



Large bore size cylinder  
Double acting/single rod/lubrication/no-lubrication

# SCS2 Series

● Bore size: φ125/φ140/φ160/φ180/φ200/φ250

JIS symbol



## Specifications

Descriptions		SCS2/SCS2-N/SCS2-LN					
Bore size	mm	φ125	φ140	φ160	φ180	φ200	φ250
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0 (≈150 psi, 10 bar)					
Min. working pressure	MPa	0.05 (≈7.3 psi, 0.5 bar)					
Proof pressure	MPa	1.6 (≈230 psi, 16 bar)					
Ambient temperature	°C	-5 (23°F) to 60 (140°F) (no freezing)					
Port size		Rc1/2	Rc3/4			Rc1	
Stroke tolerance	mm	$^{+1.0}_0$ (to 300), $^{+1.4}_0$ (to 1000), $^{+1.8}_0$ (to 1200)					
Working piston speed	mm/s	20 to 1000 (Operate within the absorbed energy.)					
Cushion		Air cushion					
Effective air cushion length	mm	21.6	21.6	21.6	21.6	26.6	26.6
Lubrication		Required (use turbine oil class 1 ISO VG32 for lubrication)/Not required for SCS2-N/LN					
Allowable absorbed energy	Cushioned	63.5	91.5	116	152	233	362
	Without cushion	0.371	0.386	0.386	0.958	1.08	2.32
		Without any cushion, this product cannot absorb large energy generated by an external load. We recommend using an external shock absorber.					

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Available stroke length (mm)	Min. stroke length (mm)	Trunnion, min. stroke (mm)
φ125	50/75/100/150/ 200/250/300	800	2000	1	23
φ140					25
φ160					27
φ180					28
φ200					28
φ250					28

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

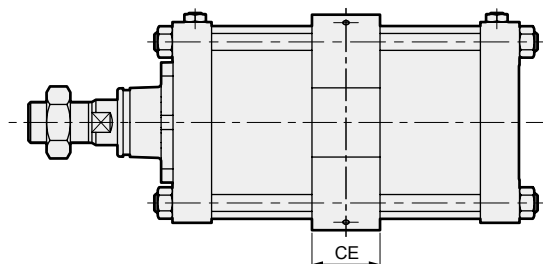
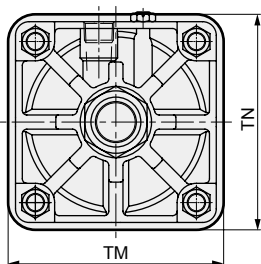
\*2: If the max. stroke length is exceeded, product specifications may not be met, depending on operating conditions. Contact CKD in this case.

## ● Non-sag block

A non-sag block will be added to the middle part of the cylinder if the stroke length is in the range given in the table below.

Additional stroke length to the non-sag block

Bore size (mm)	Stroke length
φ125	1801 to 2000
φ140	



Code	TM	TN	CE
Bore size (mm)			
φ125	150	150	50
φ140	190	170	55

### Min. stroke length with switch

Descriptions		Stroke length when mounted on the same surface	Stroke of intermediate supporting hole trunnion	Stroke length of rod side supporting hole trunnion	Stroke of head side supporting hole trunnion
Switch	Sketch				
	Bore size			Position cannot be detected at the rod side stroke end.	Position cannot be detected at the head side stroke end.
Reed switch (T*)	φ125	20 or more	120 or more	70 or more	
	φ140		125 or more	75 or more	
	φ160		130 or more	80 or more	
	φ180		135 or more	85 or more	
	φ200		140 or more	90 or more	
	φ250		150 or more	100 or more	

### Switch specifications

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

Descriptions	Proximity 2-wire		Proximity 3-wire				Reed 2-wire			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/ T2YDT			
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	100/110 VAC	5/12/24 VDC	100/110 VAC	12/24 VDC	110 VAC	220 VAC	24 VDC ±10%
Load current	5 to 100 mA	5 to 20 mA (*1)		100 mA or less	50 mA or less		5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less	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	1 m:18	1 m:33	1 m:18	1 m:18	1 m:33	1 m:18	1 m:18 3 m:49 5 m:80			1 m:33	1 m:61			
	3 m:87	3 m:49	3 m:87	3 m:49	3 m:49	3 m:87	3 m:49	3 m:49 5 m:80			3 m:87	3 m:166			
	5 m:142	5 m:80	5 m:142	5 m:80	5 m:80	5 m:142	5 m:80	5 m:80			5 m:142	5 m:272			

\*1 : 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)

\*2 : Switch for AC magnetic field (T2YD) cannot be used in DC magnetic field.

\*3 : Dimensions depend on switch model No. Refer to Ending Page 18 for details.

### Cylinder weight

(Unit: kg)

Item/mounting	Product weight when stroke length (S) = 0 mm						Switch weight		Additional weight per S = 100mm
	Basic (00)	Axial foot (LB)	Flange (FA/FB)	Eye bracket (CA)	Clevis bracket (CB)	Trunnion (TA/TB/TC)	Switch	Mounting bracket	
φ125	7.22	8.72	10.52	10.22	10.32	10.62	Refer to the weight in the switch specifications.	0.028	1.54
φ140	9.35	11.35	14.75	13.15	13.35	12.55		0.030	1.78
φ160	12.35	15.45	19.25	17.35	17.65	18.75		0.034	2.22
φ180	16.75	21.25	28.75	24.15	24.65	24.85		0.038	2.96
φ200	22.78	28.48	36.48	32.28	32.48	34.58		0.040	3.54
φ250	40.51	48.91	66.41	64.51	59.01	69.21		0.045	5.38

(Example) Product weight of SCS2-LN-LB-125B-300-T0H-D

- Product weight for S = 0 mm stroke length ..... 8.72 kg
- Additional weight for S = 300 mm stroke length .....  $1.54 \times \frac{300}{100} = 4.62$  kg
- Weight of 2 switches (T0H-D) .....  $0.018 \times 2 = 0.036$  kg
- Product weight with 2 switch brackets ..  $0.028 \times 2 = 0.056$  kg
- Product weight .....  $8.72 + 4.62 + 0.036 + 0.056 = 13.432$  kg

## How to order

Lubrication without switch (without magnet for switch)

**SCS2** - **LB** - **125** - **B** - **50** - **J** **Y**

No-lubrication without switch (without magnet for switch)

**SCS2-N** - **LB** - **125** - **B** - **50** - **J** **Y**

No-lubrication with switch (built-in magnet for switch)

**SCS2-LN** - **LB** - **125** - **B** - **50** - **T0H** - **R** - **J** **Y**

Model No.

**A** Mounting

**B** Bore size

\*1

**C** Port thread

**D** Cushion

**E** Stroke length

**F** Switch model No.

**G** Switch quantity

\*3

**H** Option

\*4

\*5

**I** Accessory

\*6

## ⚠ Precautions for model No. selection

\*1 : Hole trunnion is available as custom order for  $\phi 125$  to 160 only. Contact CKD for details about dimensions.

\*2 : Refer to page 611 for the min. stroke length with switch.

\*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 : The instantaneous max. temperature is the temperature when sparks, cutting chips, etc., instantaneously contact the bellows.

\*5 : Check below for the cushion needle position indication.

\*6 : "I" and "Y" cannot be selected together.

## [Example of model No.]

### SCS2-LN-LB-125B-50-T0H-R-JY

Model: Large bore size cylinder, double acting/lubrication/no-lubrication

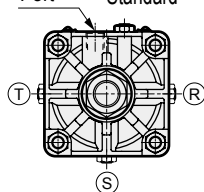
Model No. : No-lubrication with switch

- A** Mounting : Axial foot
- B** Bore size :  $\phi 125$  mm
- C** Port thread : Rc thread
- D** Cushion : Both sides cushioned
- E** Stroke length : 50 mm
- F** Switch model No. : Reed T0H switch, lead wire 1m
- G** Switch quantity : 1 on rod side
- H** Option : Bellows material for max. ambient temperature of 60°C
- I** Accessory : Rod clevis

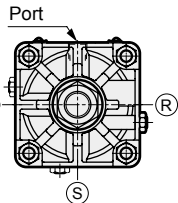
## Cushion needle position

(Needle position with the port on the top when viewed from the rod end)

Port Standard



When selecting option R, S, or T for a certified class 2 pressure vessel, the port position should be in the center as shown in the figure on the right, and the needle position should be in the offset position.



Certified class 2 pressure vessel stroke length

Bore size	Stroke length
$\phi 160$	1948 or more
$\phi 180$	1526 or more
$\phi 200$	946 or more
$\phi 250$	752 or more

Class 2 pressure vessel certification options R, S, or T

Code	Content
<b>A Mounting</b>	
00	Basic
LB	Axial foot
FA	Rod side flange
FB	Head side flange
CA	Eye bracket
CB	Clevis bracket (pin and snap ring attached)
TC	Intermediate trunnion
TA	Rod side trunnion
TB	Head side trunnion
TF	Intermediate supporting hole trunnion (custom order product)
TD	Rod side hole trunnion (custom order product)
TE	Head side hole trunnion (custom order product)

<b>B Bore size (mm)</b>	
125	$\phi 125$
140	$\phi 140$
160	$\phi 160$
180	$\phi 180$
200	$\phi 200$
250	$\phi 250$

<b>C Port thread</b>	
Blank	Rc thread
N	NPT thread (custom order product)
G	G thread (custom order product)



<b>D Cushion</b>	
B	Both sides cushioned
R	Rod side cushioned
H	Head side cushioned
N	Without cushion

<b>E Stroke length (mm)</b>			
Bore size	Stroke *2	Available stroke	Custom stroke
$\phi 125$ to $\phi 160$	1 to 800	2000	In 1 mm increments
$\phi 180$	1 to 900	2000	
$\phi 200$	1 to 1000	2000	
$\phi 250$	1 to 1200	2000	

<b>F Switch model No.</b>					
Axial lead wire	Radial lead wire	Contact	Voltage	Display	Lead wire
		AC	DC		
T0H*	T0V*	Reed	●	●	1-color display
T5H*	T5V*	Reed	●	●	Without indicator lamp
T8H*	T8V*	Reed	●	●	1-color display
T1H*	T1V*	Proximity	●	●	1-color display
T2H*	T2V*		●	●	1-color display
T3H*	T3V*		●	●	1-color display (PNP output) (custom)
T3PH*	T3PV*		●	●	2-color display
T2WH*	T2WV*		●	●	2-color display
T2YH*	T2YV*		●	●	2-color display
T3WH*	T3WV*		●	●	AC magnetic field
T3YH*	T3YV*		●	●	2-color display
T2YD*	-		●	●	2-color display
T2YDT*	-		●	●	AC magnetic field
T2JH*	T2JV*	●	●	1-color display off-delay	

<b>* Lead wire length</b>	
Blank	1 m (standard)
3	3 m (option)
5	5 m (option)

<b>G Switch quantity</b>	
R	1 on rod side
H	1 on head side
D	2
T	3
4	4

<b>H Option</b>			
<b>C2</b> With cushion section check valve			
		Max. ambient temp.	instantaneous max. temp.
J	Bellows	60°C	100°C
K	Bellows	100°C	200°C
L	Bellows	250°C	400°C
<b>M</b> Piston rod material (stainless steel)			
Blank	Cushion needle position (standard)	Standard	
R	Cushion needle position R	T  R	
S	Cushion needle position S	T  S	
T	Cushion needle position T	S	
<b>P6</b> Copper and PTFE free (custom order)			

<b>I Accessory</b>	
I	Rod eye
Y	Rod clevis (pin and snap ring attached)
B1	Eye bracket
B2	Clevis bracket (pin and snap ring attached)

### How to order switch

● Switch body + mounting bracket set

**SCS2-LN - T0H - 125**

Switch model No.  
(Item (F) on the previous page)

Bore size  
(Item (B) on the previous page)

● Switch body only

**SW - T0H**

Switch model No.  
(Item (F) on the previous page)

● Mounting bracket set

**SCS2-LN - TS - 125**

Mounting bracket

TS	T switch
T	T2YD switch

Bore size  
(Item (B) on the previous page)

