CKD

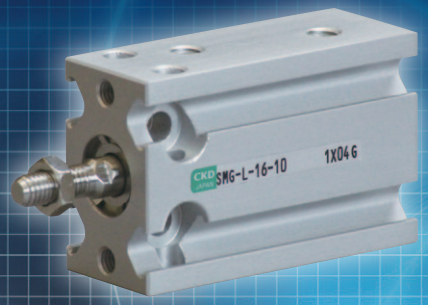
New Products

New product

Compact cylinder
SMG Series

COMPACT CYLINDER SMG SERIES

More user-friendly production variation added



Non-rotating type (SMG-M Series)

Fine speed type (SMG-F Series)

Slow and smooth action achieved,
starting at low speed of 1 mm/sec

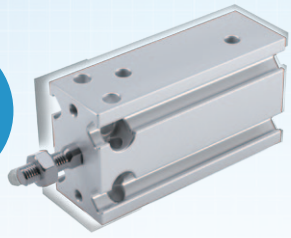
Clean room specifications (SMG-P7*/P5* Series)

Dust control in clean room (P7) and no use of copper-,
silicon-, and halogen-based materials (P5)

Lightweight and space-saving design

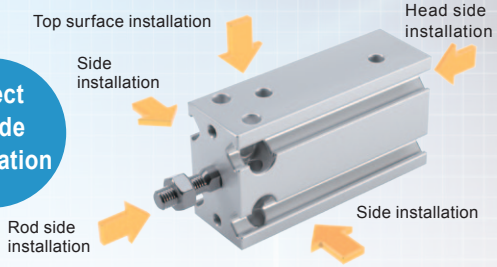
Up to 33% weight reduction (CKD comparison)

Up to 23% space saving (CKD comparison)

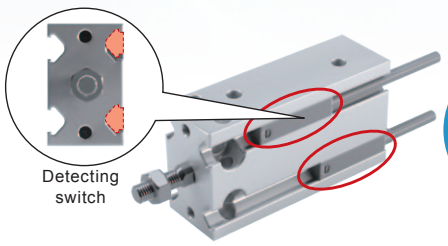


Easy-to-install, simplified shape

Direct 5-side installation



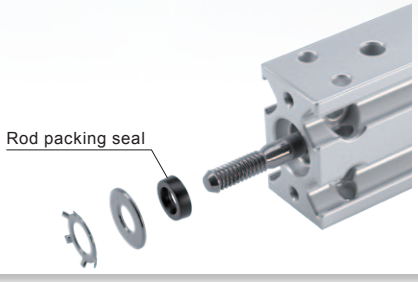
Non-protruding detection switch



Non-protruding and flat

Improved maintainability

Easy maintenance



CKD Corporation
CC-1071A 4

Series variation

Compact cylinder SMG Series

●: Standard, ◎: Option, ○: Custom order, ■: Not available

Variation	Model no. / JIS symbol	Bore size (mm)	Standard stroke length (mm)													Min. stroke length (mm)	Max. stroke length (mm)	Custom stroke length (per mm)	Switch	Page
			5	10	15	20	25	30	40	50	60	70	80	90	100	(Note 1)				
Double acting single rod type with switch	SMG SMG-L	ø6/ø10/ø16	●	●	●	●	●	●	●	●	●					5	60	5	◎	3
		ø20/ø25/ø32	●	●	●	●	●	●	●	●	●	●	●	●	●		100			
Single acting push type with switch	SMG-X SMG-XL	ø6/ø10/ø16	●	●	●											5	15	-	◎	7
		ø20/ø25/ø32	●	●	●												15			
Single acting pull type with switch	SMG-Y SMG-YL	ø6/ø10/ø16	●	●	●											5	15	-	◎	7
		ø20/ø25/ø32	●	●	●												15			
Double acting fine speed type with switch	SMG-F SMG-LF	ø6/ø10/ø16	○	○	○	○	○	○								5	30	5	◎	15
		ø20/ø25/ø32	○	○	○	○	○	○	○	○							50			
Double acting non-rotating type with switch	SMG-M SMG-ML	ø6/ø10/ø16	●	●	●	●	●	●	●	●	●					5	60	5	◎	17
		ø20/ø25/ø32	●	●	●	●	●	●	●	●	●	●	●	●	●		100			
Double acting, clean room specifications with switch	SMG-P7, P5 SMG-L-P7, P5	ø6/ø10/ø16	○	○	○	○	○	○								5	30	-	◎	21
		ø20/ø25	○	○	○	○	○	○	○	○							50			

Note 1: Refer to pages 3, 7, 15, 17 and 21 for mini. stroke length with switch.

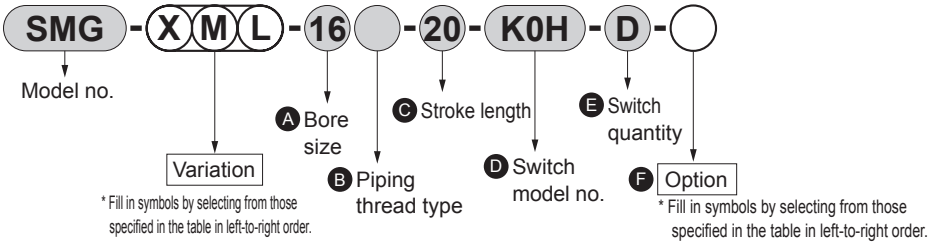
Variation and option selection table

◎: Option
○: Available (custom order)
△: Available depending on conditions (Consult with CKD.)
× : Not available

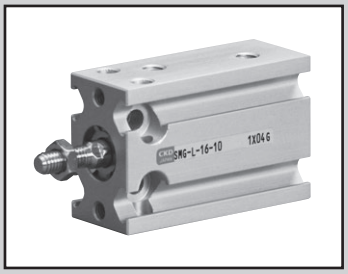
Category		Category	Variation						Port thread		Option		
			Double acting basic type	Single acting push type	Single acting pull type	Non-rotating type	With cylinder switch	Fine speed type	NPT	G	Copper and PTFE free type	Clean room specifications (Exhaust treatment)	Clean room specifications (Vacuuming)
		Symbol	none	X	Y	M	L	F	N	G	P6	P7 P5	P71 P51
Variation	Double acting basic type	Blank				◎	◎	○	○	○	Note 1	○	○
	Single acting push type	Y			×	○	◎	×	○	○	Note 1	×	×
	Single acting pull type	X				○	◎	×	○	○	Note 1	×	×
	Non-rotating type	M					◎	○	○	○	Note 1	×	×
	With cylinder switch	L						◎	○	○	Note 1	◎	◎
	Fine speed type	F							○	○	×	○	○
Port thread	NPT	N								×	Note 1	×	×
	G	G									Note 1	×	×
Option	Copper and PTFE free type	P6										×	×
	Clean room specifications (Exhaust treatment)	P7, P5											×
	Clean room specifications (Vacuuming)	P71, P51											
Accessory	Cylinder switch	Provided separately	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

Cautions
Note 1: P6 specifications as standard. (P6 symbol not required.)

<Example of model number>



Model: Compact cylinder
● Variation: Single acting, push, non-rotating, with switch
Ⓐ Bore size : ø16
Ⓑ Port thread type : Rc thread
Ⓒ Stroke length : 20 mm
Ⓓ Switch model number : Reed KOH switch, lead wire length 1 m
Ⓔ Switch quantity : 2
Ⓕ Option : Non

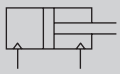


Compact cylinder Double acting single rod type

SMG Series

● Bore size: ø6/ø10/ø16/ø20/ø25/ø32

JIS symbol



Double acting

RoHS

Specifications

Descriptions	SMG SMG-L(with switch)					
Bore size mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation	Double acting					
Working fluid	Compressed air					
Max. working pressure MPa	0.7					
Min. working pressure MPa	0.12	0.06		0.05		
Proof pressure MPa	1.05					
Ambient temperature °C	-10 to 60 (no freezing)					
Port size	M5					Rc1/8
Stroke tolerance mm	+1.5 0					
Working piston speed mm/s	50 to 500					
Cushion	Rubber cushioned					
Lubrication	Not required (when lubricating, use turbine oil Class 1 ISO VG32.)					
Allowable energy absorption J	0.012	0.036	0.1	0.1	0.19	0.5

Stroke length

Bore size (mm)	Standard stroke length (mm)	Min. stroke length (mm)
ø6	5, 10, 15, 20, 25, 30, 50, 60	5
ø10		
ø16		
ø20	5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100	
ø25		
ø32		

Note 1: Custom stroke length is available per 5 mm increment.

Min. stroke length of types with switch

Bore size	1 color indicator		2 color indicator	
	K□H	K□V	K□YH	K□YV
ø6	5		5	
ø10				
ø16				
ø20				
ø25				
ø32				

Switch specifications

● 1 color/2 color indicator type

Descriptions	Proximity 2 wire		Proximity 3 wire			Reed 2 wire			
	K2H/K2V	K2YH/K2YV	K3H/K3V	K3PH/K3PV (Custom order)	K3YH/K3YV	K0H/K0V		K5H/K5V	
Applications	Specific to programmable controllers		Programmable controller, relay			Programmable controller, relay		Programmable controller, relay IC circuit (without Indicator light), serial connection	
Output method	-		NPN output	PNP output	NPN output	-			
Power voltage	-		10 to 28 VDC			-			
Load voltage	10 to 30 VDC		30 VDC or less			12/24 VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 20 mA (Note 1)		50 mA or less			5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator light	LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Yellow LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)		-	
Leakage current	1 mA or less		10 μA or less			0 mA			
Weight g	1 m: 18 3 m: 49 5 m: 80	1 m: 31 3 m: 85 5 m: 139	1 m: 18 3 m: 49 5 m: 80		1 m: 31 3 m: 85 5 m: 139	1 m: 18 3 m: 49 5 m: 80			

Note 1: The maximum load current of 20 mA applies at 25°C. The current will be lower than 20 mA if ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C.)

Cylinder weight

Unit (g)

Model no. / Bore size	Product weight when stroke length S = 0 mm: SMG Double acting	SMG-L Double acting with switch	Additional weight per S = 5 mm
ø6	18	18	3
ø10	27	27	3
ø16	41	56	6
ø20	87	115	11
ø25	164	208	17
ø32	267	335	26

(Example) Product weight

SMG-L-16-10-K2H-D
- ●Product weight when stroke length = 0 mm..... 56 g
- ●Additional weight when S = 10 mm..... 6 g × 10/5 = 12 g
- ●Weight of two cylinder switches..... 18 g × 2 = 36 g
- ●Product weight..... 56 + 12 + 36 =104 g

How to order

Without switch

SMG - **32** ○ - **25**

With switch

SMG-L - **32** ○ - **25** - **K2H** - **R**

Ⓐ Model no.
Ⓑ Bore size
Ⓒ Port thread type
Ⓓ Stroke length
Ⓔ Switch model no.
Ⓕ Switch quantity

Symbol	Descriptions
Ⓐ Model no.	
SMG	Double acting
SMG-L	Double acting with switch

Ⓑ Bore size (mm)	
6	ø6
10	ø10
16	ø16
20	ø20
25	ø25
32	ø32

Ⓒ Port thread type	
Blank	Rc thread
NN	NPT thread (ø32 only) Custom order
GN	G thread (ø32 only) Custom order

Ⓓ Stroke length (mm)		**Applicable bore size**					
		ø6	**ø10**	**ø16**	**ø20**	**ø25**	**ø32**
Standard stroke length	**5**	●	●	●	●	●	●
	10	●	●	●	●	●	●
	15	●	●	●	●	●	●
	20	●	●	●	●	●	●
	25	●	●	●	●	●	●
	30	●	●	●	●	●	●
	40	●	●	●	●	●	●
	50	●	●	●	●	●	●
	60	●	●	●	●	●	●
	70				●	●	●
	80				●	●	●
	90				●	●	●
	100				●	●	●

Ⓔ Switch model no.

Axial lead wire	Radial lead wire	Contact	Rated voltage AC	Rated voltage DC	Indicator	Lead wire
K0H*	**K0V***	Reed	●	●	1 color indicator	2 wire
K5H*	**K5V***		●	●	Without indicator light	
K2H*	**K2V***	Proximity		●	1 color indicator	2 wire
K3H*	**K3V***			●		3 wire
K3PH*	**K3PV***			●	1 color indicator type (custom order)	3 wire
K2YH*	**K2YV***			●	2 color indicator	2 wire
K3YH*	**K3YV***			●		3 wire

***Lead wire length**	
Blank	1 m (standard)
3	3 m
5	5 m

Ⓕ Switch quantity	
R	1 (rod end)
H	1 (head end)
D	2

Note on model no. selection

Note 1: Refer to page 3 for min. stroke lengths of types with switch.
Note 2: Copper and PTFE free as standard.

<Example of model number>

SMG-L-6-15-K0H-R

Model: Compact cylinder
Ⓐ Model no. : Double acting with switch
Ⓑ Bore size : ø6 mm
Ⓒ Port thread type : Rc thread
Ⓓ Stroke length : 15 mm
Ⓔ Switch model no. : Reed switch K0H, Lead wire length 1 m
Ⓕ Switch quantity : 1 (rod end)

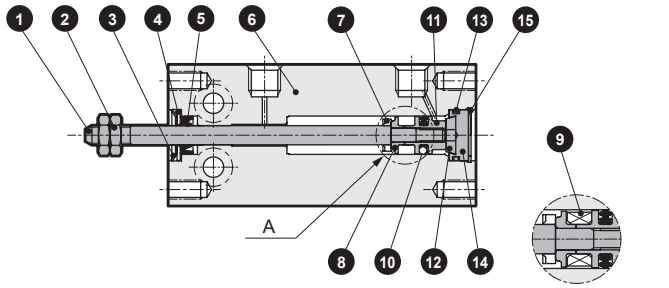
How to order switch

SW - **K2H**

Switch model no.
(See Ⓔ above.)

