

JIS Standard Compact Hydraulic Cylinder Compact Hydraulic Cylinder

Series **CHKD/CHKG**

Series **CHKD**



Nominal pressure: **10 MPa**

Bore size (mm): 20, 25, 32, 40, 50, 63, 80, 100

Series **CHKG**



Nominal pressure: **16 MPa**

Bore size (mm): 20, 25, 32, 40, 50, 63, 80, 100

CHQ

CHK ☐

CHN

CHM

CHS ☐

CH2 ☐

CHA

Related
Equipment

D- ☐

JIS Standard Compact Hydraulic Cylinder

Series **CH** **KD**

10 MPa $\varnothing 20, \varnothing 25, \varnothing 32, \varnothing 40, \varnothing 50, \varnothing 63, \varnothing 80, \varnothing 100$

How to Order

With Auto Switch

CHDKD B 32  - 30  - M9BW  - 

With auto switch
(built-in magnet)

Mounting bracket style

Symbol	Style	Port position (Note)
B	Basic style	Top
L	Foot style	Foot bracket
LB		Right
LD		Left

(Note) Indicates the relative position of the foot bracket and port, as seen from the rod side.

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

Cylinder stroke (mm)

Refer to the standard stroke table on page 1285.

Port thread type

Nil	Rc
TN	NPT

Made to Order specifications

For details, refer to page 1285.

Number of auto switches

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

Auto switch type

Nil	Without auto switch
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* Select applicable auto switch models from the table below.

Rod end thread type

Nil	Female thread
M	Male thread

* Rod end thread type is an optional product. (Refer to page 1286).

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CHDKDB50-100

Applicable Auto Switches

Refer to pages 1451 to 1510 for further details on each auto switch.

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	Electrical entry direction		0.5 (Nil)	1 (M)	3 (L)	5 (Z)				
							Perpendicular	In-line								
Solid state auto switch	Diagnostic indication (2-color display)	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay PLC	
				3-wire (PNP)			M9PV	M9P	●	●	●	○	○			
				2-wire	12 V		M9BV	M9B	●	●	●	○	○	○		—
				3-wire (NPN)	5 V, 12 V		M9NVW	M9NW	●	●	●	○	○	○		IC circuit
	3-wire (PNP)	5 V, 12 V	M9PWV	M9PW	●	●	●	○	○	○	IC circuit					
	2-wire	12 V	M9BWV	M9BW	●	●	●	○	○	○		—				
	3-wire (NPN)	5 V, 12 V	M9NAV ^{*1}	M9NA ^{*1}	○	○	○	●	●	●	IC circuit					
	3-wire (PNP)	12 V	M9PAV ^{*1}	M9PA ^{*1}	○	○	○	●	●	●		—				
Reed auto switch	—	Grommet	Yes	3-wire (NPN)	—	5 V	M9BAV ^{*1}	M9BA ^{*1}	○	○	○	○	○	—		
				No	2-wire	24 V	12 V	A96V ^{**}	A96 ^{**}	●	—	●	—	—	IC circuit	—
						100 V	A93V ^{**2}	A93 ^{**}	●	●	●	●	—	Relay PLC		
							100 V or less	A90V ^{**}	A90 ^{**}	●	—	●	—		—	IC circuit

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. A water resistant type cylinder is recommended for use in an environment which requires water resistance. Consult with SMC regarding water resistant type for foot style.

*2 1 m type lead wire is only applicable to D-A93.

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
1 m M (Example) M9NW
3 m L (Example) M9NW
5 m Z (Example) M9NWZ

* Solid state auto switches marked "○" are produced upon receipt of order.
** The D-A9 model cannot be mounted on $\varnothing 50$.

* For $\varnothing 32$ to $\varnothing 100$, there are applicable auto switches other than listed. Refer to page 1293 for details.

* For details about auto switches with pre-wired connector, refer to pages 1494 and 1495.

* Cylinders with auto switch will be shipped together with the auto switch and auto switch mounting bracket ($\varnothing 32$ to $\varnothing 50$) (not assembled).

Specifications



Bore size (mm)	20	25	32	40	50	63	80	100
Action	Double acting/Single rod							
Fluid	Hydraulic fluid							
Nominal pressure	10 MPa							
Proof pressure	15 MPa							
Maximum allowable pressure	13 MPa							
Minimum operating pressure	0.3 MPa							
Ambient and fluid temperature	Without auto switch: -10° to 80°C							
	With auto switch: -10° to 60°C							
Piston speed	8 to 100 mm/s							
Cushion	None							
Rod end thread	Female thread, Male thread							
Stroke length tolerance	+0.8 0 mm							
Mounting style	Basic style (through hole), Foot style							

Note) Refer to page 1234 for definitions of terms related to pressure.



Made to Order specifications (For details, refer to pages 1295 to 1298)

Symbol	Specifications
-XA□	Change of rod end shape
-XC61	Compatible with CHQHB series (14 MPa)
-XC63	Intermediate stroke type (Built-in spacer type)
-XC64	With air release valve



Standard Strokes

Stroke (mm) Bore size (mm)											75				100					
	5	10	15	20	25	30	35	40	45	50	Intermediate stroke [XC63] (Built-in spacer type)				Intermediate stroke [XC63] (Built-in spacer type)					
	20, 25	32	40, 50, 63	80, 100	55	60	65	70	80	85	90	95								
20, 25	○	○	○	○	○	○	○	○	○	○	—	—	—	—	—	—	—	—	—	
32	○	○	○	○	○	○	○	○	○	○	□	—	□	□	□	○	—	—	—	—
40, 50, 63	○	○	○	○	○	○	○	○	○	○	□	□	□	□	□	○	□	□	□	□
80, 100	○	○	○	○	○	○	○	○	○	○	□	□	□	□	□	○	□	□	□	□

○: Standard stroke (dedicated cylinder tube)
□: Intermediate stroke XC63 (built-in spacer type)

Manufacture of Intermediate Stroke Cylinders [XC63] (Built-in spacer type)

Intermediate strokes in 5 mm increments can be manufactured by installing spacers inside standard stroke cylinders. 55, 60, 65 and 70 mm stroke cylinders have the same overall length as a 75 mm stroke cylinder, and 80, 85, 90 and 95 mm stroke cylinders have the same length as a 100 mm stroke cylinder.

Refer to the Made to Order Specifications on page 1297 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

* Consult with SMC.

Theoretical Output

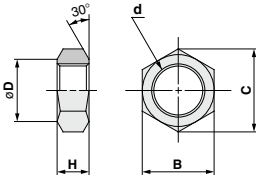
Unit: N

Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)		
				3.5	7	10
20	12	OUT	314	1099	2198	3140
		IN	201	704	1407	2010
25	14	OUT	490	1715	3430	4900
		IN	336	1176	2352	3360
32	18	OUT	804	2814	5628	8040
		IN	549	1922	3843	5490
40	22.4	OUT	1256	4396	8792	12560
		IN	862	3017	6034	8620
50	28	OUT	1963	6871	13741	19630
		IN	1347	4715	9429	13470
63	35.5	OUT	3117	10910	21819	31170
		IN	2127	7445	14889	21270
80	45	OUT	5026	17591	35182	50260
		IN	3436	12026	24052	34360
100	56	OUT	7853	27486	54971	78530
		IN	5390	18865	37730	53900

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-020	20	13	15	M8 x 1	12.5	5
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

Note) There may be a slight difference between the part numbers and the corresponding bore size.

Weight

CH□KDB/Basic style

Unit: g

Bore size (mm)	Standard stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
20	218	240	262	282	304	326	348	370	392	414	—	—
25	299	327	355	383	411	439	467	495	523	551	—	—
32	515	558	601	644	687	730	773	816	859	902	1117	1332
40	729	784	839	894	949	1004	1059	1114	1169	1224	1499	1774
50	1065	1139	1213	1287	1361	1435	1509	1583	1657	1731	2101	2471
63	1773	1882	1991	2100	2209	2318	2427	2536	2645	2754	3299	3844
80	3216	3379	3542	3868	4031	4194	4357	4520	4683	4846	5661	6476
100	6142	6384	6626	6868	7110	7352	7594	7836	8078	8320	9530	10740

CH□KDL/Foot style

Unit: g

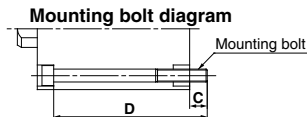
Bore size (mm)	Standard stroke (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
20	465	490	510	535	560	580	605	630	650	675	—	—
25	570	600	630	660	690	720	750	780	810	840	—	—
32	880	925	970	1015	1060	1100	1150	1190	1235	1280	1505	1730
40	1375	1435	1495	1550	1610	1670	1725	1785	1845	1900	2195	2485
50	2200	2280	2360	2435	2515	2595	2675	2755	2835	2910	3310	3705
63	3845	3960	4075	4195	4310	4425	4545	4660	4775	4895	5475	6060
80	6555	6725	6900	7235	7410	7580	7755	7930	8100	8275	9150	10010
100	11355	11610	11865	12120	12375	12630	12885	13140	13400	13655	14930	16210

Mounting Bolts for CH□KDB

The mounting bolts shown below conform to JIS B 1176, strength class 10.9 or higher.

Through hole type mounting bolts are available.
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M5x55L 4 pcs.