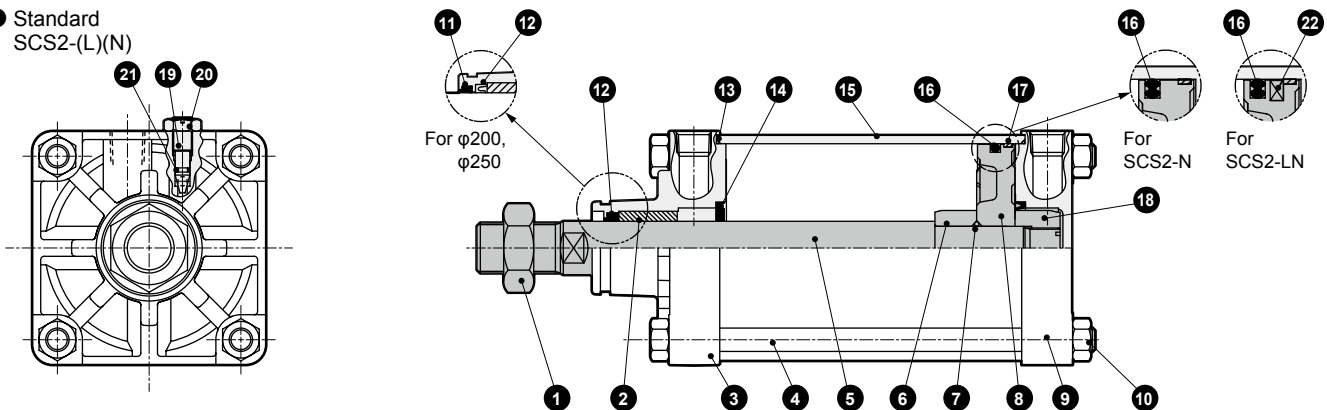
### Theoretical thrust table

(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	0.8	0.9	1.0
φ125	Push	1.23 × 10 <sup>3</sup>	1.84 × 10 <sup>3</sup>	2.45 × 10 <sup>3</sup>	3.68 × 10 <sup>3</sup>	4.91 × 10 <sup>3</sup>	6.14 × 10 <sup>3</sup>	7.36 × 10 <sup>3</sup>	8.59 × 10 <sup>3</sup>	9.82 × 10 <sup>3</sup>	1.10 × 10 <sup>4</sup>	1.23 × 10 <sup>4</sup>
	Pull	1.15 × 10 <sup>3</sup>	1.72 × 10 <sup>3</sup>	2.29 × 10 <sup>3</sup>	3.44 × 10 <sup>3</sup>	4.59 × 10 <sup>3</sup>	5.73 × 10 <sup>3</sup>	6.88 × 10 <sup>3</sup>	8.03 × 10 <sup>3</sup>	9.17 × 10 <sup>3</sup>	1.03 × 10 <sup>4</sup>	1.15 × 10 <sup>4</sup>
φ140	Push	1.54 × 10 <sup>3</sup>	2.31 × 10 <sup>3</sup>	3.08 × 10 <sup>3</sup>	4.62 × 10 <sup>3</sup>	6.16 × 10 <sup>3</sup>	7.70 × 10 <sup>3</sup>	9.24 × 10 <sup>3</sup>	1.08 × 10 <sup>4</sup>	1.23 × 10 <sup>4</sup>	1.39 × 10 <sup>4</sup>	1.54 × 10 <sup>4</sup>
	Pull	1.46 × 10 <sup>3</sup>	2.19 × 10 <sup>3</sup>	2.92 × 10 <sup>3</sup>	4.38 × 10 <sup>3</sup>	5.84 × 10 <sup>3</sup>	7.29 × 10 <sup>3</sup>	8.75 × 10 <sup>3</sup>	1.02 × 10 <sup>4</sup>	1.17 × 10 <sup>4</sup>	1.31 × 10 <sup>4</sup>	1.46 × 10 <sup>4</sup>
φ160	Push	2.01 × 10 <sup>3</sup>	3.02 × 10 <sup>3</sup>	4.02 × 10 <sup>3</sup>	6.03 × 10 <sup>3</sup>	8.04 × 10 <sup>3</sup>	1.01 × 10 <sup>4</sup>	1.21 × 10 <sup>4</sup>	1.41 × 10 <sup>4</sup>	1.61 × 10 <sup>4</sup>	1.81 × 10 <sup>4</sup>	2.01 × 10 <sup>4</sup>
	Pull	1.88 × 10 <sup>3</sup>	2.83 × 10 <sup>3</sup>	3.77 × 10 <sup>3</sup>	5.65 × 10 <sup>3</sup>	7.54 × 10 <sup>3</sup>	9.42 × 10 <sup>3</sup>	1.13 × 10 <sup>4</sup>	1.32 × 10 <sup>4</sup>	1.51 × 10 <sup>4</sup>	1.70 × 10 <sup>4</sup>	1.88 × 10 <sup>4</sup>
φ180	Push	2.54 × 10 <sup>3</sup>	3.82 × 10 <sup>3</sup>	5.09 × 10 <sup>3</sup>	7.63 × 10 <sup>3</sup>	1.02 × 10 <sup>4</sup>	1.27 × 10 <sup>4</sup>	1.53 × 10 <sup>4</sup>	1.78 × 10 <sup>4</sup>	2.04 × 10 <sup>4</sup>	2.29 × 10 <sup>4</sup>	2.54 × 10 <sup>4</sup>
	Pull	2.39 × 10 <sup>3</sup>	3.58 × 10 <sup>3</sup>	4.77 × 10 <sup>3</sup>	7.16 × 10 <sup>3</sup>	9.54 × 10 <sup>3</sup>	1.19 × 10 <sup>4</sup>	1.43 × 10 <sup>4</sup>	1.67 × 10 <sup>4</sup>	1.91 × 10 <sup>4</sup>	2.15 × 10 <sup>4</sup>	2.39 × 10 <sup>4</sup>
φ200	Push	3.14 × 10 <sup>3</sup>	4.71 × 10 <sup>3</sup>	6.28 × 10 <sup>3</sup>	9.42 × 10 <sup>3</sup>	1.26 × 10 <sup>4</sup>	1.57 × 10 <sup>4</sup>	1.88 × 10 <sup>4</sup>	2.20 × 10 <sup>4</sup>	2.51 × 10 <sup>4</sup>	2.83 × 10 <sup>4</sup>	3.14 × 10 <sup>4</sup>
	Pull	2.95 × 10 <sup>3</sup>	4.42 × 10 <sup>3</sup>	5.89 × 10 <sup>3</sup>	8.84 × 10 <sup>3</sup>	1.18 × 10 <sup>4</sup>	1.47 × 10 <sup>4</sup>	1.77 × 10 <sup>4</sup>	2.06 × 10 <sup>4</sup>	2.36 × 10 <sup>4</sup>	2.65 × 10 <sup>4</sup>	2.95 × 10 <sup>4</sup>
φ250	Push	4.91 × 10 <sup>3</sup>	7.36 × 10 <sup>3</sup>	9.82 × 10 <sup>3</sup>	1.47 × 10 <sup>4</sup>	1.96 × 10 <sup>4</sup>	2.45 × 10 <sup>4</sup>	2.95 × 10 <sup>4</sup>	3.44 × 10 <sup>4</sup>	3.93 × 10 <sup>4</sup>	4.42 × 10 <sup>4</sup>	4.91 × 10 <sup>4</sup>
	Pull	4.63 × 10 <sup>3</sup>	6.94 × 10 <sup>3</sup>	9.25 × 10 <sup>3</sup>	1.39 × 10 <sup>4</sup>	1.85 × 10 <sup>4</sup>	2.31 × 10 <sup>4</sup>	2.78 × 10 <sup>4</sup>	3.24 × 10 <sup>4</sup>	3.70 × 10 <sup>4</sup>	4.16 × 10 <sup>4</sup>	4.63 × 10 <sup>4</sup>

### Internal structure and parts list

● Standard SCS2-(L)(N)



Note: 14, 19, 20 and 21 are not required for the type without cushion.

No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon nut	Steel	Zinc chromate	13	Cylinder gasket	Nitrile rubber	
2	Bush	Iron-copper oil-impregnated bearing alloy		14	Cushion packing	Nitrile rubber/steel	
3	Rod cover	Aluminum alloy casting	Chromate	15	Cylinder tube	Aluminum alloy	Hard alumite
4	Tie rod	Steel	Zinc chromate	16	Piston packing	Nitrile rubber	
5	Piston rod	Steel	Industrial chrome plating	17	Wear ring	Polyacetal resin	
6	Cushion ring A	Steel	Zinc chromate	18	Cushion ring B	Steel	Zinc chromate
7	Piston gasket	Nitrile rubber		19	Cushion needle	Copper alloy (φ125 to φ180)	
8	Piston	Aluminum alloy casting				Steel (φ200, 250)	Zinc chromate
9	Head cover	Aluminum alloy casting	Chromate	20	Hexagon nut	Steel	Zinc chromate
10	Hexagon nut	Steel	Zinc chromate	21	Needle gasket	Nitrile rubber	
11	Dust wiper	Nitrile rubber	φ200 and φ250 only	22	Magnet	Rubber	SCS2-LN only
12	Rod packing	Nitrile rubber					

### Repair parts list

Bore size (mm)	SCS2 (lubrication)	SCS2-(L)(N) (no-lubrication)	Repair parts No.
	Kit No.	Kit No.	
φ125	SCS2-125K	SCS2-N-125K	12 13 14 16 17 21
φ140	SCS2-140K	SCS2-N-140K	
φ160	SCS2-160K	SCS2-N-160K	
φ180	SCS2-180K	SCS2-N-180K	
φ200	SCS2-200K	SCS2-N-200K	
φ250	SCS2-250K	SCS2-N-250K	11 12 13 14 16 17 21

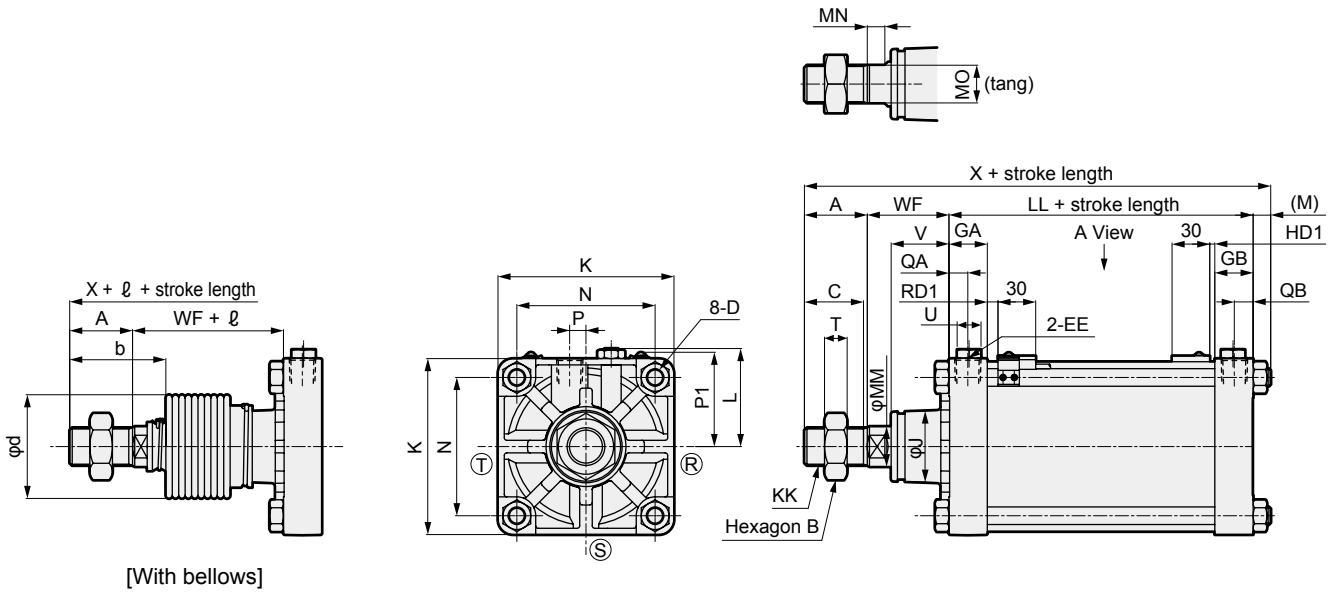
\*1: Of the no-lubrication repair parts, the piston packing is different from that of the lubrication.

### Material of mounting bracket

Mounting	Material	Remarks
LB	Steel	Paint
FA,FB	Steel	Paint
CA,CB	Cast iron	Paint
TA,TB,TC	Cast iron	Paint

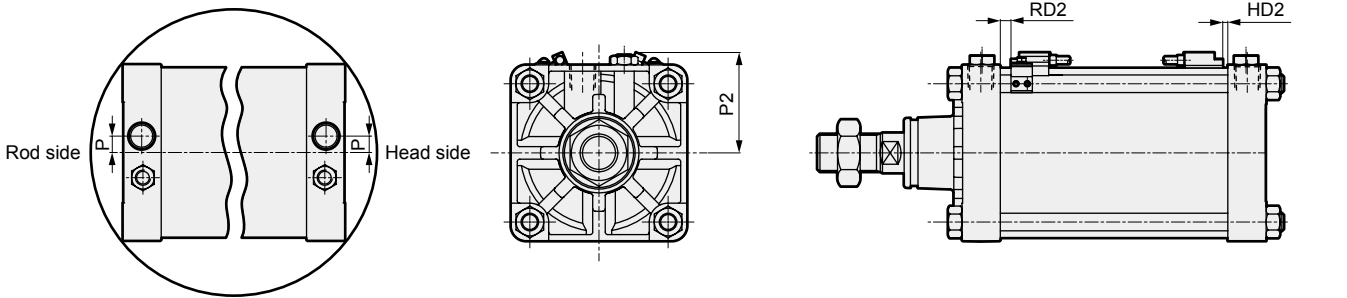
## Dimensions

● Basic (00)



[With bellows]

● 2-color display with strong magnetic field proof switch



Port position diagram (A View)

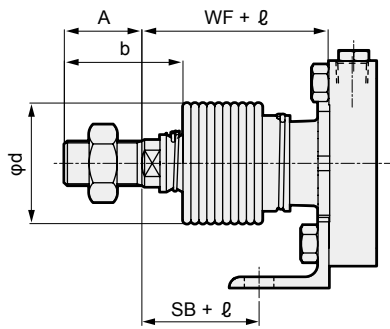
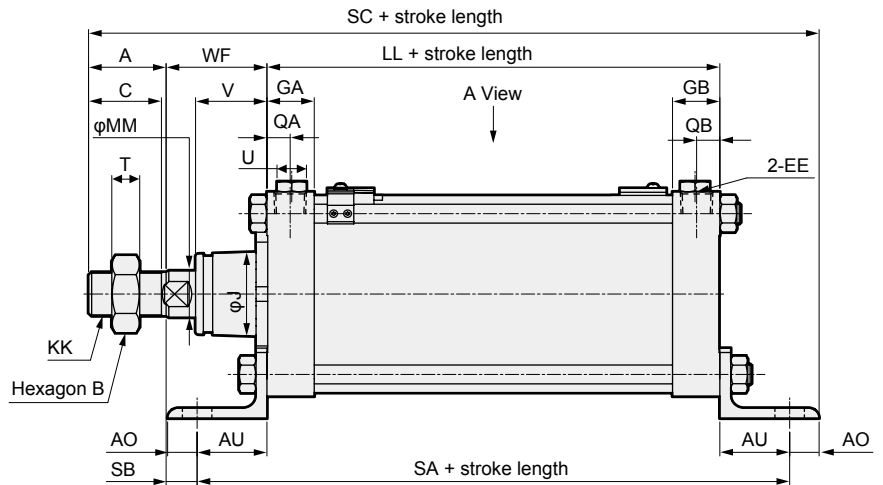
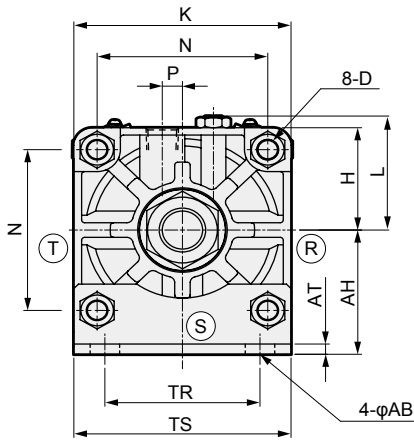
RD: Rod side max. sensitivity position  
HD: Head side max. sensitivity position

\*1 : (R), (S) and (T) indicate the cushion needle position.  
\*2 :  $\ell$  dimensions below decimal point are rounded up.  
\*3 : For the dimensions of the accessories, refer to page 623.

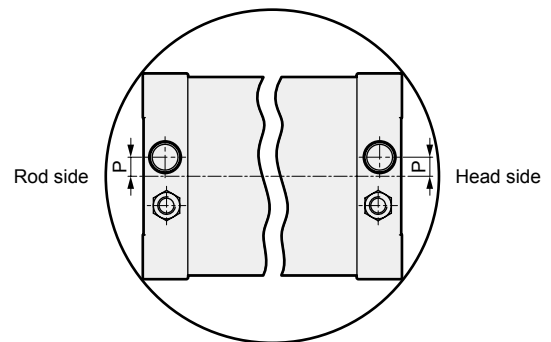
Code	Basic (00) basic dimensions																					
	Bore size (mm)		A	B	C	D	EE	GA	GB	J	K	KK	L	LL	M	MM	MN	MO	N	P	QA	QB
SRM3	φ125		50	46	47	M14×1.5	Rc1/2	30.5	30.5	57	140	M30×1.5	78 to 82	92	13.5	32	15	27	110	13	15	15
SRT3	φ140		50	46	47	M14×1.5	Rc3/4	34.5	34.5	57	157	M30×1.5	86.5 to 91	103	13.5	32	15	27	124	15	17	17
MRL2	φ160		56	55	53	M16×1.5	Rc3/4	34.5	34.5	62	177	M36×1.5	96.5 to 101	106	15.5	40	16	36	142	15	17	17
MRG2	φ180		63	60	60	M18×1.5	Rc3/4	34.5	34.5	68	200	M40×1.5	108 to 112	110	17.5	45	18	41	160	15	17	17
	φ200		72	70	69	M20×1.5	Rc3/4	37.5	37.5	75	220	M45×1.5	120.5 to 129	123	18.5	50	20	46	175	20	18	18
	φ250		88	85	84	M24×1.5	Rc1	42.5	42.5	93	274	M56×2	147.5 to 156	141	21.5	60	22	55	216	22	21	21
Code	With bellows										With switch		T0, T5, T2, T3		T2W, T3W		T2Y, T3Y, T2YD, T1, T2J		T8			
	Bore size (mm)		T	U	V	WF	X	b	d	$\ell$	P1	P2	RD1	HD1	RD1	HD1	RD2	HD2	RD2	HD2		
SM-25	φ125		18	19	45.5	65	220.5	74	75	(Stroke length/4.55) + 11	76	80	8.5	4.0	10.5	5.5	7.5	2.5	2.5	0.0		
ShkAbs	φ140		18	19	45.5	67	233.5	74	75	(Stroke length/4.55) + 9	82	86	8.5	7.0	10.5	8.5	7.5	5.5	2.5	0.5		
FJ	φ160		21	19	48	71	248.5	81	80	(Stroke length/5.15) + 9	90	95	10.5	8.0	12.5	10.0	9.5	7.0	4.5	1.5		
	φ180		24	19	53	78	268.5	90	90	(Stroke length/5.15) + 9	98	103	13.0	9.5	14.5	11.5	11.5	8.5	6.5	3.5		
FK	φ200		27	24	60	88	301.5	102	95	(Stroke length/5.30) + 9	106	111	17.5	13.0	19.0	15.0	16.0	12.0	11.0	7.0		
	φ250		34	24	64	94	344.5	120	120	(Stroke length/6.40) + 9	126	130	18.5	19.0	20.5	20.5	17.5	17.5	12.5	12.5		

### Dimensions

● Axial foot (LB)



[With bellows]



Port position diagram (A View)

\*1: Refer to page 614 for switch dimensions with switch.

