

Space saving structure

SMG

Compact cylinder

ø6/ø10/ø16
ø20/ø25/ø32



CONTENTS

Series variation	1385
Product introduction	1384
● Double acting/single rod (SMG)	1386
● Single acting/push (SMG-X)	1392
● Single acting/pull (SMG-Y)	1392
● Double acting/fine speed (SMG-F)	1400
● Double acting/rotation-stop (SMG-M)	1404
SMG Series common switch dimensions	1409
⚠ Safety precautions	1412

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/
COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/
MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

FJ

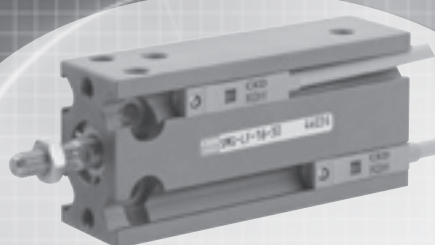
FK

Spd
Contr

Ending

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/
COVPIN2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/
MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd
Contr
Ending

Even easier to use with added variations.



Lightweight and space saving

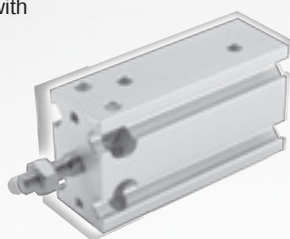
Space saving and lightweight with integration of mount block.

Max.

33%
lighter in weight
(vs. conventional)

Max.

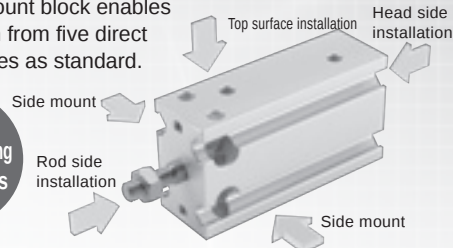
23%
space saving
(vs. conventional)



Simple shape for flexible mounting

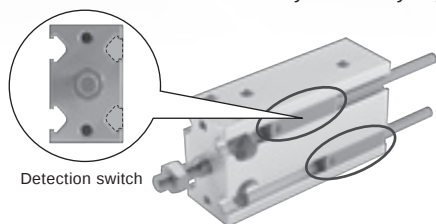
Integration of mount block enables flexible selection from five direct mounting surfaces as standard.

Direct mounting
from 5 faces



Detection switch fits in completely

Detection switch fits into the body with barely any protrusion.

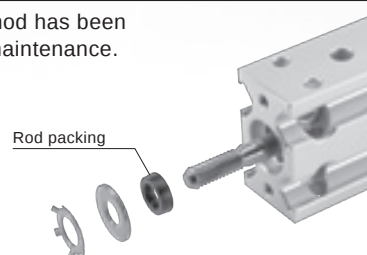


Sleek and
flat

Easy maintenance

A new mounting method has been developed for easy maintenance.

Easy
maintenance



Series variation

Compact cylinder SMG Series

●: Standard, ◎: Option, ■: Not available

Variation	Model No. JIS symbol	Bore size (mm)	Standard stroke (mm)													Min. stroke (mm) (*1)	Max. stroke (mm)	Custom stroke (per mm)	Switch	Page
			5	10	15	20	25	30	40	50	60	70	80	90	100					
Double acting/ single rod with switch	SMG SMG-L	ø6/ø10/ø16	●	●	●	●	●	●	●	●	●	■	■	■	■	5	60	5	◎	1386
		ø20/ø25/ø32	●	●	●	●	●	●	●	●	●	●	●	●	●	5	100	5	◎	
Single acting/ push with switch	SMG-X SMG-XL	ø6/ø10/ø16	●	●	●	■	■	■	■	■	■	■	■	■	■	5	15	-	◎	1392
		ø20/ø25/ø32	●	●	●	■	■	■	■	■	■	■	■	■	■	5	15	-	◎	
Single acting/pull with switch	SMG-Y SMG-YL	ø6/ø10/ø16	●	●	●	■	■	■	■	■	■	■	■	■	■	5	15	-	◎	1392
		ø20/ø25/ø32	●	●	●	■	■	■	■	■	■	■	■	■	■	5	15	-	◎	
Double acting/ fine speed with switch	SMG-F SMG-LF	ø6/ø10/ø16	●	●	●	●	●	●	■	■	■	■	■	■	■	5	30	5	◎	1400
		ø20/ø25/ø32	●	●	●	●	●	●	●	●	●	■	■	■	■	5	50	5	◎	
Double acting/ rotation-stop with switch	SMG-M SMG-ML	ø6/ø10/ø16	●	●	●	●	●	●	●	●	●	■	■	■	■	5	60	5	◎	1404
		ø20/ø25/ø32	●	●	●	●	●	●	●	●	●	●	●	●	●	5	100	5	◎	

*1: Refer to pages 1386, 1392, 1400, 1404 for the min. stroke with switch.

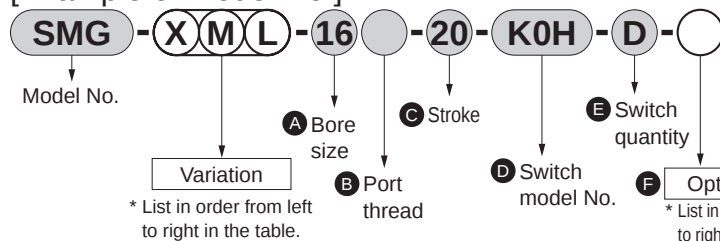
Variation and option combination selection table

Category		Category	Variation						Port thread		Option		
			Double acting basic	Single acting push	Single acting pull	Rotation-stop	With cylinder switch	Fine speed	NPT	G	Copper and PTFE free	Clean-room specs (exhaust port)	Clean-room specs (vacuum)
		Code	None	X	Y	M	L	F	N	G	P6	P7 P5	P71 P51
Variation	Double acting basic	Blank	Blank			◎	◎	◎	○	○	*1	◎	◎
	Single acting push	Y			x	○	◎	x	○	○	*1	x	x
	Single acting pull	X				○	◎	x	○	○	*1	x	x
	Rotation-stop	M					◎	○	○	○	*1	x	x
	With cylinder switch	L						◎	○	○	*1	◎	◎
	Fine speed	F							○	○	x	◎	◎
Port thread	NPT	N								x	*1	x	x
	G	G									*1	x	x
Option	Copper and PTFE free	P6										x	x
	Clean-room specs (exhaust port)	P7, P5											x
	Clean-room specs (vacuum)	P71, P51											
Accessory	Cylinder switch	Listed separately	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

◎: Option
○: Available (made-to-order product)
△: Available depending on conditions (Contact CKD.)
x: Not available

Caution
*1: P6 is provided as standard.
(P6 code is not required.)

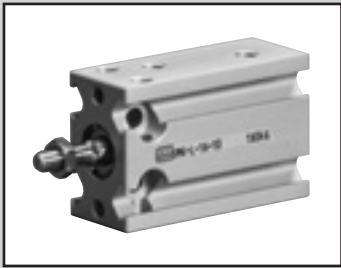
[Example of model No.]



Model No.: Compact cylinder

● Variation: Single acting/push/rotation-stop/with switch

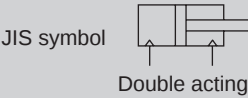
- A Bore size : ø16 mm
- B Port thread : Rc thread
- C Stroke : 20 mm
- D Switch model No.: Reed KOH switch, lead wire 1 m
- E Switch quantity : 2
- F Option : None



Compact cylinder double acting/single rod

SMG Series

● Bore size: $\varnothing 6/\varnothing 10/\varnothing 16/\varnothing 20/\varnothing 25/\varnothing 32$



Specifications

1 MPa $\approx$ 145.0 psi, 1 MPa = 10 bar

Item		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 (≈100 psi, 7 bar)					
Min. working pressure	MPa	0.12	0.06 (≈8.7 psi, 0.6 bar)		0.05 (≈7.3 psi, 0.5 bar)		
Proof pressure	MPa	1.05 (≈150 psi, 10.5 bar)					
Ambient temperature	°C	-10 (14°F) to 60 (140°F) (no freezing)					
Port size		M5					Rc1/8
Stroke tolerance	mm	+1.5 0					
Working piston speed		mm/s 50 to 500					
Cushion		With rubber cushion					
Lubrication		Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)					
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)
ø 6	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		

Min. stroke with switch

Tube Bore size	1-color LED		2-color LED	
	K ☐ H	K ☐ V	K ☐ YH	K ☐ YV
$\varnothing 6$	5		5	
$\varnothing 10$				
$\varnothing 16$				
$\varnothing 20$				
$\varnothing 25$				
$\varnothing 32$				

*1: The custom stroke is available in 5 mm increments. However, the total length is the same as that of the next longer standard stroke.

Switch specifications

● 1-color/2-color LED

Item	2-wire proximity		3-wire proximity			2-wire reed	
	K2H/K2V	K2YH/ K2YV	K3H/K3V	K3PH/K3PV (Made to order)	K3YH/ K3YV	K0H/K0V	K5H/K5V
Applications	Dedicated for programmable controller		For programmable controller, relay			For programmable controller, relay	Programmable controller, relay IC circuit (without indicator), serial connection
Output method	-		NPN output	PNP output	NPN output	-	
Power supply voltage	-		10 to 28 VDC			-	
Load voltage	10 to 30 VDC		30 VDC or less			12 V/24 VDC	110 VAC
Load current	5 to 20 mA (*3)		50 mA or less			5 to 50 mA	7 to 20 mA
Indicator	LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	-
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	

*1: Refer to Ending Page 1 for detailed switch specifications and dimensions.

*2: Switches other than the above models, such as switches with connectors, are also available. Refer to Ending Page 1.

