

SMG

Compact cylinder

ø6, ø10, ø16
ø20, ø25, ø32

Space saving structure



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Space-Saving Type

SSD2

SSG

SSD

CAT

MDC2

SMG

MSD

FC□

Cylinder Switch

Ending

Space-Saving Type

SSD2

SSG

SSD

CAT

MDC2

SMG

MSD

FC□

Cylinder Switch

Ending

Direct 5-sided mounting

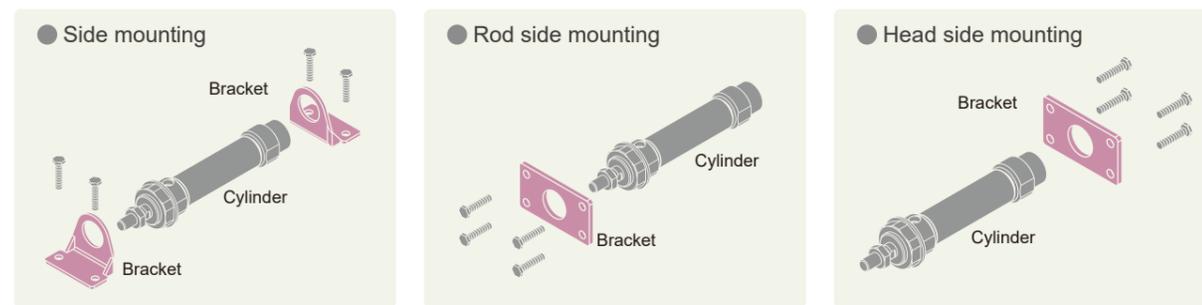
Lightweight, space-saving cylinder with integrated mount block. Direct mounting from 5 sides is possible, greatly increasing equipment design freedom.



Increased design freedom with direct mounting from 5 sides

General cylinder

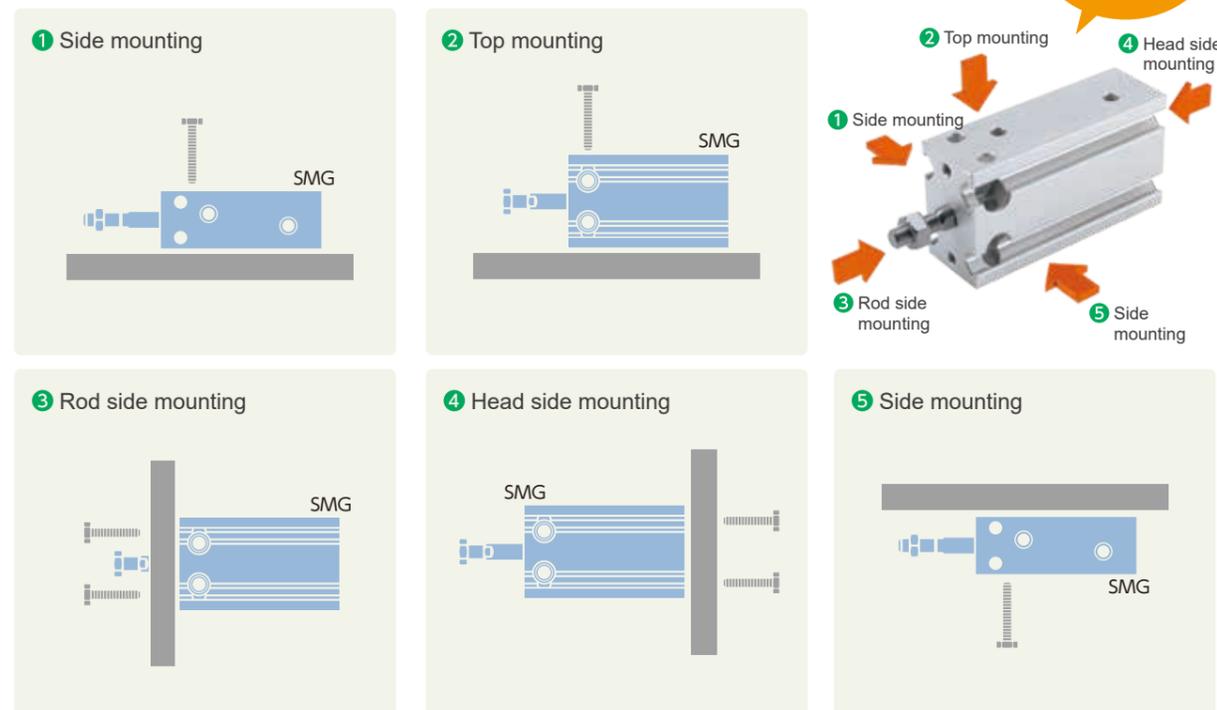
Bracket required for mounting



SMG

No bracket required, direct mounting

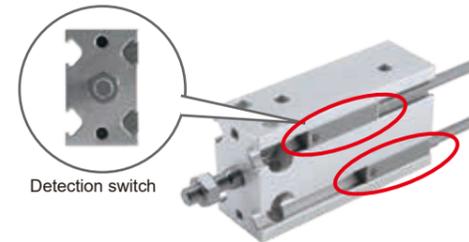
Direct 5-sided mounting



Detection switch is neat

Even with a detection switch included, there is almost no protruding space.

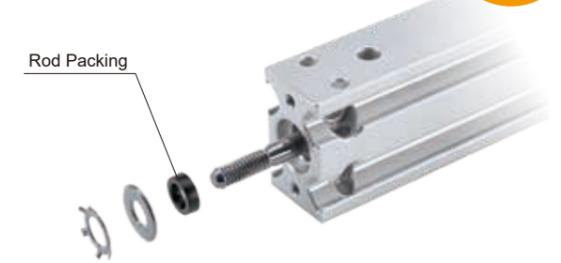
Neat and flat



Improved maintainability

Adopted a new mounting method to improve maintainability.

Easy maintenance



Variation

Double Acting/Single Rod Type

General double-acting operation

Single Acting, Push Type

Type where the piston rod is pushed out by air and returned by a spring

Single Acting, Retracting Type

Type where the piston rod is retracted by air and pushed out by a spring



Low speed type

Smooth low-speed operation possible from 1 mm/sec

Non-Rotating Type

Type with rod non-rotation feature



SMG Series Product Lineup

Model variations	Bore size (mm)	Standard stroke (mm)													
		5	10	15	20	25	30	40	50	60	70	80	90	100	
Double acting/ Single rod With Switch	SMG	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	SMG-L	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Single acting/ Push type With Switch	SMG-X	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	SMG-XL	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Single acting/ Pull type With Switch	SMG-Y	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	SMG-YL	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Double acting/ Fine speed With Switch	SMG-F	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	SMG-LF	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Double acting/ rotation-stop With Switch	SMG-M	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	SMG-ML	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Space-Saving Type

SSD2

SSG

SSD

CAT

MDC2

SMG

MSD

FC□

Cylinder Switch

Ending

Space-Saving Type

SSD2

SSG

SSD

CAT

MDC2

SMG

MSD

FC□

Cylinder Switch

Ending

●: Standard, ◎: Option, □: Not manufacturable

Variation	Model No. Circuit Diagram Symbol	Bore size (mm)	Standard Stroke (mm)													Min. Stroke (mm) (*1)	Maximum Stroke (mm)	Intermediate stroke (per mm)	Switch	Page
			5	10	15	20	25	30	40	50	60	70	80	90	100					
Double Acting, Single Rod Type with Switch 	SMG-L	ø6/ø10/ø16	●	●	●	●	●	●	●	●	●	□	□	□	□	5	60	5	◎	754
		ø20, ø25, ø32	●	●	●	●	●	●	●	●	●	●	●	●	●	5	100			
Single Acting, Push Type with Switch 	SMG-XL	ø6/ø10/ø16	●	●	●	□	□	□	□	□	□	□	□	□	5	15	-	◎	762	
		ø20, ø25, ø32	●	●	●	□	□	□	□	□	□	□	□	□	5	15				
Single Acting, Retracting Type with Switch 	SMG-YL	ø6/ø10/ø16	●	●	●	□	□	□	□	□	□	□	□	5	15	-	◎	762		
		ø20, ø25, ø32	●	●	●	□	□	□	□	□	□	□	□	□	5				15	
Double Acting, Creep Speed Type with Switch 	SMG-LF	ø6/ø10/ø16	●	●	●	●	●	●	□	□	□	□	□	5	30	5	◎	770		
		ø20, ø25, ø32	●	●	●	●	●	●	●	□	□	□	□	□	5				50	
Double Acting, Non-rotating Type with Switch 	SMG-ML	ø6/ø10/ø16	●	●	●	●	●	●	●	●	□	□	□	5	60	5	◎	774		
		ø20, ø25, ø32	●	●	●	●	●	●	●	●	●	●	●	●	5				100	

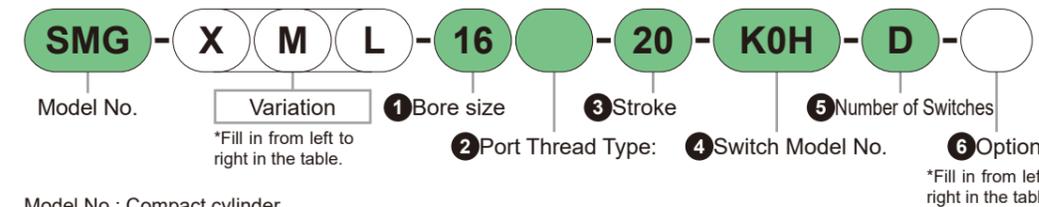
Note: Refer to P. 756, 764, 772 and 776 for the min. stroke length with switch.

Combination Availability Table for Variations and Option Items

Category	Code	Variation							Piping thread	
		Double Acting Basic Type	Single Acting, Push Type	Single Acting, Retracting Type	Non-Rotating Type	With Cylinder Switch	Low speed type	NPT	G	
Variation	Double Acting Basic Type	Blank	○	○	○	○	○	○	○	
	Single Acting, Push Type	X		×	○	○	×	○	○	
	Single Acting, Retracting Type	Y			○	○	×	○	○	
	Non-Rotating Type	M				○	○	○	○	
	With Cylinder Switch	L					○	○	○	
	Low speed type	F						○	○	
Piping thread	NPT	N							×	
	G	G								
Accessories	Cylinder Switch	Separately Shown	○	○	○	○	○	○	○	

◎Mark: Option
○Mark: Custom Products
△Mark: Manufacturable depending on conditions (Please consult)
×Mark: Not manufacturable

[Model Number Notation Example]



- Model No.: Compact cylinder
- Variation Single acting/push/rotation-stop/with switch
 - ① Bore size: ø16 mm
 - ② Port Thread Type: Rc Thread
 - ③ Stroke: 20mm
 - ④ Switch Model No. Reed K0H switch, lead wire 1 m
 - ⑤ Number of Switches: With 2 pcs.
 - ⑥ Option: None

*Fill in from left to right in the table.

