

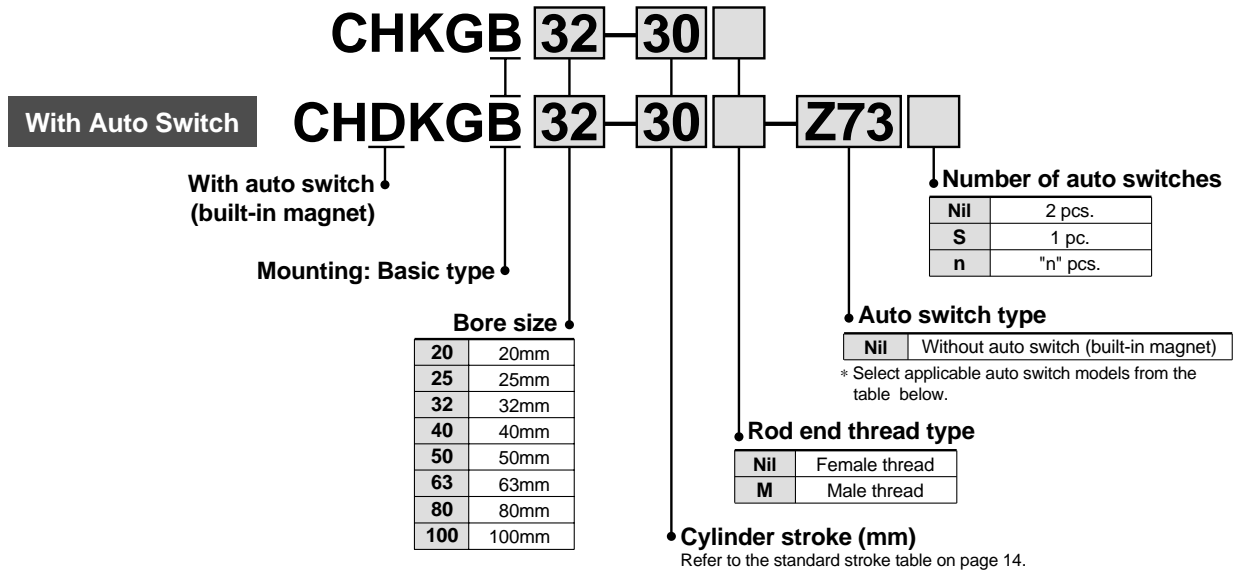
16MPa

Compact Hydraulic Cylinder

Series CH□KGB

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

How to Order



Applicable Auto Switches: Refer to "Auto Switch Guide" CAT.E-274-A for further details on each auto switch. Refer to pages 117 and 118 for auto switch circuit diagrams.

Bore sizes ∅20 and ∅25

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch type		Lead wire length (m)*			Applicable load	
					DC	AC	Electrical entry direction	Perpendicular	In-line	0.5 (Nil)	3 (L)	5 (Z)		
Reed switch	—	Grommet	No	2-wire	24V	5V, 12V	100V or less	A90V	A90	●	●	—	IC circuit	Relay
						12V	100V	A93V	A93	●	●	—	—	PLC
				Yes	3-wire (NPN equiv.)	—	5V	—	A96V	A96	●	●	—	—
Solid state switch	—	Grommet	No	3-wire (NPN)	24V	5V, 12V	—	F9NV	F9N	●	●	○	IC circuit	Relay PLC
				3-wire (PNP)				F9PV	F9P	●	●	○	—	
				2-wire				F9BV	F9B	●	●	○	—	
				—				F9NWV	F9NW	●	●	○	—	
	Diagnostic indication (2-color display)	Yes	3-wire (NPN)	F9PWV	F9PW	●	●	○	IC circuit					
			3-wire (PNP)	F9BWV	F9BW	●	●	○	—					
			2-wire	—	F9BA	—	●	○	—					
Water resistant (2-color display)	—	—	—	—	—	—	—	—	—	—	—	—		

* Lead wire length symbols: 0.5m Nil (Example) A93
3m L (Example) A93L
5m Z (Example) F9NWZ

Note) Solid state switches marked "○" are produced upon receipt of order.

Auto switch mounting bracket (screws) part nos.

