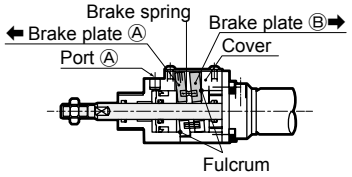
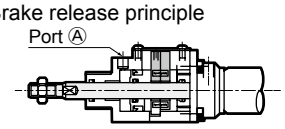
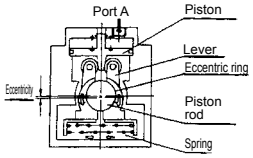
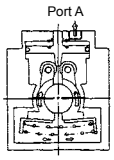
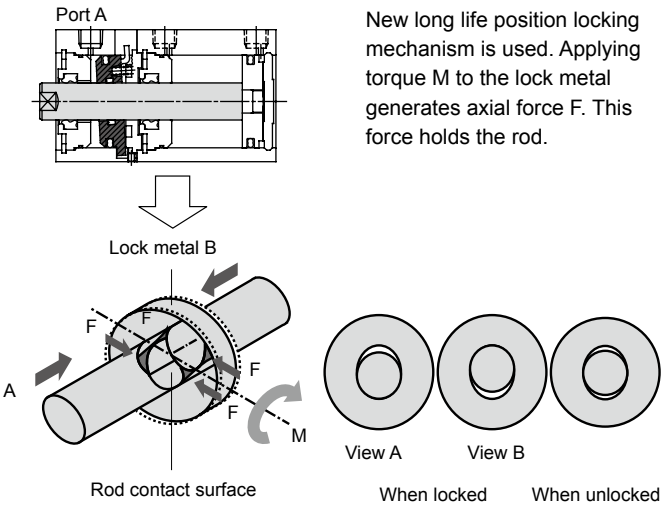
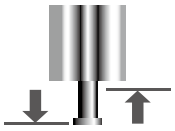
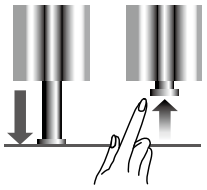
Product MAP with brake function

1) Cylinder with position locking and brake

Model	Function	Structure/Operational principle	Driving cylinder	Features
ULKP ULK	With brake (Stop when operating)	Swash plate ● Brake operating principle  When air is discharged from port A, the brake plates A and B tilt to the arrow direction from the fulcrum. This boosts the brake force by generating cylinder thrust, enabling retention of the piston rod. When air is supplied from port A, the brake plates A and B are pushed by the release piston. The brake plates A and B become perpendicular to the piston rod, and the piston rod becomes free to move. ● Brake release principle 	SCP*2 φ16 CMK2 φ20 to φ40	Cylinder with brake. It can be stopped or held stationary during operation. JSG saves more space in the brake area when compared to the conventional JSC3 Series. The ULK also saves more space by reducing the brake height compared to the conventional JSK2 Series. [Applications] (1) When multipoint positioning is required (2) When position locking is required (3) When emergency stop is required (4) When locking a workpiece
JSK2 JSM2 JSG JSC3 · JSC4		Rod clamping ● Brake release principle  Air supplied from port A pushes the piston under it and opens the lever. The eccentric rings directly connected to the lever rotate and release the piston rod. ● Brake operating principle  If air is discharged from port A, the eccentric rings rotate with the spring force, generating an eccentric load to brake the piston rod.	CMK2 φ20 to φ40 CMA2 φ20 to φ40 SCG φ40 to φ100 SCA2 φ40 to φ100 SCS2 φ125 to φ180	
USSD UFCD USC	Free position locking (Retain stationary state)	Round slit method  New long life position locking mechanism is used. Applying torque M to the lock metal generates axial force F. This force holds the rod.	SSD φ25 to φ100 FCD φ25 to φ63 SCA2 φ40 to φ100	Cylinder with position locking mechanism (for holding cylinder stationary). 2 lock direction  Opposite locking direction is free  [Application] When position locking is required

2) Braking unit

Model	Function	Size	Features
JSB3	Brake (Stop when operating)	Rod size φ16 to φ45	A module of the brake mechanism of JSC3 Series. Able to stop the movable rod immediately and lock it firmly, it can be used in safety mechanisms and clamping mechanisms of many kinds of devices.
LMB	Stationary state locked	THK Rail width: 15/20/25	A lock unit installed in a linear guide. When used with a system incorporating a linear guide, this lock unit can be used to lock a workpiece after moving it to a specified position, or to enable emergency stop for safety, etc. LMB is narrower than LML, and LML is lower-profile than LMB.
LML		THK, IKO Rail width: 15/20/25/30/35	

With brake/position locking

JSG

Tie rod cylinder with brake

φ40/φ50/φ63/φ80/φ100

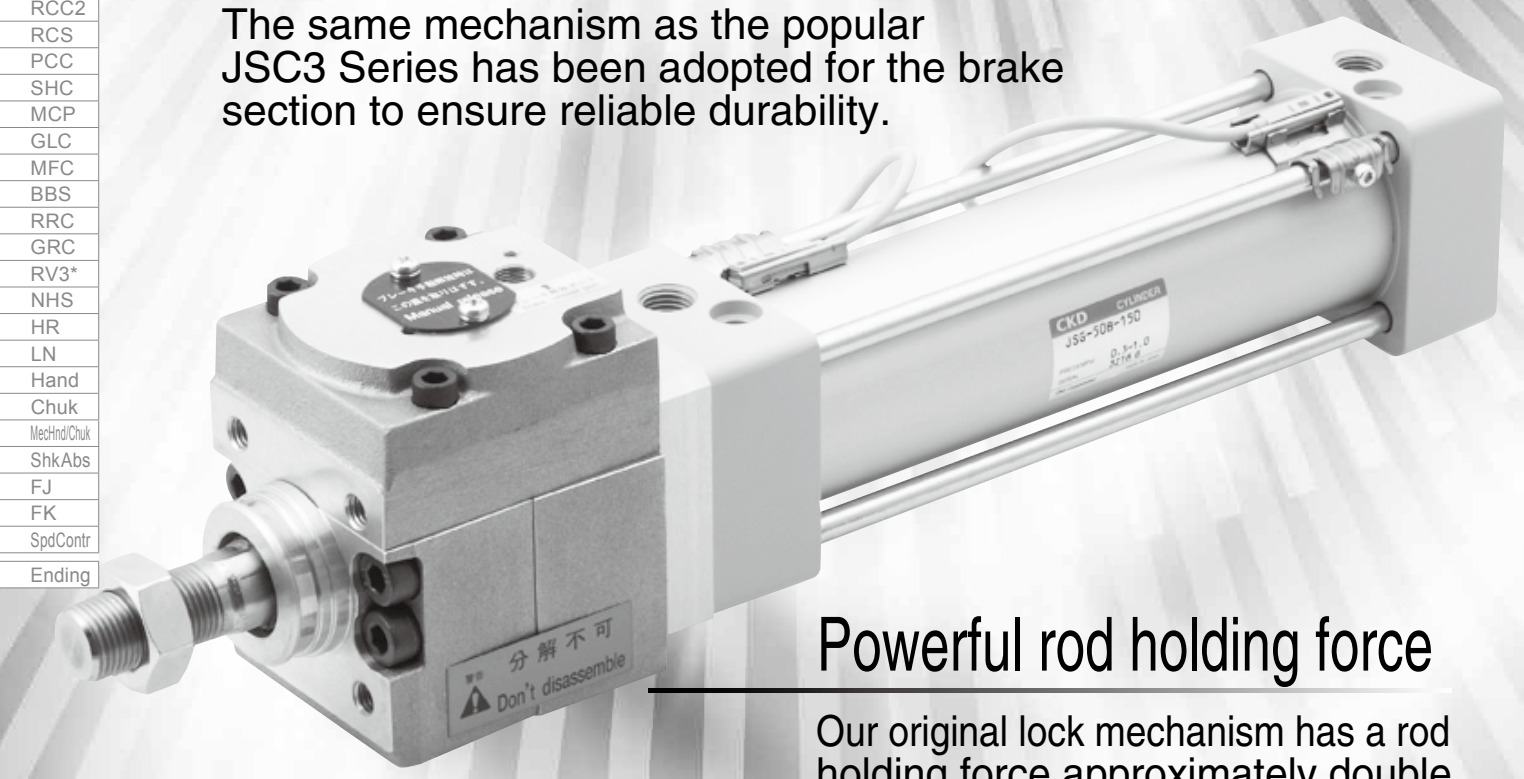
CONTENTS

Succeeding the outstanding traits of the JSC3.

The JSC3 Series brake mechanism popular for its high stopping accuracy, powerful holding force and superb reliability has been incorporated into the new environmentally friendly cylinder SCG Series. This new tie-rod JSG cylinder with brakes is free of harmful substances and is compliant with RoHS Directives. (ϕ 40 to ϕ 100)

Reliable and accomplished brake mechanism

The same mechanism as the popular JSC3 Series has been adopted for the brake section to ensure reliable durability.



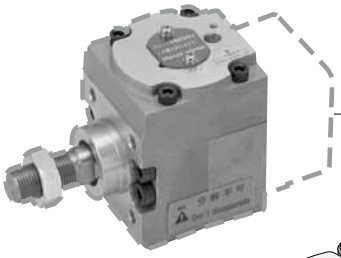
Powerful rod holding force

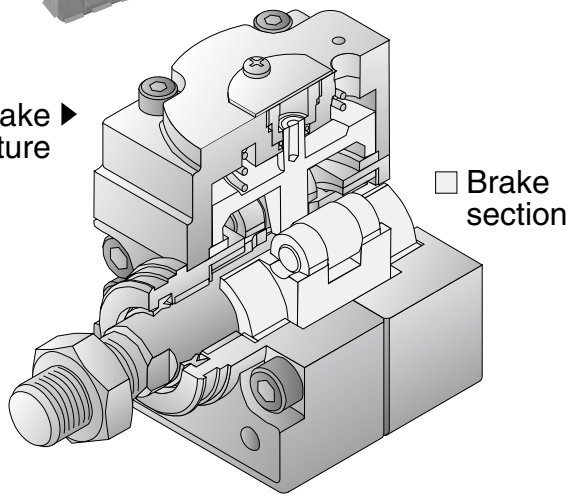
Our original lock mechanism has a rod holding force approximately double the thrust (at working pressure 0.4MPa).

Evolving into a smaller, easier-to-use cylinder.

JSG Series
Tie-rod cylinder with brake

Compact and reliable brake section



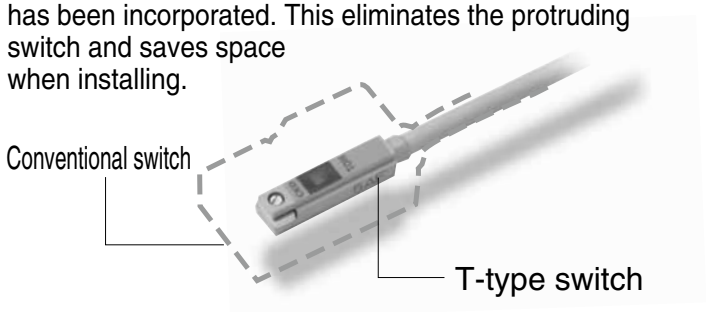


Light weight

The weight has been reduced by an average of 17% compared to the conventional cylinder.

Built-in compact switch

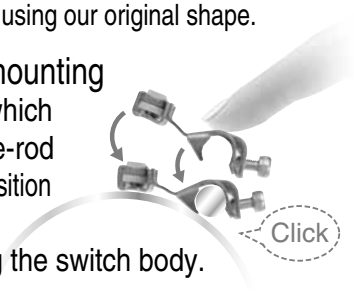
A T-type switch, smaller than the conventional, has been incorporated. This eliminates the protruding switch and saves space when installing.



New switch mounting method

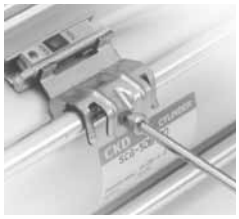
The switch can be easily and smoothly fixed with the switch fitting using our original shape.

(1) Easy switch mounting
The mechanism which sandwiches the tie-rod allows the switch position to be adjusted without supporting the switch body.



(2) Complete fixing with screw
Fixing is completed by adjusting the switch position and then tightening the screw.

The T-type switch in the rail can be finely adjusted.



Ecological products

All substances which could adversely affect the environment, including lead and hexavalent chrome, have been eliminated from the cylinder body and cylinder switch.
This product complies with the RoHS Directive issued by the EU.

RoHS

Magnet provided as standard

Switches can be additionally mounted on all products.

Space saving

The overall length of the cylinder has been shortened compared to the conventional JSC3, thereby reducing the installation space.

Unification in white

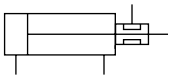
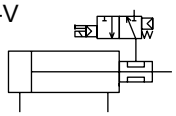
White has been adopted for the product surface color to match various devices.

JSG Series products

Series variation		Bore size					Stroke length (mm)
		φ40	φ50	φ63	φ80	φ100	25～500
Standard	JSG	●	●	●	●	●	●
With valve for brake release	JSG-V	●	●	●	●	●	●

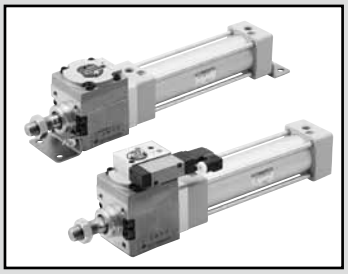
Series variation

Tie rod cylinder with brake JSG Series

Variation	Model No. JIS symbol	Bore size (mm)	Standard stroke length (mm)												Min. stroke length	
			25	50	75	100	150	200	250	300	350	400	450	500		
Double acting/ single rod	JSG 	φ40 φ50/φ63 φ80 φ100	●	●	●	●	●	●	●	●	●	●	●	●	1	
Double acting/ with valve for brake release	JSG-V 	φ40 φ50/φ63 φ80 φ100	●	●	●	●	●	●	●	●	●	●	●	●	1	

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

	Max. stroke length	Available stroke length	Custom stroke length	Mounting									Cushion		Option		Accessory						Switch	Page
				Basic	Axial foot	Rod side flange	Head side flange	Eye bracket	Clevis bracket	Rod side trunnion	Head side trunnion	Intermediate trunnion	Two-sided air cushion	Two-sided rubber cushion	Bellows (60°C)	Piston rod material stainless steel	Rod eye	Rod clevis	Eye bracket	Clevis bracket	Eye bracket	Trunnion No. 2 bracket		
				00	LB	FA	FB	CA	CB	TA	TB	TC	B	D	J	M	I	Y	B1	B2	B3	B4		
	600	800	1	●	●	●	●	●	●	●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	732
		1200																						
	700	1400																						
	800	1500																						
	600	800	1	●	●	●	●	●	●	●	●	●	●		◎	◎	◎	◎	◎	◎	◎	◎	◎	732
		1200																						
	700	1400																						
	800	1500																						



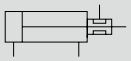
Tie rod cylinder with brake Double acting single rod/double acting with valve for brake release

JSG/JSG-V Series

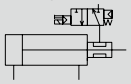
● Bore size: φ40/φ50/φ63/φ80/φ100

JIS symbol

● Double acting



● Double acting, with valve for brake release



RoHS CAD

Specifications

Descriptions			JSG					JSG-V				
Bore size		mm	φ40	φ50	φ63	φ80	φ100	φ40	φ50	φ63	φ80	φ100
Actuation			Double acting					Double acting/with valve				
Working fluid			Compressed air					Compressed air				
Max. working pressure		MPa	1.0 (≈150 psi, 10 bar)					0.7 (≈100 psi, 7 bar)				
Min. working pressure		MPa	0.3 (≈44 psi, 3 bar)					0.3 (≈44 psi, 3 bar)				
Proof pressure		MPa	1.6 (≈230 psi, 16 bar)					1.6 (≈230 psi, 16 bar)				
Ambient temperature		°C	-10 (14°F) to 60 (140°F) (no freezing)					-10 (14°F) to 60 (140°F) (no freezing)				
Port size	Brake section		Rc1/8		Rc1/4		Rc3/8	Rc1/8		Rc1/4		
	Cylinder		Rc1/4		Rc3/8		Rc1/2	Rc1/4		Rc3/8		Rc1/2
Stroke tolerance mm	With rubber cushion		$^{+1.4}_{0}$ (to 1000), $^{+1.8}_{0}$ (to 1500)					$^{+1.4}_{0}$ (to 1000), $^{+1.8}_{0}$ (to 1500)				
	With air cushion		$^{+1.0}_{0}$ (to 360), $^{+1.4}_{0}$ (to 1000), $^{+1.8}_{0}$ (to 1500)					$^{+1.0}_{0}$ (to 360), $^{+1.4}_{0}$ (to 1000), $^{+1.8}_{0}$ (to 1500)				
Working piston speed		mm/s	50 to 1000 (Operate within the allowable absorbed energy.)					50 to 1000 (Operate within the allowable absorbed energy.)				
Cushion			Either air cushion or rubber cushion can be selected					Either air cushion or rubber cushion can be selected				
Effective air cushion length		mm	8.6	13.4	13.4	15.4	15.4	8.6	13.4	13.4	15.4	15.4
Lubrication			Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)					Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)				
Stopping accuracy		mm	±1 (300 mm/s, no load)					±1 (300 mm/s, no load)				
Holding force		N	980	1569	2451	3922	6178	980	1569	2451	3922	6178
Allowable absorbed energy	With rubber cushion	J	0.9	1.6	1.6	3.3	5.8	0.9	1.6	1.6	3.3	5.8
	With air cushion	J	3.7	8.0	14.4	25.4	45.6	3.7	8.0	14.4	25.4	45.6

Electrical specification for brake valve

Descriptions	Specifications		
Rated voltage (V)	100 AC(50/60 Hz)	200 AC(50/60 Hz)	24 DC
Starting current (A)	0.056/0.044	0.028/0.022	0.075
Holding current (A)	0.028/0.022	0.014/0.011	0.075
Power consumption (W)	1.8/1.4		1.8
Thermal class	Class B (molded coil)		

*1 : 100/200 VAC coil is available for 110/220 VAC (60 Hz).
*2 : The valve specifications are the same as those of the standard model 4KB2. For details, refer to “Pneumatic Valves (CB-23SA)”.
Contact CKD when placing an order, as model numbers differ.

Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Available stroke length (mm)	Min. stroke length (mm)
φ40	25/50/75/100 150/200/250 300/350/400 450/500	600	800	1
φ50			1200	
φ63				
φ80		700	1400	
φ100		800	1500	

*1 : The custom stroke length is available in 1 mm increments.
*2 : If the maximum stroke is exceeded, product specifications may not be met, depending on operating conditions. Contact CKD in this case.
*3 : The available stroke lengths for models with bellows are as shown below.
φ40: 500 mm
φ50, φ63: 600 mm
φ80, φ100: 750 mm

Min. stroke length with switch

● T0/T5 type switch

	Different surface mounting				Same surface mounting				Center trunnion mounting				Rod side trunnion mounting Position cannot be detected at the rod side stroke end.	Head side trunnion mounting No position detection at head side stroke end.
Switch quantity	1	2	3	4	1	2	3	4	1	2	3	4	1	1
φ40	9	18	36	54	9	48(33)	78(64)	109(94)	81(81)	81(81)	164(142)	164(142)	38	38
φ50	9	18	36	54	9	18	36	54	112(112)	112(112)	121(121)	121(121)	51	53
φ63	10	19	38	57	10	19	38	57	85(73)	85(73)	91(91)	91(91)	41	42
φ80	10	20	39	59	10	20	39	59	96(79)	96(79)	99(99)	99(99)	41	47
φ100	10	20	40	60	10	20	40	60	101(84)	101(84)	105(105)	105(105)	47	53

*1: The values in ( ) are of T*V (radial lead wire).
*2: When the stroke length is 15 mm or less, the two switches could turn ON at the same time. In this case, adjust switch mounting positions to be as far apart as possible.

● T8 type switch

	Different surface mounting				Same surface mounting				Center trunnion mounting				Rod side trunnion mounting Position cannot be detected at the rod side stroke end.	Head side trunnion mounting No position detection at head side stroke end.
Switch quantity	1	2	3	4	1	2	3	4	1	2	3	4	1	1
φ40	9	18	36	54	9	54(31)	84(62)	115(92)	87(87)	87(87)	178(148)	178(148)	41	41
φ50	9	18	36	54	9	18	36	54	116(116)	116(116)	121(121)	121(121)	54	55
φ63	10	19	38	57	10	19	38	57	89(77)	89(77)	99(99)	99(99)	44	44
φ80	10	20	39	59	10	20	39	59	100(75)	100(75)	111(111)	111(111)	43	49
φ100	10	20	40	60	10	20	40	60	105(80)	105(80)	117(117)	117(117)	49	55

*1: The values in ( ) are of T*V (radial lead wire).
*2: When the stroke length is 15 mm or less, the two switches could turn ON at the same time. In this case, adjust switch mounting positions to be as far apart as possible.

● T2/T3 switch

	Different surface mounting				Same surface mounting				Center trunnion mounting				Rod side trunnion mounting Position cannot be detected at the rod side stroke end.	Head side trunnion mounting No position detection at head side stroke end.
Switch quantity	1	2	3	4	1	2	3	4	1	2	3	4	1	1
φ40	5	10	20	30	5	40(33)	70(64)	101(94)	69(60)	69(60)	152(121)	152(121)	32	32
φ50	5	10	20	30	5	10	20	30	71(62)	71(62)	71(61)	71(61)	31	32
φ63	6	11	21	32	6	11	21	32	77(68)	77(68)	77(68)	77(68)	37	38
φ80	6	11	22	33	6	11	22	33	88(79)	88(79)	88(80)	88(80)	37	43
φ100	6	11	22	33	6	11	22	33	93(84)	93(84)	93(85)	93(85)	43	49

*1: The values in ( ) are of T*V (radial lead wire).
*2: When the stroke length is 15 mm or less, the two switches could turn ON at the same time. In this case, adjust switch mounting positions to be as far apart as possible.

● T1/T2Y/T3Y/T2W/T3W/T2YD switches

	Different surface mounting				Same surface mounting				Center trunnion mounting				Rod side trunnion mounting Position cannot be detected at the rod side stroke end.	Head side trunnion mounting No position detection at head side stroke end.
Switch quantity	1	2	3	4	1	2	3	4	1	2	3	4	1	1
φ40	6	11	22	33	6	62(49)	92(80)	123(110)	91(66)	91(66)	182(127)	182(127)	43	43
φ50	6	12	24	36	6	12	24	36	93(68)	93(68)	93(68)	93(68)	42	43
φ63	6	12	24	36	6	12	24	36	99(74)	99(74)	99(74)	99(74)	48	49
φ80	7	13	25	38	7	13	25	38	110(85)	110(85)	110(86)	110(86)	48	54
φ100	7	13	26	39	7	13	26	39	115(90)	115(90)	115(92)	115(92)	54	60

*1: The values in ( ) are of T*V (radial lead wire). T2YD does not have a radial lead wire (V).
*2: When the stroke length is 15 mm or less, the two switches could turn ON at the same time. In this case, adjust switch mounting positions to be as far apart as possible.

Switch specifications

● 1-color/2-color display/for AC magnetic field proof

Descriptions	Proximity 2-wire	Proximity 2-wire			Proximity 3-wire				Reed 2-wire (*4)							Proximity 2-wire
	T1H/ T1V	T2H/T2V/ T2JH/T2JV	T2YH/ T2YV	T2WH/ T2WV	T3H/ T3V	T3PH/T3PV (custom)	T3YH/ T3YV	T3WH/ T3WV	T0H/T0V		T5H/T5V		T8H/T8V			T2YD
Applications	For programmable controller, relay, compact solenoid valve	Dedicated for programmable controller			For programmable controller, relay				For programmable controller, relay		For programmable controller, relay, IC circuit (no indicator lamp), serial connection		For programmable controller, relay			For programmable controller
Output method	-				NPN output	PNP output	NPN output	NPN output	-							
Pwr. supp. V.	-				10 to 28 VDC				-							
Load voltage	85 to 265 VAC	10 to 30 VDC		24 VDC ±10%	30 VDC or less				12/24 VDC	110 VAC	5/12/24 VDC	110 VAC	12/24 VDC	110 VAC	220 VAC	24 VDC ±10%
Load current	5 to 100 mA	5 to 20 mA (*2)			100 mA or less		50 mA or less		5 to 50 mA	7 to 20 mA	≤50 mA	≤20 mA	5 to 50 mA	7 to 20 mA	7 to 10 mA	5 to 20 mA
Indicator lamp	LED (Lit when ON)	LED (Lit when ON)	Red/green 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)	Red/green LED (Lit when ON)	LED (Lit when ON)		Without indicator lamp		LED (Lit when ON)			Red/green LED (Lit when ON)
Leakage current	≤ 1 mA at 100 VAC, ≤ 2 mA at 200 VAC	1 mA or less			10 μA or less				0 mA							1 mA or less
Weight g	1 m:33 3 m:87 5 m:142	1 m:18 3 m:49 5 m:80	1 m:33 3 m:87 5 m:142	1 m:18 3 m:49 5 m:80	1 m:18 3 m:49 5 m:80		1 m:33 3 m:87 5 m:142	1 m:18 3 m:49 5 m:80	1 m:18 3 m:49 5 m:80				1 m:33 3 m:87 5 m:142			1 m:61 3 m:166 5 m:272

*1 : Refer to Ending Page 1 for other switch specifications.
*2 : The above 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)
*3 : Switch for AC magnetic field (T2YD) cannot be used in DC magnetic field.
*4 : The T0/T5 switch can also be used with 220 VAC. Contact CKD about working conditions.
*5 : Dimensions depend on switch model No. Refer to Ending Page 18 for details.

Weight table

Unit: kg

Bore size (mm)	Weight for 0 mm stroke length						Added weight /50 mm stroke	Switch weight	Mounting bracket weight	Accessory weight	
	Basic (00)	Foot (LB)	Flange (FA, FB)	Eye bracket (CA)	Clevis bracket (CB)	Trunnion (TA,TB,TC)				I	Y
φ40	1.75	1.89	2.16	1.94	1.94	2.09	0.17	Refer to the weight in the switch specifications.	0.008	0.09	0.14
φ50	2.91	3.07	3.54	3.32	3.32	3.40	0.23			0.20	0.33
φ63	3.94	4.28	4.96	4.49	4.51	4.82	0.25			0.20	0.33
φ80	7.81	8.24	9.38	9.08	9.09	9.30	0.40			0.52	0.96
φ100	12.08	12.94	14.40	13.80	13.83	14.65	0.51			0.48	0.92

(Example) Product weight of JSG-LB-50B-200-T0H-D-Y

Product weight for stroke length 0 mm .....3.07 kg
Additional weight for stroke length 200 mm .....0.23×200/50=0.92 kg
Weight of 2 TOH switches .....0.018×2=0.036 kg
Weight of 2 mounting brackets .....0.008×2=0.016 kg
Weight of rod clevis .....0.33 kg
Product weight .....3.07+0.92+0.036+0.016+0.33=4.372 kg

Theoretical thrust table

(Unit: N)

Bore size (mm)	Operating direction	Working pressure MPa											
		0.05	0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
φ40	Push	62.8	1.26×10^2	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	52.8	1.06×10^2	1.58×10^2	2.11×10^2	3.17×10^2	4.22×10^2	5.28×10^2	6.33×10^2	7.39×10^2	8.44×10^2	9.50×10^2	1.06×10^3
φ50	Push	98.2	1.96×10^2	2.95×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	82.5	1.65×10^2	2.47×10^2	3.30×10^2	4.95×10^2	6.60×10^2	8.25×10^2	9.90×10^2	1.15×10^3	1.32×10^3	1.48×10^3	1.65×10^3
φ63	Push	1.56×10^2	3.12×10^2	4.68×10^2	6.23×10^2	9.35×10^2	1.25×10^3	1.56×10^3	1.87×10^3	2.18×10^3	2.49×10^3	2.81×10^3	3.12×10^3
	Pull	1.40×10^2	2.80×10^2	4.20×10^2	5.61×10^2	8.41×10^2	1.12×10^3	1.40×10^3	1.68×10^3	1.96×10^3	2.24×10^3	2.52×10^3	2.80×10^3
φ80	Push	2.51×10^2	5.03×10^2	7.54×10^2	1.01×10^3	1.51×10^3	2.01×10^3	2.51×10^3	3.02×10^3	3.52×10^3	4.02×10^3	4.52×10^3	5.03×10^3
	Pull	2.27×10^2	4.54×10^2	6.80×10^2	9.07×10^2	1.36×10^3	1.81×10^3	2.27×10^3	2.72×10^3	3.17×10^3	3.63×10^3	4.08×10^3	4.54×10^3
φ100	Push	3.93×10^2	7.85×10^2	1.18×10^3	1.57×10^3	2.36×10^3	3.14×10^3	3.93×10^3	4.71×10^3	5.50×10^3	6.28×10^3	7.07×10^3	7.85×10^3
	Pull	3.57×10^2	7.15×10^2	1.07×10^3	1.43×10^3	2.14×10^3	2.86×10^3	3.57×10^3	4.29×10^3	5.00×10^3	5.72×10^3	6.43×10^3	7.15×10^3

How to order

Without switch (built-in magnet for switch)

JSG - LB - 40 ( ) B - 100 - ( ) —— J - I

With switch (built-in magnet for switch)

JSG - LB - 40 ( ) B - 100 - ( ) - T2H - R - J - I

Ⓐ Model No.
Ⓑ Mounting *1
Ⓒ Bore size
Ⓓ Port thread
Ⓔ Cushion
Ⓕ Stroke length
Ⓖ Solenoid valve voltage
Ⓗ Switch model No.
Ⓘ Switch quantity *3
Ⓙ Option
Ⓚ Accessory *4

Code	Content	Ⓐ Model No. Double acting	Double acting, brake release valve -Y
Ⓑ Mounting			
00	Basic	●	●
LB	Axial foot	●	●
FA	Rod side flange	●	●
FB	Head side flange	●	●
CA	Eye bracket	●	●
CB	Clevis bracket (pin and split pin attached)	●	●
TA	Rod side trunnion	●	●
TB	Head side trunnion	●	●
TC	Intermediate trunnion	●	●
Ⓒ Bore size (mm)			
40	φ40	●	●
50	φ50	●	●
63	φ63	●	●
80	φ80	●	●
100	φ100	●	●
Ⓓ Port thread			
Blank	Rc thread	●	●
N	NPT thread (custom order product)	●	●
G	G thread (custom order product)	●	●
Ⓔ Cushion			
B	Two-sided air cushion (basic)	●	●
D	Two-sided rubber cushion	●	●
Note: The rubber cushion has a longer total length than the air cushion.			

Ⓕ Stroke length (mm)

Bore size	Stroke length *2	Available stroke length	Custom stroke length
φ40	1 to 600	800	In 1 mm increments
φ50		1200	
φ63			
φ80	1 to 700	1400	
φ100	1 to 800	1500	

Ⓖ Solenoid valve voltage			
1	100 VAC		●
2	200 VAC		●
3	24 VDC		●
4	12 VDC		●

Ⓗ Switch model No.

Axial lead wire	Radial lead wire	Contact	Voltage AC	Voltage DC	Display	Lead wire
T0H*	**T0V***	Reed	●	●	1-color display	2-wire
T5H*	**T5V***		●	●	Without indicator lamp	
T8H*	**T8V***		●	●	1-color display	2-wire
T1H*	**T1V***	Proximity	●		1-color display	2-wire
T2H*	**T2V***			●	1-color display	2-wire
T3H*	**T3V***			●		3-wire
T3PH*	**T3PV***			●	1-color display (custom order)	3-wire
T2WH*	**T2WV***			●	2-color display	2-wire
T2YH*	**T2YV***			●		
T3WH*	**T3WV***			●		3-wire
T3YH*	**T3YV***			●		
T3PH*	**T3PV***			●	1-color display (custom order)	3-wire
T2YD*	**-**			●	2-color display AC magnetic field	2-wire
T2YDT*	**-**			●		
T2JH*	**T2JV***			●	1-color display off-delay	2-wire

*** Lead wire length**			
Blank	1 m (standard)	●	●
3	3 m (option)	●	●
5	5 m (option)	●	●
Ⓘ Switch quantity			
R	1 on rod side	●	●
H	1 on head side	●	●
D	2	●	●
T	3	●	●

Ⓙ Option

		Max. ambient temperature	Instantaneous ambient temperature		
J	Bellows	60°C	100°C	●	●
M	Piston rod material stainless steel			●	●

Ⓚ Accessory			
I	Rod eye	●	●
Y	Rod clevis (pin and split pin attached)	●	●
B1	Eye bracket	●	●
B2	Clevis bracket (pin and split pin attached)	●	●
B3	Eye bracket	●	●
B4	Trunnion No. 2 bracket (2 pcs./set)	●	●

⚠ Precautions for model No. selection

*1 : Mounting bracket will be shipped with the product. (Trunnion is assembled at shipment.)
*2 : The custom stroke length is available in 1 mm increments.
*3 : When selecting TA or TB as mounting, the number of switches is limited to "H" (1 on head side) for TA, and "R" (1 on rod side) for TB.
*4 : "I" and "Y" cannot be selected together.

[Example of model No.]

JSG-V-LB-40B-100-1-T2H-D-JI

Model: Tie rod cylinder with brake

Ⓐ Model No. : Double acting, with valve for brake release
Ⓑ Mounting : Axial foot
Ⓒ Bore size : φ40 mm
Ⓓ Port thread : Rc thread
Ⓔ Cushion : With two-sided air cushion
Ⓕ Stroke length : 100 mm
Ⓖ Solenoid valve voltage : 100 VAC
Ⓗ Switch model No. : Proximity T2H switch, lead wire 1 m
Ⓘ Switch quantity : 2
Ⓙ Option : With bellows
Ⓚ Accessory : Rod eye (attachment)

How to order switch

● Switch body + mounting bracket set

SCG - T0H - 40

- T0H: Switch model No. (Item Ⓗ on the previous page)
- 40: Bore size (Item Ⓒ on the previous page)

● Switch body only

SW - T0H

- T0H: Switch model No. (Item Ⓗ on the previous page)

Note: Contact CKD when using an environment-friendly T type switch.