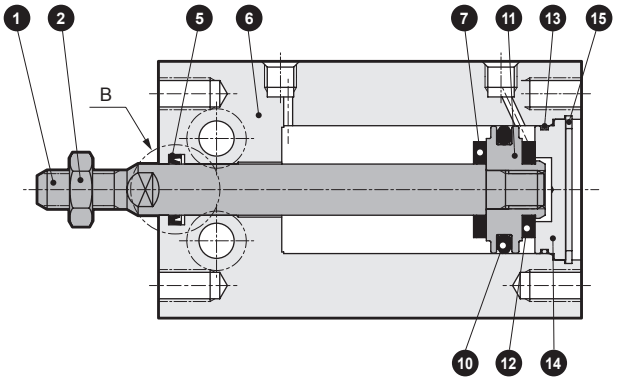
Internal structure and parts list

● ø6/ø10 (double acting)

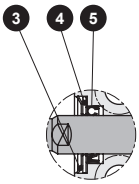


Section A with switch

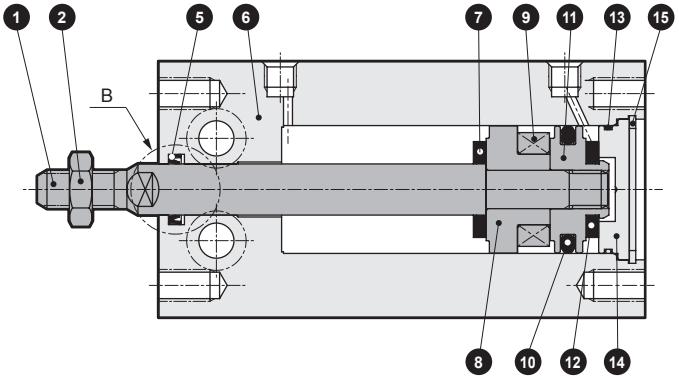
● ø16 to 32 (double acting)



● ø16 to 32 (double acting/with switch)



Section B when diameter is ø16



No.	Parts name	Material	Remarks
1	Piston rod	Stainless steel	ø20, 25, 32 Industrial chrome plating
2	Rod nut	Steel	Nickeling
3	CR snap ring	Stainless steel	
4	Cap	Stainless steel	
5	Rod packing seal	Nitrile rubber	
6	Body	Aluminum alloy	Hard alumite
7	Cushion rubber R	Urethane rubber	
8	Spacer	Aluminum alloy	Chromate

No.	Parts name	Material	Remarks
9	Magnet	-	
10	Piston packing seal	Nitrile rubber	
11	Piston	Aluminum alloy	Chromate
12	Cushion rubber H	Urethane rubber	
13	Guard gasket	Nitrile rubber	
14	Cover	Aluminum alloy	Chromate
15	C type snap ring	Steel	Phosphoric acid zinc

Repair parts list

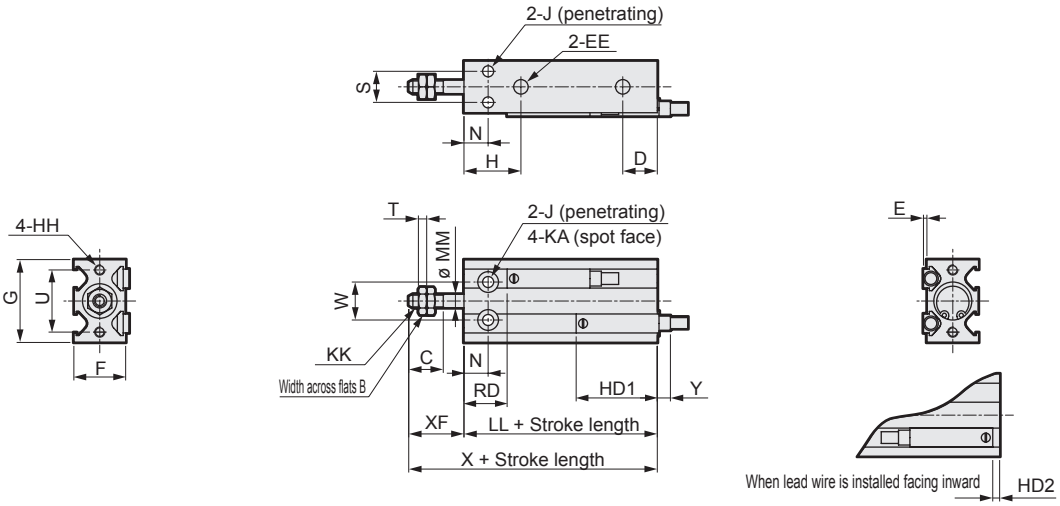
Bore size (mm)	Kit no.	Repair parts no.
ø6	SMG-6K	❸❺❼❿⓬⓭
ø10	SMG-10K	
ø16	SMG-16K	

Bore size (mm)	Kit no.	Repair parts no.
ø20	SMG-20K	❺❼❿⓬⓭
ø25	SMG-25K	
ø32	SMG-32K	

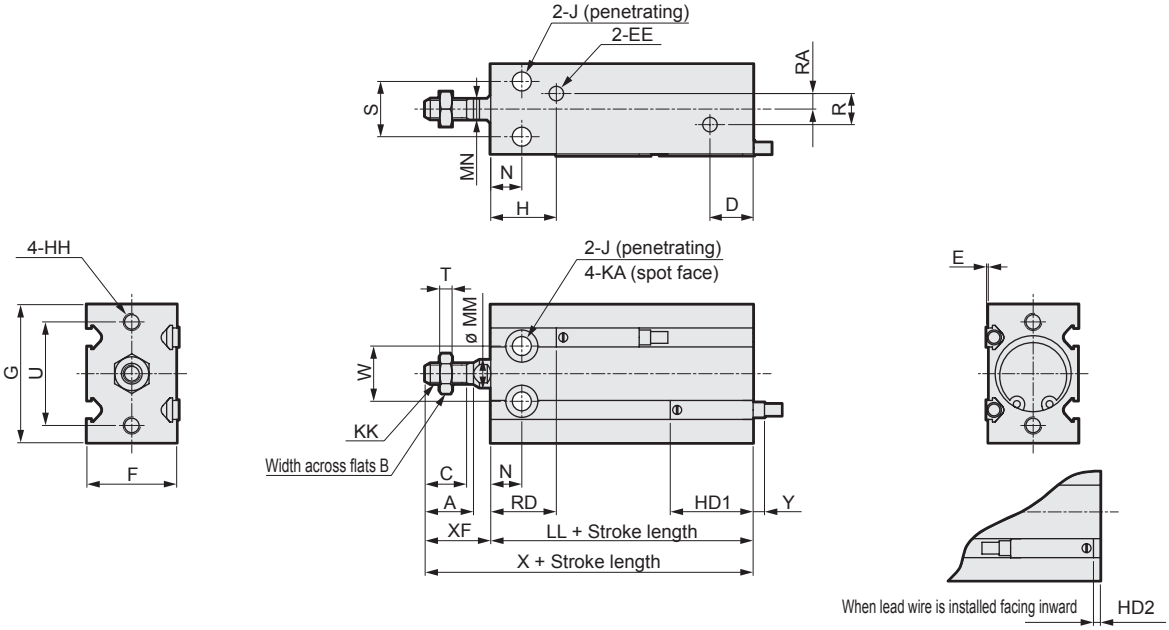
Dimensions

● Double acting SMG-(L)

ø6/10



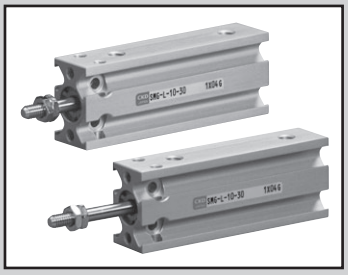
ø16/ø20/ø25/ø32



Symbol / Bore size	A	B	C	D	EE	F	G	H	HH	J	KA	KK	MM	MN	N	R	RA	S
ø6	-	5.5	7	10	M5	13	22	15	M3 depth 5	3.2	6 depth 4.8	M3	3	-	7	-	-	7
ø10	-	7	10	10	M5	15	24	16.5	M3 depth 5	3.2	6 depth 5	M4	4	-	7	-	-	9
ø16	12.5	8	11	11.5	M5	20	32	(Note 1) 16.5	M4 depth 6	4.5	7.5 depth 6.5	M5	6	5	7	4	2	12
ø20	14	10	12	12.5	M5	26	40	19	M5 depth 8	5.5	9 depth 8	M6	8	6	9	9	4.5	16
ø25	18	13	15.5	13	M5	32	50	21.5	M5 depth 8	5.5	9 depth 9	M8	10	8	10	9	4.5	20
ø32	22	17	19.5	12.5	Rc1/8	40	62	23	M6 depth 9	6.6	11 depth 11.5	M10 × 1.25	12	10	11	13.5	4.5	24

Symbol / Bore size	T	U	W	XF	LL		X		E		HD1	HD2	RD	Y (Note 2)
					w/o switch	w/ switch	w/o switch	w/ switch	K0/5	K2/3,K3P				
ø6	1.8	17	10	13	33	33	46	46	0.5	1	20	1	13	7
ø10	2.4	18	11	16	36	36	52	52	0.5	1	23.5	4.5	12.5	3.5
ø16	3.2	25	14	16	30	40	46	56	0	0.5	24.5	5.5	15.5	2.5
ø20	3.6	30	16	19	36	46	55	65	0	0.5	27	8	19	0
ø25	5	38	20	23	40	50	63	73	0	0.5	29	10	21	-2
ø32	6	48	24	27	42	52	69	79	0	0.5	30.5	11.5	21.5	-3.5

Note 1: 14.5 if 5 stroke length without switch
Note 2: Y dimension refers to projecting length from the edge of the switch's body. (Negative dimension means the length retracting from the body's end surface.)
Note 3: When calculating LL+stroke length and X + stroke length of custom stroke, do not add the value of custom stroke. Add the standard stroke value above.
(Example: If the custom stroke is 35 mm, calculate including standard stroke 40 mm.)



Compact cylinder Single acting push type with switch
Single acting pull type with switch

SMG-$^{X}_{Y}$ Series

● Bore size: ø6/ø10/ø16/ø20/ø25/ø32

JIS symbol

Single acting push type

Single acting pull type

RoHS

Specifications

Descriptions		SMG-X, SMG-Y SMG-XL, SMG-YL (with switch)					
Bore size	mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation	SMG-X(L)	Single acting push type					
	SMG-Y(L)	Single acting pull type					
Working fluid		Compressed air					
Max. working pressure	MPa	0.7					
Min. working pressure MPa	SMG-X(L)	0.2	0.15				0.13
	SMG-Y(L)						
Proof pressure	MPa	1.05					
Ambient temperature	°C	-10 to 60 (no freezing)					
Port size		M5					Rc1/8
Stroke tolerance	mm	+1.5 0					
Working piston speed	mm/s	50 to 500					
Cushion		Note) Rubber cushioned					
Lubrication		Not required (when lubricating, use turbine oil Class 1 ISO VG32.)					
Allowable energy absorption J		0.012	0.036	0.05	0.1	0.19	0.5

Note 1: Do not leave the single acting cylinder in a pressurized state. If left pressurized, the piston rod may not return with spring power when pressure is released.
Note 2: ø6 comes with rubber cushion on one side.

Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
ø6	5, 10, 15	15	5
ø10			
ø16			
ø20			
ø25			
ø32			

Min. stroke length of types with switch

Model	Bore size	1 color indicator		2 color indicator	
		K□H	K□V	K□YH	K□YV
SMG-XL SMG-YL	ø6	5		5	
	ø10				
	ø16				
	ø20				
	ø25				
	ø32				

Switch specifications

● 1 color/2 color indicator type

Descriptions	Proximity 2 wire		Proximity 3 wire			Reed 2 wire			
	K2H/K2V	K2YH/K2YV	K3H/K3V	K3PH/K3PV (Custom order)	K3YH/K3YV	K0H/K0V		K5H/K5V	
Applications	Specific to programmable controllers		Programmable controller, relay			Programmable controller, relay		Programmable controller, relay IC circuit (without Indicator light), serial connection	
Output method	-		NPN output	PNP output	NPN output	-			
Power voltage	-		10 to 28 VDC			-			
Load voltage	10 to 30 VDC		30 VDC or less			12/24 VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 20 mA (Note 1)		50 mA or less			5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator light	LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Yellow LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)		-	
Leakage current	1 mA or less		10 μA or less			0 mA			
Weight	1 m: 18 3 m: 49 5 m: 80	1 m: 31 3 m: 85 5 m: 139	1 m: 18 3 m: 49 5 m: 80		1 m: 31 3 m: 85 5 m: 139	1 m: 18 3 m: 49 5 m: 80			

Note 1: The maximum load current of 20 mA applies at 25°C. The current will be lower than 20 mA if ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C.)

SMG-X Cylinder weight

Model no.	5		10		15	
Bore size	w/o switch	w/ switch	w/o switch	w/ switch	w/o switch	w/ switch
ø6	21	21	23	24	26	26
ø10	31	31	34	34	41	41
ø16	47	62	53	68	66	81
ø20	98	125	109	135	131	158
ø25	180	223	196	240	233	277
ø32	293	361	319	386	376	444

SMG-Y Cylinder weight

Model no.	5		10		15	
Bore size	w/o switch	w/ switch	w/o switch	w/ switch	w/o switch	w/ switch
ø6	20	21	23	23	26	26
ø10	30	30	33	33	39	40
ø16	61	62	67	68	79	80
ø20	98	124	108	135	130	157
ø25	180	223	196	240	231	275
ø32	291	359	317	385	372	439

SMG-X/SMG-Y Spring load

Unit: N

Bore size (mm)	Stroke length (mm)	Stroke length at 0 (zero)	Full stroke length during operation	Bore size (mm)	Stroke length (mm)	Stroke length at 0 (zero)	Full stroke length during operation
ø6	5	3.1	3.8	ø20	5	14	19
	10	2.3			10	8.8	
	15	1.6			15		
ø10	5	5.5	8.0	ø25	5	19	25
	10	3.0			10	14	
	15				15		
ø16	5	11	16	ø32	5	25	30
	10	5.9			10	21	
	15				15		

How to order

Without switch

SMG-X - 32 ( ) - 15

With switch

SMG-XL - 32 ( ) - 15 - K2H - R

Ⓐ Model no.