Bore sizes (mm)	Mounting bracket part no.	Applicable switches	
		Reed switches	Solid state switches
20 & 25	BHK1-020	D-A9□ D-A9□V	D-F9□ D-F9□V D-F9□W D-F9□WV D-F9BAL
32 to 100	BHK2-032	D-Z7□ D-Z8□	D-Y5□ D-Y6□ D-Y7□ D-Y7□V D-Y7□W D-Y7□WV D-Y7BAL

Note) For cylinders with auto switches, the switches (already attached to mounting brackets) are packed together with the cylinder for shipment, but are not mounted on the cylinder.

Bore sizes ∅32 to ∅100

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch type		Lead wire length (m)*			Applicable load	
					DC	AC	Electrical entry direction	Perpendicular	In-line	0.5 (Nil)	3 (L)	5 (Z)		
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	24V	5V	—	—	Z76	●	●	—	IC circuit	—
				2-wire				—	Z73	●	●	●	—	
Solid state switch	—	Grommet	No	3-wire (NPN)	24V	5V, 12V	100V or less	—	Z80	●	●	—	IC circuit	Relay PLC
				3-wire (PNP)				Y69A	Y59A	●	●	○	IC circuit	
				2-wire				Y7PV	Y7P	●	●	○	—	
Diagnostic indication (2-color display)	Yes	Grommet	Yes	3-wire (NPN)	24V	5V, 12V	—	Y7NV	Y7N	●	●	○	IC circuit	Relay PLC
				3-wire (PNP)				Y7PV	Y7P	●	●	○	—	
				2-wire				Y69B	Y59B	●	●	○	—	
				—				Y7NWV	Y7NW	●	●	○	—	
				—				Y7PWV	Y7PW	●	●	○	IC circuit	
Water resistant (2-color display)	—	—	—	—	—	—	—	Y7BWV	Y7BW	●	●	○	—	
—	—	—	—	—	—	—	—	—	Y7BA	—	●	○	—	

* Lead wire length symbols: 0.5m Nil (Example) Y59A
3m L (Example) Y59AL
5m Z (Example) Y59AZ

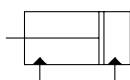
Note) Solid state switches marked "○" are produced upon receipt of order.

- Light and compact aluminum body.
- Auto switch can be mounted.
- Auto switch mounting does not affect overall length.
- A wide range of operating pressures, bore sizes, and standard strokes make wide selections possible.



Pages 22 to 24

JIS symbol



Specifications

Action	Double acting/Single rod type
Fluid	Hydraulic fluid
Nominal pressure	16MPa
Proof pressure	24MPa
Maximum allowable pressure	16MPa
Minimum operating pressure	0.3MPa
Ambient and fluid temperature	Without auto switch: -10° to 80°C
	With auto switch: -10° to 60°C
Piston speed	8 to 100mm/s
Cushion	None
Rod end thread	Female thread, Male thread
Thread tolerance	JIS class 2
Stroke length tolerance	+0.8 0 mm
Mounting type	Basic type
Mounting	Through hole

Note) Refer to page 136 for definitions of terms related to pressure.

Standard Strokes

Bore sizes (mm)	Standard strokes (mm)
20 & 25	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
32	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75
40, 50, 63, 80, 100	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

Manufacture of Intermediate Stroke Cylinders

Intermediate strokes in 5mm increments can be manufactured by installing spacers inside standard stroke cylinders.

55, 60, 65 and 70mm stroke cylinders have the same overall length as a 75mm stroke cylinder, and 80, 85, 90 and 95mm stroke cylinders have the same length as a 100mm stroke cylinder.

Refer to the Made to Order Specifications on page 23 for the ordering procedure.

Hydraulic Fluid Compatibility

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

* Contact SMC.