*3: The max. load current is 20 mA at 25 $^{\circ}\text{C}$. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25 $^{\circ}\text{C}$. (5 to 10 mA at 60 $^{\circ}\text{C}$)

Cylinder weight

(Unit: g)

Model No. Bore size	Product weight when stroke S = 0 mm		Additional weight per S = 5mm
	SMG double acting	SMG-L double acting/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-L-16-10-K2H-D ● Product weight for 0 mm stroke 56 g
 ● Additional weight when S = 10 mm 6 g x 10/5 = 12 g
 ● Weight of 2 cylinder switches 18 g x 2 = 36 g
 ● Product weight 56 g + 12 g + 36 g = 104 g

Theoretical thrust table

(Unit: N)

Bore size (mm)	Operating direction	Working 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	1.01x10 ²	1.21x10 ²	1.41x10 ²
	Pull	17.3	25.9	34.6	51.8	69.1	86.4	1.04x10 ²	1.21x10 ²
ø20	Push	31.4	47.1	62.8	94.2	1.26x10 ²	1.57x10 ²	1.88x10 ²	2.20x10 ²
	Pull	26.4	39.6	52.8	79.2	1.06x10 ²	1.32x10 ²	1.58x10 ²	1.85x10 ²
ø25	Push	49.1	73.6	98.2	1.47x10 ²	1.96x10 ²	2.45x10 ²	2.95x10 ²	3.44x10 ²
	Pull	41.2	61.9	82.5	1.24x10 ²	1.65x10 ²	2.06x10 ²	2.47x10 ²	2.89x10 ²
ø32	Push	80.4	1.21x10 ²	1.61x10 ²	2.41x10 ²	3.22x10 ²	4.02x10 ²	4.83x10 ²	5.63x10 ²
	Pull	69.1	1.04x10 ²	1.38x10 ²	2.07x10 ²	2.76x10 ²	3.46x10 ²	4.15x10 ²	4.84x10 ²

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/ COVP/N2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/ MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd Contr
Ending

How to order

No switch (without magnet for switch)

SMG - **32** - **25**

With switch (built-in magnet for switch)

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

A Model No.

B Bore size

C Port thread

D Stroke

E Switch model No.

F Switch quantity

Precautions for model No. selection

*1: Refer to page 1386 for the min. stroke with switch.

*2: Copper and PTFE free as standard.

[Example of model No.]

SMG-L-6-15-K0H-R

Model: Compact cylinder

B Bore size : $\phi 6$ mm

C Port thread : Rc thread

D Stroke : 15 mm

E Switch model No. : Reed switch K0H, lead wire length 1 m

F Switch quantity : 1 rod side

How to order switch

SW - **K2H**

Switch model No.
(Item **E** above)

Code	Description
A Model No.	
SMG	Double acting
SMG-L	Double acting/with switch

B Bore size (mm)	
6	$\phi 6$
10	$\phi 10$
16	$\phi 16$
20	$\phi 20$
25	$\phi 25$
32	$\phi 32$

C Port thread	
Blank	Rc thread
NN	NPT thread ($\phi 32$ only) (made-to-order product)
GN	G thread ($\phi 32$ only) (made-to-order product)

D Stroke (mm)		Applicable bore size					
		$\phi 6$	$\phi 10$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$
Standard stroke	5	●	●	●	●	●	●
	10	●	●	●	●	●	●
	15	●	●	●	●	●	●
	20	●	●	●	●	●	●
	25	●	●	●	●	●	●
	30	●	●	●	●	●	●
	40	●	●	●	●	●	●
	50	●	●	●	●	●	●
	60	●	●	●	●	●	●
	70				●	●	●
	80				●	●	●
	90				●	●	●
	100				●	●	●

E Switch model No.						
Axial lead wire	Radial lead wire	Contact	Voltage		Indicator	Lead wire
			AC	DC		
K0H*	K0V*	Reed	●	●	1-color LED	2-wire
K5H*	K5V*		●	●	No indicator lamp	
K2H*	K2V*	Proximity		●	1-color LED	2-wire
K3H*	K3V*			●	1-color LED (made-to-order product)	3-wire
K3PH*	K3PV*			●		3-wire
K2YH*	K2YV*			●	2-color LED	2-wire
K3YH*	K3YV*			●		3-wire

* Lead wire length

Blank	1 m (Standard)
3	3 m
5	5 m

F Switch quantity

R	1 on rod side
H	1 on head side
D	2

Clean-room specifications (Catalog No. CB-033SA)

● Anti-dust generation structure for use in cleanrooms

SMG - - **P7***

SMG - - **P5***

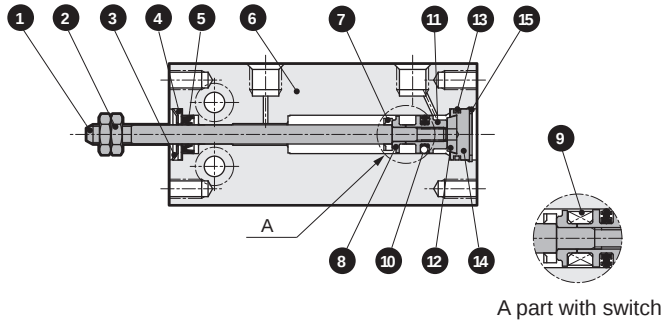
Specifications for rechargeable battery (Catalog No. CC-1226A)

● Design compatible with rechargeable battery manufacturing process

SMG - - **P4***

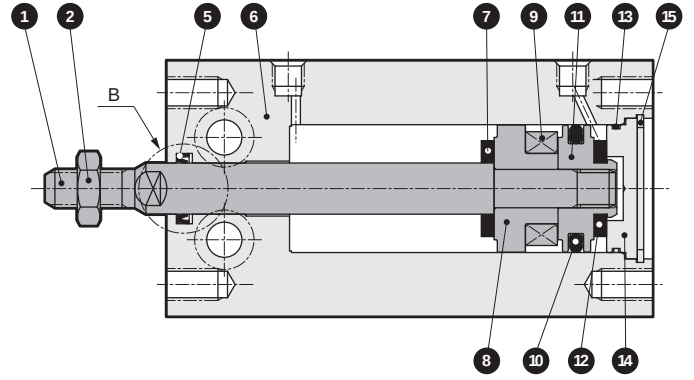
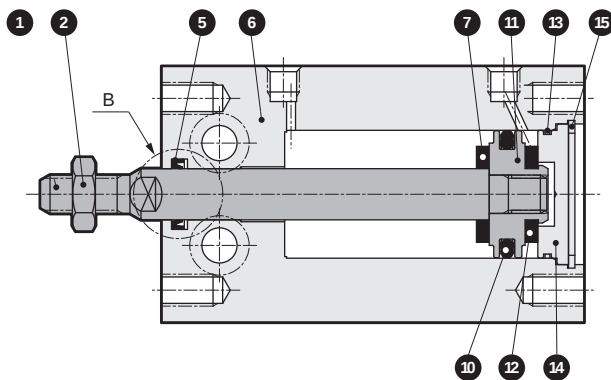
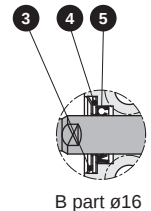
Internal structure and parts list

● $\phi 6/\phi 10$ (double acting)



● $\phi 16$ to 32 (double acting)

● $\phi 16$ to 32 (double acting/with switch)



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Piston rod	Stainless steel	$\phi 20, 25, 32$ Industrial chrome plating	9	Magnet	-	
2	Rod nut	Steel	Nickeling	10	Piston packing	Nitrile rubber	
3	CR snap ring	Stainless steel		11	Piston	Aluminum alloy	Chromate
4	Cap	Stainless steel		12	Cushion rubber H	Urethane rubber	
5	Rod packing	Nitrile rubber		13	Cover gasket	Nitrile rubber	
6	Body	Aluminum alloy	Hard alumite	14	Cover	Aluminum alloy	Chromate
7	Cushion rubber R	Urethane rubber		15	C-snap ring	Steel	Zinc phosphate
8	Spacer	Aluminum alloy	Chromate				

Repair parts list

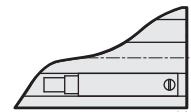
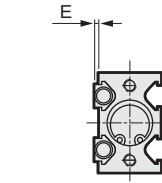
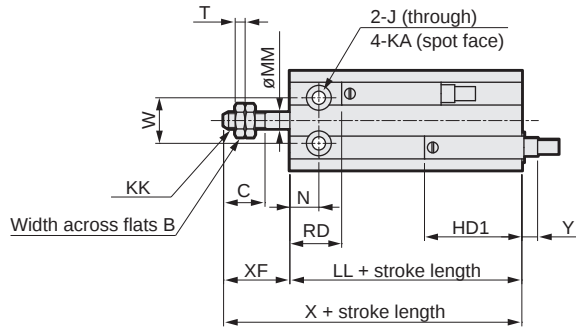
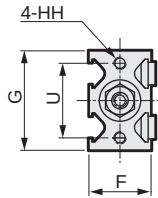
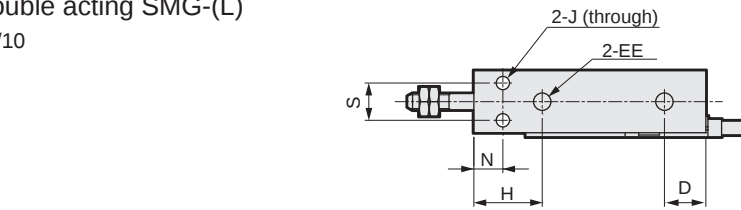
Bore size (mm)	Kit No.	Repair parts No.	Bore size (mm)	Kit No.	Repair parts No.
$\phi 6$	SMG-6K	3 5 7 10 12 13	$\phi 20$	SMG-20K	5 7 10 12 13
$\phi 10$	SMG-10K		$\phi 25$	SMG-25K	
$\phi 16$	SMG-16K		$\phi 32$	SMG-32K	

Dimensions



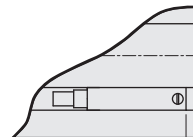
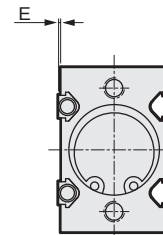
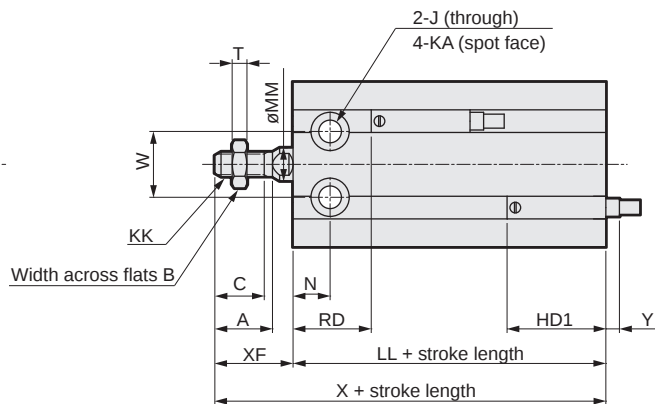
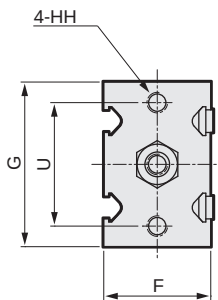
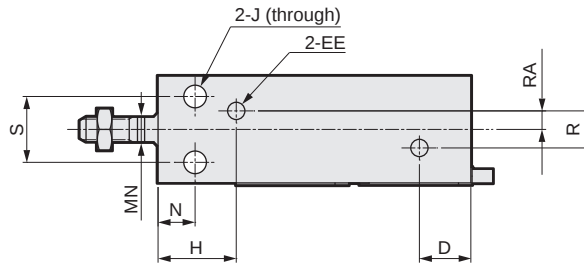
● Double acting SMG-(L)

ø6/10



For lead wire inward mounting

ø16/ø20/ø25/ø32



For lead wire inward mounting

Code	A	B	C	D	EE	F	G	H	HH	J	KA	KK	MM	MN	N	R	RA	S
Bore size																		
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	M10x1.25	12	10	11	13.5	4.5	24

Code	T	U	W	XF	LL		X		E	HD1	HD2	RD	Y (*2)
Bore size					No switch	With switch	No switch	With switch					
ø6	1.8	17	10	13	33	33	46	46	1	20	1	13	7
ø10	2.4	18	11	16	36	36	52	52	1	23.5	4.5	12.5	3.5
ø16	3.2	25	14	16	30	40	46	56	0.5	24.5	5.5	15.5	2.5
ø20	3.6	30	16	19	36	46	55	65	0.5	27	8	19	0
ø25	5	38	20	23	40	50	63	73	0.5	29	10	21	-2
ø32	6	48	24	27	42	52	69	79	0.5	30.5	11.5	21.5	-3.5

*1 : 14.5 for 5 stroke without switch

*2 : 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)

*3 : To calculate LL+ stroke or X+ stroke when using custom stroke, apply the next longer standard stroke (instead of the custom stroke) to the stroke value. (Example: If the custom stroke is 35 mm, apply the standard stroke of 40 mm)

*4 : Refer to page 1409 for HD, RD, and protruding dimensions of 2-color LED switches.