\*2: (B), (S) and (T) indicate the cushion needle position.

\*3: ℓ dimensions below decimal point are rounded up.

\*4: For the dimensions of the accessories, refer to page 623.

Code	Axial foot (LB) basic dimensions																	
Bore size (mm)	A	AB	AH	AT	AO	AU	B	C	D	EE	GA	GB	J	K	KK	L	LL	MM
φ125	50	19	85	7	19	45	46	47	M14×1.5	Rc1/2	30.5	30.5	57	140	M30×1.5	78 to 82	92	32
φ140	50	19	100	8	20	50	46	47	M14×1.5	Rc3/4	34.5	34.5	57	157	M30×1.5	86.5 to 91	103	32
φ160	56	19	106	10	20	53	55	53	M16×1.5	Rc3/4	34.5	34.5	62	177	M36×1.5	96.5 to 101	106	40
φ180	63	24	125	10	27	60	60	60	M18×1.5	Rc3/4	34.5	34.5	68	200	M40×1.5	108 to 112	110	45
φ200	72	24	132	12	27	62	70	69	M20×1.5	Rc3/4	37.5	37.5	75	220	M45×1.5	120.5 to 129	123	50
φ250	88	29	160	12	28	70	85	84	M24×1.5	Rc1	42.5	42.5	93	274	M56×2	147.5 to 156	141	60

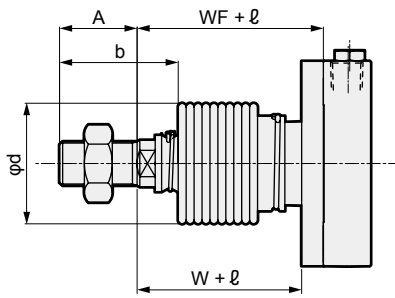
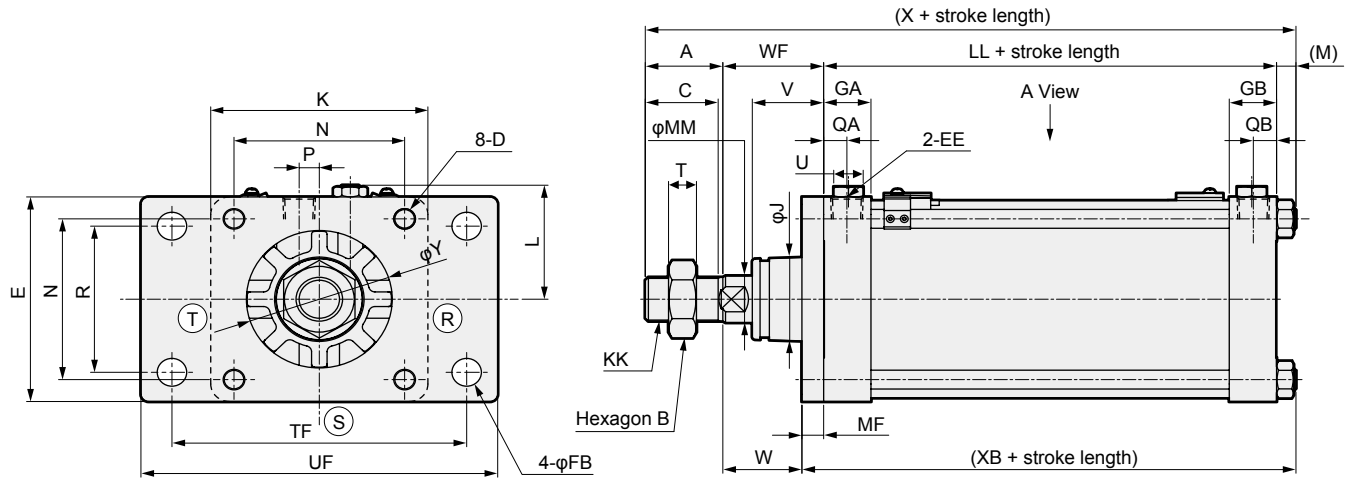
  

Code	Basic dimensions															With bellows			
Bore size (mm)	MN	MO	N	P	QA	QB	SA	SB	SC	T	TR	TS	U	V	WF	X	b	d	ℓ
φ125	15	27	110	13	15	15	182	20	271	18	100	140	19	45.5	65	222	74	75	(Stroke length/4.55) + 11
φ140	15	27	124	15	17	17	203	17	290	18	112	157	19	45.5	67	235	74	75	(Stroke length/4.55) + 9
φ160	16	36	142	15	17	17	212	18	306	21	118	177	19	48	71	250	81	80	(Stroke length/5.15) + 9
φ180	18	41	160	15	17	17	230	18	338	24	132	200	19	53	78	270	90	90	(Stroke length/5.15) + 9
φ200	20	46	175	20	18	18	247	26	372	27	150	220	24	60	88	303	102	95	(Stroke length/5.30) + 9
φ250	22	55	216	22	21	21	281	24	421	34	180	274	24	64	94	346	120	120	(Stroke length/6.40) + 9

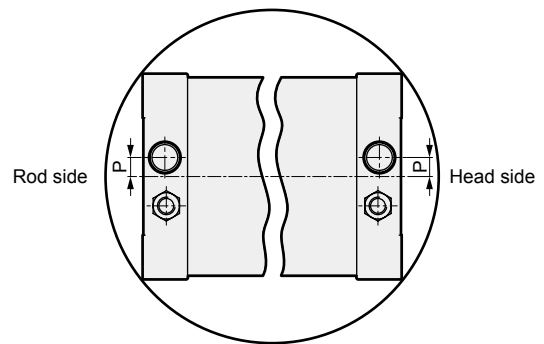
- SCP\*3
- CMK2
- CMA2
- SCM
- SCG
- SCA2
- SCS2**
- CKV2
- CAV2/COVP/N2
- SSD2
- SSG
- SSD
- CAT
- MDC2
- MVC
- SMG
- MSD/MSDG
- FC\*
- STK
- SRL3
- SRG3
- SRM3
- SRT3
- MRL2
- MRG2
- SM-25
- ShkAbs
- FJ
- FK
- Spd Contr
- Ending

## Dimensions

● Rod side flange (FA)



[With bellows]



Port position diagram (A View)

\*1: Refer to page 614 for switch dimensions with switch.

\*2: (R), (S) and (T) indicate the cushion needle position.

\*3: ℓ dimensions below decimal point are rounded up.

\*4: For the dimensions of the accessories, refer to page 623.

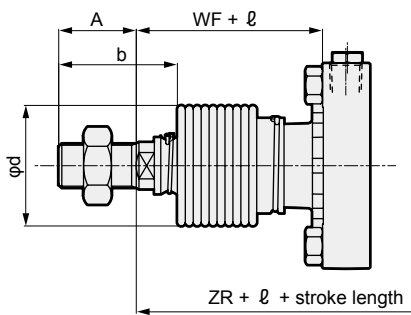
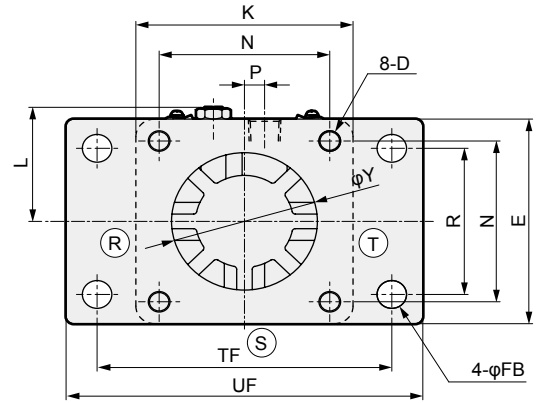
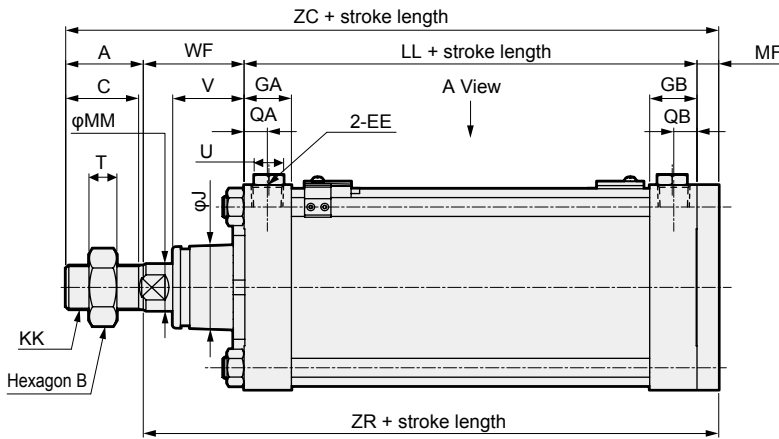
Code	Rod side flange (FA) basic dimensions																	
	Bore size (mm)	A	B	C	D	E	EE	FB	GA	GB	J	K	KK	L	LL	M	MF	MM
MRG2	φ125	50	46	47	M14×1.5	140	Rc1/2	19	30.5	30.5	57	140	M30×1.5	78 to 82	92	11	14	32
	φ140	50	46	47	M14×1.5	157	Rc3/4	19	34.5	34.5	57	157	M30×1.5	86.5 to 91	103	11	19	32
SM-25	φ160	56	55	53	M16×1.5	177	Rc3/4	19	34.5	34.5	62	177	M36×1.5	96.5 to 101	106	13	19	40
	φ180	63	60	60	M18×1.5	200	Rc3/4	24	34.5	34.5	68	200	M40×1.5	108 to 112	110	15	25	45
ShkAbs	φ200	72	70	69	M20×1.5	220	Rc3/4	24	37.5	37.5	75	220	M45×1.5	120.5 to 129	123	16	25	50
	φ250	88	85	84	M24×1.5	274	Rc1	29	42.5	42.5	93	274	M56×2	147.5 to 156	141	19	30	60

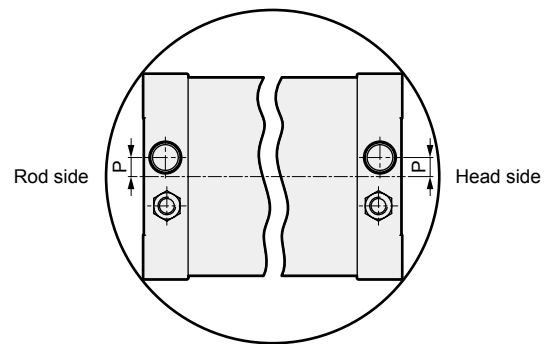
Code	Bore size (mm)	With bellows																	
		N	QA	QB	P	R	T	TF	UF	U	V	W	WF	X	XB	Y	b	d	ℓ
FK	φ125	110	15	15	13	100	18	190	230	19	45.5	51	65	218	117	94	74	75	(Stroke length/4.55) + 11
	φ140	124	17	17	15	112	18	212	250	19	45.5	48	67	231	133	94	74	75	(Stroke length/4.55) + 9
Spd Contr	φ160	142	17	17	15	118	21	236	280	19	48	52	71	246	138	107	81	80	(Stroke length/5.15) + 9
	φ180	160	17	17	15	132	24	265	310	19	53	53	78	266	150	113	90	90	(Stroke length/5.15) + 9
	φ200	175	18	18	20	150	27	280	330	24	60	63	88	299	164	131	102	95	(Stroke length/5.30) + 9
Ending	φ250	216	21	21	22	180	34	355	415	24	64	64	94	342	190	153	120	120	(Stroke length/6.40) + 9

### Dimensions

● Head side flange (FB)



[With bellows]



Port position diagram (A View)

\*1: Refer to page 614 for switch dimensions with switch.

\*2: (B), (S) and (T) indicate the cushion needle position.

\*3: ℓ dimensions below decimal point are rounded up.

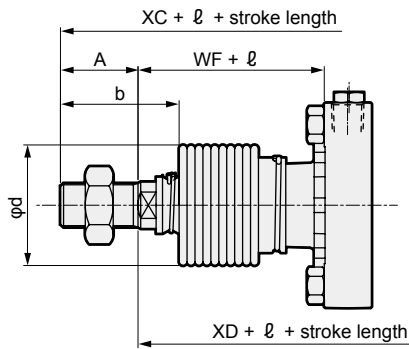
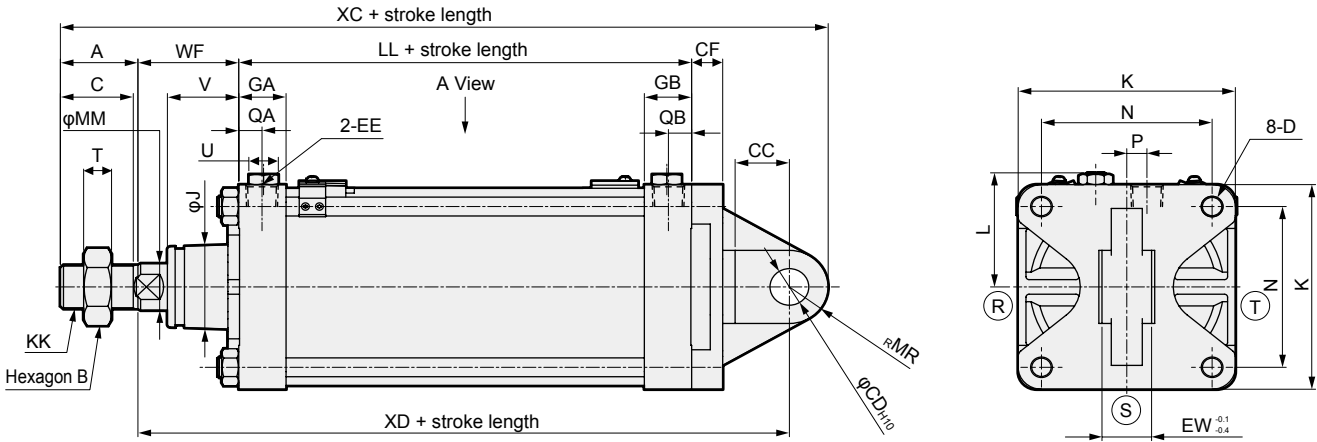
\*4: For the dimensions of the accessories, refer to page 623.

Code	Head side flange (FB) basic dimensions																
Bore size (mm)	A	B	C	D	E	EE	FB	GA	GB	J	K	KK	L	LL	MF	MM	
φ125	50	46	47	M14×1.5	140	Rc1/2	19	30.5	30.5	57	140	M30×1.5	78 to 82	92	14	32	
φ140	50	46	47	M14×1.5	157	Rc3/4	19	34.5	34.5	57	157	M30×1.5	86.5 to 91	103	19	32	
φ160	56	55	53	M16×1.5	177	Rc3/4	19	34.5	34.5	62	177	M36×1.5	96.5 to 101	106	19	40	
φ180	63	60	60	M18×1.5	200	Rc3/4	24	34.5	34.5	68	200	M40×1.5	108 to 112	110	25	45	
φ200	72	70	69	M20×1.5	220	Rc3/4	24	37.5	37.5	75	220	M45×1.5	120.5 to 129	123	25	50	
φ250	88	85	84	M24×1.5	274	Rc1	29	42.5	42.5	93	274	M56×2	147.5 to 156	141	30	60	
Code	Head side flange (FB) basic dimensions													With bellows			
Bore size (mm)	N	QA	QB	P	R	T	TF	U	UF	V	WF	Y	ZC	ZR	b	d	ℓ
φ125	110	15	15	13	100	18	190	19	230	45.5	65	94	221	171	74	75	(Stroke length/4.55) + 11
φ140	124	17	17	15	112	18	212	19	250	45.5	67	94	239	189	74	75	(Stroke length/4.55) + 9
φ160	142	17	17	15	118	21	236	19	280	48	71	107	252	196	81	80	(Stroke length/5.15) + 9
φ180	160	17	17	15	132	24	265	19	310	53	78	113	276	213	90	90	(Stroke length/5.15) + 9
φ200	175	18	18	20	150	27	280	24	330	60	88	131	308	236	102	95	(Stroke length/5.30) + 9
φ250	216	21	21	22	180	34	355	24	415	64	94	153	353	265	120	120	(Stroke length/6.40) + 9

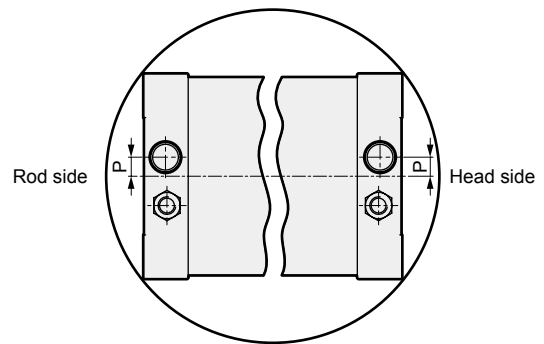


## Dimensions

● Eye bracket (CA)



[With bellows]



Port position diagram (A View)

\*1: Refer to page 614 for switch dimensions with switch.

