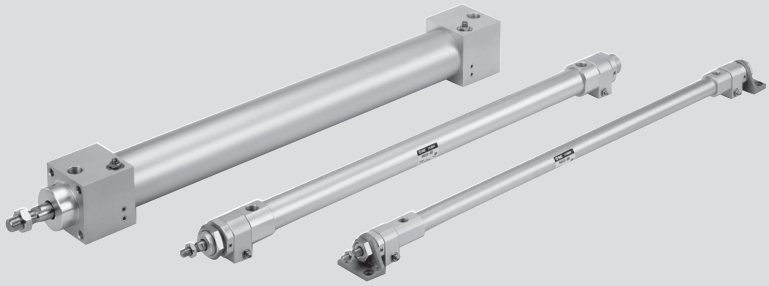
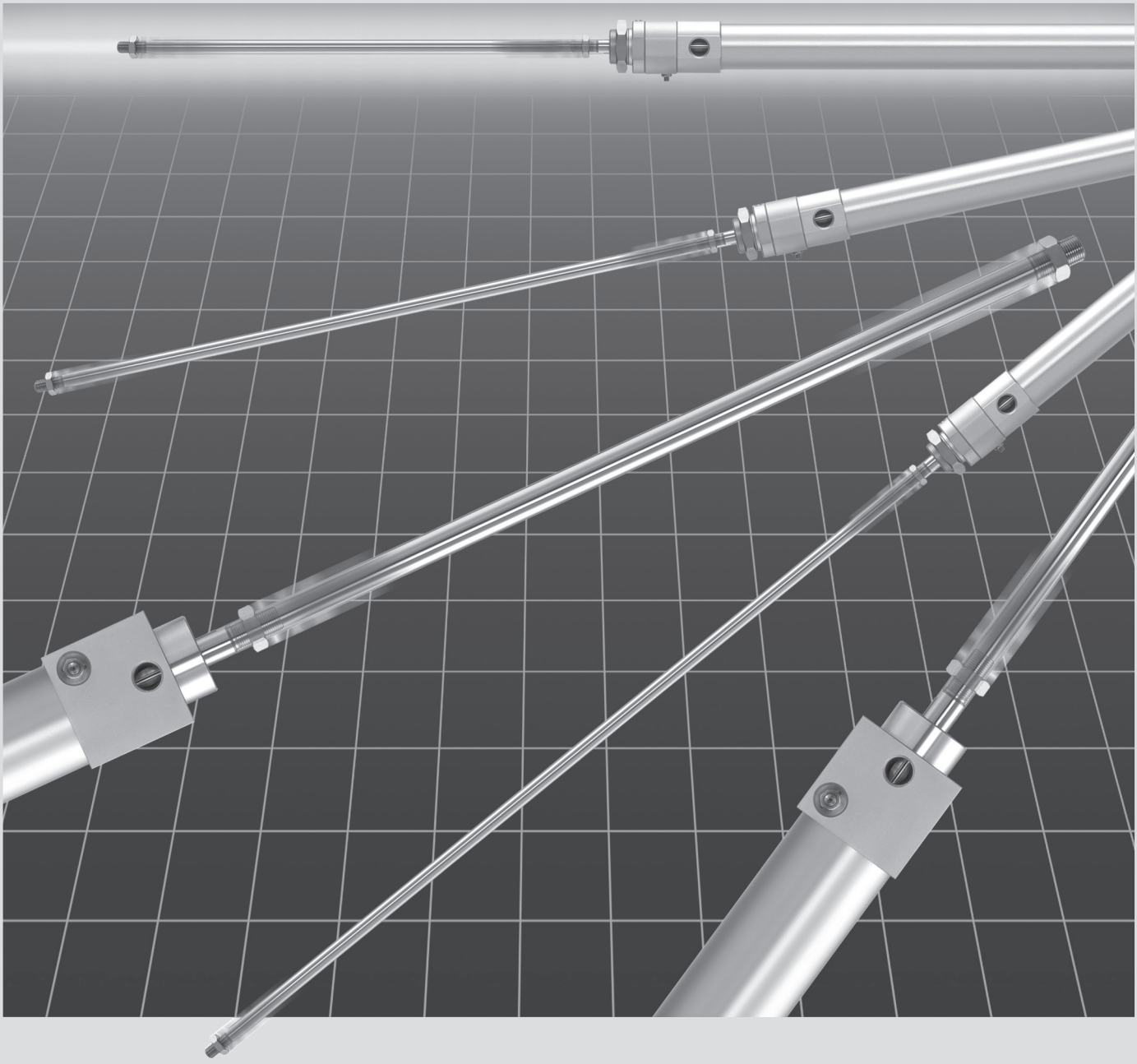
High Power Cylinder

Ø 20, Ø 25, Ø 32, Ø 40, Ø 50, Ø 63, Ø 80, Ø 100





***RHC* Series**

SMC

EMC-RHC-01A-UK

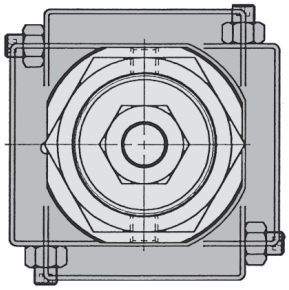
High power cylinder:

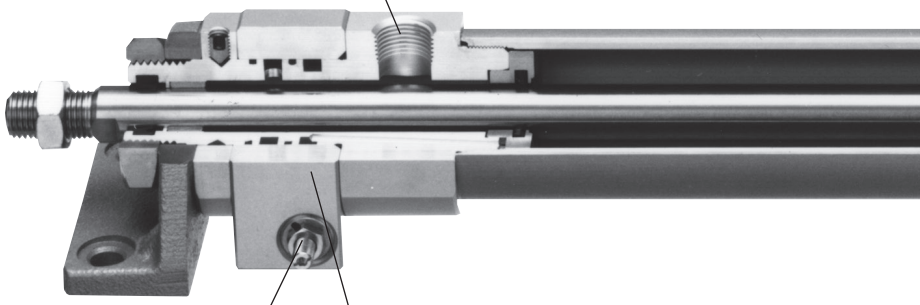
Smooth cushioning for high speed operation (3000 low/medium speed operation with heavy loads

The capacity to absorb 10 to 20 times more energy than general purpose cylinders.

Supply/Exhaust port

The diameter of the port orifice has been enlarged to support high speed operation.





Relief valve adjusting screw

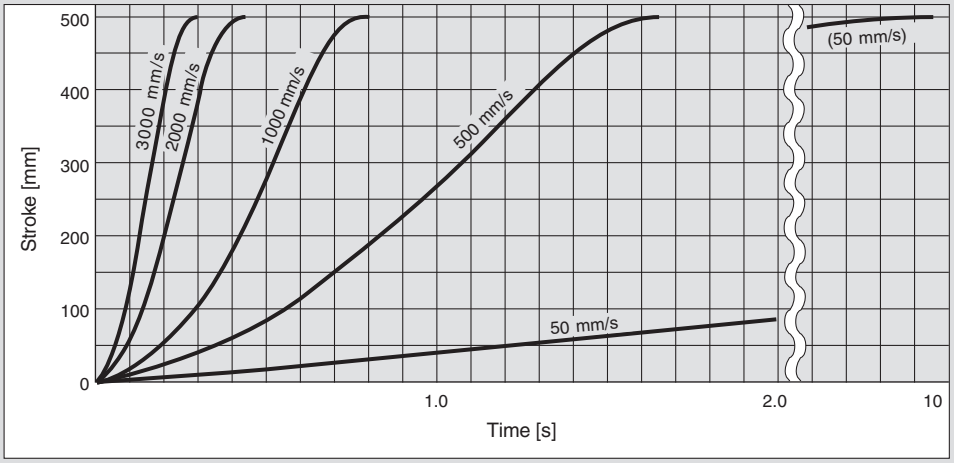
Relief valve body

The relief valve body rotates 360°, enabling relief adjustment from any direction. (Ø 20, Ø 25, Ø 32, Ø 40)

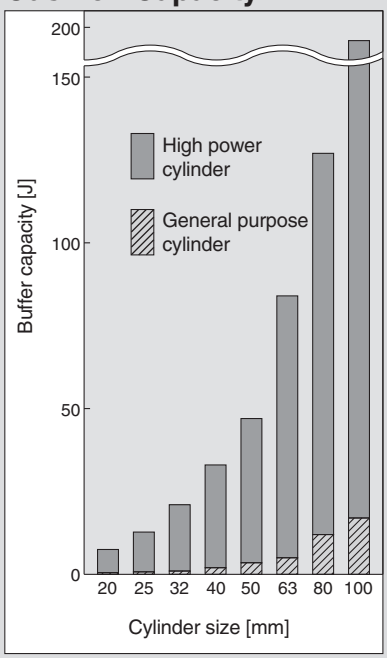
Mounting and Cushion Adjustment

Piping/mounting man-hours are the same as that of the general purpose cylinders.
Cushion adjustment (relief adjustment) man-hours are the same as the adjustment (cushion needle adjustment) for general purpose cylinders.

Quality of Cushioning (RHCF40-500, Load mass 5 kg, Supply pressure 0.5 MPa, Horizontal operation)



Cushion Capacity



RHC Series

mm/s) with light loads and

Cushion ring

The long cushion ring can absorb larger energy (in terms of speed and weight).

Cushion seal

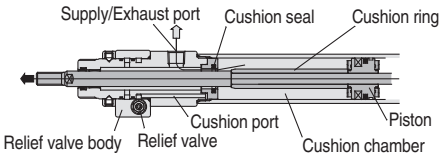
Strong seals are used for improved high speed durability and cushioning performance.

Relief valve

The relief valve is used as a cushion valve and it provides better cushioning performance than a needle throttle of a general purpose cylinder.

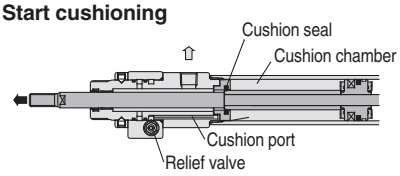
Working Principle

1. Before cushioning



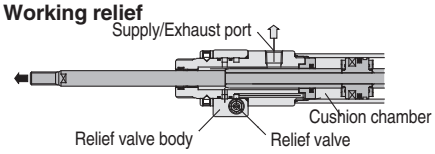
Air passes via the clearance between the cushion seal and the piston rod to the supply/exhaust port.

2. Start cushioning



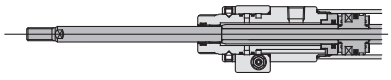
The cushion seal establishes the cushion chamber. Air flows to the cushion port provided in the rod cover.

3. Working relief



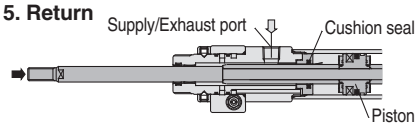
Air passes through the relief valve provided in the relief valve body, through the inside of the rod cover, to the supply/exhaust port.

4. Finish cushioning



Transferring to the opposite stroke, air passes through the cushion seal that functions as a check valve, and starts to push the piston.

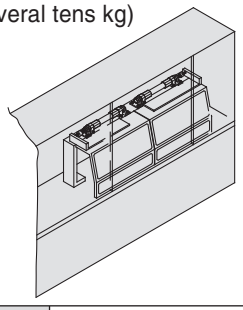
5. Return



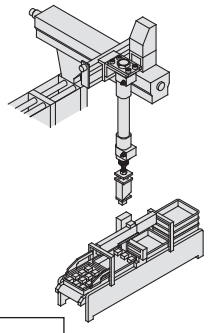
The cushion ring travels past the cushion seal, and the stroke becomes the opposite of step 1, and the movements shown in steps 1 through 4 above are carried out on the head cover side.