Space-Saving Type
SSD2
SSG
SSD
CAT
MDC2
SMG
MSD
FC□

Space-Saving Type
SSD2
SSG
SSD
CAT
MDC2
SMG
MSD
FC□

Cylinder Switch
Ending

Cylinder Switch
Ending

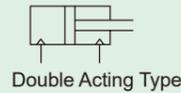


Compact Cylinder Double Acting, Single Rod Type

SMG Series

● Tube bore: ø6, ø10, ø16, ø20, ø25, ø32

Circuit Diagram Symbol

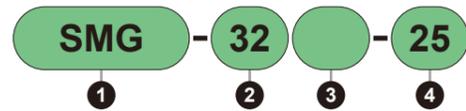


Double Acting Type

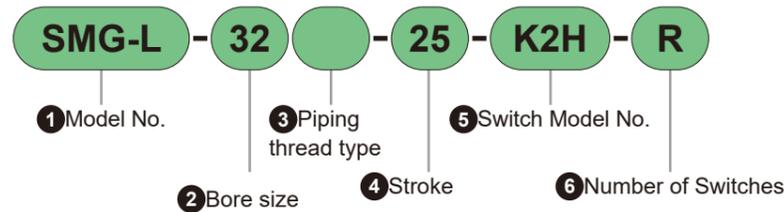


Model No. Notation Method

Without Switch
(Without magnet for switch)



With Switch
(Built-in magnet for switch)



1 Model No.

Code	Content
SMG	Double Acting Type
SMG-L	Double-acting type, With switch

2 Bore size (mm)

Code	Content
6	ø6
10	ø10
16	ø16
20	ø20
25	ø25
32	ø32

3 Piping thread type

Code	Content
Blank	M5 (ø6 to ø25) Rc thread (ø32)
NN	NPT thread (ø32 only) Custom order
GN	G thread (ø32 only) Custom order

4 Stroke (mm)

Bore size	Stroke	Intermediate Stroke
ø6 to ø16	5 to 60	Every 5 mm (*2)
ø20 to ø32	5 to 100	

*1: For the minimum stroke of the standard stroke with switch, see P. 756.

*2: The overall length dimension is the same as the standard stroke above it.

5 Switch Model No.

For switch details, please refer to P. 869. Switches are included to the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead Wire *1		
			AC	DC	AC	DC	Straight	L-shape	
Solid State	1-Color	2-wire	—	10 to 30	—	5 to 20 *2	K2H□	K2V□	
		3-wire (NPN)	—	30 or less	—	50 or less	K3H□	K3V□	
		3-wire (PNP)	—		K3PH□		K3PV□		
	2-Color	2-wire	—	10 to 30	—	5 to 20	K2YH□	K2YV□	
		3-wire (NPN)	—	30 or less	—	50 or less	K3YH□	K3YV□	
			—		—		—	—	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	K0H□	K0V□	
	No Indicator LED			5/12/24	20 or less	50 or less	K5H□	K5V□	

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length" table.

*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)

*3: Switches other than the model numbers listed above are also available. (Custom products) For details, refer to P. 869.

*Lead wire length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m K0H 3
3 m K0H 3
5 m K0H 5

6 Number of Switches

Code	Content
R	With 1 on Rod Side
H	With 1 on Head Side
D	With 2 pcs

*For combinations of variations and options, see P. 753.

Clean Specification

(Catalog No. CB-033SAA)

● Dust generation prevention structure usable in cleanrooms



Rechargeable Battery Compatible Specification

(Catalog No. CC-1226AA)

● Structure usable in secondary battery manufacturing processes



*Please contact us for details.

High Durability Components HP Series

(Catalog No. CC-1421AA)

● Long-life actuator that can contribute to productivity improvement with stable operation



Switch Single Unit Model No. Display Method



5 Switch Model No.

Specifications

Item	SMG SMG-L (with switch)						
	mm	ø6	ø10	ø16	ø20	ø25	ø32
Bore size	mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation method		Double Acting Type					
Operating Fluid		Compressed Air					
Maximum Operating Pressure	MPa	0.7					
Min. operating pressure	MPa	0.12	0.06		0.05		
Proof Pressure	MPa	1.05					
Ambient Temperature	°C	-10 to 60 (however, no freezing)					
Port Size		M5				Rc1/8	
Stroke tolerance	mm	+1.5 0					
Operating piston speed	mm/s	50 to 500					
Cushion		With Rubber Cushion					
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)					
Allowable absorbed energy	J	0.012	0.036	0.1	0.1	0.19	0.5

Cylinder Weight

(Unit: g)

Model No. Bore size	Product Weight when stroke S = 0 mm		Per S=5 mm Added Weight
	SMG Double Acting Type	SMG-L Double-acting type, With switch	
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

- Product Weight at stroke = 0 mm: 56 g
- Added weight at S = 10 mm: $6 \text{ g} \times 10/5 = 12 \text{ g}$
- Weight of cylinder switch (2 pcs.): $18 \text{ g} \times 2 = 36 \text{ g}$
- Product Weight $56 \text{ g} + 12 \text{ g} + 36 \text{ g} = 104 \text{ g}$

Stroke

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

Note: Intermediate strokes can be manufactured in 5 mm increments. However, the overall length dimension will be the same as the dimension of the standard stroke above it.

Theoretical Thrust Table

(Unit: N)

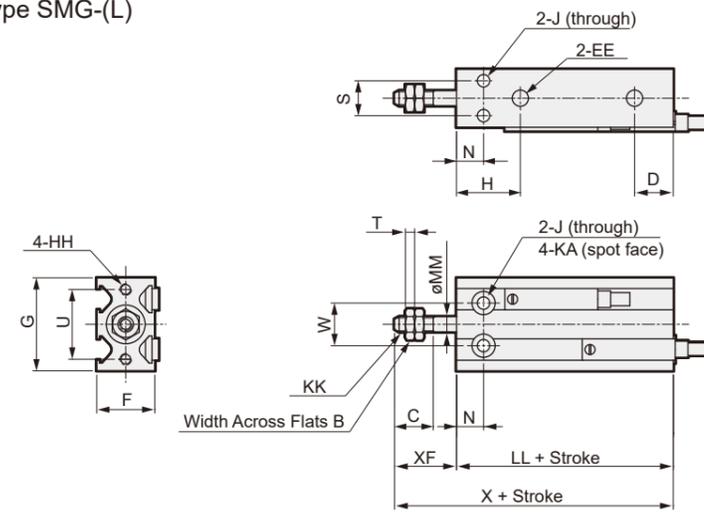
Bore size (mm)	Operating Direction	Operating Pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø6	Push	-	4.24	5.65	8.48	11.3	14.1	17.0	19.8
	Pull	-	3.18	4.24	6.36	8.48	10.6	12.7	14.8
ø10	Push	7.85	11.8	15.7	23.6	31.4	39.3	47.1	55.0
	Pull	6.60	9.90	13.2	19.8	26.4	33.0	39.6	46.2
ø16	Push	20.1	30.2	40.2	60.3	80.4	1.01×10^2	1.21×10^2	1.41×10^2
	Pull	17.3	25.9	34.6	51.8	69.1	86.4	1.04×10^2	1.21×10^2
ø20	Push	31.4	47.1	62.8	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2
	Pull	26.4	39.6	52.8	79.2	1.06×10^2	1.32×10^2	1.58×10^2	1.85×10^2
ø25	Push	49.1	73.6	98.2	1.47×10^2	1.96×10^2	2.45×10^2	2.95×10^2	3.44×10^2
	Pull	41.2	61.9	82.5	1.24×10^2	1.65×10^2	2.06×10^2	2.47×10^2	2.89×10^2
ø32	Push	80.4	1.21×10^2	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2
	Pull	69.1	1.04×10^2	1.38×10^2	2.07×10^2	2.76×10^2	3.46×10^2	4.15×10^2	4.84×10^2

Minimum Stroke with Switch

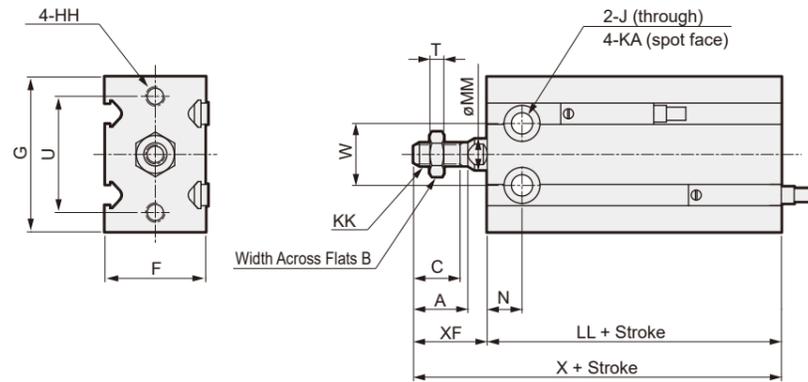
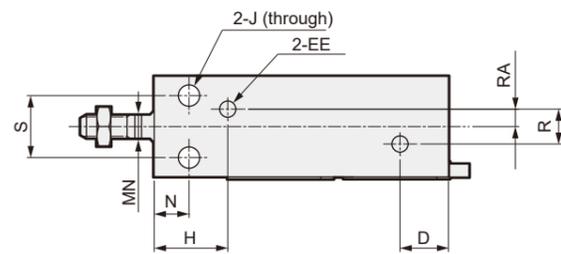
Tube Bore size	1-color indication type		2-color indicator type	
	K□H	K□V	K□YH	K□YV
ø6	5		5	
ø10				
ø16				
ø20				
ø25	5		5	
ø32				

Outline Dimension Drawing

● Double acting type SMG-(L)
ø6, 10



ø16, ø20, ø25, ø32



Code 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	(*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

Code Bore size	T	U	W	XF	LL		X	
					Without Switch	With switch	Without Switch	With switch
ø6	1.8	17	10	13	33	33	46	46
ø10	2.4	18	11	16	36	36	52	52
ø16	3.2	25	14	16	30	40	46	56
ø20	3.6	30	16	19	36	46	55	65
ø25	5	38	20	23	40	50	63	73
ø32	6	48	24	27	42	52	69	79

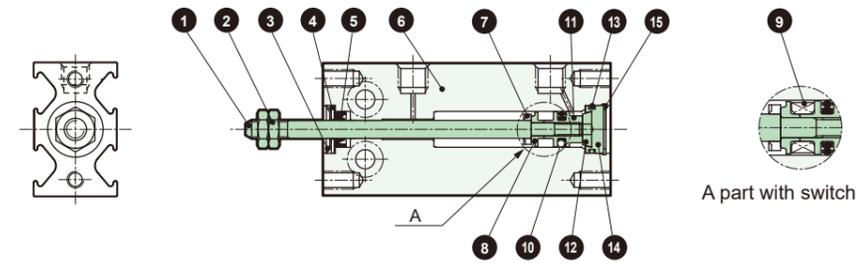
*1: For a 5-stroke model without a switch, the H dimension for bore size ø16 is 14.5.

*2: When calculating LL + stroke and X + stroke dimensions for intermediate strokes, do not use the intermediate stroke value for the stroke; instead, use the value of the standard stroke above it. (Example: If the custom stroke is 35mm, apply the standard stroke 40mm.)

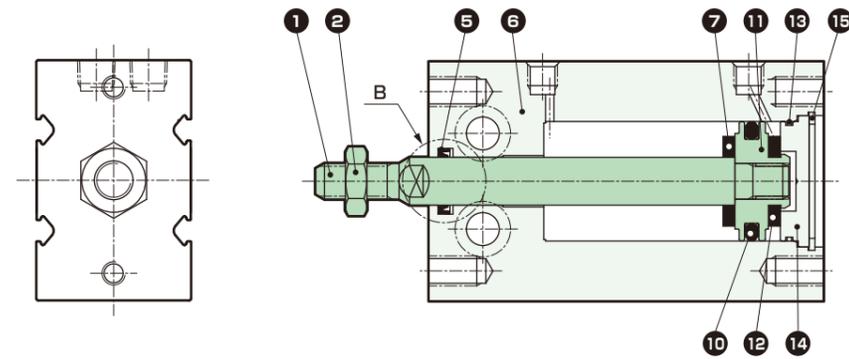
*3: For dimensions of models with switches, see P. 780 and 781.