\*2: (R), (S) and (T) indicate the cushion needle position.

\*3: ℓ dimensions below decimal point are rounded up.

\*4: For the dimensions of the accessories, refer to page 623.

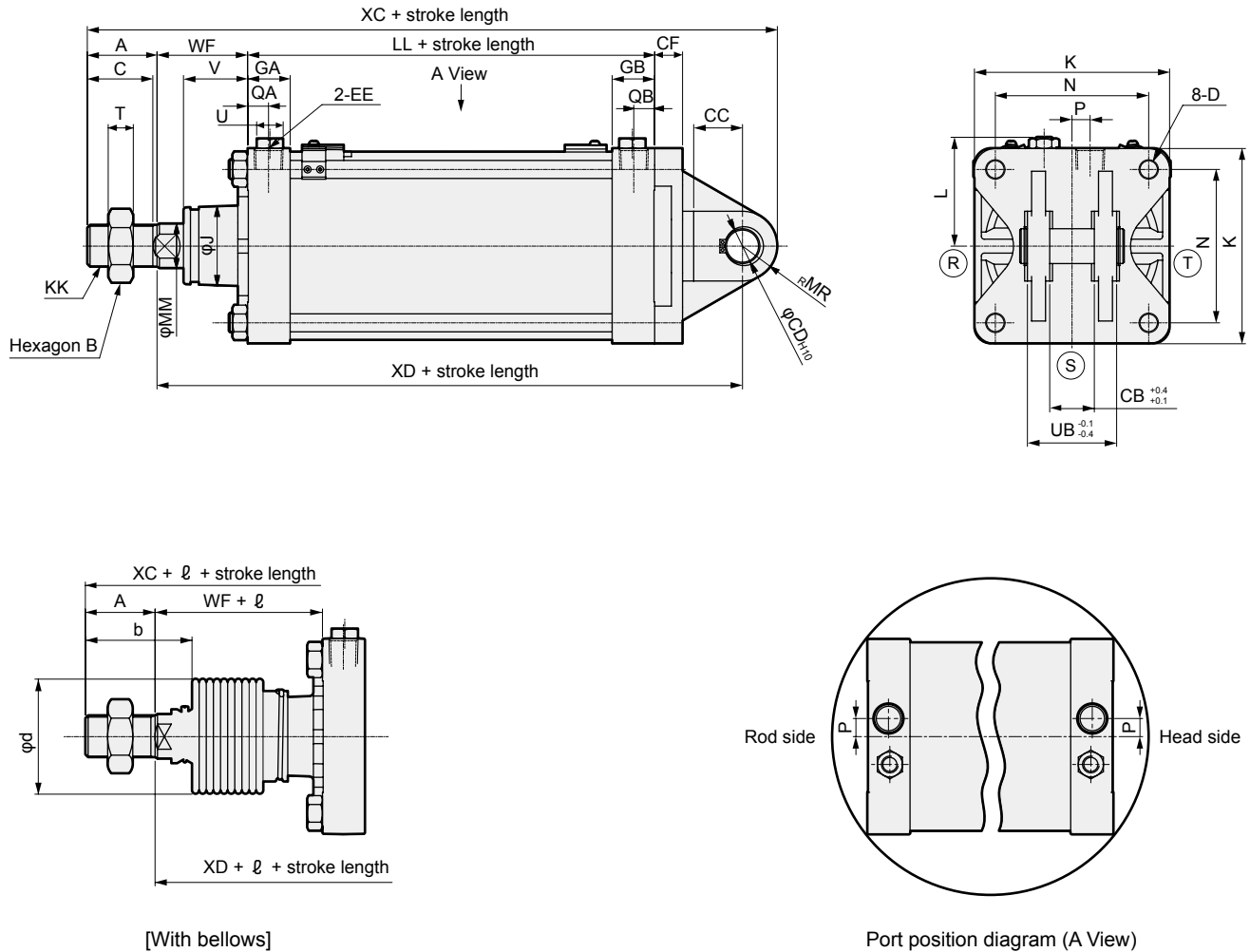
Code	Eye bracket (CA) basic dimensions																
Bore size (mm)	A	B	C	D	CC	CD	CF	EE	EW	GA	GB	J	K	KK	L	LL	MM
φ125	50	46	47	M14×1.5	35	25	20	Rc1/2	32	30.5	30.5	57	140	M30×1.5	78 to 82	92	32
φ140	50	46	47	M14×1.5	40	28	22	Rc3/4	36	34.5	34.5	57	157	M30×1.5	86.5 to 91	103	32
φ160	56	55	53	M16×1.5	40	32	24	Rc3/4	40	34.5	34.5	62	177	M36×1.5	96.5 to 101	106	40
φ180	63	60	60	M18×1.5	55	40	25	Rc3/4	50	34.5	34.5	68	200	M40×1.5	108 to 112	110	45
φ200	72	70	69	M20×1.5	55	40	30	Rc3/4	50	37.5	37.5	75	220	M45×1.5	120.5 to 129	123	50
φ250	88	85	84	M24×1.5	65	50	35	Rc1	63	42.5	42.5	93	274	M56×2	147.5 to 156	141	60

Code	With bellows													
Bore size (mm)	MR	N	P	QA	QB	T	U	V	WF	XC	XD	b	d	ℓ
φ125	25	110	13	15	15	18	19	45.5	65	295	220	74	75	(Stroke length/4.55) + 11
φ140	28	124	15	17	17	18	19	45.5	67	323	245	74	75	(Stroke length/4.55) + 9
φ160	32	142	15	17	17	21	19	48	71	340	252	81	80	(Stroke length/5.15) + 9
φ180	40	160	15	17	17	24	19	53	78	381	278	90	90	(Stroke length/5.15) + 9
φ200	40	175	20	18	18	27	24	60	88	413	301	102	95	(Stroke length/5.30) + 9
φ250	50	216	22	21	21	34	24	64	94	483	345	120	120	(Stroke length/6.40) + 9

### Dimensions

- Clevis bracket (CB)



[With bellows]

Port position diagram (A View)

\*1: Refer to page 614 for switch dimensions with switch.

\*2: (R), (S) and (T) indicate the cushion needle position.

\*3:  $l$  dimensions below decimal point are rounded up.

\*4: For the dimensions of the accessories, refer to page 623.

\*5: A pin and a snap ring are attached.

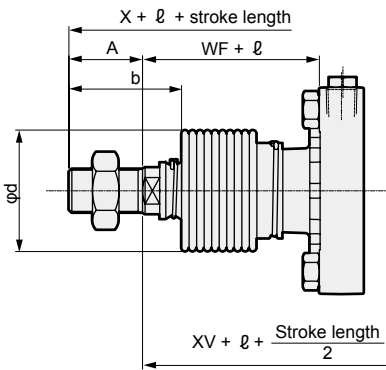
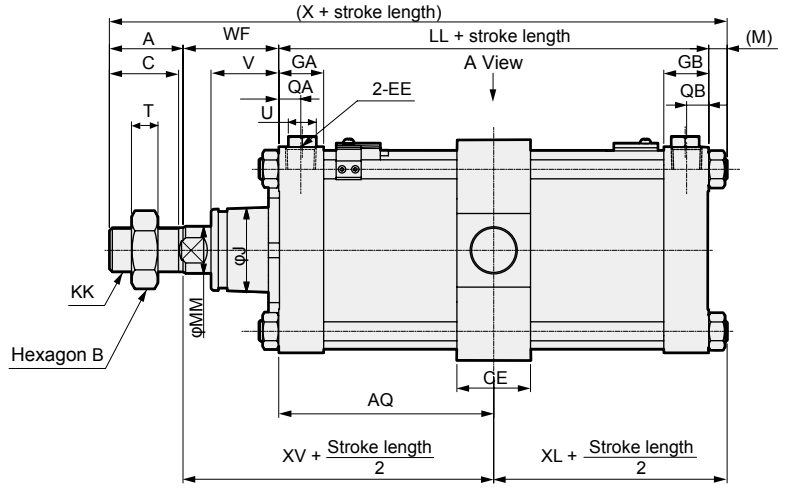
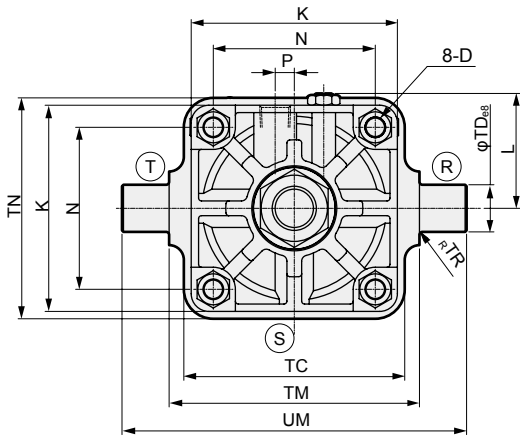
Code	Clevis bracket (CB) basic dimensions															
Bore size (mm)	A	B	C	D	CB	CC	CD	CF	EE	GA	GB	J	K	KK	L	LL
φ125	50	46	47	M14 × 1.5	32	35	25	20	Rc1/2	30.5	30.5	57	140	M30 × 1.5	78 to 82	92
φ140	50	46	47	M14 × 1.5	36	40	28	22	Rc3/4	34.5	34.5	57	157	M30 × 1.5	86.5 to 91	103
φ160	56	55	53	M16 × 1.5	40	40	32	24	Rc3/4	34.5	34.5	62	177	M36 × 1.5	96.5 to 101	106
φ180	63	60	60	M18 × 1.5	50	55	40	25	Rc3/4	34.5	34.5	68	200	M40 × 1.5	108 to 112	110
φ200	72	70	69	M20 × 1.5	50	55	40	30	Rc3/4	37.5	37.5	75	220	M45 × 1.5	120.5 to 129	123
φ250	88	85	84	M24 × 1.5	63	65	50	35	Rc1	42.5	42.5	93	274	M56 × 2	147.5 to 156	141

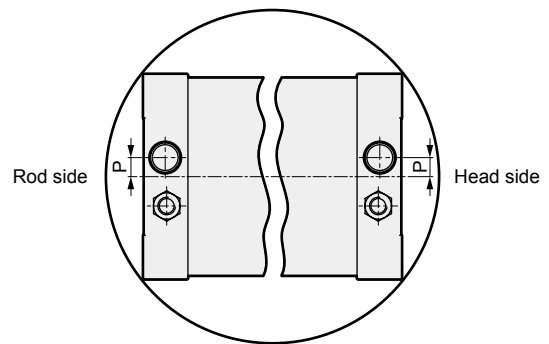
Code	With bellows															
Bore size (mm)	MM	MR	N	P	QA	QB	T	U	UB	V	WF	XC	XD	b	d	$l$
φ125	32	25	110	13	15	15	18	19	64	45.5	65	295	220	74	75	(Stroke length/4.55) + 11
φ140	32	28	124	15	17	17	18	19	72	45.5	67	323	245	74	75	(Stroke length/4.55) + 9
φ160	40	32	142	15	17	17	21	19	80	48	71	340	252	81	80	(Stroke length/5.15) + 9
φ180	45	40	160	15	17	17	24	19	100	53	78	381	278	90	90	(Stroke length/5.15) + 9
φ200	50	40	175	20	18	18	27	24	100	60	88	413	301	102	95	(Stroke length/5.30) + 9
φ250	60	50	216	22	21	21	34	24	126	64	94	483	345	120	120	(Stroke length/6.40) + 9

## Dimensions

### ● Intermediate trunnion (TC)



[With bellows]



Port position diagram (A View)

\*1: Refer to page 614 for switch dimensions with switch.

\*2: (R), (S) and (T) indicate the cushion needle position.

\*3: ℓ dimensions below decimal point are rounded up.

\*4: For the dimensions of the accessories, refer to page 623.

\*5: Refer to page 610 for the min. stroke length.

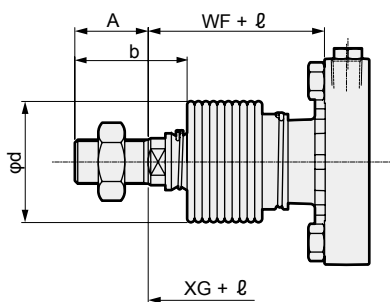
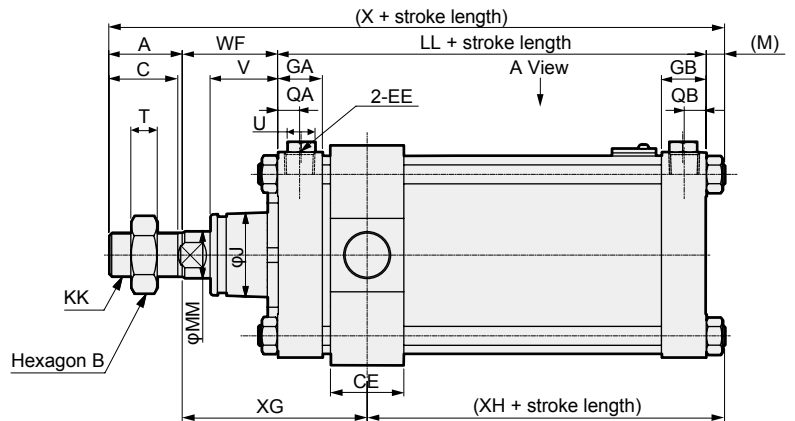
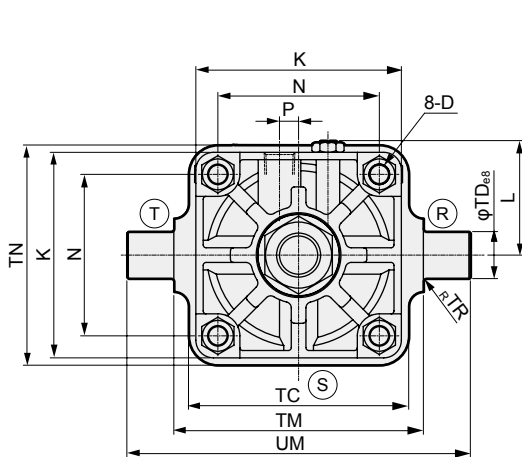
Code	Intermediate trunnion (TC) basic dimensions																	
	Bore size (mm)	A	AQ	B	C	CE	D	EE	GA	GB	J	K	KK	L	LL	M	MM	N
φ125	50	46 + St/2	46	47	50	M14 × 1.5	Rc1/2	30.5	30.5	57	140	M30 × 1.5	78 to 82	92	11	32	110	13
φ140	50	51.5 + St/2	46	47	55	M14 × 1.5	Rc3/4	34.5	34.5	57	157	M30 × 1.5	86.5 to 91	103	11	32	124	15
φ160	56	53 + St/2	55	53	60	M16 × 1.5	Rc3/4	34.5	34.5	62	177	M36 × 1.5	96.5 to 101	106	13	40	142	15
φ180	63	55 + St/2	60	60	65	M18 × 1.5	Rc3/4	34.5	34.5	68	200	M40 × 1.5	108 to 112	110	15	45	160	15
φ200	72	61.5 + St/2	70	69	70	M20 × 1.5	Rc3/4	37.5	37.5	75	220	M45 × 1.5	120.5 to 129	123	16	50	175	20
φ250	88	70.5 + St/2	85	84	80	M24 × 1.5	Rc1	42.5	42.5	93	274	M56 × 2	147.5 to 156	141	19	60	216	22