Application Examples

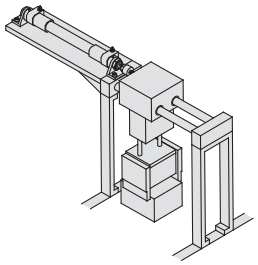
Opening/closing doors
(2000 mm/s,
several tens kg)



High speed Z-axis
(Up to 3000 mm/s, several kg)



Transfer equipment
40 kg, 1000 mm/s (For Ø 32)



RHC Series
Model Selection

Model Selection Example of High Power Cylinder

Selection Example 1. Horizontal Drive

Operating conditions

Horizontal drive	Graph (1)-1
Load mass	**M** = 100 kg
Stroke	**St** = 500 mm
Time for stroke required	**To** = 0.5 s

Estimate of the maximum speed

Average stroke speed	**Vm** = **St/To** = 1000 mm/s
Maximum speed	**Vmax** = 1.5 **Vm** = 1500 mm/s

Model selection by graph

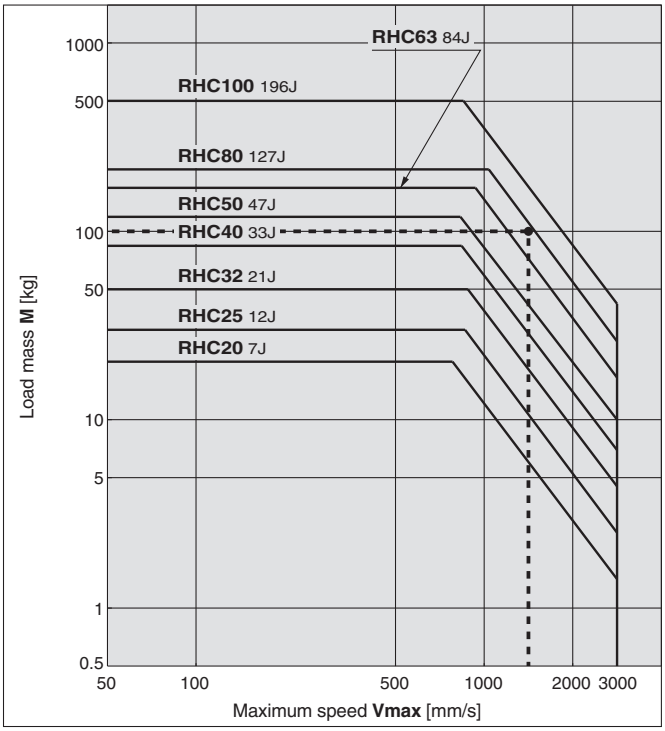
Load mass	**M** = 100 kg
Max. speed	**Vmax** = 1500 mm/s

Graph (1)-1 ●

RHC80

∗ Use an external guide, etc. for horizontal actuation of a load.

Graph (1)-1 Horizontal Drive Supply Pressure 0.5 MPa



Selection Example 2. Vertical Drive

Operating conditions

Vertical drive	Graph (1)-2
Load mass	**M** = 5 kg
Stroke	**St** = 800 mm
Time for stroke required	**To** = 0.5 s

Estimate of the maximum speed

Average stroke speed	**Vm** = **St/To** = 1600 mm/s
Maximum speed	**Vmax** = 1.5 **Vm** = 2400 mm/s

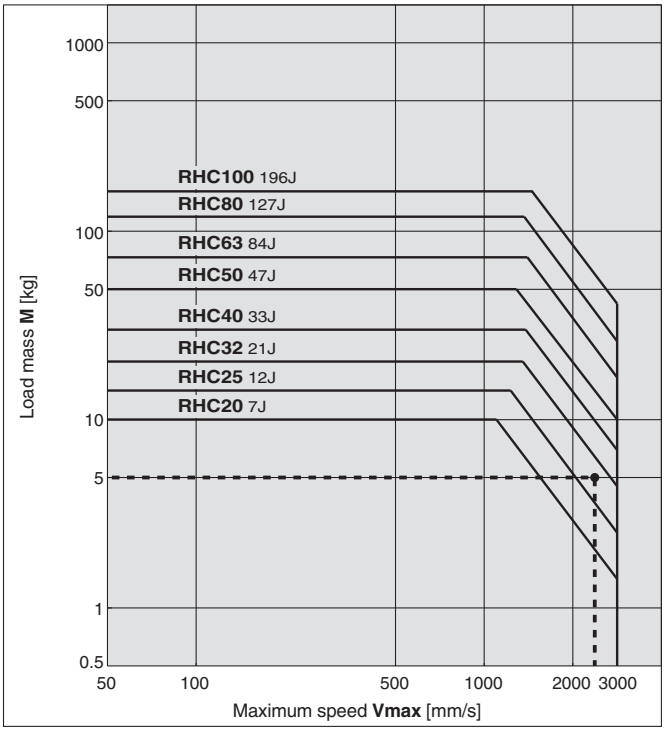
Model selection by graph

Load mass	**M** = 5 kg
Max. speed	**Vmax** = 2400 mm/s

Graph (1)-2 ●

RHC32

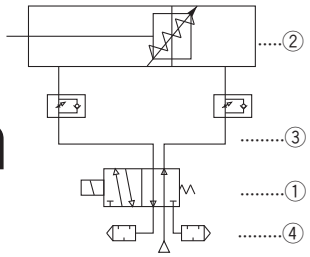
Graph (1)-2 Vertical Drive Supply Pressure 0.5 MPa



Maximum Energy Absorption

Bore size [mm]	20	25	32	40	50	63	80	100
Maximum energy absorption [J]	7	12	21	33	47	84	127	196

RHC Series
System Selection

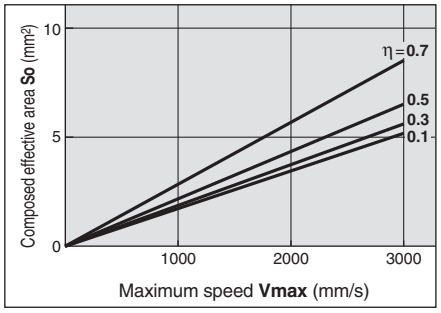


① Solenoid valve (A to G)
② Speed control valve (1-A to 2-B)
③ Piping 3 m
④ Silencer
(Supply pressure 0.5 MPa)

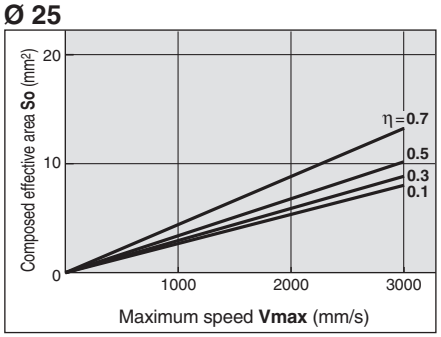
Apply η (cylinder load ratio) and Vmax (max. speed) and determine effective sectional area "So".

Refer to "System Selection" table, and the appropriate solenoid valve, speed control valve and bore size may be selected.

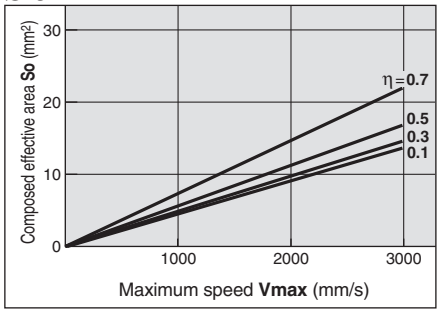
Ø 20



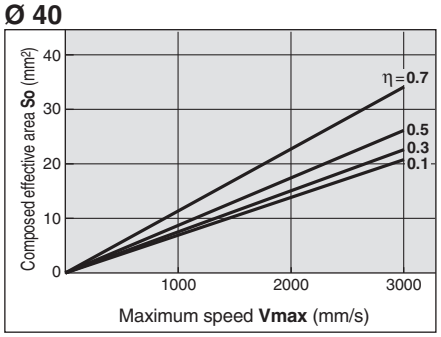
Ø 25



Ø 32



Ø 40



η: Cylinder load ratio
Vmax: Maximum speed (Refer to page 3.)

System Selection

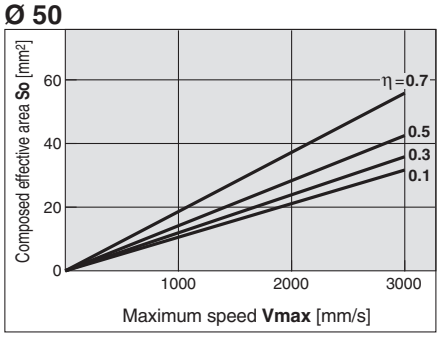
Bore size (mm)	Maximum speed (mm/s)	Composed effective area (mm²)	Solenoid valve ( ): Effective area [mm²] A	B	C	D	E	Speed controller 1 With One-touch fittings		Speed controller 2 Standard type		Tubing O.D. (mm) Steel piping size
			3.6 to 6.3	9.0 to 14.4	16.2 to 21.6	36 to 45	64.8 to 67	1-A	Elbow type	2-A	Metal elbow type	
			VQ1000 (3.6)	VQ2000 (14.4)	—	VQ4000 (36.0)	—	1-B	Universal type			
			VQ1000 (5.4)	—	VQ2000 (16.2)	VQ4000 (39.6)	—					
			SY3000 (5.4)	SY5000 (12.6)	SY7000 (21.6)	—	—	1-C	In-line type			
			SX3000 (5.4)	SX5000 (12.6)	SX7000 (21.6)	—	—					
			SYJ5000 (4.5)	SYJ7000 (12.6)	—	—	—					
			VQZ1000 (3.6)	VQZ2000 (12.6)	VQZ3000 (16.2)	—	—					
			VQZ1000 (6.3)	VQZ2000 (12.6)	VQZ3000 (21.6)	—	—					
			—	—	VFR2000 (16.2)	VFR3000 (41.4)	VFR4000 (67.0)			2-A	Metal elbow type	
			—	VFS1000 (9.0)	VFS2000 (18.0)	VFS3000 (36.0)	VFS4000 (64.5)			2-B	In-line type	
			—	—	—	—	—					
20	500	1.5						1-A	AS22□1F (3.5)			Ø 6 1/8, 1/4
								1-B	AS23□1F (3.5)			
								1-C	AS2051F (4.5)			
								2-A	AS22□0 (2.9)			
								2-B	AS2000 (3.8)			
	1000	3						1-C	AS3001F (6.5)			Ø 6 1/4, 3/8
								2-B	AS3000,AS3500 (12.3)			
	1500	4.5						1-C	AS4001F (16)			Ø 10 1/4, 3/8
								2-B	AS3000,AS3500 (12.3)			
	2000	6						1-C	AS4001F (16)			Ø 10 1/4, 3/8
								2-B	AS3000,AS3500 (12.3)			
	2500	7.5						1-C	AS4001F (16)			Ø 10 1/4, 3/8
								2-B	AS3000, AS3500 (12.3)			
	3000	9						1-C	AS4001F (16)			Ø 10 1/4, 3/8
								2-B	AS3000, AS3500 (12.3)			
25	500	2.5						1-C	AS2051F (4.5)			Ø 6 1/4, 3/8
								2-B	AS3000, AS3500 (12.3)			
	1000	5						1-C	AS3001F (10)			Ø 8 1/4, 3/8
								2-B	AS3000, AS3500 (12.3)			
	1500	7.5						1-C	AS4001F (16)			Ø 10 1/4, 3/8
								2-B	AS3000, AS3500 (12.3)			
	2000	10						1-C	AS4001F (16)			Ø 10 1/4
								2-B	AS4000 (25.5)			
	2500	12.5						2-B	AS4000 (25.5)			1/4
	3000	15						2-B	AS4000 (25.5)			1/4
32	500	4						1-A	AS32□1F(10)			Ø 6 Ø 10 1/4, 3/8
								1-B	AS33□1F (10)			
								1-C	AS4001F (16)			
								2-A	AS32□0 (13)			
								2-B	AS3000, AS3500 (12.3)			
	1000	8						1-C	AS4001F (16)			Ø 10 1/4, 3/8
								2-A	AS32□0 (13)			
								2-B	AS3000,AS3500 (12.3)			
	1500	12						2-B	AS4000 (25.5)			1/4, 3/8
	2000	16						2-B	AS5000 (74)			3/8
	2500	20						2-B	AS5000 (74)			3/8
	3000	24						2-B	AS5000 (74)			3/8
40	500	6						1-A	AS32□1F (10)			Ø 8 Ø 10 1/4, 3/8
								1-B	AS33□1F (10)			
								1-C	AS4001F (16)			
								2-A	AS32□0 (13)			
								2-B	AS3000, AS3500 (12.3)			
	1000	12						2-B	AS4000 (25.5)			3/8, Ø 12
	1500	18						2-B	AS5000 (74)			3/8, Ø 12
	2000	24						2-B	AS5000 (74)			3/8, Ø 12
	2500	30						2-B	AS5000 (74)			3/8, Ø 12
	3000	36						2-B	AS420 (74)			3/8, Ø 12

Note) Refer to page 7 for maximum absorbed energy since cushioning ability may in some cases exceed the allowable cushioning ability if the cylinder is used under high speeds and large loads.