Minimum Strokes for Auto Switch Mounting

ø20 & ø25

No. of auto switches	Auto switch type		
	D-A9□, D-F9□W D-A9□V, D-F9□WV	D-F9□ D-F9□V	D-F9BAL
1 pc.	5	5	15
2 pcs.	10	5	15

ø32 to ø100

No. of auto switches	Auto switch type			
	D-Z7 D-Z8	D-Y7□W D-Y7□WV	D-Y5, D-Y7□V D-Y6 D-Y7	D-Y7BAL
1 pc.	5	10	5	15
2 pcs.	10	10	5	15

Theoretical Output

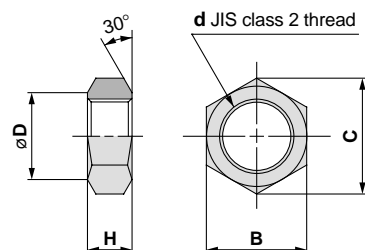
Unit: N

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)			
				3.5	7	10	16
20	12	OUT	314	1099	2198	3140	5024
		IN	201	704	1407	2010	3216
25	14	OUT	490	1715	3430	4900	7840
		IN	336	1176	2352	3360	5376
32	18	OUT	804	2814	5628	8040	12864
		IN	549	1922	3843	5490	8784
40	22.4	OUT	1256	4396	8792	12560	20096
		IN	862	3017	6034	8620	13792
50	28	OUT	1963	6871	13741	19630	31408
		IN	1347	4715	9429	13470	21552
63	35.5	OUT	3117	10910	21819	31170	49872
		IN	2127	7445	14889	21270	34032
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)

Optional Parts

Rod end nut



(mm)

Part no.	Bore size (mm)	B	C	d	D	H
NTH-025	20	17	19.6	M10 x 1.25	16.5	6
NTH-032	25	19	21.9	M12 x 1.25	18	7
NTH-040	32	22	25.4	M16 x 1.5	21	10
NTH-050	40	27	31.2	M20 x 1.5	26	12
NTH-060	50	32	37	M24 x 1.5	31	14
NTH-080	63	41	47.3	M30 x 1.5	40	17
NTH-100	80	55	63.5	M39 x 1.5	54	20
NTH-125	100	70	80.8	M48 x 1.5	69	26

Weights

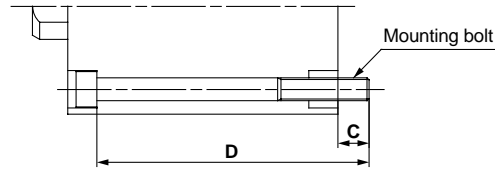
Unit: g

Bore size (mm)	Standard stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
20	221	242	263	284	305	326	347	368	389	410	—	—
25	312	339	366	393	420	447	474	501	528	555	—	—
32	581	625	669	713	757	801	845	889	933	977	1197	—
40	927	986	1045	1104	1163	1222	1281	1340	1399	1458	1753	2048
50	1351	1430	1509	1588	1667	1746	1825	1904	1983	2062	2457	2852
63	1813	1936	2059	2182	2305	2428	2551	2674	2797	2920	3535	4150
80	3870	4053	4236	4419	4602	4785	4968	5151	5334	5517	6432	7347
100	7188	7457	7726	7995	8264	8533	8802	9071	9340	9609	10954	12299

Mounting Bolts for CH□KGB

Through hole type mounting bolts are available.
 How to order: Add "Bolt" in front of the bolts to be used.
 Example: M8 x 80 / 4 pcs.

Mounting bolt diagram



Model	C	D	Mounting bolt		
CH□KGB20 -5 (M)	12.4	55	M5 x 55/		
		60	x 60/		
		65	x 60/		
		70	x 70/		
		75	x 75/		
		80	x 80/		
		85	x 85/		
		90	x 90/		
		95	x 95/		
		100	x 100/		
		CH□KGB25 -5 (M)	10.4	55	M5 x 55/
				60	x 60/
65	x 60/				
70	x 70/				
75	x 75/				
80	x 80/				
85	x 85/				
90	x 90/				
95	x 95/				
100	x 100/				
CH□KGB32 -5 (M)	10.5			65	M6 x 65/
				70	x 70/
		75	x 75/		
		80	x 80/		
		85	x 85/		
		90	x 90/		
		95	x 95/		
		100	x 100/		
		105	x 105/		
		110	x 110/		
		135	x 135/		
		CH□KGB40 -5 (M)	13.5	75	M8 x 75/
80	x 80/				
85	x 85/				
90	x 90/				
95	x 95/				
100	x 100/				
105	x 105/				
110	x 110/				
115	x 115/				
120	x 120/				
145	x 145/				
170	x 170/				