Symbol	Descriptions
Ⓐ Model no.	
SMG-X	Single acting push type
SMG-XL	Single acting push type with switch
SMG-Y	Single acting pull type
SMG-YL	Single acting pull type with switch

Ⓑ Bore size

Ⓑ Bore size (mm)	
6	ø6
10	ø10
16	ø16
20	ø20
25	ø25
32	ø32

Ⓒ Port thread type

Ⓒ Port thread type	
Blank	Rc thread
NN	NPT thread (ø32 only) Custom order
GN	G thread (ø32 only) Custom order

Ⓓ Stroke length

Ⓓ Stroke length (mm)	
Bore size	Stroke length
6 to 32	5, 10, 15

Ⓔ Switch model no.

Ⓔ Switch model no.						
Axial lead wire	Radial lead wire	Contact	Rated voltage AC	Rated voltage DC	Indicator	Lead wire
K0H*	**K0V***	Reed	●	●	1 color indicator	2 wire
K5H*	**K5V***	Reed	●	●	Without indicator light	2 wire
K2H*	**K2V***	Proximity		●	1 color indicator	2 wire
K3H*	**K3V***	Proximity		●	1 color indicator	3 wire
K3PH*	**K3PV***	Proximity		●	1 color indicator type (custom order)	3 wire
K2YH*	**K2YV***	Proximity		●	2 color indicator	2 wire
K3YH*	**K3YV***	Proximity		●	2 color indicator	3 wire

***Lead wire length**	
Blank	1 m (standard)
3	3 m
5	5 m

Ⓕ Switch quantity

Ⓕ Switch quantity	
R	1 (rod end)
H	1 (head end)
D	2

Note on model no. selection

Note 1: Refer to page 7 for min. stroke lengths of types with switch.
Note 2: Copper and PTFE free as standard.

<Example of model number>

SMG-XL-6-15-K0H-R

Model: Compact cylinder

Ⓐ Model no. : Single acting push type with switch
Ⓑ Bore size : ø6 mm
Ⓒ Port thread type : Rc thread
Ⓓ Stroke length : 15 mm
Ⓔ Switch model no. : Reed switch K0H, lead wire length 1 m
Ⓕ Switch quantity : 1 (rod end)

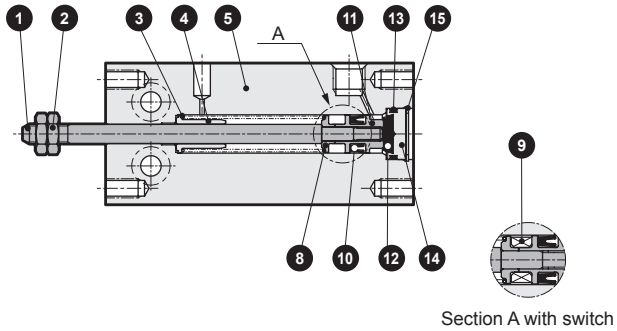
How to order switch

SW - K2H

Switch model no.
(See Ⓔ above.)

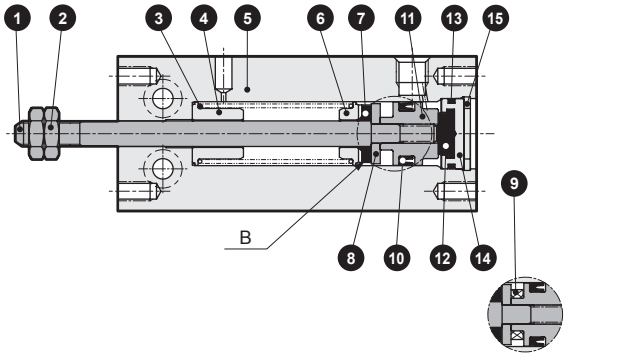
Internal structure and parts list

● ø6 (Single acting push type)



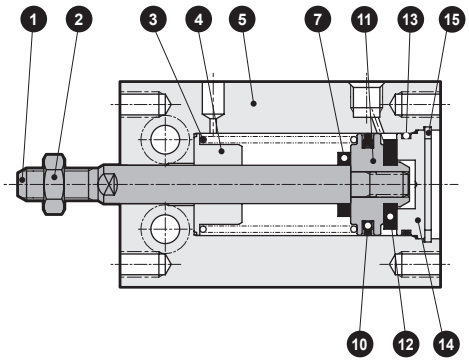
Section A with switch

● ø10 (Single acting push type)

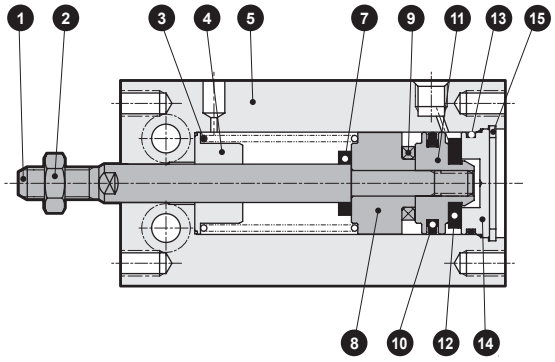


Section B with switch

● ø6 to 32 (Single acting push type)



● ø6 to 32 (Single acting push type with switch)



No.	Parts name	Material	Remarks
1	Piston rod	Stainless steel	ø20, 25, 32 Industrial chrome plating
2	Rod nut	Steel	Nickeling
3	Coil spring	Piano wire	Electrode position coating
4	Spring holder	Aluminum alloy	
5	Body	Aluminum alloy	Hard alumite
6	Spring holder	Aluminum alloy	
7	Cushion rubber R	Urethane rubber	
8	Spacer	Aluminum alloy	Chromate

No.	Parts name	Material	Remarks
9	Magnet	-	
10	Piston packing seal	Nitrile rubber	
11	Piston	Aluminum alloy	Chromate
12	Cushion rubber H	Urethane rubber	
13	Guard gasket	Nitrile rubber	
14	Cover	Aluminum alloy	Chromate
15	C type snap ring	Steel	Phosphoric acid zinc

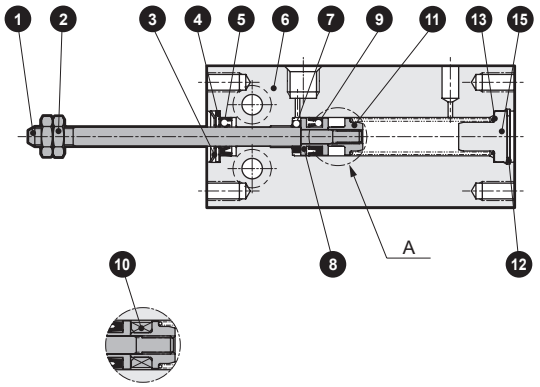
Repair parts list

Bore size (mm)	Kit no.	Repair parts no.
ø6	SMG-X-6K	⑩ ⑫ ⑬
ø10	SMG-X-10K	⑦ ⑩ ⑫ ⑬
ø16	SMG-X-16K	

Bore size (mm)	Kit no.	Repair parts no.
ø20	SMG-X-20K	⑦ ⑩ ⑫ ⑬
ø25	SMG-X-25K	
ø32	SMG-X-32K	

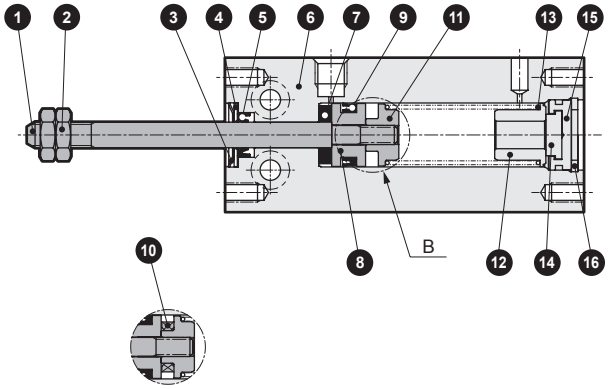
Internal structure and parts list

● ø6 (single acting pull type)



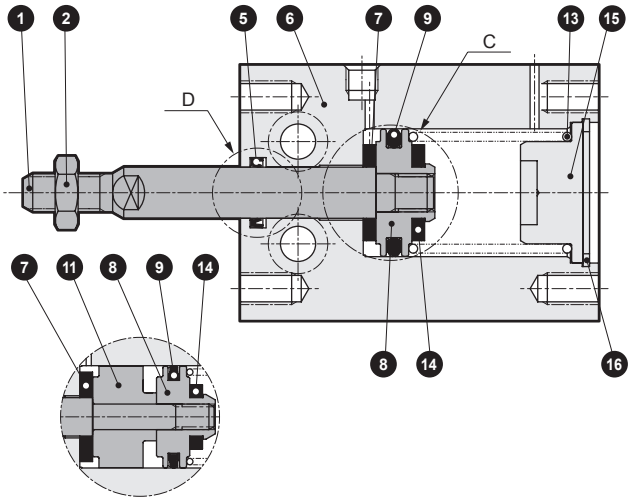
Section A with switch

● ø10 (single acting pull type)



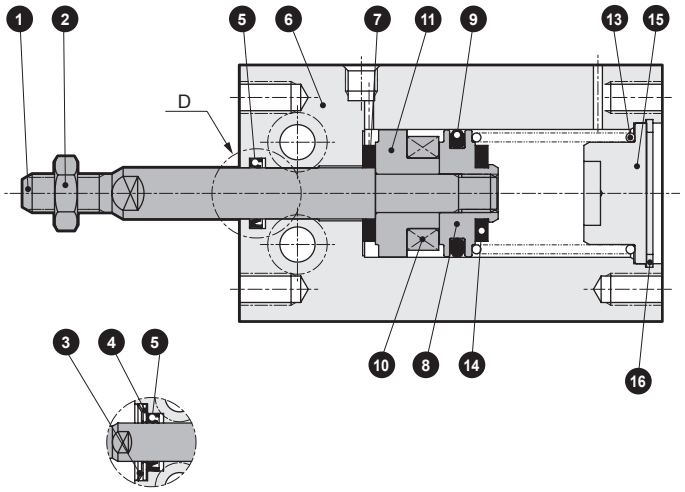
Section B with switch

● ø16 to 32 (single acting pull type)



Section C when diameter is ø16

● ø16 to 32 (single acting pull type with switch)



Section D when diameter is ø16

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Piston rod	Stainless steel	ø20, 25, 32 Industrial chrome plating	9	Piston packing seal	Nitrile rubber	
2	Rod nut	Steel	Nickeling	10	Magnet	-	
3	CR snap ring	Stainless steel		11	Spacer	Aluminum alloy	Chromate
4	Cap	Stainless steel		12	Spring holder	Aluminum alloy	
5	Rod packing seal	Nitrile rubber		13	Coil spring	Piano wire	Electrode position coating
6	Body	Aluminum alloy	Hard alumite	14	Cushion rubber H	Urethane rubber	
7	Cushion rubber R	Urethane rubber		15	Cover	Aluminum alloy	Chromate
8	Piston	Aluminum alloy	Chromate	16	C type snap ring	Steel	Phosphoric acid zinc

Repair parts list

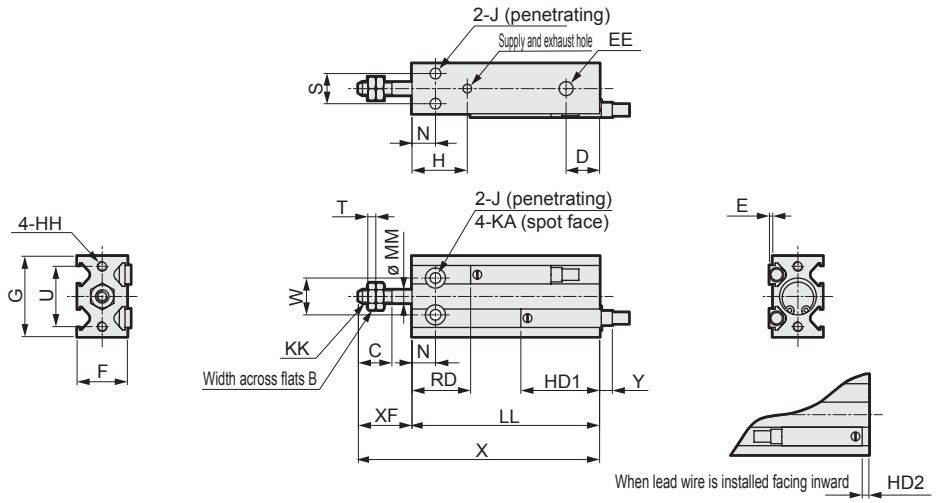
Bore size (mm)	Kit no.	Repair parts no.
ø6	SMG-Y-6K	❸❺❼❾
ø10	SMG-Y-10K	❸❺❼❾⓮
ø16	SMG-Y-16K	

Bore size (mm)	Kit no.	Repair parts no.
ø20	SMG-Y-20K	❺❼❾⓮
ø25	SMG-Y-25K	
ø32	SMG-Y-32K	