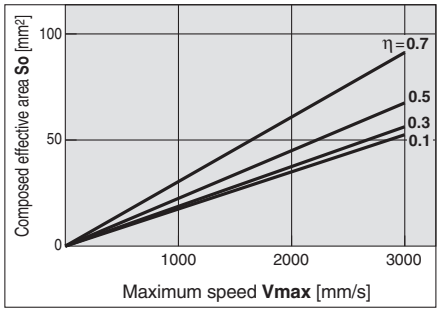
Apply η (cylinder load ratio) and Vmax (max. speed) and determine effective sectional area "So".

Refer to "System Selection" table, and the appropriate solenoid valve, speed control valve and bore size may be selected.

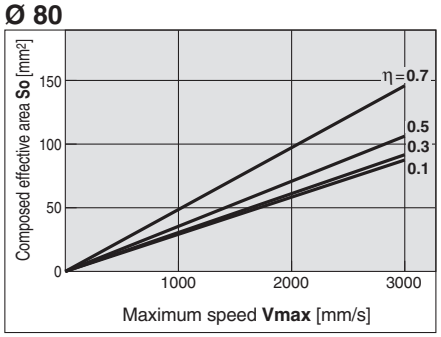
Ø 50



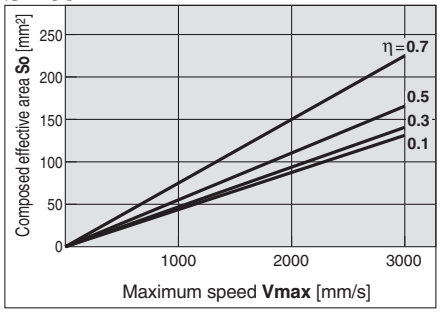
Ø 63



Ø 80



Ø 100



η: Cylinder load ratio
Vmax: Maximum speed (Refer to page 3.)

System Selection

Bore size [mm]	Maximum speed [mm/s]	Composed effective area [mm²]	Solenoid valve ( ): Effective area [mm²] C	D	E	F	G	Speed controller		Tubing I.D. [mm] Steel piping size
			16.2 to 21.6	36 to 45	64.8 to 67	102.6 to 120	180 to 300			
			—	VQ4000 (36.0)	—	—	—	1 With One-touch fittings	1-A Elbow type	
			VQ2000 (16.2)	VQ4000 (39.6)	—	—	—		1-B Universal type	
			SY7000 (21.6)	—	—	—	—			
			SX7000 (21.6)	—	—	—	—		1-C In-line type	
			—	—	—	—	—			
			VQZ3000 (16.2)	—	—	—	—	2 Standard type	2-A Metal elbow type	
			VQZ3000 (21.6)	—	—	—	—			
			VFR2000 (16.2)	VFR3000 (41.4)	VFR4000 (67.0)	VFR5000 (102.6)	VFR6000 (191)			
			VFS2000 (18.0)	VFS3000 (36.0)	VFS4000 (64.5)	VFS5000 (12.6)	VFS6000 (180)		2-B In-line type	
			—	—	—	VP□50 (120)	VP□70 (300)			
50	500	9.5	■					1-A	AS42□1F (24)	Ø 8, Ø 10 1/4
			■					2-B	AS43□1F (24)	
			■					1-C	AS4001F (16)	
			■					2-A	AS4200 (26)	
			■					2-B	AS420 (102)	
	1000	19			■			1-A	AS42□1F (26)	Ø 12, Ø 16 1/4, 3/8
					■			2-B	AS43□1F (24)	
				■				2-A	AS4200 (26)	
				■				2-B	AS420 (102)	
	1500	28.5		■				2-B	AS420 (102)	3/8, Ø 16
	2000	38			■			2-B	AS420 (102)	3/8, Ø 16
	2500	47				■		2-B	AS420 (102)	3/8, Ø 16
	3000	56.5					■	2-B	AS420 (102)	1/2, Ø 16
63	500	15			■			1-A	AS42□1F (24)	Ø 10, Ø 12, Ø 16 1/4, 3/8
					■			2-B	AS43□1F (24)	
				■				1-C	AS4001F (16)	
				■				2-A	AS4200 (26)	
			■					2-B	AS420 (102)	
	1000	30		■				2-B	AS420 (102)	3/8, Ø 16
	1500	45			■			2-B	AS420 (102)	1/2, Ø 16
	2000	60				■		2-B	AS420 (102)	1/2, Ø 16
	2500	75					■	2-B	AS600 (258)	3/4, Ø 16
	3000	89.5					■	2-B	AS500 (123)	3/4, Ø 16
80	500	24.5				■		2-A	AS4200 (26)	Ø 16 3/8, 1/2
				■				2-B	AS420 (102)	
	1000	48.5				■		2-B	AS500 (123)	3/8, Ø 16
	1500	72.5					■	2-B	AS600 (258)	1/2, Ø 16
	2000	96.5					■	2-B	AS600 (258)	3/4
	2500	120.5					■	2-B	AS600 (258)	3/4
	3000	106					■	2-B	AS600 (258)	3/4
100	500	38			■			2-B	AS420 (102)	3/8
	1000	75.5					■	2-B	AS600 (258)	1/2, Ø 16
	1500	113					■	2-B	AS600 (258)	3/4
	2000	110.5					■	2-B	AS600 (258)	3/4
	2500	138					■	2-B	AS800 (586)	3/4
	3000	88.5					■	2-B	AS500 (123)	3/4

Note) Refer to page 7 for the maximum absorbed energy since cushioning ability may in some cases exceed the allowable cushioning ability if the cylinder is used under high speeds and large loads.

High Power Cylinder
RHC Series
Ø 20, Ø 25, Ø 32, Ø 40, Ø 50, Ø 63, Ø 80, Ø 100

How to Order

RHC B 20 □ – □ – M9BW □ – C – □

High power cylinder

Mounting type

B	Basic type
L	Axial foot type
F	Rod side flange type
G	Head side flange type

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Port type

—	Rc
TN	NPT

Cylinder stroke (mm)
∗ Refer to page 7 for standard strokes.

Auto switch

—	Without auto switch (Built-in magnet)

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

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Made to Order
Refer to page 7 for details.

Auto switch mounting bracket Note)
Note) This symbol is indicated when the D-A9□ or M9□ type auto switch is specified. This mounting bracket does not apply to other auto switches (D-C7□ and H7□, etc.) (—)

Applicable Auto Switches/Refer to the website: **www.smc.eu** for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model: Applicable bore size (mm) Ø 20 to Ø 63 Perpendicular	Ø 20 to Ø 63 In-line	Ø 80, Ø 100 In-line	Lead wire length [m] 0.5 (—)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	—	●	●	●	○	—	○	IC circuit	Relay, PLC
							—	—	G59	●	—	●	○	—	○		
				3-wire (PNP)			M9PV	M9P	—	●	●	●	○	—	○		
							—	—	G5P	●	—	●	○	—	○		
				2-wire	12 V		M9BV	M9B	—	●	●	●	○	—	○	—	
							—	—	K59	●	—	●	○	—	○		
		Connector					—	H7C	—	●	—	●	●	●	—		
		Terminal conduit		3-wire (NPN)	5 V, 12 V		—	G39		—	—	—	—	●	—	IC circuit	
				2-wire	12 V		—	K39		—	—	—	—	●	—	—	
	Diagnostic indication (2-colour indicator)	Grommet		3-wire (NPN)	5 V, 12 V		M9NWV	M9NW	—	●	●	●	○	—	○	IC circuit	
							—	—	G59W	●	—	●	○	—	○		
				3-wire (PNP)			M9PWV	M9PW	—	●	●	●	○	—	○		
							—	—	G5PW	●	—	●	○	—	○		
				2-wire	12 V		M9BWV	M9BW	—	●	●	●	○	—	○	—	
							—	—	K59W	●	—	●	○	—	○		
	Water resistant (2-colour indicator)			3-wire (NPN)	5 V, 12 V		M9NAV∗1	M9NA∗1	—	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PAV∗1	M9PA∗1	—	○	○	●	○	—	○		
				2-wire	12 V		M9BAV∗1	M9BA∗1	—	○	○	●	○	—	○	—	
							—	—	G5BA∗1	●	—	●	○	—	○		
	With diagnostic output (2-colour indicator)			4-wire (NPN)	5 V, 12 V		—	H7NF	G59F	●	—	●	○	—	○	IC circuit	
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	—	●	—	●	—	—	—	IC circuit	—
			No	2-wire	24 V	12 V	100 V	A93V∗2	A93	—	●	●	●	●	—	—	—	Relay, PLC
							100 V or less	A90V	A90	—	●	—	●	—	—	—	IC circuit	
			Yes				100 V, 200 V	—	B54		●	—	●	●	—	—	—	
			No				200 V or less	—	B64		●	—	●	—	—	—	—	
		Connector	Yes				—	—	C73C	—	●	—	●	●	●	—		
			No				24 V or less	—	C80C	—	●	—	●	●	●	—	IC circuit	
		Terminal conduit	Yes				—	—	A33		—	—	—	—	●	—	—	
		DIN terminal					100 V, 200 V	—	A34		—	—	—	—	●	—		
								—	A44		—	—	—	—	●	—		
	Diagnostic indication (2-colour indicator)	Grommet				—	—	—	B59W		●	—	●	—	—	—		

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.
∗2 1 m type lead wire is only applicable to D-A93.

∗ Lead wire length symbols: 0.5 m ····· — (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ
None ····· N (Example) H7CN

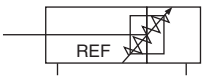
∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗ D-A9□V/M9□V/M9□WV/D-M9□A(V) types cannot be mounted.
∗ Do not indicate suffix "N" for no lead wire on D-A3□/A44/G39/K39 models.

∗ Since there are other applicable auto switches than listed, refer to page 19 for details.
∗ For details about auto switches with pre-wired connector, refer to website: **www.smc.eu**.
∗ D-A9□/M9□/M9□W auto switches are shipped together (not assembled). (Only auto switch mounting brackets are assembled before shipped.)

Specifications

Bore size [mm]	20	25	32	40	50	63	80	100
Fluid	Air							
Proof pressure	1.5 MPa							
Maximum operating pressure	1.0 MPa							
Minimum operating pressure	0.05 MPa							
Ambient and fluid temperature	-10 to 60 °C (No freezing)							
Piston speed	50 to 3000 mm/s							
Cushion	Air cushion							
Maximum energy absorption [J]	7	12	21	33	47	84	127	196
Effective cushioning stroke [mm]	80	80	80	80	80	80	80	80
Lubrication	Not required (Non-lube)							
Stroke length tolerance	Up to 1000 st: $^{+1.4}_{0}$, 1001 to 1500 st: $^{+1.8}_{0}$							
Mounting	Basic type, Axial foot type, Rod/Head side flange type							

Symbol



Made to Order

Made to Order

Symbol	Specification
-XC3	Special port location*
-XC6	Made of stainless steel
-XC93	Water resistance + Stable lubrication function**

* Ø 20 to Ø 40 only
** Ø 32, Ø 40 only

Stroke

[mm]

Bore size [mm]	Minimum stroke (Recommended) (1)	Standard stroke (2)	Max. stroke
20	250	up to 700	1500
25	250	up to 700	1500
32	250	up to 1000	1500
40	250	up to 1000	1500
50	250	up to 1200	1500
63	250	up to 1200	1500
80	250	up to 1400	1500
100	250	up to 1500	1500

Note 1) Strokes shorter than the recommended minimum stroke (1 to 249 st) can be manufactured, but cushion capability may not be satisfied since the effective cushion stroke for this cylinder is long.
Note 2) Stroke exceeding the standard stroke length is not subject to the guarantee.