● Switch mounting bracket set

SCG - T - 40

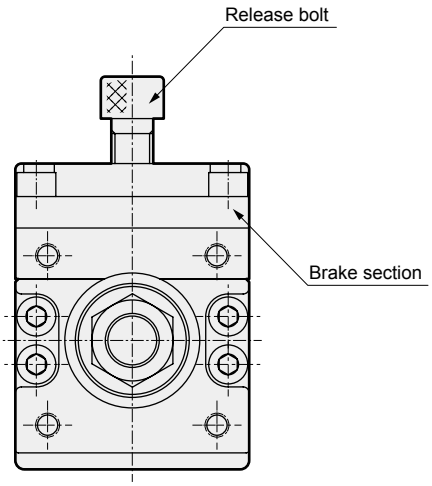
- T: Mounting bracket
- 40: Bore size (Item Ⓒ on the previous page)

How to order mounting bracket

Bore size (mm) / Mounting bracket		φ40	φ50	φ63	φ80	φ100
Foot (LB)	*1	JSG-LB-40	JSG-LB-50	JSG-LB-63	SCG-LB-80	SCG-LB-100
Flange (FA) (FB)	*2	JSG-FA-40	JSG-FA-50	JSG-FA-63	SCG-FA-80	SCG-FA-100
Eye bracket (CA)		SCG-CA-40	SCG-CA-50	SCG-CA-63	SCG-CA-80	SCG-CA-100
Clevis bracket (CB)	*3	SCG-CB-40	SCG-CB-50	SCG-CB-63	SCG-CB-80	SCG-CB-100

*1: The foot (LB) mounting bracket is provided as 2 pcs./set.
*2: Specify the flange (FA) with bellows as "JSG-FA-(bore size)-J".
*3: Pin, split pin and plain washer are attached.
*4: All mounting brackets have mounting bolts attached.

How to release the brake section manually



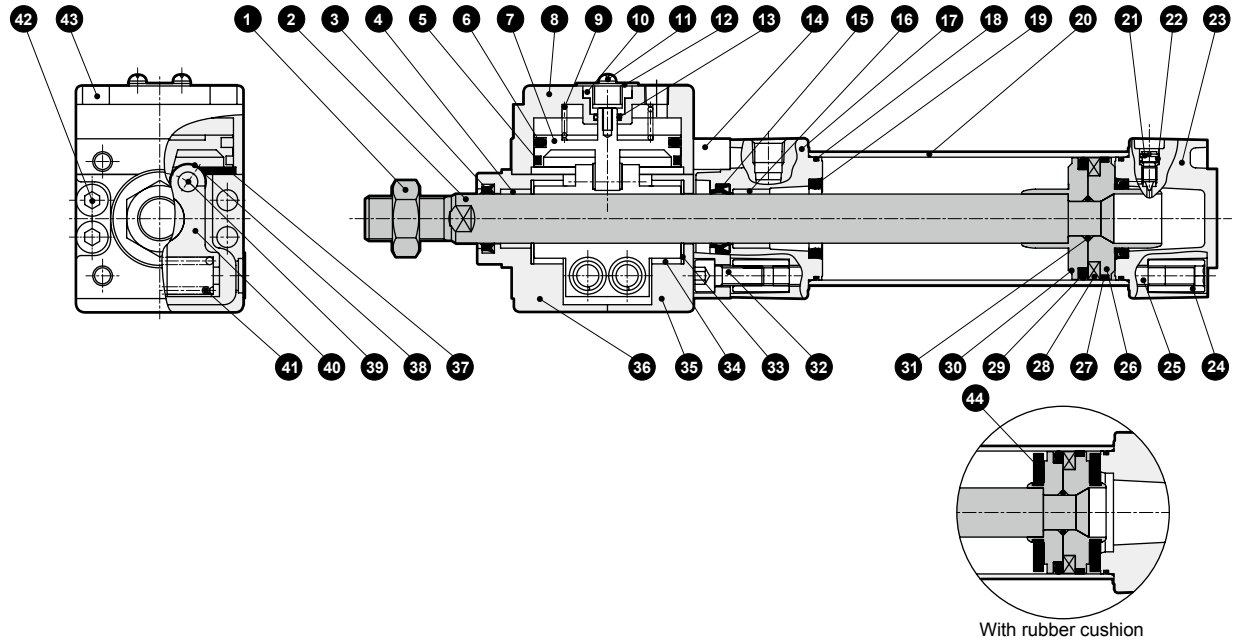
The brakes are released by screwing a bolt into the manual release port (female threads on top of brakes).
(The brake may go out if the bolt is screwed in too far.
Refer to the appropriate screw-in volume in the table below.)
Always remove the bolt during normal use.

Release bolt size

Bore size	Bolt screw diameter	Bolt length		Appropriate screw-in volume
		JSG	JSG-V	
φ40	M12×1.75	16 or more	40 or more	3 rotations or less
φ50	M12×1.75	16 or more	40 or more	4 rotations or less
φ63	M14×2	16 or more	40 or more	4 rotations or less
φ80	M16×2	20 or more	40 or more	4.5 rotations or less
φ100	M18×2.5	20 or more	50 or more	5 rotations or less

Internal structure and parts list

● JSG



With rubber cushion

No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Rod nut	Steel	Nickel plating	24	Round nut	Steel	Zinc chromate
2	Piston rod	Steel	Industrial chrome plating	25	Tie rod	Steel	Zinc chromate
3	Dust wiper	Nitrile rubber		26	Piston H	φ40: Aluminum alloy φ50 to φ100: Aluminum alloy die-casting	
4	Bush	Oil impregnated bearing alloy					
5	Wear ring	Acetal resin		27	Wear ring	Polyacetal resin	
6	Piston packing B	Nitrile rubber		28	Magnet	Resin	
7	Brake piston	Cast iron	Phosphate coating	29	Piston packing	Nitrile rubber	
8	Body H	Aluminum casting	Chromate	30	Piston R	φ40: Aluminum alloy φ50 to φ100: Aluminum alloy die-casting	
9	Spring	Piano wire					
10	Piston guide	Cast iron	Phosphate coating	31	Piston gasket	Nitrile rubber	
11	Phillips pan head machine screw/captive washer	Steel	Zinc chromate	32	Hexagon socket head cap screw	Alloy steel	Black finish
12	Dust cover	Aluminum alloy	Alumite	33	Thrust washer		
13	Gasket	Nitrile rubber		34	Bush	Dry bearing	
14	Joint plate	Aluminum alloy	Alumite	35	Body R	Aluminum casting	Chromate
15	Rod packing	Nitrile rubber		36	Body F	Aluminum casting	Chromate
16	Bush	Oil impregnated bearing alloy		37	Cushion rubber	Urethane rubber	
17	Rod cover	Aluminum alloy die-casting	Paint	38	Bearing		
18	Cylinder gasket	Nitrile rubber		39	Pin	Alloy steel	
19	Cushion packing	Nitrile rubber, steel	Zinc chromate	40	Brake shoe metal	Cast iron	Nickel plating
20	Cylinder tube	Aluminum alloy	Hard alumite	41	Spring	Piano wire	
21	Cushion needle	Copper alloy	Nickel plating	42	Hexagon socket head cap screw	Alloy steel	Black finish
22	Needle gasket	Nitrile rubber		43	Hexagon socket head cap screw	Alloy steel	Black finish
23	Head cover	Aluminum alloy die-casting	Paint	44	Cushion rubber	Urethane rubber	

Note: Never disassemble the brake section, as the powerful spring installed can be dangerous.

Repair parts list

● With air cushion

Bore size (mm)	Kit No.	Repair parts No.
φ40	JSG-40BK	③ ⑮ ⑱ ⑲ ㉒ ㉗ ㉙
φ50	JSG-50BK	
φ63	JSG-63BK	
φ80	JSG-80BK	
φ100	JSG-100BK	

Note: Specify the kit No. when placing an order.

● With rubber cushion

Bore size (mm)	Kit No.	Repair parts No.
φ40	JSG-40DK	③ ⑮ ⑱ ㉒ ㉗ ㉙ ㊹
φ50	JSG-50DK	
φ63	JSG-63DK	
φ80	JSG-80DK	
φ100	JSG-100DK	

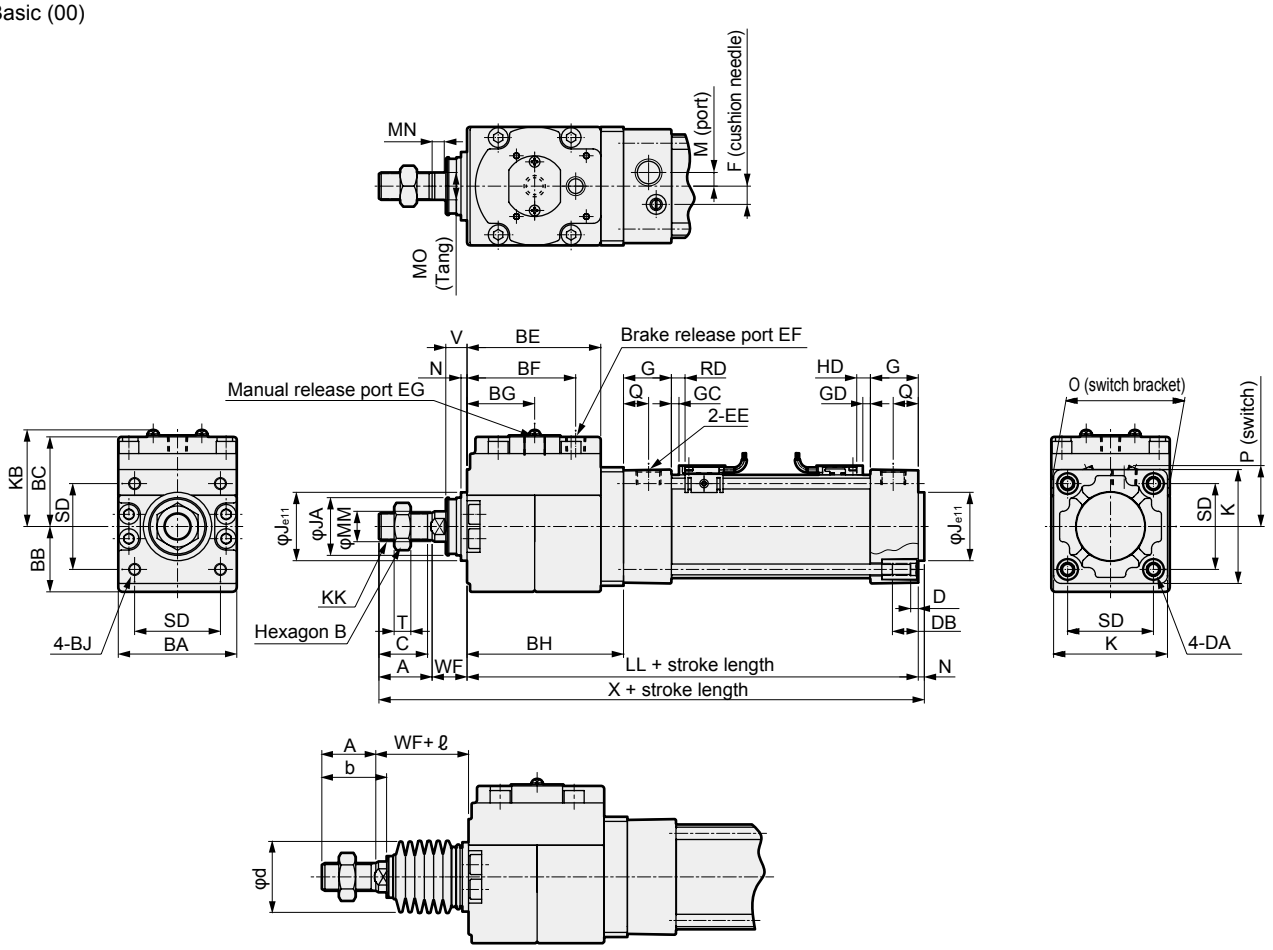
Note: Specify the kit No. when placing an order.

Material of mounting bracket

Mounting	Material	Remarks
LB	Steel	Nickel plating
FA/FB	Steel	Paint
CA/CB	Cast iron	Paint
TA/TB/TC	Cast iron	Paint

Dimensions CAD

● Basic (00)



*1 : Dimensions in ( ) are for the rubber cushion. The entire length is longer compared with the air cushion.
(φ40: +6mm, φ50/φ63: +8mm, φ80/φ100: +10mm)
*2 : RD and HD dimensions in dimension drawings indicate the position of switch end, and GC and GD indicate the position of switch rail end.
*3 : Refer to page 747 for dimensions of the type with valves (JSG-V).
*4 : Refer to page 748 for HD, RD and protruding dimensions of other switches.

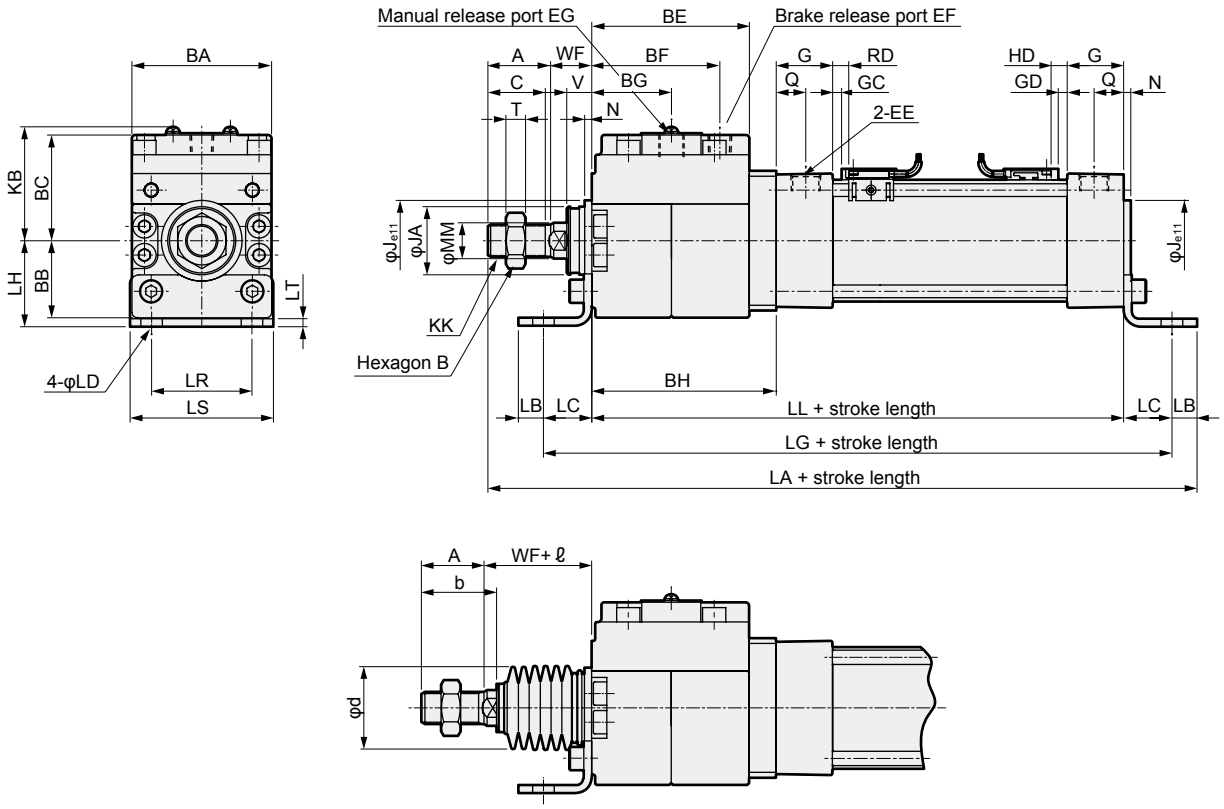
Code	Basic (00) basic dimensions																			
Bore size (mm)	A	B	BA	BB	BC	BE	BF	BG	BH	BJ	C	DA	DB	DC	EE	EF	EG	F	G	J
φ40	30	22	57	31.5	46.5	63	52.5	32.5	77	M6 depth 12	27	M6	16	5	Rc1/4	Rc1/8	M12	9	27	35
φ50	35	27	68	38	54	74	59	39	89	M8 depth 12	32	M8	16	5	Rc1/4	Rc1/8	M12	10.5	31.5	40
φ63	35	27	78	43	59	88	71.5	44.5	103	M8 depth 14	32	M8	16	5	Rc3/8	Rc1/4	M14	12	31.5	45
φ80	40	32	98	53	72.5	108	81.5	54.5	131	M10 depth 16	37	M10	16	5	Rc3/8	Rc1/4	M16	14	38	45
φ100	40	41	118	63	80.5	129	101	65.5	151	M10 depth 18	37	M10	16	5	Rc1/2	Rc3/8	M18	15	38	55

Code																	
Bore size (mm)	JA	K	KB	KK	*1 LL	M	MM	MN	MO	N	O	Q	SD	T	V	WF	*1 X
φ40	31	52	51.1	M14×1.5	161(167)	4	16	6	14	4	57	14	38	8	13	21	216(222)
φ50	38	65	58.6	M18×1.5	183(191)	5	20	7	17	4	68	15.5	46.5	11	14	23	245(253)
φ63	38	75	63.6	M18×1.5	197(205)	9	20	7	17	4	78	16.5	56.5	11	14	23	259(267)
φ80	43	95	77.1	M22×1.5	245(255)	11.5	25	10	22	4	95	19	72	13	20	32	321(331)
φ100	51	114	85.1	M26×1.5	265(275)	17	30	10	27	4	114	19	89	16	20	32	341(351)

Code	With bellows														With switch ($T0^{H}_{V}$, $T5^{H}_{V}$, $T2^{H}_{V}$, $T3^{H}_{V}$, $T3P^{H}_{V}$)				
Bore size (mm)	A	b	d	WF	ℓ										*1 GC	*1 GD	*1 RD	*1 HD	P
					50 or less	Over 50 to 100	Over 100 to 150	Over 150 to 200	Over 200 to 300	Over 300 to 400	Over 400 to 500	Over 500 to 600	Over 600 to 700	Over 700 to 750					
φ40	30	35	40	21	30	43	55	68	93	118	143	-	-	-	1(4)	1(4)	5(8)	5(8)	29
φ50	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	1(5)	6.5(10.5)	5(9)	34
φ63	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	1(5)	6.5(10.5)	5(9)	40
φ80	40	50	53	32	29	42	54	67	92	117	142	167	192	204	8.5(13.5)	2(7)	12.5(17.5)	6(11)	-
φ100	40	52.5	61	32	29	42	54	67	92	117	142	167	192	204	8(13)	2.5(7.5)	12(17)	6.5(11.5)	-

Dimensions

● Axial foot (LB)



*1 : Dimensions in ( ) are for the rubber cushion. The entire length is longer compared with the air cushion.
(φ40: +6mm, φ50/φ63: +8mm, φ80/φ100: +10mm)
*2 : RD and HD dimensions in dimension drawings indicate the position of switch end, and GC and GD indicate the position of switch rail end.
*3 : Refer to page 747 for dimensions of the type with valves (JSG-V).
*4 : Refer to page 748 for HD, RD and protruding dimensions of other switches.