Model	C	D	Mounting bolt part no.
CH□KDB20-5 (M)	12.4	55	CQ-M5 x 55L
-10 (M)		60	x 60L
-15 (M)		65	x 65L
-20 (M)		70	x 70L
-25 (M)		75	x 75L
-30 (M)		80	x 80L
-35 (M)		85	x 85L
-40 (M)		90	x 90L
-45 (M)		95	x 95L
-50 (M)		100	x 100L
CH□KDB25-5 (M)	10.4	55	CQ-M5 x 55L
-10 (M)		60	x 60L
-15 (M)		65	x 65L
-20 (M)		70	x 70L
-25 (M)		75	x 75L
-30 (M)		80	x 80L
-35 (M)		85	x 85L
-40 (M)		90	x 90L
-45 (M)		95	x 95L
-50 (M)		100	x 100L
CH□KDB32-5 (M)	10.5	60	CQ-M6 x 60L
-10 (M)		65	x 65L
-15 (M)		70	x 70L
-20 (M)		75	x 75L
-25 (M)		80	x 80L
-30 (M)		85	x 85L
-35 (M)		90	x 90L
-40 (M)		95	x 95L
-45 (M)		100	x 100L
-50 (M)		105	x 105L
-75 (M)		130	x 130L
CH□KDB40-5 (M)	13.5	65	CQ-M8 x 65L
-10 (M)		70	x 70L
-15 (M)		75	x 75L
-20 (M)		80	x 80L
-25 (M)		85	x 85L
-30 (M)		90	x 90L
-35 (M)		95	x 95L
-40 (M)		100	x 100L
-45 (M)		105	x 105L
-50 (M)		110	x 110L
-75 (M)		135	x 135L
-100 (M)		160	x 160L

Model	C	D	Mounting bolt part no.
CH□KDB50-5 (M)	15.8	70	CQ-M10 x 70L
-10 (M)		75	x 75L
-15 (M)		80	x 80L
-20 (M)		85	x 85L
-25 (M)		90	x 90L
-30 (M)		95	x 95L
-35 (M)		100	x 100L
-40 (M)		105	x 105L
-45 (M)		110	x 110L
-50 (M)		115	x 115L
-75 (M)		140	x 140L
-100 (M)		165	x 165L
CH□KDB63-5 (M)	16	75	CQ-M12 x 75L
-10 (M)		80	x 80L
-15 (M)		85	x 85L
-20 (M)		90	x 90L
-25 (M)		95	x 95L
-30 (M)		100	x 100L
-35 (M)		105	x 105L
-40 (M)		110	x 110L
-45 (M)		115	x 115L
-50 (M)		120	x 120L
-75 (M)		145	x 145L
-100 (M)		170	x 170L
CH□KDB80-5 (M)	22.2	90	CQ-M14 x 90L
-10 (M)		95	x 95L
-15 (M)		100	x 100L
-20 (M)		105	x 105L
-25 (M)		110	x 110L
-30 (M)		115	x 115L
-35 (M)		120	x 120L
-40 (M)		125	x 125L
-45 (M)		130	x 130L
-50 (M)		135	x 135L
-75 (M)		160	x 160L
-100 (M)		185	x 185L
CH□KDB100-5 (M)	26.5	110	CQ-M16 x 110L
-10 (M)		115	x 115L
-15 (M)		120	x 120L
-20 (M)		125	x 125L
-25 (M)		130	x 130L
-30 (M)		135	x 135L
-35 (M)		140	x 140L
-40 (M)		145	x 145L
-45 (M)		150	x 150L
-50 (M)		155	x 155L
-75 (M)		180	x 180L
-100 (M)		205	x 205L

CHQ

CHK□

CHN

CHM

CHS□

CH2□

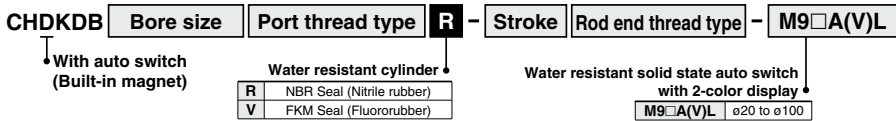
CHA

Related Equipment

D-□

Water Resistant Type

A special scraper is installed on the basic cylinder to prevent liquid in the surrounding area from entering the cylinder. It can be used in environments where exposure to machine tool coolants is likely, as well as in environments where water spray and splashing is frequent, such as in food processing machinery and car washing equipment.



Some of the parts are different from the dimensions of the basic type.
Refer to Best Pneumatics No. 2 for details.

⚠ Specific Product Precautions

Be sure to read before handling. Refer to front matter 38 for Safety Instructions, and pages 1234 to 1241 for precautions for hydraulic cylinder and auto switch.

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□KDB 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.

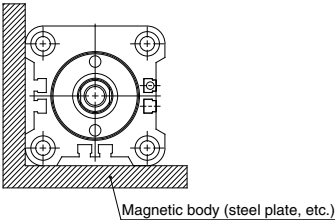
7. When the cylinder head side contains hydraulic fluid or is in a normally pressurized condition, the applied load must not be allowed to strike the piston rod end. Avoid such applications.

8. When mounting the cylinder body with mounting bolts, use tightening torques in the table at left as a guide.

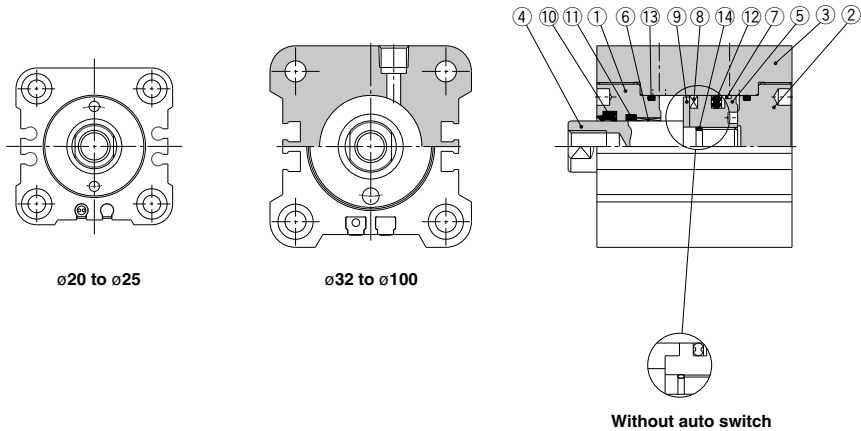
Body mounting bolt tightening torques

Bore size (mm)	Mounting bolt size	Tightening torque (N·m)
20	M5	2.5
25	M5	4
32	M6	7
40	M8	16
50	M10	30
63	M12	40
80	M14	70
100	M16	100

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 auto switch only
9	Magnet plate	Stainless steel	With auto switch only
10	Scraper	NBR	
11	Rod seal		
12	Piston seal		
13	Tube gasket		
14	Piston gasket		

Replacement Parts/Seal Kit

Bore size (mm)	Seal kit no.	Content
20	CHKD20-PS	Nos. ⑦, ⑩, ⑪, ⑫, and ⑬ from the chart at left
25	CHKD25-PS	
32	CHKD32-PS	
40	CHKD40-PS	
50	CHKD50-PS	
63	CHKD63-PS	
80	CHKD80-PS	
100	CHKD100-PS	

* Seal kit consists of items ⑦, ⑩, ⑪, ⑫ and ⑬, and can be ordered by using the seal kit number for each bore size.

* Special tools are necessary for disassembly. Contact SMC for recommended tool designs and dimensions. Furthermore, ø80 and ø100 are tightened with a large tightening torque, so disassembly will be difficult. Contact SMC if disassembly is required.

CHQ

CHK□

CHN

CHM

CHS□

CH2□

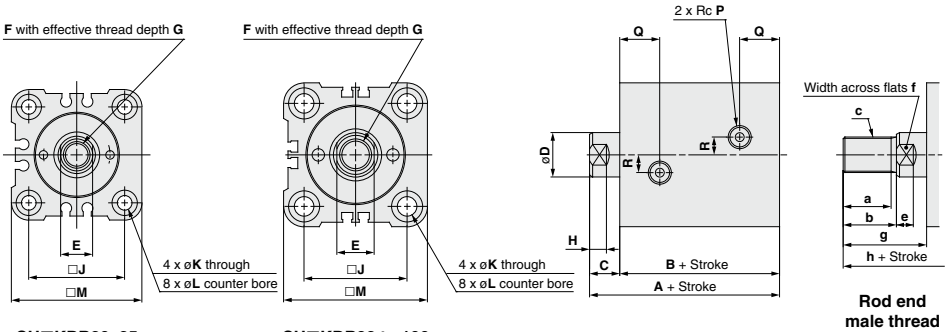
CHA

Related Equipment

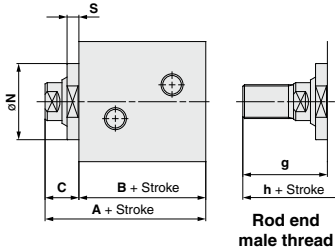
D-□

Dimensions

Basic style/CH□KDB



Water resistant type



(mm)															
Bore size (mm)	A	B	C	D	E	F	G	H	J	K	L	M	P	Q	R
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
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
32	61	51	10	18	14	M12 x 1.75	15	7	47	6.6	11 depth 6.5	63	1/4	19.5	10
40	65	55	10	22.4	19	M16 x 2	20	7	52	9	14 depth 8.6	71	1/4	20.5	10
50	71	60	11	28	24	M20 x 2.5	24	8	58	11	17.5 depth 10.8	81	1/4	22	10
63	80	67	13	35.5	30	M27 x 3	33	9	69	13	20 depth 13	97	1/4	25.5	10
80	95	78	17	45	41	M30 x 3.5	36	14	86	15	23 depth 15.2	117	3/8	30	15
100	122	96	26	56	50	M39 x 4	45	21	106	17	26 depth 17.5	142	3/8	36	15

Note 1) Body dimensions are the same with or without auto switches.