MEMO

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/ COVP/N2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/ MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd Contr
Ending



Compact cylinder

Single acting/push

Single acting/pull

SMG-X_Y Series

● Bore size: $\varnothing 6/\varnothing 10/\varnothing 16/\varnothing 20/\varnothing 25/\varnothing 32$

JIS symbol



Single acting/push



Single acting/pull



Specifications

1 MPa = 10 bar

Item		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					
	SMG-Y(L)	Single acting/pull					
Working fluid		Compressed air					
Max. working pressure MPa		0.7 (≈100 psi, 7 bar)					
Min. working pressure MPa	SMG-X(L)	0.2	0.15 (≈22 psi, 1.5 bar)				0.13
	SMG-Y(L)	(≈29 psi)					(≈19 psi)
Proof pressure MPa		1.05 (≈150 psi, 10.5 bar)					
Ambient temperature °C		-10 (14°F) to 60 (140°F) (no freezing)					
Port size		M5					Rc1/8
Stroke tolerance mm		+1.5 0					
Working piston speed mm/s		50 to 500					
Cushion		Note) With rubber cushion					
Lubrication		Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)					
Allowable absorbed energy J		0.012	0.036	0.05	0.1	0.19	0.5

*1: Do not leave the single acting cylinder pressurized for a long time. If it is left pressurized for long periods, the piston rod may not return due to spring load when the pressure is released.

*2: One side rubber-cushioned for $\varnothing 6$.

Stroke

Bore size (mm)	Standard stroke (mm)	Max. stroke (mm)	Min. stroke (mm)
$\varnothing 6$	5, 10, 15	15	5
$\varnothing 10$			
$\varnothing 16$			
$\varnothing 20$			
$\varnothing 25$			
$\varnothing 32$			

Min. stroke with switch

Model	Bore size	1-color LED		2-color LED	
		K□H	K□V	K□YH	K□YV
SMG-XL SMG-YL	$\varnothing 6$	5		5	
	$\varnothing 10$				
	$\varnothing 16$				
	$\varnothing 20$				
	$\varnothing 25$				
	$\varnothing 32$				

SMG-X/SMG-Y spring load

(Unit: N)

Bore size (mm)	Stroke (mm)	When stroke = 0	Full stroke Operating	Bore size (mm)	Stroke (mm)	When stroke = 0	At full stroke operation
ø6	5	3.1	3.8	ø20	5	14	19
	10	2.3			10		
	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		

Switch specifications

● 1-color/2-color LED

Item	2-wire proximity		3-wire proximity			2-wire reed			
	K2H/K2V	K2YH/ K2YV	K3H/K3V	K3PH/K3PV (Made to order)	K3YH/ K3YV	K0H/K0V		K5H/K5V	
Applications	Dedicated for programmable controller		For programmable controller, relay			For programmable controller, relay		Programmable controller, relay IC circuit (without indicator), serial connection	
Output method	-		NPN output	PNP output	NPN output	-			
Power supply voltage	-		10 to 28 VDC			-			
Load voltage	10 to 30 VDC		30 VDC or less			12 V/24 VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 20 mA (*3)		50 mA or less			5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator	LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)		-	
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			

*1: Refer to Ending Page 1 for detailed switch specifications and dimensions.

*2: Switches other than the above models, such as switches with connectors, are also available. Refer to Ending Page 1.

*3: The max. load current is 20 mA at 25°C. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25°C.
(5 to 10 mA at 60°C.)

SMG-X Cylinder weight

(Unit: g)

Model No. Bore size	5		10		15	
	No switch	With switch	No switch	With switch	No 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	
	No switch	With switch	No switch	With switch	No 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)	Working 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	1.05x10 ²	1.25x10 ²
ø20	43.8	75.2	1.07x10 ²	1.38x10 ²	1.69x10 ²	2.01x10 ²
ø25	73.2	1.22x10 ²	1.71x10 ²	2.20x10 ²	2.70x10 ²	3.19x10 ²
ø32	1.31x10 ²	2.11x10 ²	2.92x10 ²	3.72x10 ²	4.53x10 ²	5.33x10 ²

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

● SMG-Y

(Unit: N)

Bore size (mm)	Working 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	1.05x10 ²
ø20	33.8	60.2	86.6	1.13x10 ²	1.39x10 ²	1.66x10 ²
ø25	57.5	98.7	1.40x10 ²	1.81x10 ²	2.22x10 ²	2.64x10 ²
ø32	1.08x10 ²	1.77x10 ²	2.46x10 ²	3.16x10 ²	3.85x10 ²	4.54x10 ²

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

How to order

No switch (without magnet for switch)

SMG-X - **32** - **15**

With switch (built-in magnet for switch)

SMG-XL - **32** - **15** - **K2H** - **R**

A Model No.

B Bore size

C Port thread

D Stroke

E Switch model No.

F Switch quantity

Code		Description				
A Model No.						
SMG-X	Single acting push					
SMG-XL	Single acting push/with switch					
SMG-Y	Single acting pull					
SMG-YL	Single acting pull/with switch					
B Bore size (mm)						
6	ø6					
10	ø10					
16	ø16					
20	ø20					
25	ø25					
32	ø32					
C Port thread						
Blank	Rc thread					
NN	NPT thread (ø32 only) (made-to-order product)					
GN	G thread (ø32 only) (made-to-order product)					
D Stroke (mm)						
Bore size	Stroke					
6 to 32	5, 10, 15					
E Switch model No.						
Axial lead wire	Radial lead wire	Contact	Voltage		Indicator	Lead wire
			AC	DC		
K0H*	K0V*	Reed	●	●	1-color LED	2-wire
K5H*	K5V*		●	●	No indicator lamp	
K2H*	K2V*	Proximity		●	1-color LED	2-wire
K3H*	K3V*			●		3-wire
K3PH*	K3PV*			●	1-color LED (made-to-order product)	3-wire
K2YH*	K2YV*			●	2-color LED	2-wire
K3YH*	K3YV*			●		3-wire
* Lead wire length						
Blank	1 m (Standard)					
3	3 m					
5	5 m					
F Switch quantity						
R	1 on rod side					
H	1 on head side					
D	2					

Precautions for model No. selection

*1: Refer to page 1392 for the min. stroke with switch.

*2: Copper and PTFE free as standard.

[Example of model No.]

SMG-XL-6-15-K0H-R

Model: Compact cylinder

A Model No. : Single acting push

B Bore size : ø6 mm

C Port thread : Rc thread

D Stroke : 15 mm

E Switch model No. : Reed switch K0H, lead wire length 1 m

F Switch quantity : 1 on rod side

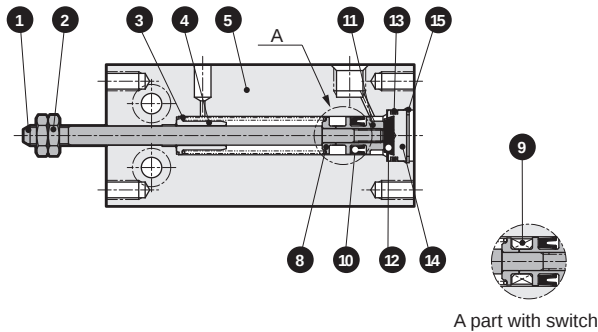
How to order switch

SW - **K2H**

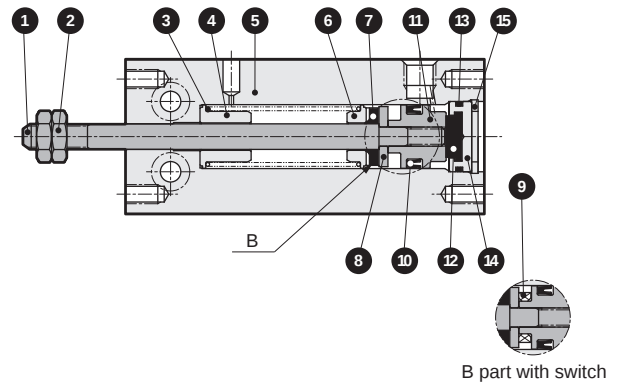
Switch model No.
(Item **E** above)

Internal structure and parts list

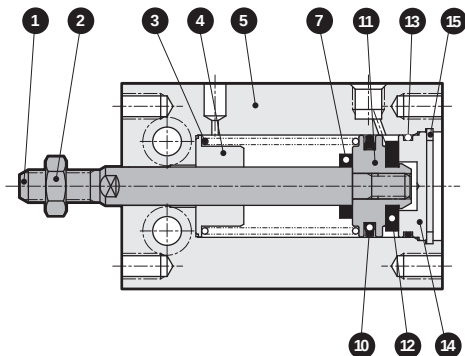
● $\phi 6$ (single acting push)



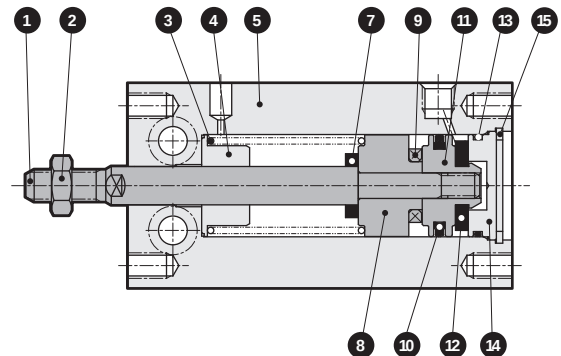
● $\phi 10$ (single acting push)