Internal Structure Diagram/Material

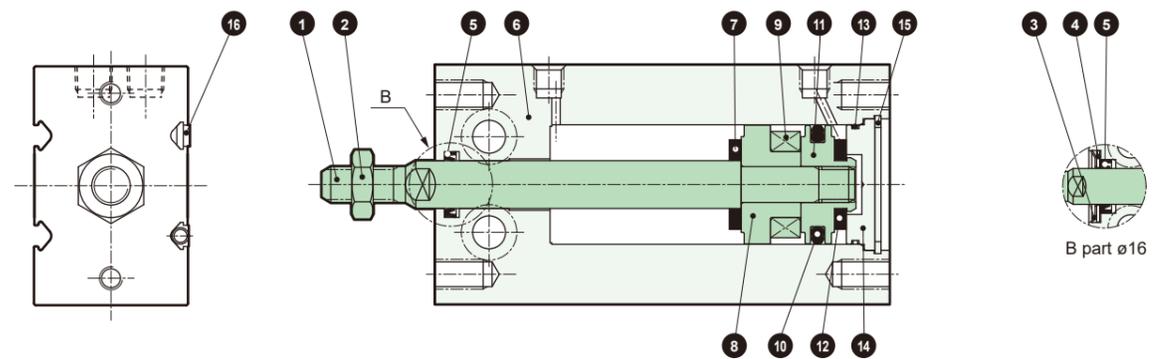
● ø6, ø10 (Double acting type)



● ø16 to 32 (Double acting type)



● ø16 to 32 (Double acting type, With switch)



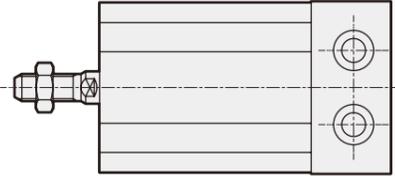
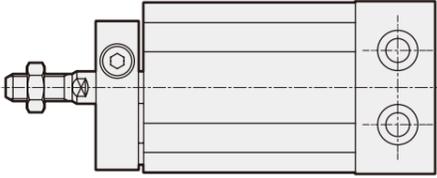
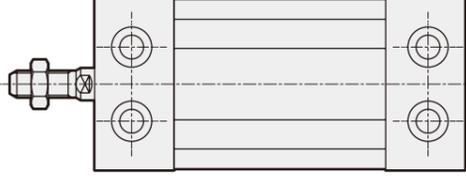
Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	ø20,25,32: Industrial hard chrome plating	10	Piston Packing	Nitrile Rubber	
2	Rod Nut	Steel	Nickel Plating	11	Piston	Aluminum Alloy	Chromate
3	CR type retaining ring	Stainless Steel		12	Cushion rubber H	Urethane Rubber	
4	Cap	Stainless Steel		13	Cover gasket	Nitrile Rubber	
5	Rod Packing	Nitrile Rubber		14	Cover	Aluminum Alloy	Chromate
6	Cylinder Body	Aluminum Alloy	Hard Anodized	15	C-type retaining ring	Steel	Zinc phosphate
7	Cushion rubber R	Urethane Rubber		With Switch			
8	Spacer	Aluminum Alloy	Chromate	16	Switch		
9	Magnet	-					

For maintenance parts, please visit the CKD Equipment Product Site (<https://www.ckd.co.jp/kiki/en/>) → "model No." → Maintenance Parts.

Information on Compact Cylinder SMD2 Compatible Models

As of October 2015, the SMD2 series has been remodeled to the SMG series. Since SMG does not have some of the mounting types that were available for SMD2, compatible models have been prepared to support these mounting types. (Custom order)

If you are currently using SMD2 and require these mounting types, please consult us.

Mounting type	SMD2 Dimension Compatible Model	
	Double acting, Single acting, Fine speed	Non-Rotating
DA	Compatible with SMG standard products. Mounting compatible with SMD2. However, the overall length will be shorter.	
DB		
DC		

Other Information

① Regarding specifications

Please note that for SMD2 dimension-compatible models, there are changes to the spring load values for single-acting push type and single-acting retracting type. There is no effect on operation.

② Regarding dimensions

The port position will be partially changed.

*Please check with us for details.

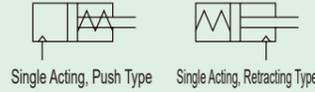


Compact Cylinder Single Acting, Push Type
Single Acting, Retracting Type

SMG^X/_Y Series

● Tube bore: $\phi 6$, $\phi 10$, $\phi 16$, $\phi 20$, $\phi 25$, $\phi 32$

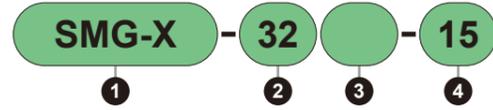
Circuit Diagram
Symbol



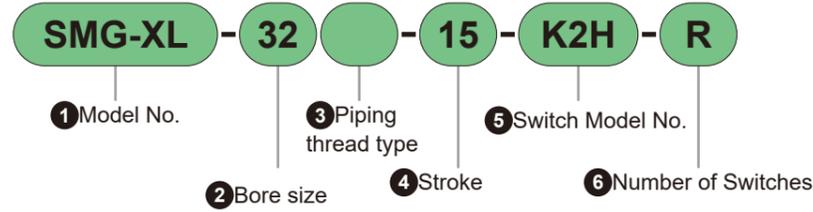
SMG-X/_Y Series
Model No. Notation Method

Model No. Notation Method

Without Switch
(Without magnet for switch)



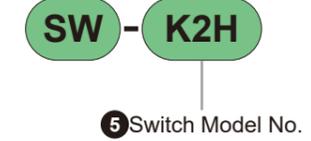
With Switch
(Built-in magnet for switch)



6 Number of Switches

Code	Content
R	With 1 on Rod Side
H	With 1 on Head Side
D	With 2 pcs

Switch Single Unit Model No. Display Method



*For combinations of variations and options, see P. 753.

1 Model No.

Code	Content
SMG-X	Single Acting, Push Type
SMG-XL	Single acting push type, With switch
SMG-Y	Single Acting, Retracting Type
SMG-YL	Single acting retracting type, With switch

2 Bore size (mm)

Code	Content
6	$\phi 6$
10	$\phi 10$
16	$\phi 16$
20	$\phi 20$
25	$\phi 25$
32	$\phi 32$

3 Piping thread type

Code	Content
Blank	M5 ($\phi 6$ to $\phi 25$) Rc thread ($\phi 32$)
NN	NPT thread ($\phi 32$ only) Custom order
GN	G thread ($\phi 32$ only) Custom order

4 Stroke (mm)

Bore size	Standard Stroke
$\phi 6$ to $\phi 32$	5, 10, 15

Note: Refer to P. 764 for min. stroke with switch.

5 Switch Model No.

For switch details, please refer to P. 869. Switches are included to the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead Wire *1		Image
			AC	DC	AC	DC	Straight	L-shape	
Solid State	1-Color	2-wire	—	10 to 30	—	5 to 20 *2	K2H□	K2V□	
		3-wire (NPN)	—	30 or less	—	50 or less	K3H□	K3V□	
		3-wire (PNP)	—	30 or less	—	50 or less	K3PH□	K3PV□	
	2-Color	2-wire	—	10 to 30	—	5 to 20	K2YH□	K2YV□	
		3-wire (NPN)	—	30 or less	—	50 or less	K3YH□	K3YV□	
		3-wire (PNP)	—	30 or less	—	50 or less	K3YH□	K3YV□	
Reed	1-Color	2-wire	110	12/24	7 to 20	5 to 50	K0H□	K0V□	
	No Indicator LED	2-wire	110	5/12/24	20 or less	50 or less	K5H□	K5V□	

*Lead wire length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m K0H □
3 m K0H [3]
5 m K0H [5]

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length" table.

*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)

*3: Switches other than the model numbers listed above are also available. (Custom products) For details, refer to P. 869.

Specifications

Item		SMG-X, SMG-Y SMG-XL, SMG-YL (with switch)					
Bore size	mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation method	SMG-X (L)	Single Acting, Push Type					
	SMG-Y (L)	Single Acting, Retracting Type					
Operating Fluid		Compressed Air					
Maximum Operating Pressure	MPa	0.7					
Min. operating pressure	SMG-X (L)	0.2	0.15			0.13	
	SMG-Y (L)						
Proof Pressure	MPa	1.05					
Ambient Temperature	°C	-10 to 60 (however, no freezing)					
Port Size		M5				Rc1/8	
Stroke tolerance	mm	+1.5 0					
Operating piston speed	mm/s	50 to 500					
Cushion		With rubber cushion *2					
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)					
Allowable absorbed energy J		0.012	0.036	0.05	0.1	0.19	0.5

*1: Do not leave single-acting cylinders pressurized. If left pressurized, the piston rod may not return by spring force when the pressure is released.
*2: ø6 comes with a rubber cushion on one side.

Stroke

Bore Size (mm)	Standard Stroke (mm)	Maximum Stroke (mm)	Min. Stroke (mm)
ø6	5, 10, 15	15	5
ø10			
ø16			
ø20			
ø25			
ø32			

Minimum Stroke with Switch

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

SMG-X/SMG-Y Spring load

(Unit: N)

Bore size (mm)	Stroke (mm)	Stroke 0 o'clock	Full stroke During operation	Bore size (mm)	Stroke (mm)	Stroke 0 o'clock	At Full Stroke 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		

SMG-X Cylinder weight

(Unit: g)

Model No. Bore size	5		10		15	
	Without Switch	With switch	Without Switch	With switch	Without Switch	With 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

(Unit: g)

Model No. Bore size	5		10		15	
	Without Switch	With switch	Without Switch	With switch	Without Switch	With 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

Theoretical Thrust Table

●SMG-X

(Unit: N)

Bore size (mm)	Operating Pressure MPa					
	0.2	0.3	0.4	0.5	0.6	0.7
ø6	-	4.68	7.51	10.3	13.2	16.0
ø10	7.71	15.6	23.4	31.3	39.1	47.0
ø16	24.2	44.3	64.4	84.5	1.05×10 ²	1.25×10 ²
ø20	43.8	75.2	1.07×10 ²	1.38×10 ²	1.69×10 ²	2.01×10 ²
ø25	73.2	1.22×10 ²	1.71×10 ²	2.20×10 ²	2.70×10 ²	3.19×10 ²
ø32	1.31×10 ²	2.11×10 ²	2.92×10 ²	3.72×10 ²	4.53×10 ²	5.33×10 ²

Note: The load above indicates thrust excluding the spring force at the push end.