Rod end male threads

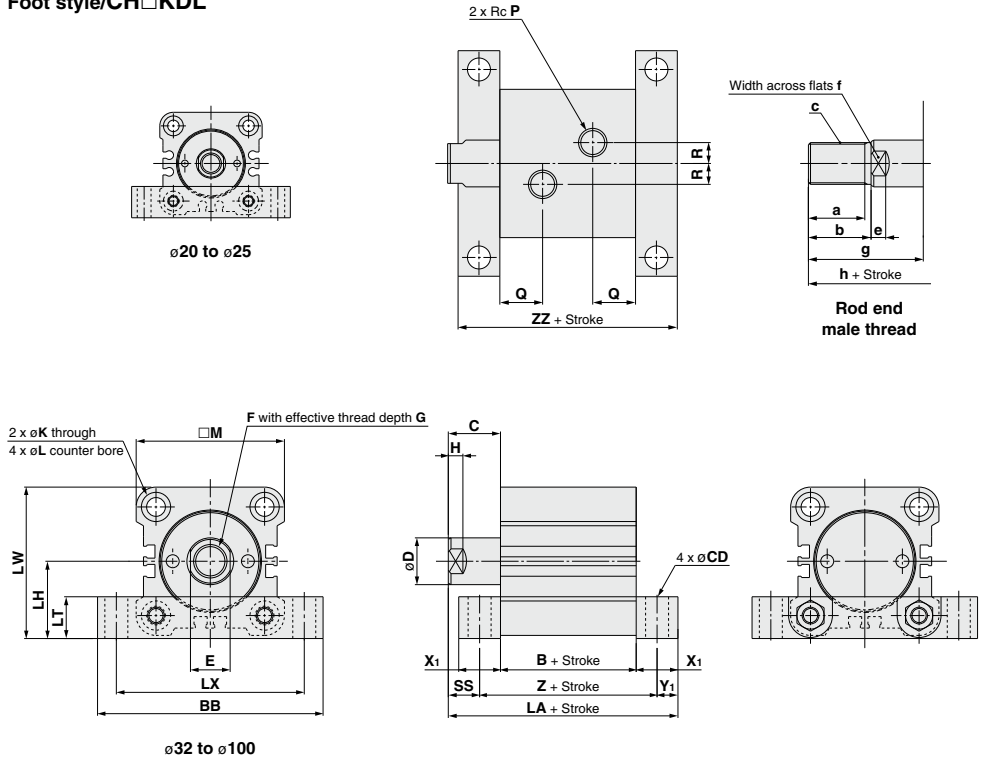
(mm)							
Bore size (mm)	a	b	c	e	f	g	h
20	12.5	15	M10 x 1.25	6	10	23	66
25	15.5	18	M12 x 1.25	6	12	26	71
32	22	25	M16 x 1.5	7	14	35	86
40	27	30	M20 x 1.5	7	19	40	95
50	32	35	M24 x 1.5	8	24	46	106
63	42	45	M30 x 1.5	9	30	58	125
80	57	60	M39 x 1.5	14	41	77	155
100	72	75	M48 x 1.5	21	50	101	197

Water resistant type

(mm)							
Bore size (mm)	A	B	C	N	S	g	h
20	61	43	18	26.5	6	33	76
25	63	45	18	30	6	36	81
32	71	51	20	38	7	45	96
40	75	55	20	45	7	50	105
50	81	60	21	55	7	56	116
63	90	67	23	66	7	68	135
80	105	78	27	86	7	87	165
100	132	96	36	104	7	111	207

Dimensions

Foot style/CH□KDL



CHQ

CHK□

CHN

CHM

CHS□

CH2□

CHA

Related Equipment

D-□

Bore size (mm)	LA	B	BB	C	CD	D	E	F	G	H	K	L	LH	LT	LX
20	76	43	70	18	6.6	12	10	M8 x 1.25	10	6	5.5	9.5 depth 5.4	23	15	58
25	78	45	76	18	6.6	14	12	M10 x 1.5	12	6	5.5	9.5 depth 5.4	26	15	64
32	86	51	94	19	9	18	14	M12 x 1.75	15	7	6.6	11 depth 6.5	33	16	79
40	98	55	108	23	11	22.4	19	M16 x 2	20	7	9	14 depth 8.6	37	20	90
50	111	60	126	27	14	28	24	M20 x 2.5	24	8	11	17.5 depth 10.8	43	24	104
63	130	67	146	33	16	35.5	30	M27 x 3	33	9	13	20 depth 13	52	30	121
80	151	78	172	38	18	45	41	M30 x 3.5	36	14	15	23 depth 15.2	63	35	144
100	179	96	208	43	22	56	50	M39 x 4	45	21	17	26 depth 17.5	76	40	174

Note 1) Body dimensions are the same with or without auto switches.

Bore size (mm)	LW	M	P	Q	R	SS	X ₁	Y ₁	Z	ZZ
20	44.5	43	1/8	16.5	6	10.5	15	7.5	58	73
25	50.5	49	1/8	17	8	10.5	15	7.5	60	75
32	64.5	63	1/4	19.5	10	11	16	8	67	83
40	72.5	71	1/4	20.5	10	13	20	10	75	95
50	83.5	81	1/4	22	10	15	24	12	84	108
63	100.5	97	1/4	25.5	10	18	30	15	97	127
80	121.5	117	3/8	30	15	20.5	35	17.5	113	148
100	147	142	3/8	36	15	23	40	20	136	176

Rod end male threads

Bore size (mm)	a	b	c	e	f	g	h
20	12.5	15	M10 x 1.25	6	10	33	91
25	15.5	18	M12 x 1.25	6	12	36	96
32	22	25	M16 x 1.5	7	14	44	111
40	27	30	M20 x 1.5	7	19	53	128
50	32	35	M24 x 1.5	8	24	62	146
63	42	45	M30 x 1.5	9	30	78	175
80	57	60	M39 x 1.5	14	41	98	221
100	72	75	M48 x 1.5	21	50	118	254

Series CH□KD Auto Switch Mounting

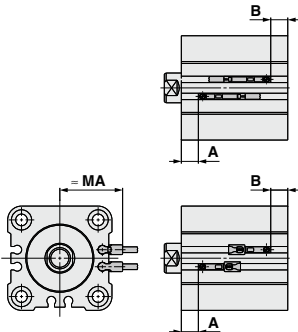
Refer to pages 1451 to 1510 for detailed specifications.

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

ø20, ø25

D-M9□
D-M9□W
D-M9□A
D-A9□

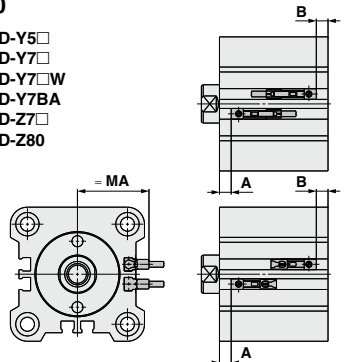
D-M9□V
D-M9□WV
D-M9□AV
D-A9□V



ø32 to ø100

D-M9□
D-M9□W
D-M9□A
D-A9□
D-Y5□
D-Y7□
D-Y7□W
D-Y7BA
D-Z7□
D-Z80

D-M9□V
D-M9□WV
D-M9□AV
D-Y6□
D-Y7□V
D-Y7□WV
D-A9□V



Auto Switch Proper Mounting Positions

(mm)

Bore size (mm)	Solid state auto switch				Reed auto switch			
	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV		D-Y59□/Y69□ D-Y7□/Y7□V D-Y7□W/Y7□WV D-Y7BA		D-A9□/A9□V		D-Z7□/Z80	
	A	B	A	B	A	B	A	B
20	12	19	—	—	8	15	—	—
25	13	20	—	—	9	16	—	—
32	15	21.5	10	16.5	11	17.5	10	16.5
40	17	23.5	12	18.5	13	19.5	12	18.5
50	18	27.5	13	22.5	—	—	13	22.5
63	21.5	31	16.5	26	17.5	27	16.5	26
80	23.5	40	18.5	35	19.5	36	18.5	35
100	31.5	49.5	26.5	44.5	27.5	45.5	26.5	44.5

Note 1) D-A9□/A9□V models cannot be mounted on ø50.

Note 2) Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Mounting Heights

(mm)

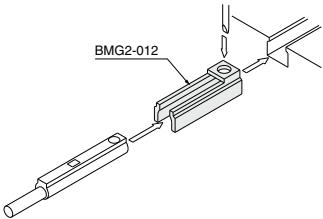
Bore size (mm)	D-M9□ D-M9□W D-M9□A D-A9□	D-M9□V D-M9□WV D-M9□AV	D-A9□V	D-Y59□ D-Y7P D-Y7□W D-Y7BA D-Z7□ D-Z80	D-Y69□ D-Y7PV D-Y7□WV
	U	U	U	U	U
20	21.5	28	25.5	—	—
25	24.5	30	27.5	—	—
32	31.5	34	31.5	31.5	31.5
40	35.5	38.5	36	35.5	35.5
50	40.5 (Note)	44.5	— (Note)	40.5	41.5
63	48.5	53	50.5	48.5	50
80	58.5	63.5	61	58.5	60.5
100	71	76	73.5	71	73

Note 1) D-A9□/A9□V models cannot be mounted on ø50.