Mounting Bracket Part No.

Mounting bracket	Qty.	Bore size [mm] 20	25	32	40	50	63	80	100	Description
Axial foot	Note) 2	RHC-L020	RHC-L025	RHC-L032	RHC-L040	RHC-L050	RHC-L063	RHC-L080	RHC-L100	Ø 20 to Ø 40 : Foot x 2, Mounting nut x 1 Ø 50 to Ø 100: Foot x 2, Bracket mounting bolt x 8, Spring washer x 8
Flange	1	RHC-F020	RHC-F025	RHC-F032	RHC-F040	RHC-F050	RHC-F063	RHC-F080	RHC-F100	Ø 20 to Ø 40 : Flange x 1 Ø 50 to Ø 100: Flange x 1, Bracket mounting bolt x 4, Spring washer x 4

Note) Order 2 foot brackets for a cylinder.

Theoretical Output

[N]

Bore size [mm]	Rod size [mm]	Operating direction	Piston area [mm²]	Operating pressure [MPa]								
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
20	10	OUT	314	63	94	126	157	188	220	251	283	314
		IN	236	47	71	94	118	142	165	189	212	236
25	12	OUT	491	98	147	196	246	295	344	393	442	491
		IN	378	76	113	151	189	227	265	302	340	378
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	1260	252	378	504	630	756	882	1010	1130	1260
		IN	1060	212	318	424	530	636	742	848	954	1060
50	20	OUT	1960	392	588	784	980	1180	1370	1570	1760	1960
		IN	1650	330	495	660	825	990	1160	1320	1490	1650
63	20	OUT	3120	624	936	1250	1560	1870	2180	2500	2810	3120
		IN	2800	560	840	1120	1400	1680	1960	2240	2520	2800
80	25	OUT	5030	1010	1510	2010	2520	3020	3520	4020	4530	5030
		IN	4540	908	1360	1820	2270	2720	3180	3630	4090	4540
100	30	OUT	7850	1570	2360	3140	3930	4710	5500	6280	7070	7850
		IN	7150	1430	2150	2860	3580	4290	5010	5720	6440	7150

Note) Theoretical output [N] = Pressure [MPa] x Piston area [mm²]

Weight (In the case of 500 stroke)

[kg]

Bore size [mm]		**20**	**25**	**32**	**40**	**50**	**63**	**80**	**100**
Basic weight	Basic type	1.20	1.62	2.04	3.20	4.90	6.08	8.93	13.60
	Axial foot type	1.44	1.88	2.44	3.72	5.95	7.32	11.04	16.67
	Flange type	1.29	1.79	2.23	3.47	5.68	6.97	10.67	15.92
Additional weight per each 50 mm of stroke		0.06	0.08	0.09	0.15	0.22	0.25	0.35	0.51

Calculation: (Example) **RHCL32-600**
- Basic mass (500 st) ····· 2.44 (kg) (Foot type Ø 32)
- Additional weight ····· 0.09 (kg/50 st)
- Cylinder stroke ····· 600 (st)

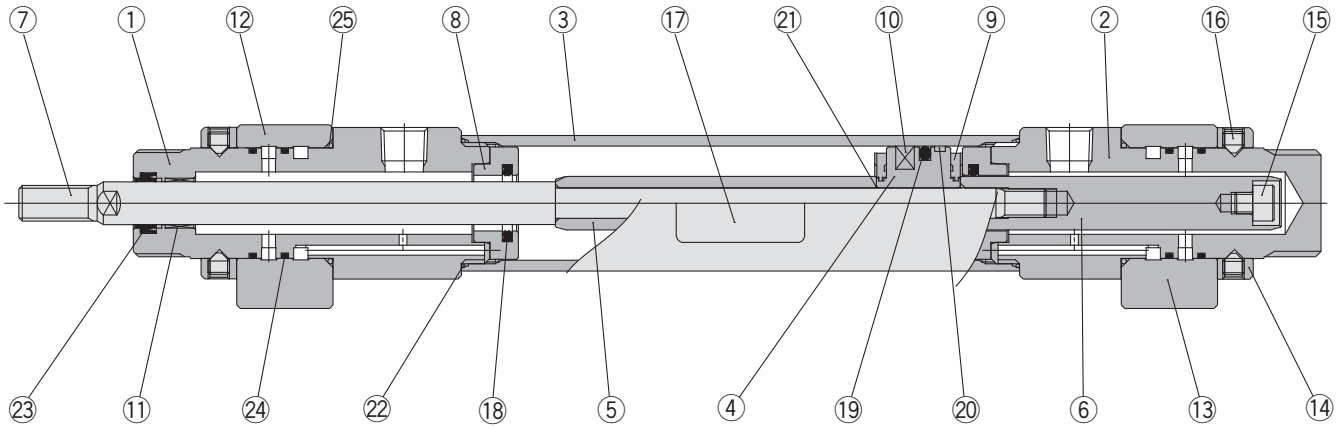
2.44 + 0.09 x (600 – 500)/50 = 2.62 kg

Series Applicable to Operating Environments that Do Not Accept Copper

- Copper and Fluorine-free·····20-series

∗ For details, refer to the SMC website.

Construction: Ø 20 to Ø 40



Component Parts

No.	Description	Material	Qty.	Note
1	**Rod cover**	Aluminium alloy	1	Clear anodised
2	**Head cover**	Aluminium alloy	1	Clear anodised
3	**Cylinder tube**	Aluminium alloy	1	Hard anodised
4	**Piston**	Aluminium alloy	1	Chromated
5	**Cushion ring A**	Carbon steel	1	Hard chrome plated
6	**Cushion ring B**	Carbon steel	1	Hard chrome plated
7	**Piston rod**	Carbon steel *	1	Hard chrome plated
8	**Cushion spacer**	Steel	2	Chromated
9	**Bumper**	Urethane	2	
10	**Magnet**	—	1	
11	**Bushing**	Bearing alloy	1	
12	**Relief valve assembly (Rod side)**	—	1	
13	**Relief valve assembly (Head side)**	—	1	
14	**Relief valve body holder**	Aluminium alloy	2	Clear anodised
15	**Hexagon socket head cap screw**	Carbon steel	1	Ø 20: M5 x 0.8 x 6 Ø 25, Ø 32: M6 x 1 x 6 Ø 40: M8 x 1.25 x 8
16	**Hexagon socket head set screw**	Carbon steel	2	Ø 20, Ø 25: M5 x 0.8 x 6 Ø 32, Ø 40: M6 x 1 x 8
17	**Plate**	—	1	
18	**Cushion seal**	Special resin	2	
19	**Piston seal**	NBR	1	
20	**Wear ring**	Resin	1	
21	**Piston gasket**	NBR	1	
22	**Cylinder tube gasket**	NBR	2	
23	**Rod seal**	NBR	1	
24	**O-ring**	NBR	4	
25	**O-ring**	NBR	2	

* Stainless steel for Ø 20 and Ø 25

Replacement Parts/Seal Kit

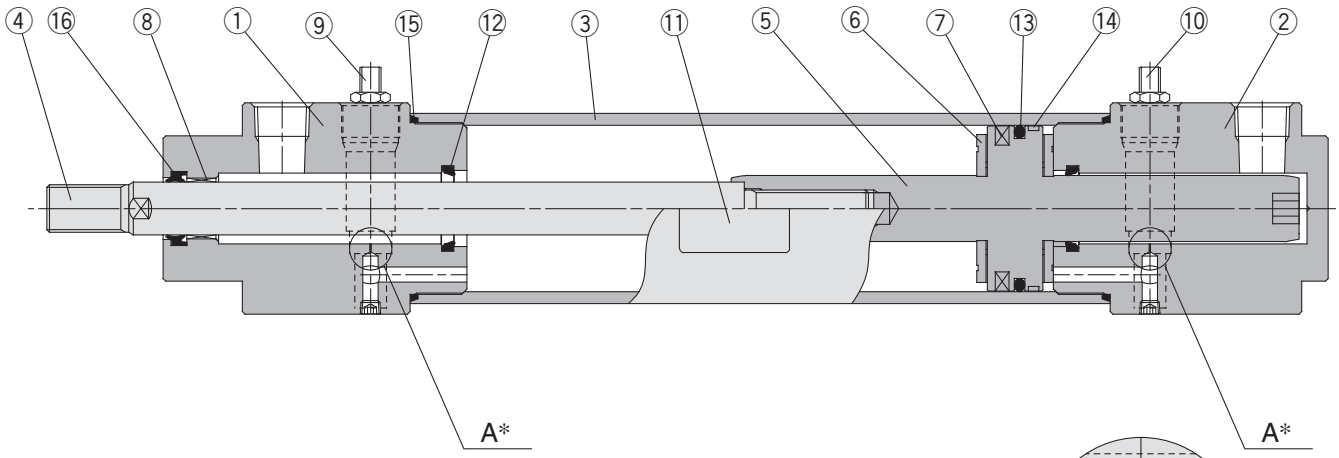
Bore size [mm]	Kit no.	Contents
20	RHC20-PS	Set of nos. left ⑱, ⑲, ⑳, ㉒, ㉓, ㉔, ㉕
25	RHC25-PS	
32	RHC32-PS	
40	RHC40-PS	

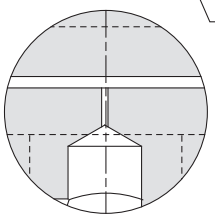
* Seal kit includes a grease pack (10 g).
Order with the following part number when only the grease pack is needed.
Grease pack part no.: GR-S-010 (10 g)

⚠ Caution

When disassembling cylinders with bore sizes of Ø 20 through Ø 40, grip the double flat part of either the rod cover or the head cover with a vise and loosen the other side with a wrench or an adjustable angle wrench, and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position.

Construction: Ø 50 to Ø 100





Enlarged view of "A"

Component Parts

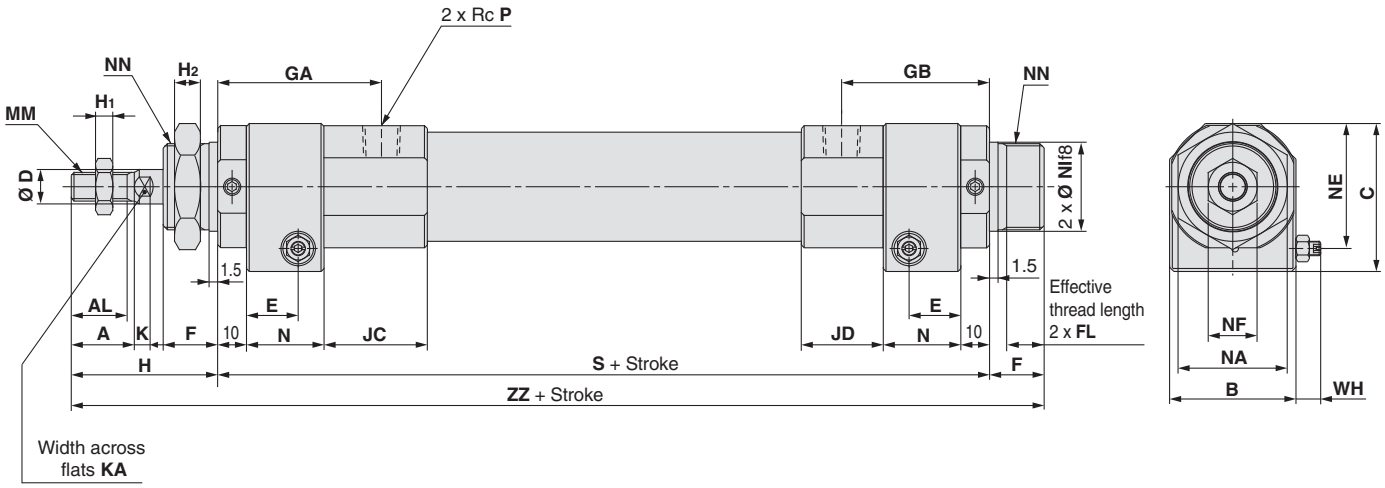
No.	Description	Material	Note
1	**Rod cover**	Aluminium alloy	Clear anodised
2	**Head cover**	Aluminium alloy	Clear anodised
3	**Cylinder tube**	Aluminium alloy	Hard anodised
4	**Piston rod**	Carbon steel	Hard chromate plated
5	**Piston**	Aluminium alloy	Hard anodised
6	**Bumper**	Urethan	
7	**Magnet**	—	
8	**Bushing**	Bearing alloy	
9	**Relief valve assembly L**	—	
10	**Relief valve assembly R**	—	
11	**Plate**	—	
12	**Cushion seal**	Urethan	
13	**Piston seal**	NBR	
14	**Wear ring**	Resin	
15	**Cylinder tube gasket**	NBR	
16	**Rod seal**	NBR	

⚠ Caution

Cylinders with Ø 50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. Contact SMC when disassembly is required.

