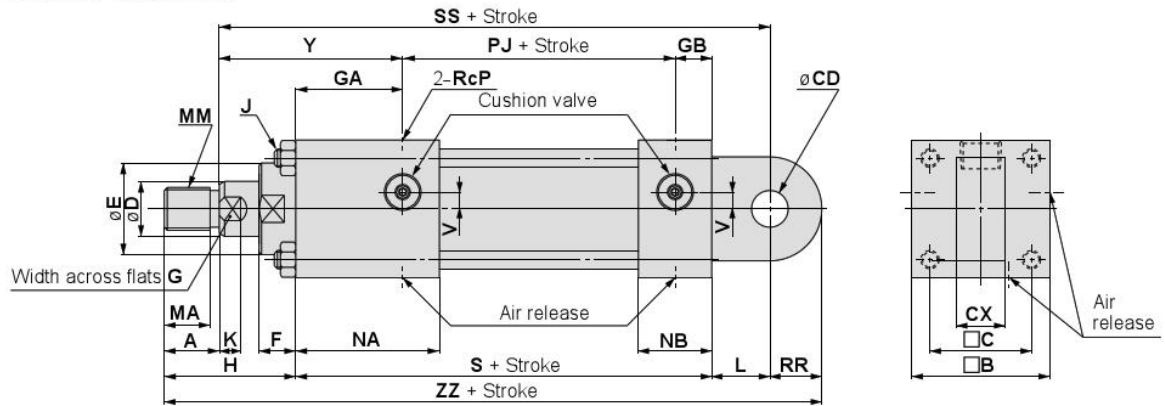
Rear Flange / CHSGFZ



Bore size (mm)	Stroke range	A	B	BB	C	D	E	F	FD	FX	FY	FZ	G	GA	GB	H	J	K	MA	MM	NA	NB	P	PJ	S	V	Y	Z	ZZ
32	25 to 800	18	45	45	33.2	18	30	12	6.6	58	33	70	14	35	12	43	M6 - 1	7	15	M14 - 1.5	46	23	1/4	56	103	5.5	60	128	146
40	25 to 800	22	63	63	41.7	22	34	12	11	87	41	110	19	37	18	47	M8 - 1	9	19	M16 - 1.5	51	32	3/8	73	128	6.5	62	153	175
50	25 to 800	28	75	75	52.3	28	42	9	14	105	52	130	24	42	18	53	M12 - 1.25	11	25	M20 - 1.5	57	33	1/2	74	134	7	67	159	187
63	25 to 800	36	90	90	64.3	36	50	13	14	117	65	145	30	39	17	68	M12 - 1.25	13	32	M27 - 2	55	33	1/2	80	136	12	71	168	204
80	25 to 800	45	115	115	82.7	45	60	9	18	149	83	180	41	46	20	76	M16 - 1.5	17	41	M33 - 2	66	40	3/4	93	159	15	77	190	235
100	25 to 1000	56	130	130	96.9	56	72	10	18	162	97	200	50	47	20	91	M16 - 1.5	19	52	M42 - 2	67	40	3/4	101	168	15	82	203	259