● $\phi 16$ to 32 (single acting push)



● $\phi 16$ to 32 (single acting push/with switch)



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Piston rod	Stainless steel	$\phi 20, 25, 32$ Industrial chrome plating	9	Magnet	-	
2	Rod nut	Steel	Nickeling	10	Piston packing	Nitrile rubber	
3	Coil spring	Piano wire	Electrodeposition	11	Piston	Aluminum alloy	Chromate
4	Spring holder	Aluminum alloy		12	Cushion rubber H	Urethane rubber	
5	Body	Aluminum alloy	Hard alumite	13	Cover gasket	Nitrile rubber	
6	Spring holder	Aluminum alloy		14	Cover	Aluminum alloy	Chromate
7	Cushion rubber R	Urethane rubber		15	C-snap ring	Steel	Zinc phosphate
8	Spacer	Aluminum alloy	Chromate				

Repair parts list

Bore size (mm)	Kit No.	Repair parts No.
$\phi 6$	SMG-X-6K	10 12 13
$\phi 10$	SMG-X-10K	7 10 12 13
$\phi 16$	SMG-X-16K	

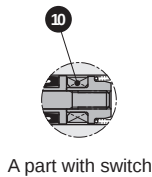
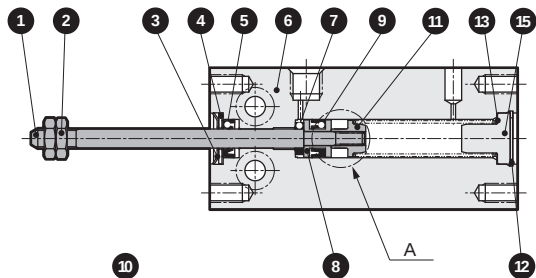
Bore size (mm)	Kit No.	Repair parts No.
$\phi 20$	SMG-X-20K	7 10 12 13
$\phi 25$	SMG-X-25K	
$\phi 32$	SMG-X-32K	

SMG-Y Series

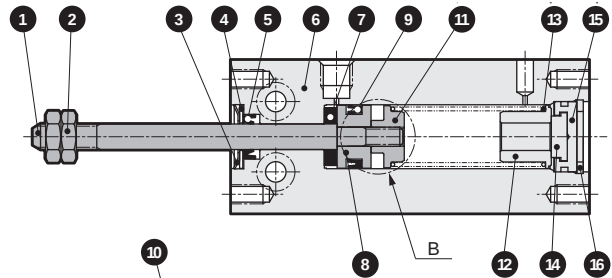
Internal structure and parts list

● ø6 (single acting pull)

● ø10 (single acting pull)



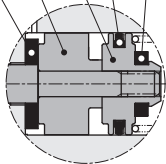
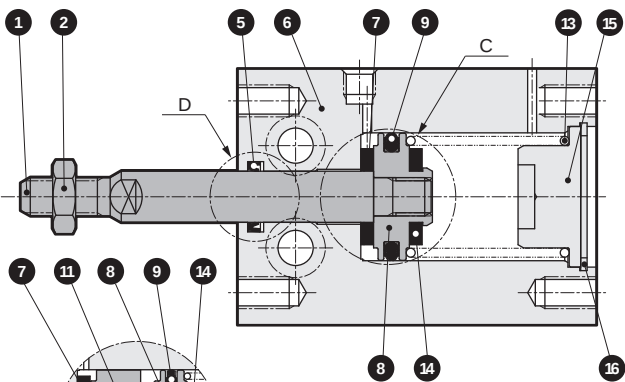
A part with switch



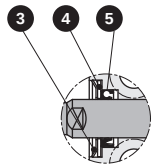
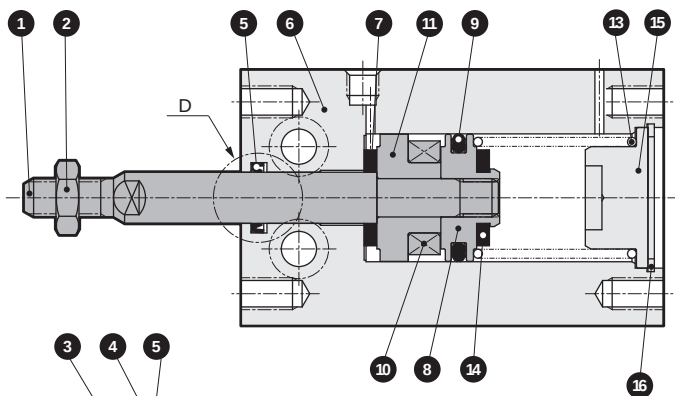
B part with switch

● ø16 to 32 (single acting pull)

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



C part ø16



D part ø16

No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Piston rod	Stainless steel	ø20, 25, 32 Industrial chrome plating	9	Piston packing	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	Nitrile rubber		13	Coil spring	Piano wire	Electrodeposition
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-snap ring	Steel	Zinc phosphate

Repair parts list

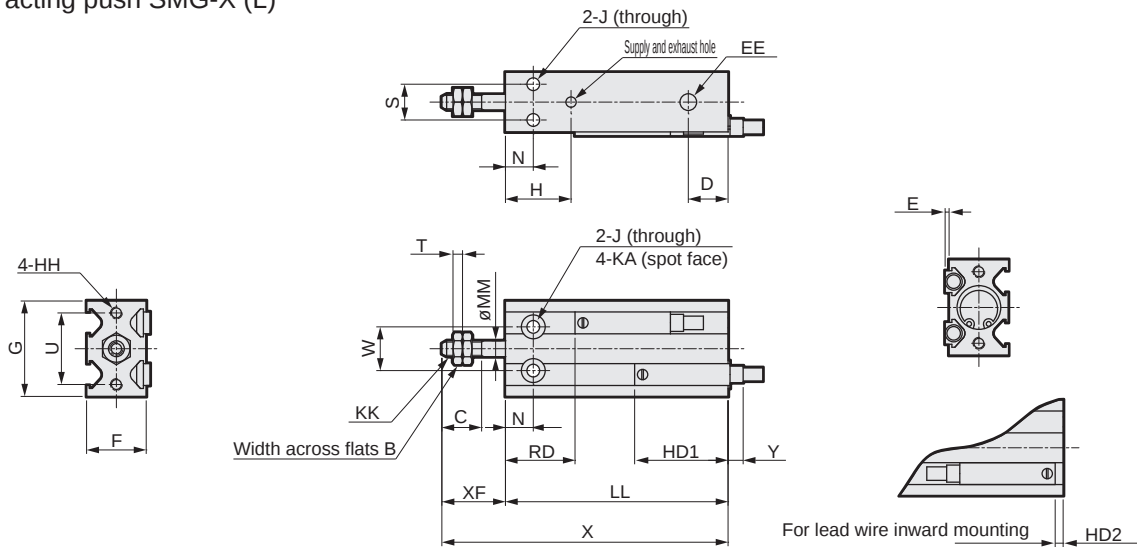
Bore size (mm)	Kit No.	Repair parts No.
ø6	SMG-Y-6K	3 5 7 9
ø10	SMG-Y-10K	3 5 7 9 14
ø16	SMG-Y-16K	

Bore size (mm)	Kit No.	Repair parts No.
ø20	SMG-Y-20K	
ø25	SMG-Y-25K	5 7 9 14
ø32	SMG-Y-32K	

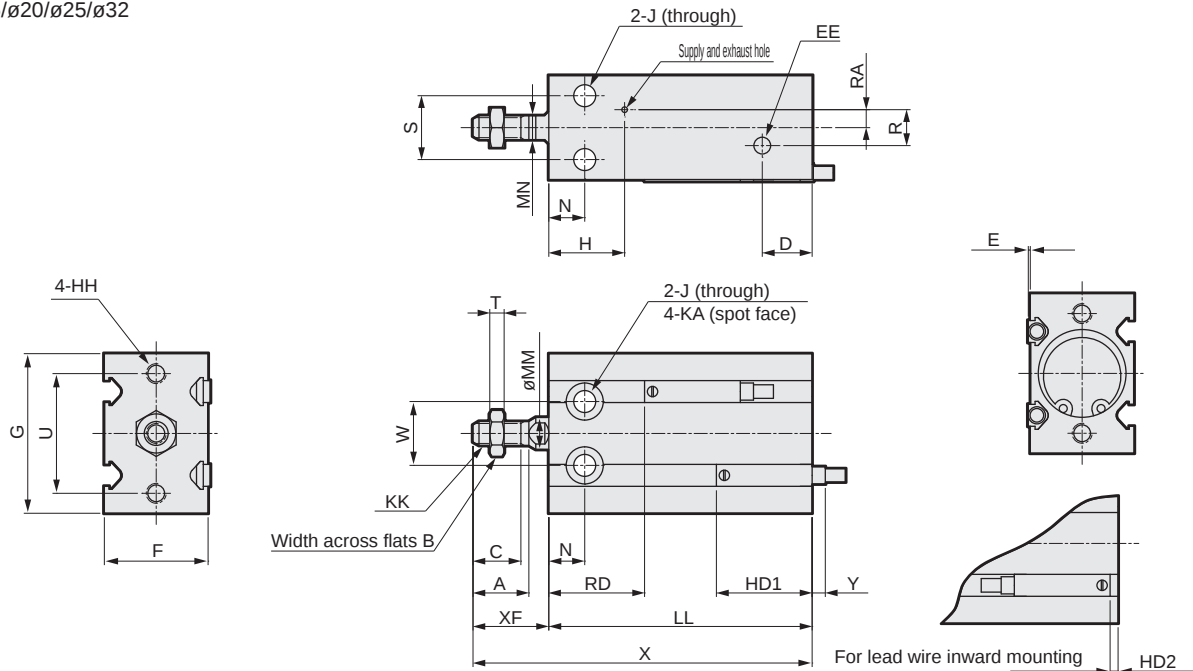
Dimensions



● Single acting push SMG-X (L) ø6/10



ø16/ø20/ø25/ø32



Code	A	B	C	D	EE	F	G	H	HH	J	KA	KK	MM	MN	N	R	RA	S	T
Bore size																			
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	M10x1.25	12	10	11	13.5	4.5	24	6

Code	U	W	XF	LL						X						E	HD1	HD2	RD			Y (*1)
Bore size				No switch			With switch			No switch			With switch						5st.	10st.	15st.	
ø6	17	10	13	38	43	48	38	43	48	51	56	61	51	56	61	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	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	0.5	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	0.5	27	8	19	24	0	
ø25	38	20	23	45	50	60	55	60	70	68	73	83	78	83	93	0.5	29	10	21	26	-2	
ø32	48	24	27	47	52	62	57	62	72	74	79	89	84	89	99	0.5	30.5	11.5	21.5	26.5	-3.5	

*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: Refer to page 1409 for HD, RD, and protruding dimensions of 2-color LED switches.