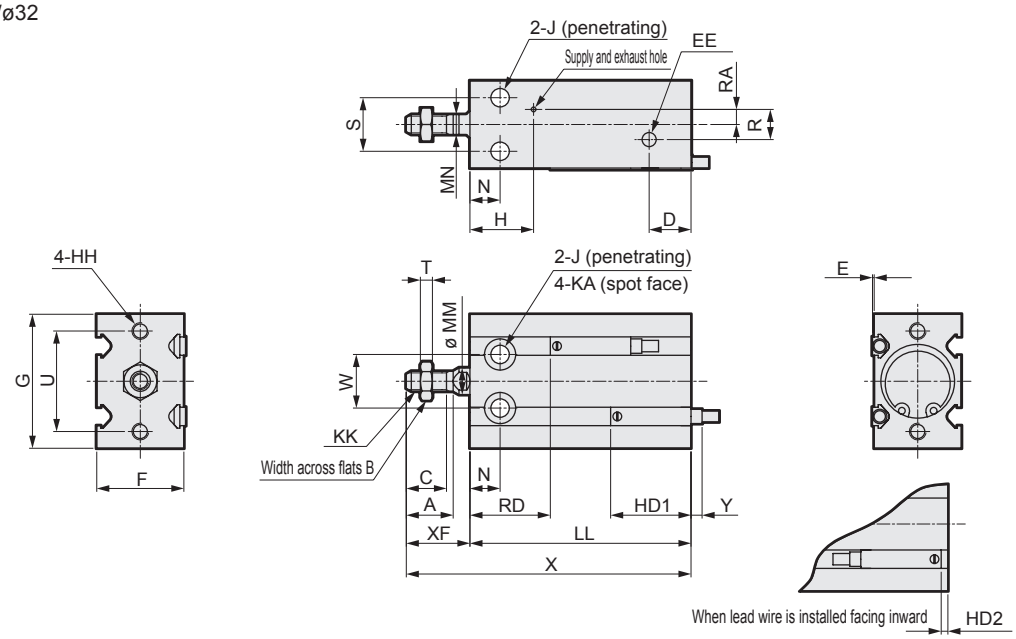
Dimensions CAD

● Single acting push type SMG-X (L)

ø6/10



ø16/ø20/ø25/ø32



Symbol / Bore size	A	B	C	D	EE	F	G	H	HH	J	KA	KK	MM	MN	N	R	RA	S	T
ø6	-	5.5	7	10	M5	13	22	15	M3 depth 5	3.2	6 depth 4.8	M3	3	-	7	-	-	7	1.8
ø10	-	7	10	10	M5	15	24	16.5	M3 depth 5	3.2	6 depth 5	M4	4	-	7	-	-	9	2.4
ø16	12.5	8	11	11.5	M5	20	32	16.5	M4 depth 6	4.5	7.5 depth 6.5	M5	6	5	7	4	2	12	3.2
ø20	14	10	12	12.5	M5	26	40	19	M5 depth 8	5.5	9 depth 8	M6	8	6	9	9	4.5	16	3.6
ø25	18	13	15.5	13	M5	32	50	21.5	M5 depth 8	5.5	9 depth 9	M8	10	8	10	9	4.5	20	5
ø32	22	17	19.5	12.5	Rc1/8	40	62	23	M6 depth 9	6.6	11 depth 11.5	M10 × 1.25	12	10	11	13.5	4.5	24	6

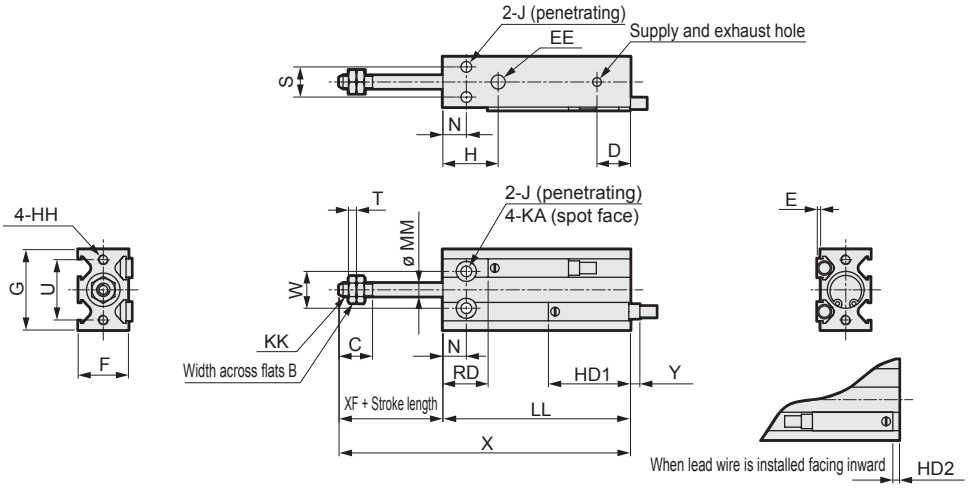
Symbol / Bore size	U	W	XF	LL						X						E		HD1	HD2	RD		Y (Note 1)
				w/o switch			w/ switch			w/o switch			w/ switch			K0/5	K2/3,K3P			5,10st.	15st.	
				5st.	10st.	15st.	5st.	10st.	15st.	5st.	10st.	15st.	5st.	10st.	15st.							
ø6	17	10	13	38	43	48	38	43	48	51	56	61	51	56	61	0.5	1	21.5	2.5	11.5	11.5	5.5
ø10	18	11	16	41	46	56	41	46	56	57	62	72	57	62	72	0.5	1	23.5	4.5	12.5	17.5	3.5
ø16	25	14	16	35	40	50	45	50	60	51	56	66	61	66	76	0	0.5	24.5	5.5	15.5	20.5	2.5
ø20	30	16	19	41	46	56	51	56	66	60	65	75	70	75	85	0	0.5	27	8	19	24	0
ø25	38	20	23	45	50	60	55	60	70	68	73	83	78	83	93	0	0.5	29	10	21	26	-2
ø32	48	24	27	47	52	62	57	62	72	74	79	89	84	89	99	0	0.5	30.5	11.5	21.5	26.5	-3.5

Note 1: Y dimension refers to the length projecting from the end surface of switch body.
(Negative dimension means the length retracting from the body's end surface.)

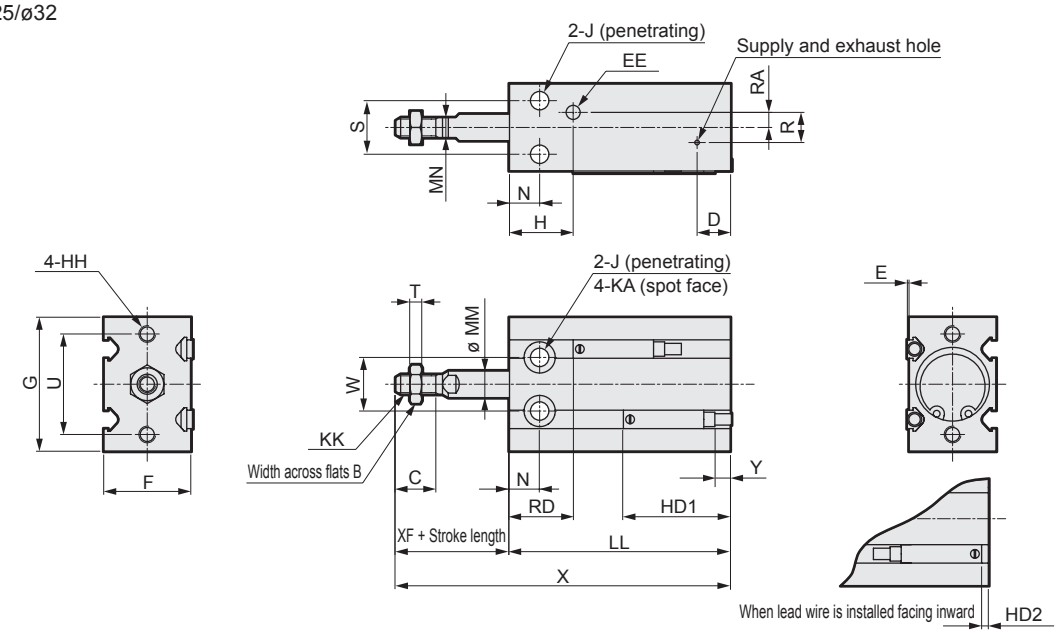
Dimensions CAD

● Single acting pull type, SMG-Y (L)

ø6/ø10



ø16/ø20/ø25/ø32

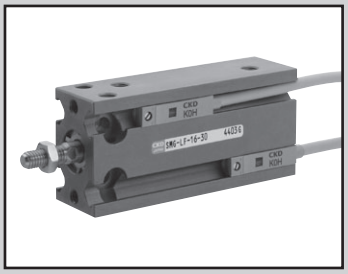


Symbol / Bore size	A	B	C	D	EE	F	G	H	HH	J	KA	KK	MM	MN	N	R	RA	S	T	U
ø6	-	5.5	7	10	M5	13	22	15	M3 depth 5	3.2	6 depth 4.8	M3	3	-	7	-	-	7	1.8	17
ø10	-	7	10	10	M5	15	24	16.5	M3 depth 5	3.2	6 depth 5	M4	4	-	7	-	-	9	2.4	18
ø16	12.5	8	11	11.5	M5	20	32	16.5	M4 depth 6	4.5	7.5 depth 6.5	M5	6	5	7	4	2	12	3.2	25
ø20	14	10	12	12.5	M5	26	40	19	M5 depth 8	5.5	9 depth 8	M6	8	6	9	9	4.5	16	3.6	30
ø25	18	13	15.5	13	M5	32	50	21.5	M5 depth 8	5.5	9 depth 9	M8	10	8	10	9	4.5	20	5	38
ø32	22	17	19.5	12.5	Rc1/8	40	62	23	M6 depth 9	6.6	11 depth 11.5	M10 × 1.25	12	10	11	13.5	4.5	24	6	48

Symbol / Bore size	W	XF	LL						X						E		HD1		HD2		RD	Y (Note 1)	
			w/o switch			w/ switch			w/o switch			w/ switch			K0/5	K2/3,K3P							
			5st.	10st.	15st.	5st.	10st.	15st.	5st.	10st.	15st.	5st.	10st.	15st.			5,10st.	15st.	5,10st.	15st.		5,10st.	15st.
ø6	10	13	38	43	48	38	43	48	56	66	76	56	66	76	0.5	1	22.5	22.5	3.5	3.5	10.5	4.5	4.5
ø10	11	16	41	46	56	41	46	56	62	72	87	62	72	87	0.5	1	22.5	27.5	3.5	8.5	13.5	4.5	-0.5
ø16	14	16	45	50	60	45	50	60	66	76	91	66	76	91	0	0.5	24.5	29.5	5.5	10.5	15.5	2.5	-2.5
ø20	16	19	41	46	56	51	56	66	65	75	90	75	85	100	0	0.5	27	32	8	13	19	0	-5
ø25	20	23	45	50	60	55	60	70	73	83	98	83	93	108	0	0.5	29	34	10	15	21	-2	-7
ø32	24	27	47	52	62	57	62	72	79	89	104	89	99	114	0	0.5	30.5	35.5	11.5	16.5	21.5	-3.5	-8.5

Note 1: Y dimension refers to the length projecting from the end surface of switch body.
(Negative dimension means the length retracting from the body's end surface.)

MEMO

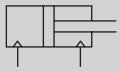


Compact cylinder Double acting fine speed type

SMG-F Series

● Bore size: ø6/ø10/ø16/ø20/ø25/ø32

JIS symbol



Double acting

Custom order RoHS

Specifications

Descriptions	SMG-F SMG-L (with switch)					
Bore size mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation	Double acting					
Working fluid	Compressed air					
Max. working pressure MPa	0.7					
Min. working pressure MPa	0.12	0.06		0.05		
Proof pressure MPa	1.05					
Ambient temperature °C	5 to 60					
Port size	M5					Rc1/8
Stroke tolerance mm	+1.5 0					
Working piston speed mm/s	1 to 200					
Cushion	Rubber cushioned					
Lubrication	N/A					
Allowable energy absorption J	0.012	0.036	0.1	0.1	0.19	0.5

Stroke length

Bore size (mm)	Standard stroke length (mm)	Min. stroke length (mm)
ø6	5, 10, 15, 20, 25, 30	5
ø10		
ø16		
ø20	5, 10, 15, 20, 25, 30, 50,	
ø25		
ø32		

Note 1: Custom stroke length can be set in 5 mm increments.

Min. stroke length of types with switch

Bore size	1 color indicator		2 color indicator	
	K□H	K□V	K□YH	K□YV
ø6	5		5	
ø10				
ø16				
ø20				
ø25				
ø32				

Switch specifications

● 1 color/2 color indicator type

Descriptions	Proximity 2 wire		Proximity 3 wire			Reed 2 wire			
	K2H/K2V	K2YH/K2YV	K3H/K3V	K3PH/K3PV (Custom order)	K3YH/K3YV	K0H/K0V		K5H/K5V	
Applications	Specific to programmable controllers		Programmable controller, relay			Programmable controller, relay		Programmable controller, relay IC circuit (without Indicator light), serial connection	
Output method	-		NPN output	PNP output	NPN output	-			
Power voltage	-		10 to 28 VDC			-			
Load voltage	10 to 30 VDC		30 VDC or less			12/24 VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 20 mA (Note 1)		50 mA or less			5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator light	LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Yellow LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)		-	
Leakage current	1 mA or less		10 μA or less			0 mA			
Weight g	1 m: 18 3 m: 49 5 m: 80	1 m: 31 3 m: 85 5 m: 139	1 m: 18 3 m: 49 5 m: 80		1 m: 31 3 m: 85 5 m: 139	1 m: 18 3 m: 49 5 m: 80			

Note 1: The maximum load current of 20 mA applies at 25°C. The current will be lower than 20 mA if ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C.)

Weight

It has the same weight as SMG Series of double acting single rod type. Refer to page 3.

Dimensions

It has the same weight as SMG Series of double acting single rod type. Refer to page 6.

How to order

Without switch

SMG-F - 32 ( ) - 25

With switch

SMG-LF - 32 ( ) - 25 - K2H - R

Ⓐ Model no.
Ⓑ Bore size
Ⓒ Port thread type
Ⓓ Stroke length
Ⓔ Switch model no.
Ⓕ Switch quantity

Symbol	Descriptions
Ⓐ Model no.	
SMG-F	Double acting fine speed type
SMG-LF	Double acting fine speed type with switch

Ⓑ Bore size (mm)	
6	ø6
10	ø10
16	ø16
20	ø20
25	ø25
32	ø32

Ⓒ Port thread type	
Blank	Rc thread
NN	NPT thread (ø32 only)
GN	G thread (ø32 only)

Ⓓ Stroke length (mm)		**Applicable bore size**					
		ø6	**ø10**	**ø16**	**ø20**	**ø25**	**ø32**
Standard stroke length	**5**	●	●	●	●	●	●
	10	●	●	●	●	●	●
	15	●	●	●	●	●	●
	20	●	●	●	●	●	●
	25	●	●	●	●	●	●
	30	●	●	●	●	●	●
	40				●	●	●
	50				●	●	●

Ⓔ Switch model no.