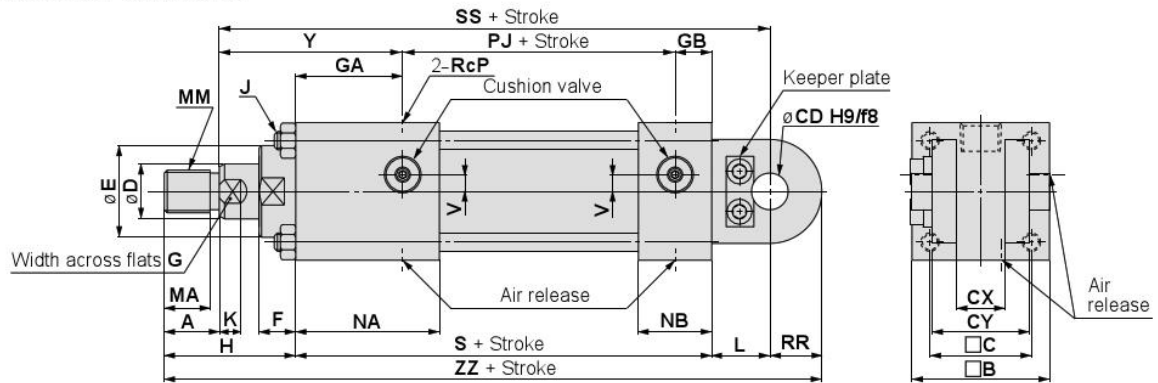
Dimensions

Single Clevis / CHSGCA



Bore size (mm)	Stroke range	A	B	C	CD	CX	D	E	F	G	GA	GB	H	J	K	L	MA	MM	NA	NB	P	PJ	RR	S	SS	V	Y	ZZ	
32	25 to 800	18	45	33.2	12	$+0.043_0$	16	18	30	12	14	35	12	43	M6 · 1	7	19	15	M14 · 1.5	46	23	1/4	56	17	103	147	5.5	60	182
40	25 to 800	22	63	41.7	14		20	22	34	12	19	37	18	47	M8 · 1	9	19	19	M16 · 1.5	51	32	3/8	73	17	128	172	6.5	62	211
50	25 to 800	28	75	52.3	20	$+0.052_0$	30	28	42	9	24	42	18	53	M12 · 1.25	11	32	25	M20 · 1.5	57	33	1/2	74	29	134	191	7	67	248
63	25 to 800	36	90	64.3	20		30	36	50	13	30	39	17	68	M12 · 1.25	13	32	32	M27 · 2	55	33	1/2	80	29	136	200	12	71	265
80	25 to 800	45	115	82.7	28	$+0.062_0$	40	45	60	9	41	46	20	76	M16 · 1.5	17	39	41	M33 · 2	66	40	3/4	93	34	159	229	15	77	308
100	25 to 1000	56	130	96.9	36		50	56	72	10	50	47	20	91	M16 · 1.5	19	54	52	M42 · 2	67	40	3/4	101	50	168	257	15	82	363

Double Clevis / CHSGCB



Bore size (mm)	Stroke range	A	B	C	CD	CX	CY	D	E	F	G	GA	GB	H	J	K	L	MA	MM	NA	NB	P	PJ	RR
32	25 to 800	18	45	33.2	12	16	32	18	30	12	14	35	12	43	M6 · 1	7	19	15	M14 · 1.5	46	23	1/4	56	17
40	25 to 800	22	63	41.7	14	20	43	22	34	12	19	37	18	47	M8 · 1	9	19	19	M16 · 1.5	51	32	3/8	73	17
50	25 to 800	28	75	52.3	20	30	60	28	42	9	24	42	18	53	M12 · 1.25	11	32	25	M20 · 1.5	57	33	1/2	74	29
63	25 to 800	36	90	64.3	20	30	60	36	50	13	30	39	17	68	M12 · 1.25	13	32	32	M27 · 2	55	33	1/2	80	29
80	25 to 800	45	115	82.7	28	40	80	45	60	9	41	46	20	76	M16 · 1.5	17	39	41	M33 · 2	66	40	3/4	93	34
100	25 to 1000	56	130	96.9	36	50	100	56	72	10	50	47	20	91	M16 · 1.5	19	54	52	M42 · 2	67	40	3/4	101	50

Tolerances

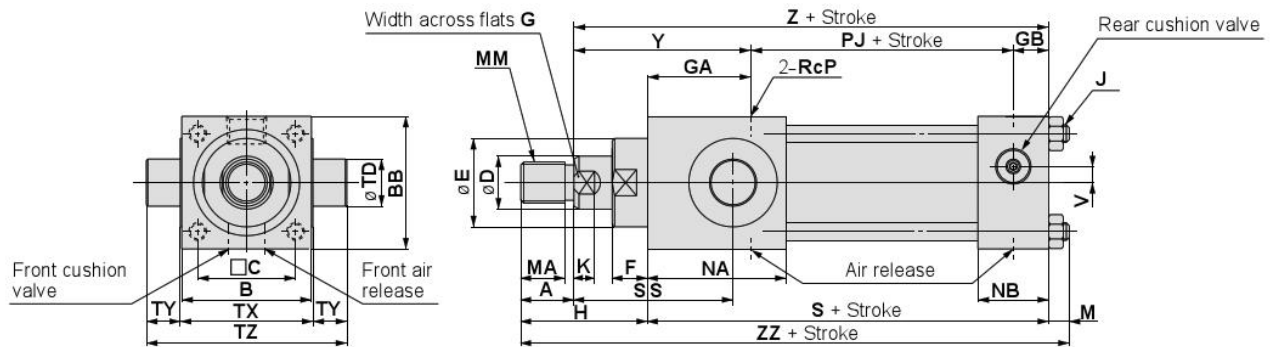
Bore size (mm)	S	SS	V	Y	ZZ
32	103	147	5.5	60	182
40	128	172	6.5	62	211
50	134	191	7	67	248
63	136	200	12	71	265
80	159	229	15	77	308
100	168	257	15	82	363

Bore size (mm)	CD	
	H9	f8
32	+0.043 0	-0.016 -0.043
40		
50	+0.052 0	-0.020 -0.053
63		
80	+0.062 0	-0.025 -0.064
100		