●SMG-Y

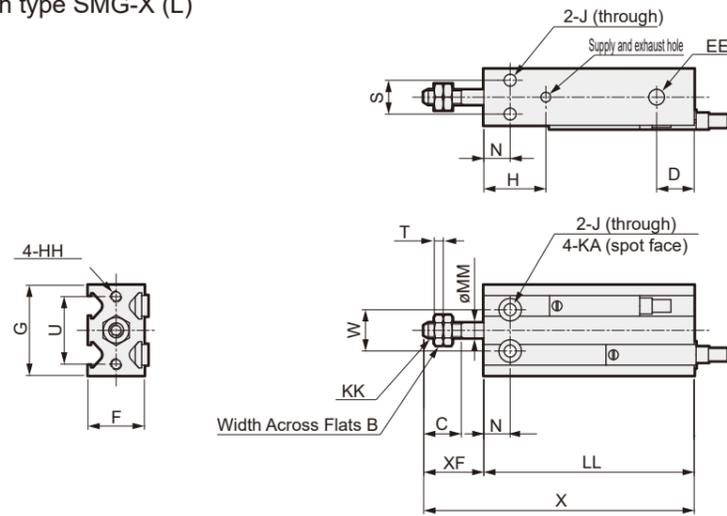
(Unit: N)

Bore size (mm)	Operating Pressure MPa					
	0.2	0.3	0.4	0.5	0.6	0.7
ø6	-	2.56	4.68	6.80	8.92	11.0
ø10	5.19	11.8	18.4	25.0	31.6	38.2
ø16	18.6	35.8	53.1	70.4	87.7	1.05×10 ²
ø20	33.8	60.2	86.6	1.13×10 ²	1.39×10 ²	1.66×10 ²
ø25	57.5	98.7	1.40×10 ²	1.81×10 ²	2.22×10 ²	2.64×10 ²
ø32	1.08×10 ²	1.77×10 ²	2.46×10 ²	3.16×10 ²	3.85×10 ²	4.54×10 ²

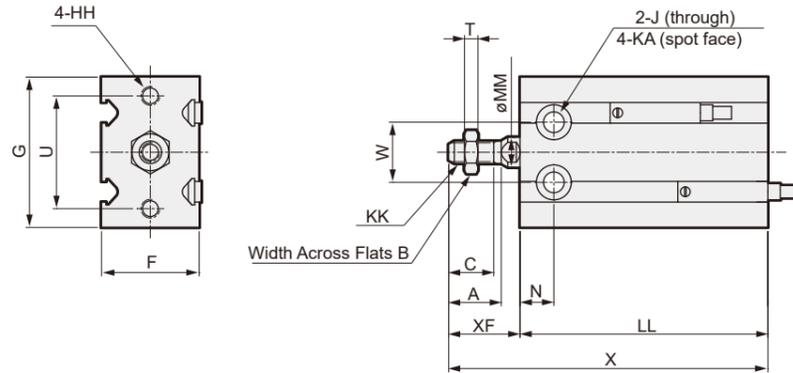
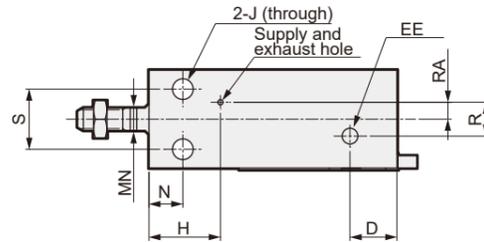
Note: The load above indicates thrust excluding the spring force at the pull end.

Outline Dimension Drawing

- Single acting push type SMG-X (L)
ø6, 10



ø16, ø20, ø25, ø32



Code Bore size	A	B	C	D	EE	F	G	H	HH	J	KA	KK	MM	MN	N
	ø6	-	5.5	7	10	M5	13	22	15	M3 Depth 5	3.2	6 Depth 4.8	M3	3	-
ø10	-	7	10	10	M5	15	24	16.5	M3 Depth 5	3.2	6 Depth 5	M4	4	-	7
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
ø20	14	10	12	12.5	M5	26	40	19	M5 Depth 8	5.5	9 Depth 8	M6	8	6	9
ø25	18	13	15.5	13	M5	32	50	21.5	M5 Depth 8	5.5	9 Depth 9	M8	10	8	10
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

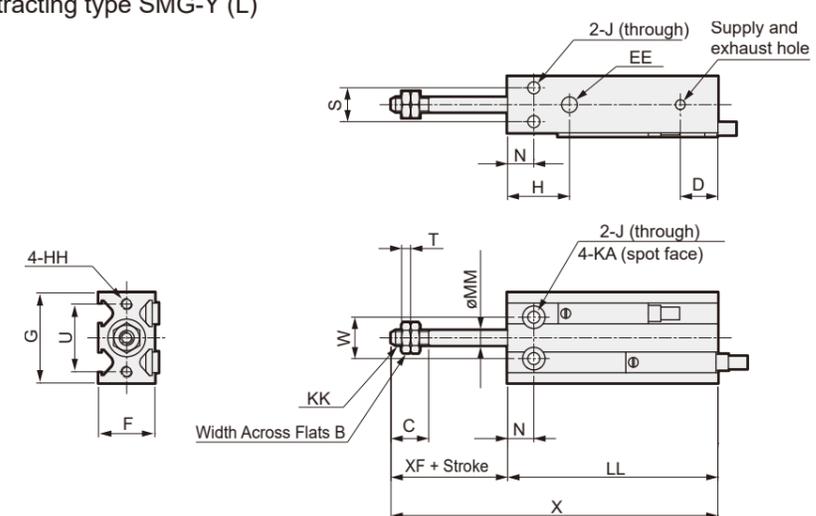
Code Bore size	R	RA	S	T	U	W	XF	LL						X					
								Without Switch			With switch			Without Switch			With switch		
								5st.	10st.	15st.	5st.	10st.	15st.	5st.	10st.	15st.	5st.	10st.	15st.
ø6	-	-	7	1.8	17	10	13	38	43	48	38	43	48	51	56	61	51	56	61
ø10	-	-	9	2.4	18	11	16	41	46	56	41	46	56	57	62	72	57	62	72
ø16	4	2	12	3.2	25	14	16	35	40	50	45	50	60	51	56	66	61	66	76
ø20	9	4.5	16	3.6	30	16	19	41	46	56	51	56	66	60	65	75	70	75	85
ø25	9	4.5	20	5	38	20	23	45	50	60	55	60	70	68	73	83	78	83	93
ø32	13.5	4.5	24	6	48	24	27	47	52	62	57	62	72	74	79	89	84	89	99

Note: Refer to P. 780 and 781 for dimensions with each switch.

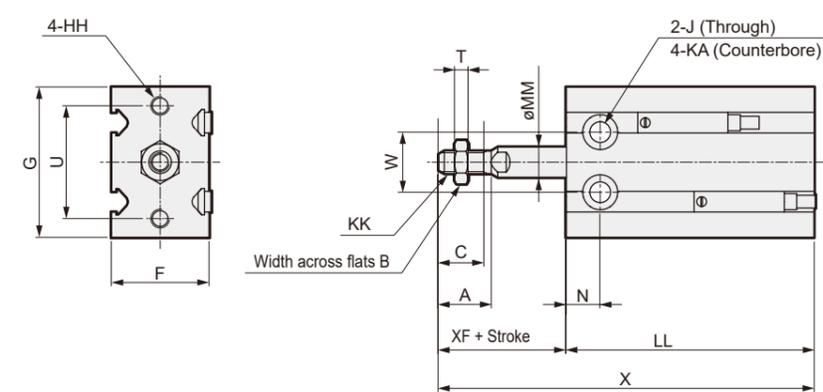
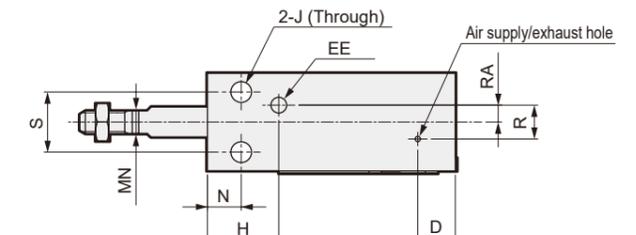
Single Acting, Retracting Type

Outline Dimension Drawing

- Single acting retracting type SMG-Y (L)
ø6, 10



ø16, ø20, ø25, ø32



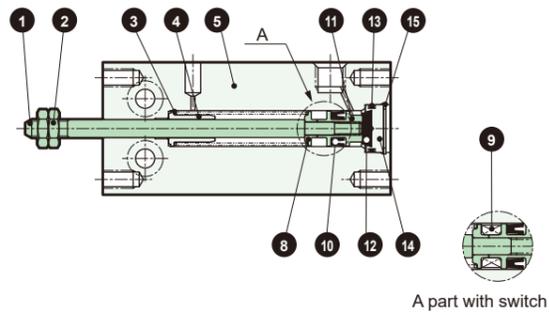
Code Bore size	A	B	C	D	EE	F	G	H	HH	J	KA	KK	MM	MN	N
	ø6	-	5.5	7	10	M5	13	22	15	M3 Depth 5	3.2	6 Depth 4.8	M3	3	-
ø10	-	7	10	10	M5	15	24	16.5	M3 Depth 5	3.2	6 Depth 5	M4	4	-	7
ø16	12.5	8	11	11.5	M5	20	32	16.5	M4 Depth 6	4.5	7.5 Depth 6.5	M5	6	5	7
ø20	14	10	12	12.5	M5	26	40	19	M5 Depth 8	5.5	9 Depth 8	M6	8	6	9
ø25	18	13	15.5	13	M5	32	50	21.5	M5 Depth 8	5.5	9 Depth 9	M8	10	8	10
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

Code Bore size	R	RA	S	T	U	W	XF	LL						X					
								Without Switch			With switch			Without Switch			With switch		
								5st.	10st.	15st.	5st.	10st.	15st.	5st.	10st.	15st.	5st.	10st.	15st.
ø6	-	-	7	1.8	17	10	13	38	43	48	38	43	48	56	66	76	56	66	76
ø10	-	-	9	2.4	18	11	16	41	46	56	41	46	56	62	72	87	62	72	87
ø16	4	2	12	3.2	25	14	16	45	50	60	45	50	60	62	76	91	66	76	91
ø20	9	4.5	16	3.6	30	16	19	41	46	56	51	56	66	65	75	90	75	85	100
ø25	9	4.5	20	5	38	20	23	45	50	60	55	60	70	73	83	98	83	93	108
ø32	13.5	4.5	24	6	48	24	27	47	52	62	57	62	72	79	89	104	89	99	114

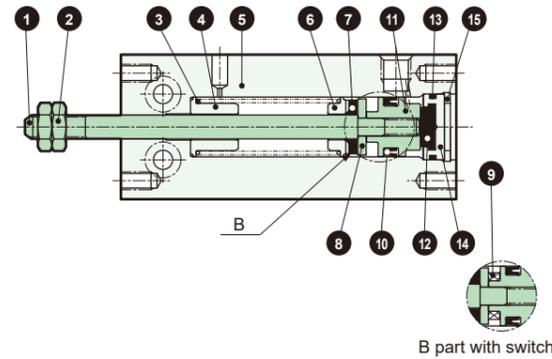
Note: Refer to P. 780 and 781 for dimensions with each switch.