Axial lead wire	Radial lead wire	Contact	Rated voltage AC	Rated voltage DC	Indicator	Lead wire
K0H*	**K0V***	Reed	●	●	1 color indicator	2 wire
K5H*	**K5V***		●	●	Without indicator light	
K2H*	**K2V***	Proximity		●	1 color indicator	2 wire
K3H*	**K3V***			●		3 wire
K3PH*	**K3PV***			●	1 color indicator type (custom order)	3 wire
K2YH*	**K2YV***			●	2 color indicator	2 wire
K3YH*	**K3YV***			●		3 wire

***Lead wire length**	
Blank	1 m (standard)
3	3 m
5	5 m

Ⓕ Switch quantity	
R	1 (rod end)
H	1 (head end)
D	2

Note on model no. selection

Note 1: Refer to page 15 for min. stroke lengths of types with switch.
~~Note 2: Copper and PTFE free as standard.~~

<Example of model number>

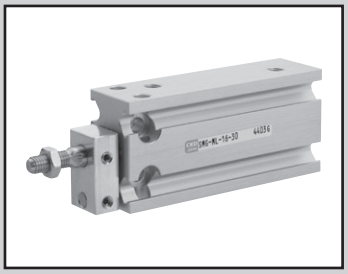
SMG-LF-6-15-K0H-R

Model: Compact cylinder
Ⓐ Model no. : Double acting fine speed type with switch
Ⓑ Bore size : ø6 mm
Ⓒ Port thread type : Rc thread
Ⓓ Stroke length : 15 mm
Ⓔ Switch model no. : Reed switch K0H, Lead wire length 1 m
Ⓕ Switch quantity : 1 (rod end)

How to order switch

SW - K2H

Switch model no.
(See Ⓔ above.)

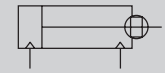


Compact cylinder Double acting fine speed type

SMG-M Series

● Bore size: ø6/ø10/ø16/ø20/ø25/ø32

JIS symbol



Double acting, non-rotating type

RoHS

Specifications

Descriptions	SMG-M SMG-ML (with switch)					
Bore size mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation	Double acting					
Working fluid	Compressed air					
Max. working pressure MPa	0.7					
Min. working pressure MPa	0.15	0.10		0.08		
Proof pressure MPa	1.05					
Ambient temperature °C	-10 to 60 (no freezing)					
Port size	M5					Rc1/8
Stroke tolerance mm	+1.5 0					
Working piston speed mm/s	50 to 500					
Cushion	Rubber cushioned					
Lubrication	Not required (when lubricating, use turbine oil Class 1 ISO VG32.)					
Revolvable angle tolerance Note 1	±0.8°			±0.5°		
Rotation torque allowance N·m	0.008	0.025	0.088	0.17	0.33	0.67
Allowable energy absorption J	0.012	0.036	0.1	0.1	0.19	0.5

Note 1: The value when a stroke length of 0 (deflection of position rod excluded)

Stroke length

Bore size (mm)	Standard stroke length (mm)	Min. stroke length (mm)
ø6	5, 10, 15, 20, 25, 30, 50, 60	5
ø10		
ø16		
ø20	5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100	
ø25		
ø32		

Note 1: Custom stroke length can be set in 5 mm increments.

Min. stroke length of types with switch

Bore size	1 color indicator		2 color indicator	
	K□H	K□V	K□YH	K□YV
ø6	5		5	
ø10				
ø16				
ø20				
ø25				
ø32				

Switch specifications

● 1 color/2 color indicator type

Descriptions	Proximity 2 wire		Proximity 3 wire			Reed 2 wire			
	K2H/K2V	K2YH/K2YV	K3H/K3V	K3PH/K3PV (Custom order)	K3YH/K3YV	K0H/K0V		K5H/K5V	
Applications	Specific to programmable controllers		Programmable controller, relay			Programmable controller, relay		Programmable controller, relay IC circuit (without Indicator light), serial connection	
Output method	-		NPN output	PNP output	NPN output	-			
Power voltage	-		10 to 28 VDC			-			
Load voltage	10 to 30 VDC		30 VDC or less			12/24 VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 20 mA (Note 1)		50 mA or less			5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator light	LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Yellow LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)		-	
Leakage current	1 mA or less		10 µA or less			0 mA			
Weight g	1 m: 18 3 m: 49 5 m: 80	1 m: 31 3 m: 85 5 m: 139	1 m: 18 3 m: 49 5 m: 80		1 m: 31 3 m: 85 5 m: 139	1 m: 18 3 m: 49 5 m: 80			

Note 1: The maximum load current of 20 mA applies at 25°C. The current will be lower than 20 mA if ambient temperature around the switch is higher than 25˚C. (5 to 10 mA at 60˚C.)

Cylinder weight

Unit (g)

Model no. / Bore size	Product weight when stroke length S = 0 mm		Additional weight per S = 5 mm
	SMG-M Double acting non-rotating type	SMG-ML Double acting non-rotating type with switch	
ø6	23	23	3
ø10	33	33	3
ø16	51	66	6
ø20	106	134	12
ø25	197	241	18
ø32	329	397	27

(Example) Product weight

SMG-ML-16-10-K2H-D
- ● Product weight when stroke length = 0 mm..... 66 g
- ● Additional weight when S = 10 mm..... 6 g × 10/5 = 12 g
- ● Weight of two cylinder switches..... 18 g × 2 = 36 g
- ● Product weight ..... 66 + 12 + 36 = 114 g

How to order

Without switch

SMG-M - 32 ( ) - 25

With switch

SMG-ML - 32 ( ) - 25 - K2H - R

Ⓐ Model no.
Ⓑ Bore size
Ⓒ Port thread type
Ⓓ Stroke length
Ⓔ Switch model no.
Ⓕ Switch quantity

Symbol	Descriptions
Ⓐ Model no.	
SMG-M	Double acting non-rotating type
SMG-ML	Double acting non-rotating with switch

Ⓑ Bore size (mm)	
6	ø6
10	ø10
16	ø16
20	ø20
25	ø25
32	ø32

Ⓒ Port thread type	
Blank	Rc thread
NN	NPT thread (ø32 only) Custom order
GN	G thread (ø32 only) Custom order

Ⓓ Stroke length (mm)		**Applicable bore size**					
		ø6	**ø10**	**ø16**	**ø20**	**ø25**	**ø32**
Standard stroke length	**5**	●	●	●	●	●	●
	10	●	●	●	●	●	●
	15	●	●	●	●	●	●
	20	●	●	●	●	●	●
	25	●	●	●	●	●	●
	30	●	●	●	●	●	●
	40	●	●	●	●	●	●
	50	●	●	●	●	●	●
	60	●	●	●	●	●	●
	70				●	●	●
	80				●	●	●
	90				●	●	●
	100				●	●	●

Ⓔ Switch model no.

Axial lead wire	Radial lead wire	Contact	Rated voltage AC	Rated voltage DC	Indicator	Lead wire
K0H*	**K0V***	Reed	●	●	1 color indicator	2 wire
K5H*	**K5V***		●	●	Without indicator light	
K2H*	**K2V***	Proximity		●	1 color indicator	2 wire
K3H*	**K3V***			●		3 wire
K3PH*	**K3PV***			●	1 color indicator type (custom order)	3 wire
K2YH*	**K2YV***			●	2 color indicator	2 wire
K3YH*	**K3YV***			●		3 wire

***Lead wire length**	
Blank	1 m (standard)
3	3 m
5	5 m

Ⓕ Switch quantity	
R	1 (rod end)
H	1 (head end)
D	2

Notes on model no. selection

Note 1: Refer to page 17 for min. stroke lengths of types with switch.
Note 2: Copper and PTFE free as standard.

<Example of model number>

SMG-ML-6-15-K0H-R

Model: Compact cylinder
Ⓐ Model no. : Double acting non-rotating type with switch
Ⓑ Bore size : ø6 mm
Ⓒ Port thread type : Rc thread
Ⓓ Stroke length : 15 mm
Ⓔ Switch model no. : Reed switch K0H, Lead wire length 1 m
Ⓕ Switch quantity : 1 (rod end)

How to order switch

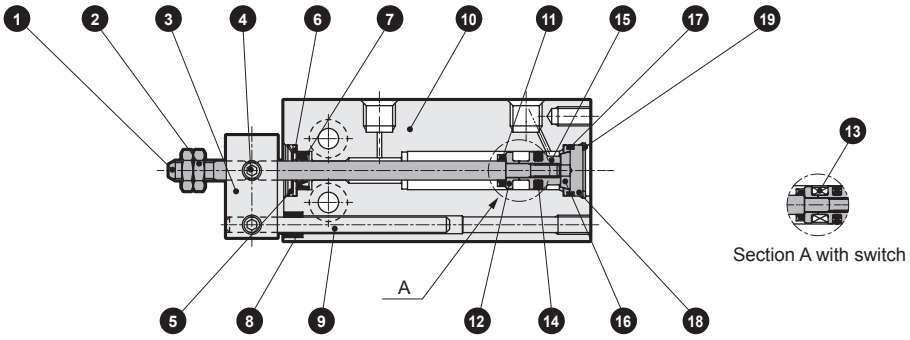
SW - K2H

Switch model no.
(See Ⓔ above.)

Internal structure and parts list

● SMG-M-6/10 (Double acting non-rotating type)

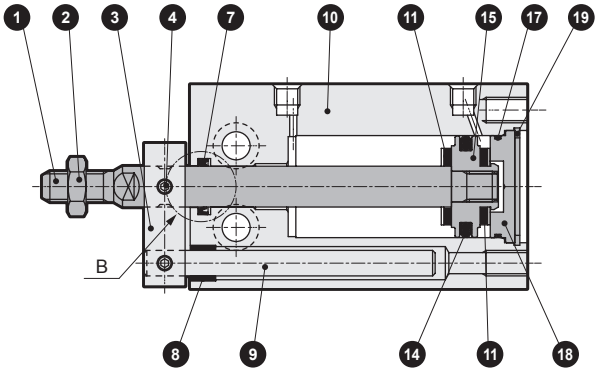
• ø 6/ø10



Section A with switch

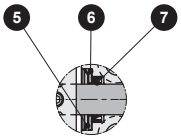
● SMG-M-16 to 32 (Double acting non-rotating type)

• ø16 to 32

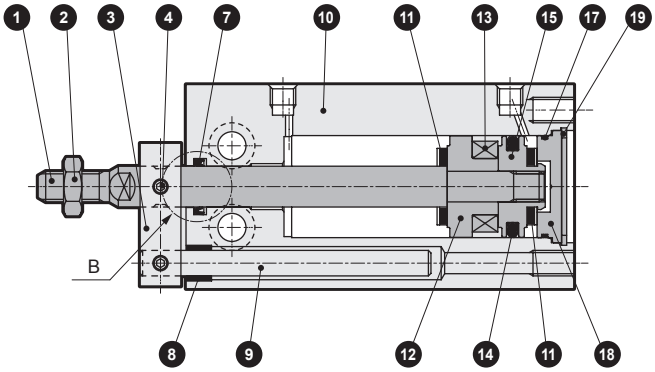


● SMG-M-16 to 32 (Double acting non-rotating type with switch)

• ø16 to 32



Section B when diameter is ø16



No.	Parts name	Material	Remarks
1	Piston rod	Stainless steel	ø20, 25, 32 Industrial chrome plating
2	Rod nut	Steel	Nickeling
3	Non-rotating plate	Aluminum alloy	Chromate
4	Hexagon socket set screw	Stainless steel	
5	CR ring	Stainless steel	
6	Cap	Stainless steel	
7	Rod packing seal	Nitrile rubber	
8	Non-rotating bush	Acetal resin	
9	Guide bar	Stainless steel	ø32 Industrial chrome plating
10	Body	Aluminum alloy	Hard alumite

No.	Parts name	Material	Remarks
11	Cushion rubber R	Urethane rubber	
12	Spacer	Aluminum alloy	Chromate
13	Magnet	-	
14	Piston packing seal	Nitrile rubber	
15	Piston	Aluminum alloy	Chromate
16	Cushion rubber H	Urethane rubber	
17	Guard gasket	Nitrile rubber	
18	Cover	Aluminum alloy	Chromate
19	C type snap ring	Steel	Phosphoric acid zinc

Repair parts list

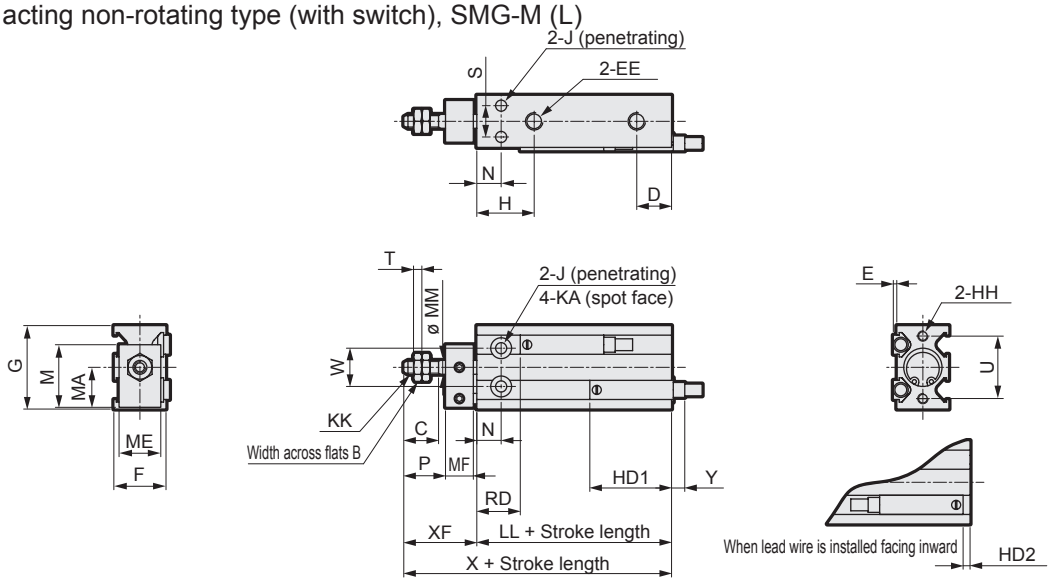
Bore size (mm)	Kit no.	Repair parts no.
ø6	SMG-M-6K	④ ⑤ ⑦ ⑪ ⑭ ⑯ ⑰
ø10	SMG-M-10K	
ø16	SMG-M-16K	