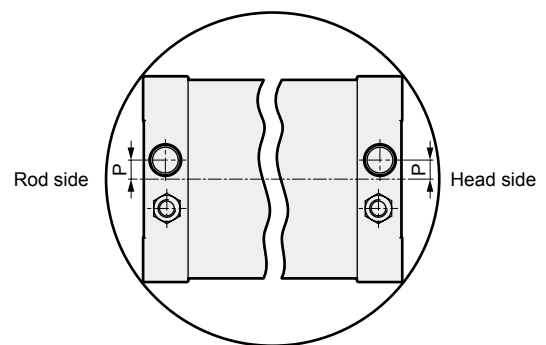
Code	With bellows																	
	Bore size (mm)	QA	QB	T	TC	TD	TM	TN	TR	U	UM	V	WF	X	XV	XL	b	d
φ125	15	15	18	150	32	170	150	2	19	234	45.5	65	218	111	57	74	75	(Stroke length/4.55) + 11
φ140	17	17	18	154	36	190	170	2	19	262	45.5	67	231	118.5	62.5	74	75	(Stroke length/4.55) + 9
φ160	17	17	21	190	40	212	190	2	19	292	48	71	246	124	66	81	80	(Stroke length/5.15) + 9
φ180	17	17	24	210	45	236	210	2	19	326	53	78	266	133	70	90	90	(Stroke length/5.15) + 9
φ200	18	18	27	242	45	265	242	2	24	355	60	88	299	149.5	77.5	102	95	(Stroke length/5.30) + 9
φ250	21	21	34	300	56	335	300	2	24	447	64	94	342	164.5	89.5	120	120	(Stroke length/6.40) + 9

### Dimensions

● Rod side trunnion (TA)



[With bellows]



Port position diagram (A View)

\*1: Refer to page 614 for switch dimensions with switch.

\*2: (R), (S) and (T) indicate the cushion needle position.

\*3: ℓ dimensions below decimal point are rounded up.

\*4: For the dimensions of the accessories, refer to page 623.

\*5: Refer to page 610 for the min. stroke length.

\*6: Position cannot be detected at rod side stroke end.

Code	Rod side trunnion (TA) basic dimensions																
Bore size (mm)	A	B	C	CE	D	EE	GA	GB	J	K	KK	L	LL	M	MM	N	P
φ125	50	46	47	50	M14 × 1.5	Rc1/2	30.5	30.5	57	140	M30 × 1.5	78 to 82	92	11	32	110	13
φ140	50	46	47	55	M14 × 1.5	Rc3/4	34.5	34.5	57	157	M30 × 1.5	86.5 to 91	103	11	32	124	15
φ160	56	55	53	60	M16 × 1.5	Rc3/4	34.5	34.5	62	177	M36 × 1.5	96.5 to 101	106	13	40	142	15
φ180	63	60	60	65	M18 × 1.5	Rc3/4	34.5	34.5	68	200	M40 × 1.5	108 to 112	110	15	45	160	15
φ200	72	70	69	70	M20 × 1.5	Rc3/4	37.5	37.5	75	220	M45 × 1.5	120.5 to 129	123	16	50	175	20
φ250	88	85	84	80	M24 × 1.5	Rc1	42.5	42.5	93	274	M56 × 2	147.5 to 156	141	19	60	216	22

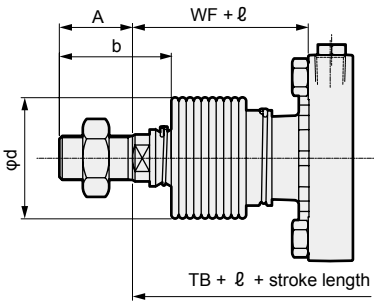
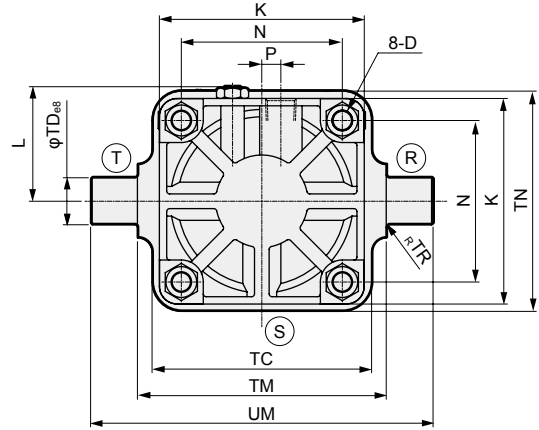
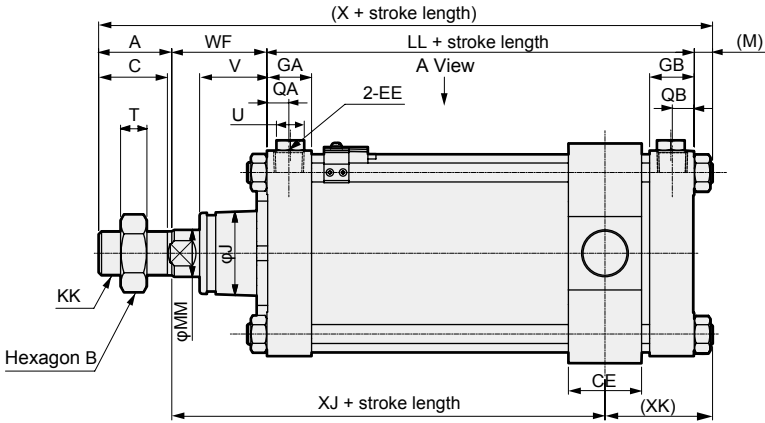
  

Code	With bellows																	
Bore size (mm)	QA	QB	T	TC	TD	TM	TN	TR	U	UM	V	WF	X	XG	XH	b	d	ℓ
φ125	15	15	18	150	32	170	150	2	19	234	45.5	65	218	126	42	74	75	(Stroke length/4.55) + 11
φ140	17	17	18	154	36	190	170	2	19	262	45.5	67	231	134.5	46.5	74	75	(Stroke length/4.55) + 9
φ160	17	17	21	190	40	212	190	2	19	292	48	71	246	141	49	81	80	(Stroke length/5.15) + 9
φ180	17	17	24	210	45	236	210	2	19	326	53	78	266	150.5	52.5	90	90	(Stroke length/5.15) + 9
φ200	18	18	27	242	45	265	242	2	24	355	60	88	299	168	59	102	95	(Stroke length/5.30) + 9
φ250	21	21	34	300	56	335	300	2	24	447	64	94	342	184	70	120	120	(Stroke length/6.40) + 9

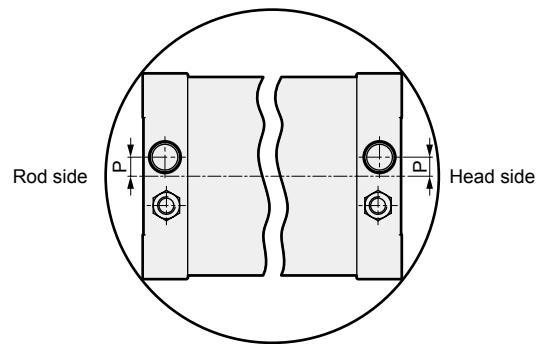
- SCP\*3
- CMK2
- CMA2
- SCM
- SCG
- SCA2
- SCS2**
- CKV2
- CAV2/COVP/N2
- SSD2
- SSG
- SSD
- CAT
- MDC2
- MVC
- SMG
- MSD/MSDG
- FC\*
- STK
- SRL3
- SRG3
- SRM3
- SRT3
- MRL2
- MRG2
- SM-25
- ShkAbs
- FJ
- FK
- Spd Contr
- Ending

## Dimensions

● Head side trunnion (TB)



[With bellows]



Port position diagram (A View)

\*1: Refer to page 614 for switch dimensions with switch.

\*2: (R), (S) and (T) indicate the cushion needle position.

\*3: ℓ dimensions below decimal point are rounded up.

\*4: For the dimensions of the accessories, refer to page 623.

\*5: Refer to page 610 for the min. stroke length.

\*6: Position cannot be detected at head side stroke end.

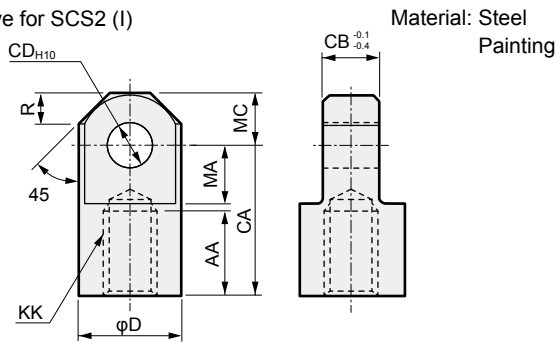
Code	Head side trunnion (TB) basic dimensions																
	Bore size (mm)	A	B	C	CE	D	EE	GA	GB	J	K	KK	L	LL	M	MM	N
φ125	50	46	47	50	M14 × 1.5	Rc1/2	30.5	30.5	57	140	M30 × 1.5	78 to 82	92	11	32	110	13
φ140	50	46	47	55	M14 × 1.5	Rc3/4	34.5	34.5	57	157	M30 × 1.5	86.5 to 91	103	11	32	124	15
φ160	56	55	53	60	M16 × 1.5	Rc3/4	34.5	34.5	62	177	M36 × 1.5	96.5 to 101	106	13	40	142	15
φ180	63	60	60	65	M18 × 1.5	Rc3/4	34.5	34.5	68	200	M40 × 1.5	108 to 112	110	15	45	160	15
φ200	72	70	69	70	M20 × 1.5	Rc3/4	37.5	37.5	75	220	M45 × 1.5	120.5 to 129	123	16	50	175	20
φ250	88	85	84	80	M24 × 1.5	Rc1	42.5	42.5	93	274	M56 × 2	147.5 to 156	141	19	60	216	22

Code														With bellows				
	Bore size (mm)	QA	QB	T	TC	TD	TM	TN	TR	U	UM	V	WF	X	XJ	XK	b	d
φ125	15	15	18	150	32	170	150	2	19	234	45.5	65	218	96	72	74	75	(Stroke length/4.55) + 11
φ140	17	17	18	154	36	190	170	2	19	262	45.5	67	231	102.5	78.5	74	75	(Stroke length/4.55) + 9
φ160	17	17	21	190	40	212	190	2	19	292	48	71	246	107	83	81	80	(Stroke length/5.15) + 9
φ180	17	17	24	210	45	236	210	2	19	326	53	78	266	115.5	87.5	90	90	(Stroke length/5.15) + 9
φ200	18	18	27	242	45	265	242	2	24	355	60	88	299	131	96	102	95	(Stroke length/5.30) + 9
φ250	21	21	34	300	56	335	300	2	24	447	64	94	342	145	109	120	120	(Stroke length/6.40) + 9

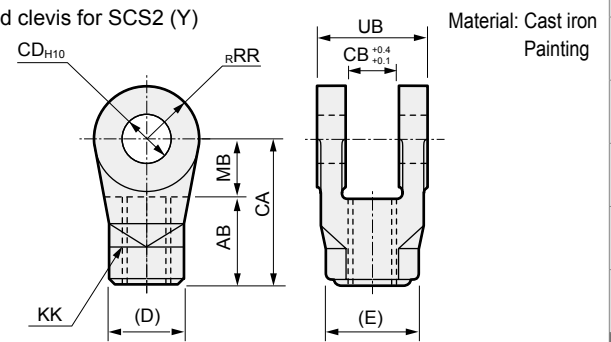
### SCS2 Series common accessory dimensions

#### ● Rod eye for SCS2 (I)



Code Model No.	AA	CA	CB	CD	D	KK	MA	MC	R	Weight (kg)
SCS2-125-I	50	85	32	25	55	M30 × 1.5	32	27.5	15.5	1.25
SCS2-140-I	50	90	36	28	60	M30 × 1.5	35	30	18	1.65
SCS2-160-I	60	105	40	32	70	M36 × 1.5	40	35	21	2.55
SCS2-180-I	65	115	50	40	85	M40 × 1.5	47.5	42.5	29	4.20
SCS2-200-I	75	125	50	40	85	M45 × 1.5	47.5	42.5	29	4.35
SCS2-250-I	88	150	63	50	105	M56 × 2	57.5	52.5	36.5	8.05

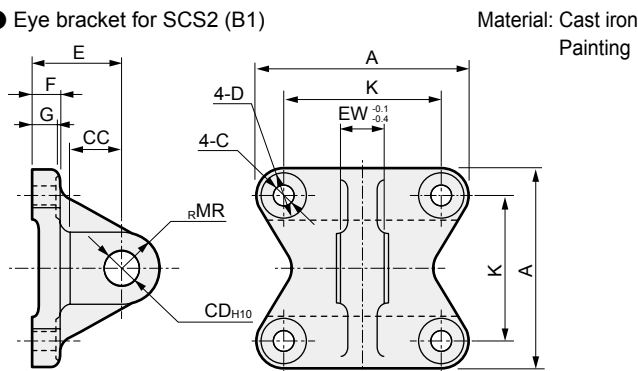
#### ● Rod clevis for SCS2 (Y)



Code Model No.	AB	CA	CB	CD	D	E	KK	MB	RR	UB	Wt (kg)
SCS2-125-Y	50	85	32	25 <sup>+0.084</sup> <sub>0</sub>	46	53.1	M30 × 1.5	35	27.5	64	1.30
SCS2-140-Y	50	90	36	28 <sup>+0.084</sup> <sub>0</sub>	46	53.1	M30 × 1.5	40	30	72	1.65
SCS2-160-Y	60	105	40	32 <sup>+0.100</sup> <sub>0</sub>	55	63.5	M36 × 1.5	45	35	80	2.55
SCS2-180-Y	65	115	50	40 <sup>+0.100</sup> <sub>0</sub>	60	69.3	M40 × 1.5	50	42.5	100	4.40
SCS2-200-Y	75	125	50	40 <sup>+0.100</sup> <sub>0</sub>	70	80.8	M45 × 1.5	50	42.5	100	4.85
SCS2-250-Y	88	150	63	50 <sup>+0.100</sup> <sub>0</sub>	85	98.1	M56 × 2	62	52.5	126	7.05

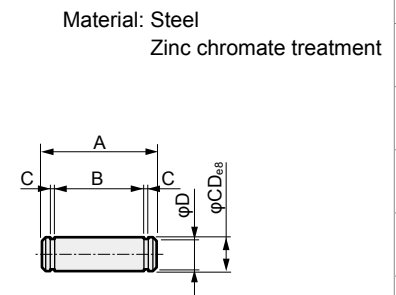
Note: A pin and a snap ring are attached.