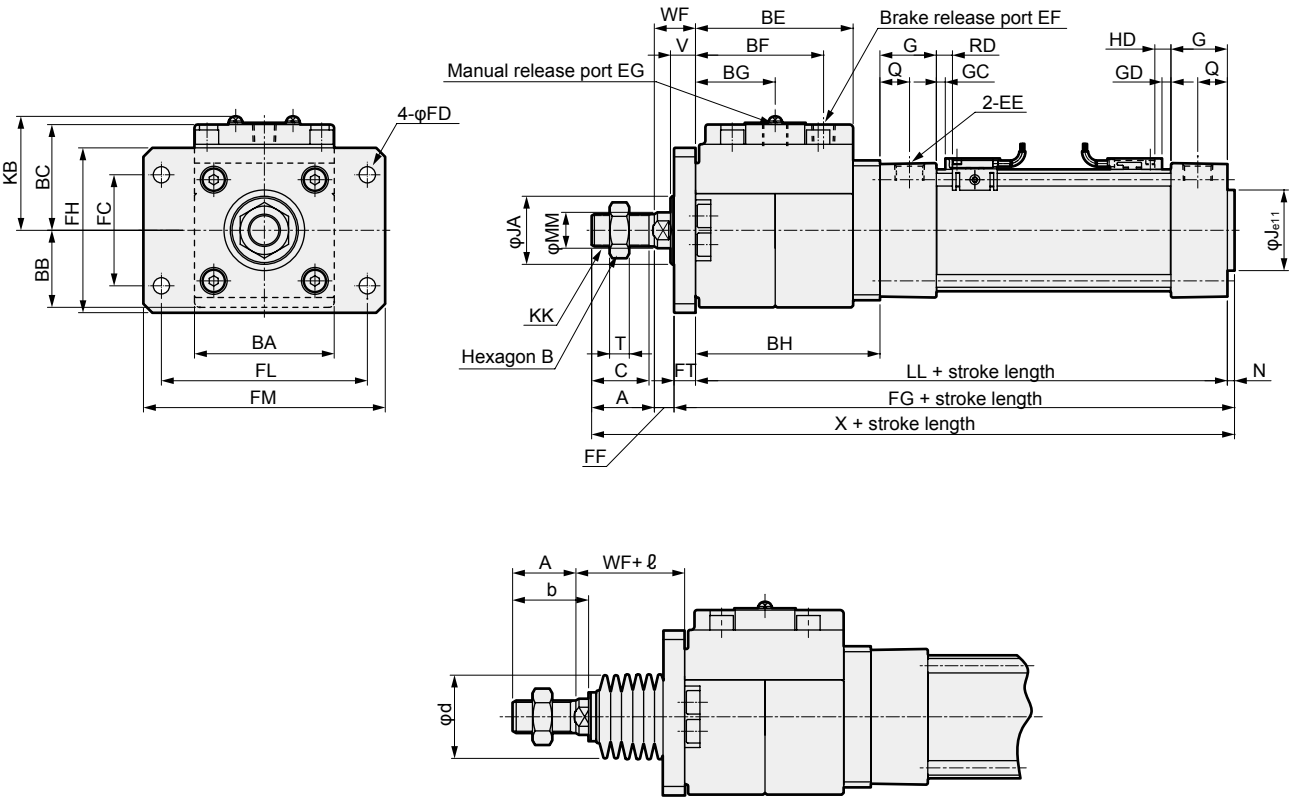
Code	Axial foot (LB) basic dimensions																		
Bore size (mm)	A	B	BA	BB	BC	BE	BF	BG	BH	C	EE	EF	EG	G	J	JA	KB	KK	*1 LL
φ40	30	22	57	31.5	46.5	63	52.5	32.5	77	27	Rc1/4	Rc1/8	M12	27	35	31	51.1	M14×1.5	161(167)
φ50	35	27	68	38	54	74	59	39	89	32	Rc1/4	Rc1/8	M12	31.5	40	38	58.6	M18×1.5	183(191)
φ63	35	27	78	43	59	88	71.5	44.5	103	32	Rc3/8	Rc1/4	M14	31.5	45	38	63.6	M18×1.5	197(205)
φ80	40	32	98	53	72.5	108	81.5	54.5	131	37	Rc3/8	Rc1/4	M16	38	45	43	77.1	M22×1.5	245(255)
φ100	40	41	118	63	80.5	129	101	65.5	151	37	Rc1/2	Rc3/8	M18	38	55	51	85.1	M26×1.5	265(275)

Code							Mounting dimensions								
Bore size (mm)	MM	N	Q	T	V	WF	*1 L A	LB	LC	LD	*1 LG	LH	LR	LS	LT
φ40	16	4	14	8	13	21	247(253)	11	24	9	209(215)	33	38	55	3.2
φ50	20	4	15.5	11	14	23	279(287)	11	27	9	237(245)	40	46	70	3.2
φ63	20	4	16.5	11	14	23	296(304)	14	27	12	251(259)	48	56	80	4.5
φ80	25	4	19	13	20	32	361(371)	14	30	12	305(315)	55	72	95	4.5
φ100	30	4	19	16	20	32	385(395)	16	32	14	329(339)	65	89	114	6

Code	With bellows														With switch (T0Ⓥ, T5Ⓥ, T2Ⓥ, T3Ⓥ, T3PⓋ)				
Bore size (mm)	A	b	d	WF	ℓ										*1 GC	*1 GD	*1 RD	*1 HD	P
					50 or less	Over 50 to 100	Over 100 to 150	Over 150 to 200	Over 200 to 300	Over 300 to 400	Over 400 to 500	Over 500 to 600	Over 600 to 700	Over 700 to 750					
φ40	30	35	40	21	30	43	55	68	93	118	143	-	-	-	1(4)	1(4)	5(8)	5(8)	29
φ50	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	1(5)	6.5(10.5)	5(9)	34
φ63	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	1(5)	6.5(10.5)	5(9)	40
φ80	40	50	53	32	29	42	54	67	92	117	142	167	192	204	8.5(13.5)	2(7)	12.5(17.5)	6(11)	-
φ100	40	52.5	61	32	29	42	54	67	92	117	142	167	192	204	8(13)	2.5(7.5)	12(17)	6.5(11.5)	-

Dimensions CAD

● Rod side flange (FA)



*1 : Dimensions in ( ) are for the rubber cushion. The entire length is longer compared with the air cushion.
(φ40: +6mm, φ50/φ63: +8mm, φ80/φ100: +10mm)
*2 : RD and HD dimensions in dimension drawings indicate the position of switch end, and GC and GD indicate the position of switch rail end.
*3 : Refer to page 747 for dimensions of the type with valves (JSG-V).
*4 : Refer to page 748 for HD, RD and protruding dimensions of other switches.

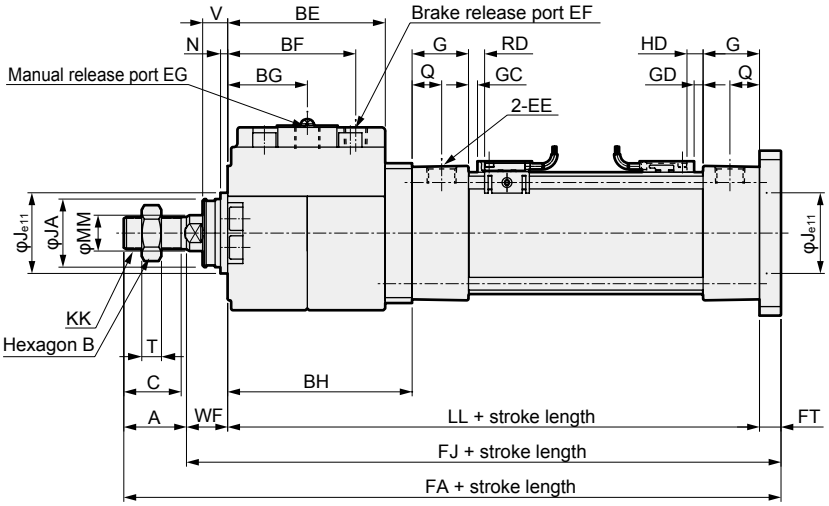
Code	Rod side flange (FA) basic dimensions																		
Bore size (mm)	A	B	BA	BB	BC	BE	BF	BG	BH	C	EE	EF	EG	G	J	JA	KB	KK	*1 LL
φ40	30	22	57	31.5	46.5	63	52.5	32.5	77	27	Rc1/4	Rc1/8	M12	27	35	31	51.1	M14×1.5	161(167)
φ50	35	27	68	38	54	74	59	39	89	32	Rc1/4	Rc1/8	M12	31.5	40	38	58.6	M18×1.5	183(191)
φ63	35	27	78	43	59	88	71.5	44.5	103	32	Rc3/8	Rc1/4	M14	31.5	45	38	63.6	M18×1.5	197(205)
φ80	40	32	98	53	72.5	108	81.5	54.5	131	37	Rc3/8	Rc1/4	M16	38	45	43	77.1	M22×1.5	245(255)
φ100	40	41	118	63	80.5	129	101	65.5	151	37	Rc1/2	Rc3/8	M18	38	55	51	85.1	M26×1.5	265(275)

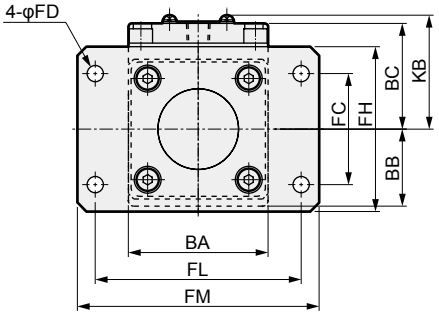
Code								Mounting dimensions							
Bore size (mm)	MM	N	Q	T	V	WF	*1 X	FC	FD	FF	*1 FG	FH	FL	FM	FT
φ40	16	4	14	8	13	21	216(222)	46	9	11	175(181)	65	83	101	10
φ50	20	4	15.5	11	14	23	245(253)	52	9	11	199(207)	77	100	120	12
φ63	20	4	16.5	11	14	23	259(267)	62	9	11	213(221)	92	115	135	12
φ80	25	4	19	13	20	32	321(331)	63	12	16	265(275)	100	126	153	16
φ100	30	4	19	16	20	32	341(351)	75	14	16	285(295)	120	150	178	16

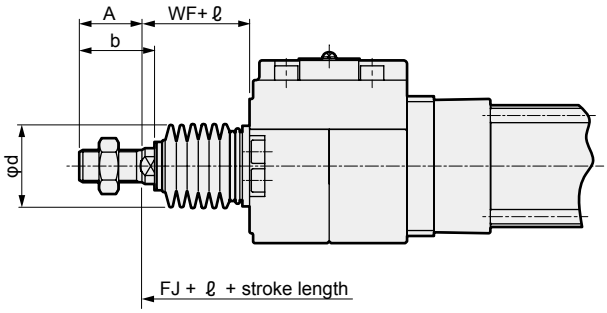
Code	With bellows														With switch ($T0^{H}_{V}$, $T5^{H}_{V}$, $T2^{H}_{V}$, $T3^{H}_{V}$, $T3P^{H}_{V}$)				
Bore size (mm)	A	b	d	WF	ℓ										*1 GC	*1 GD	*1 RD	*1 HD	P
					50 or less	Over 50 to 100	Over 100 to 150	Over 150 to 200	Over 200 to 300	Over 300 to 400	Over 400 to 500	Over 500 to 600	Over 600 to 700	Over 700 to 750					
φ40	30	35	40	21	30	43	55	68	93	118	143	-	-	-	1(4)	1(4)	5(8)	5(8)	29
φ50	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	1(5)	6.5(10.5)	5(9)	34
φ63	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	1(5)	6.5(10.5)	5(9)	40
φ80	40	50	53	32	29	42	54	67	92	117	142	167	192	204	8.5(13.5)	2(7)	12.5(17.5)	6(11)	-
φ100	40	52.5	61	32	29	42	54	67	92	117	142	167	192	204	8(13)	2.5(7.5)	12(17)	6.5(11.5)	-

Dimensions CAD

● Head side flange (FB)







*1 : Dimensions in ( ) are for the rubber cushion. The entire length is longer compared with the air cushion.
(φ40: +6mm, φ50/φ63: +8mm, φ80/φ100: +10mm)
*2 : RD and HD dimensions in dimension drawings indicate the position of switch end, and GC and GD indicate the position of switch rail end.
*3 : Refer to page 747 for dimensions of the type with valves (JSG-V).
*4 : Refer to page 748 for HD, RD and protruding dimensions of other switches.

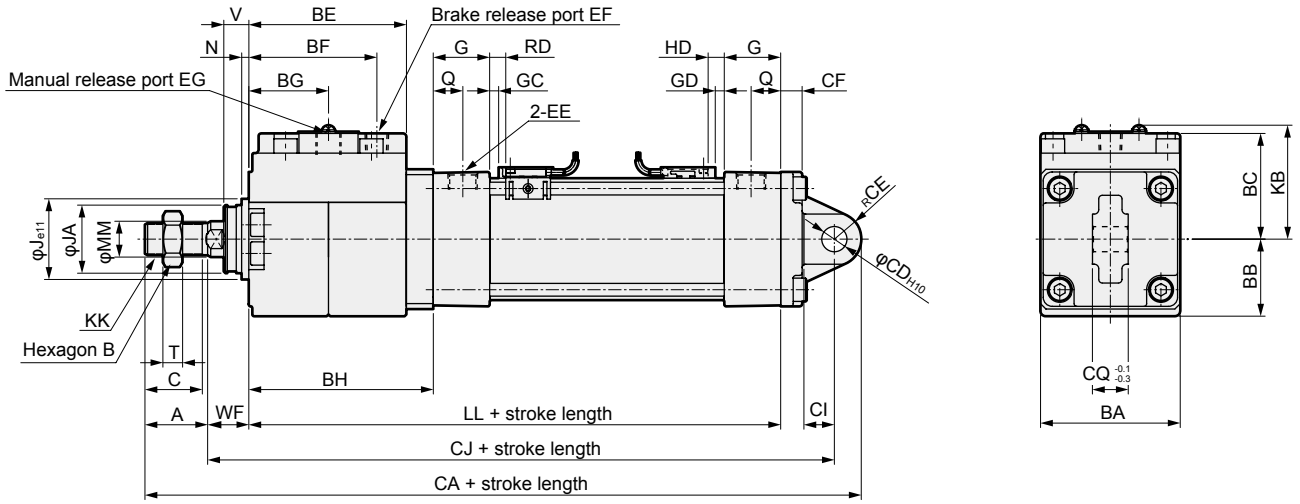
Code	Head side flange (FB) basic dimensions																		
Bore size (mm)	A	B	BA	BB	BC	BE	BF	BG	BH	C	EE	EF	EG	G	J	JA	KB	KK	*1 LL
φ40	30	22	57	31.5	46.5	63	52.5	32.5	77	27	Rc1/4	Rc1/8	M12	27	35	31	51.1	M14×1.5	161(167)
φ50	35	27	68	38	54	74	59	39	89	32	Rc1/4	Rc1/8	M12	31.5	40	38	58.6	M18×1.5	183(191)
φ63	35	27	78	43	59	88	71.5	44.5	103	32	Rc3/8	Rc1/4	M14	31.5	45	38	63.6	M18×1.5	197(205)
φ80	40	32	98	53	72.5	108	81.5	54.5	131	37	Rc3/8	Rc1/4	M16	38	45	43	77.1	M22×1.5	245(255)
φ100	40	41	118	63	80.5	129	101	65.5	151	37	Rc1/2	Rc3/8	M18	38	55	51	85.1	M26×1.5	265(275)