Dimensions: Basic Type

Ø 20 to Ø 40

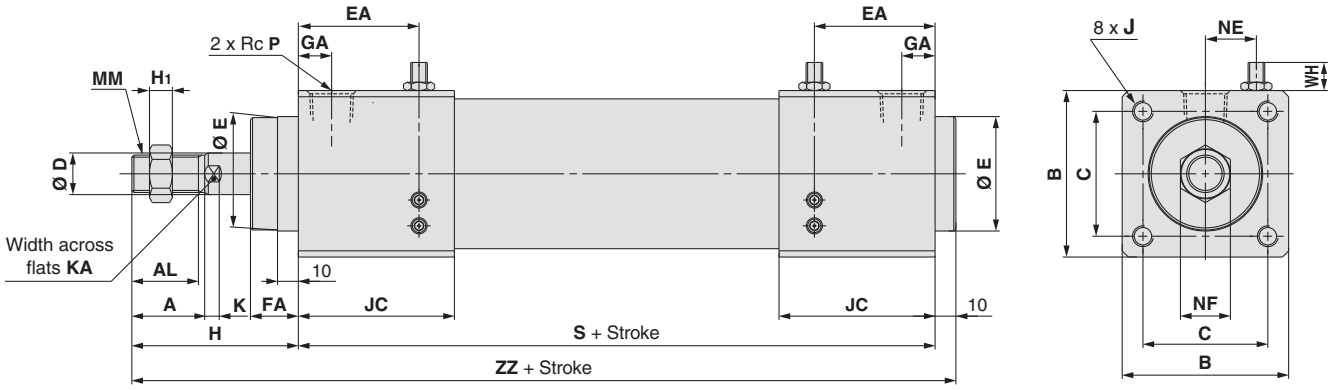


[mm]

Bore size [mm]	A	AL	B	C	D	E	F	FL	GA	GB	H	H_1	H_2
20	18	15.5	32	40.5	10	14.5	16	11.5	53.5	47.5	44	5	8
25	22	19.5	36	45.5	12	18	16	11.5	56.5	49.5	48	6	8
32	22	19.5	44	51.5	12	18	19	14.5	55	51.5	51	6	9
40	24	21	53	61.5	16	20.5	21	16.5	56	51.5	54.5	8	11

Bore size [mm]	JC	JD	K	KA	MM	N	NE	NA	NF	NI	NN	P	S	WH	ZZ
20	43	30.5	5	8	M8 x 1.25	22	33.5	26	13	$23^{-0.020}_{-0.053}$	M22 x 1.5	1/4	192	5.8 to 8.8	252
25	39	25.5	5.5	10	M10 x 1.25	27	37	32	17	$25^{-0.020}_{-0.053}$	M24 x 1.5	1/4	193		257
32	36	28.5	5.5	10	M10 x 1.25	27	43.5	38	17	$31^{-0.025}_{-0.064}$	M30 x 1.5	3/8	195		265
40	32	23	7.5	14	M14 x 1.5	30	52.5	41	22	$34^{-0.025}_{-0.064}$	M33 x 2.0	3/8	201.5	6.8 to 11.3	277

Ø 50 to Ø 100



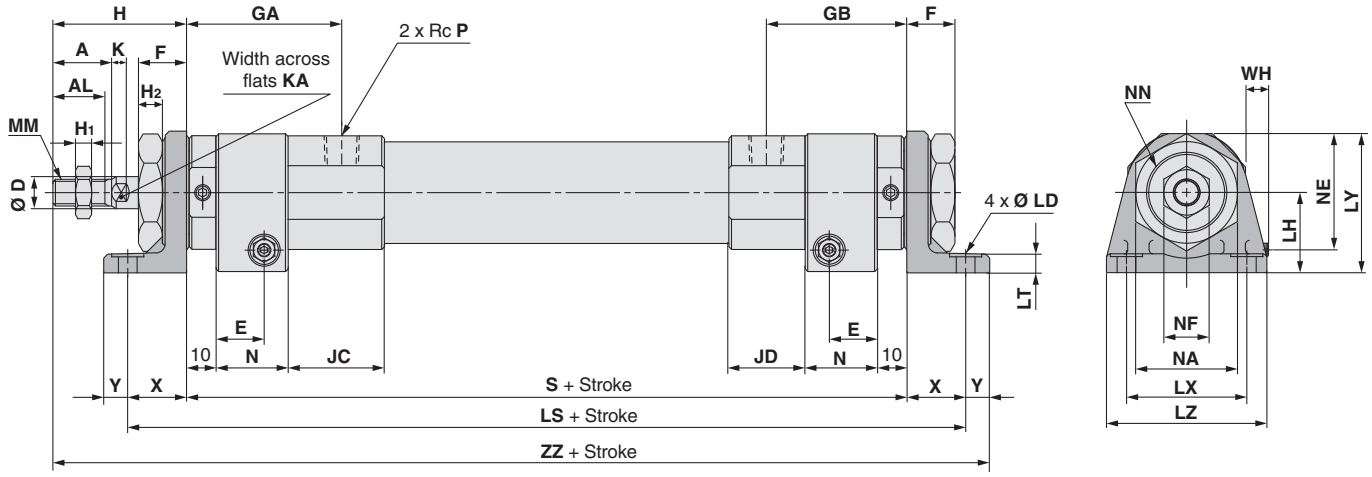
[mm]

Bore size [mm]	A	AL	B	C	D	E	EA	FA	GA	H
50	35	32	70	53	20	$50^{0}_{-0.062}$	62	23	16	80
63	35	32	80	60	20	$55^{0}_{-0.074}$	58	23	16	80
80	40	37	95	75	25	$65^{0}_{-0.074}$	61	23	20	90
100	40	37	116	90	30	$80^{0}_{-0.074}$	63	25	20	95

Bore size [mm]	H_1	J	JC	K	KA	MM	NE	NF	P	S	WH	ZZ
50	11	M10 x 1.5 thread depth 20	75	7	18	M18 x 1.5	25	27	1/2	215	6.8 to 11.3	305
63	11	M10 x 1.5 thread depth 20	75	7	18	M18 x 1.5	24.5	27	1/2	215		305
80	13	M12 x 1.75 thread depth 25	78	10	22	M22 x 1.5	30.5	32	3/4	228	8.5 to 13.5	328
100	16	M12 x 1.75 thread depth 25	80	10	26	M26 x 1.5	34	41	3/4	236		341

Dimensions: Axial Foot Type

Ø 20 to Ø 40

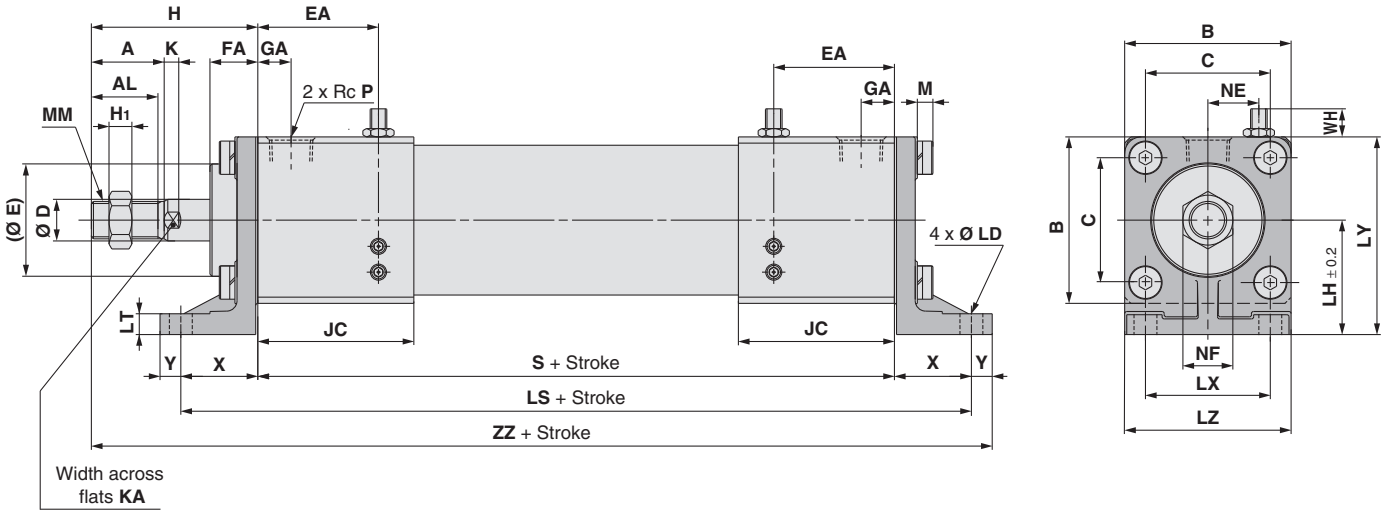


[mm]

Bore size [mm]	A	AL	D	E	F	GA	GB	H	H1	H2	JC	JD	K	KA	LD	LH
20	18	15.5	10	14.5	16	53.5	47.5	44	5	8	43	30.5	5	8	7	25
25	22	19.5	12	18	16	56.5	49.5	48	6	8	39	25.5	5.5	10	7	28
32	22	19.5	12	18	19	55	51.5	51	6	9	36	28.5	5.5	10	7	30
40	24	21	16	20.5	21	56	51.5	54.5	8	11	32	23	7.5	14	9	35

Bore size [mm]	LS	LT	LX	LY	LZ	MM	N	NA	NE	NF	NN	P	S	WH	X	Y	ZZ
20	232	6.5	40	41	55	M8 x 1.25	22	26	33.5	13	M22 x 1.5	1/4	192	5.8 to 8.8	20	9	265
25	233	6.5	40	46.5	55	M10 x 1.25	27	32	37	17	M24 x 1.5	1/4	193		20	9	270
32	241	7	45	53	60	M10 x 1.25	27	38	43.5	17	M30 x 1.5	3/8	195		23	9	278
40	251.5	7	55	62	75	M14 x 1.5	30	41	52.5	22	M33 x 2.0	3/8	201.5	6.8 to 11.3	25	11	292

Ø 50 to Ø 100



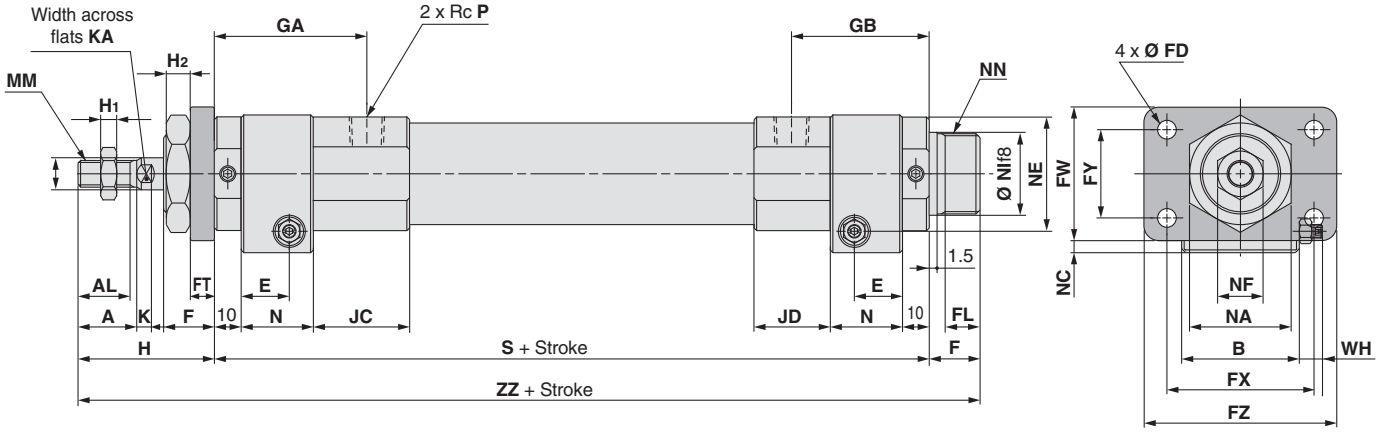
[mm]