Model	C	D	Mounting bolt
CH□KGB50 -5 (M)	15.5	80	M10 x 80/
		85	x 85/
		90	x 90/
		95	x 95/
		100	x 100/
		105	x 105/
		110	x 110/
		115	x 115/
		120	x 120/
		125	x 125/
		150	x 150/
		175	x 175/
CH□KGB63 -5 (M)	16	85	M12 x 85/
		90	x 90/
		95	x 95/
		100	x 100/
		105	x 105/
		110	x 110/
		115	x 115/
		120	x 120/
		125	x 125/
		130	x 130/
		155	x 155/
		180	x 180/
CH□KGB80 -5 (M)	22	100	M14 x 100/
		105	x 105/
		110	x 110/
		115	x 115/
		120	x 120/
		125	x 125/
		130	x 130/
		135	x 135/
		140	x 140/
		145	x 145/
		170	x 170/
		195	x 195/
CH□KGB100 -5 (M)	26.5	120	M16 x 120/
		125	x 125/
		130	x 130/
		135	x 135/
		140	x 140/
		145	x 145/
		150	x 150/
		155	x 155/
		160	x 160/
		165	x 165/
		190	x 190/
		215	x 215/

⚠ Specific Product Precautions

Be sure to read before handling. Refer to pages 135 through 141 for safety instructions, hydraulic cylinder and auto switch precautions.

Usage

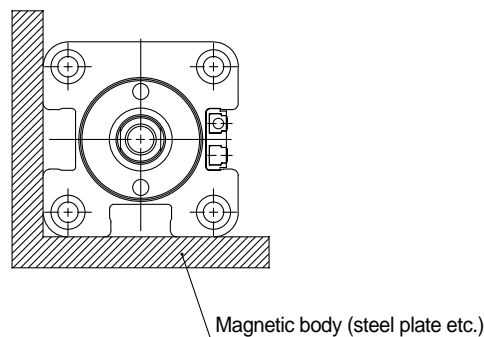
⚠ Caution

1. Use hexagon socket head cap screws (JISB1176, strength class 10.9 or higher) for cylinder mounting.
2. Since a lateral load (eccentric load) cannot be applied to the piston rod, build the mounting jig in such a way that a lateral load will not be applied to the piston rod.
3. Make sure that the interlocking length of the rod end thread (male or female thread) and the mounting material is at least 80% of the thread diameter.
4. When operating a cylinder for the first time, be sure to release the air inside the cylinder and the piping. When the air release is complete, operate the cylinder at reduced pressure, then gradually increase it to the normal operating pressure.
5. Since Series CH□KGB does not have an air release plug, release air from other components (e.g. from piping, etc.) as well.
6. Do not use two cylinders facing one another horizontally or vertically in such a way that their piston rods strike each other.
7. When the cylinder head side contains hydraulic fluid or is in a normally pressurized condition, the applied load must not be allowed to strike the piston rod end. Avoid such applications.
8. When mounting the cylinder body with mounting bolts, use tightening torques in the table at left as a guide.