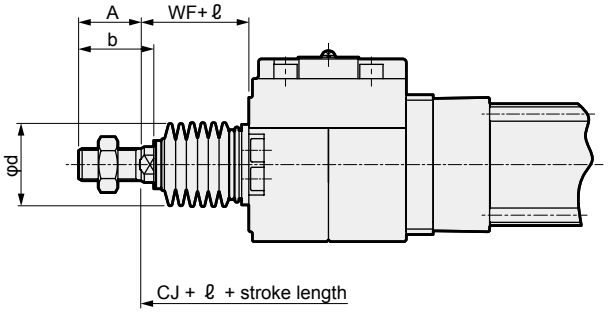
Code							Mounting dimensions							
Bore size (mm)	MM	N	Q	T	V	WF	*1 FA	FC	FD	FH	*1 FJ	FL	FM	FT
φ40	16	4	14	8	13	21	222(228)	46	9	65	192(198)	83	101	10
φ50	20	4	15.5	11	14	23	253(261)	52	9	77	218(226)	100	120	12
φ63	20	4	16.5	11	14	23	267(275)	62	9	92	232(240)	115	135	12
φ80	25	4	19	13	20	32	333(343)	63	12	100	293(303)	126	153	16
φ100	30	4	19	16	20	32	353(363)	75	14	120	313(323)	150	178	16

Code	With bellows														With switch ($T0^{H}_{V}$, $T5^{H}_{V}$, $T2^{H}_{V}$, $T3^{H}_{V}$, $T3P^{H}_{V}$)				
Bore size (mm)	A	b	d	WF	ℓ										*1 GC	*1 GD	*1 RD	*1 HD	P
					50 or less	Over 50 to 100	Over 100 to 150	Over 150 to 200	Over 200 to 300	Over 300 to 400	Over 400 to 500	Over 500 to 600	Over 600 to 700	Over 700 to 750					
φ40	30	35	40	21	30	43	55	68	93	118	143	-	-	-	1(4)	1(4)	5(8)	5(8)	29
φ50	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	1(5)	6.5(10.5)	5(9)	34
φ63	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	1(5)	6.5(10.5)	5(9)	40
φ80	40	50	53	32	29	42	54	67	92	117	142	167	192	204	8.5(13.5)	2(7)	12.5(17.5)	6(11)	-
φ100	40	52.5	61	32	29	42	54	67	92	117	142	167	192	204	8(13)	2.5(7.5)	12(17)	6.5(11.5)	-

Dimensions CAD

● Eye bracket (CA)





*1 : Dimensions in ( ) are for the rubber cushion. The entire length is longer compared with the air cushion.
(φ40: +6mm, φ50/φ63: +8mm, φ80/φ100: +10mm)
*2 : RD and HD dimensions in dimension drawings indicate the position of switch end, and GC and GD indicate the position of switch rail end.
*3 : Refer to page 747 for dimensions of the type with valves (JSG-V).
*4 : Refer to page 748 for HD, RD and protruding dimensions of other switches.

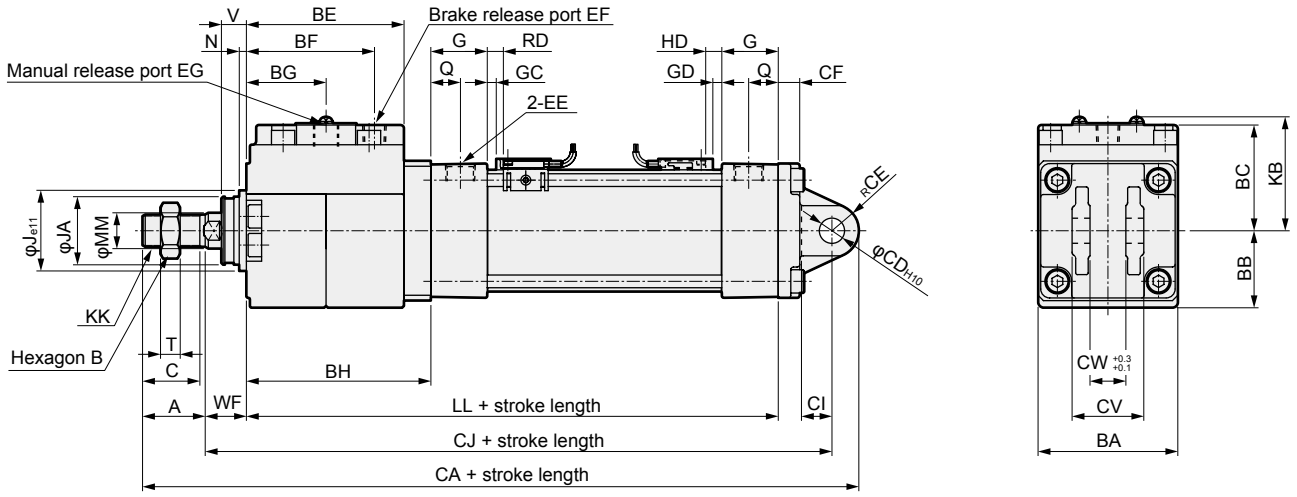
Code	Eye bracket (CA) basic dimensions																		
Bore size (mm)	A	B	BA	BB	BC	BE	BF	BG	BH	C	EE	EF	EG	G	J	JA	KB	KK	*1 LL
φ40	30	22	57	31.5	46.5	63	52.5	32.5	77	27	Rc1/4	Rc1/8	M12	27	35	31	51.1	M14×1.5	161(167)
φ50	35	27	68	38	54	74	59	39	89	32	Rc1/4	Rc1/8	M12	31.5	40	38	58.6	M18×1.5	183(191)
φ63	35	27	78	43	59	88	71.5	44.5	103	32	Rc3/8	Rc1/4	M14	31.5	45	38	63.6	M18×1.5	197(205)
φ80	40	32	98	53	72.5	108	81.5	54.5	131	37	Rc3/8	Rc1/4	M16	38	45	43	77.1	M22×1.5	245(255)
φ100	40	41	118	63	80.5	129	101	65.5	151	37	Rc1/2	Rc3/8	M18	38	55	51	85.1	M26×1.5	265(275)

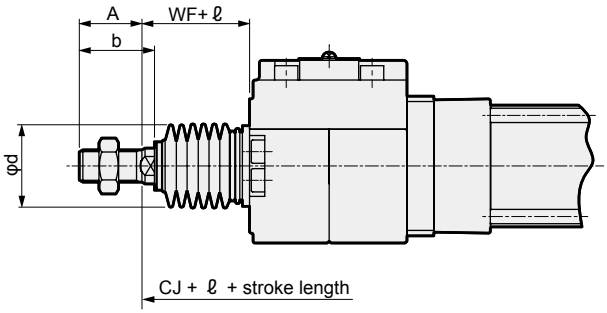
Code							Mounting dimensions						
Bore size (mm)	MM	N	Q	T	V	WF	*1 CA	CD	CE	CF	CI	*1 CJ	CQ
φ40	16	4	14	8	13	21	246(252)	10	11	9	13	205(211)	14
φ50	20	4	15.5	11	14	23	286(294)	14	15	12	17	236(244)	20
φ63	20	4	16.5	11	14	23	300(308)	14	15	12	17	250(258)	20
φ80	25	4	19	13	20	32	382(392)	22	23	15	26	319(329)	30
φ100	30	4	19	16	20	32	402(412)	22	23	15	26	339(349)	30

Code	With bellows														With switch ($T0^{H}_{V}$, $T5^{H}_{V}$, $T2^{H}_{V}$, $T3^{H}_{V}$, $T3P^{H}_{V}$)				
Bore size (mm)	A	b	d	WF	ℓ										*1 GC	*1 GD	*1 RD	*1 HD	P
					50 or less	Over 50 to 100	Over 100 to 150	Over 150 to 200	Over 200 to 300	Over 300 to 400	Over 400 to 500	Over 500 to 600	Over 600 to 700	Over 700 to 750					
φ40	30	35	40	21	30	43	55	68	93	118	143	-	-	-	1(4)	1(4)	5(8)	5(8)	29
φ50	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	1(5)	6.5(10.5)	5(9)	34
φ63	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	1(5)	6.5(10.5)	5(9)	40
φ80	40	50	53	32	29	42	54	67	92	117	142	167	192	204	8.5(13.5)	2(7)	12.5(17.5)	6(11)	-
φ100	40	52.5	61	32	29	42	54	67	92	117	142	167	192	204	8(13)	2.5(7.5)	12(17)	6.5(11.5)	-

Dimensions CAD

● Clevis bracket (CB)





*1 : Dimensions in ( ) are for the rubber cushion. The entire length is longer compared with the air cushion.
(φ40: +6mm, φ50/φ63: +8mm, φ80/φ100: +10mm)
*2 : RD and HD dimensions in dimension figures indicate the position of switch end, and GC and GD indicate the position of switch rail end.
*3 : Refer to page 747 for dimensions of the type with valves (JSG-V).
*4 : Refer to page 748 for HD, RD and protruding dimensions of other switches.
*5 : Pin, split pin and plain washer are attached.

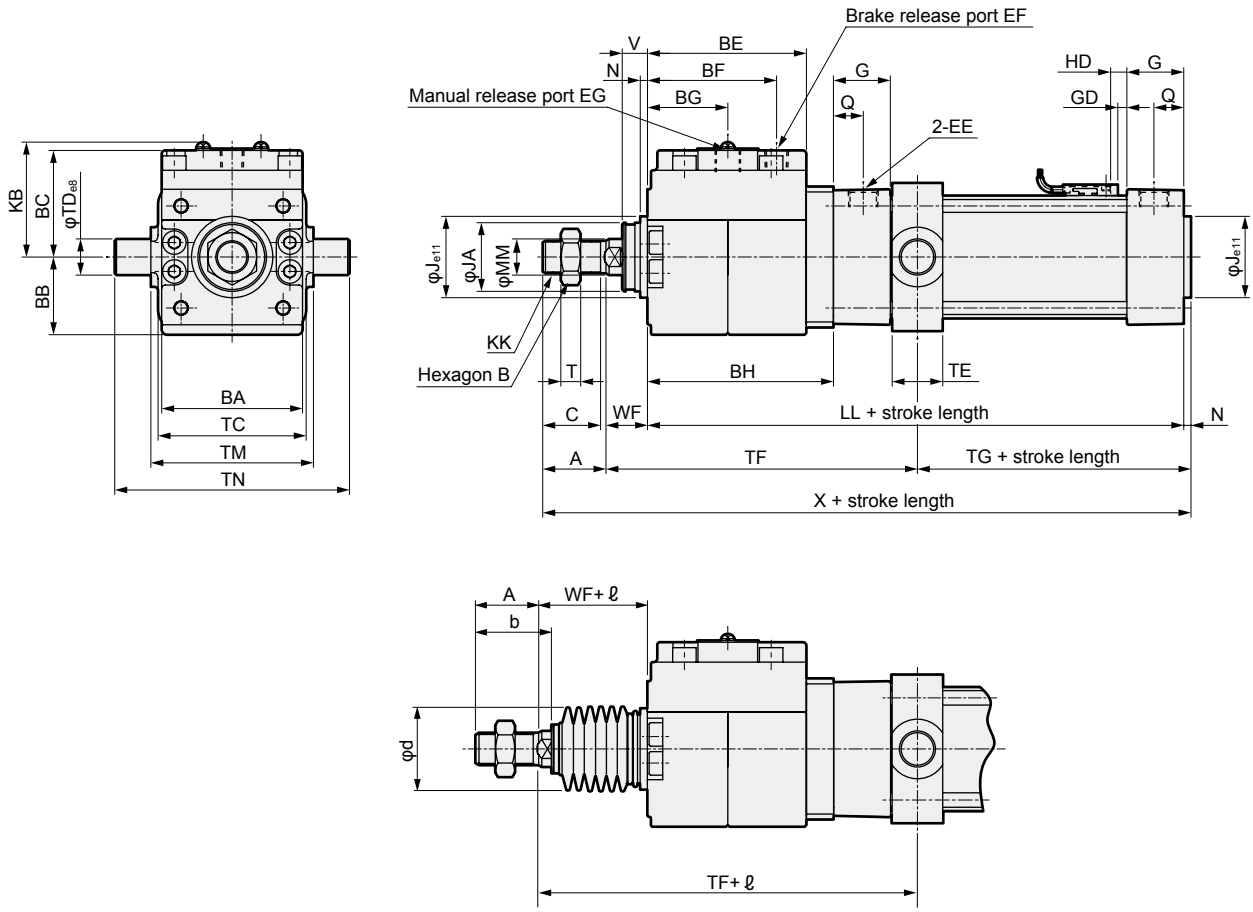
Code	Clevis bracket (CB) basic dimensions																		
Bore size (mm)	A	B	BA	BB	BC	BE	BF	BG	BH	C	EE	EF	EG	G	J	JA	KB	KK	*1 LL
φ40	30	22	57	31.5	46.5	63	52.5	32.5	77	27	Rc1/4	Rc1/8	M12	27	35	31	51.1	M14×1.5	161(167)
φ50	35	27	68	38	54	74	59	39	89	32	Rc1/4	Rc1/8	M12	31.5	40	38	58.6	M18×1.5	183(191)
φ63	35	27	78	43	59	88	71.5	44.5	103	32	Rc3/8	Rc1/4	M14	31.5	45	38	63.6	M18×1.5	197(205)
φ80	40	32	98	53	72.5	108	81.5	54.5	131	37	Rc3/8	Rc1/4	M16	38	45	43	77.1	M22×1.5	245(255)
φ100	40	41	118	63	80.5	129	101	65.5	151	37	Rc1/2	Rc3/8	M18	38	55	51	85.1	M26×1.5	265(275)

Code							Mounting dimensions							
Bore size (mm)	MM	N	Q	T	V	WF	*1 CA	CD	CE	CF	CI	*1 CJ	CV	CW
φ40	16	4	14	8	13	21	246(252)	10	11	9	13	205(211)	28	14
φ50	20	4	15.5	11	14	23	286(294)	14	15	12	17	236(244)	40	20
φ63	20	4	16.5	11	14	23	300(308)	14	15	12	17	250(258)	40	20
φ80	25	4	19	13	20	32	382(392)	22	23	15	26	319(329)	60	30
φ100	30	4	19	16	20	32	402(412)	22	23	15	26	339(349)	60	30

Code	With bellows														With switch (T0Ⅵ, T5Ⅵ, T2Ⅵ, T3Ⅵ, T3PⅥ)				
Bore size (mm)	A	b	d	WF	ℓ										*1 GC	*1 GD	*1 RD	*1 HD	P
					50 or less	Over 50 to 100	Over 100 to 150	Over 150 to 200	Over 200 to 300	Over 300 to 400	Over 400 to 500	Over 500 to 600	Over 600 to 700	Over 700 to 750					
φ40	30	35	40	21	30	43	55	68	93	118	143	-	-	-	1(4)	1(4)	5(8)	5(8)	29
φ50	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	1(5)	6.5(10.5)	5(9)	34
φ63	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	1(5)	6.5(10.5)	5(9)	40
φ80	40	50	53	32	29	42	54	67	92	117	142	167	192	204	8.5(13.5)	2(7)	12.5(17.5)	6(11)	-
φ100	40	52.5	61	32	29	42	54	67	92	117	142	167	192	204	8(13)	2.5(7.5)	12(17)	6.5(11.5)	-

Dimensions CAD

● Rod side trunnion (TA)



*1 : Dimensions in ( ) are for the rubber cushion. The entire length is longer compared with the air cushion.
(φ40: +6mm, φ50/φ63: +8mm, φ80/φ100: +10mm)
*2 : A switch cannot be installed on the rod side.
*3 : HD in the dimensions indicates the position of switch end, and GD indicates the position of switch rail end.
*4 : Refer to page 747 for dimensions of the type with valves (JSG-V).
*5 : Refer to page 748 for HD and protruding dimensions of other switches.