Internal Structure Diagram/Material

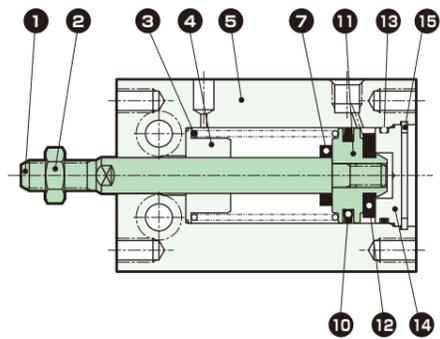
● $\phi 6$ (Single acting push type)



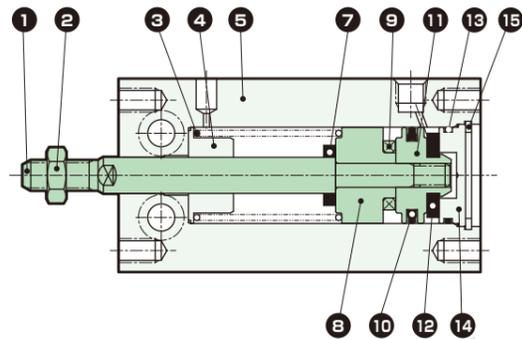
● $\phi 10$ (Single acting push type)



● $\phi 16$ to 32 (Single acting push type)



● $\phi 16$ to 32 (Single acting push type, With switch)

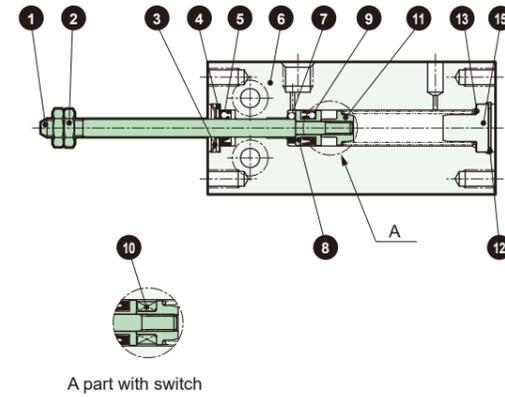


Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	$\phi 20, 25, 32$: Industrial hard chrome plating	9	Magnet	-	
2	Rod Nut	Steel	Nickel Plating	10	Piston Packing	Nitrile Rubber	
3	Coil Spring	Piano Wire	Electrodeposition Coating	11	Piston	Aluminum Alloy	Chromate
4	Spring Retainer	Aluminum Alloy		12	Cushion rubber H	Urethane Rubber	
5	Cylinder Body	Aluminum Alloy	Hard Anodized	13	Cover gasket	Nitrile Rubber	
6	Spring Retainer	Aluminum Alloy		14	Cover	Aluminum Alloy	Chromate
7	Cushion rubber R	Urethane Rubber		15	C-type retaining ring	Steel	Zinc phosphate
8	Spacer	Aluminum Alloy	Chromate				

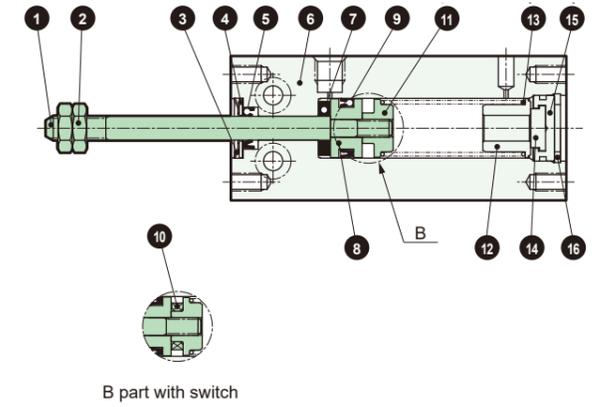
Internal Structure Diagram/Material

Internal Structure Diagram/Material

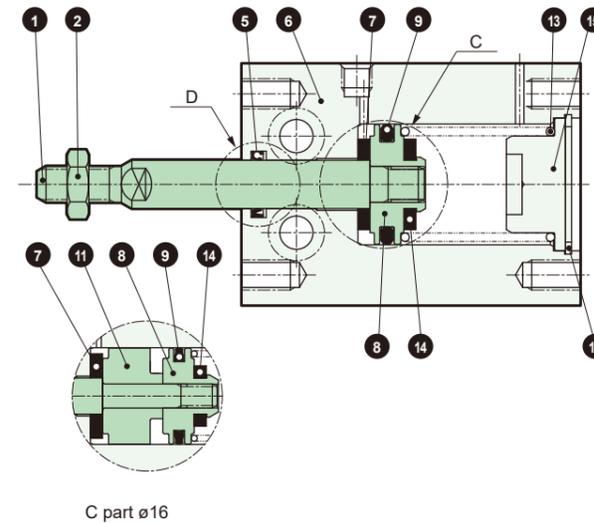
● $\phi 6$ (Single acting retracting type)



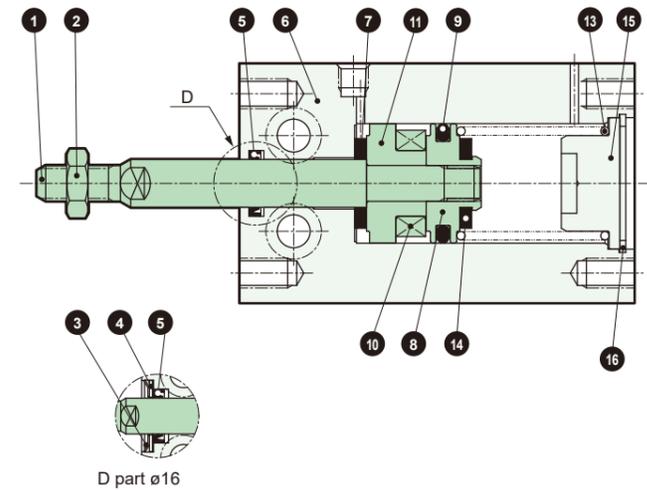
● $\phi 10$ (Single acting retracting type)



● $\phi 16$ to 32 (Single acting retracting type)



● $\phi 16$ to 32 (Single acting retracting type, With switch)



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	$\phi 20, 25, 32$: Industrial hard chrome plating	9	Piston Packing	Nitrile Rubber	
2	Rod Nut	Steel	Nickel Plating	10	Magnet		
3	CR type retaining ring	Stainless Steel		11	Spacer	Aluminum Alloy	Chromate
4	Cap	Stainless Steel		12	Spring Retainer	Aluminum Alloy	
5	Rod Packing	Nitrile Rubber		13	Coil Spring	Piano Wire	Electrodeposition Coating
6	Cylinder Body	Aluminum Alloy	Hard Anodized	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 retaining ring	Steel	Zinc phosphate

For maintenance parts, please visit the CKD Equipment Product Site (<https://www.ckd.co.jp/kiki/en/>) → "model No." → Maintenance Parts .

For maintenance parts, please visit the CKD Equipment Product Site (<https://www.ckd.co.jp/kiki/en/>) → "model No." → Maintenance Parts .

Space-Saving Type

SSD2

SSG

SSD

CAT

MDC2

SMG

MSD

FC

Cylinder Switch

Ending

Space-Saving Type

SSD2

SSG

SSD

CAT

MDC2

SMG

MSD

FC

Cylinder Switch

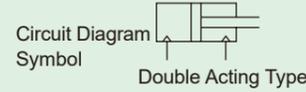
Ending



Compact cylinder Double acting/fine speed

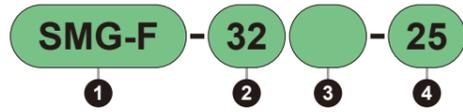
SMG-F Series

- Tube bore: $\phi 6$, $\phi 10$, $\phi 16$, $\phi 20$, $\phi 25$, $\phi 32$

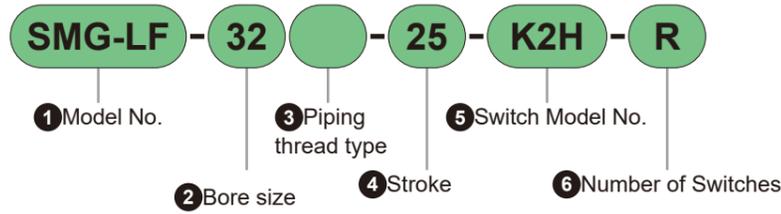


Model No. Notation Method

Without Switch
(Without magnet for switch)



With Switch
(Built-in magnet for switch)



1 Model No.

Code	Content
SMG-F	Double Acting/Ultra Low Speed Type
SMG-LF	Double acting, Ultra low speed type, With switch

2 Bore size (mm)

Code	Content
6	$\phi 6$
10	$\phi 10$
16	$\phi 16$
20	$\phi 20$
25	$\phi 25$
32	$\phi 32$

3 Piping thread type

Code	Content
Blank	M5 ($\phi 6$ to $\phi 25$) Rc thread ($\phi 32$)
NN	NPT thread ($\phi 32$ only) Custom order
GN	G thread ($\phi 32$ only) Custom order

4 Stroke (mm)

Bore size	Stroke	Intermediate Stroke
$\phi 6$ to $\phi 16$	5 to 30	Every 5 mm *2
$\phi 20$ to $\phi 32$	5 to 50	

*1: Refer to P. 772 for the min. stroke length with standard stroke length switch.
*2: The overall length dimension is the same as the standard stroke above it.

5 Switch Model No.

For switch details, please refer to P. 869. Switches are included to the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead Wire *1		Image
			AC	DC	AC	DC	Straight	L-shape	
Solid State	1-Color	2-wire	—	10 to 30	—	5 to 20 *2	K2H□	K2V□	
		3-wire (NPN)	—	30 or less	—	50 or less	K3H□	K3V□	
		3-wire (PNP)	—		K3PH□		K3PV□		
	2-Color	2-wire	—	10 to 30	—	5 to 20	K2YH□	K2YV□	
		3-wire (NPN)	—	30 or less	—	50 or less	K3YH□	K3YV□	
		2-wire	110	12/24	7 to 20	5 to 50	K0H□	K0V□	
Reed	No Indicator LED	2-wire	—	5/12/24	20 or less	50 or less	K5H□	K5V□	

*Lead wire length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m K0H
3 m K0H ³
5 m K0H ⁵

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length" table.

*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)

*3: Switches other than the model numbers listed above are also available. (Custom products) For details, refer to P. 869.

6 Number of Switches

Code	Content
R	With 1 on Rod Side
H	With 1 on Head Side
D	With 2 pcs

Clean Specification

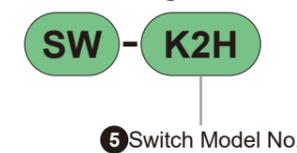
(Catalog No. CB-033SAA)

- Dust generation prevention structure usable in cleanrooms



*For combinations of variations and options, see P. 753.

Switch Single Unit Model No. Display Method



Specifications

Item	SMG-F SMG-LF (with switch)						
	mm	ø6	ø10	ø16	ø20	ø25	ø32
Bore size	mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation method		Double Acting Type					
Operating Fluid		Compressed Air					
Maximum Operating Pressure	MPa	0.7					
Min. operating 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					
Operating piston speed	mm/s	1 to 200					
Cushion		With Rubber Cushion					
Lubrication		Lubrication Not Possible					
Allowable Absorbed Energy J		0.012	0.036	0.1	0.1	0.19	0.5

Stroke

Bore Size (mm)	Standard Stroke (mm)	Min. Stroke (mm)
ø6	5, 10, 15, 20, 25, 30	5
ø10		
ø16		
ø20	5, 10, 15, 20, 25, 30, 40, 50	
ø25		
ø32		

Minimum Stroke with Switch

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

Note: Intermediate strokes can be manufactured in 5 mm increments.