Auto Switch Mounting Brackets: Part Nos.

Auto switch models	Bore size (mm)
	ø32 to ø100
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV D-A9□/A9□V	BMG2-012

Note 1) D-A9□/A9□V models cannot be mounted on ø50.



* Examples of D-A9□(V), M9□(V), M9□W(V), M9□A(V) models mounted on CHKD.

Minimum Auto Switch Mounting Stroke

Auto Switch Mounting Number	(mm)				
	D-M9□ D-M9□V D-Y59□ D-Y69□ D-Y7P D-Y7PV	D-A9□ D-A9□V D-Z7□ D-Z80	D-Y7□W D-Y7□WV	D-M9□W D-M9□WV D-M9□A D-M9□AV	D-Y7BA
1 pc.	5	5	10	10	15
2 pcs.	5	10	10	15	15

Operating Range

Auto switch models	(mm)							
	Bore size							
	20	25	32	40	50	63	80	100
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	4.5	4.5	4	7	5	5.5	7.5	11
D-Y59□/Y69□ D-Y7□/Y7□V D-Y7□W/Y7□WV D-Y7BA	—	—	8	9.5	11.5	11.5	16	17
D-A9□/A9□V D-Z7□/Z80	12	11	9	9.5	—	11.5	15	17
	—	—	9.5	11	12	14	16	20

Note) D-A9□/A9□V models cannot be mounted on ø50.

* 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.

CHQ

CHK□

CHN

CHM

CHS□

CHZ□

CHA

Related Equipment

D-□

For ø32 to ø100, besides the models listed in "How to Order," the following auto switches are applicable.

Refer to pages 1451 to 1510 for detailed auto switch specifications.

Auto switch type	Part no.	Electrical entry	Features
Solid state	D-Y69A, Y69B, Y7PV	Grommet (perpendicular)	—
	D-Y7NWW, Y7PWV, Y7BWV		Diagnostic indication (2-color display)
	D-Y59A, Y59B, Y7P	Grommet (in-line)	—
	D-Y7NW, Y7PW, Y7BW		Diagnostic indication (2-color display)
	D-Y7BA		Water resistant (2-color display)
Reed	D-Z73, Z76	Grommet (in-line)	—
	D-Z80		Without indicator light

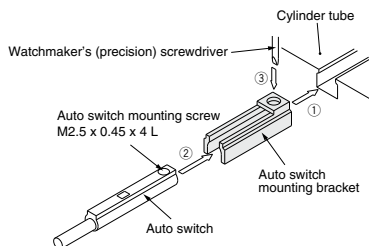
* Solid state auto switches are also available with pre-wired connector. Refer to pages 1494 and 1495 for details.

* Normally closed (N.C. = b contact), solid state auto switches (D-F9G, F9H, Y7G, Y7H) are also available. For details, refer to pages 1463 and 1465.

How to Mount and Move the Auto Switch

<Applicable auto switch>

Solid state D-M9N(V), D-M9P(V), D-M9B(V),
D-M9NW(V), D-M9PW(V), D-M9BW(V)
D-M9NA(V), D-M9PA(V), D-M9BA(V)
Reed D-A90(V), D-A93(V), D-A96(V)



1. Insert the auto switch mounting bracket into the auto switch mounting groove to set it roughly to the auto switch mounting position.
2. Insert the auto switch into the attachment part of the auto switch mounting bracket.
3. After confirming the detecting position, secure the auto switch by tightening the set screw (M2.5) attached to the auto switch.
4. When changing the detecting position, carry out in the state of 2.

Note) When tightening the auto switch mounting screw, use a watchmaker's screw driver with a grip diameter of 5 to 6 mm.

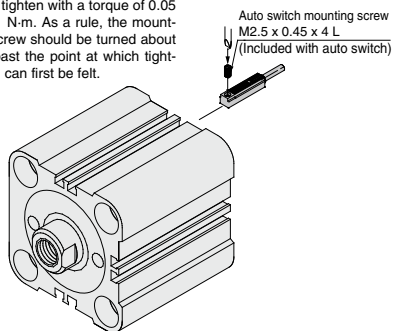
Also, tighten with a torque of 0.1 to 0.15 N-m. As a rule, the mounting screw should be turned about 90° past the point at which tightening can first be felt.

<Applicable auto switch>

Solid state D-Y59^Δ, D-Y69^Δ, D-Y7P(V)
D-Y7NW(V), D-Y7PW(V), D-Y7BW(V)
D-Y7BA
Reed D-Z73, D-Z76, D-Z80

Note) When tightening the auto switch mounting screw, use a watchmaker's screw driver with a grip diameter of 5 to 6 mm.

Also, tighten with a torque of 0.05 to 0.1 N-m. As a rule, the mounting screw should be turned about 90° past the point at which tightening can first be felt.



1. Insert the auto switch into the mounting groove and set it at the auto switch mounting position.
2. After reconfirming the detecting position, tighten the mounting screw to secure the auto switch.
3. Modification of the detecting position should be made in the condition of 1.

Series CH□KD Simple Specials

These changes are dealt with Simple Specials System.



Symbol

1 Change of Rod End Shape

-XA1/2/7/18/20/22/31/32/33/34

CH (D) KD Mounting type Bore size Rod size series - Stroke Suffix for auto switch - X **A0**

Indicate the rod end shape pattern symbol

A0 Note) Male thread effective length should be no more than 100 mm.	A1 Note) Male thread effective length should be no more than 100 mm.	A2 Note) Male thread effective length should be no more than 100 mm.	A7 Note) Male thread effective length should be no more than 100 mm.													
A18 Note) Male thread effective length should be no more than 100 mm.	A20 Note) Male thread effective length should be no more than 100 mm.	A22 Note) Male thread effective length should be no more than 100 mm.	A31 Note) Female thread effective depth should be no more than twice the thread diameter.													
A32 Note) Male thread effective length should be no more than 100 mm.	A33 Note) Female thread effective depth should be no more than twice the thread diameter.	A34 Note) Male thread effective length should be no more than 100 mm.	Note 1) Dimensions indicated with an asterisk (*) in the patterns A1, A2, A18, A20, A22, A31, A32, A33, and A34 are provided in the table below. Note 2) The tolerance and finish values not indicated in the figures above are the same as for standard products, or may be at the discretion of SMC. <table><tr><th>Pattern</th><th>Dimension for *</th></tr><tr><td>A1</td><td rowspan="9">øD-2</td></tr><tr><td>A2</td></tr><tr><td>A7</td></tr><tr><td>A18</td></tr><tr><td>A20</td></tr><tr><td>A22</td></tr><tr><td>A31</td></tr><tr><td>A32</td></tr><tr><td>A33</td></tr><tr><td>A34</td></tr></table>	Pattern	Dimension for *	A1	øD-2	A2	A7	A18	A20	A22	A31	A32	A33	A34
Pattern	Dimension for *															
A1	øD-2															
A2																
A7																
A18																
A20																
A22																
A31																
A32																
A33																
A34																

If dimensions other than the above are necessary, please indicate as such.

CHQ

CHK□

CHN

CHM

CHS□

CH2□

CHA

Related Equipment

D-□

2 Series CHQHB (14 MPa) Interchangeable Parts

Symbol

-XC61

CH□KDB **Bore size** - **Stroke** **Rod end thread type** - **Auto switch** **Suffix for auto switch** - **XC61**

CH□QHB interchangeable parts

Interchangeable contents Overall length End thread size

Cylinder mounting

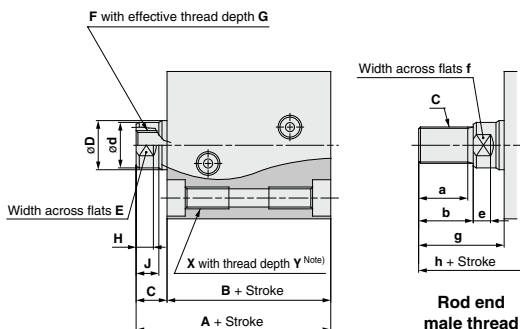
Nil	Through hole
R	Front taps
H	Rear taps
W	Double side taps

* Built-in spacer types are required for intermediate strokes.

(Example) The overall length of the cylinder tube for CHDKDB50-60-XC61, is equivalent to 75 strokes.

Dimensions

CH□KDB□-□-XC61□



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	63	51	12	18	15	13	M10 x 1.5	12	7	8.5	M8 x 1.25	16
40	69	55	14	22.4	19	16	M12 x 1.75	15	8	10	M10 x 1.5	20
50	75	60	15	28	24	21	M16 x 2	20	9.5	11.5	M12 x 1.75	24
63	85	67	18	35.5	31	27	M20 x 2.5	24	11.5	14	M16 x 2	24
80	99	78	21	45	39	36	M27 x 3	33	15	17	M18 x 2.5	27
100	122	96	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	83
40	22	25	M16 x 1.5	8	16	39	94
50	27	30	M20 x 1.5	9.5	21	45	105
63	32	35	M24 x 1.5	11.5	27	53	120
80	40	43	M30 x 1.5	15	36	64	142
100	47	50	M39 x 1.5	17.5	41	76	172

Part no. suffix	X & Y dimensions
-XC61	None
-XC61R	4 places on front side
-XC61H	4 places on rear side
-XC61W	8 places on both sides

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

3 Intermediate Stroke Type (Built-in spacer type)

Symbol

-XC63

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

CH□KDB [Bore size] - [Stroke] [Rod end thread type] - [Auto switch] [Suffix for auto switch] - **XC63**

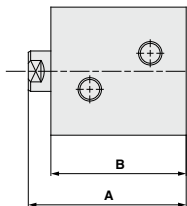
CH□KDL [Bore size] - [Stroke] [Rod end thread type] - [Auto switch] [Suffix for auto switch] - **XC63**

Intermediate stroke

Bore size (mm)	Applicable stroke	Applicable cylinder tube
32	55, 60, 65, 70	For 75 mm stroke
40 50 63 80	55, 60, 65, 70	For 75 mm stroke
100	80, 85, 90, 95	For 100 mm stroke

Dimensions

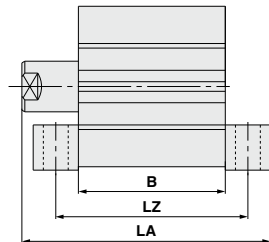
CH□KDB□-□-XC63



Bore size (mm)	Stroke		55, 60, 65, 70		80, 85, 90, 95	
	A	B	A	B	A	B
32	136	126	—	—	—	—
40	140	130	165	155	—	—
50	146	135	171	160	—	—
63	155	142	180	167	—	—
80	170	153	195	178	—	—
100	197	171	222	196	—	—

Note) Dimensions other than those highlighted above are standard.