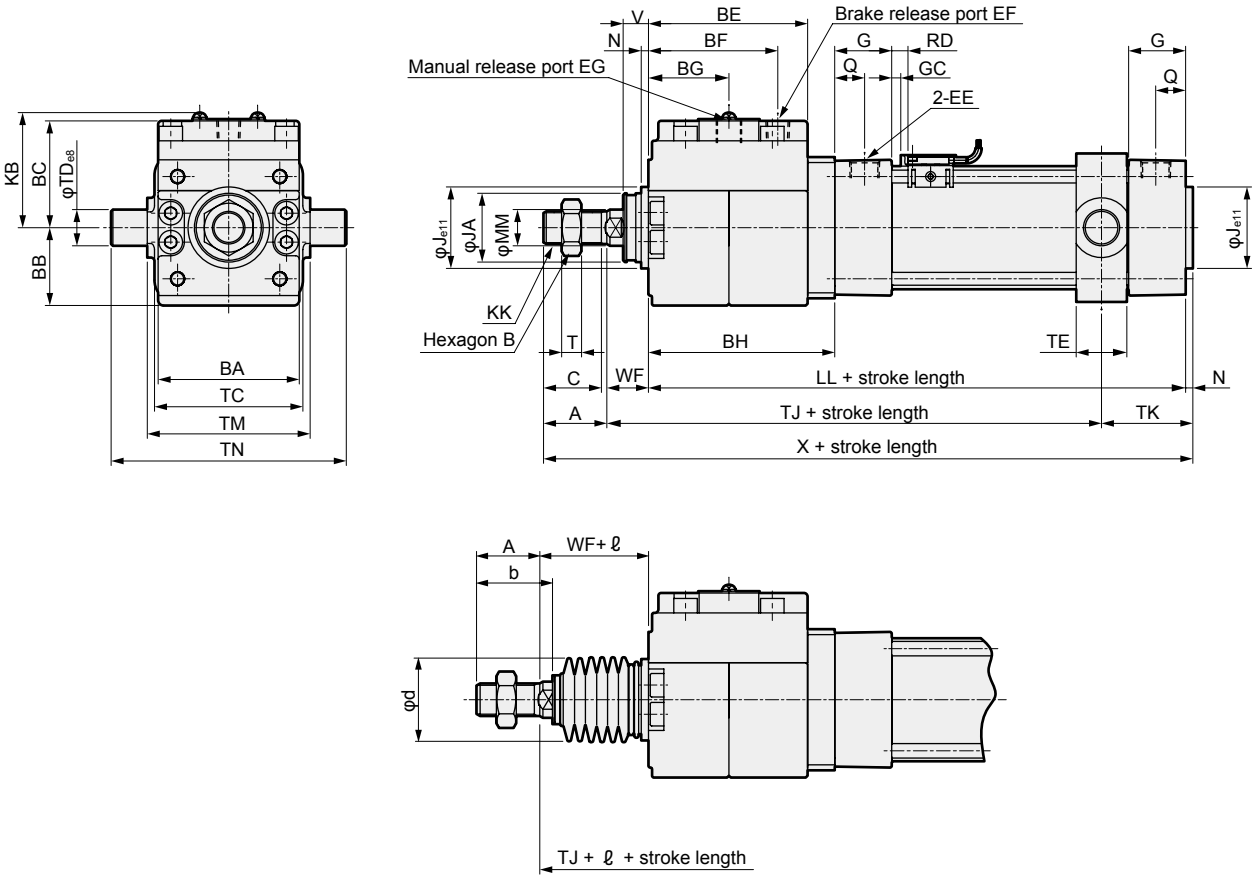
Code	Rod side trunnion (TA) basic dimensions																		
Bore size (mm)	A	B	BA	BB	BC	BE	BF	BG	BH	C	EE	EF	EG	G	J	JA	KB	KK	*1 LL
φ40	30	22	57	31.5	46.5	63	52.5	32.5	77	27	Rc1/4	Rc1/8	M12	27	35	31	51.1	M14×1.5	161(167)
φ50	35	27	68	38	54	74	59	39	89	32	Rc1/4	Rc1/8	M12	31.5	40	38	58.6	M18×1.5	183(191)
φ63	35	27	78	43	59	88	71.5	44.5	103	32	Rc3/8	Rc1/4	M14	31.5	45	38	63.6	M18×1.5	197(205)
φ80	40	32	98	53	72.5	108	81.5	54.5	131	37	Rc3/8	Rc1/4	M16	38	45	43	77.1	M22×1.5	245(255)
φ100	40	41	118	63	80.5	129	101	65.5	151	37	Rc1/2	Rc3/8	M18	38	55	51	85.1	M26×1.5	265(275)

Code								Mounting dimensions						
Bore size (mm)	MM	N	Q	T	V	WF	*1 X	TC	TD	TE	TF	*1 TG	TM	TN
φ40	16	4	14	8	13	21	216(222)	57	16	22	137	49(55)	63	95
φ50	20	4	15.5	11	14	23	245(253)	67	16	22	155.5	54.5(62.5)	75	107
φ63	20	4	16.5	11	14	23	259(267)	82	20	28	172.5	51.5(59.5)	90	130
φ80	25	4	19	13	20	32	321(331)	100	20	34	219	62(72)	110	150
φ100	30	4	19	16	20	32	341(351)	121	25	40	242	59(69)	132	182

Code	With bellows														With switch ($T0^{H}_{V}$, $T5^{H}_{V}$, $T2^{H}_{V}$, $T3^{H}_{V}$, $T3P^{H}_{V}$)	
Bore size (mm)	A	b	d	WF	ℓ										*1 GD	*1 HD
					50 or less	Over 50 to 100	Over 100 to 150	Over 150 to 200	Over 200 to 300	Over 300 to 400	Over 400 to 500	Over 500 to 600	Over 600 to 700	Over 700 to 750		
φ40	30	35	40	21	30	43	55	68	93	118	143	-	-	-	1(4)	5(8)
φ50	35	42	47	23	31	44	56	69	94	119	144	169	-	-	1(5)	5(9)
φ63	35	42	47	23	31	44	56	69	94	119	144	169	-	-	1(5)	5(9)
φ80	40	50	53	32	29	42	54	67	92	117	142	167	192	204	2(7)	6(11)
φ100	40	52.5	61	32	29	42	54	67	92	117	142	167	192	204	2.5(7.5)	6.5(11.5)

Dimensions

● Head side trunnion (TB)



*1 : Dimensions in ( ) are for the rubber cushion. The entire length is longer compared with the air cushion.
(φ40: +6mm, φ50/φ63: +8mm, φ80/φ100: +10mm)
*2 : Switch cannot be installed on the head side.
*3 : RD in the dimensions indicates the position of switch end, and GC indicates the position of switch rail end.
*4 : Refer to page 747 for dimensions of the type with valves (JSG-V).
*5 : Refer to page 748 for RD dimensions and protruding dimensions of other switches.

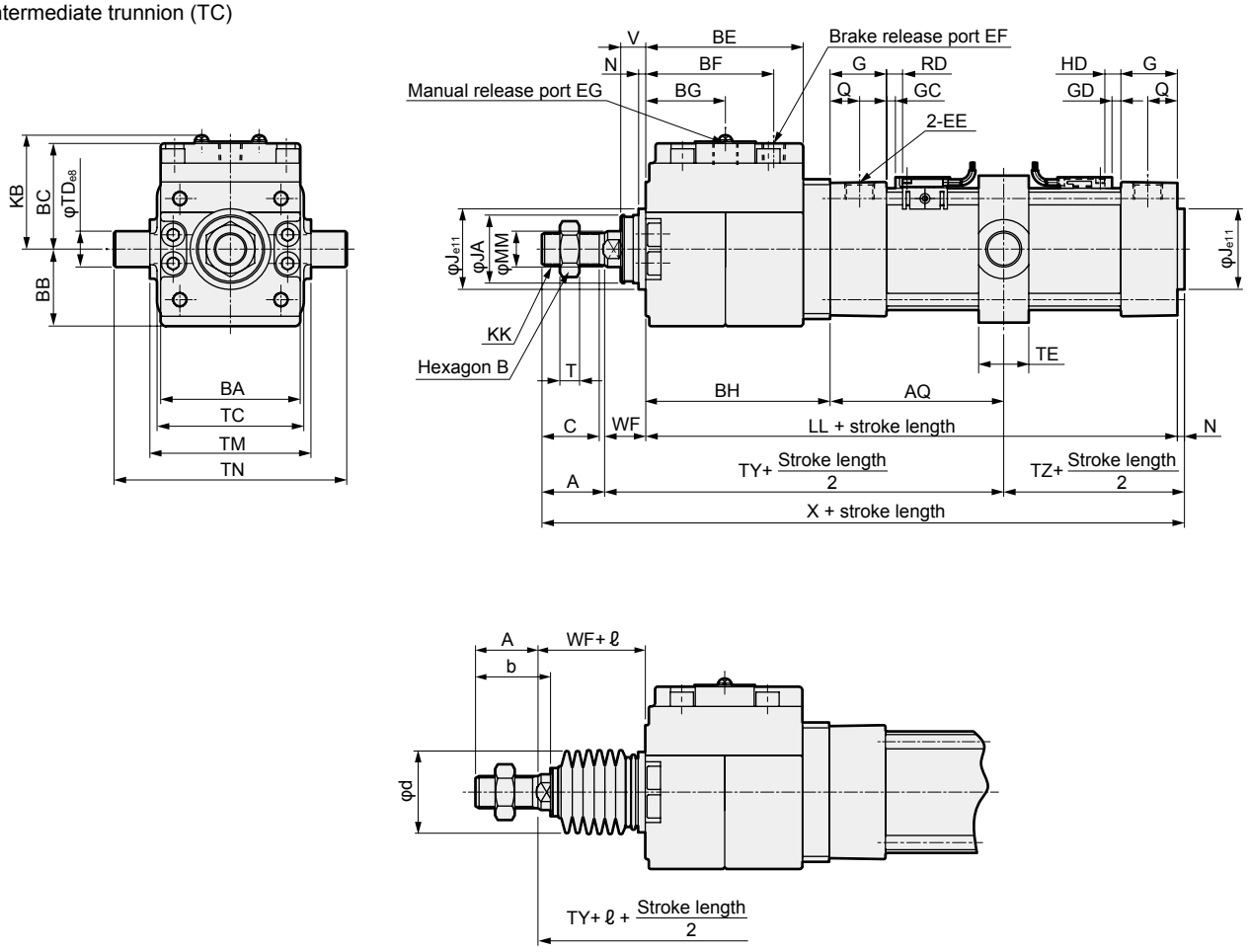
Code	Rod side trunnion (TB) basic dimensions																	
Bore size (mm)	A	B	BA	BB	BC	BE	BF	BG	BH	C	EE	EF	EG	G	J	JA	KB	KK	*1 LL
φ40	30	22	57	31.5	46.5	63	52.5	32.5	77	27	Rc1/4	Rc1/8	M12	27	35	31	51.1	M14×1.5	161(167)
φ50	35	27	68	38	54	74	59	39	89	32	Rc1/4	Rc1/8	M12	31.5	40	38	58.6	M18×1.5	183(191)
φ63	35	27	78	43	59	88	71.5	44.5	103	32	Rc3/8	Rc1/4	M14	31.5	45	38	63.6	M18×1.5	197(205)
φ80	40	32	98	53	72.5	108	81.5	54.5	131	37	Rc3/8	Rc1/4	M16	38	45	43	77.1	M22×1.5	245(255)
φ100	40	41	118	63	80.5	129	101	65.5	151	37	Rc1/2	Rc3/8	M18	38	55	51	85.1	M26×1.5	265(275)

Code								Mounting dimensions						
Bore size (mm)	MM	N	Q	T	V	WF	*1 X	TC	TD	TE	*1 TJ	TK	TM	TN
φ40	16	4	14	8	13	21	216(222)	57	16	22	143(149)	43	63	95
φ50	20	4	15.5	11	14	23	245(253)	67	16	22	162.5(170.5)	47.5	75	107
φ63	20	4	16.5	11	14	23	259(267)	82	20	28	173.5(181.5)	50.5	90	130
φ80	25	4	19	13	20	32	321(331)	100	20	34	221(231)	60	110	150
φ100	30	4	19	16	20	32	341(351)	121	25	40	238(248)	63	132	182

Code	With bellows														With switch ($T0^{H}_{V}$, $T5^{H}_{V}$, $T2^{H}_{V}$, $T3^{H}_{V}$, $T3P^{H}_{V}$)	
Bore size (mm)	A	b	d	WF	ℓ										*1 GC	*1 RD
					50 or less	Over 50 to 100	Over 100 to 150	Over 150 to 200	Over 200 to 300	Over 300 to 400	Over 400 to 500	Over 500 to 600	Over 600 to 700	Over 700 to 750		
φ40	30	35	40	21	30	43	55	68	93	118	143	-	-	-	1(4)	5(8)
φ50	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	6.5(10.5)
φ63	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	6.5(10.5)
φ80	40	50	53	32	29	42	54	67	92	117	142	167	192	204	8.5(13.5)	12.5(17.5)
φ100	40	52.5	61	32	29	42	54	67	92	117	142	167	192	204	8(13)	12(17)

Dimensions CAD

● Intermediate trunnion (TC)



*1 : Dimensions in ( ) are for the rubber cushion. The entire length is longer compared with the air cushion.
(φ40: +6mm, φ50/φ63: +8mm, φ80/φ100: +10mm)
*2 : RD and HD dimensions in dimension figures indicate the position of switch end, and GC and GD indicate the position of switch rail end.
*3 : Refer to page 747 for dimensions of the type with valves (JSG-V).
*4 : Refer to page 748 for HD, RD and protruding dimensions of other switches.

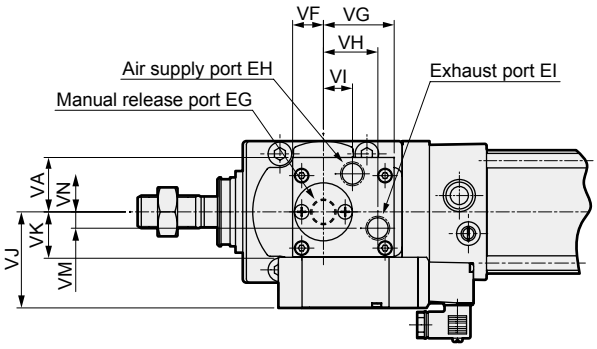
Code	Intermediate trunnion (TC) basic dimensions																		
Bore size (mm)	A	B	BA	BB	BC	BE	BF	BG	BH	C	EE	EF	EG	G	J	JA	KB	KK	*1 LL
φ40	30	22	57	31.5	46.5	63	52.5	32.5	77	27	Rc1/4	Rc1/8	M12	27	35	31	51.1	M14×1.5	161(167)
φ50	35	27	68	38	54	74	59	39	89	32	Rc1/4	Rc1/8	M12	31.5	40	38	58.6	M18×1.5	183(191)
φ63	35	27	78	43	59	88	71.5	44.5	103	32	Rc3/8	Rc1/4	M14	31.5	45	38	63.6	M18×1.5	197(205)
φ80	40	32	98	53	72.5	108	81.5	54.5	131	37	Rc3/8	Rc1/4	M16	38	45	43	77.1	M22×1.5	245(255)
φ100	40	41	118	63	80.5	129	101	65.5	151	37	Rc1/2	Rc3/8	M18	38	55	51	85.1	M26×1.5	265(275)

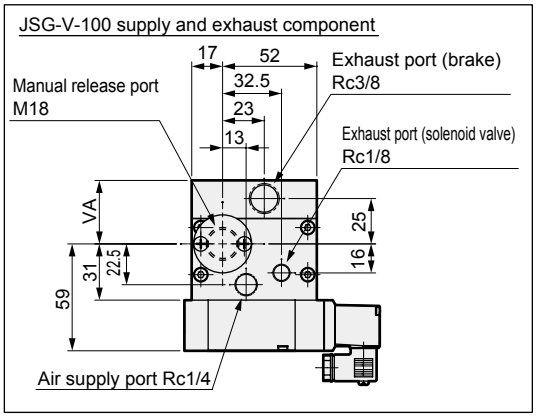
Code								Mounting dimensions							
Bore size (mm)	MM	N	Q	T	V	WF	*1 X	TC	TD	TE	TM	TN	*1 TY	*1 TZ	*1 AQ
φ40	16	4	14	8	13	21	216(222)	57	16	22	63	95	140(143)	46(49)	42(45)+Stroke length / 2
φ50	20	4	15.5	11	14	23	245(253)	67	16	22	75	107	159(163)	51(55)	47(51)+Stroke length / 2
φ63	20	4	16.5	11	14	23	259(267)	82	20	28	90	130	173(177)	51(55)	47(51)+Stroke length / 2
φ80	25	4	19	13	20	32	321(331)	100	20	34	110	150	220(225)	61(66)	57(62)+Stroke length / 2
φ100	30	4	19	16	20	32	341(351)	121	25	40	132	182	240(245)	61(66)	57(62)+Stroke length / 2

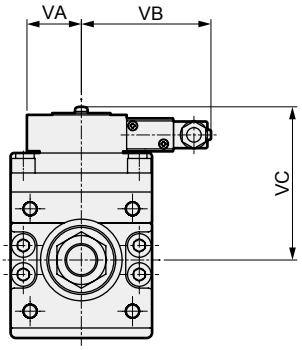
Code	With bellows														With switch ($T0^{H}_{V}$, $T5^{H}_{V}$, $T2^{H}_{V}$, $T3^{H}_{V}$, $T3P^{H}_{V}$)				
Bore size (mm)	A	b	d	WF	ℓ										*1 GC	*1 GD	*1 RD	*1 HD	P
					50 or less	Over 50 to 100	Over 100 to 150	Over 150 to 200	Over 200 to 300	Over 300 to 400	Over 400 to 500	Over 500 to 600	Over 600 to 700	Over 700 to 750					
φ40	30	35	40	21	30	43	55	68	93	118	143	-	-	-	1(4)	1(4)	5(8)	5(8)	29
φ50	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	1(5)	6.5(10.5)	5(9)	34
φ63	35	42	47	23	31	44	56	69	94	119	144	169	-	-	2.5(6.5)	1(5)	6.5(10.5)	5(9)	40
φ80	40	50	53	32	29	42	54	67	92	117	142	167	192	204	8.5(13.5)	2(7)	12.5(17.5)	6(11)	-
φ100	40	52.5	61	32	29	42	54	67	92	117	142	167	192	204	8(13)	2.5(7.5)	12(17)	6.5(11.5)	-