Cylinder Weight

(Unit: g)

Model No.	Product Weight when stroke S = 0 mm		Additional weight per S = 5 mm
	SMG-F Double Acting Type	SMG-LF Double-acting type, With switch	
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-LF-16-10-K2H-D

- Product weight for 0 mm stroke length 56 g
- Added weight at S = 10 mm: 6 g × 10/5 = 12 g
- Weight of cylinder switch (2 pcs.): 18 g × 2 = 36 g
- Product Weight 56 g + 12 g + 36 g = 104 g

Theoretical Thrust Table

(Unit: N)

Bore size (mm)	Operating Direction	Operating Pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø6	Push	-	4.24	5.65	8.48	11.3	14.1	17.0	19.8
	Pull	-	3.18	4.24	6.36	8.48	10.6	12.7	14.8
ø10	Push	7.85	11.8	15.7	23.6	31.4	39.3	47.1	55.0
	Pull	6.60	9.90	13.2	19.8	26.4	33.0	39.6	46.2
ø16	Push	20.1	30.2	40.2	60.3	80.4	1.01×10 ²	1.21×10 ²	1.41×10 ²
	Pull	17.3	25.9	34.6	51.8	69.1	86.4	1.04×10 ²	1.21×10 ²
ø20	Push	31.4	47.1	62.8	94.2	1.26×10 ²	1.57×10 ²	1.88×10 ²	2.20×10 ²
	Pull	26.4	39.6	52.8	79.2	1.06×10 ²	1.32×10 ²	1.58×10 ²	1.85×10 ²
ø25	Push	49.1	73.6	98.2	1.47×10 ²	1.96×10 ²	2.45×10 ²	2.95×10 ²	3.44×10 ²
	Pull	41.2	61.9	82.5	1.24×10 ²	1.65×10 ²	2.06×10 ²	2.47×10 ²	2.89×10 ²
ø32	Push	80.4	1.21×10 ²	1.61×10 ²	2.41×10 ²	3.22×10 ²	4.02×10 ²	4.83×10 ²	5.63×10 ²
	Pull	69.1	1.04×10 ²	1.38×10 ²	2.07×10 ²	2.76×10 ²	3.46×10 ²	4.15×10 ²	4.84×10 ²

Outline Dimension Drawing

Same as SMG Series (double acting/single rod). See P. 758.

Space-Saving Type

SSD2

SSG

SSD

CAT

MDC2

SMG

MSD

FC□

Cylinder Switch

Ending

Space-Saving Type

SSD2

SSG

SSD

CAT

MDC2

SMG

MSD

FC□

Cylinder Switch

Ending

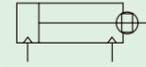


Compact cylinder Double acting/rotation-stop

SMG-M Series

- Tube bore: $\phi 6$, $\phi 10$, $\phi 16$, $\phi 20$, $\phi 25$, $\phi 32$

Circuit Diagram Symbol

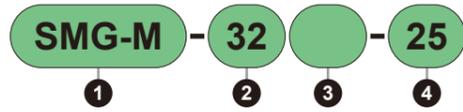


Double Acting, Non-Rotating Type

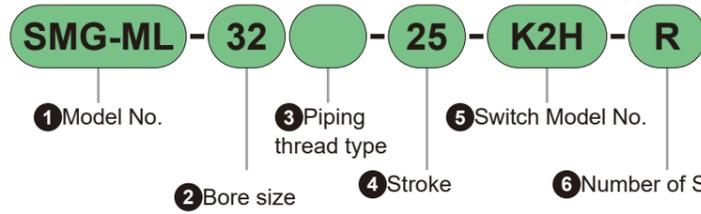


Model No. Notation Method

Without Switch
(Without magnet for switch)



With Switch
(Built-in magnet for switch)



1 Model No. 2 Bore size 3 Piping thread type 4 Stroke 5 Switch Model No. 6 Number of Switches

1 Model No.

Code	Content
SMG-M	Double Acting, Non-Rotating Type
SMG-ML	Double Acting, Non-rotating Type, With Switch

2 Bore size (mm)

Code	Content
6	$\phi 6$
10	$\phi 10$
16	$\phi 16$
20	$\phi 20$
25	$\phi 25$
32	$\phi 32$

3 Piping thread type

Code	Content
Blank	M5 ($\phi 6$ to $\phi 25$) Rc thread ($\phi 32$)
NN	NPT thread ($\phi 32$ only) Custom order
GN	G thread ($\phi 32$ only) Custom order

4 Stroke (mm)

Bore size	Stroke	Intermediate Stroke
$\phi 6$ to $\phi 16$	5 to 60	Every 5 mm *2
$\phi 20$ to $\phi 32$	5 to 100	

*1: Refer to page 776 for the min. stroke length with standard stroke length switch.

*2: The overall length dimension is the same as the standard stroke above it.

5 Switch Model No.

For switch details, please refer to P. 869. Switches are included to the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead Wire *1		Image
			AC	DC	AC	DC	Straight	L-shape	
Solid State	1-Color	2-wire	—	10 to 30	—	5 to 20 *2	K2H□	K2V□	
		3-wire (NPN)	—	30 or less	—	50 or less	K3H□	K3V□	
		3-wire (PNP)	—		K3PH□		K3PV□		
	2-Color	2-wire	—	10 to 30	—	5 to 20	K2YH□	K2YV□	
		3-wire (NPN)	—	30 or less	—	50 or less	K3YH□	K3YV□	
		1-Color	2-wire	110	12/24	7 to 20	5 to 50	K0H□	
No Indicator LED	5/12/24	20 or less			50 or less	K5H□	K5V□		

*1: For "□" in the switch model number, enter the code selected from the "Lead wire length" table.

*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)

*3: Switches other than the model numbers listed above are also available. (Custom products) For details, refer to P. 869.

*Lead wire length

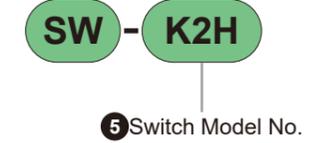
Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m K0H
3 m K0H [3]
5 m K0H [5]

6 Number of Switches

Code	Content
R	With 1 on Rod Side
H	With 1 on Head Side
D	With 2 pcs

Switch Single Unit Model No. Display Method



*For combinations of variations and options, see P. 753.

Specifications

Item	SMG-M SMG-ML (with switch)						
	mm	ø6	ø10	ø16	ø20	ø25	ø32
Bore size	mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation method		Double Acting Type					
Operating Fluid		Compressed Air					
Maximum Operating Pressure	MPa	0.7					
Min. operating 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					
Operating piston speed	mm/s	50 to 500					
Cushion		With Rubber Cushion					
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)					
Non-rotation accuracy	*1	±0.8°			±0.5°		
Allowable rotational torque	N·m	0.008	0.025	0.088	0.17	0.33	0.67
Allowable absorbed energy	J	0.012	0.036	0.1	0.1	0.19	0.5

*1: Initial value at the pull end (excluding piston rod sag).

Stroke

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

Note: Intermediate strokes can be manufactured in 5 mm increments.

Minimum Stroke with Switch

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

Cylinder Weight

(Unit: g)

Model No.	Product Weight when stroke 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 for 0 mm stroke length 66 g
 - Added weight at S = 10 mm: 6 g × 10/5 = 12 g
 - Weight of cylinder switch (2 pcs.): 18 g × 2 = 36 g
 - Product weight 66g + 12g + 36g=114g

Theoretical Thrust Table

(Unit: N)

Bore size (mm)	Operating Direction	Operating Pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø6	Push	-	4.24	5.65	8.48	11.3	14.1	17.0	19.8
	Pull	-	3.18	4.24	6.36	8.48	10.6	12.7	14.8
ø10	Push	7.85	11.8	15.7	23.6	31.4	39.3	47.1	55.0
	Pull	6.60	9.90	13.2	19.8	26.4	33.0	39.6	46.2
ø16	Push	20.1	30.2	40.2	60.3	80.4	1.01×10 ²	1.21×10 ²	1.41×10 ²
	Pull	17.3	25.9	34.6	51.8	69.1	86.4	1.04×10 ²	1.21×10 ²
ø20	Push	31.4	47.1	62.8	94.2	1.26×10 ²	1.57×10 ²	1.88×10 ²	2.20×10 ²
	Pull	26.4	39.6	52.8	79.2	1.06×10 ²	1.32×10 ²	1.58×10 ²	1.85×10 ²
ø25	Push	49.1	73.6	98.2	1.47×10 ²	1.96×10 ²	2.45×10 ²	2.95×10 ²	3.44×10 ²
	Pull	41.2	61.9	82.5	1.24×10 ²	1.65×10 ²	2.06×10 ²	2.47×10 ²	2.89×10 ²
ø32	Push	80.4	1.21×10 ²	1.61×10 ²	2.41×10 ²	3.22×10 ²	4.02×10 ²	4.83×10 ²	5.63×10 ²
	Pull	69.1	1.04×10 ²	1.38×10 ²	2.07×10 ²	2.76×10 ²	3.46×10 ²	4.15×10 ²	4.84×10 ²