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/
COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/
MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

FJ

FK

Spd
Contr

Ending

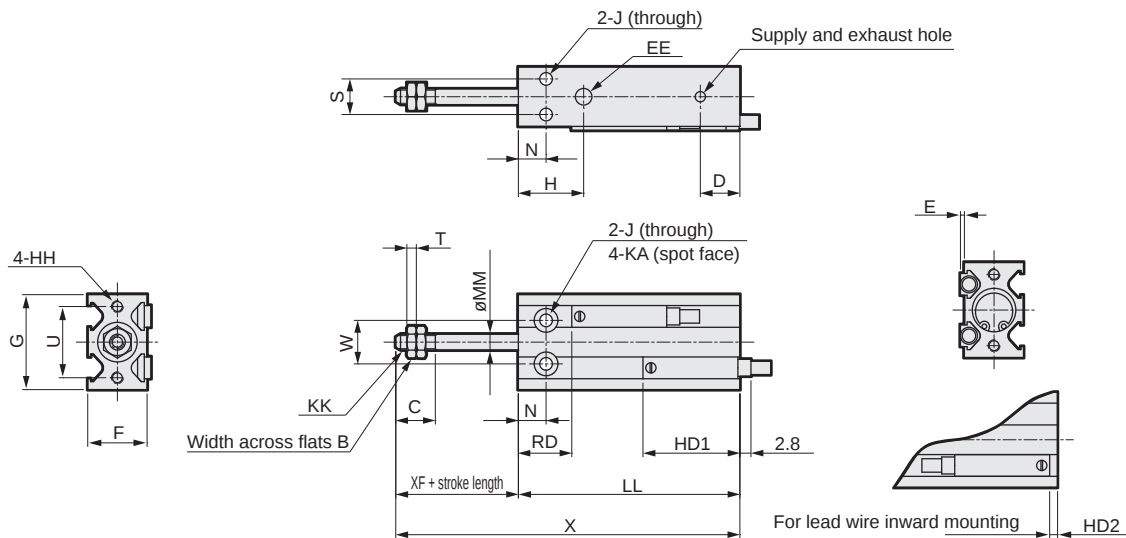
SMG-Y Series

Dimensions

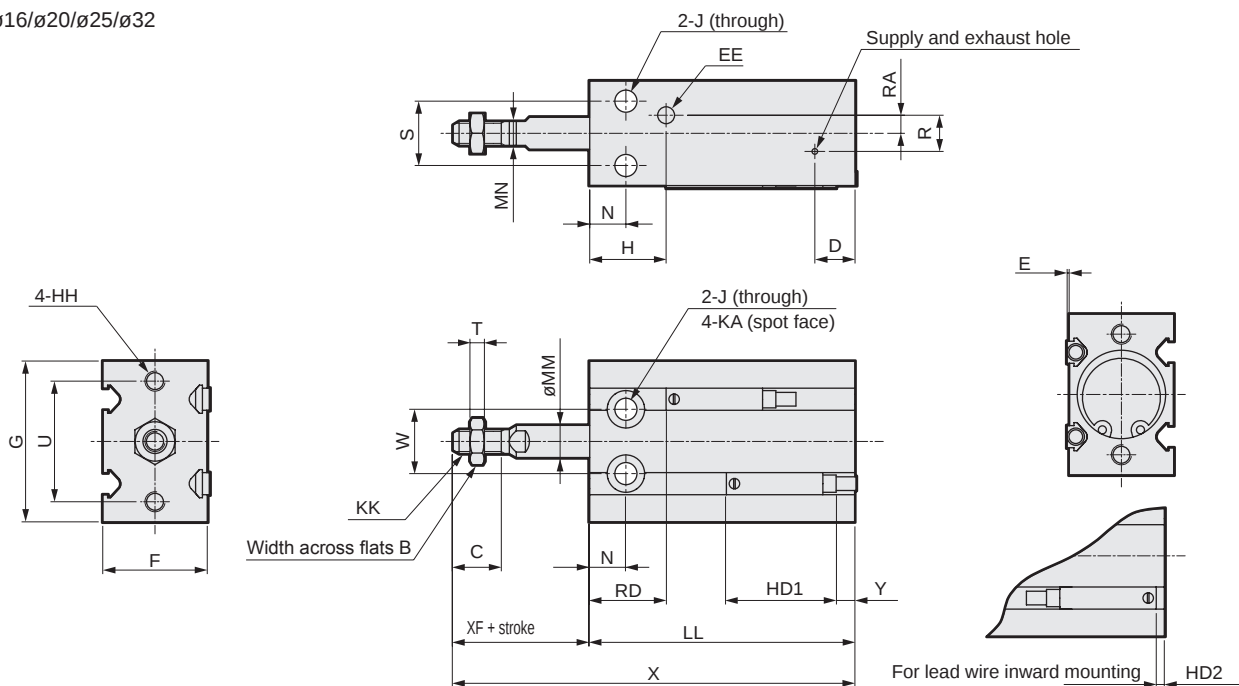


● Single acting pull SMG-Y (L)

ø6/10



ø16/ø20/ø25/ø32



Code	A	B	C	D	EE	F	G	H	HH	J	KA	KK	MM	MN	N	R	RA	S	T	U
Bore size																				
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	M10x1.25	12	10	11	13.5	4.5	24	6	48

Code	W	XF	LL						X						E	HD1			HD2		RD	Y (*1)		
Bore size			No switch			With switch			No switch			With switch				5, 10st.			5, 10st.			5, 10st.		
			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	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	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	0.5	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	0.5	27	32	8	13	19	0	-5		
ø25	20	23	45	50	60	55	60	70	73	83	98	83	93	108	0.5	29	34	10	15	21	-2	-7		
ø32	24	27	47	52	62	57	62	72	79	89	104	89	99	114	0.5	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: Refer to page 1409 for HD, RD, and protruding dimensions of 2-color LED switches.

MEMO

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/
COVP/IN2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/
MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

FJ

FK

Spd
Contr

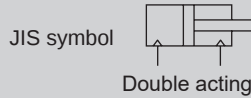
Ending



Compact cylinder double acting/fine speed

SMG-F Series

● Bore size: $\varnothing 6/\varnothing 10/\varnothing 16/\varnothing 20/\varnothing 25/\varnothing 32$



RoHS

Specifications

1 MPa $\approx$ 145.0 psi, 1 MPa = 10 bar

Item	SMG-F SMG-LF (with switch)						
Bore size	mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation	Double acting						
Working fluid	Compressed air						
Max. working pressure	MPa	0.7 (≈100 psi, 7 bar)					
Min. working pressure	MPa	0.12	0.06 (≈8.7 psi, 0.6 bar)		0.05 (≈7.3 psi, 0.5 bar)		
Proof pressure	MPa	1.05 (≈150 psi, 10.5 bar)					
Ambient temperature	°C	5 (41°F) to 60 (140°F)					
Port size		M5					Rc1/8
Stroke tolerance	mm	+1.5 0					
Working 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)
ø 6	5, 10, 15, 20, 25, 30	5
ø10		
ø16		
ø20	5, 10, 15, 20, 25, 30, 40, 50	
ø25		
ø32		

Min. stroke with switch

Bore size	1-color LED		2-color LED	
	K□H	K□V	K□YH	K□YV
$\varnothing 6$	5	5	5	5
$\varnothing 10$				
$\varnothing 16$				
$\varnothing 20$				
$\varnothing 25$				
$\varnothing 32$				

*1: The custom stroke is available in 5 mm increments.

Switch specifications

● 1-color/2-color LED

Item	2-wire proximity		3-wire proximity			2-wire reed	
	K2H/K2V	K2YH/ K2YV	K3H/K3V	K3PH/K3PV (Made to order)	K3YH/ K3YV	K0H/K0V	K5H/K5V
Applications	Dedicated for programmable controller		For programmable controller, relay			For programmable controller, relay	For programmable controller, relay, IC circuit (without indicator), serial connection
Output method	-		NPN output	PNP output	NPN output	-	
Power supply voltage	-		10 to 28 VDC			-	
Load voltage	10 to 30 VDC		30 VDC or less			12 V/24 VDC	110 VAC
Load current	5 to 20 mA (*3)		50 mA or less			5 to 50 mA	7 to 20 mA
Indicator	LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	-
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: 31 3 m: 85 5 m: 139	1 m: 18 3 m: 49 5 m: 80	

*1: Refer to Ending Page 1 for detailed switch specifications and dimensions.

*2: Switches other than the above models, such as switches with connectors, are also available. Refer to Ending Page 1.

*3: The max. load current is 20 mA at 25 $^{\circ}\text{C}$. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25 $^{\circ}\text{C}$. (5 to 10 mA at 60 $^{\circ}\text{C}$)

Weight

Same as SMG Series (double acting/single rod). Refer to page 1387.

Dimensions

Same as SMG Series (double acting/single rod). Refer to page 1390.

Cylinder weight

(Unit: g)

Model No. Bore size	Product weight when stroke S = 0 mm		Additional weight per S = 5 mm
	SMG-F double acting	SMG-LF double acting/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 56 g
- Additional weight when S = 10 mm 6 g x 10/5 = 12 g
- Weight of 2 cylinder switches 18 g x 2 = 36 g
- Product weight 56 g + 12 g + 36 g = 104 g

Theoretical thrust table

(Unit: N)

Bore size (mm)	Operating direction	Working 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	1.01x10 ²	1.21x10 ²	1.41x10 ²
	Pull	17.3	25.9	34.6	51.8	69.1	86.4	1.04x10 ²	1.21x10 ²
ø20	Push	31.4	47.1	62.8	94.2	1.26x10 ²	1.57x10 ²	1.88x10 ²	2.20x10 ²
	Pull	26.4	39.6	52.8	79.2	1.06x10 ²	1.32x10 ²	1.58x10 ²	1.85x10 ²
ø25	Push	49.1	73.6	98.2	1.47x10 ²	1.96x10 ²	2.45x10 ²	2.95x10 ²	3.44x10 ²
	Pull	41.2	61.9	82.5	1.24x10 ²	1.65x10 ²	2.06x10 ²	2.47x10 ²	2.89x10 ²
ø32	Push	80.4	1.21x10 ²	1.61x10 ²	2.41x10 ²	3.22x10 ²	4.02x10 ²	4.83x10 ²	5.63x10 ²
	Pull	69.1	1.04x10 ²	1.38x10 ²	2.07x10 ²	2.76x10 ²	3.46x10 ²	4.15x10 ²	4.84x10 ²

SMG-F Series

How to order

No switch (without magnet for switch)

SMG-F - **32** - **25**

With switch (built-in magnet for switch)

SMG-LF - **32** - **25** - **K2H** - **R**

A Model No.