Bore size (mm)	Kit no.	Repair parts no.
ø20	SMG-M-20K	④ ⑦ ⑪ ⑭ ⑯ ⑰
ø25	SMG-M-25K	
ø32	SMG-M-32K	

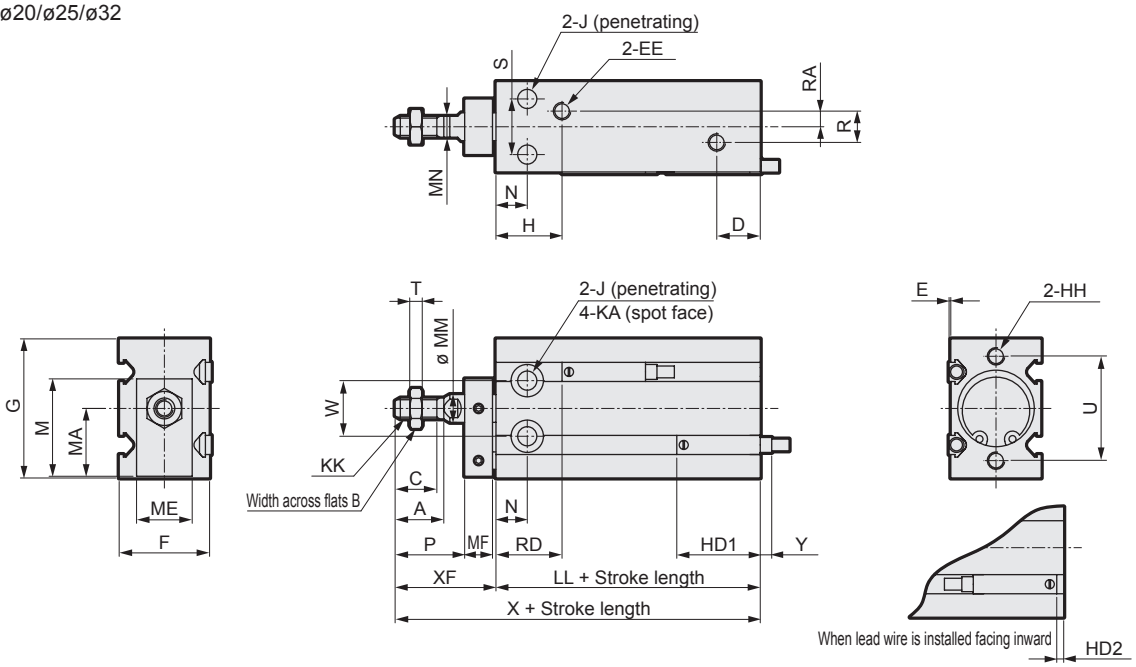
Dimensions

● Double acting non-rotating type (with switch), SMG-M (L)

●ø 6/ø10



● ø16/ø20/ø25/ø32



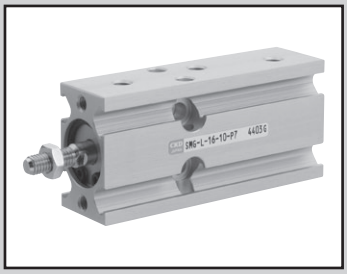
Symbol / Bore size	A	B	C	D	EE	F	G	H	HH	J	KA	KK	M	MA	ME	MF	MM	MN	N	P	R	RA
ø6	-	5.5	7	10	M5	13	22	15	M3 depth 5	3.2	6 depth 4.8	M3	16	10.5	11	8	3	-	7	9	-	-
ø10	-	7	10	10	M5	15	24	16.5	M3 depth 5	3.2	6 depth 5	M4	18	11.5	12	8	4	-	7	12	-	-
ø16	12.5	8	11	11.5	M5	20	32	(Note 1) 16.5	M4 depth 6	4.5	7.5 depth 6.5	M5	22	15.5	13	8	6	5	7	17	4	2
ø20	14	10	12	12.5	M5	26	40	19	M5 depth 8	5.5	9 depth 8	M6	28	19.5	16	8	8	6	9	20	9	4.5
ø25	18	13	15.5	13	M5	32	50	21.5	M5 depth 8	5.5	9 depth 9	M8	35	24.5	20	10	10	8	10	22	9	4.5
ø32	22	17	19.5	12.5	Rc1/8	40	62	23	M6 depth 9	6.6	11 depth 11.5	M10 × 1.25	42.5	30.5	24	12	12	10	11	29	13.5	4.5

Symbol / Bore size	S	T	U	W	XF	LL		X		E		HD1	HD2	RD	Y
						w/o switch	w/ switch	w/o switch	w/ switch	K0/5	K2/3,K3P				
ø6	7	1.8	17	10	18	33	33	51	51	0.5	1	20	1	13	7
ø10	9	2.4	18	11	21	36	36	57	57	0.5	1	23.5	4.5	12.5	3.5
ø16	12	3.2	25	14	26	30	40	56	66	0	0.5	24.5	5.5	15.5	2.5
ø20	16	3.6	30	16	29	36	46	65	75	0	0.5	27	8	19	0
ø25	20	5	38	20	33	40	50	73	83	0	0.5	29	10	21	-2
ø32	24	6	48	24	42	42	52	84	94	0	0.5	30.5	11.5	21.5	-3.5

Note 1: 14.5 when a stroke length of 5 without switch

Note 2: Y dimension refers to the length projecting from the end surface of switch body. (Negative dimension means the length retracting from the body's end surface.)

Note 3: When calculating LL + stroke length and X + stroke length of custom stroke, do not include a value of custom stroke. Add a standard stroke value above instead. (Example: For a custom stroke of 35 mm, the standard stroke of 40 mm should be included for calculation.)

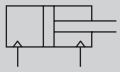


Compact cylinder Double acting single rod type

SMG-P7*/P5* Series

● Bore size: ø6/ø10/ø16/ø20/ø25

JIS symbol



Double acting

Custom order RoHS

Specifications

Descriptions	SMG-P7*/P5* SMG-L-P7*/P5* (with switch)				
Bore size mm	ø6	ø10	ø16	ø20	ø25
Actuation	Double acting				
Working fluid	Compressed air				
Max. working pressure MPa	0.7				
Min. working pressure MPa	0.12	0.06		0.05	
Proof pressure MPa	1.05				
Ambient temperature °C	-10 to 60 (no freezing)				
Port size	M5				
Stroke tolerance mm	+1.5 0				
Working piston speed mm/s	50 to 500				
Cushion	Rubber cushioned				
Lubrication	Not required (when lubricating, use turbine oil Class 1 ISO VG32.)				
Allowable energy absorption J	0.012	0.036	0.1	0.1	0.19

Stroke length

Bore size (mm)	Standard stroke length (mm)	Min. stroke length (mm)
ø6	5, 10, 15, 20, 25, 30	30
ø10		
ø16		
ø20	5, 10, 15, 20, 25, 30, 50,	50
ø25		
ø32		

Note 1: Custom stroke length can be set in 5 mm increments.

Min. stroke length of types with switch

Bore size	1 color indicator		2 color indicator	
	K□H	K□V	K□YH	K□YV
ø6	5		5	
ø10				
ø16				
ø20				
ø25				
ø32				

Switch specifications

● 1 color/2 color indicator type

Descriptions	Proximity 2 wire		Proximity 3 wire			Reed 2 wire			
	K2H/K2V	K2YH/K2YV	K3H/K3V	K3PH/K3PV (Custom order)	K3YH/K3YV	K0H/K0V		K5H/K5V	
Applications	Specific to programmable controllers		Programmable controller, relay			Programmable controller, relay		Programmable controller, relay IC circuit (without Indicator light), serial connection	
Output method	-		NPN output	PNP output	NPN output	-			
Power voltage	-		10 to 28 VDC			-			
Load voltage	10 to 30 VDC		30 VDC or less			12/24 VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 20 mA (Note 1)		50 mA or less			5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator light	LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Yellow LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)		-	
Leakage current	1 mA or less		10 μA or less			0 mA			
Weight g	1 m: 18 3 m: 49 5 m: 80	1 m: 31 3 m: 85 5 m: 139	1 m: 18 3 m: 49 5 m: 80		1 m: 31 3 m: 85 5 m: 139	1 m: 18 3 m: 49 5 m: 80			

Note 1: The maximum load current of 20 mA applies at 25°C. The current will be lower than 20 mA if ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C.)

Cylinder weight

Unit (g)

Model no. / Bore size	Product weight when stroke length S = 0 mm		Additional weight per S = 5 mm
	SMG-P7*/P5* Double acting	SMG-L-P7*/P5* Double acting with switch	
ø6	26	26	3
ø10	36	36	3
ø16	60	75	6
ø20	123	151	11
ø25	216	260	17

(Example) Product weight

SMG-L-16-10-K2H-D-P7

- Product weight when stroke length = 0 mm ..75 g
- Additional weight when S = 10 mm.....6 g × 10/5 = 12 g
- Weight of two cylinder switches.....18 g × 2 = 36 g
- Product weight .....75 + 12 + 36 = 123 g

How to order

Without switch

SMG - 25 - 25 ——— P7

With switch

SMG-L - 25 - 25 - K2H - R - P7

Symbol	Descriptions
Ⓐ Model no.	
SMG	Double acting
SMG-L	Double acting with switch

Ⓐ Model no.

Ⓑ Bore size (mm)	
6	ø6
10	ø10
16	ø16
20	ø20
25	ø25

Ⓑ Bore size

Ⓒ Stroke length (mm)		**Applicable bore size**				
		ø6	**ø10**	**ø16**	**ø20**	**ø25**
Standard stroke length	**5**	●	●	●	●	●
	10	●	●	●	●	●
	15	●	●	●	●	●
	20	●	●	●	●	●
	25	●	●	●	●	●
	30	●	●	●	●	●
	40				●	●
	50				●	●

Ⓒ Stroke length

Ⓓ Switch model no.

Axial lead wire	Radial lead wire	Contact	Rated voltage AC	Rated voltage DC	Indicator	Lead wire
K0H*	**K0V***	Reed	●	●	1 color indicator	2 wire
K5H*	**K5V***		●	●	Without indicator light	
K2H*	**K2V***	Proximity		●	1 color indicator	2 wire
K3H*	**K3V***			●		3 wire
K3PH*	**K3PV***			●	1 color indicator type (custom order)	3 wire
K2YH*	**K2YV***			●	2 color indicator	2 wire
K3YH*	**K3YV***			●		3 wire

Ⓓ Switch model no.

***Lead wire length**	
Blank	1 m (standard)
3	3 m
5	5 m

Ⓔ Switch quantity	
R	1 (rod end)
H	1 (head end)
D	2

Ⓔ Switch quantity

Ⓕ Bore size (mm)	Structure	Material restrictions
P7	Exhaust treatment	-
P71	Vacuuming	-
P5	Exhaust treatment	Copper-, silicon-, and halogen (fluorine, chlorine, or bromine) -based materials are not acceptable.
P51	Vacuuming	Copper-, silicon-, and halogen (fluorine, chlorine, or bromine) -based materials are not acceptable.

Ⓕ Clean room specifications

Notes on model no. selection

Note 1: Refer to page 21 for min. stroke lengths of types with switch.
Note 2: Copper and PTFE free as standard.

<Example of model number>

SMG-L-6-15-K0H-R-P7

Model: Compact cylinder
- Ⓐ Model no. : Double acting with switch
- Ⓑ Bore size : ø6 mm
- Ⓒ Stroke length : 15 mm
- Ⓓ Switch model No. : Reed switch K0H, Lead wire length 1 m
- Ⓔ Switch quantity : 1 (rod end)
- Ⓕ Clean room specifications : Exhaust treatment

How to order switch

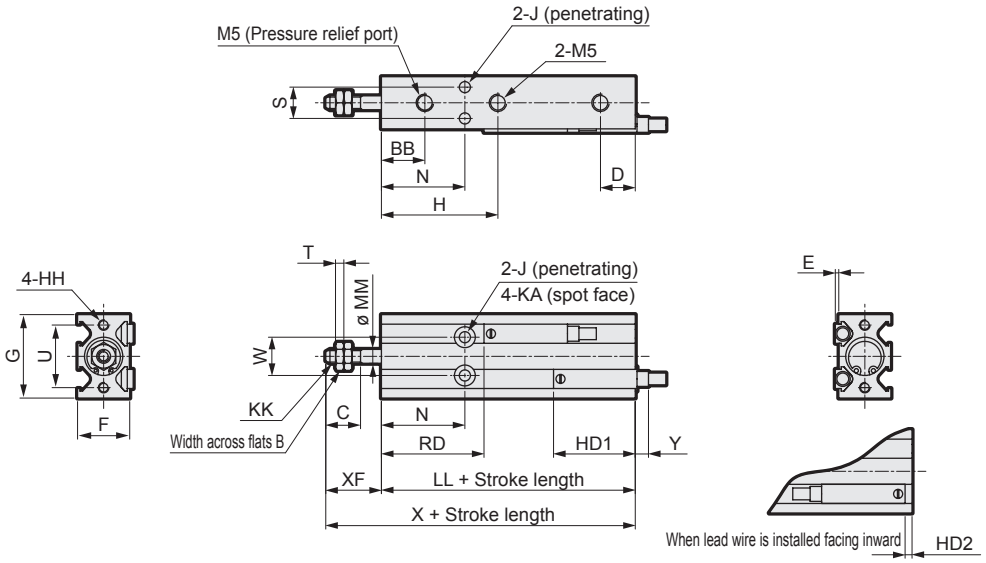
SW - K2H

Switch model no.
(See Ⓓ above.)