Space-Saving Type

SSD2

SSG

SSD

CAT

MDC2

SMG

MSD

FC□

Cylinder Switch

Ending

Space-Saving Type

SSD2

SSG

SSD

CAT

MDC2

SMG

MSD

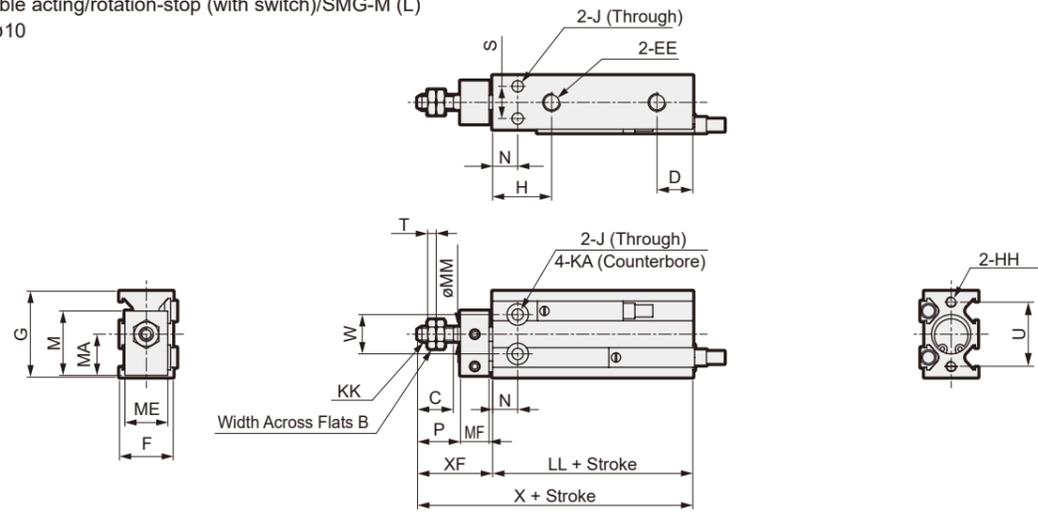
FC□

Cylinder Switch

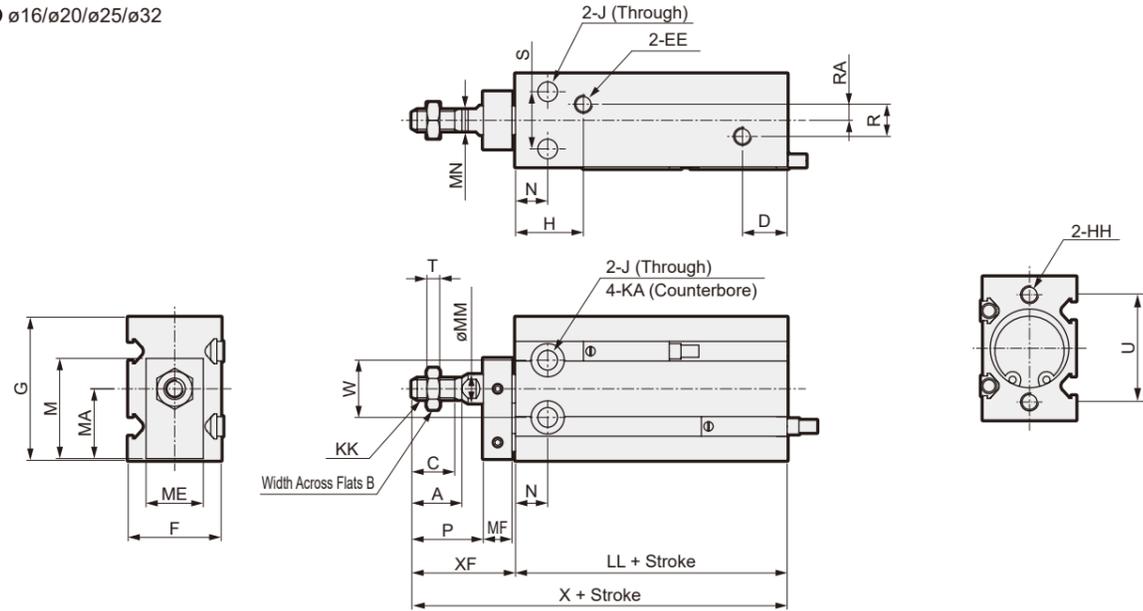
Ending

Outline Dimension Drawing

- Double acting/rotation-stop (with switch)/SMG-M (L)
- $\phi 6/\phi 10$



- $\phi 16/\phi 20/\phi 25/\phi 32$



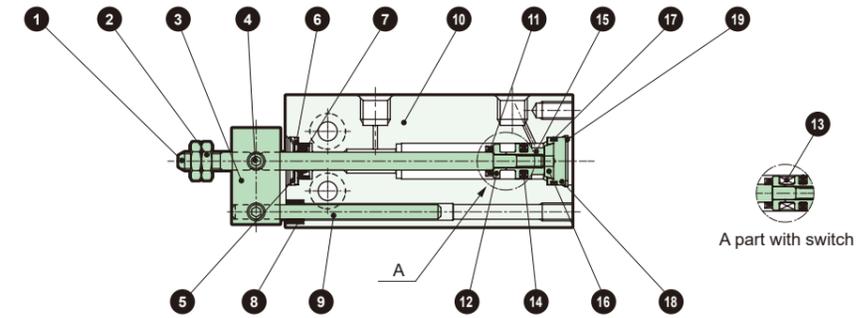
Code	A	B	C	D	EE	F	G	H	HH	J	KA	KK	M	MA	ME	MF	MM
$\phi 6$	-	5.5	7	10	M5	13	22	15	M3 Depth 5	3.2	6 Depth 4.8	M3	16	10.5	11	8	3
$\phi 10$	-	7	10	10	M5	15	24	16.5	M3 Depth 5	3.2	6 Depth 5	M4	18	11.5	12	8	4
$\phi 16$	12.5	8	11	11.5	M5	20	32	(*1) 16.5	M4 Depth 6	4.5	7.5 Depth 6.5	M5	22	15.5	13	8	6
$\phi 20$	14	10	12	12.5	M5	26	40	19	M5 Depth 8	5.5	9 Depth 8	M6	28	19.5	16	8	8
$\phi 25$	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
$\phi 32$	22	17	19.5	12.5	Rc1/8	40	62	23	M6 Depth 9	6.6	11 Depth 11.5	M10 x 1.25	42.5	30.5	24	12	12

Code	Bore size	MN	N	P	R	RA	S	T	U	W	XF	LL		X	
												Without Switch	With switch	Without Switch	With switch
$\phi 6$	-	7	9	-	-	7	1.8	17	10	18		33	33	51	51
$\phi 10$	-	7	12	-	-	9	2.4	18	11	21		36	36	57	57
$\phi 16$	5	7	17	4	2	12	3.2	25	14	26		30	40	56	66
$\phi 20$	6	9	20	9	4.5	16	3.6	30	16	29		36	46	65	75
$\phi 25$	8	10	22	9	4.5	20	5	38	20	33		40	50	73	83
$\phi 32$	10	11	29	13.5	4.5	24	6	48	24	42		42	52	84	94

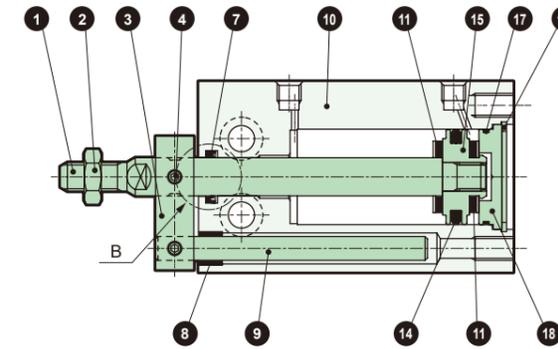
*1: For a 5-stroke model without a switch, the H dimension for bore size $\phi 16$ is 14.5.
 *2: When calculating LL + stroke and X + stroke dimensions for intermediate strokes, do not use the intermediate stroke value for the stroke; instead, use the value of the standard stroke above it. (Example: If the custom stroke is 35mm, apply the standard stroke 40mm.)
 *3: For dimensions of models with switches, see P. 780 and 781.

Internal Structure Diagram/Material

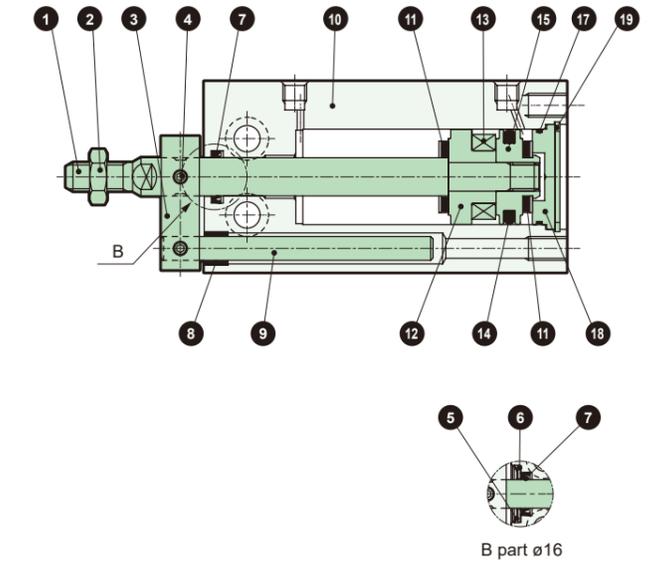
- $\phi 6/\phi 10$ (double acting/rotation-stop)



- $\phi 16$ to $\phi 32$ (double acting/rotation-stop)



- $\phi 16$ to $\phi 32$ (double acting/rotation-stop/with switch)

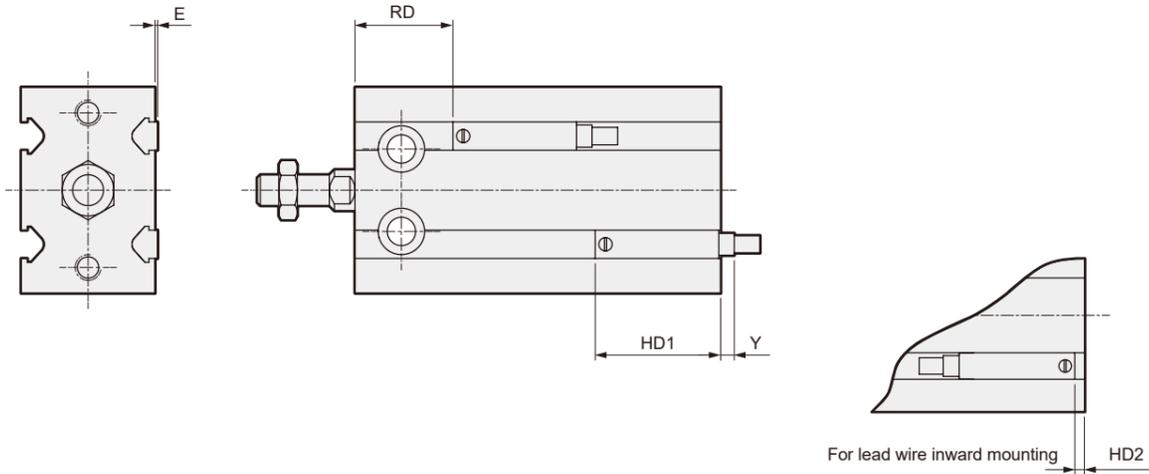


Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Stainless Steel	$\phi 20, 25, 32$: Industrial chrome plating	11	Cushion rubber R	Urethane Rubber	
2	Rod Nut	Steel	Nickel Plating	12	Spacer	Aluminum Alloy	Chromate
3	Non-rotating plate	Aluminum Alloy	Chromate	13	Magnet		
4	Hexagon socket set screw	Stainless Steel		14	Piston Packing	Nitrile Rubber	
5	CR type retaining ring	Stainless Steel		15	Piston	Aluminum Alloy	Chromate
6	Cap	Stainless Steel		16	Cushion rubber H	Urethane Rubber	
7	Rod Packing	Nitrile Rubber		17	Cover gasket	Nitrile Rubber	
8	Non-Rotating Bushing	Polyacetal		18	Cover	Aluminum Alloy	Chromate
9	Guide bar	Stainless Steel	$\phi 32$: Industrial chrome plating	19	C-snap ring	Steel	Zinc phosphate
10	Cylinder Body	Aluminum Alloy	Hard Anodized				

For maintenance parts, refer to the CKD component product site
 (<https://www.ckd.co.jp/kiki/en/>) -> "Model No." -> See Maintenance Parts .