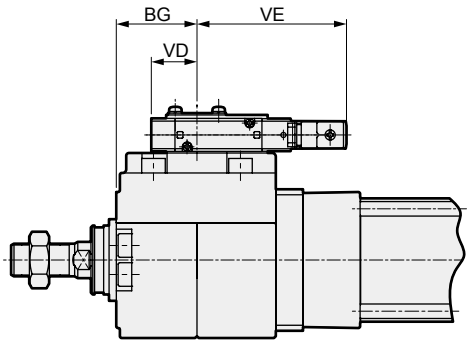
Dimensions CAD

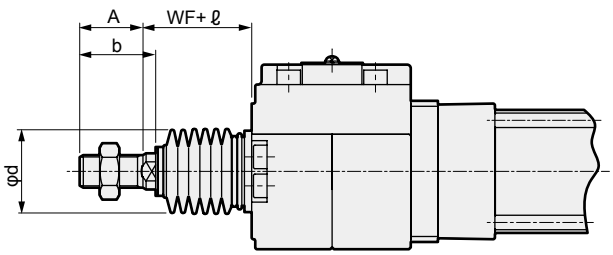
● JSG-V (with valve for brake release)











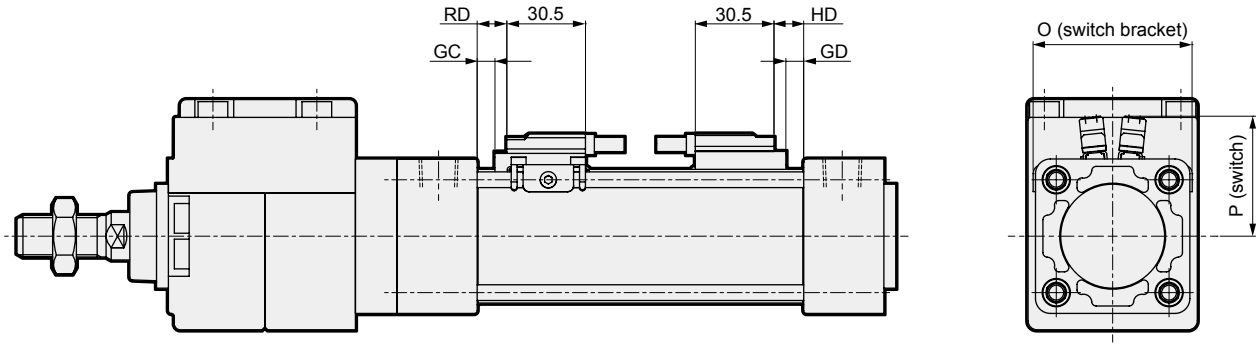
*1: The shape of the JSG-V-100 supply and exhaust port differs from that of other sizes. Refer to the dimensions of JSG-V-100 supply and exhaust components in the upper right figure.

Code	With valve for brake release (JSG-V) basic dimensions																
Bore size (mm)	BG	EG	EH	EI	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VM	VN
φ40	32.5	M12	Rc1/8	Rc1/8	26	62.5	72	24	83.5	19	38	30	12.5	44	16	4	16
φ50	39	M12	Rc1/8	Rc1/8	26	62.5	79.5	24	83.5	19	38	30	12.5	44	16	4	16
φ63	44.5	M14	Rc1/4	Rc1/4	30	71.5	84.5	25	82.5	17	39	30	16	53	25	9	21
φ80	54.5	M16	Rc1/4	Rc1/4	30	71.5	98	25	82.5	17	39	30	16	53	25	9	21
φ100	65.5	M18	*1		35	77.5	113	21	86.5	*1							

Code	With bellows													
Bore size (mm)	A	b	d	WF	ℓ									
					50 or less	Over 50 to 100	Over 100 to 150	Over 150 to 200	Over 200 to 300	Over 300 to 400	Over 400 to 500	Over 500 to 600	Over 600 to 700	Over 700 to 750
φ40	30	35	40	21	30	43	55	68	93	118	143	-	-	-
φ50	35	42	47	23	31	44	56	69	94	119	144	169	-	-
φ63	35	42	47	23	31	44	56	69	94	119	144	169	-	-
φ80	40	50	53	32	29	42	54	67	92	117	142	167	192	204
φ100	40	52.5	61	32	29	42	54	67	92	117	142	167	192	204

* Dimensions other than those listed above are the same as those of double acting/single rod. Refer to pages 738 to 746.

JSG Series common (with T1, T$^2_3$Y, T2J, T2YD/T, T8, T$^2_3$W switches) dimensions CAD



T1, T$^2_3$Y, T2J, T2YD/T, T8, T$^2_3$W switch installation dimensions

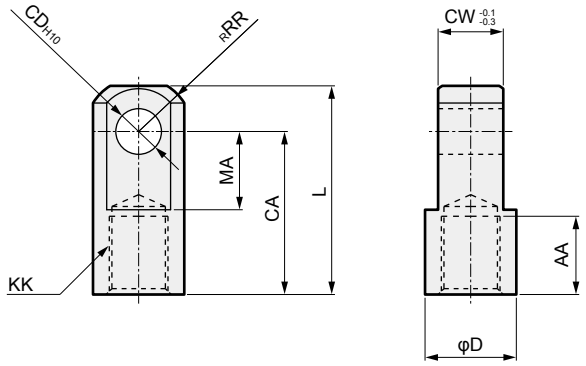
Code	T1, T2Y, T3Y, T2J, T2YD/T *2				T8 *2			T2W, T3W					O
Bore size (mm)	P		GC	GD	P	GC	GD	P	GC	GD	RD	HD	
	T1, T2YD/T	Others											
φ40	40	35	4(7)	4(7)	35	0(2)	0(2)	29	3.5(6.5)	3.5(6.5)	7.5(10.5)	7.5(10.5)	58
φ50	44	39	5.5(9.5)	4(8)	39	0.5(4.5)	0(3)	33	5(9)	3(7)	9(13)	7(11)	68
φ63	50	45	5.5(9.5)	4(8)	45	0.5(4.5)	0(3)	39	5(9)	3(7)	9(13)	7(11)	78
φ80	57	52	11.5(16.5)	5(10)	52	6.5(11.5)	0(5)	47	11(16)	4(9)	15(20)	8(13)	95
φ100	64	59	11(16)	5.5(10.5)	59	6(11)	0.5(5.5)	54	10.5(15.5)	4.5(9.5)	14.5(19.5)	8.5(13.5)	114

*1: RD and HD dimensions in dimension drawings indicate the position of switch end, and GC and GD indicate the position of switch rail end.
*2: The switch tip position is at the switch rail end (RD = GC/HD = GD).
*3: Dimensions in ( ) are for the rubber cushion.

JSG Series common accessory dimensions (rod eye, clevis, bracket)

● Rod eye (I)

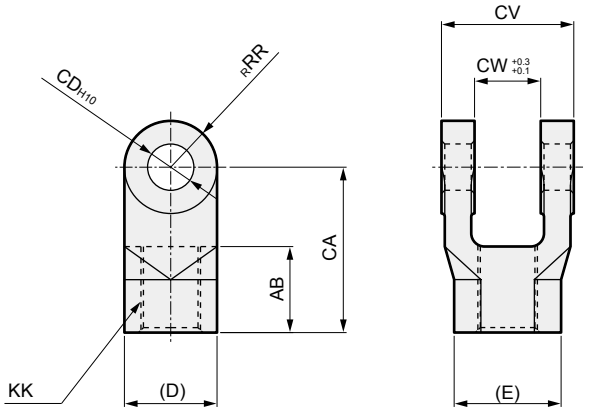
Material: Steel
Painting



Model No.	Bore size (mm)	AA	CA	CD	CW	D	KK	L	MA	RR	Wt (kg)
SCG-I-40	40	19	40	10	14	22	M14×1.5	50	19	12.5	0.07
SCG-I-50	50,63	24	50	14	20	28	M18×1.5	64	24	16.5	0.20
SCG-I-80	80	26	60	22	30	40	M22×1.5	80	34	23.5	0.52
SCG-I-100	100	26	60	22	30	40	M26×1.5	80	34	23.5	0.48

● Rod clevis (Y)

Material: Cast iron
Painting

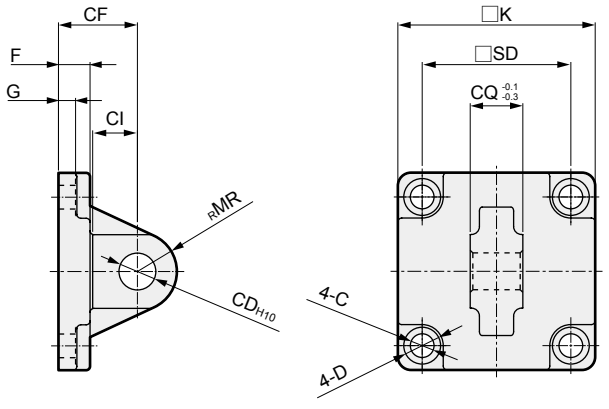


Model No.	Bore size (mm)	AB	CA	CD	CV	CW	D	E	KK	RR	Wt (kg)
SCG-Y-40	40	21	40	10	28	14	22	25.4	M14×1.5	11	0.13
SCG-Y-50	50,63	26	50	14	40	20	28	32.3	M18×1.5	14	0.30
SCG-Y-80	80	31	65	22	60	30	40	46.2	M22×1.5	20	0.94
SCG-Y-100	100	31	65	22	60	30	40	46.2	M26×1.5	20	0.92

Note: A pin, a split pin and a plain washer are attached.

● Eye bracket (B1)

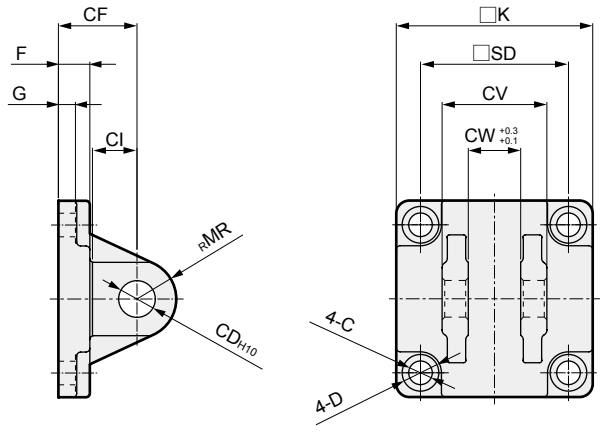
Material: Cast iron
Painting



Model No.	Bore size (mm)	C	CD	CF	CI	CQ	D	F	G	K	MR	SD	Wt (kg)
SCG-B1-40	40	6.6	10	23	13	14	11	9	4.5	52	11	38	0.16
SCG-B1-50	50	9	14	30	17	20	14	12	6.5	65	15	46.5	0.38
SCG-B1-63	63	9	14	30	17	20	14	12	6.5	75	15	56.5	0.48
SCG-B1-80	80	11	22	42	26	30	17	15	8.5	95	23	72	1.19
SCG-B1-100	100	11	22	42	26	30	17	15	8.5	114	23	89	1.56

● Clevis bracket (B2)

Material: Cast iron
Painting



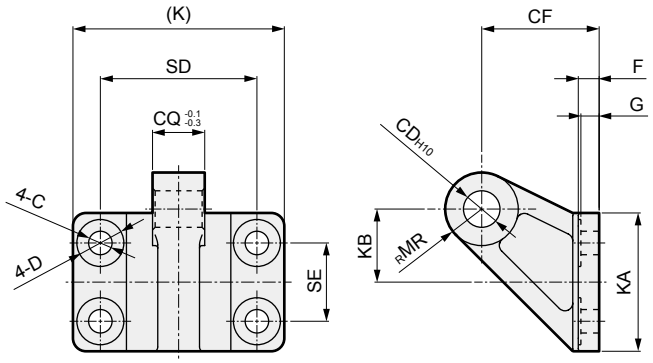
Model No.	Bore size (mm)	C	CD	CF	CI	CV	CW	D	F	G	K	MR	SD	Wt (kg)
SCG-B2-40	40	6.6	10	23	13	28	14	11	9	4.5	52	11	38	0.20
SCG-B2-50	50	9	14	30	17	40	20	14	12	6.5	65	15	46.5	0.46
SCG-B2-63	63	9	14	30	17	40	20	14	12	6.5	75	15	56.5	0.58
SCG-B2-80	80	11	22	42	26	60	30	17	15	8.5	95	23	72	1.52
SCG-B2-100	100	11	22	42	26	60	30	17	15	8.5	114	23	89	1.91

Note: A pin, a split pin and a plain washer are attached.

Accessory dimensions

● Eye bracket (B3)

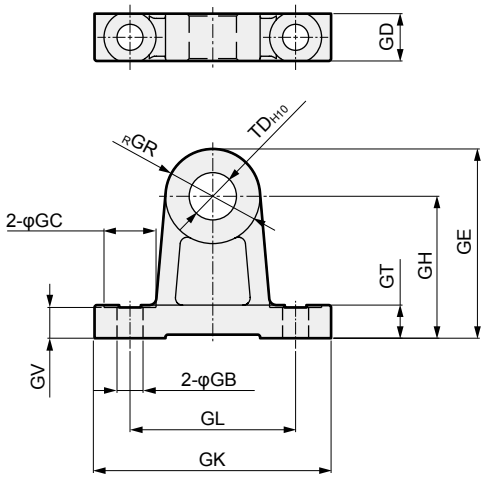
Material: Cast iron
Painting



Model No.	Bore size (mm)	C	CD	CF	CQ	D	F	G	K	KA	KB	MR	SD	SE	Wt (kg)
SCG-B3-32	40	6.6	10	33	14	15	7	6	62	42	21	10	44	22	0.21
SCG-B3-50	50,63	9	14	45	20	18	8	7	81	53	28	14	60	30	0.45
SCG-B3-80	80,100	11	22	65	30	22	10	9	111	73	41.5	22	86	45	1.23

● Trunnion No. 2 bracket (B4)

Material: Cast iron
Painting

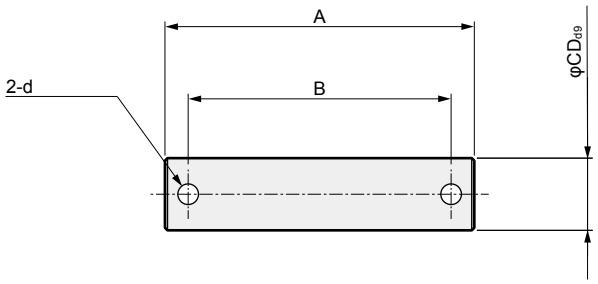


Model No.	Bore size (mm)	GB	GC	GD	GE	GR	GH	GK	GL	GT	GV	TD	Wt (kg)
SCG-B4-40	40,50	9	18	17	60	30	45	80	60	12	11	16	0.43
SCG-B4-63	63,80	11	22	20	80	40	60	100	70	14	13	20	0.87
SCG-B4-100	100	13.5	24	26	100	50	75	120	90	17	16	25	1.75

Note: The bracket is provided as 2 pcs./set.

● Pin (P)

Material: Steel
Zinc chromate treatment



Model No.	Applicable bore size (mm)	A	B	CD	d	Weight (kg)
SCG-P-32	40	44	36	10	3	0.04
SCG-P-50	50,63	60	51	14	4	0.10
SCG-P-80	80,100	82	72	22	4	0.34

Note: Split pin and plain washer are attached.

Applications

This product can be used with devices and equipment requiring the following functions.

1 When multipoint positioning is required (transfer/positioning)

The equipment can be accurately stopped at several required positions.

2 When position locking is required

The brakes can be applied and held instantly when the air source or power is turned OFF (during power failure or accident), preventing equipment damage and securing safety.

3 When emergency stop is required

The cylinder can be immediately stopped with electric signals, etc., when a worker enters a hazardous area.

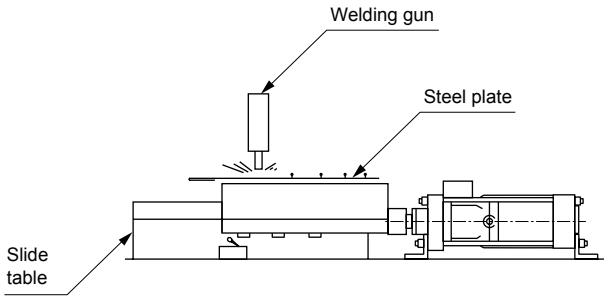
4 Workpiece lock

When locking the workpiece to the jig or mounting base, etc., it can be locked even if there is no pneumatic source or power. The workpiece can be transferred while locked to the jig.