CH□KDL□-□-XC63



Bore size (mm)	Stroke			55, 60, 65, 70			80, 85, 90, 95		
	LA	B	LZ	LA	B	LZ	LA	B	LZ
32	161	126	142	—	—	—	—	—	—
40	173	130	150	198	155	175	—	—	—
50	186	135	159	211	160	184	—	—	—
63	205	142	172	230	167	197	—	—	—
80	226	153	188	251	178	213	—	—	—
100	254	171	211	279	196	236	—	—	—

CHQ

CHK□

CHN

CHM

CHS□

CH2□

CHA

Related Equipment

D-□

4 With Air Release Valve

Symbol

-XC64

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

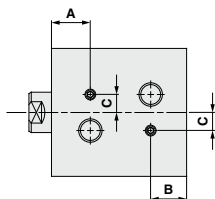
CH□KDB [Bore size] - [Stroke] [Rod end thread type] - [Auto switch] [Suffix for auto switch] - **XC64**

CH□KDL [Bore size] - [Stroke] [Rod end thread type] - [Auto switch] [Suffix for auto switch] - **XC64**

With air release valve

Dimensions

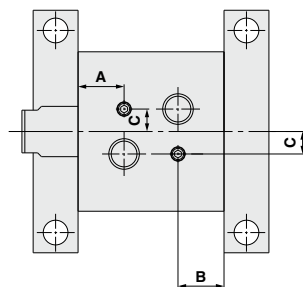
CH□KDB□-□-XC64



Bore size (mm)	A	B	C
20	16.5	14.5	7
25	17	15	8
32	19.5	17	10
40	20.5	17.5	10
50	22	19.5	10
63	25.5	22	10
80	30	26.5	15
100	36	33	15

Note) Dimensions other than those highlighted above are standard.

CH□KDL□-□-XC64



Compact Hydraulic Cylinder

Series **CH** ☐ **KG**

16 MPa

ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

How to Order

CHKG **B** **32** ☐ - **30** ☐ - ☐

With Auto Switch

CHDKG **B** **32** ☐ - **30** ☐ - **M9BW** ☐ - ☐

With auto switch
(built-in magnet)

Mounting bracket style

Symbol	Style	Port position Note)
B	Basic style	—
L	Foot style	Top
LB		Right
LD		Left
		Foot bracket

Note) Indicates the relative position of the foot bracket and port, as seen from the rod side.

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

Made to Order specifications
For details, refer to page 1300.

Number of auto switches

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

Auto switch type

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

* Select applicable auto switch models from the table below.

Rod end thread type

Nil	Female thread
M	Male thread

* Rod end thread type is an optional product. (Refer to page 1301).

Cylinder stroke (mm)

Refer to the standard stroke table on page 1300.

Port thread type

Nil	Rc
TN	NPT

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CHDKGB50-100

Applicable Auto Switches Refer to pages 1451 to 1510 for further details on each auto switch.

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	Perpendicular ø20, ø25 ø32 to ø100	In-line ø20, ø25 ø32 to ø100	0.5 (Nil)	1 (M)	3 (L)	5 (Z)					
Solid state auto switch	Diagnostic indication (2-color display)	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay PLC		
				3-wire (PNP)			M9PV	M9P	●	●	●	○	○				
				2-wire	12 V		M9BV	M9B	●	●	●	○	○	—			
				3-wire (NPN)			M9NVV	M9NV	●	●	●	○	○	IC circuit			
	3-wire (PNP)			M9PVV	M9PW		●	●	●	○	○	—					
	2-wire			12 V	M9BVV		M9BW	●	●	●	○		○	—			
	3-wire (NPN)			5 V, 12 V	M9NAV ^{*1}		M9NA ^{*1}	○	○	●	○	○	IC circuit				
	3-wire (PNP)				M9PAV ^{*1}		M9PA ^{*1}	○	○	●	○	○					
Reed auto switch	Water resistant (2-color display)	Grommet	No	2-wire	12 V	M9BAV ^{*1}	M9BA ^{*1}	○	○	●	○	○	—	—	Relay PLC		
				3-wire (NPN)	—	5 V	—	A96V	—	A96	Z76	●	—			●	—
				100 V or less	—	A90V	—	A90	Z80	●	—	●	—				

*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 Nil (Example) M9NV
1 m M (Example) M9NVW
3 m L (Example) M9NVWL
5 m Z (Example) M9NVWZ

* Solid state auto switches marked "○" are produced upon receipt of order.

* For ø32 to ø100, there are applicable auto switches other than listed. Refer to page 1308 for details.

* For details about auto switches with pre-wired connector, refer to pages 1494 and 1495.

* Cylinders with auto switch will be shipped together with the auto switch and auto switch mounting bracket (ø32 to ø50) (not assembled).





Made to Order specifications
(For details, refer to pages 1310 to 1313)

Symbol	Specifications
-XA ☐	Change of rod end shape
-XC62	Compatible with series CHQHB series (14 MPa)
-XC63	Intermediate stroke type (Built-in spacer type)
-XC64	With air release valve



Specifications

Bore size (mm)	20	25	32	40	50	63	80	100
Action	Double acting/Single rod type							
Fluid	Hydraulic fluid							
Nominal pressure	16 MPa							
Proof pressure	24 MPa							
Maximum allowable pressure	16 MPa							
Minimum operating pressure	0.3 MPa							
Ambient and fluid temperature	Without auto switch: -10° to 80°C							
	With auto switch: -10° to 60°C							
Piston speed	8 to 100 mm/s							
Cushion	None							
Rod end thread	Female thread, Male thread							
Stroke length tolerance	+0.8 0 mm							
Mounting style	Basic style (through hole), Foot style							

Note) Refer to page 1234 for definitions of terms related to pressure.

Standard Strokes

Stroke (mm)	5	10	15	20	25	30	35	40	45	50	75	100	125	150	175
Bore size (mm)															
20, 25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
40, 50, 63, 80, 100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Stroke (mm)	75				100				125			
Bore size (mm)	Intermediate stroke [XC63] (Built-in spacer type)				Intermediate stroke [XC63] (Built-in spacer type)				Intermediate stroke [XC63] (Built-in spacer type)			
	55	60	65	70	80	85	90	95	105	110	115	120
20, 25	□	□	□	□	○	□	□	□	○	—	—	—
32	□	□	□	□	○	□	□	□	○	□	□	□
40, 50, 63, 80, 100	□	□	□	□	○	□	□	□	○	□	□	□

Stroke (mm)	150				175			
Bore size (mm)	Intermediate stroke [XC63] (Built-in spacer type)				Intermediate stroke [XC63] (Built-in spacer type)			
	130	135	140	145	155	160	165	170
20, 25	—	—	—	—	—	—	—	—
32	□	□	□	□	○	—	—	—
40, 50, 63, 80, 100	□	□	□	□	○	□	□	□

○: Standard stroke (dedicated cylinder tube)
□: Intermediate stroke XC63 (built-in spacer type)

Manufacture of Intermediate Stroke Cylinders [XC63] (Built-in spacer type)

Intermediate strokes in 5 mm increments can be manufactured by installing spacers inside standard stroke cylinders. 55, 60, 65 and 70 mm stroke cylinders have the same overall length as a 75 mm stroke cylinder, and 80, 85, 90 and 95 mm stroke cylinders have the same length as a 100 mm stroke cylinder, 105, 110, 115 and 120 mm stroke cylinders, have the same overall length as a 125 mm stroke cylinder, 130, 135, 140 and 145 mm stroke cylinders have the same overall length as a 150 mm stroke cylinder, 155, 160, 165 and 170 mm stroke cylinders have the same overall length as a 175 mm stroke cylinder.

Refer to the Made to Order Specifications on page 1312 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

* Consult with SMC.

Theoretical Output

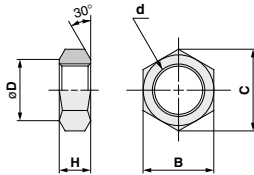
Unit: N

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



Part no.	Bore size (mm)	B	C	d	D	H
NTH-020	20	13	15	M8 x 1	12.5	5
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

Note) There may be a slight difference between the part numbers and the corresponding bore size.