Bore size [mm]	A	AL	B	C	D	E	EA	FA	GA	H	H1	JC	K	KA	LD
50	35	32	70	53	20	$50^{0}_{-0.062}$	62	23	16	80	11	75	7	18	11
63	35	32	80	60	20	$55^{0}_{-0.074}$	58	23	16	80	11	75	7	18	11
80	40	37	95	75	25	$65^{0}_{-0.074}$	61	23	20	90	13	78	10	22	13
100	40	37	116	90	30	$80^{0}_{-0.074}$	63	25	20	95	16	80	10	26	13

Bore size [mm]	LH	LS	LT	LY	LX	LZ	M	MM	NE	NF	P	S	WH	X	Y	ZZ
50	52	275	10	88.5	53	73	7.5	M18 x 1.5	25	27	1/2	215	6.8 to 11.3	30	10	335
63	55	289	10	95	60	80	7.5	M18 x 1.5	24.5	27	1/2	215	8.5 to 13.5	37	10	342
80	65	308	12	115	75	100	10	M22 x 1.5	30.5	32	3/4	228		40	13	371
100	80	330	14	139	90	118	10	M26 x 1.5	34	41	3/4	236		47	13	391

Dimensions: Rod Side Flange Type

Ø 20 to Ø 40

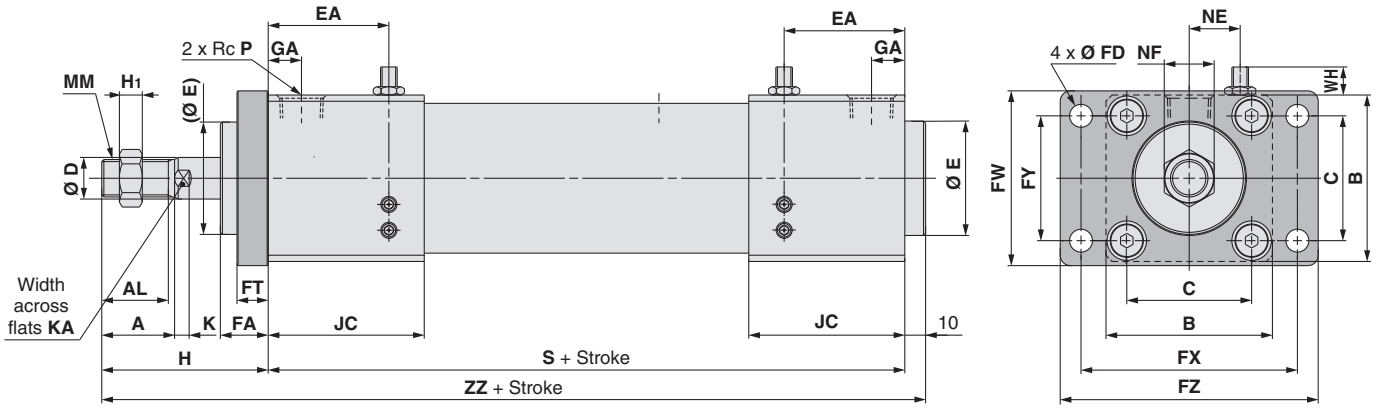


[mm]

Bore size [mm]	A	AL	B	D	E	F	FL	FD	FT	FX	FY	FW	FZ	GA	GB	H_1	H_2
20	18	15.5	32	10	14.5	16	11.5	7	6	51	21	38	68	53.5	47.5	5	8
25	22	19.5	36	12	18	16	11.5	7	9	53	27	44	70	56.5	49.5	6	8
32	22	19.5	44	12	18	19	14.5	7	9	55	33	50	72	55	51.5	6	9
40	24	21	53	16	20.5	21	16.5	9	9	66	36	60	84	56	51.5	8	11

Bore size [mm]	H	JC	JD	K	KA	MM	N	NA	NC	NE	NF	NI	NN	P	S	WH	ZZ
20	44	43	30.5	5	8	M8 x 1.25	22	26	5.5	33.5	13	$23^{-0.020}_{-0.053}$	M22 x 1.5	1/4	192		252
25	48	39	25.5	5.5	10	M10 x 1.25	27	32	5.5	37	17	$25^{-0.020}_{-0.053}$	M24 x 1.5	1/4	193	5.8 to 8.8	257
32	51	36	28.5	5.5	10	M10 x 1.25	27	38	4.5	43.5	17	$31^{-0.025}_{-0.064}$	M30 x 1.5	3/8	195		265
40	54.5	32	23	7.5	14	M14 x 1.5	30	41	4.5	52.5	22	$34^{-0.025}_{-0.064}$	M33 x 2.0	3/8	201.5	6.8 to 11.3	277

Ø 50 to Ø 100



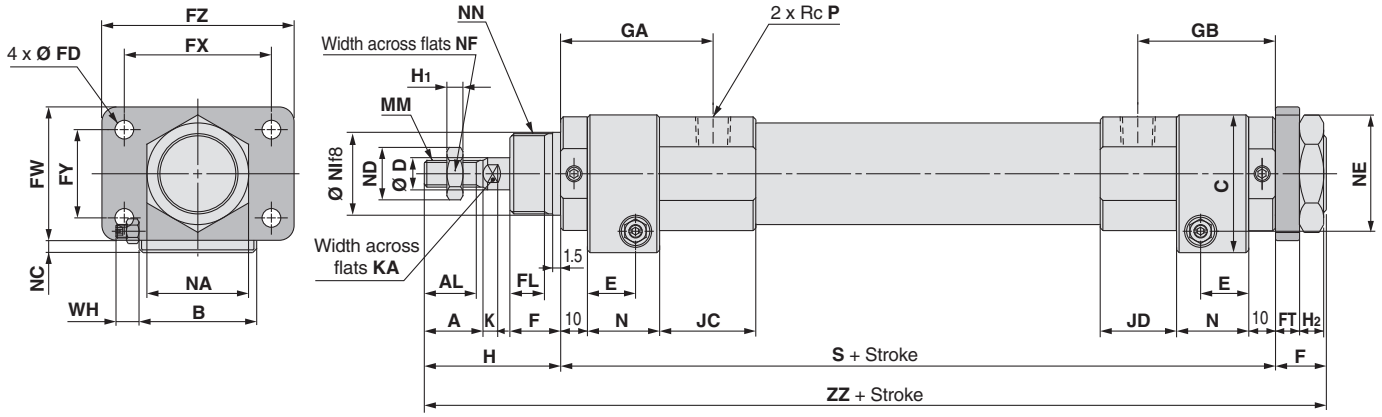
[mm]

Bore size [mm]	A	AL	B	C	D	E	EA	FA	FD	FT	FW	FX
50	35	32	70	53	20	$50^{0}_{-0.062}$	62	23	11	15	78	96
63	35	32	80	60	20	$55^{0}_{-0.074}$	58	23	11	15	84	104
80	40	37	95	75	25	$65^{0}_{-0.074}$	61	23	13	18	106	130
100	40	37	116	90	30	$80^{0}_{-0.074}$	63	25	13	20	120	145

Bore size [mm]	FY	FZ	GA	H	H_1	JC	K	KA	MM	NE	NF	P	S	WH	ZZ
50	53	116	16	80	11	75	7	18	M18 x 1.5	25	27	1/2	215	6.8 to 11.3	305
63	60	124	16	80	11	75	7	18	M18 x 1.5	24.5	27	1/2	215		305
80	75	155	20	90	13	78	10	22	M22 x 1.5	30.5	32	3/4	228	8.5 to 13.5	328
100	90	172	20	95	16	80	10	26	M26 x 1.5	34	41	3/4	236		341

Dimensions: Head Side Flange Type

Ø 20 to Ø 40

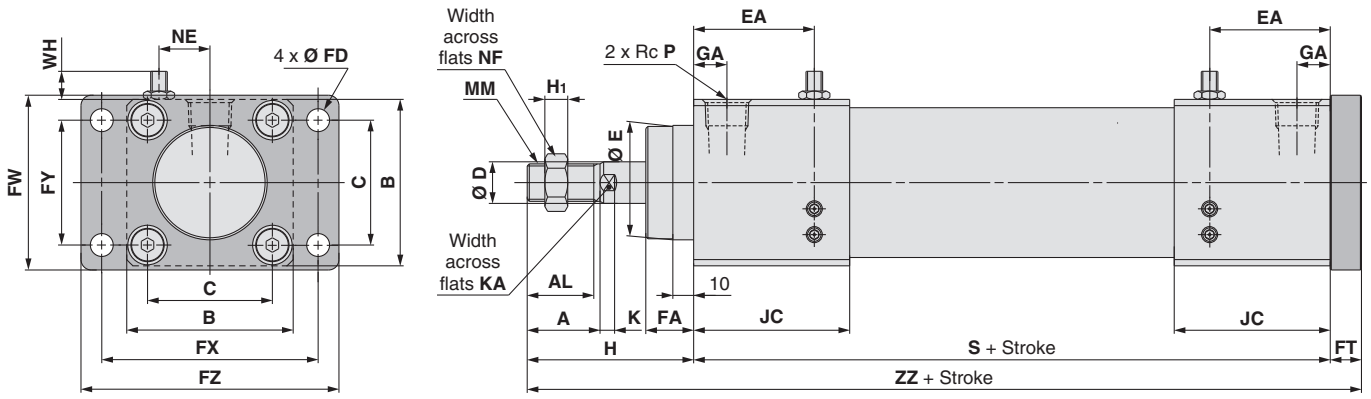


[mm]

Bore size [mm]	A	AL	B	C	D	E	F	FL	FD	FT	FX	FY	FW	FZ	GA	GB	H_1	H_2
20	18	15.5	32	40.5	10	14.5	16	11.5	7	6	51	21	38	68	53.5	47.5	5	8
25	22	19.5	36	45.5	12	18	16	11.5	7	9	53	27	44	70	56.5	49.5	6	8
32	22	19.5	44	51.5	12	18	19	14.5	7	9	55	33	50	72	55	51.5	6	9
40	24	21	53	61.5	16	20.5	21	16.5	9	9	66	36	60	84	56	51.5	8	11

Bore size [mm]	H	JC	JD	K	KA	MM	N	NA	NB	NC	NE	NF	NI	NN	P	S	WH	ZZ
20	44	43	30.5	5	8	M8 x 1.25	22	26	30	5.5	33.5	13	$23^{-0.020}_{-0.053}$	M22 x 1.5	1/4	192		252
25	48	39	25.5	5.5	10	M10 x 1.25	27	32	36.9	5.5	37	17	$25^{-0.020}_{-0.053}$	M24 x 1.5	1/4	193	5.8 to 8.8	257
32	51	36	28.5	5.5	10	M10 x 1.25	27	38	43.9	4.5	43.5	17	$31^{-0.025}_{-0.064}$	M30 x 1.5	3/8	195		265
40	54.5	32	23	7.5	14	M14 x 1.5	30	41	47.3	4.5	52.5	22	$34^{-0.025}_{-0.064}$	M33 x 2.0	3/8	201.5	6.8 to 11.3	277

Ø 50 to Ø 100



[mm]