Series CHSG

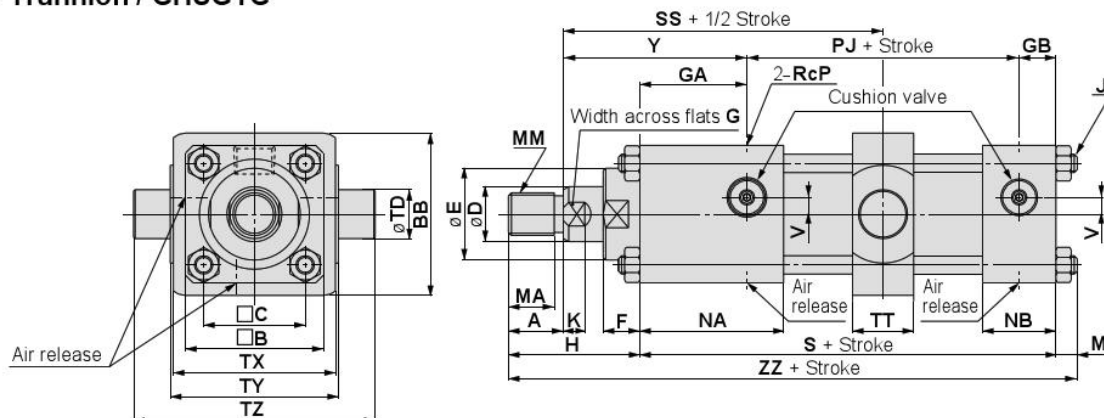
Dimensions

Front Trunnion / CHSGTA



Bore size (mm)	Stroke range	A	B	BB	C	D	E	F	G	GA	GB	H	J	K	M	MA	MM	NA	NB	P	PJ	TD	TX	TZ	S	SS	V	Y	Z	ZZ	
32	25 to 800	18	44	45	33.2	18	30	12	14	35	12	43	M6 - 1	7	7.5	15	M14 - 1.5	46	23	1/4	56	16	^{+0.016} _{-0.043}	45	68	103	54	5.5	60	128	153.5
40	25 to 800	22	61	63	41.7	22	34	12	19	37	18	47	M8 - 1	9	10	19	M16 - 1.5	51	32	3/8	73	20	^{+0.020} _{-0.053}	63	95	128	57	6.5	62	153	185
50	25 to 800	28	75	75	52.3	28	42	9	24	42	18	53	M12 - 1.25	11	12	25	M20 - 1.5	57	33	1/2	74	25	^{+0.020} _{-0.053}	76	116	134	64	7	67	159	199
63	25 to 800	36	87	90	64.3	36	50	13	30	39	17	68	M12 - 1.25	13	12	32	M27 - 2	55	33	1/2	80	32	^{+0.025} _{-0.064}	89	139	136	70	12	71	168	216
80	25 to 800	45	112	115	82.7	45	60	9	41	46	20	76	M16 - 1.5	17	16	41	M33 - 2	66	40	3/4	93	40	^{+0.025} _{-0.064}	114	178	159	76	15	77	190	251
100	25 to 1000	56	125	130	96.9	56	72	10	50	47	20	91	M16 - 1.5	19	16	52	M42 - 2	67	40	3/4	101	50		127	207	168	71	15	82	203	275

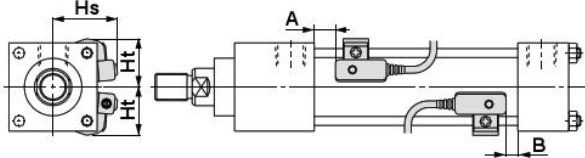
Center Trunnion / CHSGTC



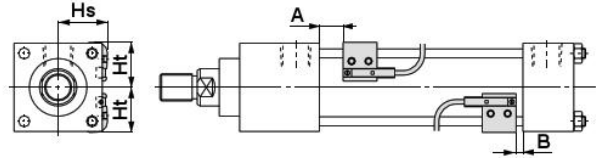
Bore size (mm)	Stroke range	A	B	BB	C	D	E	F	G	GA	GB	H	J	K	M	MA	MM	NA	NB	P	PJ	S	SS	TD	TT	TX	TY	TZ	V	Y	ZZ	
32	25 to 800	18	45	57	33.2	18	30	12	14	35	12	43	M6 - 1	7	7.5	15	M14 - 1.5	46	23	1/4	56	103	88	16	0	20	53	55	79	5.5	60	153.5
40	25 to 800	22	63	65	41.7	22	34	12	19	37	18	47	M8 - 1	9	10	19	M16 - 1.5	51	32	3/8	73	128	98.5	20	+0.033 -0.043	26	72	76	108	6.5	62	185
50	25 to 800	28	75	75	52.3	28	42	9	24	42	18	53	M12 - 1.25	11	12	25	M20 - 1.5	57	33	1/2	74	134	104	25	+0.004 -0.043	29	88	89	129	7	67	199
63	25 to 800	36	90	90	64.3	36	50	13	30	39	17	68	M12 - 1.25	13	12	32	M27 - 2	55	33	1/2	80	136	111	32	+0.009 -0.054	36	90	100	150	12	71	216
80	25 to 800	45	115	115	82.7	45	60	9	41	46	20	76	M16 - 1.5	17	16	41	M33 - 2	66	40	3/4	93	159	123.5	40	+0.009 -0.054	44	123	127	191	15	77	251
100	25 to 1000	56	130	130	96.9	56	72	10	50	47	20	91	M16 - 1.5	19	16	52	M42 - 2	67	40	3/4	101	168	132.5	50		54	130	140	220	15	82	275