Weight

CH□KGB/Basic style

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	1417
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

CH□KGL/Foot style

Unit: g

Bore size (mm)	Standard stroke (mm)														
	5	10	15	20	25	30	35	40	45	50	75	100	125	150	175
20	465	490	515	535	560	580	605	625	650	670	785	890	—	—	—
25	585	610	640	670	700	725	755	785	815	840	985	1130	—	—	—
32	945	990	1040	1085	1130	1175	1220	1265	1310	1360	1585	1815	2045	2270	—
40	1580	1645	1705	1770	1830	1895	1955	2015	2080	2140	2455	2765	3075	3390	3700
50	2495	2580	2665	2750	2835	2915	3000	3085	3170	3255	3675	4095	4515	4935	5355
63	3900	4030	4160	4290	4420	4550	4685	4815	4945	5075	5730	6380	7035	7685	8340
80	7225	7420	7615	7805	8000	8195	8385	8580	8775	8965	9935	10990	11870	12835	13800
100	12425	12710	12990	13275	13555	13840	14120	14405	14685	14970	16385	17795	19210	20625	22035

CHQ

CHK□

CHN

CHM

CHS□

CHZ□

CHA

Related
Equipment

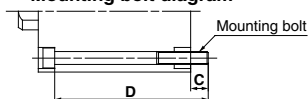
D-□

Mounting Bolts for CH□KGB The mounting bolts shown below conform to JIS B 1176, strength class 10.9 or higher.

Through hole type mounting bolts are available.
Refer to the following for ordering procedures.
Order the actual number of bolts that will be used.

Example) CQ-M5x55L 4 pcs.

Mounting bolt diagram



Model	C	D	Mounting bolt part no.
CH□KGB20-5 (M)	12.4	55	CQ-M5 x 55L
-10 (M)		60	x 60L
-15 (M)		65	x 65L
-20 (M)		70	x 70L
-25 (M)		75	x 75L
-30 (M)		80	x 80L
-35 (M)		85	x 85L
-40 (M)		90	x 90L
-45 (M)		95	x 95L
-50 (M)		100	x 100L
-75 (M)		125	x 125L
-100 (M)		150	x 150L
CH□KGB25-5 (M)	10.4	55	CQ-M5 x 55L
-10 (M)		60	x 60L
-15 (M)		65	x 65L
-20 (M)		70	x 70L
-25 (M)		75	x 75L
-30 (M)		80	x 80L
-35 (M)		85	x 85L
-40 (M)		90	x 90L
-45 (M)		95	x 95L
-50 (M)		100	x 100L
-75 (M)		125	x 125L
-100 (M)		150	x 150L
CH□KGB32-5 (M)	10.5	65	CQ-M6 x 65L
-10 (M)		70	x 70L
-15 (M)		75	x 75L
-20 (M)		80	x 80L
-25 (M)		85	x 85L
-30 (M)		90	x 90L
-35 (M)		95	x 95L
-40 (M)		100	x 100L
-45 (M)		105	x 105L
-50 (M)		110	x 110L
-75 (M)		135	x 135L
-100 (M)		160	x 160L
-125 (M)		185	x 185L
-150 (M)		210	x 210L
CH□KGB40-5 (M)	13.5	75	CQ-M8 x 75L
-10 (M)		80	x 80L
-15 (M)		85	x 85L
-20 (M)		90	x 90L
-25 (M)		95	x 95L
-30 (M)		100	x 100L
-35 (M)		105	x 105L
-40 (M)		110	x 110L
-45 (M)		115	x 115L
-50 (M)		120	x 120L
-75 (M)		145	x 145L
-100 (M)		170	x 170L
-125 (M)		195	x 195L
-150 (M)		220	x 220L
-175 (M)		245	x 245L

Model	C	D	Mounting bolt part no.
CH□KGB50-5 (M)	15.5	80	CQ-M10 x 80L
-10 (M)		85	x 85L
-15 (M)		90	x 90L
-20 (M)		95	x 95L
-25 (M)		100	x 100L
-30 (M)		105	x 105L
-35 (M)		110	x 110L
-40 (M)		115	x 115L
-45 (M)		120	x 120L
-50 (M)		125	x 125L
-75 (M)		150	x 150L
-100 (M)		175	x 175L
-125 (M)		200	x 200L
-150 (M)		225	x 225L
-175 (M)		250	x 250L
CH□KGB63-5 (M)	16	85	CQ-M12 x 85L
-10 (M)		90	x 90L
-15 (M)		95	x 95L
-20 (M)		100	x 100L
-25 (M)		105	x 105L
-30 (M)		110	x 110L
-35 (M)		115	x 115L
-40 (M)		120	x 120L
-45 (M)		125	x 125L
-50 (M)		130	x 130L
-75 (M)		155	x 155L
-100 (M)		180	x 180L
-125 (M)		205	x 205L
-150 (M)		230	x 230L
-175 (M)		255	x 255L
CH□KGB80-5 (M)	22	100	CQ-M14 x 100L
-10 (M)		105	x 105L
-15 (M)		110	x 110L
-20 (M)		115	x 115L
-25 (M)		120	x 120L
-30 (M)		125	x 125L
-35 (M)		130	x 130L
-40 (M)		135	x 135L
-45 (M)		140	x 140L
-50 (M)		145	x 145L
-75 (M)		170	x 170L
-100 (M)		195	x 195L
-125 (M)		220	x 220L
-150 (M)		245	x 245L
-175 (M)		270	x 270L
CH□KGB100-5 (M)	26.5	120	CQ-M16 x 120L
-10 (M)		125	x 125L
-15 (M)		130	x 130L
-20 (M)		135	x 135L
-25 (M)		140	x 140L
-30 (M)		145	x 145L
-35 (M)		150	x 150L
-40 (M)		155	x 155L
-45 (M)		160	x 160L
-50 (M)		165	x 165L
-75 (M)		190	x 190L
-100 (M)		215	x 215L
-125 (M)		240	x 240L
-150 (M)		265	x 265L
-175 (M)		290	x 290L

⚠ Specific Product Precautions

Be sure to read before handling. Refer to front matter 38 for Safety Instructions, and pages 1234 to 1241 for precautions for hydraulic cylinder and auto switch.

Usage

⚠ Caution

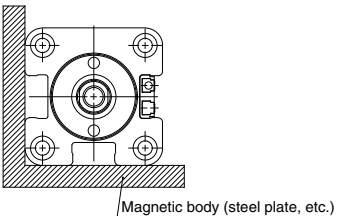
- 1. Use hexagon socket head cap screws (JISB1176, strength class 10.9 or higher) for cylinder mounting.
- 2. Since a lateral load (eccentric load) cannot be applied to the piston rod, build the mounting jig in such a way that a lateral load will not be applied to the piston rod.
- 3. Make sure that 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.

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

- 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.

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.



CHQ

CHK□

CHN

CHM

CHS□

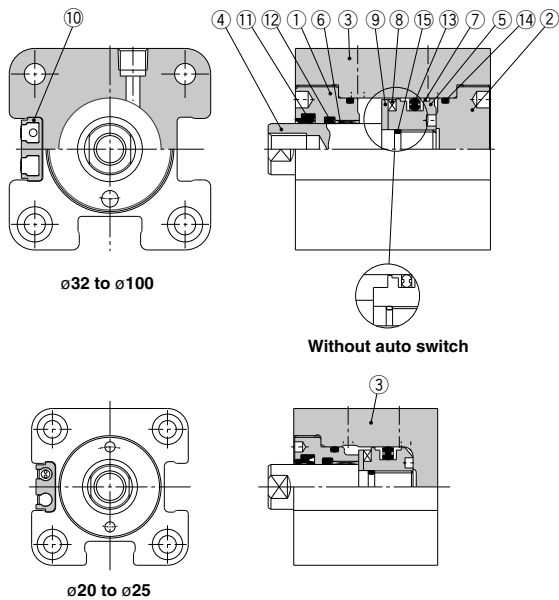
CH2□

CHA

Related Equipment

D-□

Construction



Parts List

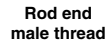
No.	Description	Material	Note
1	Rod cover	Aluminum alloy	Black anodized
2	Head cover	Aluminum alloy	Black anodized
3	Cylinder tube	Aluminum alloy	Hard anodized
4	Piston rod	ø20, ø25 Stainless steel ø32 to ø100 Carbon steel	Hard chromium electroplated
5	Piston	Stainless steel	
6	Bushing	Copper alloy	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

Replacement Parts/Seal kit

Bore size (mm)	Seal kit no.	Content
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 kit consists of items ⑦, ⑪, ⑫, ⑬ and ⑭ and can be ordered by using the seal kit number for each bore size.
- * Special tools are necessary for disassembly. Contact SMC for recommended tool designs and dimensions. Furthermore, ø80 and ø100 are tightened with a large tightening torque, so disassembly will be difficult. Contact SMC if disassembly is required.

Basic style/CH□KGB

CHK ☐**CHN**CHMCHS ☐CH2□

CHA

Related Equipment

D-☐

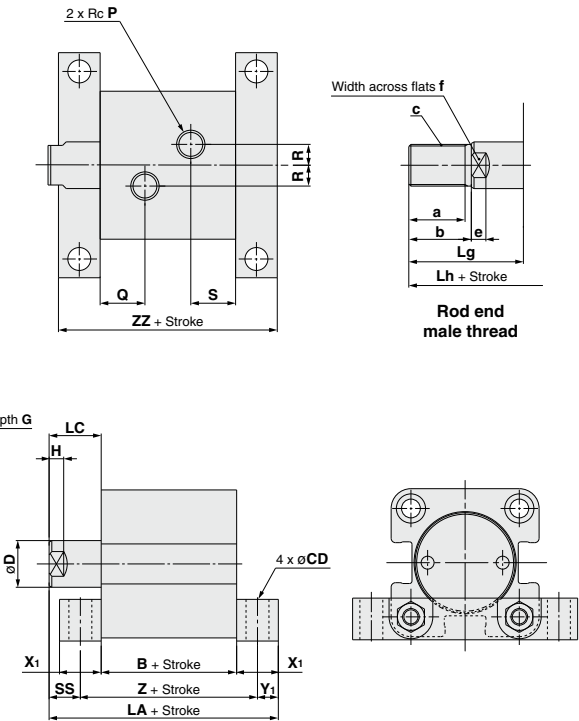
Note 1) Body dimensions are the same with or without auto switches.