Bore size [mm]	A	AL	B	C	D	E	EA	FA	FD	FT	FW	FX	FY
50	35	32	70	53	20	$50^{0}_{-0.062}$	62	23	11	15	78	96	53
63	35	32	80	60	20	$55^{0}_{-0.074}$	58	23	11	15	84	104	60
80	40	37	95	75	25	$65^{0}_{-0.074}$	61	23	13	18	106	130	75
100	40	37	116	90	30	$80^{0}_{-0.074}$	63	25	13	20	120	145	90

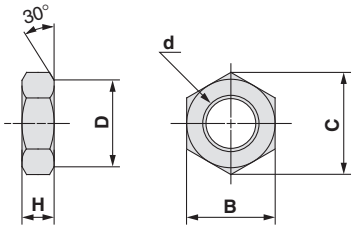
Bore size [mm]	FZ	GA	H	H_1	JC	K	KA	MM	NE	NF	P	S	WH	ZZ
50	116	16	80	11	75	7	18	M18 x 1.5	25	27	1/2	215	6.8 to 11.3	310
63	124	16	80	11	75	7	18	M18 x 1.5	24.5	27	1/2	215		310
80	155	20	90	13	78	10	22	M22 x 1.5	30.5	32	3/4	228	8.5 to 13.5	336
100	172	20	95	16	80	10	26	M26 x 1.5	34	41	3/4	236		351

RHC Series
Accessory

Mounting Nut

[mm]

Material: Carbon steel

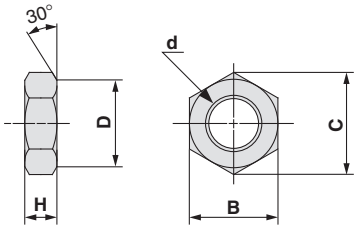


Part no.	Applicable bore size [mm]	B	C	D	d	H
SOR-20	**20**	26	30	26	M22 x 1.5	8
SOR-25	**25**	32	36.9	32	M24 x 1.5	8
SOR-32	**32**	38	43.9	38	M30 x 1.5	9
SOR-40	**40**	41	47.3	41	M33 x 2.0	11

Rod End Nut

[mm]

Material: Carbon steel



Part no.	Applicable bore size [mm]	B	C	D	d	H
NT-02	**20**	13	15	12.5	M8 x 1.25	5
NT-03	**25/32**	17	19.6	16.5	M10 x 1.25	6
NT-04	**40**	22	25.4	21.0	M14 x 1.5	8
NT-05	**50/63**	27	31	26	M18 x 1.5	11
NT-08	**80**	32	37	31	M22 x 1.5	13
NT-10	**100**	41	47.3	39	M26 x 1.5	16

Auto Switch Mounting 1

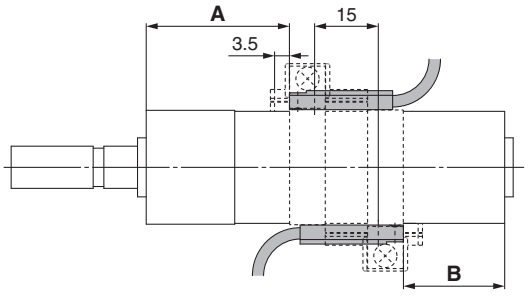
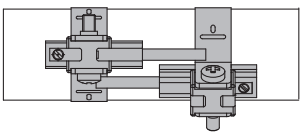
Minimum Stroke for Auto Switch Mounting

n: No. of auto switches [mm]

Auto switch model	No. of auto switches mounted				
	1	2		n	
		Different surfaces	Same surface	Different surfaces	Same surface
D-A9□ **D-M9□** **D-M9□W**	10	15 Note 1)	45 Note 1)	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	45 + 45 (n – 2) (n = 2, 3, 4, 5···)
D-M9□	5	15 Note 1)	40 Note 1)	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	55 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□W	10	15 Note 1)	40 Note 1)	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	55 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□A	10	25	40 Note 1)	$25 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	60 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-A9□	5	15	30 Note 1)	$15 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	50 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□V	5	20	35	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	35 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-A9□V	5	15	25	$15 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	25 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□WV **D-M9□AV**	10	20	35	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	35 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-C7□ **D-C80**	10	15	50	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	50 + 45 (n – 2) (n = 2, 3, 4, 5···)
D-H7□ **D-H7□W** **D-H7BA** **D-H7NF**	10	15	60	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	60 + 45 (n – 2) (n = 2, 3, 4, 5···)
D-C73C **D-C80C** **D-H7C**	10	15	65	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	65 + 50 (n – 2) (n = 2, 3, 4, 5···)
D-B5□/B64 **D-G5□/K59** **D-G5□W/K59W** **D-G5BA** **D-G5NT**	10	15	75	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	75 + 55 (n – 2) (n = 2, 3, 4, 5···)
D-B59W	15	20	75	$20 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	75 + 55 (n – 2) (n = 2, 3, 4, 5···)
D-A3□ **D-A44** **D-G39** **D-K39**	10	35	100	35 + 30 (n – 2) (n = 2, 3, 4, 5…)	100 + 100 (n – 2) (n = 2, 3, 4, 5···)

Note 3) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.

Note 1) Auto switch mounting

Auto switch model	2 auto switches	
	Different surfaces Note 1)	Same surface Note 1)
	 Correct auto switch mounting position is 3.5 mm from the back face of the switch holder.	 The auto switch is mounted by slightly displacing it in a direction (cylinder tube circumferential exterior) so that the auto switch and lead wire do not interfere with each other.
D-M9□ **D-M9□W**	Less than 20 stroke Note 2)	Less than 55 stroke Note 2)
D-M9□A	Less than 20 stroke Note 2)	Less than 60 stroke Note 2)
D-A9□	—	Less than 50 stroke Note 2)

Note 2) Minimum stroke for auto switch mounting in types other than those mentioned in Note 1.

Auto Switch Mounting 2

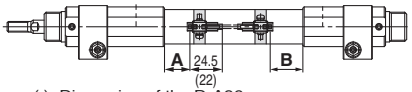
Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

Reed auto switch

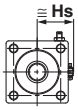
D-A9□

Ø 20 to Ø 40

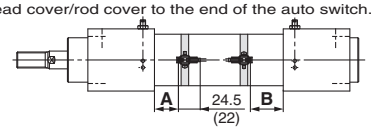
( ): Dimension of the D-A96.
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.



Ø 50 to Ø 63



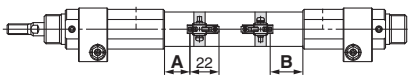
( ): Dimension of the D-A96.
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.



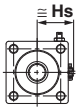
D-A9□V

Ø 20 to Ø 40

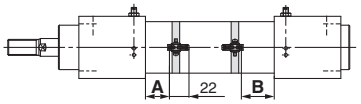
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.



Ø 50 to Ø 63

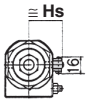


A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

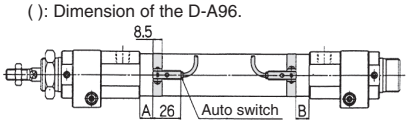


D-C7□, C80

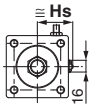
Ø 20 to Ø 40

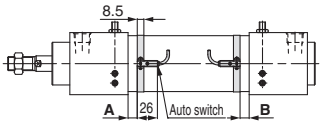


( ): Dimension of the D-A96.



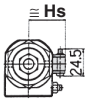
Ø 50 to Ø 63

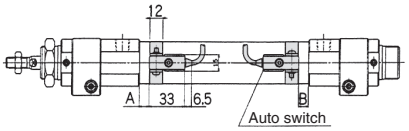




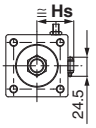
D-B5□, B64, B59W

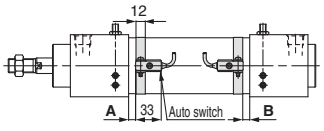
Ø 20 to Ø 40





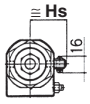
Ø 50 to Ø 63

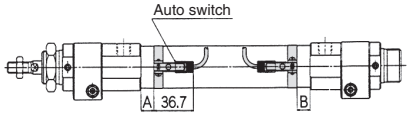




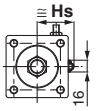
D-C73C, C80C

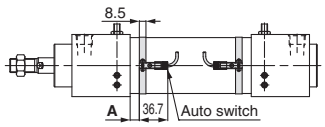
Ø 20 to Ø 40



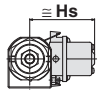


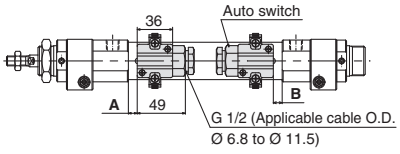
Ø 50 to Ø 63





D-A3□, G39, K39



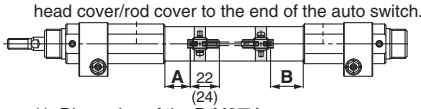


Solid state auto switch

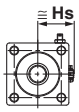
D-M9□, M9□W, M9□A

Ø 20 to Ø 40

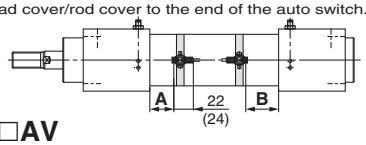
( ): Dimension of the D-M9□A.
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.



Ø 50 to Ø 63



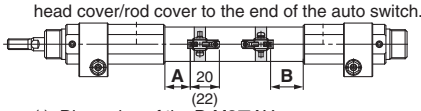
( ): Dimension of the D-M9□A.
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.



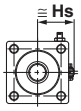
D-M9□V, M9□WV, M9□AV

Ø 20 to Ø 40

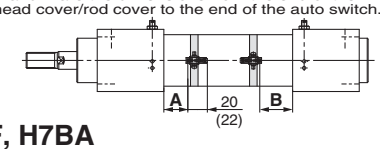
( ): Dimension of the D-M9□AV.
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.



Ø 50 to Ø 63

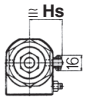


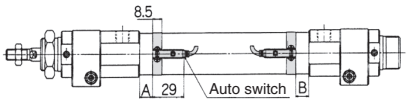
( ): Dimension of the D-M9□AV.
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.



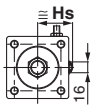
D-H7□, H7□W, H7NF, H7BA

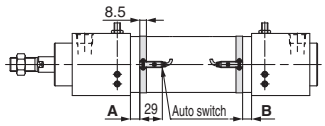
Ø 20 to Ø 40





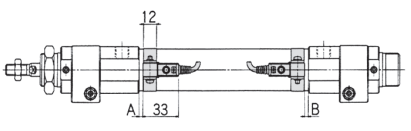
Ø 50 to Ø 63



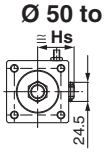


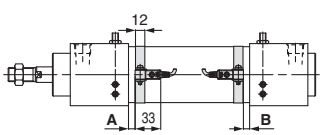
D-G5□, K59, G5□W, K59W, G5NT, G5BA

Ø 20 to Ø 40



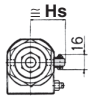
Ø 50 to Ø 63

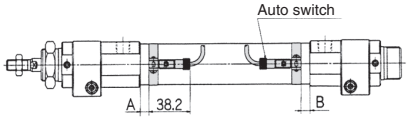




D-H7C

Ø 20 to Ø 40





Ø 50 to Ø 63

D-A44

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

Auto Switch Proper Mounting Position

[mm]

Auto switch model / Bore size [mm]	D-A9□ D-A9□V		D-M9□ D-M9□W D-M9□A D-M9□V D-M9□WV D-M9□AV		D-C7□ D-C80 D-C73C D-C80C		D-B5□ D-B64		D-H7□ D-H7C D-H7NF D-H7□W D-H7BA		D-G5□ D-G5□W D-G5NT D-G5BA D-K59 D-K59W		D-B59W		D-A33□ D-A44 D-G39 D-K39	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	14.5	20	18.5	24	15	20.5	9	14.5	14	19.5	10.5	16	12	17.5	8.5	14
25	14.5	20	18.5	24	15	20.5	9	14.5	14	19.5	10.5	16	12	17.5	8.5	14
32	14.5	22	18.5	26	15	22.5	9	16.5	14	21.5	10.5	18	12	19.5	8.5	16
40	19.5	27	23.5	31	20	27.5	14	21.5	19	26.5	15.5	23	17	24.5	13.5	21
50	17.5	27.5	21.5	31.5	18	28	12	22	17	27	13.5	23.5	15	25	11.5	21.5
63	17.5	27.5	21.5	31.5	18	28	12	22	17	27	13.5	23.5	15	25	11.5	21.5
80	—	—	—	—	—	—	13.5	27.5	—	—	15	29	16.5	30.5	13	27
100	—	—	—	—	—	—	15.5	29.5	—	—	17	31	18.5	32.5	15	29