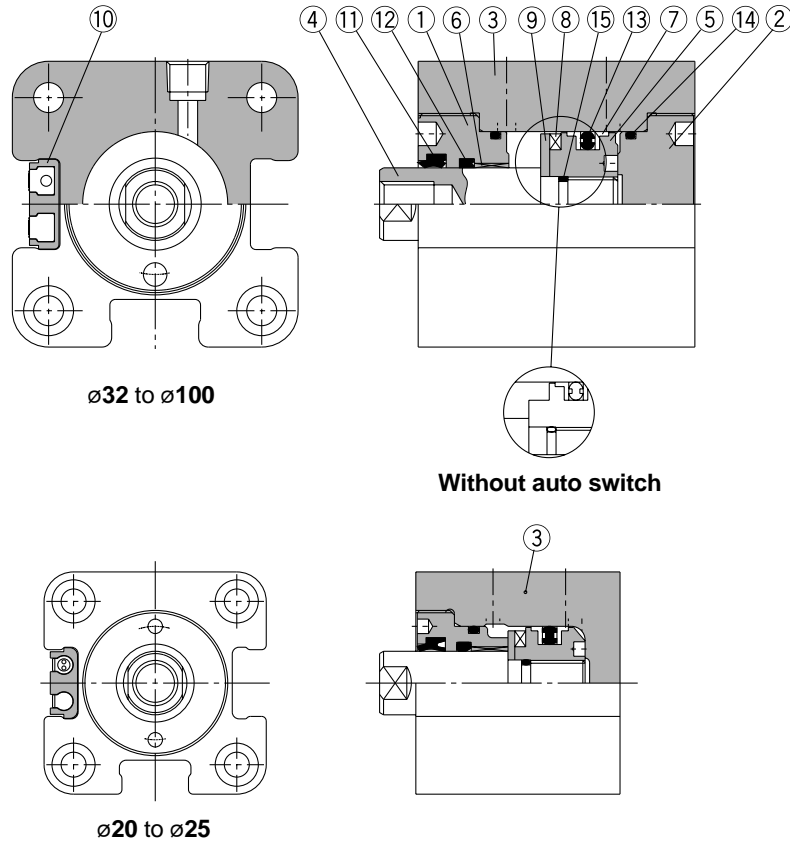
Body mounting bolt tightening torques

Bore size (mm)	Mounting bolt size	Tightening torque N·m
20	M5	3.0
25	M5	4.9
32	M6	10
40	M8	20
50	M10	40
63	M12	50
80	M14	80
100	M16	120

Consult with SMC when using a cylinder in close proximity to a magnetic body (including proximity on any side) as shown in the figure below, as the operation of auto switches may become unstable.



Construction



Parts list

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	Black anodized
2	Head cover	Aluminum alloy	Black anodized
3	Cylinder tube	Aluminum alloy	Hard anodized
4	Piston rod	ø20 & ø25: Stainless steel ø32 to ø100: Carbon steel	Hard chromium electroplated
5	Piston	Stainless steel	
6	Bushing	Copper alloy	
7	Back-up ring	Resin	
8	Magnet	—	With switch only
9	Magnet plate	Stainless steel	With switch only
10	Switch mounting bracket	Aluminum alloy	With switch only
11	Scraper	NBR	
12	Rod seal		With back-up ring
13	Piston seal		
14	Tube gasket		
15	Piston gasket		

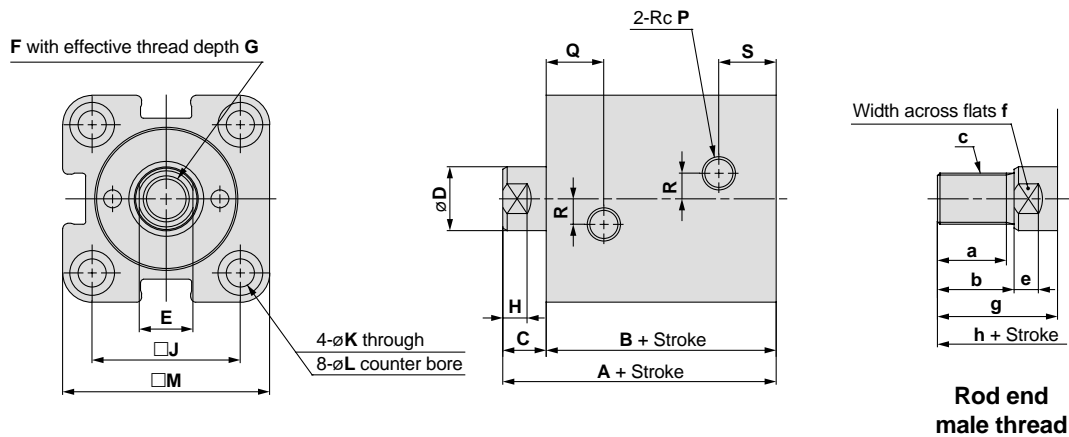
Replacement parts: Seal kits

Bore size (mm)	Seal kit no.	Kit components
20	CHKG20-PS	Nos. 7, 11, 12, 13 and 14 from the chart at left
25	CHKG25-PS	
32	CHKG32-PS	
40	CHKG40-PS	
50	CHKG50-PS	
63	CHKG63-PS	
80	CHKG80-PS	
100	CHKG100-PS	

* Seal kits consist of items 7, 11, 12, 13 and 14 and can be ordered by using the seal kit number for each bore size.