Applications

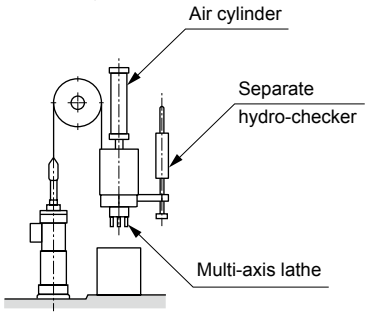
1 Linear multipoint welding

When welding steel plates, etc., linearly at several points, this cylinder can be used to move and position the slide table or welding gun.



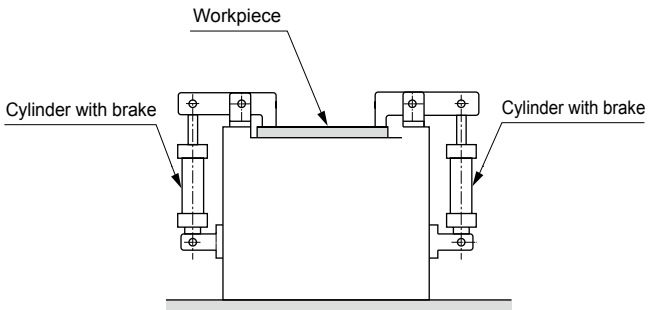
2 Position locking

If there is a load in the vertical direction and the load could fall under its own weight when the pressure source is cut off, the brakes will be applied to prevent falling.



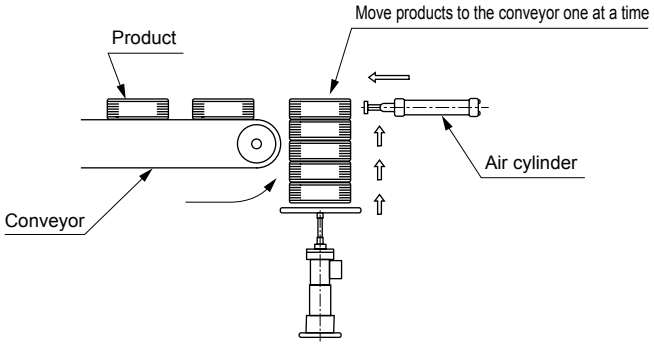
3 Workpiece lock

When locking the workpiece to the jig, etc., if the brake cylinder is used, it will be locked even when the pneumatic source or power is OFF.



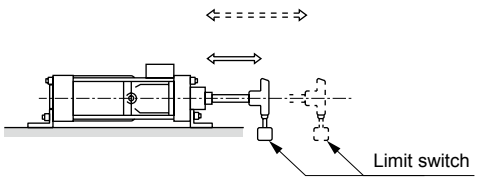
4 Movement to conveyor

Move products to the conveyor one at a time.



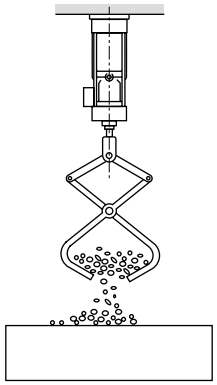
5 When several cylinders with different strokes are required

When different-sized products are in motion on a conveyor, etc., in many cases the stroke length for the cylinders set there must also be changed. Using the brake cylinder, a cylinder compatible with different strokes is created electrically.



6 Hopper open/close

In the case where a hopper must be closed at a specific weight in powder manufacturing, accurate measurement is obtained by stopping the hopper, measuring it accurately and then completely closing it.



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: Tie rod with brake JSG Series

Design/selection

⚠WARNING

■ Design a structure that prevents person(s) from coming into contact with the driven workpiece as well as the moving parts of the cylinder with brakes.

Provide a protective cover so that no human body directly touches the unit. In case of possible contact, provide safety measures such as a sensor for emergency stop before making contact and a buzzer to warn of danger.

■ Use a balanced circuit that accommodates the protrusion of the piston rod.

If the cylinder is stopped part-way in the stroke with the brake, etc., and air pressure is applied to one side of the cylinder, the piston rod will pop out at high speeds when the brake is released. This could cause physical harm, such as pinched hands or feet, or mechanical damage. Use a balance circuit, such as the basic circuit, to prevent popping out.

■ The holding force is the ability to hold static load that is not accompanied by vibration or shock, in a state where the brake is operating under no load.

Take care when constantly using near the upper limit of the holding force.

■ Do not apply loads with impact, strong vibration, or torque while brakes are activated.

If load is externally applied with impact, or if strong vibration or rotational force is externally applied, the holding force can be reduced, creating a dangerous situation.

■ Consider the stopping accuracy and overrun distance during the braking.

Because a mechanical lock is applied, the cylinder does not stop instantly when the stop signal is issued, but stops with a time-wise delay. The stroke at which the cylinder slides due to this delay is the overrun distance. The max. and min. width of the overrun distance is the stopping accuracy.

- To achieve the required stop position, move the limit switch forward by the overrun distance.
- The limit switch must have a detection length (dog length) of the overrun distance + α.
- The operating range of CKD cylinder switches is 7 to 16 mm, depending on the switch model. If overrun distance exceeds this, provide self-holding of the contact at the switch load.

■ In order to improve stopping accuracy, ensure that the brake stops the cylinder as soon as possible after receiving the stop signal.

Use a high response DC control electricity circuit or valve, and set the valve as close to the cylinder as possible.

■ The stopping accuracy is susceptible to fluctuations in piston speed.

If the piston speed changes due to load fluctuations or by some disturbance while the cylinder is moving, the stopping position may vary sharply. Make sure that the piston speed stays the same up to just before the stop position. Since the speed changes significantly in the cushioned range and in the acceleration range after starting operation, the variability of the stopping position will increase.

⚠WARNING

■ Basic circuit

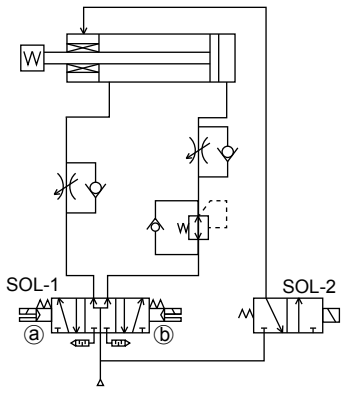
Always adopt the following circuit even for position locking and emergency stop applications. A 2-position valve cannot be used because it affects the brake section even when the cylinder thrust is stopped.

Maintain thrust and load balance with the following circuit. Brakes may not be released when load is applied to brakes.

● Horizontal load

When piping is as shown in Fig. 1, equal pressure is applied to both ends of the piston when stopped to prevent the rod from popping out when the brakes are released. Install a regulator with check valve on the head side to maintain thrust balance.

Fig. 1



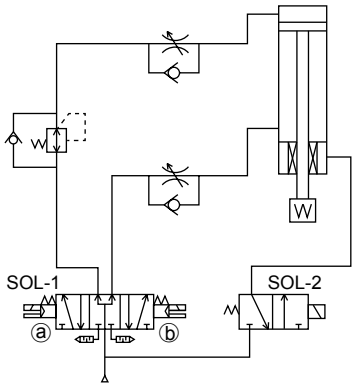
ⓐ SOL-1 ⓑ		SOL-2	Operational status
OFF	OFF	OFF	Stop
ON	OFF	ON	Reverse
OFF	ON	ON	Forward

Design/selection

● For downward vertical load

If load faces downward as shown in Fig. 2, the rod malfunctions in the load direction when brakes are released. Place a regulator with a check valve on the head side to reduce thrust in the load direction and balance the load.

Fig. 2

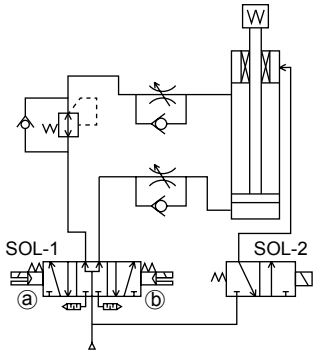


ⓐ SOL-1	ⓑ	SOL-2	Operational status
OFF	OFF	OFF	Stop
ON	OFF	ON	Drop
OFF	ON	ON	Rise

● For upward vertical load

If load faces upward as shown in Fig. 3, the rod malfunctions in the load direction when brakes are released. Place a regulator with a check valve on the rod side to reduce thrust in the load direction and balance the load.

Fig. 3



ⓐ SOL-1	ⓑ	SOL-2	Operational status
OFF	OFF	OFF	Stop
ON	OFF	ON	Drop
OFF	ON	ON	Rise

⚠CAUTION

■ Mount a speed controller on the cylinder.

Mount the speed controller on the cylinder.
Use within the working piston speed range of each series.

■ Stopping accuracy

● Stopping pitch and load factor

Stopping accuracy differs with stopping pitch and load factor. The load factor below is recommended for achieving specified stopping accuracy.

Stop pitch	Load factor
	JSG
50 mm or less	20% of thrust
50 mm to 100 mm	40% of thrust
100 mm or more	60% of thrust

● Selection of valve for brake

The stopping accuracy and overrun distance will change according to the responsiveness of the brake valve. Refer to the JSG-V electrical specification for brake valve and select from the CKD pneumatic valve 4KB2 Series. Connect the valve directly to the brake port to improve stopping accuracy.

● When using a PLC (programmable controller)

If a PLC (programmable controller) is used as the electrical control unit for the valve for brake, stopping accuracy drops due to scan time (computing time). When using a PLC, do not assemble the valve for brake into the PLC circuit.

■ Do not make major changes in applied load when stopped with brakes, or the stopping position may change.

⚠CAUTION

■ As a cushion mechanism integrated in the cylinder, the rubber cushion and the air cushion are available. The purpose of the air cushion is to absorb the piston's kinetic energy by using air compressibility, avoiding collisions of piston and cover at the stroke end. Thus, the cushion is not used to decelerate the piston speed (deceleration action) near the stroke end. The following table shows the kinetic energy that can be absorbed by the cushion. If the kinetic energy exceeds these values, or if bouncing caused by the air compressibility is to be avoided, consider using another shock absorber.

Bore size (mm)	Rubber cushion	Air cushion	
	Allowable absorbed energy J	Effective air cushion length (mm)	Allowable absorbed energy J
φ40	0.9	8.6	3.7
φ50	1.6	13.4	8.0
φ63	1.6	13.4	14.4
φ80	3.3	15.4	25.4
φ100	5.8	15.4	45.6

Kinetic energy (J) =

$$\frac{1}{2} \times \text{Weight (kg)} \times \{\text{Speed (m/s)}\}^2$$

(Note) Calculating kinetic energy

Average cylinder speed is obtained with $Va = \frac{L}{T}$.

Va : Average speed (m/s)

L : Cylinder stroke length (m)

T : Operating time (s)

With respect to this, the cylinder speed just before rushing into the cushion can be obtained with the following simple formula.

$Vm = \frac{L}{T} \times (1+1.5\times \frac{\omega}{100})$

Vm : Speed just before rush-into the cushion (m/s)

ω : Cylinder load factor (%)

Use this Vm value as speed to calculate kinetic energy.

Mounting, installation and adjustment

⚠WARNING

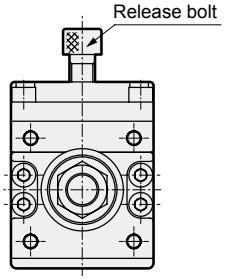
■ Release brakes before coupling the load to the end of the rod. If coupled while brakes are applied, torque or load exceeding holding force may be applied to the piston rod and damage the brake mechanism.

■ If the brake is released while air is applied to only one side of the cylinder, the piston rod can pop out at high speed, creating a dangerous situation. When releasing the brake during adjustment or other maintenance, always observe the following:

- Check that no one is in the movable range of the load and that no problems will arise if the load moves when brakes are released.
- When releasing the brake, perform position locking or take other measures:
  - · Place the load to the bottom end
  - · Pressurize both sides
  - · Place a strut

  to prevent the load from falling.
- Confirm that air is not pressured on only one side of the cylinder when releasing brakes.

■ How to manually release the brake



Note: How to release the brake

- The brakes are released by screwing the release bolt into the female threads (brake release port) on the top of the brakes. (Always remove the release bolt during normal use.)

Release bolt size

Bore size	Bolt screw diameter	Bolt length		Appropriate screw-in volume
		JSG	JSG-V	
φ40	M12×1.75	16 or more	40 or more	3 rotations or less
φ50	M12×1.75	16 or more	40 or more	4 rotations or less
φ63	M14×2	16 or more	40 or more	4 rotations or less
φ80	M16×2	20 or more	40 or more	4.5 rotations or less
φ100	M18×2.5	20 or more	50 or more	5 rotations or less

■ Brakes are released manually or by pressurizing the brake release port. When mounting the load, the brake release operation may cause the load to fall; make sure to check that the brake is operational when the manual release operation is set to default or when there is no air in the brake release port.

■ Do not apply torque to the rod when braking, as the holding force will decrease, creating hazardous conditions. Also, use this product in mechanisms in which the rod does not rotate.

■ Do not apply to the cylinder any force that exceeds the brake holding force listed in the catalog.

Mounting, installation and adjustment

⚠WARNING

■ With the JSG Series, the brakes can be manually released by screwing a hexagon socket head cap bolt into the brake release female thread on the top of the brakes. However, the brakes may be damaged if the bolt is screwed in too far; use the appropriate screw insertion depth for the release bolt shown in the table below.

Bore size	Suitable screw-in volume
φ40	3 rotations or less
φ50	4 rotations or less
φ63	4 rotations or less
φ80	4.5 rotations or less
φ100	5 rotations or less

■ If there is any play, such as looseness, in the brake signal dog, stopping accuracy is affected. Securely fix to eliminate play, etc.

■ If the piston speed is fast, the detection dog must be long enough to match relay response time. If the dog is short, the stop signal is not output and operation does not stop.

⚠CAUTION

■ Adjust the air balance in the cylinder.
With brakes released, place a load on the cylinder and balance the load by adjusting pneumatic pressure applied to the cylinder rod side and head side. Malfunctions such as piston popping out during brake release or abnormal brake release can be prevented by accurately balancing the load.

■ Adjust the installation position of the detector parts, including the cylinder switch.
When braking, consider the overrun distance vis-a-vis the desired stop position and adjust the installation positions for detector parts, including the cylinder switch.

■ Load fluctuations during the reciprocating stroke of the cylinder can cause inconsistent piston speed, leading to greater variation in the stop position. Adjust the mounting of the load so as to prevent any load fluctuations during the reciprocating stroke of the cylinder, especially before the stop position.

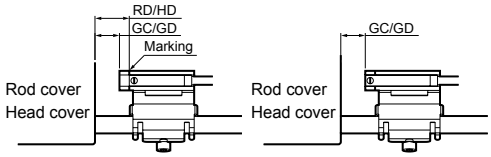
■ Since the speed changes significantly in the cushioned range and in the acceleration range after starting operation, the variability of the stopping position will increase. For this reason, the accuracy described in the specifications may not be obtained when a step just after start of the operation has a short stroke length to the next point.

■ Load to piston rod
Limit load movement using guides so play and torsion do not occur.

■ Maintaining the rod sliding parts
Protect the piston rod sliding surface from scratches and dents. Such scratches and dents can cause damage to packings, resulting in leakage and/or brake failure.

Caution for mounting the switch

■ When assembling the switch mounting bracket
When assembling the cylinder onto the switch bracket, fit the tie rod to be installed into the bracket, and move the switch so that it is at the center of the operation range (ON range). Then tighten the fixing bolts with a tightening torque of 0.6 to 0.9 N·m. The bracket position (GC, GD) and switch positions (RD, HD) at which the max. sensitivity is attained at both stroke ends are shown in the dimensions.



1-color display switch　　2-color display switch

■ When moving the switch position to the stroke length direction, the 1-color display switch can be finely adjusted ±3 mm from the factory default max. sensitivity position. If the adjusting range exceeds ±3 mm, or when adjusting the 2-color display switch, loosen the switch mounting bracket fixing bolt and move the bracket position.

■ Fixing the switch
For screw fixing when using T2, T3, T0, or T5, use a flathead screwdriver (clockwork screwdriver, precision screwdriver, etc.) with a grip diameter of 5 to 6 mm, a 2.4 mm or smaller tip, and a thickness of 0.3 mm or less to tighten the screws with a tightening torque of 0.1 to 0.2 N·m.
When using T*C, T2J, T2Y, or T3Y, tighten the screw with a tightening torque of 0.5 to 0.7 N·m.
The switch mounting bracket rail has a mark at 4 mm from the rail end. Use as a guide to the mounting position when replacing the switch.
Switch rail markings are set to the default switch max. sensitivity position. The max. sensitivity position may change when the switch is changed or when the switch mounting bracket is moved. Adjust the position accordingly in this case.

Use/maintenance

⚠WARNING

- The brake section can be removed from the cylinder body. Do not disassemble or inspect brakes, or a hazardous situation may occur when brakes are used again.
- The required grease is applied to brakes. Avoid applying extra grease and do not wipe grease off.
- The required grease is applied when brakes are replaced, so there is no need to apply grease to rods.
- Always use the product with the dust cover on, except for when performing manual release, in order to prevent failure or malfunction.

⚠CAUTION

- Air supply pipes that are too narrow or too long can reduce stopping accuracy.
- Frictional resistance increases and causes the piston speed to change when the cylinder has been stopped for a long time, such as when using first thing in the morning or afternoon. This may impair stopping accuracy. Conduct conditioning operations to obtain a stable stopping accuracy.