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Mounting Height

[mm]

Auto switch model / Bore size [mm]	D-M9□V D-M9□WV D-M9□AV D-A9□V	D-M9□ D-M9□W D-M9□A D-A9□ D-H7□ D-H7□W D-H7NF D-H7BA D-C7/C8	D-B5□/B64 D-B59W D-G5□/K59 D-G5□W D-K59W D-G5NT D-G5BA D-H7C	D-C73C D-C80C	D-A3□ D-G39 D-K39	D-A44
	Hs	Hs	Hs	Hs	Hs	Hs
20	25.5	24.5	27.5	27	62	72
25	28	27	30	29.5	64.5	74.5
32	31.5	30.5	33.5	33	68	78
40	36	35	38	37.5	72.5	82.5
50	41.5	40.5	43.5	43	78	88
63	48.5	47.5	50.5	50.5	85	95
80	—	—	59	—	93.5	103.5
100	—	—	69.5	—	104	114

Auto Switch Mounting 3

Operating Range

[mm]

Auto switch model	Bore size [mm]							
	20	25	32	40	50	63	80	100
D-A9□(V)	7	6	8	8	8	9	—	—
D-M9□(V) D-M9□W(V) D-M9□A(V)	3.5	3.5	4	4	5	5.5	—	—
D-C7□/C80 D-C73C/C80C	8	10	9	10	10	11	—	—
D-B5□/B64	8	10	9	10	10	11	11	11
D-B59W	13	13	14	14	14	17	16	18
D-H7□/H7NF/H7□W/H7BA	4	4	4.5	5	6	6.5	6.5	7
D-H7C	7	8.5	9	10	9.5	10.5	10.5	11
D-A3□/A44	9	10	9	10	10	11	11	11
D-G39/K39	8	9	9	9	9	10	10	11
D-G5□/K59/G5□W D-K59W/G5BA/G5NT	4	4	4.5	5	6	6.5	6.5	7

∗ Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30 % dispersion.) There may be the case it will vary substantially depending on an ambient environment.

Mounting Bracket Part No.

Auto switch model	Bore size [mm]							
	Ø 20	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
D-M9□(V) D-M9□W(V) D-A9□(V)	Note 1) BMA3-020	Note 1) BMA3-025	Note 1) BMA3-032	Note 1) BMA3-040	Note 1) BMA3-050	Note 1) BMA3-063	—	—
D-M9□A(V)	Note 2) BMA3-020S	Note 2) BMA3-025S	Note 2) BMA3-032S	Note 2) BMA3-040S	Note 2) BMA3-050S	Note 2) BMA3-063S	—	—
D-C7□/C80 D-C73C/C80C D-H7□ D-H7□W D-H7NF D-H7BA	BMA2-020A	BMA2-025A	BMA2-032A	BMA2-040A	BMA2-050A	BMA2-063A	—	—
D-B5□/B64 D-B59W D-G5□/K59 D-G5□W/K59W D-G5BAL/G59F D-G5NT	BA-01	BA-02	BA-32	BA-04	BA-05	BA-06	BA-08	BA-10
D-A3□/A44 D-G39/K39	BD1-01M	BD1-02M	BD1-02	BD1-04M	BD1-05M	BD1-06M	BD1-08M	BD1-10M

Note 1) Set part number which includes the auto switch mounting band (BMA2-□□□A) and the holder kit (BJ5-1/Switch bracket: Transparent). Since the switch bracket (made from nylon) are affected in an environment where alcohol, chloroform, methylamines, hydrochloric acid or sulfuric acid is splashed over, so it cannot be used. Please consult SMC regarding other chemicals.

Note 2) Set part number which includes the auto switch mounting band (BMA2-□□□AS/Stainless steel screw) and the holder kit (BJ4-1/Switch bracket: White).

Note 3) For the D-M9□A(V) type auto switch, do not install the switch bracket on the indicator light.

[Mounting screw set made of stainless steel]

The following set of mounting screws made of stainless steel is available. Use it in accordance with the operating environment. (Please order the auto switch mounting bracket separately, since it is not included.)

BBA3: For D-B5/B6/G5/K5

BBA4: D-C7/C8/H7

The above stainless steel screws are used when a cylinder is shipped with the D-H7BA or G5BA auto switches. When only an auto switch is shipped independently, the BBA3 or BBA4 is attached.

(1) BJ□-1 is a set of "a" and "b".
BJ4-1 (Switch bracket: White)
BJ5-1 (Switch bracket: Transparent)

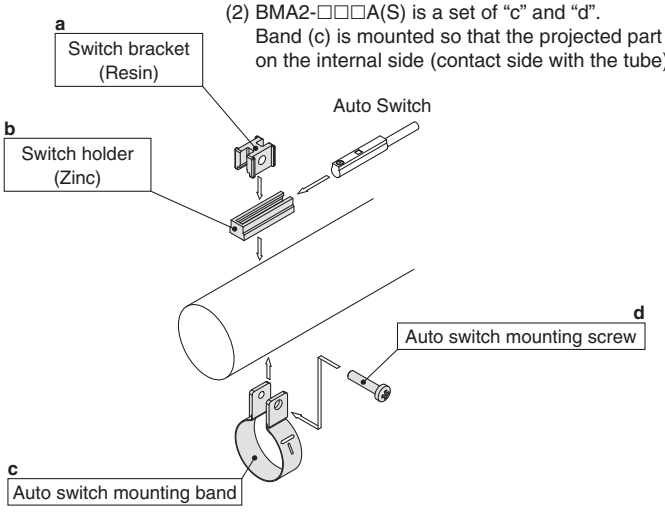
(2) BMA2-□□□A(S) is a set of "c" and "d".
Band (c) is mounted so that the projected part is on the internal side (contact side with the tube).

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted.

Type	Model	Electrical entry (Fetching direction)	Features	Applicable bore size [mm]
Reed	D-C73, C76	Grommet (In-line)	—	Ø 20 to Ø 63
	D-C80		Without indicator light	
	D-B53		—	Ø 20 to Ø 100
Solid state	D-H7A1, H7A2, H7B		—	Ø 20 to Ø 63
	D-H7NW, H7PW, H7BW		Diagnostic indication (2-colour indicator)	
	D-G5NT		With timer	Ø 20 to Ø 100

∗ For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to website: **www.smc.eu** for details.

∗ Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H types) are also available. Refer to website: **www.smc.eu** for details.



RHC Series
Specific Product Precautions

Be sure to read this before handling the products.
Refer to back page for Safety Instructions.

Mounting

⚠Caution

Use an external guide, etc. for horizontal actuation of a load.

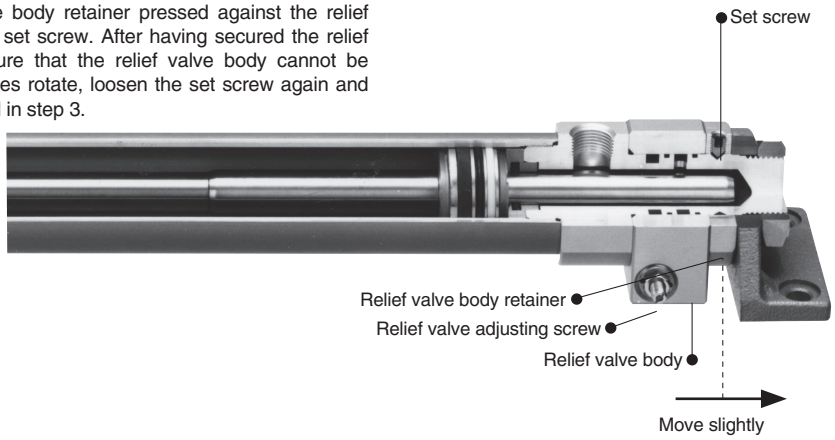
How to Rotate the Relief Valve Body (Ø 20, Ø 25, Ø 32, Ø 40)

⚠Caution

The relief adjusting screw can be placed in any direction by rotating the relief valve body by following the steps given below.

Procedure

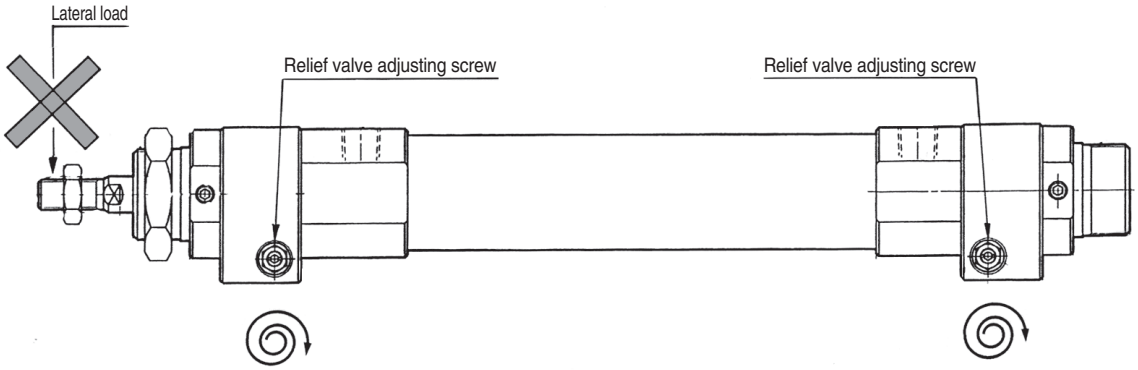
1. Verify that there is no residual pressure in the cylinder. Then, loosen the mounting bracket (such as foot, flange, etc.).
2. Loosen the set screw that is provided in the relief valve body retainer and rotate the relief valve body.
3. While keeping the relief valve body retainer pressed against the relief valve body, secure it with the set screw. After having secured the relief valve body retainer, make sure that the relief valve body cannot be rotated. In the event that it does rotate, loosen the set screw again and repeat the operation described in step 3.



Handling

⚠Caution

1. Confirm that the relief valve body does not rotate when the cylinder is mounted. If there is play in the axial direction of the relief valve body, the cushion may become ineffective. When attaching brackets (foot, flange), do so after loosening the relief valve body set screw. Retighten the relief valve body set screw after the brackets have been attached. (Ø 20, 25, 32, 40)
2. The cylinder stroke end cushion adjusting screw is adjusted six turns (10 turns for Ø 63, Ø 80 and Ø 100) starting from the position where it is rotated fully clockwise to counterclockwise (fully closed). It should never be rotated more than six turns (more than 10 turns for Ø 63, Ø 80 and Ø 100) from the position where it is rotated fully counterclockwise (fully open). This may damage the spring inside the relief valve.
3. The cylinder ports are designed so that a maximum speed 3000 mm/s can be obtained. However, it may not be possible to attain the desired speed in the case of short cylinder strokes. It may also be impossible to attain the desired speed due to restriction by component equipment (valves, speed control valves, piping, fitting, etc.). Make every effort to ensure sufficient effective area in the component equipment.
4. Avoid applications in which lateral loads are applied to the cylinder piston rod. Especially in the case of long strokes, implement measures such as providing a guide for the load.



6 turns at most (Ø 20, 25, 32, 40, 50)
10 turns at most (Ø 63, 80, 100)

6 turns at most (Ø 20, 25, 32, 40, 50)
10 turns at most (Ø 63, 80, 100)

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC) [1], and other safety regulations.

⚠ **Caution:**	**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
⚠ **Warning:**	**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Danger:**	**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots - Safety.
etc.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.
1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.
1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

1. The product is provided for use in manufacturing industries.
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first. [2] Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

2) Vacuum pads are excluded from this 1 year warranty.
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ Caution

SMC products are not intended for use as instruments for legal metrology.
Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.
Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

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