Series CH□KGB

Dimensions



Bore size (mm)	A	B	C	D	E	F	G	H	J	K	L	M	P	Q	R	S
20	51	43	8	12	10	M8 x 1.25	10	6	30	5.5	9.5 depth 5.4	43	1/8	16.5	6	11.5
25	53	45	8	14	12	M10 x 1.5	12	6	36	5.5	9.5 depth 5.4	49	1/8	17	8	12
32	66	56	10	18	14	M12 x 1.75	15	7	47	6.6	11 depth 6.5	63	1/4	19.5	10	19.5
40	75	65	10	22.4	19	M16 x 2	20	7	52	9	14 depth 8.6	71	1/4	21.5	10	21.5
50	81	70	11	28	24	M20 x 2.5	24	8	58	11	17.5 depth 10.8	81	1/4	24	10	24
63	90	77	13	35.5	30	M27 x 3	33	9	69	13	20 depth 13	100	1/4	27.5	10	27.5
80	105	88	17	45	41	M30 x 3.5	36	14	86	15	23 depth 15.2	121	3/8	31	15	31
100	132	106	26	56	50	M39 x 4	45	21	106	17	26 depth 17.5	146	3/8	36	15	36

Note) Body dimensions are the same with or without auto switches.

Bore size (mm)	a	b	c	e	f	g	h
20	11	15	M10 x 1.25	6	10	23	66
25	14	18	M12 x 1.25	6	12	26	71
32	21	25	M16 x 1.5	7	14	35	91
40	26	30	M20 x 1.5	7	19	40	105
50	31	35	M24 x 1.5	8	24	46	116
63	41	45	M30 x 1.5	9	30	58	135
80	56	60	M39 x 1.5	14	41	77	165
100	71	75	M48 x 1.5	21	50	101	207

Series CH□KGB Auto Switch Specifications

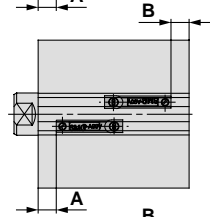
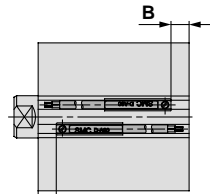
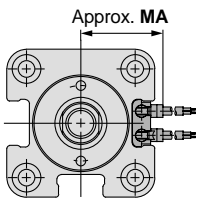
Refer to "Auto Switch Guide" CAT.E274-A for detailed specifications.



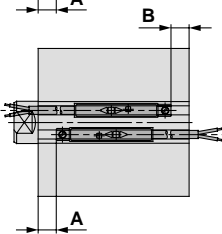
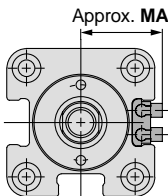
Auto Switches: Proper Mounting Positions and Mounting Heights for Stroke End Detection

ø20 & ø25

D-A9□
D-F9□
D-F9□W



D-A9□V
D-F9□V
D-F9□WV



D-F9BAL

Proper auto switch mounting positions (mm)

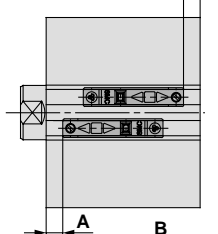
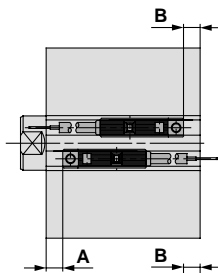
Bore size (mm)	D-A9□ D-A9□V		D-F9□ D-F9□V D-F9□W D-F9□WV		D-F9BAL	
	A	B	A	B	A	B
20	12	11	16	15	15	14
25	13	12	17	16	16	15

Auto switch mounting heights (mm)

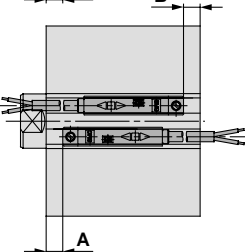
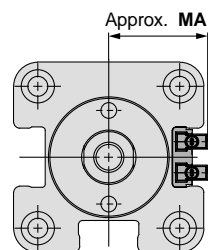
Bore size (mm)	D-A9□V	D-F9□V D-F9□WV	D-F9BAL
	MA	MA	MA
20	25.5	28	25.5
25	27.5	30	27.5