#### ● Eye bracket for SCS2 (B1)



Code Model No.	A	C	CC	CD	D	E	EW	F	G	K	MR	Weight (kg)
SCS2-125-B1	140	16	35	25	23	63	32	20	18	110	25	2.35
SCS2-140-B1	154	16	40	28	23	75	36	22	20	124	28	3.30
SCS2-160-B1	174	18	40	32	26	75	40	24	22	142	32	4.65
SCS2-180-B1	196	20	55	40	29	90	50	25	23	160	40	6.75
SCS2-200-B1	220	22	55	40	32	90	50	30	28	175	40	9.40
SCS2-250-B1	274	26	65	50	39	110	63	35	33	216	50	16.85

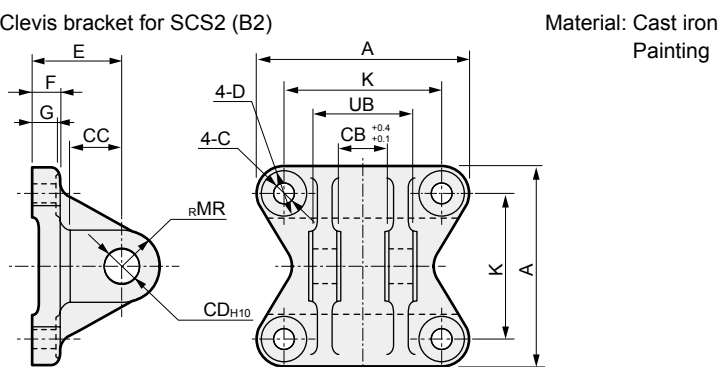
#### ● Pin (P)



Code Model No.	A	B	C	CD	D	Applicable snap ring	Wt (kg)	Compatible model
SCS2-125-P	75	66.3	1.35	25	23.9	C type for shaft 25	0.25	SCS2-125
SCS2-140-P	84	74.7	1.65	28	26.6	C type for shaft 28	0.40	SCS2-140
SCS2-160-P	92	82.7	1.65	32	30.3	C type for shaft 32	0.50	SCS2-160
SCS2-180-P	115	103.2	1.9	40	38	C type for shaft 40	1.15	SCS2-180/200
SCS2-250-P	144	129.6	2.2	50	47	C type for shaft 50	2.25	SCS2-250

Note: A pin and a snap ring are attached with the clevis, clevis bracket and rod clevis.

#### ● Clevis bracket for SCS2 (B2)



Code Model No.	A	C	CB	CC	CD	D	E	F	G	K	MR	UB	Weight (kg)
SCS2-125-B2	140	16	32	35	25	23	63	20	18	110	25	64	2.65
SCS2-140-B2	154	16	36	40	28	23	75	22	20	124	28	72	3.85
SCS2-160-B2	174	18	40	40	32	26	75	24	22	142	32	80	5.45
SCS2-180-B2	196	20	50	55	40	29	90	25	23	160	40	100	8.70
SCS2-200-B2	220	22	50	55	40	32	90	30	28	175	40	100	10.55
SCS2-250-B2	274	26	63	65	50	39	110	35	33	216	50	126	19.55

Note: A pin and a snap ring are attached.

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

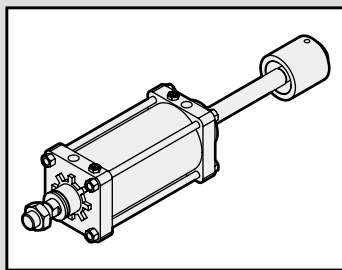
FJ

FK

Spd

Contr

Ending



Large bore size cylinder  
Double acting/push side stroke adjustable

# SCS2-P Series

● Bore size: φ125/φ140/φ160/φ180/φ200/φ250

JIS symbol



\* Custom order product.

## Specifications

Descriptions		SCS2-P (Stroke adjustable)					
Bore size	mm	φ125	φ140	φ160	φ180	φ200	φ250
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0 (≈150 psi, 10 bar)					
Min. working pressure	MPa	0.1 (≈15 psi, 1 bar)					
Proof pressure	MPa	1.6 (≈230 psi, 16 bar)					
Ambient temperature	°C	-5 (23°F) to 60 (140°F) (no freezing)					
Port size		Rc1/2	Rc3/4			Rc1	
Stroke tolerance	mm	$^{+1.0}_0$ (to 300), $^{+1.4}_0$ (to 1000), $^{+1.8}_0$ (to 1200)					
Working piston speed	mm/s	20 to 1000 (Operate within the absorbed energy.)					
Cushion		Air cushion (The rod side cushion does not function when adjusting the stroke direction.)					
Effective air cushion length	mm	21.6	21.6	21.6	21.6	26.6	26.6
Adjustable stroke range	mm	25,50,75,100					
Lubrication		Required (use turbine oil class 1 ISO VG32 for lubrication)					
Allowable absorbed energy	Cushioned	63.5	91.5	116	152	233	362
	Without cushion	0.371	0.386	0.386	0.958	1.08	2.32
Without any cushion, this product cannot absorb large energy generated by an external load. We recommend using an external shock absorber.							

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Trunnion min. stroke (mm)
φ125	50/75/100/150/ 200/250/300	800	25	25
φ140				25
φ160				27
φ180		900		28
φ200		1,000		28
φ250		1,200		28

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

\*2: If the max. stroke length is exceeded, product specifications may not be met, depending on operating conditions. Contact CKD in this case.

## Cylinder weight

(Unit: kg)

Item/mounting	Product weight when stroke length (S) = 0 mm and stroke length (S) adjustment = 25 mm							Additional weight per S = 100 mm
	Bore size (mm)	Basic (00)	Axial foot (LB)	Flange (FA/FB)	Eye bracket (CA)	Clevis bracket (CB)	Trunnion (TA/TB/TC)	
φ125	11.42	12.92	14.72	14.42	14.52	14.82	0.51	2.17
φ140	13.35	15.35	18.75	17.15	17.35	16.55	0.51	2.41
φ160	18.45	21.55	25.35	23.45	23.75	24.85	0.72	3.21
φ180	24.65	29.15	36.65	32.05	32.55	32.75	0.93	4.21
φ200	33.98	39.68	47.68	43.48	43.68	45.78	1.09	5.08
φ250	57.81	66.21	83.71	81.81	76.31	86.51	1.53	7.60

(Example) Product weight of SCS2-P-LB-125B-300-25

- Product weight for S = 0 mm stroke length... 12.92 kg
- Additional weight for S = 300 mm stroke length...  $1.54 \times \frac{300}{100} = 4.62$  kg
- Weight for 25 mm stroke length adjustment... 0.51 kg
- Product weight... 12.92 + 4.62 + 0.51 = 18.05 kg

## 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	0.8	0.9	1.0
φ125	Push/Pull	$1.15 \times 10^3$	$1.72 \times 10^3$	$2.29 \times 10^3$	$3.44 \times 10^3$	$4.59 \times 10^3$	$5.73 \times 10^3$	$6.88 \times 10^3$	$8.03 \times 10^3$	$9.17 \times 10^3$	$1.03 \times 10^4$	$1.15 \times 10^4$
φ140	Push/Pull	$1.46 \times 10^3$	$2.19 \times 10^3$	$2.92 \times 10^3$	$4.38 \times 10^3$	$5.84 \times 10^3$	$7.29 \times 10^3$	$8.75 \times 10^3$	$1.02 \times 10^4$	$1.17 \times 10^4$	$1.31 \times 10^4$	$1.46 \times 10^4$
φ160	Push/Pull	$1.88 \times 10^3$	$2.83 \times 10^3$	$3.77 \times 10^3$	$5.65 \times 10^3$	$7.54 \times 10^3$	$9.42 \times 10^3$	$1.13 \times 10^4$	$1.32 \times 10^4$	$1.51 \times 10^4$	$1.70 \times 10^4$	$1.88 \times 10^4$
φ180	Push/Pull	$2.39 \times 10^3$	$3.58 \times 10^3$	$4.77 \times 10^3$	$7.16 \times 10^3$	$9.54 \times 10^3$	$1.19 \times 10^4$	$1.43 \times 10^4$	$1.67 \times 10^4$	$1.91 \times 10^4$	$2.15 \times 10^4$	$2.39 \times 10^4$
φ200	Push/Pull	$2.95 \times 10^3$	$4.42 \times 10^3$	$5.89 \times 10^3$	$8.84 \times 10^3$	$1.18 \times 10^4$	$1.47 \times 10^4$	$1.77 \times 10^4$	$2.06 \times 10^4$	$2.36 \times 10^4$	$2.65 \times 10^4$	$2.95 \times 10^4$
φ250	Push/Pull	$4.63 \times 10^3$	$6.94 \times 10^3$	$9.25 \times 10^3$	$1.39 \times 10^4$	$1.85 \times 10^4$	$2.31 \times 10^4$	$2.78 \times 10^4$	$3.24 \times 10^4$	$3.70 \times 10^4$	$4.16 \times 10^4$	$4.63 \times 10^4$

### How to order

Without switch (without magnet for switch)

**SCS2-P** - **LB** - **125** - **B** - **50** - **25** - **J** **Y**

**A** Mounting  
\*1

**B** Bore size

**C** Port thread

**D** Cushion

**E** Stroke length

**F** Adjustable stroke range

**G** Option  
\*2

\*3

**H** Accessory  
\*4

### ⚠ Precautions for model No. selection

- \*1: Hole trunnion is available as custom order for  $\phi 125$  to 160 only. Contact CKD for details about dimensions.
- \*2: The instantaneous max. temperature is the temperature when sparks, cutting chips, etc., instantaneously contact the bellows.
- \*3: Check the figures below for the cushion needle position indication.
- \*4: "I" and "Y" cannot be selected together.

[Example of model No.]

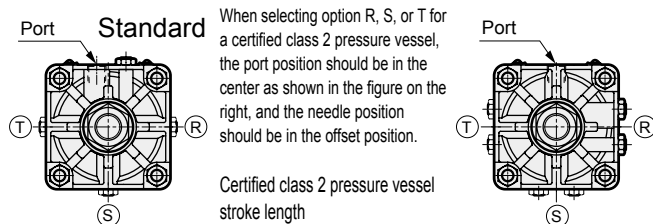
**SCS2-P-LB-125B-50-25-JY**

Model: Large bore size cylinder stroke adjustable

- A** Mounting : Axial foot
- B** Bore size :  $\phi 125$  mm
- C** Port thread : Rc thread
- D** Cushion : With two-sided air cushion
- E** Stroke length : 50 mm
- F** Adjustable stroke range : 25 mm
- G** Option : Bellows material for max. ambient temperature 60°C
- H** Accessory : Rod clevis

### Cushion needle position

(Needle position with the port on the top when viewed from the rod end)



Certified class 2 pressure vessel stroke length

Bore size	Stroke length
$\phi 200$	946 or more
$\phi 250$	752 or more

Class 2 pressure vessel certification options R, S, or T

Code	Content
<b>A Mounting</b>	
00	Basic
LB	Axial foot
FA	Rod side flange
FB	Head side flange
TC	Intermediate trunnion
TA	Rod side trunnion
TB	Head side trunnion
TF	Intermediate supporting hole trunnion (custom order product)
TD	Rod side hole trunnion (custom order product)
TE	Head side hole trunnion (custom order product)

<b>B Bore size (mm)</b>	
125	$\phi 125$
140	$\phi 140$
160	$\phi 160$
180	$\phi 180$
200	$\phi 200$
250	$\phi 250$

<b>C Port thread</b>	
Blank	Rc thread
N	NPT thread (custom order product)
G	G thread (custom order product)

<b>D Cushion</b>	
B	Both sides cushioned
R	Rod side cushioned
H	Head side cushioned
N	Without cushion

<b>E Stroke length (mm)</b>		
Bore size	Stroke length	Custom stroke length
$\phi 125$ to $\phi 160$	25 to 800	In 1 mm increments
$\phi 180$	25 to 900	
$\phi 200$	25 to 1000	
$\phi 250$	25 to 1200	

<b>F Adjustable stroke range (mm)</b>	
25	25
50	50
75	75
100	100

<b>G Option</b>			
C2 With cushion section check valve			
		Max. ambient temp.	Instantaneous ambient temp.
J	Bellows	60°C	100°C
K	Bellows	100°C	200°C
L	Bellows	250°C	400°C
M	Piston rod material (stainless steel)		
Blank	Cushion needle position (standard)		Standard
R	Cushion needle position R		T
S	Cushion needle position S		S
T	Cushion needle position T		R
P6	Copper and PTFE free (custom order product)		

<b>H Accessory</b>	
I	Rod eye
Y	Rod clevis (pin and snap ring attached)

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

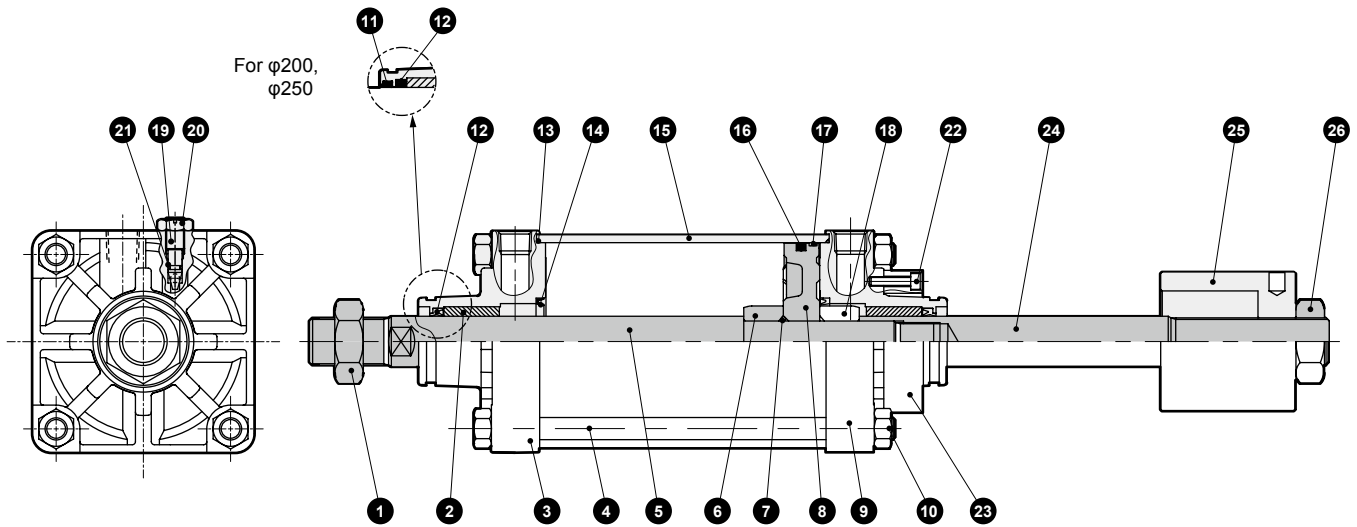
Spd  
Contr

Ending



# SCS2-P Series

## Internal structure and parts list



Note: 14, 19, 20 and 21 are not required for the type without cushion.