Proper Auto Switch Mounting Position for Stroke End Detection and Mounting Height

D-A5□/A6□
D-F5□(W)/J5□(W)/F5BAL



D-Z7□/Z80



Proper Auto Switch Mounting Position

Bore size (mm)	D-A5□/A6□		D-A59W		D-F5□/J5□ D-F5□W/J59W D-F59F D-F5BAL		D-F5LF		D-F5NTL		D-Z7□/Z80	
	A	B	A	B	A	B	A	B	A	B	A	B
32	—	—	—	—	10.5	4.5	14.5	8.5	15.5	9.5	—	—
40	12.5	0.5	16.5	4.5	19	7	23	11	24	12	16	4
50	12.5	0	16.5	3.5	19	6	23	10	24	11	16	3
63	14.5	1.5	18.5	5.5	21	8	25	12	26	13	18	5
80	17.5	3.5	21.5	7.5	24	10	28	14	29	15	21	7
100	21	8	25	12	27.5	14.5	31.5	18.5	32.5	19.5	24.5	11.5

Auto Switch Mounting Height

Bore size (mm)	D-A5□/A6□ D-A59W		D-F5□/J5□ D-F5□W/J59W D-F59F D-F5BAL D-F5NTL		D-F5LF		D-Z7□/Z80	
	Ht	Hs	Ht	Hs	Ht	Hs	Ht	Hs
32	—	—	25	32.5	25	33.5	—	—
40	30	38.5	30	36	30	37	28.5	29
50	37.5	43.5	37.5	41	37.5	42	36	37
63	43.5	49	43.5	46.5	43.5	47.5	42	42.5
80	56.5	59.5	56.5	57	56.5	58	54.5	54
100	64.5	69	64.5	66	64.5	67	61.5	62.5

Operating Range

Auto switch model	Bore size (mm)					
	32	40	50	63	80	100
D-A5□/A6□	—	9	10	11	14	17.5
D-A59W	—	12.5	13	14.5	17.5	22
D-Z7□/Z80	—	8.5	9.5	10.5	14.5	19.5
D-F5□/J5□ D-F5□W/J59W D-F5BAL/F5NTL D-F59F	4	4.5	5	4	5.5	6.5
D-F5LF	5	5.5	6	5	6.5	7.5

Minimum Auto Switch Mounting Stroke

Auto switch model	Auto switch mounting number	Mounting bracket other than center trunnion	Center trunnion					
			32	40	50	63	80	100
D-A5□/A6□	2 (Different side and same side), 1	25	—	120	120	130	135	145
	n	$25+55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	—	$120+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$120+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$130+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$135+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$145+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
D-A59W	2 (Different side and same side), 1	30	—	125	130	135	145	155
	n	$30+55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	—	$125+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$130+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$135+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$145+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$155+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
D-F5□/J5□ D-F5□W/J59W D-F5BAL	2 (Different side and same side), 1	20	110	125	130	135	140	150
	n	$20+55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$110+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$125+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$130+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$135+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$140+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$150+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
D-F5□F/F5NTL	2 (Different side and same side), 1	20	125	140	145	150	155	165
	n	$20+55 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	$125+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$140+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$145+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$150+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$155+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$165+55 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...
D-Z7□/Z80	2 (Different side and same side), 1	25	—	95	100	105	115	125
	n	$25+40 \frac{(n-2)}{2}$ n = 2, 4, 6, 8...	—	$95+40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$100+40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$105+40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$115+40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...	$125+40 \frac{(n-4)}{2}$ n = 4, 8, 12, 16...

Besides the models listed in "How to Order," the following auto switches are applicable.
Contact SMC for detailed auto switch specifications.

Auto switch type	Part no.	Electrical entry	Features
Reed	D-A53, A56	Grommet (in-line)	—
	D-A64, A67		Without indicator light
	D-Z80		
Solid state	D-F5NTL	Grommet (in-line)	With timer

Solid state switches are also available with pre-wired connector. Contact SMC for detailed auto switch specifications.