ø32 to ø100

D-Z7
D-Z8
D-Y5□
D-Y7□
D-Y7□W



D-Y6□
D-Y7□V
D-Y7□WV



D-Y7BAL

Proper auto switch mounting positions (mm)

Bore size (mm)	D-Z7, D-Z8, D-Y5 D-Y6, D-Y7 D-Y7□V, D-Y7□WV D-Y7BAL	
	A	B
32	13.5	18
40	19	21.5
50	19	26.5
63	21.5	31
80	24.5	39
100	34.5	46.5

Auto switch mounting heights (mm)

Bore size (mm)	D-Y7BAL
	MA
32	33
40	37.5
50	43.5
63	52
80	62.5
100	75

Series CH□KGB

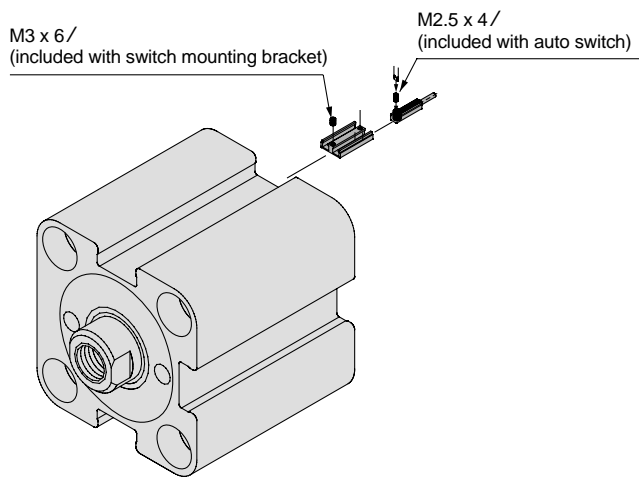
Auto Switch Mounting

When mounting auto switches, they should first be set into the mounting bracket and inserted into the cylinder's switch mounting groove from the direction shown in the drawing below. After setting in the mounting position, use a hexagon wrench to tighten the switch mounting bracket screw that is included.

⚠ Caution

When tightening the auto switch mounting screw, use a watchmakers screw driver with a handle about 5 to 6 mm in diameter.

When tightening the mounting bracket screw, use a 1.5mm hexagon wrench. The tightening torque should be approximately 0.1 to 0.2N·m for types D-A9 and D-F9, and 0.05 to 0.1N·m for types D-Z7, D-Z8, D-Y5, D-Y6 and D-Y7. As a rule, the mounting screw should be turned about 90° past the point at which tightening can first be felt.



Series CH□KGB

Made to Order Specifications 1

Contact SMC for detailed specifications, lead times, and prices.



1

Series CHQHB (14MPa) Interchangeable Parts

CH□KGB Bore size Stroke Rod end thread type Auto switch Quantity XC62

Note) The interchangeable contents are the "C" dimension (from the front end surface to the rod end) and the "F" dimension (rod end thread size).

CH□QHB Interchangeable parts Note)

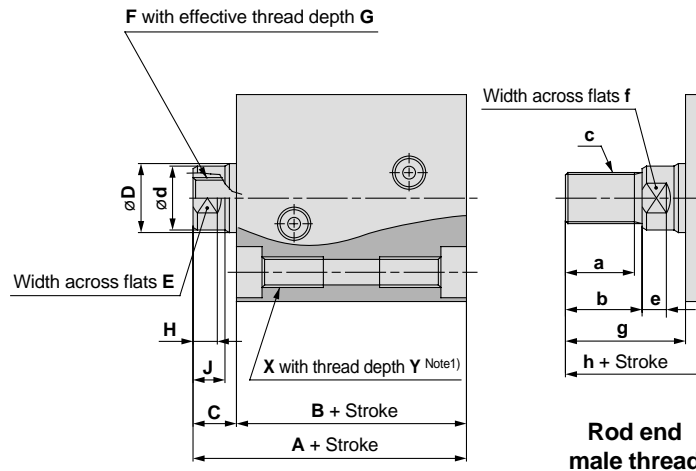
Interchangeable contents	Piston rod C dimension End thread size F dimension
--------------------------	---