(mm)

h

Dimensions

Foot style/CH□KGL



(mm)																
Bore size (mm)	LA	B	BB	LC	CD	D	E	F	G	H	K	L	LH	LT	LX	LW
20	76	43	70	18	6.6	12	10	M8 x 1.25	10	6	5.5	9.5 depth 5.4	23	15	58	44.5
25	78	45	76	18	6.6	14	12	M10 x 1.5	12	6	5.5	9.5 depth 5.4	26	15	64	50.5
32	91	56	94	19	9	18	14	M12 x 1.75	15	7	6.6	11 depth 6.5	33	16	79	64.5
40	108	65	108	23	11	22.4	19	M16 x 2	20	7	9	14 depth 8.6	37	20	90	72.5
50	121	70	126	27	14	28	24	M20 x 2.5	24	8	11	17.5 depth 10.8	43	24	104	83.5
63	140	77	146	33	16	35.5	30	M27 x 3	33	9	13	20 depth 13	52	30	121	102
80	161	88	172	38	18	45	41	M30 x 3.5	36	14	15	23 depth 15.2	63	35	144	123.5
100	189	106	208	43	22	56	50	M39 x 4	45	21	17	26 depth 17.5	76	40	174	149

Note 1) Body dimensions are the same with or without auto switches.

(mm)												
Bore size (mm)	M	P	Q	R	S	SS	X ₁	Y ₁	Z	ZZ		
20	43	1/8	16.5	6	11.5	10.5	15	7.5	58	73		
25	49	1/8	17	8	12	10.5	15	7.5	60	75		
32	63	1/4	19.5	10	19.5	11	16	8	72	88		
40	71	1/4	21.5	10	21.5	13	20	10	85	105		
50	81	1/4	24	10	24	15	24	12	94	118		
63	100	1/4	27.5	10	27.5	18	30	15	107	137		
80	121	3/8	31	15	31	20.5	35	17.5	123	158		
100	146	3/8	36	15	36	23	40	20	146	186		

Rod end male threads										(mm)	
Bore size (mm)	a	b	c	e	f	Lg	Lh				
20	12.5	15	M10 x 1.25	6	10	33	91				
25	15.5	18	M12 x 1.25	6	12	36	96				
32	22	25	M16 x 1.5	7	14	44	116				
40	27	30	M20 x 1.5	7	19	53	138				
50	32	35	M24 x 1.5	8	24	62	156				
63	42	45	M30 x 1.5	9	30	78	185				
80	57	60	M39 x 1.5	14	41	98	221				
100	72	75	M48 x 1.5	21	50	118	264				

Series CH□KG

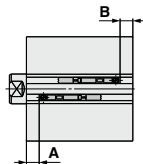
Auto Switch Specifications

Refer to pages 1451 to 1510 for detailed specifications.

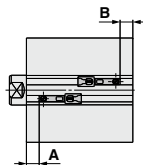
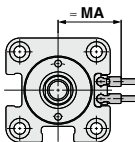
Auto Switches: Proper Mounting Positions and Mounting Heights for Stroke End Detection

ø20, ø25

D-M9□
D-M9□W
D-M9□A
D-A9□

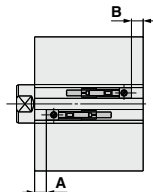


D-M9□V
D-M9□WV
D-M9□AV
D-A9□V

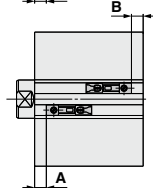
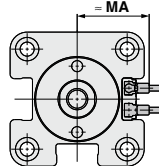


ø32 to ø100

D-M9□ D-Y5□
D-M9□W D-Y7□
D-M9□A D-Y7□W
D-A9□ D-Y7BA
D-Z7□
D-Z80



D-M9□V
D-M9□WV
D-M9□AV
D-Y6□
D-Y7□V
D-Y7□WV
D-A9□V



Auto Switch Proper Mounting Positions

(mm)

Bore size (mm)	Solid state auto switch				Reed auto switch			
	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV		D-Y59□/Y69□ D-Y7□/Y7□V D-Y7□W/Y7□WV D-Y7BA		D-A9□/A9□V		D-Z7□/Z80	
	A	B	A	B	A	B	A	B
20	16	15	—	—	12	11	—	—
25	17	16	—	—	13	12	—	—
32	18.5	23	13.5	18	—	—	13.5	18
40	24	26.5	19	21.5	—	—	19	21.5
50	24	31.5	19	26.5	—	—	19	26.5
63	26.5	36	21.5	31	—	—	21.5	31
80	29.5	44	24.5	39	—	—	24.5	39
100	39.5	51.5	34.5	46.5	—	—	34.5	46.5

Note 1) D-A9□/A9□V models cannot be mounted on ø32 to ø100.

Note 2) Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Mounting Heights

(mm)

Bore size (mm)	D-M9□ D-M9□W D-M9□A D-A9□	D-M9□V D-M9□WV D-M9□AV	D-A9□V	D-Y59□ D-Y7P D-Y7□W D-Y7BA D-Z7□ D-Z80	D-Y69□ D-Y7PV D-Y7□WV
	U	U	U	U	U
20	22	28	25.5	—	—
25	24.5	30	27.5	—	—
32	31.5	34.5	—	31.5	31.5
40	35.5	39	—	35.5	36
50	40.5	45	—	40.5	42
63	50	53.5	—	50	50.5
80	60.5	64	—	60.5	61
100	73	76.5	—	73	73.5

* D-A9□/A9□V models cannot be mounted on ø32 to ø100.

CHQ

CHK□

CHN

CHM

CHS□

CH2□

CHA

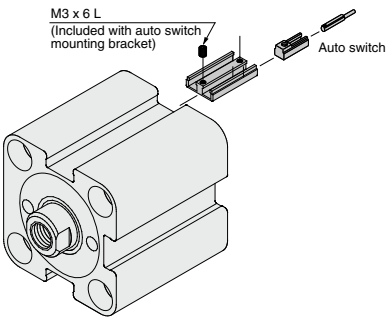
Related
Equipment

D-□

Auto Switch Mounting Brackets: Part Nos.

Auto switch models	Bore size (mm)	
	ø20, 25	ø32 to ø100
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV D-A9□/A9□V	BHK1-020	Note1) ① BHK2-032 ② BMG2-012
D-Y59□/Y69□ D-Y7□/Y7□V D-Y7□W/Y7□WV D-Y7BA D-Z7□/Z80	—	BHK2-032

Note 1) Two types of mounting brackets are used as a set.
Note 2) D-A9□/A9□V models cannot be mounted on ø32 to ø100.



Minimum Auto Switch Mounting Stroke

Auto Switch Mounting Number	(mm)				
	D-M9□ D-M9□V D-Y59□ D-Y69□ D-Y7P D-Y7PV	D-A9□ D-A9□V D-Z7□ D-Z80	D-Y7□W D-Y7□WV	D-M9□W D-M9□WV D-M9□A D-M9□AV	D-Y7BA
1 pcs.	5	5	10	10	15
2 pcs.	5	10	10	15	15

Operating Range

Auto switch models	(mm)							
	20	25	32	40	50	63	80	100
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	6	5.5	4.5	5.5	5.5	6.5	8.5	9.5
D-Y59□/Y69□ D-Y7□/Y7□V D-Y7□W/Y7□WV D-Y7BA	—	—	8	9.5	11.5	11.5	16	17
D-A9□/A9□V	12	11	—	—	—	—	—	—
D-Z7□/Z80	—	—	9.5	11	12	14	16	20

* 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.

For ø32 to ø100, besides the models listed in "How to Order," the following auto switches are applicable. Refer to pages 1451 to 1510 for detailed auto switch specifications.

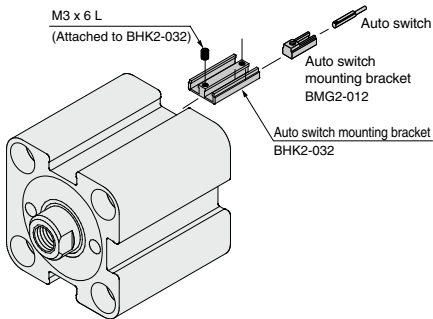
Auto switch type	Part no.	Electrical entry	Features
Solid state	D-Y69A, Y69B, Y7PV	Grommet (Perpendicular)	—
	D-Y7NWV, Y7PWV, Y7BWV		Diagnostic indication (2-color display)
	D-Y59A, Y59B, Y7P	Grommet (In-line)	—
	D-Y7NW, Y7PW, Y7BW		Diagnostic indication (2-color display)
	D-Y7BA		Water resistant (2-color display)
Reed	D-Z73, Z76	Grommet (In-line)	—
	D-Z80		Without indicator light

* Solid state auto switches are also available with pre-wired connector. Refer to pages 1494 and 1495 for details.
* Normally closed (N.C. = b contact), solid state auto switches (D-F9G, F9H, Y7G, Y7H) are also available. For details, refer to pages 1463 and 1465.