B Bore size

C Port thread

D Stroke

E Switch model No.

Precautions for model No. selection

*1: Refer to page 1400 for the min. stroke with switch.

[Example of model No.]

SMG-LF-6-15-K0H-R

Model: Compact cylinder

A Model No. : Double acting/fine speed/with switch

B Bore size : $\phi 6$ mm

C Port thread : Rc thread

D Stroke : 15 mm

E Switch model No. : Reed switch K0H,
Lead wire length 1 m

F Switch quantity : 1 on rod side

How to order switch

SW - **K2H**

Switch model No.
(Item **E** above)

Code	Description
A Model No.	
SMG-F	Double acting/fine speed
SMG-LF	Double acting/fine speed/with switch

B Bore size (mm)	
6	$\phi 6$
10	$\phi 10$
16	$\phi 16$
20	$\phi 20$
25	$\phi 25$
32	$\phi 32$

C Port thread	
Blank	Rc thread
NN	NPT thread ($\phi 32$ only)
GN	G thread ($\phi 32$ only)

D Stroke (mm)		Applicable bore size					
		$\phi 6$	$\phi 10$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$
Standard stroke	5	●	●	●	●	●	●
	10	●	●	●	●	●	●
	15	●	●	●	●	●	●
	20	●	●	●	●	●	●
	25	●	●	●	●	●	●
	30	●	●	●	●	●	●
	40				●	●	●
	50				●	●	●

E Switch model No.						
Axial lead wire	Radial lead wire	Contact	Voltage		Indicator	Lead wire
			AC	DC		
K0H*	K0V*	Reed	●	●	1-color LED	2-wire
K5H*	K5V*		●	●	No indicator lamp	
K2H*	K2V*	Proximity		●	1-color LED	2-wire
K3H*	K3V*			●		3-wire
K3PH*	K3PV*			●	1-color LED (custom)	3-wire
K2YH*	K2YV*			●	2-color LED	2-wire
K3YH*	K3YV*			●		3-wire

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

F Switch quantity	
R	1 on rod side
H	1 on head side
D	2

F Switch quantity

MEMO

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/
COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/
MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

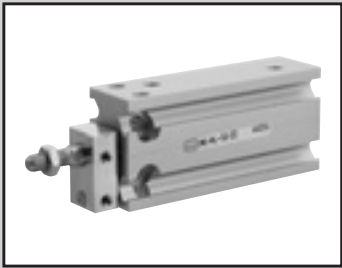
FJ

FK

Spd
Contr

Ending

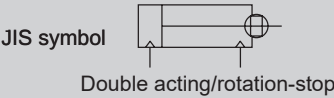
SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/
COVPIN2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/
MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd
Contr
Ending



Compact cylinder double acting/rotation-stop

SMG-M Series

● Bore size: ø6/ø10/ø16/ø20/ø25/ø32



Specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item		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 (≈100 psi, 7 bar)					
Min. working pressure	MPa	0.15	0.10 (≈15 psi, 1 bar)		0.08 (≈12 psi, 0.8 bar)		
Proof pressure	MPa	1.05 (≈150 psi, 10.5 bar)					
Ambient temperature	°C	-10 (14°F) to 60 (140°F) (no freezing)					
Port size		M5					Rc1/8
Stroke tolerance	mm	+1.5 0					
Working piston speed	mm/s	50 to 500					
Cushion		With rubber cushion					
Lubrication		Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)					
Non-rotating accuracy	*1	±0.8°			±0.5°		
Allowable 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 retracted end (excluding piston rod deflection).

Stroke

Bore size (mm)	Standard stroke (mm)	Min. stroke (mm)
ø 6	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		

*1: The custom stroke is available in 5 mm increments.

Min. stroke with switch

Bore size	1-color LED		2-color LED	
	K □ H	K □ V	K □ YH	K □ YV
ø 6	5	5	5	5
ø10				
ø16				
ø20				
ø25				
ø32				

Switch specifications

● 1-color/2-color LED

Item	2-wire proximity		3-wire proximity			2-wire reed			
	K2H/K2V	K2YH/ K2YV	K3H/K3V	K3PH/K3PV (Made to order)	K3YH/ K3YV	K0H/K0V		K5H/K5V	
Applications	Dedicated for programmable controller		For programmable controller, relay			For programmable controller, relay		For programmable controller, relay, IC circuit (without indicator), serial connection	
Output method	-		NPN output	PNP output	NPN output	-			
Power supply voltage	-		10 to 28 VDC			-			
Load voltage	10 to 30 VDC		30 VDC or less			12 V/24 VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 20 mA (*1)		50 mA or less			5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator	LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)		-	
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			

*1: Refer to Ending Page 1 for detailed switch specifications and dimensions.

*2: Switches other than the above models, such as switches with connectors, are also available. Refer to Ending Page 1.

*3: The max. load current is 20 mA at 25°C. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C)

Cylinder weight

(Unit: g)

Model No.	Product weight when stroke S = 0 mm		Additional weight per S = 5mm
	SMG-M	SMG-ML	
Bore size	Double acting/rotation-stop	Double acting/rotation-stop/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 66 g
- Additional weight when S = 10 mm 6 g x 10/5 = 12 g
- Weight of 2 cylinder switches 18 g x 2 = 36 g
- Product weight 66 g + 12 g + 36 g = 114 g

Theoretical thrust table

(Unit: N)

Bore size (mm)	Operating direction	Working 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	1.01x10 ²	1.21x10 ²	1.41x10 ²
	Pull	17.3	25.9	34.6	51.8	69.1	86.4	1.04x10 ²	1.21x10 ²
ø20	Push	31.4	47.1	62.8	94.2	1.26x10 ²	1.57x10 ²	1.88x10 ²	2.20x10 ²
	Pull	26.4	39.6	52.8	79.2	1.06x10 ²	1.32x10 ²	1.58x10 ²	1.85x10 ²
ø25	Push	49.1	73.6	98.2	1.47x10 ²	1.96x10 ²	2.45x10 ²	2.95x10 ²	3.44x10 ²
	Pull	41.2	61.9	82.5	1.24x10 ²	1.65x10 ²	2.06x10 ²	2.47x10 ²	2.89x10 ²
ø32	Push	80.4	1.21x10 ²	1.61x10 ²	2.41x10 ²	3.22x10 ²	4.02x10 ²	4.83x10 ²	5.63x10 ²
	Pull	69.1	1.04x10 ²	1.38x10 ²	2.07x10 ²	2.76x10 ²	3.46x10 ²	4.15x10 ²	4.84x10 ²

SMG-M Series

How to order

No switch (without magnet for switch)

SMG-M - **32** - **25**

With switch (built-in magnet for switch)

SMG-ML - **32** - **25** - **K2H** - **R**

A Model No.

B Bore size

C Port thread

D Stroke

E Switch model No.

Precautions for model No. selection

*1: Refer to page 1404 for the min. stroke with switch.

*2: Copper and PTFE free as standard.

[Example of model No.]

SMG-ML-6-15-K0H-R

Model: Compact cylinder

A Model No. : Double acting/rotation-stop/with switch

B Bore size : $\phi 6$ mm

C Port thread : Rc thread

D Stroke : 15 mm

E Switch model No. : Reed switch K0H,
Lead wire length 1 m

F Switch quantity : 1 on rod side

How to order switch

SW - **K2H**

Switch model No.
(Item **E** above)

Code	Description
A Model No.	
SMG-M	Double acting/rotation-stop
SMG-ML	Double acting/rotation-stop/with switch

B Bore size (mm)	
6	$\phi 6$
10	$\phi 10$
16	$\phi 16$
20	$\phi 20$
25	$\phi 25$
32	$\phi 32$

C Port thread	
Blank	Rc thread
NN	NPT thread ($\phi 32$ only) (made-to-order product)
GN	G thread ($\phi 32$ only) (made-to-order product)

D Stroke (mm)		Applicable bore size					
		$\phi 6$	$\phi 10$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$
Standard stroke	5	●	●	●	●	●	●
	10	●	●	●	●	●	●
	15	●	●	●	●	●	●
	20	●	●	●	●	●	●
	25	●	●	●	●	●	●
	30	●	●	●	●	●	●
	40	●	●	●	●	●	●
	50	●	●	●	●	●	●
	60	●	●	●	●	●	●
	70				●	●	●
	80				●	●	●
	90				●	●	●
	100				●	●	●

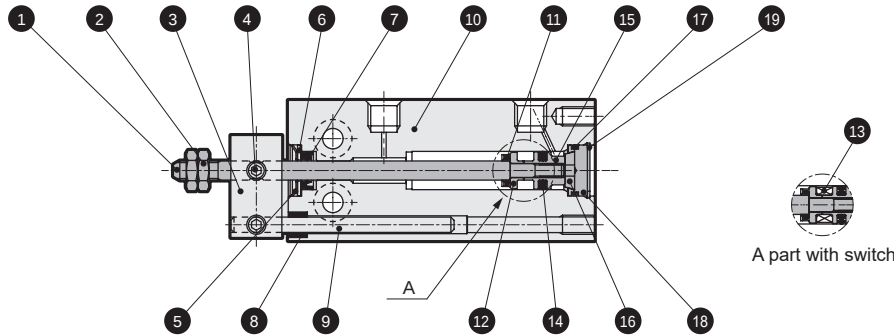
E Switch model No.						
Axial lead wire	Radial lead wire	Contact	Voltage		Indicator	Lead wire
			AC	DC		
K0H*	K0V*	Reed	●	●	1-color LED	2-wire
K5H*	K5V*		●	●	No indicator lamp	
K2H*	K2V*	Proximity		●	1-color LED	2-wire
K3H*	K3V*			●		3-wire
K3PH*	K3PV*			●	1-color LED (custom)	3-wire
K2YH*	K2YV*			●	2-color LED	2-wire
K3YH*	K3YV*			●		3-wire

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

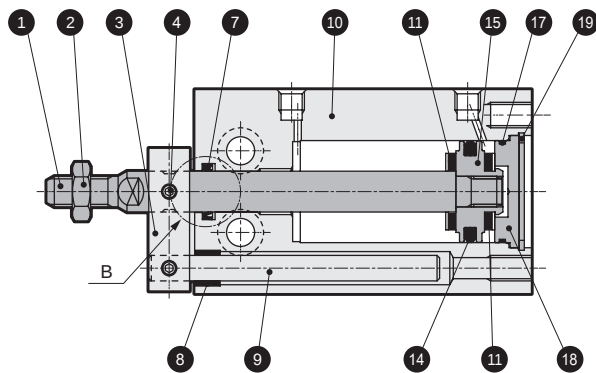
F Switch quantity	
R	1 on rod side
H	1 on head side
D	2