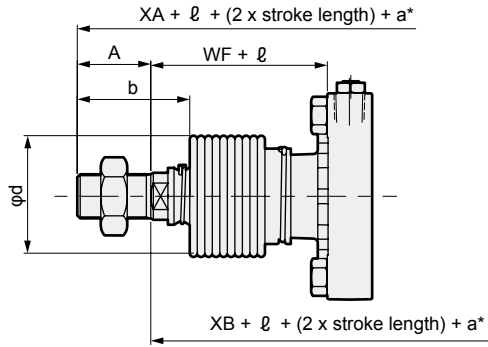
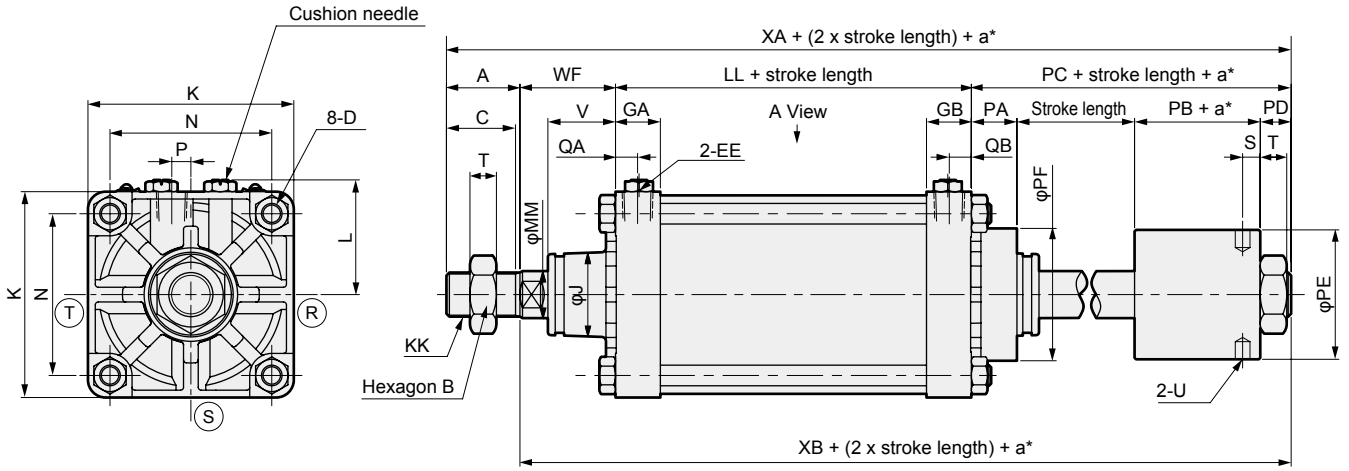
No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon nut	Steel	Zinc chromate	14	Cushion packing	Nitrile rubber/steel	
2	Bush	Iron-copper oil-impregnated bearing alloy		15	Cylinder tube	Aluminum alloy	Hard alumite
3	Rod cover	Aluminum alloy casting	Chromate	16	Piston packing	Nitrile rubber	
4	Tie rod	Steel	Zinc chromate	17	Wear ring	Polyacetal resin	
5	Piston rod A	Steel	Industrial chrome plating	18	Cushion ring B	Steel	Zinc chromate
6	Cushion ring A	Steel	Zinc chromate	19	Cushion needle	Copper alloy ( $\phi 125$ to $\phi 180$ ) Steel ( $\phi 200$ , 250)	Zinc chromate
7	Piston gasket	Nitrile rubber		20	Hexagon nut	Steel	Zinc chromate
8	Piston	Aluminum alloy casting		21	Needle gasket	Nitrile rubber	
9	Head cover	Aluminum alloy casting	Chromate	22	Hexagon socket head cap screw	Steel	Black finish
10	Hexagon nut	Steel	Zinc chromate	23	Stopper ring	Steel	Zinc phosphate treatment
11	Dust wiper	Nitrile rubber	$\phi 200$ and $\phi 250$ only	24	Piston rod B	Steel	Industrial chrome plating
12	Rod packing	Nitrile rubber		25	Stopper	Steel	Zinc phosphate treatment
13	Cylinder gasket	Nitrile rubber		26	Hexagon nut	Steel	Zinc chromate

## Repair parts list

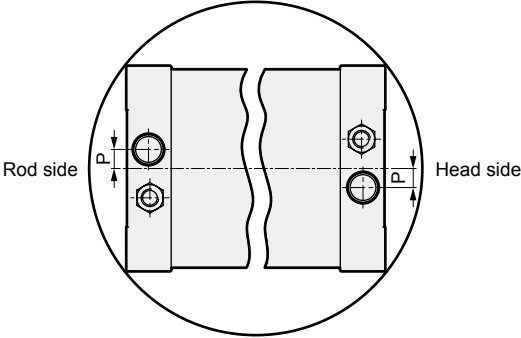
Same as SCS2-D Series. Refer to page 636.

### Dimensions

● Basic (00)



[With bellows]



Port position diagram (A View)

\*1: (R), (S) and (T) indicate the cushion needle position.

\*: a: Adjustable stroke length

Code	A	B	C	D	EE	GA	J	K	KK	L	LL	MM	P	PA	PB	PC
Bores size (mm)																
φ125	50	46	47	M14 × 1.5	Rc1/2	30.5	57	140	M30 × 1.5	78 to 82	92	32	13	31	40.5	92.5
φ140	50	46	47	M14 × 1.5	Rc3/4	34.5	57	157	M30 × 1.5	86.5 to 91	103	32	15	31	40.5	92.5
φ160	56	55	53	M16 × 1.5	Rc3/4	34.5	62	177	M36 × 1.5	96.5 to 101	106	40	15	34	46	106
φ180	63	60	60	M18 × 1.5	Rc3/4	34.5	68	200	M40 × 1.5	108 to 112	110	45	15	34	52	115
φ200	72	70	69	M20 × 1.5	Rc3/4	37.5	75	220	M45 × 1.5	120.5 to 129	123	50	20	57	48	137
φ250	88	85	84	M24 × 1.5	Rc1	42.5	93	274	M56 × 2	147.5 to 156	141	60	22	60	58	157

Code	PD	PE	PF	QA	S	T	U	V	WF	XA	XB	With bellows		
Bores size (mm)												b	d	l
φ125	21	88	90	15	12	18	φ10 depth 10	45.5	65	299.5	249.5	74	75	(Stroke length/4.55) + 11
φ140	21	88	90	17	12	18	φ10 depth 10	45.5	67	312.5	262.5	74	75	(Stroke length/4.55) + 9
φ160	26	98	104	17	14.5	21	φ14 depth 15	48	71	339	283	81	80	(Stroke length/5.15) + 9
φ180	29	108	110	17	16	24	φ14 depth 15	53	78	366	303	90	90	(Stroke length/5.15) + 9
φ200	32	120	128	18	18	27	φ14 depth 15	60	88	420	348	102	95	(Stroke length/5.30) + 9
φ250	39	141	150	21	22.5	34	φ14 depth 15	64	94	480	392	120	120	(Stroke length/6.40) + 9

\* Dimensions of other mounting are the same as those of the double acting SCS2 Series. Refer to pages 615 to 622.

\* For the dimensions of the accessories, refer to page 623.

- 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



Large bore size cylinder  
Double acting/heat resistant

# SCS2-T Series

● Bore size: φ125/φ140/φ160/φ180/φ200/φ250

JIS symbol



## Specifications

Descriptions		SCS2-T (heat resistant)					
Bore size	mm	φ125	φ140	φ160	φ180	φ200	φ250
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0 (≈150 psi, 10 bar)					
Min. working pressure	MPa	0.05 (≈7.3 psi, 0.5 bar)					
Proof pressure	MPa	1.6 (≈230 psi, 16 bar)					
Ambient temperature	°C	5 (41°F) to 120 (248°F) (*1)					
Port size		Rc1/2	Rc3/4			Rc1	
Stroke tolerance	mm	$^{+1.0}_0$ (to 300), $^{+1.4}_0$ (to 1000), $^{+1.8}_0$ (to 1200)					
Working piston speed	mm/s	20 to 1000 (Operate within the absorbed energy.)					
Cushion		Air cushion					
Effective air cushion length	mm	21.6	21.6	21.6	21.6	26.6	26.6
Lubrication		Unavailable (*2)					
Allowable absorbed energy	Cushioned	63.5	91.5	116	152	233	362
	Without cushion	0.371	0.386	0.386	0.958	1.08	2.32
Without any cushion, this product cannot absorb large energy generated by an external load. We recommend using an external shock absorber.							

\*1: The ambient temperature for the following products is 5 to 100°C.

Bore size	Stroke length
φ200	946 or more
φ250	752 or more

Custom order of the above is available for applications with 5 to 120°C ambient temperature. Contact CKD separately.

\*2: Periodically apply additional heat-resistant grease.

\*3: Consult with CKD if localized heating is occurring.

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Trunnion, min. stroke (mm)
φ125	50/75/100/150/ 200/250/300	800	1	23
φ140				25
φ160				27
φ180		900		28
φ200		1000		28
φ250		1200		28

\*3: The custom stroke length is available in 1 mm increments.

\*4: If the max. stroke length is exceeded, product specifications may not be met, depending on operating conditions. Contact CKD in this case.

## Cylinder weight

(Unit: kg)

Item/mounting	Product weight when stroke length (S) = 0 mm						Additional weight per S = 100 mm
	Bore size (mm)	Basic (00)	Axial foot (LB)	Flange (FA/FB)	Eye bracket (CA)	Clevis bracket (CB)	
φ125	7.22	8.72	10.52	10.22	10.32	10.62	1.54
φ140	9.35	11.35	14.75	13.15	13.35	12.55	1.78
φ160	12.35	15.45	19.25	17.35	17.65	18.75	2.22
φ180	16.75	21.25	28.75	24.15	24.65	24.85	2.96
φ200	22.78	28.48	36.48	32.28	32.48	34.58	3.54
φ250	40.51	48.91	66.41	64.51	59.01	69.21	5.38

(Example) Product weight of SCS2-T-LB-125B-300 ———— {  
 ● Product weight for S = 0 mm stroke length ... 8.72 kg  
 ● Additional weight for S = 300 mm stroke length ...  $1.54 \times \frac{300}{100} = 4.62$  kg  
 ● Product weight ... 8.72 + 4.62 = 13.34 kg

## 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	0.8	0.9	1.0
φ125	Push	$1.23 \times 10^3$	$1.84 \times 10^3$	$2.45 \times 10^3$	$3.68 \times 10^3$	$4.91 \times 10^3$	$6.14 \times 10^3$	$7.36 \times 10^3$	$8.59 \times 10^3$	$9.82 \times 10^3$	$1.10 \times 10^4$	$1.23 \times 10^4$
	Pull	$1.15 \times 10^3$	$1.72 \times 10^3$	$2.29 \times 10^3$	$3.44 \times 10^3$	$4.59 \times 10^3$	$5.73 \times 10^3$	$6.88 \times 10^3$	$8.03 \times 10^3$	$9.17 \times 10^3$	$1.03 \times 10^4$	$1.15 \times 10^4$
φ140	Push	$1.54 \times 10^3$	$2.31 \times 10^3$	$3.08 \times 10^3$	$4.62 \times 10^3$	$6.16 \times 10^3$	$7.70 \times 10^3$	$9.24 \times 10^3$	$1.08 \times 10^4$	$1.23 \times 10^4$	$1.39 \times 10^4$	$1.54 \times 10^4$
	Pull	$1.46 \times 10^3$	$2.19 \times 10^3$	$2.92 \times 10^3$	$4.38 \times 10^3$	$5.84 \times 10^3$	$7.29 \times 10^3$	$8.75 \times 10^3$	$1.02 \times 10^4$	$1.17 \times 10^4$	$1.31 \times 10^4$	$1.46 \times 10^4$
φ160	Push	$2.01 \times 10^3$	$3.02 \times 10^3$	$4.02 \times 10^3$	$6.03 \times 10^3$	$8.04 \times 10^3$	$1.01 \times 10^4$	$1.21 \times 10^4$	$1.41 \times 10^4$	$1.61 \times 10^4$	$1.81 \times 10^4$	$2.01 \times 10^4$
	Pull	$1.88 \times 10^3$	$2.83 \times 10^3$	$3.77 \times 10^3$	$5.65 \times 10^3$	$7.54 \times 10^3$	$9.42 \times 10^3$	$1.13 \times 10^4$	$1.32 \times 10^4$	$1.51 \times 10^4$	$1.70 \times 10^4$	$1.88 \times 10^4$
φ180	Push	$2.54 \times 10^3$	$3.82 \times 10^3$	$5.09 \times 10^3$	$7.63 \times 10^3$	$1.02 \times 10^4$	$1.27 \times 10^4$	$1.53 \times 10^4$	$1.78 \times 10^4$	$2.04 \times 10^4$	$2.29 \times 10^4$	$2.54 \times 10^4$
	Pull	$2.39 \times 10^3$	$3.58 \times 10^3$	$4.77 \times 10^3$	$7.16 \times 10^3$	$9.54 \times 10^3$	$1.19 \times 10^4$	$1.43 \times 10^4$	$1.67 \times 10^4$	$1.91 \times 10^4$	$2.15 \times 10^4$	$2.39 \times 10^4$
φ200	Push	$3.14 \times 10^3$	$4.71 \times 10^3$	$6.28 \times 10^3$	$9.42 \times 10^3$	$1.26 \times 10^4$	$1.57 \times 10^4$	$1.88 \times 10^4$	$2.20 \times 10^4$	$2.51 \times 10^4$	$2.83 \times 10^4$	$3.14 \times 10^4$
	Pull	$2.95 \times 10^3$	$4.42 \times 10^3$	$5.89 \times 10^3$	$8.84 \times 10^3$	$1.18 \times 10^4$	$1.47 \times 10^4$	$1.77 \times 10^4$	$2.06 \times 10^4$	$2.36 \times 10^4$	$2.65 \times 10^4$	$2.95 \times 10^4$
φ250	Push	$4.91 \times 10^3$	$7.36 \times 10^3$	$9.82 \times 10^3$	$1.47 \times 10^4$	$1.96 \times 10^4$	$2.45 \times 10^4$	$2.95 \times 10^4$	$3.44 \times 10^4$	$3.93 \times 10^4$	$4.42 \times 10^4$	$4.91 \times 10^4$
	Pull	$4.63 \times 10^3$	$6.94 \times 10^3$	$9.25 \times 10^3$	$1.39 \times 10^4$	$1.85 \times 10^4$	$2.31 \times 10^4$	$2.78 \times 10^4$	$3.24 \times 10^4$	$3.70 \times 10^4$	$4.16 \times 10^4$	$4.63 \times 10^4$

### How to order

**SCS2-T** - **LB** - **125** - **B** - **50** - **M** **Y**

**A** Mounting  
\*1

**B** Bore size

**C** Port thread

**D** Cushion

**E** Stroke length

**F** Option  
\*2

\*3

**G** Accessory  
\*4

### ⚠ Precautions for model No. selection

- \*1: Hole trunnion is available as custom order for  $\phi 125$  to  $160$  only. Contact CKD for details about dimensions.
- \*2: The instantaneous max. temperature is the temperature when sparks, cutting chips, etc., instantaneously contact the bellows.
- \*3: Check the figures below for the cushion needle position indication.
- \*4: "I" and "Y" cannot be selected together.