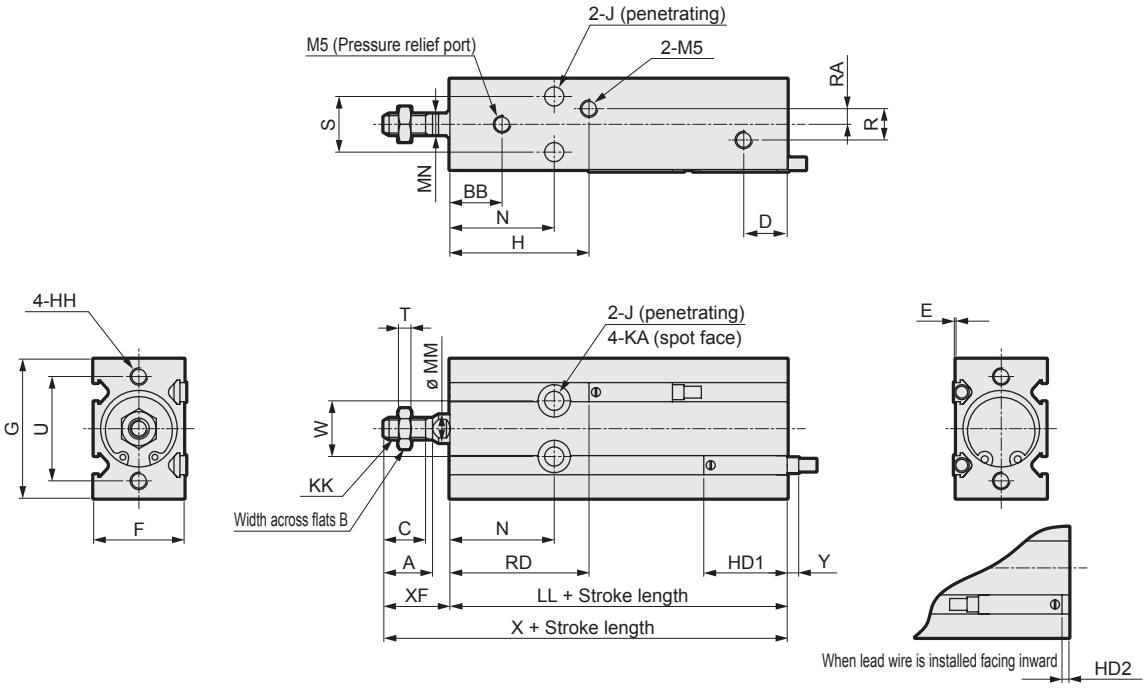
Dimensions

● Double acting single rod type, SMG-(L)-P7*/P5*

● ø6/ø10



● ø16/ø20/ø25



Symbol / Bore size	A	B	BB	C	D	F	G	H	HH	J	KA	KK	MM	MN	N	R	RA	S	T	U	W
ø6	-	5.5	15	7	10	13	22	31	M3 depth 5	3.2	6 depth 4.8	M3	3	-	23	-	-	7	1.8	17	10
ø10	-	7	12.5	10	10	15	24	33.5	M3 depth 5	3.2	6 depth 5	M4	4	-	24	-	-	9	2.4	18	11
ø16	12.5	8	12	11	11.5	20	32	Note) 36.5	M4 depth 6	4.5	7.5 depth 6.5	M5	6	5	27	4	2	12	3.2	25	14
ø20	14	10	15	12	12.5	26	40	40	M5 depth 8	5.5	9 depth 8	M6	8	6	30	9	4.5	16	3.6	30	16
ø25	18	13	15	15.5	13	32	50	40.5	M5 depth 8	5.5	9 depth 9	M8	10	8	29	9	4.5	20	5	38	20

Symbol / Bore size	XF	LL		X		E		HD1	HD2	RD	Y
		w/o switch	w/ switch	w/o switch	w/ switch	K0/5	K2/3,K3P				
ø6	13	49	49	62	62	0.5	1	20	1	29	7
ø10	16	53	53	69	69	0.5	1	23.5	4.5	29.5	3.5
ø16	16	50	60	66	76	0	0.5	24.5	5.5	35.5	2.5
ø20	19	57	67	76	86	0	0.5	27	8	40	0
ø25	23	59	69	82	92	0	0.5	29	10	40	-2

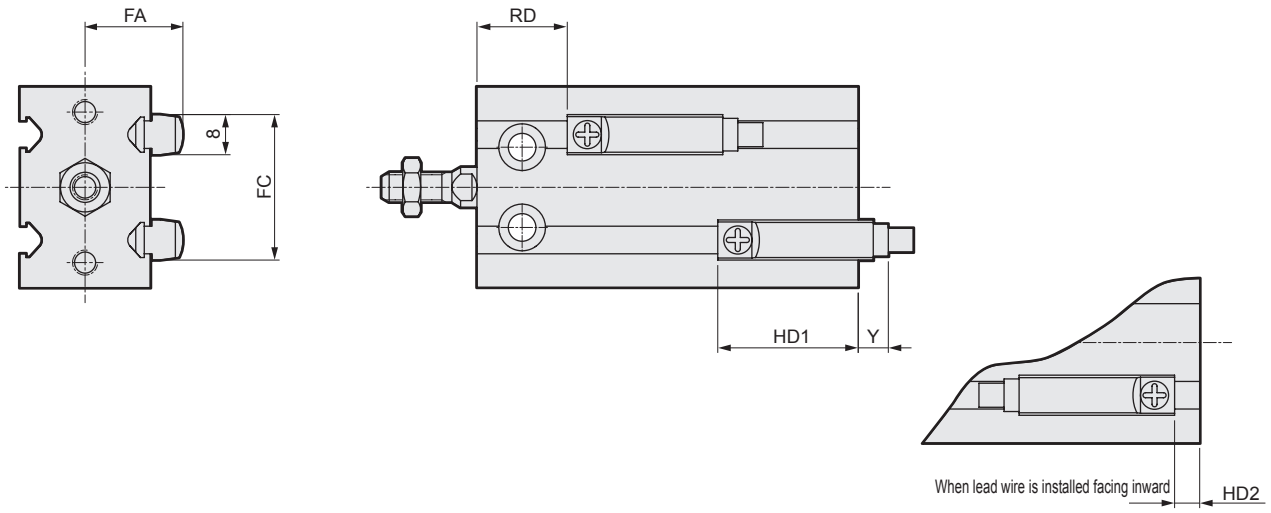
Note 1: 34.5 when a stroke length of 5 without switch

Note 2: Y dimension refers to the length projecting from the end surface of switch body. (Negative dimension means the length retracting from the body's end surface.)

Note 3: When calculating LL + stroke length and X + stroke length of custom stroke, do not include a value of custom stroke. Add a standard stroke value above instead. (Example: For a custom stroke of 35 mm, the standard stroke of 40 mm should be included for calculation.)

Dimensions of SMG Series with common switch (2 color indicator type)

● SMG-L (with switch: K2Y$^{H}_{V}$, K3Y$^{H}_{V}$)
-XL
-YL
-ML
-LF
-L-P7*/P5*



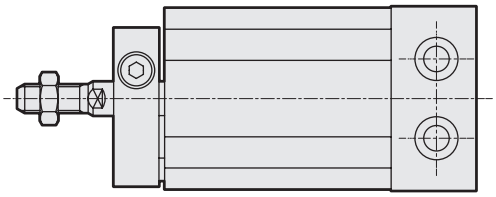
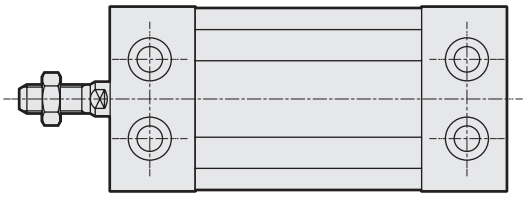
Symbol / Bore size	FA	FC	Double acting, double acting/fine speed (F), double acting non-rotating (M)					Single acting push type (X)						Single acting pull type (Y)								
			HD1	HD2	RD	Y		HD1	HD2	RD		Y		HD1		HD2		RD	Y (Note 1)			
																			5,10st.		15st.	
						Axial lead wire	Radial lead wire			5,10st.	15st.	Axial lead wire	Radial lead wire	5,10st.	15st.	5,10st.	15st.		Axial lead wire	Radial lead wire	Axial lead wire	Radial lead wire
ø6	13.5	18	21	0	12	13	10	22.5	1.5	10.5	10.5	11.5	8.5	23.5	23.5	2.5	2.5	9.5	10.5	7.5	10.5	7.5
ø10	14.5	21	24.5	3.5	11.5	9.5	6.5	24.5	3.5	11.5	16.5	9.5	6.5	23.5	28.5	2.5	7.5	12.5	10.5	7.5	5.5	2.5
ø16	16.5	27	25.5	4.5	14.5	8.5	5.5	25.5	4.5	14.5	19.5	8.5	5.5	25.5	30.5	4.5	9.5	14.5	8.5	5.5	3.5	0.5
ø20	19.5	29	28	7	18	6	3	28	7	18	23	6	3	28	33	7	12	18	6	3	1	-2
ø25	22.5	32	30	9	20	4	1	30	9	20	25	4	1	30	35	9	14	20	4	1	-1	-4
ø32	26.5	34	31.5	10.5	20.5	2.5	-0.5	31.5	10.5	20.5	25.5	2.5	-0.5	31.5	36.5	10.5	15.5	20.5	2.5	-0.5	-2.5	-5.5

Symbol / Bore size	Double acting, clean room specifications (P7*/P5*)				
	HD1	HD2	RD	Y	
				Axial lead wire	Radial lead wire
ø6	21	0	28	13	10
ø10	24.5	3.5	28.5	9.5	6.5
ø16	25.5	4.5	34.5	8.5	5.5
ø20	28	7	39	6	3
ø25	30	9	39	4	1

Note 1: Y dimension refers to the length projecting from the end surface of switch body. (Negative dimension means the length retracting from the body's end surface.)

Introduction to Compact cylinder SMD2 compatibles

We would like to announce a model change from SMD2 Series to SMG Series to be issued in April, 2015. As part of installation types provided with SMD2 are not available in new SMG Series, we offer compatible models with such installation types. (Custom order)
If you use SMD2 models now and need those installation types in future, please contact with CKD.

Mounting style	SMD2 dimension compatibles	
	Double acting, single acting, fine speed	Non-rotating
DA	Provided as SMG standards. Installing compatibility with SMD2. Dimensions of full length are, however, become shorter.	
DB		
DC		

■Additional information

(1) Regarding specification values

Note that the spring load values of single acting/push and single acting/pull types will be changed for SMD2 dimension compatibles. There is no impact on operation.

(2) Dimensions

Some of port positions will be changed.

*For details, please contact CKD.

MEMO

Safety precautions

Always read this section before use.

When designing and manufacturing equipment that employs CKD products, you are responsible for checking that the equipment's mechanism, pneumatic control circuit, hydraulic control circuit, and the electrical controls that control these parts can ensure safety. You are also responsible for manufacturing safe equipment.
It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely.
Observe warnings and precautions to ensure device safety.
Check that device safety is ensured, and manufacture a safe device.

⚠ Warning

1 This product was designed and manufactured for use as equipment and parts for general industrial machinery. It must be handled by an operator having sufficient knowledge and experience in handling.

2 Use this product in accordance with specifications.

This product must be used within its stated specifications. Do not attempt to modify or additionally machine the product. This product is intended for use as a general-purpose industrial device or part. It is not intended for use outdoors or for use under the following conditions or environment.
(Note that this product can be used when CKD is consulted prior to use and the customer consents to CKD product specifications. The customer must provide safety measures to avoid risks in the event of problems.)

❶ Usage with or within components or applications that come into direct contact with nuclear energy, railroad, aviation, ships, vehicles, medical devices, beverage, and food. Usage in applications where safety is required such as amusement equipment, emergency shutoff circuit, press machine, brake circuit, and safeguards.
❷ Use for applications where life or assets could be adversely affected, and special safety measures are required.

3 Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.

ISO 4414, JIS B 8370 (pneumatic system rules)
JFPS 2008 (Principles for pneumatic cylinder selection and use)
Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, body standards and regulations, etc.

4 Do not handle, pipe, or remove devices before confirming safety.

❶ Inspect and service the machine and devices after confirming safety of the entire system related to this product.
❷ Note that there may be hot or charged sections even after operation is stopped.
❸ When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power to the facility. Discharge any compressed air from the system, and pay attention to possible water leakage and leakage of electricity.
❹ When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.

5 Observe warnings and cautions on the pages below to prevent accidents.

■ The safety cautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

⚠ DANGER: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.
⚠ WARNING: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.
⚠ CAUTION: When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Items listed under "Caution" can also possibly lead to serious results depending on the situation.
Important details are listed for each; please make sure to follow them.

Precautions when ordering

1 Warranty period

"Warranty Period" is one (1) year from the first delivery to the customer.

2 Scope of warranty

In case any defect attributable to CKD is found during the Warranty Period, CKD shall, at its own discretion, repair the defect or replace the relevant product in whole or in part, according to its own judgment.
Note that the following faults are excluded from the warranty term:
(1) Product abuse/misuse contrary to conditions/environment recommended in its catalogs/specifications
(2) Failure caused by other than the delivered product
(3) Use the product for other than its intended purposes
(4) Third-party repair/modification
(5) Faults caused by reason that is unforeseeable with technology put into practical use at the time of delivery
(6) Failure attributable to force majeure
In no event shall CKD be liable for business interruptions, loss of profits, personal injury, costs of delay or for any other special, indirect, incidental or consequential losses, costs or damages.

3 Compatibility confirmation

In no event shall CKD be liable for merchantability or fitness for a particular purpose, notwithstanding any disclosure to CKD of the use to which the product is to be put.

Pneumatic components

Safety Precautions

Be sure to read the instructions before use.
Refer to Pneumatic Cylinders No. CB-029S for general details on cylinders and cylinder switch.

Special precautions: Compact cylinder SMG Series

Design and selection

1. Common

⚠ Caution

Minimum working pressure in the specification column indicates default value.
Depending on the working conditions and duration, it may exceed the specified value. Please consult us when using near the minimum working pressure.