SMG Series Switch Dimensions

- K0H/V, K5H/V, K2H/V, K3H/V, K3PH/V
- SMG-L, SMG-XL, SMG-YL, SMG-LF, SMG-ML



Code	K0, K5, K2, K3, K3P										
	SMG-L, SMG-LF, SMG-ML					SMG-XL					
Bore size (mm)	E	HD1	HD2	RD	Y	E	HD1	HD2	RD		Y
									5, 10st	15 st	
ø6	1	20	1	13	7	1	21.5	2.5	11.5	11.5	5.5
ø10	1	23.5	4.5	12.5	3.5	1	23.5	4.5	12.5	17.5	3.5
ø16	0.5	24.5	5.5	15.5	2.5	0.5	24.5	5.5	15.5	20.5	2.5
ø20	0.5	27	8	19	0	0.5	27	8	19	24	0
ø25	0.5	29	10	21	-2	0.5	29	10	21	26	-2
ø32	0.5	30.5	11.5	21.5	-3.5	0.5	30.5	11.5	21.5	26.5	-3.5

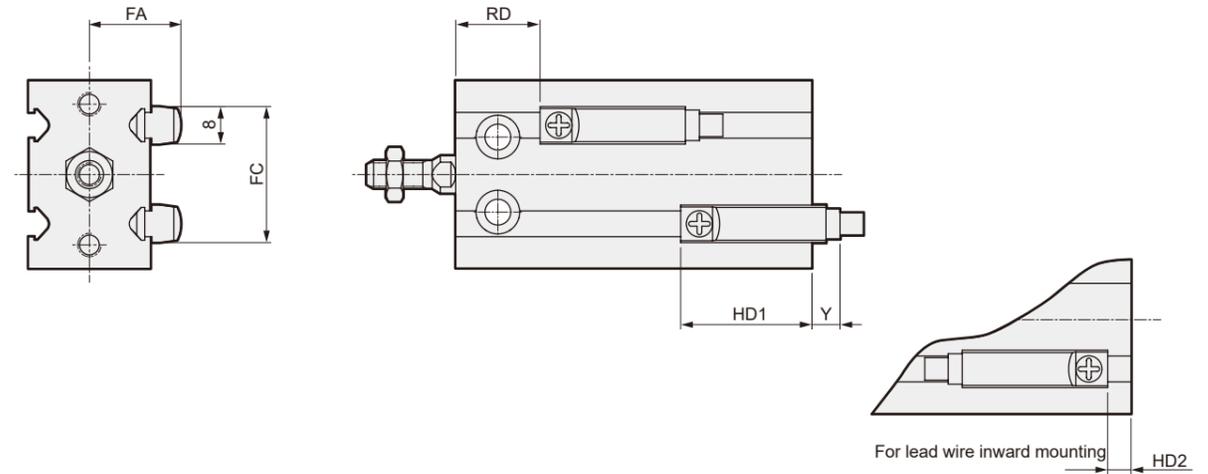
Code	K0, K5, K2, K3, K3P							
	Bore size (mm)	E	HD1		HD2		RD	Y
5, 10st			15 st	5, 10st	15 st	5, 10st		15 st
ø6	1	22.5	22.5	3.5	3.5	10.5	4.5	4.5
ø10	1	22.5	27.5	3.5	8.5	13.5	4.5	-0.5
ø16	0.5	24.5	29.5	5.5	10.5	15.5	2.5	-2.5
ø20	0.5	27	32	8	13	19	0	-5
ø25	0.5	29	34	10	15	21	-2	-7
ø32	0.5	30.5	35.5	11.5	16.5	21.5	-3.5	-8.5

*1: Y dimensions indicate the protruding dimensions from the end surface of the switch body. (Negative dimensions indicate the pull dimensions from the end surface of the body)
 *2: For switch mountability, refer to the model number display method for each variation.

External Dimensions Diagram with Switch

SMG Series Switch Dimensions

- K2YH/V, K3YH/V
- SMG-L, SMG-XL, SMG-YL, SMG-LF, SMG-ML



Code	FA	FC	K2Y, K3Y										
			SMG-L, SMG-LF, SMG-ML				SMG-XL						
Bore size (mm)	HD1	HD2	RD	Y		HD1	HD2	RD		Y			
				Straight lead wire type	L-shaped lead wire type			5,10 st	15st.	Straight lead wire type	L-shaped lead wire type		
ø6	13.5	18	21	0	12	13	10	22.5	1.5	10.5	10.5	11.5	8.5
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
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
ø20	19.5	29	28	7	18	6	3	28	7	18	23	6	3
ø25	22.5	32	30	9	20	4	1	30	9	20	25	4	1
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

Code	K2Y, K3Y									
	SMG-YL									
Bore size (mm)	HD1		HD2		RD	Y (*1)				
	5,10 st	15st.	5,10 st	15st.		5,10 st		15st.		
						Straight lead wire type	L-shaped lead wire type	Straight lead wire type	L-shaped lead wire type	
ø6	23.5	23.5	2.5	2.5	9.5	10.5	7.5	10.5	7.5	
ø10	23.5	28.5	2.5	7.5	12.5	10.5	7.5	5.5	2.5	
ø16	25.5	30.5	4.5	9.5	14.5	8.5	5.5	3.5	0.5	
ø20	28	33	7	12	18	6	3	1	-2	
ø25	30	35	9	14	20	4	1	-1	-4	
ø32	31.5	36.5	10.5	15.5	20.5	2.5	-0.5	-2.5	-5.5	

*1: Y dimensions indicate the protruding dimensions from the end surface of the switch body. (Negative dimensions indicate the pull dimensions from the end surface of the body)
 *2: For switch mountability, refer to the model number display method for each variation.

Space-Saving Type

SSD2

SSG

SSD

CAT

MDC2

SMG

MSD

FC□

Cylinder Switch

Ending

Space-Saving Type

SSD2

SSG

SSD

CAT

MDC2

SMG

MSD

FC□

Cylinder Switch

Ending



To Use This Product Safely

Be sure to read this before use.

For general cylinder information, see Intro 41, and for cylinder switches, see P. 924.

Individual Precautions: Compact cylinder SMG Series

During Design/Selection

1. Common

Caution

The min. working pressure in the specifications column indicates the initial value. Depending on the conditions of use or duration of use, the specifications may be exceeded. When using around the min. working pressure, consult with CKD.

1. Fine speed SMG-F

Caution

Use without lubrication.

Lubrication may change characteristics.

Install the speed controller near the cylinder.

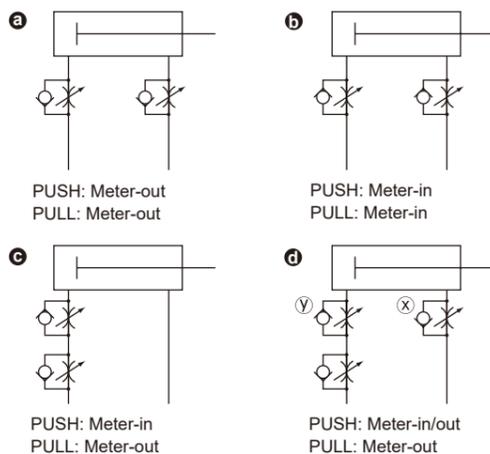
If installed far from the cylinder, the speed will become unstable. For the speed controller, SC-M3/M5-F, SCD-M3/M5-F Series are recommended.

Generally, the higher the air pressure and the lower the load factor, the more stable the speed.

Use with a load factor of 50% or less.

Speed control is stable with a meter-out circuit.

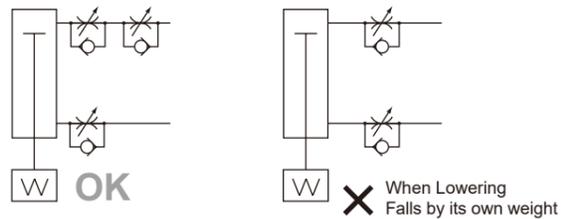
When driving a single-rod cylinder at creep speed in the PUSH direction, if the load resistance is small, a flying-out phenomenon may occur at the start of operation. As countermeasures, use circuits **b**, **c** or **d**. In addition, the **d** circuit is the most stable.



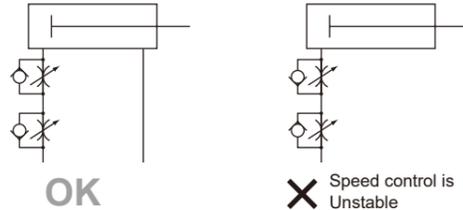
d Speed adjustment method for PUSH operation of the circuit:
1. Speed setting with x speed controller
2. Throttle with y speed controller until projection stops.
3. Reconfirmation of speed

(*1)When comparing **b**, **c**, **d**, operation is the most stable with the **d** circuit.

(*2) For vertical mounting, it will fall by its own weight in a meter-in circuit, so combine it with a meter-out circuit.



(*3) For series connection of speed controllers, use the circuit shown in the figure below.



(Guideline for lurching occurrence)

Lurching occurs in the following cases:

• Thrust > Resistance

*Resistance: Thrust due to residual pressure on exhaust side (For creep speed type, intake pressure = residual pressure)
For horizontal use: Frictional force due to load
For vertical use: Dead weight of the load

Do not apply lateral load to the cylinder.

Operation becomes unstable when lateral load is applied.

Avoid use in locations with vibration.

Operation becomes unstable due to the influence of vibration.

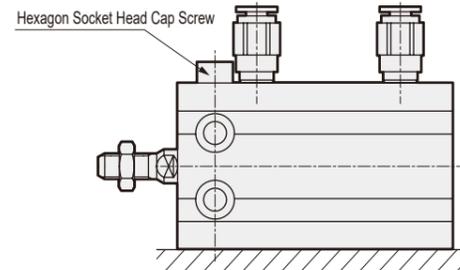
During Use

1. Common

Caution

Depending on the stroke length or mounting method, applicable piping fittings are limited. Therefore, use the recommended fittings as below.

Figure 1



Item Bore	Port Size	Recommended fitting	Item Bore	Port Size	Recommended fitting
6	M5	SC3W-M5-4,6 SC3U-M5-4,6 GWS4-M5 GWS6-M5 (*1) GWS4, 6-M5-S GWL4-M5 GWL6-M5 (*1)	20	M5	SC3W-M5-4,6 SC3U-M5-4,6 GWS4-M5 GWS6-M5 (*1) GWS4, 6-M5-S GWL4-M5 GWL6-M5 (*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 (*1) GWS6-M5 (*2) GWS4-M5-S GWS6-M5-S (*1) GWL4-M5 (*1) GWL6-M5 (*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

*1) Excluding 5 stroke length or mounting method in "Fig. 1".

*2) Excluding 5, 10 mm stroke length or mounting method in "Fig. 1".

When mounting the body with the through bolt, tighten with tightening torque as shown in the table below.

Bore	Bolt used	Tightening torque
ø6/10	M3	0.6 to 1.1 N·m
ø16	M4	1.5 to 2.7 N·m
ø20/25	M5	3.0 to 5.4 N·m
ø32	M6	5.2 to 9.2 N·m

2. Single acting SMG-X/Y

Caution

Do not leave single-acting cylinders pressurized.

If left pressurized, the piston rod may not return by spring force when the pressure is released.

3. Fine speed SMG-F

Caution

Adjust alignment etc. so that no lateral load is applied to the cylinder. In addition, install and adjust the sliding guide to avoid twisting.

- Fluctuations in load or resistance will make operation unstable.
- Guides with a large difference between static and dynamic friction will have unstable operation.

4. Rotation-stop SMG-M

Caution

When attaching load to the piston rod, do not apply more torque than the allowable torque.

Do not put your fingers into the gap between the rotation-stop plate and the rotation-stop cylinder tube.

Never put your fingers through the gap because fingers may be pinched between the rotation-stop plate and the cylinder tube while the piston rod is pulled.

Do not apply rotation torque to the piston rod. If by any chance torque is applied due to the shape of the jig, use without exceeding the allowable torque.

After maintenance, when connecting the piston rod and rotation-stop plate, fasten with hexagon socket set screws, applying the tightening torque given in the table below.

Bore	Applicable hexagon socket set screw	Tightening torque
ø6/10/16	M3	0.6 N·m
ø20/25	M4	1.4 N·m
ø32	M5	4.2 N·m

For precautions regarding mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components Product website (<https://www.ckd.co.jp/kiki/en/>) -> "Model No." -> "Instruction Manual".