Cylinder mounting

Nil	Through hole
R	Front taps
H	Rear taps
W	Double side taps

Dimensions

CH□KGB□-□-XC62□



Bore size (mm)	A	B	C	D	d	E	F	G	H	J	X	Y
20	53	43	10	12	11	10	M6 x 1	8	5.5	6.5	M6 x 1	12
25	56	45	11	14	13	12	M8 x 1.25	10	6.5	7.5	M6 x 1	12
32	68	56	12	18	15	13	M10 x 1.5	12	7	8.5	M8 x 1.25	16
40	79	65	14	22.4	19	16	M12 x 1.75	15	8	10	M10 x 1.5	20
50	85	70	15	28	24	21	M16 x 2	20	9.5	11.5	M12 x 1.75	24
63	95	77	18	35.5	31	27	M20 x 2.5	24	11.5	14	M16 x 2	24
80	109	88	21	45	39	36	M27 x 3	33	15	17	M18 x 2.5	27
100	132	106	26	56	48	41	M30 x 3.5	36	17.5	22	M20 x 2.5	30

Rod end male threads

Bore size (mm)	a	b	c	e	f	g	h
20	12	14	M8 x 1	5.5	10	24	67
25	14.5	17	M10 x 1.25	6.5	12	28	73
32	17.5	20	M12 x 1.25	7	13	32	88
40	22	25	M16 x 1.5	8	16	39	104
50	27	30	M20 x 1.5	9.5	21	45	115
63	32	35	M24 x 1.5	11.5	27	53	130
80	40	43	M30 x 1.5	15	36	64	152
100	47	50	M39 x 1.5	17.5	41	76	182

Part no. suffix	X & Y dimensions
-XC62	None
-XC62R	4 places on front side
-XC62H	4 places on rear side
-XC62W	8 places on both sides

Note) The relationship between the mounting taps (X & Y dimensions) provided on cylinder tubes and their order numbers is as shown above.

Series CH□KGB

Made to Order Specifications 2

Contact SMC for detailed specifications, lead times, and prices.



2 Intermediate Stroke Type

Intermediate strokes in 5mm increments can be manufactured by installing spacers inside standard stroke cylinders.

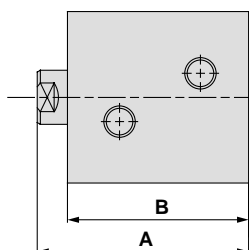
CH□KGB Bore size Stroke Rod end thread type Auto switch Quantity XC63

Intermediate stroke

Strokes	Applicable tube
55, 60, 65, 70	For 75mm stroke
80, 85, 90, 95	For 100mm stroke

Dimensions

CH□KGB□-□-XC63



Bore size (mm) \ Stroke	55, 60, 65, 70		80, 85, 90, 95	
	A	B	A	B
32	141	131	—	—
40	150	140	175	165
50	156	145	181	170
63	165	152	190	177
80	180	163	205	188
100	207	181	232	206

Note) Dimensions other than those highlighted above are standard.

Series CH□KGB

Made to Order Specifications 3

Contact SMC for detailed specifications, lead times, and prices.



3

With Air Release Valve

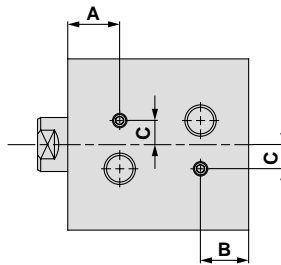
Air release valves are provided on cylinder tube surfaces machined for ports.

CH□KGB Bore size Stroke Rod end thread type Auto switch Quantity XC64

With air release valve

Dimensions

CH□ KGB□-□-XC64



Bore size (mm)	A	B	C
20	16.5	9.5	7
25	17	10	8
32	19.5	17	10
40	21.5	18.5	10
50	24	21.5	10
63	27.5	24	10
80	31	27.5	15
100	36	33	15

Note) Dimensions other than those highlighted above are standard.