2. Fine speed type SMG-F

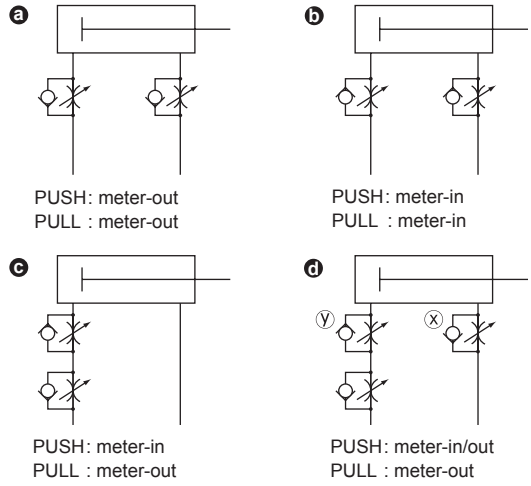
⚠ Caution

■ Use with no lubrication.
Lubrication may change characteristics.

■ Assemble the speed control valve near the cylinder.
If installed away from the cylinder, speed adjustment becomes unstable.
For speed control valves, SC-M3/M5-F and SCD-M3/M5-F Series are recommended.

■ Generally, the higher air pressure, and the smaller load result in the more stable operation.
Load factor of 50% or less is recommended.

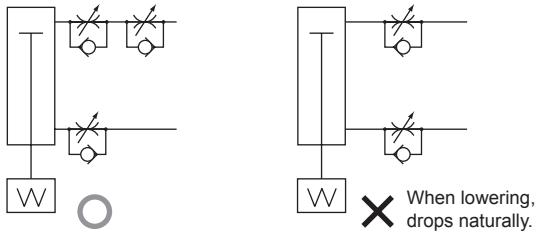
■ Stable speed control can be achieved with the meter-out circuit.
When driving the single rod cylinder at fine speed with the operation direction set to PUSH, popping-out may occur if operation is started when load resistance is small. As a corrective action, use ⓑ, ⓒ, or ⓓ circuit. ⓓ circuit can produce the stablest condition.



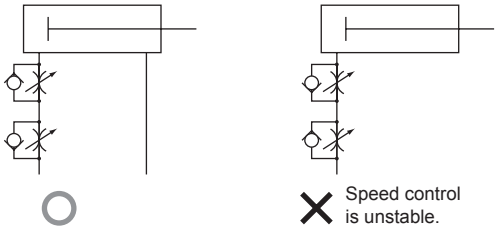
ⓓHow to adjust the speed of PUSH activation in circuit:
1. Set a speed with the x speed control valve.
2. Lower the flow rate with the y speed control valve until popping out no longer occurs.
3. Check the speed again.

(Note 1) Comparing ⓑ ⓒ ⓓ , ⓓ circuit shows the stablest operation.

(Note 2) When vertical installation, a meter-in circuit results in falling by its self-weight. So, provide a meter-out circuit.



(Note 3) Connect the speed control valve in the series as the following circuit:



(Cause of popping-out)

- Reduce the flow rate to reach a fine speed at the exhaust side in a meter-out circuit. This results in the same pressure level on the both sides immediately after valve is switched. The thrust caused by the differential of pressurized area of piston is applied to the PUSH direction and a popping-out of piston rod occurs.

(Predicting popping-out phenomenon)

- It could occur when piston rod area × air pressure > load resistance.

■ No lateral load should be applied to the cylinder. Install and adjust the sliding guide so as not to be twisted.
Variations of load or resistance may result in unstable operations.
Large differential between static friction and dynamic friction of guide results in unstable operation.

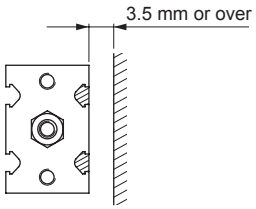
■ Avoid use under vibration conditions.
The product will be adversely affected by vibration and operate unstably.

Installation and adjustment

1. Common

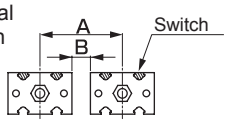
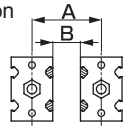
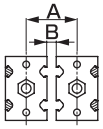
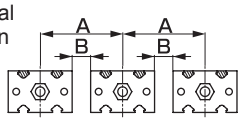
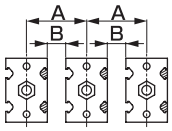
⚠ Caution

■ The cylinder may malfunction if a magnetic substance, such as a steel plate, is nearby. Move the magnetic substance to at least 3.5 mm from the cylinder.
(Same clearance for all bore sizes)



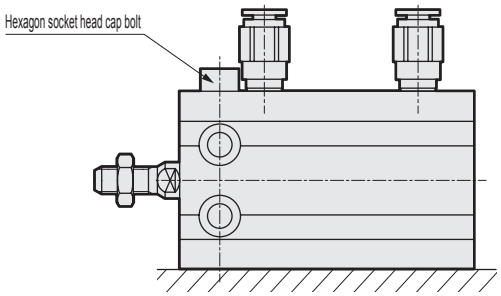
■ When installing cylinders adjacently, provide the following installation pitch to prevent switches from malfunctioning:

Unit: mm

Adjacent conditions			Switch model no.	ø6	ø10	ø16	ø20	ø25	ø32	Remarks
Two cylinders in parallel	- Horizontal installation 	A	K0, K5	27	29	37	45	55	67	
			K2, K3							
		B	K0, K5	4.5						
			K2, K3							
	- Vertical installation Install the switch on the opposite side of the cylinder at the side. 	A	K0, K5	28	21	25	33	41	46	Note that when a cylinder is installed, the switch position cannot be adjusted if the driver length is longer than the B dimension.
			K2, K3	25	28	35	40	50	55	
		B	K0, K5	5.5	5.5	5.5	6.5	8.5	5.5	
			K2, K3	11.5	12.5	14.5	14.5	17.5	14.5	
	- Vertical Install a switch at the side of the adjacent cylinder. 	A	K0, K5	14	16	21	27	33	41	
			K2, K3							
		B	K0, K5	0.5						
			K2, K3							
Three or more cylinders in parallel	• Horizontal installation 	A	K0, K5	27	29	37	45	55	67	
			K2, K3							
		B	K0, K5	4.5						
			K2, K3							
	• Vertical installation 	A	K0, K5	19	22	26	34	42	47	Note that when a cylinder is installed, the switch position cannot be adjusted if the driver length is longer than the B dimension.
			K2, K3	27	29	35	44	51	56	
		B	K0, K5	6.5	6.5	6.5	7.5	9.5	6.5	
			K2, K3	13.5	13.5	14.5	17.5	18.5	15.5	

■ There are restrictions on the piping fittings to be used depending on the stroke length or installation method. Therefore, please use the recommended fittings below.

Fig. 1



Items / Port size	Port size	Recommended joints	Items / Port size	Port size	Recommended joints
6	M5	SC3W-M5-4,6 SC3U-M5-4,6 GWS4-M5 GWS6-M5 (Note 1) GWS4,6-M5-S GWL4-M5 GWL6-M5 (Note 1)	20	M5	SC3W-M5-4,6 SC3U-M5-4,6 GWS4-M5 GWS6-M5 (Note 1) GWS4,6-M5-S GWL4-M5 GWL6-M5 (Note 1)
10	M5	SC3W-M5-4,6 SC3U-M5-4,6 GWS4,6-M5 GWS4,6-M5-S GWL4,6-M5	25	M5	SC3W-M5-4,6 SC3U-M5-4,6 GWS4,6-M5 GWS4,6-M5-S GWL4,6-M5
16	M5	SC3W-M5-4,6 SC3U-M5-4,6 GWS4-M5 (Note 1) GWS6-M5 (Note 2) GWS4-M5-S GWS6-M5-S (Note 1) GWL4-M5 (Note 1) GWL6-M5 (Note 2)	32	Rc1/8	SC3W-6-4,6,8 SC3U-6-4,6,8 GWS4,6,8-6 GWS4,6,8-6-S GWL4,6,8-6

Note 1) Except when stroke length is 5 or when using an installation method in "Fig. 1".
Note 2) Except when stroke length is 5,10 or when using an installation method in "Fig. 1".

■ When using a through bolt to install the body, tighten it according to the tightening torque in the table below.

Port size	Applicable bolts	Tightening torque
ø6/ø10	M3	0.6 to 1.1 N·m
ø16	M4	1.5 to 2.7 N·m
ø20/ø25	M5	3.0 to 5.4 N·m
ø32	M6	5.2 to 9.2 N·m

2. Single acting type SMG-X/Y

⚠ Caution

■ Do not leave the single acting cylinder in a pressurized state.
If left pressurized, the piston rod may not return by a spring power when pressure is released.

3. Fine speed type SMG-F

⚠ Caution

■ Adjust the core or the like so that a lateral load is not applied to the cylinder.
Install and adjust the cylinder so as not to be twisted against the sliding guide.
- The presence of load or resistance variation may result in unstable operations.
- Large differential between static friction and dynamic friction of guide results in unstable operation.

4. Non-rotating type SMG-M

⚠ Caution

■ When placing a load on the piston rod, do not apply a torque larger than the rotation torque allowance.

5. Clean room specifications SMG-P7*/P5*

⚠ Caution

■ The product must be unpacked in the clean room.
- The product is wrapped in an anti static sheet in the clean room and packed in a package box. When installing in the clean room, it is recommended to open the box to remove the product package outside the clean room and then unpack it from the wrapping in the clean room.

During use and maintenance

1. Non-rotating type SMG-M

⚠ Caution

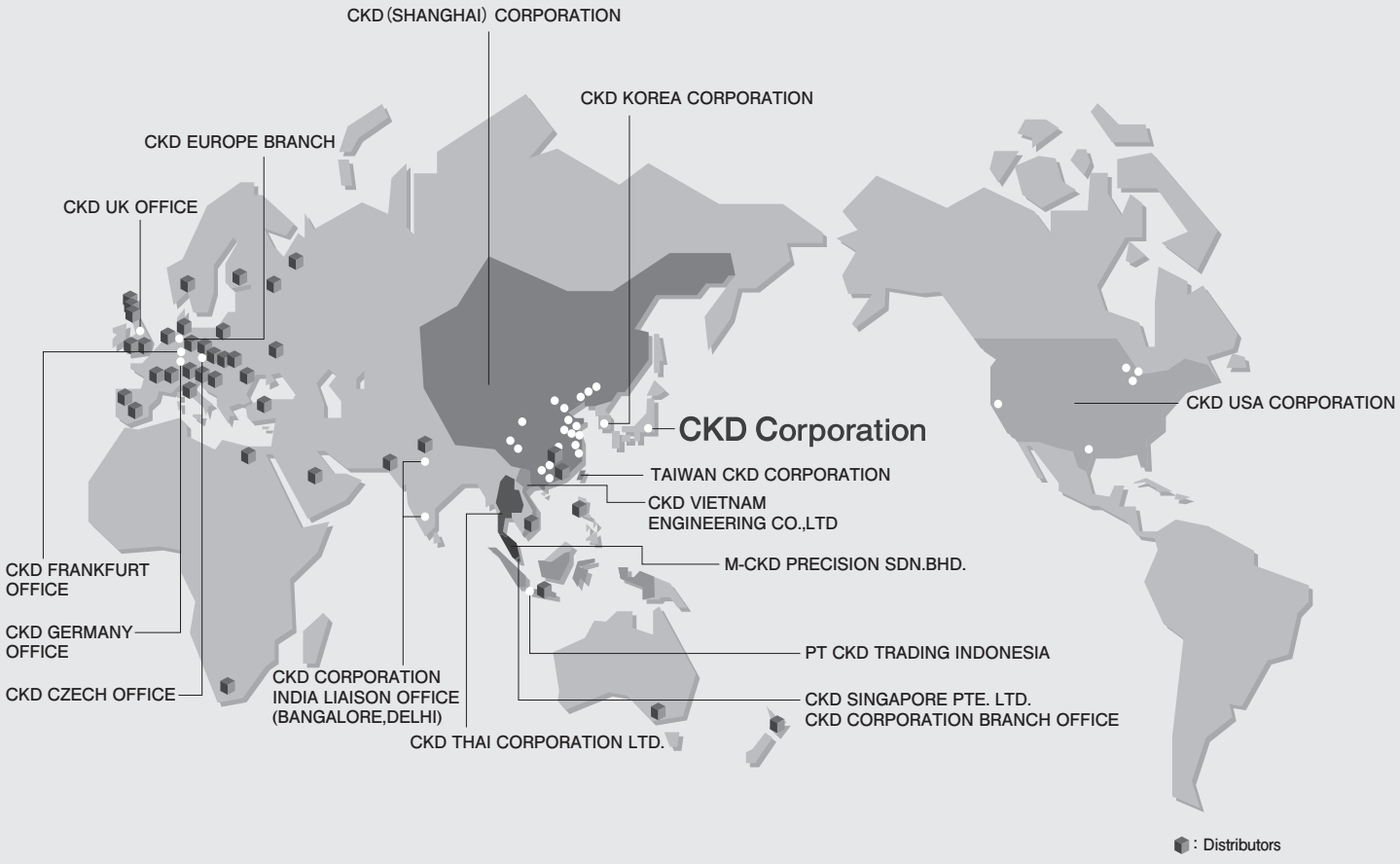
■ Do not place fingers between the baffle non-rotating plate and cylinder tube.
Fingers may get caught between the non-rotating plate and cylinder tube when the piston rod is pulled in. Keep fingers away from this gap.

■ Make sure that a rotation torque is not applied to the piston rod.
In the unlikely event that the shape of a jig or the like may develop a torque on the piston rod, suppress the torque under the rotation torque allowance while using.

■ After maintenance, when tightening the piston rod and non-rotating plate, use a hexagon socket screw for tightening according to the tightening torque in the table below.

Port size	Applicable hexagon socket screw	Tightening torque
ø6/ø10/ø16	M3	0.6 N·m
ø20/ø25	M4	1.4 N·m
ø32	M5	4.2 N·m

WORLD-NETWORK



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