Internal structure and parts list

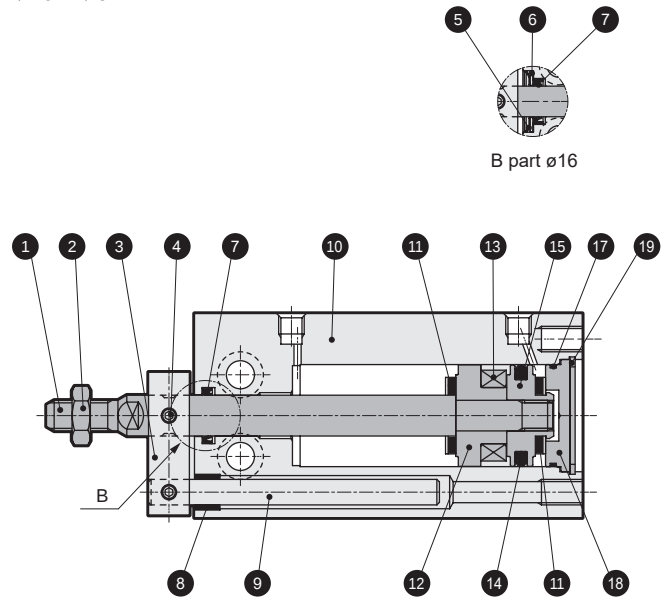
- SMG-M-6/10 (double acting/rotation-stop)
- $\phi 6/\phi 10$



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



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



No.	Part name	Material	Remarks	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	Nickeling	12	Spacer	Aluminum alloy	Chromate
3	Rotation-stop plate	Aluminum alloy	Chromate	13	Magnet	-	
4	Hexagon socket set screw	Stainless steel		14	Piston packing	Nitrile rubber	
5	CR type snap 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	Rotation-stop bush	Acetal resin		18	Cover	Aluminum alloy	Chromate
9	Guide bar	Stainless steel	$\phi 32$ Industrial chrome plating	19	C-snap ring	Steel	Zinc phosphate
10	Body	Aluminum alloy	Hard alumite				

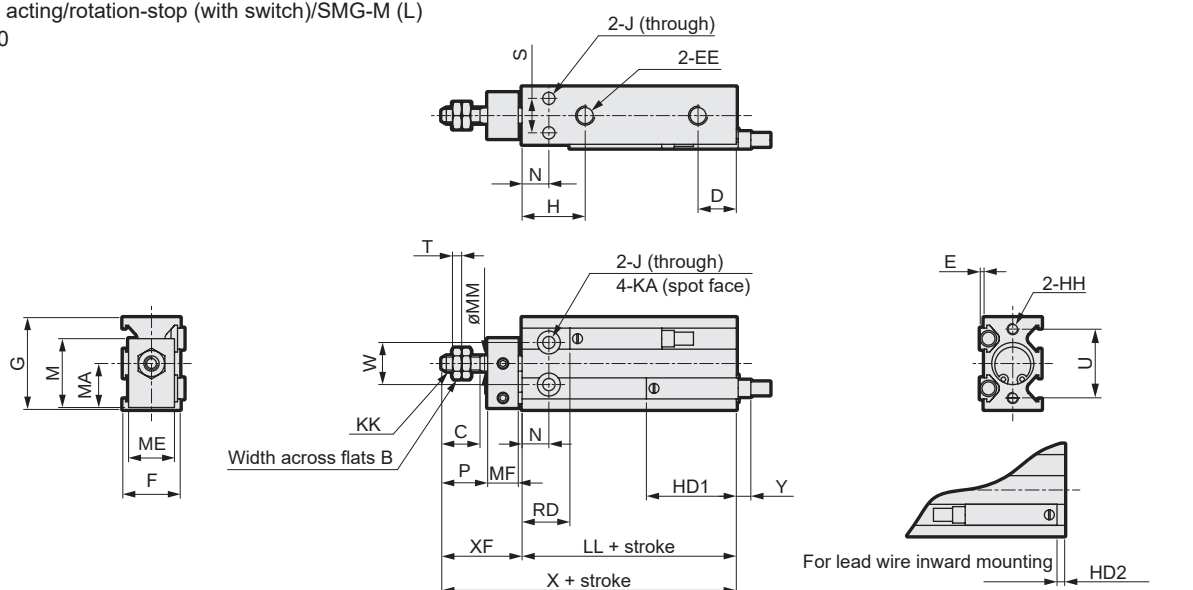
Repair parts list

Bore size (mm)	Kit No.	Repair parts No.	Bore size (mm)	Kit No.	Repair parts No.
$\phi 6$	SMG-6K	5 7 11 14 16 17	$\phi 20$	SMG-20K	7 11 14 16 17
$\phi 10$	SMG-10K		$\phi 25$	SMG-25K	
$\phi 16$	SMG-16K		$\phi 32$	SMG-32K	

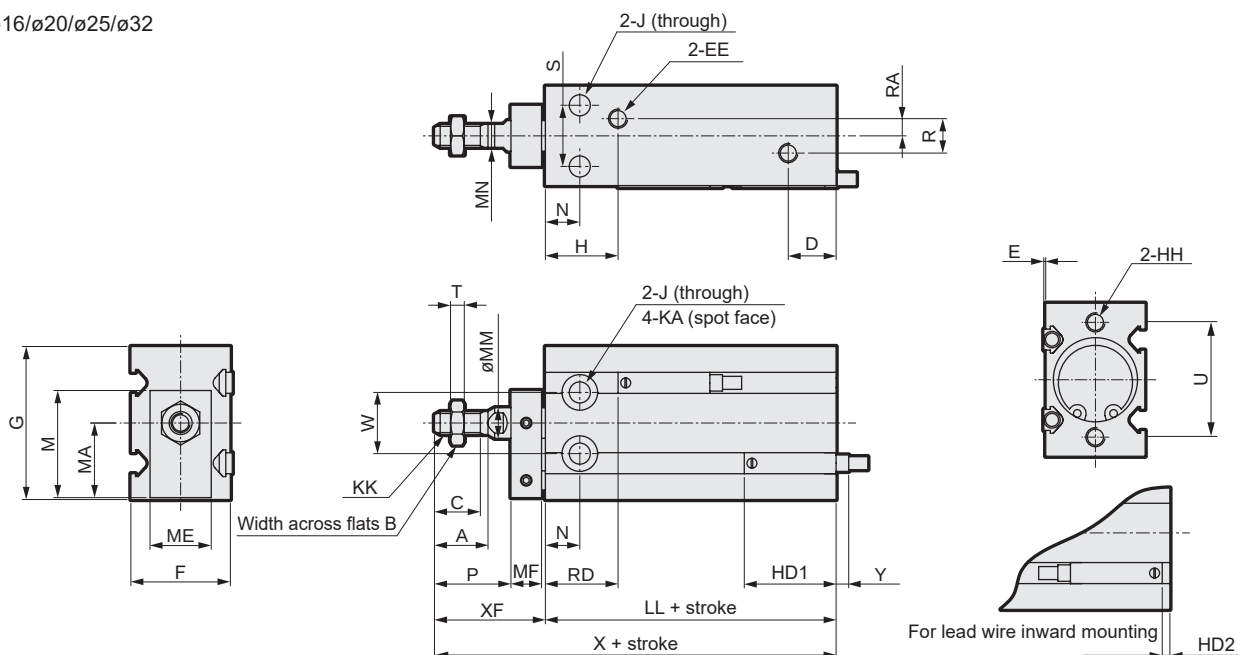
Dimensions

● 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	MN	N	P	R	RA
Bore size																						
$\phi 6$	-	5.5	7	10	M5	13	22	15	M3 depth 5	3.2	6 depth 4.8	M3	16	10.5	11	8	3	-	7	9	-	-
$\phi 10$	-	7	10	10	M5	15	24	16.5	M3 depth 5	3.2	6 depth 5	M4	18	11.5	12	8	4	-	7	12	-	-
$\phi 16$	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	5	7	17	4	2
$\phi 20$	14	10	12	12.5	M5	26	40	19	M5 depth 8	5.5	9 depth 8	M6	28	19.5	16	8	8	6	9	20	9	4.5
$\phi 25$	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	8	10	22	9	4.5
$\phi 32$	22	17	19.5	12.5	Rc1/8	40	62	23	M6 depth 9	6.6	11 depth 11.5	M10x1.25	42.5	30.5	24	12	12	10	11	29	13.5	4.5

Code	S	T	U	W	XF	LL		X		E	HD1	HD2	RD	Y
Bore size						No switch	With switch	No switch	With switch					
ø6	7	1.8	17	10	18	33	33	51	51	1	20	1	13	7
ø10	9	2.4	18	11	21	36	36	57	57	1	23.5	4.5	12.5	3.5
ø16	12	3.2	25	14	26	30	40	56	66	0.5	24.5	5.5	15.5	2.5
ø20	16	3.6	30	16	29	36	46	65	75	0.5	27	8	19	0
ø25	20	5	38	20	33	40	50	73	83	0.5	29	10	21	-2
ø32	24	6	48	24	42	42	52	84	94	0.5	30.5	11.5	21.5	-3.5

*1 : 14.5 for 5 stroke without switch

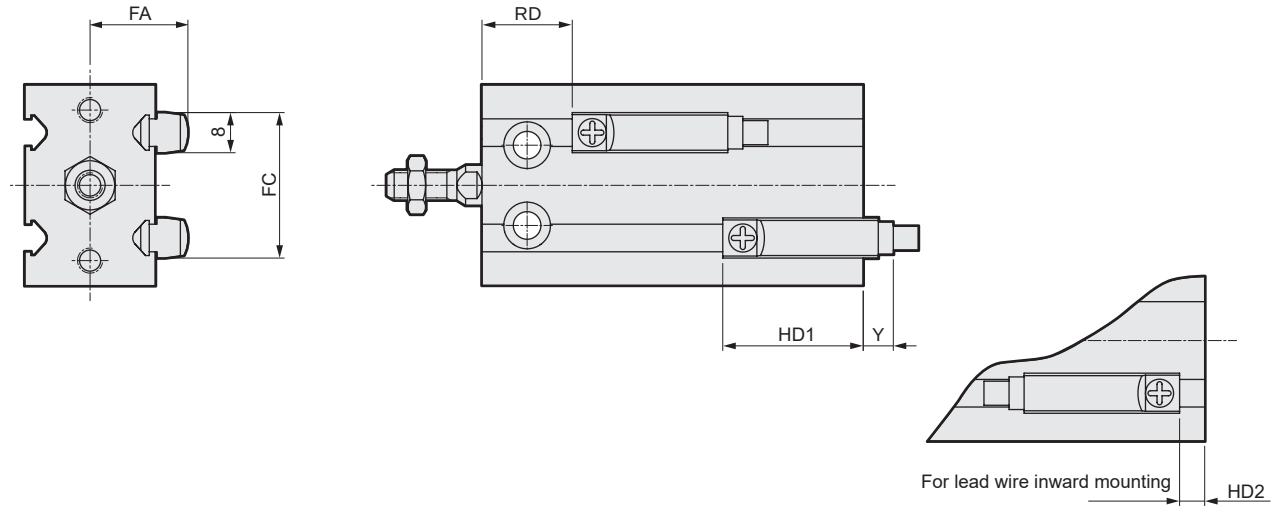
*2 : Y dimensions indicate the protruding dimensions from the end surface of the switch body. (Negative dimensions indicate the pull dimensions from the end surface of the body)

*3 : To calculate LL+ stroke or X+ stroke when using custom stroke, apply the next longer standard stroke (instead of the custom stroke) to the stroke value. (Example: If the custom stroke is 35 mm, apply the standard stroke of 40 mm)

*4 : Refer to page 1409 for HD, RD, and protruding dimensions of 2-color LED switches.