How to Mount and Move the Auto Switch

<Applicable auto switch>

Solid state D-M9N(V), D-M9P(V), D-M9B(V)
D-M9NW(V), D-M9PW(V), D-M9BW(V)
D-M9NA(V), D-M9PA(V), D-M9BA(V)
Reed D-A90(V), D-A93(V), D-A96(V)



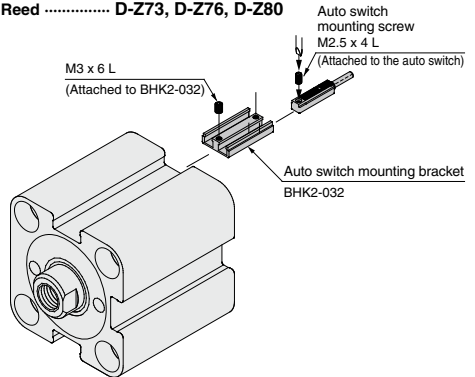
1. Set BMG2-012 into the auto switch mounting bracket (BHK2-032).
2. Set the auto switch into the auto switch mounting part of BMG2-012, then insert it into the cylinder's auto switch installing groove.
3. In the above state, set the approximate auto switch mounting sections, then, using a hexagonal wrench, tighten the mounting screw (M3 x 6L) that is an accessory to BHK-032.
4. After confirming the detecting position, tighten the mounting screw (M2.5) for the auto switch to keep it in place.

When tightening the auto switch mounting screw, use a watchmaker's screw driver with a grip diameter of 5 to 6 mm. When tightening the mounting bracket screw included with BHK-032, use a 1.5 mm hexagon wrench.

Also, tighten with a torque of 0.1 to 0.15 N-m. As a rule, the mounting screw should be turned about 90° past the point at which tightening can first be felt.

<Applicable auto switch>

Solid state D-Y59_A, D-Y69_A, D-Y7P(V)
D-Y7NW(V), D-Y7PW(V), D-Y7BW(V)
D-Y7BA
Reed D-Z73, D-Z76, D-Z80



When tightening the auto switch mounting screw, use a watchmaker's screw driver with a grip diameter of 5 to 6 mm. When tightening the mounting bracket screw, use a 1.5 mm hexagon wrench. Also, tighten with a torque of 0.1 to 0.15 N-m. As a rule, the mounting screw should be turned about 90° past the point at which tightening can first be felt.

CHQ

CHK□

CHN

CHM

CHS□

CHZ□

CHA

Related Equipment

D-□

Series CH□KG Simple Specials

These changes are dealt with Simple Specials System.



Symbol

1 Change of Rod End Shape

-XA1/2/7/18/20/22/31/32/33/34

CH (D) KG Mounting type Bore size Rod size series - Stroke Suffix for auto switch - X A0

Indicate the rod end shape pattern symbol

A0 Note) Male thread effective length should be no more than 100 mm.	A1 Note) Male thread effective length should be no more than 100 mm.	A2 Note) Male thread effective length should be no more than 100 mm.	A7 Note) Male thread effective length should be no more than 100 mm.													
A18 Note) Male thread effective length should be no more than 100 mm.	A20 Note) Male thread effective length should be no more than 100 mm.	A22 Note) Male thread effective length should be no more than 100 mm.	A31 Note) Female thread effective depth should be no more than twice the thread diameter.													
A32 Note) Male thread effective length should be no more than 100 mm.	A33 Note) Female thread effective depth should be no more than twice the thread diameter.	A34 Note) Male thread effective length should be no more than 100 mm.	Note 1) Dimensions indicated with an asterisk (*) in the patterns A1, A2, A7, A18, A20, A22, A31, A32, A33, and A34 are provided in the table below. Note 2) The tolerance and finish values not indicated in the figures above are the same as for standard products, or may be at the discretion of SMC. <table><tr><th>Pattern</th><th>Dimension for *</th></tr><tr><td>A1</td><td rowspan="9">øD-2</td></tr><tr><td>A2</td></tr><tr><td>A7</td></tr><tr><td>A18</td></tr><tr><td>A20</td></tr><tr><td>A22</td></tr><tr><td>A31</td></tr><tr><td>A32</td></tr><tr><td>A33</td></tr><tr><td>A34</td></tr></table> If dimensions other than the above are necessary, please indicate as such.	Pattern	Dimension for *	A1	øD-2	A2	A7	A18	A20	A22	A31	A32	A33	A34
Pattern	Dimension for *															
A1	øD-2															
A2																
A7																
A18																
A20																
A22																
A31																
A32																
A33																
A34																

2 Series CHQHB (14 MPa) Interchangeable Parts

Symbol

-XC62

CH□KGB **Bore size** - **Stroke** **Rod end thread type** - **Auto switch** **Suffix for auto switch** - **XC62** **□**

CH□QHB Interchangeable parts ^(Note)

(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).

Interchangeable contents

Piston rod
C dimension
End thread size
F dimension

Cylinder mounting

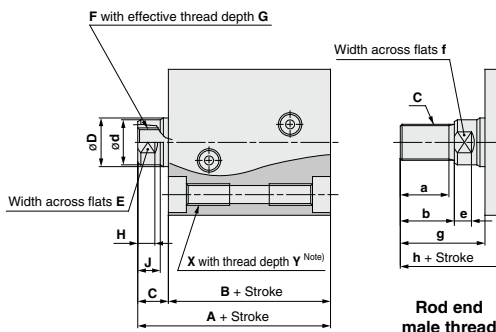
Nil	Through hole
R	Front taps
H	Rear taps
W	Double side taps

* Built-in spacer types are required for intermediate strokes.

(Example) The overall length of the cylinder tube for CHDKGB50-60-XC62, is equivalent to 75 strokes.

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.

3 Intermediate Stroke Type (Built-in spacer type)

Symbol

-XC63

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

CH□KGB [Bore size] - [Stroke] [Rod end thread type] - [Auto switch] [Suffix for auto switch] - **XC63**

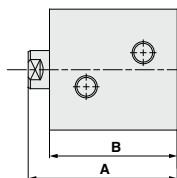
CH□KGL [Bore size] - [Stroke] [Rod end thread type] - [Auto switch] [Suffix for auto switch] - **XC63**

Intermediate stroke ↓

Bore size (mm)	Applicable stroke	Applicable cylinder tube
32	55, 60, 65, 70	For 75 mm stroke
	80, 85, 90, 95	For 100 mm stroke
	105, 110, 115, 120	For 125 mm stroke
	130, 135, 140, 145	For 150 mm stroke
	155, 160, 165, 170	For 175 mm stroke
40 50 63 80 100	55, 60, 65, 70	For 75 mm stroke
	80, 85, 90, 95	For 100 mm stroke
	105, 110, 115, 120	For 125 mm stroke
	130, 135, 140, 145	For 150 mm stroke
	155, 160, 165, 170	For 175 mm stroke

Dimensions

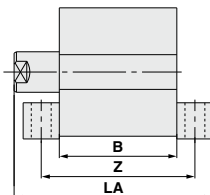
CH□KGB□-XC63



Stroke Dimensions Bore size (mm)	55, 60, 65, 70		80, 85, 90, 95		105, 110, 115, 120		130, 135, 140, 145		155, 160, 165, 170	
	A	B	A	B	A	B	A	B	A	B
32	141	131	166	156	191	181	216	206	—	—
40	150	140	175	165	200	190	225	215	250	240
50	156	145	181	170	206	195	231	220	256	245
63	165	152	190	177	215	202	240	227	265	252
80	180	163	205	188	230	213	255	238	280	263
100	207	181	232	206	257	231	282	256	307	281

Note) Dimensions other than those highlighted above are standard.

CH□KGL□-XC63



Stroke Dimensions Bore size (mm)	55, 60, 65, 70			80, 85, 90, 95			105, 110, 115, 120			130, 135, 140, 145			155, 160, 165, 170		
	LA	B	Z	LA	B	Z	LA	B	Z	LA	B	Z	LA	B	Z
32	166	131	147	191	156	172	216	181	197	241	206	222	—	—	—
40	183	140	160	208	165	185	233	190	210	258	215	235	283	240	260
50	196	145	169	221	170	194	246	195	219	271	220	244	296	245	269
63	215	152	182	240	177	207	265	202	232	290	227	257	315	252	282
80	236	163	198	261	188	223	286	213	248	311	238	273	336	263	298
100	264	181	221	289	206	246	314	231	271	339	256	296	364	281	321

4 With Air Release Valve

Symbol

-XC64

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

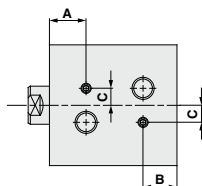
CH□KGB **Bore size** - **Stroke** **Rod end thread type** - **Auto switch** **Suffix for auto switch** - **XC64**

CH□KGL **Bore size** - **Stroke** **Rod end thread type** - **Auto switch** **Suffix for auto switch** - **XC64**

With air release valve

Dimensions

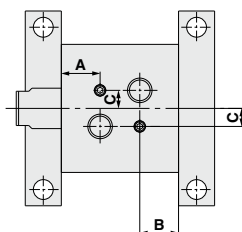
CH□KGB□-□-XC64



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.

CH□KGL□-□-XC64



CHQ

CHK□

CHN

CHM

CHS□

CH2□

CHA

Related Equipment

D-□