SMG Series with switch common dimensions (2-color LED)

- SMG-L (with switch: K2Y^H/_V, K3Y^H/_V)
 - XL
 - YL
 - ML
 - LF



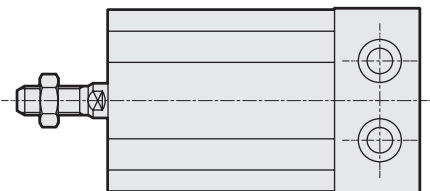
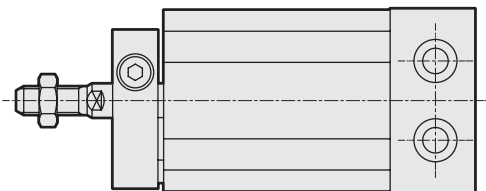
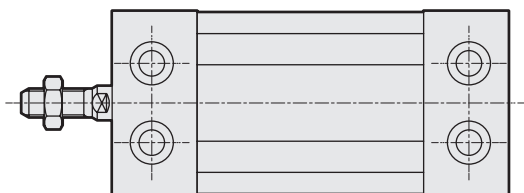
Code	FA	FC	Double acting, double acting/fine speed (F), double acting/rotation-stop (M)						Single acting/push (X)						Single acting/pull (Y)									
Bore size			HD1	HD2	RD	Y		HD1	HD2	RD		Y		HD1		HD2		RD	Y (*1)					
						Axial lead wire	Radial lead wire			5, 10st.	15st.	Axial lead wire	Radial lead wire	5, 10st.	15st.	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		

*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)

Guide to compact cylinder SMD2 compatibility

SMD2 Series models have been changed to SMG Series from October 2015.

Since some of the mounting set for SMD2 do not exist for SMG, compatible devices are provided to support such mounting. (Made-to-order product)
If you need these mounting while using SMD2 at this time, contact CKD.

Mounting	SMD2 compatible dimensions	
	Double acting/single acting/fine speed	Rotation-stop
DA	Supported with SMG standard products. SMD2 compatible mounting. However, the total length is shorter.	
DB		
DC		

Other guides

(1) Specification values

Note that there is a change in spring load value of single acting/push and single acting/pull in SMD2 compatible dimensions.

(2) Dimensions

Some port positions are changed.

* Check with CKD for details.

MEMO

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/
COVP/IN2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/
MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

FJ

FK

Spd
Contr

Ending



Safety Precautions

Be sure to read this section before use.

Refer to Intro Page 73 for general information of the cylinder, and to Intro Page 80 for general information of the cylinder switch.

Product-specific cautions: Compact cylinder SMG Series

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.

Applying lubrication may cause changes in characteristics.

■ Assemble the speed controller near the cylinder.

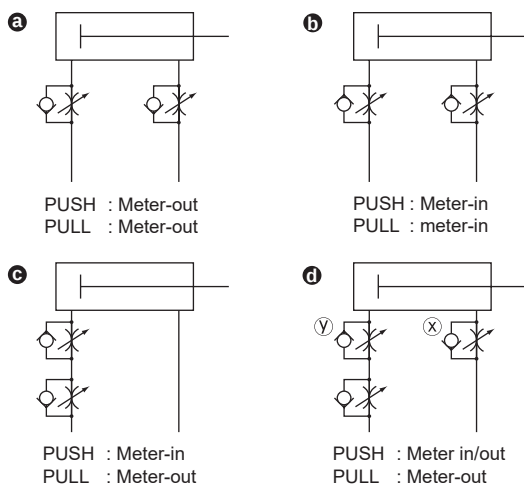
When installed far from the cylinder, the speed becomes unstable.
For the speed controller, SC-M3/M5-F, SCD-M3/M5-F Series are recommended.

■ In general, the speed is stabler at higher air pressure and lower load factor.

Use at a 50% or less load factor.

■ Stable speed control is achieved with a meter-out circuit.

When fine speed activation is performed with operating direction PUSH for the single rod cylinder, the popping out phenomenon occurs when operation starts if the load resistance is low. For countermeasures, use the **b**, **c**, or **d** circuit. Note that circuit **d** is the most stable.

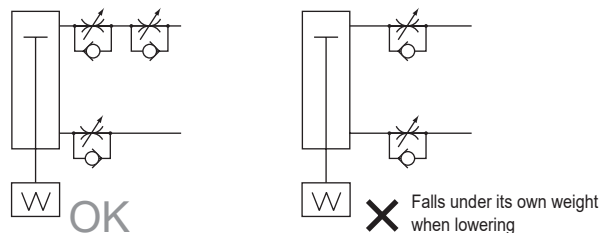


Speed adjustment method for PUSH operation of **d** circuit:

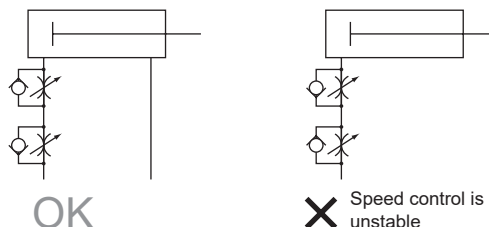
1. Set the speed with the speed controller x.
2. Restrict the speed with the speed controller y until there is no popping out.
3. Check the speed again.

(*1) When compared to **b** **c** **d** the circuit **d** is the most stable.

(*2) For vertical mounting, combine the cylinder with a meter-out circuit, as it will fall under its own weight when a meter-in circuit is used.



(*3) Use the circuit shown in the figure below for the serial connection of the speed controllers.



(Guidelines for pop-out generation)

Popping out occurs in the following cases.

· Thrust > Resistance

* Resistance: Thrust caused by residual pressure on the exhaust side + { When using horizontally: frictional force caused by load
(in the fine speed, suction pressure = residual pressure) { When using vertically: load self-weight

■ Do not apply a lateral load to the cylinder.

With a lateral load, operation will become unstable.

■ Avoid using this product where vibration is present.

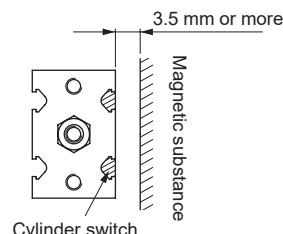
The product will be adversely affected by vibration and operation will become unstable.

Mounting, installation and adjustment

1. Common

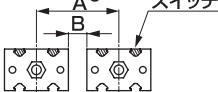
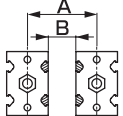
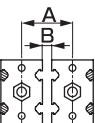
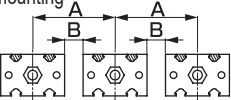
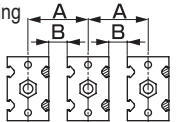
CAUTION

■The cylinder switch may malfunction if there is a magnetic substance such as a metal plate installed adjacently. Check that a distance of 3.5mm is provided from the surface of the cylinder switch.
(Same for all bore sizes)



■The cylinder switch may malfunction when cylinders are installed adjacently. In order to prevent switch malfunctions, provide a mounting pitch of the value in the table below and over.

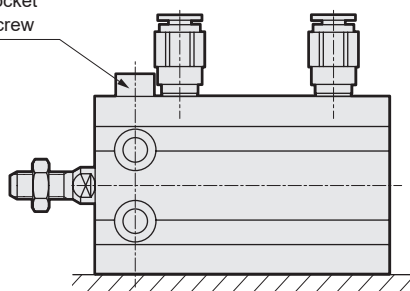
(Unit: mm)

Conditions of side-by-side installation			Switch model No.	ø6	ø10	ø16	ø20	ø25	ø32	Remarks
Two cylinders in parallel	• Horizontal mounting 	A	K0, K5	27	29	37	45	55	67	
			K2, K3							
		B	K0, K5	4.5						
			K2, K3							
	• Vertical mounting Next to switch cylinder side Mounting on 	A	K0, K5	28	21	25	33	41	46	Note that switch position cannot be adjusted if the length of the screwdriver is longer than B dimension with cylinders mounted.
			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 mounting Switch on side Cylinder Opposite side 	A	K0, K5	14	16	21	27	33	41	
			K2, K3							
		B	K0, K5	0.5						
			K2, K3							
3 or more cylinders in parallel	• Horizontal mounting 	A	K0, K5	27	29	37	45	55	67	
			K2, K3							
		B	K0, K5	4.5						
			K2, K3							
	• Vertical mounting 	A	K0, K5	19	22	26	34	42	47	Note that switch position cannot be adjusted if the length of the screwdriver is longer than B dimension with cylinders mounted.
			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	

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

Fig. 1

Hexagon socket head cap screw



Item	Port size	Recommended fittings	Item	Port size	Recommended fittings
Bore size			Bore size		
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 GWS 4,6,8-6 GWS4,6,8-6-S GWL4,6,8-6

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

*2) Excluding 5 or 10 strokes or mounting method in "Fig. 1".

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/
COVPIN2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/
MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd
Contr
Ending

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

Bore size	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 the single acting cylinder pressurized. If it is left pressurized for long periods, the piston rod may not return due to spring load when the pressure is released.

3. Fine speed SMG-F

⚠ CAUTION

- Perform adjustment such as centering so that a lateral load is not applied to the cylinder. In addition, install and adjust the sliding guide to avoid twisting.
 - When the load or the resistance fluctuates, operation becomes unstable.
 - With a large difference between static friction and kinematic friction of the guide, operation becomes unstable.

4. Rotation-stop SMG-M

⚠ CAUTION

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

Use/maintenance

1. Rotation-stop SMG-M

⚠ CAUTION

- 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 size	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