### [Example of model No.]

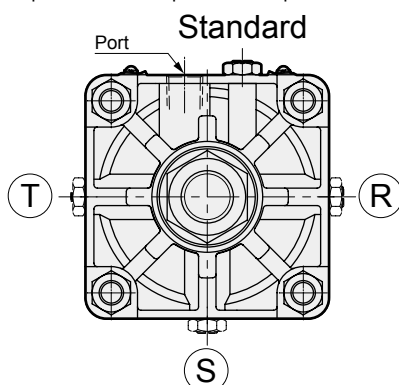
#### SCS2-T-LB-125 B-50-MY

Model: Large bore size cylinder, double acting/heat resistant

- A** Mounting : Axial foot
- B** Bore size :  $\phi 125$  mm
- C** Port thread : Rc thread
- D** Cushion : Both sides cushioned
- E** Stroke length : 50 mm
- F** Option : Piston rod material change (stainless steel)
- G** Accessory : Rod clevis

### Cushion needle position

(Needle position with the port on the top when viewed from the rod end)



Code	Content	
<b>A Mounting</b>		
<b>00</b>	Basic	
<b>LB</b>	Axial foot	
<b>FA</b>	Rod side flange	
<b>FB</b>	Head side flange	
<b>CA</b>	Eye bracket	
<b>CB</b>	Clevis bracket (pin and snap ring attached)	
<b>TC</b>	Intermediate trunnion	
<b>TA</b>	Rod side trunnion	
<b>TB</b>	Head side trunnion	
<b>TF</b>	Intermediate supporting hole trunnion (custom order product)	
<b>TD</b>	Rod side hole trunnion (custom order product)	
<b>TE</b>	Head side hole trunnion (custom order product)	
<b>B Bore size (mm)</b>		
<b>125</b>	$\phi 125$	
<b>140</b>	$\phi 140$	
<b>160</b>	$\phi 160$	
<b>180</b>	$\phi 180$	
<b>200</b>	$\phi 200$	
<b>250</b>	$\phi 250$	
<b>C Port thread</b>		
<b>Blank</b>	Rc thread	
<b>N</b>	NPT thread (custom order product)	
<b>G</b>	G thread (custom order product)	
<b>D Cushion</b>		
<b>B</b>	Both sides cushioned	
<b>R</b>	Rod side cushioned	
<b>H</b>	Head side cushioned	
<b>N</b>	Without cushion	
<b>E Stroke length (mm)</b>		
<b>Bore size</b>	<b>Stroke length</b>	<b>Custom stroke length</b>
$\phi 125$ to $\phi 160$	<b>1 to 800</b>	<b>In 1 mm increments</b>
$\phi 180$	<b>1 to 900</b>	
$\phi 200$	<b>1 to 1000</b>	
$\phi 250$	<b>1 to 1200</b>	
<b>F Option</b>		
<b>C2</b>	With cushion section check valve	
<b>L</b>	Bellows   Max. ambient temp. 250°C   Instantaneous max. temp 400°C	
<b>M</b>	Piston rod material (stainless steel)	
<b>Blank</b>	Cushion needle position (standard)	Standard 
<b>R</b>	Cushion needle position R	
<b>S</b>	Cushion needle position S	
<b>T</b>	Cushion needle position T	
<b>G Accessory</b>		
<b>I</b>	Rod eye	
<b>Y</b>	Rod clevis (pin and snap ring attached)	
<b>B1</b>	Eye bracket	
<b>B2</b>	Clevis bracket (pin and snap ring attached)	

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

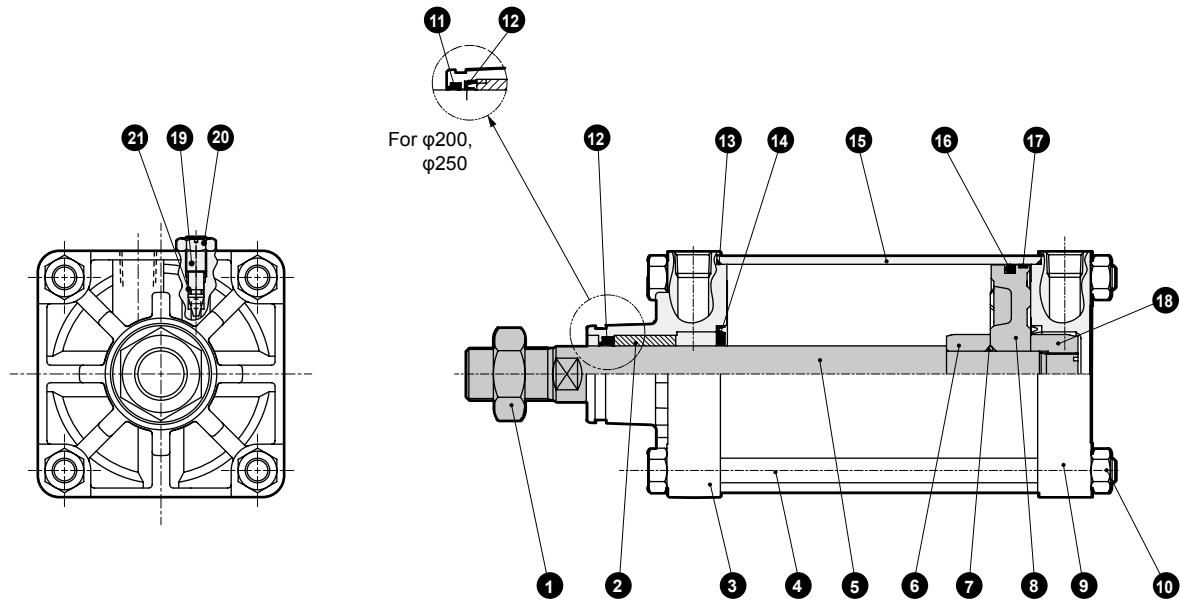
Spd

Contr

Ending

# SCS2-T Series

## Internal structure and parts list



● Note: 14, 19, 20 and 21 are not required for the type without cushion.

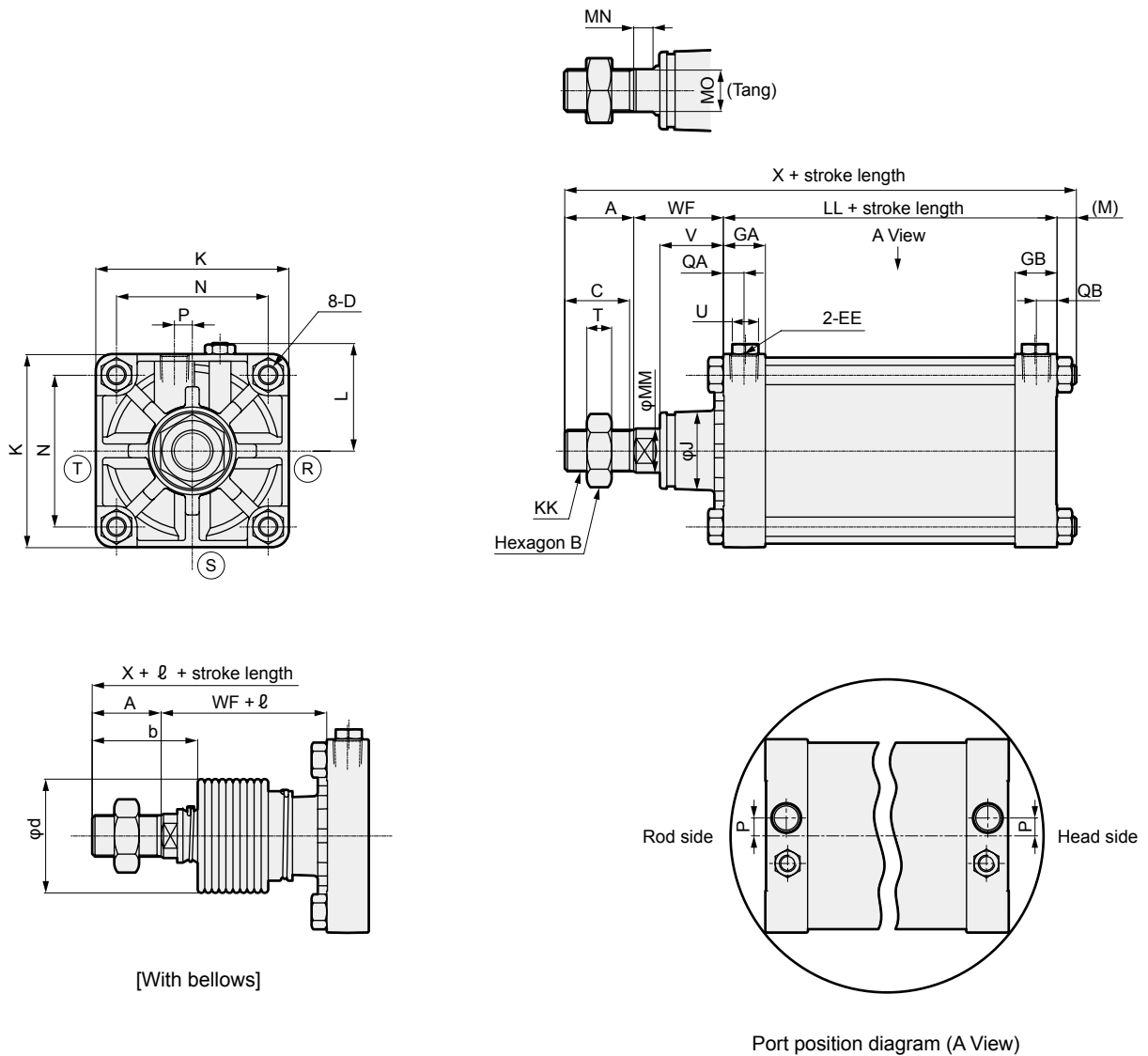
No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon nut	Steel	Zinc chromate	13	Cylinder gasket	Fluoro rubber	
2	Bush	Iron/copper oil-impreg bearing		14	Cushion packing	Fluoro rubber/steel	
3	Rod cover	Aluminum alloy casting	Chromate	15	Cylinder tube	Aluminum alloy	Hard alumite
4	Tie rod	Steel	Zinc chromate	16	Piston packing	Fluoro rubber	
5	Piston rod	Steel	Industrial chrome plating	17	Wear ring	Fiber-reinforced phenolic resin	
6	Cushion ring A	Steel	Zinc chromate	18	Cushion ring B	Steel	Zinc chromate
7	Piston gasket	Fluoro rubber		19	Cushion needle	Copper alloy (φ125 to φ180) Steel (φ200, 250)	Zinc chromate
8	Piston	Aluminum alloy casting		20	Hexagon nut	Steel	Zinc chromate
9	Head cover	Aluminum alloy casting	Chromate	21	Needle gasket	Fluoro rubber	
10	Hexagon nut	Steel	Zinc chromate				
11	Dust wiper	Fluoro rubber	φ200 and φ250 only				
12	Rod packing	Fluoro rubber					

## Repair parts list

Bore size (mm)	Kit No.	Repair parts No.
φ125	SCS2-T-125K	
φ140	SCS2-T-140K	
φ160	SCS2-T-160K	12 13 14 16 17 21
φ180	SCS2-T-180K	
φ200	SCS2-T-200K	
φ250	SCS2-T-250K	11 12 13 14 16 17 21

## Dimensions

● Basic (00)



\*1: (R), (S) and (T) indicate the cushion needle position.  
 \*2: ℓ dimensions below decimal point are rounded up.

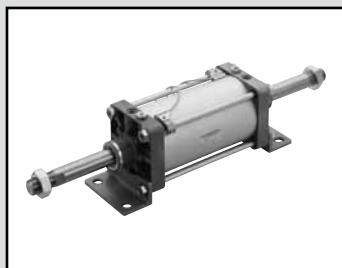
Code	Basic (00) basic dimensions																
Bore size (mm)	A	B	C	D	EE	GA	GB	J	K	KK	L	LL	M	MM	MN	MO	N
φ125	50	46	47	M14 × 1.5	Rc1/2	30.5	30.5	57	140	M30 × 1.5	78 to 82	92	13.5	32	15	27	110
φ140	50	46	47	M14 × 1.5	Rc3/4	34.5	34.5	57	157	M30 × 1.5	86.5 to 91	103	13.5	32	15	27	124
φ160	56	55	53	M16 × 1.5	Rc3/4	34.5	34.5	62	177	M36 × 1.5	96.5 to 101	106	15.5	40	16	36	142
φ180	63	60	60	M18 × 1.5	Rc3/4	34.5	34.5	68	200	M40 × 1.5	108 to 112	110	17.5	45	18	41	160
φ200	72	70	69	M20 × 1.5	Rc3/4	37.5	37.5	75	220	M45 × 1.5	120.5 to 129	123	18.5	50	20	46	175
φ250	88	85	84	M24 × 1.5	Rc1	42.5	42.5	93	274	M56 × 2	147.5 to 156	141	21.5	60	22	55	216

Code	With bellows										
Bore size (mm)	P	QA	QB	T	U	V	WF	X	b	d	ℓ
φ125	13	15	15	18	19	45.5	65	220.5	74	75	(Stroke length/4.55) + 11
φ140	15	17	17	18	19	45.5	67	233.5	74	75	(Stroke length/4.55) + 9
φ160	15	17	17	21	19	48	71	248.5	81	80	(Stroke length/5.15) + 9
φ180	15	17	17	24	19	53	78	268.5	90	90	(Stroke length/5.15) + 9
φ200	20	18	18	27	24	60	88	301.5	102	95	(Stroke length/5.30) + 9
φ250	22	21	21	34	24	64	94	344.5	120	120	(Stroke length/6.40) + 9

\* Dimensions of other mounting are the same as those of the double acting SCS2 Series. Refer to pages 615 to 622.  
 \* For the dimensions of the accessories, refer to page 623.

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

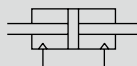


Large bore size cylinder  
Double acting/double rod/lubrication/no-lubrication

# SCS2-D Series

● Bore size: φ125/φ140/φ160/φ180/φ200/φ250

JIS symbol



\* Custom order product.

## Specifications

Descriptions		SCS2-D/SCS2-LND (double rod)					
Bore size	mm	φ125	φ140	φ160	φ180	φ200	φ250
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0 (≈150 psi, 10 bar)					
Min. working pressure	MPa	0.1 (≈15 psi, 1 bar)					
Proof pressure	MPa	1.6 (≈230 psi, 16 bar)					
Ambient temperature	°C	-5 (23°F) to 60 (140°F) (no freezing)					
Port size		Rc1/2	Rc3/4			Rc1	
Stroke tolerance	mm	$^{+1.0}_0$ ( to 300), $^{+1.4}_0$ ( to 1000), $^{+1.8}_0$ ( to 1200)					
Working piston speed	mm/s	20 to 1000 (Operate within the absorbed energy.)					
Cushion		Air cushion					
Effective air cushion length	mm	21.6	21.6	21.6	21.6	26.6	26.6
Lubrication		SCS-D: Required (use turbine oil class 1 ISO VG32 for lubrication)/Not required for SCS-LND					
Allowable absorbed energy	Cushioned	63.5	91.5	116	152	233	362
	Without cushion	0.371	0.386	0.386	0.958	1.08	2.32
		Without any cushion, this product cannot absorb large energy generated by an external load. We recommend using an external shock absorber.					

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Trunnion min. stroke (mm)
φ125	50/75/100/150/	800	1	23
φ140				25
φ160	200/250/300	900		27
φ180		1,000		28
φ200	1,200	1,200		28
φ250		28		

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

\*2: If the max. stroke length is exceeded, product specifications may not be met, depending on operating conditions. Contact CKD in this case.

## Min. stroke length with switch

Item	Stroke length when mounted on the same surface	Stroke of intermediate supporting hole trunnion	Stroke length of rod side supporting hole trunnion	Stroke of head side supporting hole trunnion	
Bore size (mm)					
Switch	Sketch				
	Bore size			Position cannot be detected at the rod side stroke end.	Position cannot be detected at the head side stroke end.
Reed switch (T*)	φ125	20 or more	120 or more	70 or more	
	φ140		125 or more	75 or more	
	φ160		130 or more	80 or more	
	φ180		135 or more	85 or more	
	φ200		140 or more	90 or more	
	φ250	150 or more	100 or more		

### 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				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 T2YDT				
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	100/110 VAC	5/12/24 VDC	100/110 VAC	12/24 VDC	110 VAC	220 VAC	24 VDC ±10%
Load current	5 to 100 mA		5 to 20 mA (*1)				100 mA or less		50 mA or less		5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less	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	1 m:18	1 m:33	1 m:18	1 m:18	1 m:33	1 m:18	1 m:18	1 m:18 3 m:49 5 m:80			1 m:33		1 m:61				
	3 m:87	3 m:49	3 m:87	3 m:49	3 m:49	3 m:87	3 m:49	3 m:49	3 m:49 5 m:80			3 m:87		3 m:166				
	5 m:142	5 m:80	5 m:142	5 m:80	5 m:80	5 m:142	5 m:80	5 m:80	5 m:80			5 m:142		5 m:272				

\*1 : 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)

\*2 : Switch for AC magnetic field (T2YD) cannot be used in DC magnetic field.

\*3 : Dimensions depend on switch model No. Refer to Ending Page 18 for details.

### Cylinder weight

(Unit: kg)

Item/mounting	Product weight when stroke length (S) = 0 mm						Switch weight		Additional weight per S = 100 mm
	Basic (00)	Axial foot (LB)	Flange (FA/FB)	Eye bracket (CA)	Clevis bracket (CB)	Trunnion (TA/TB/TC)	Switch	Mounting bracket	
φ125	9.02	10.52	12.32	12.02	12.12	12.42	Refer to the weight in the switch specifications.	0.028	2.17
φ140	10.95	12.95	16.35	14.75	14.95	14.15		0.030	2.41
φ160	15.05	18.15	21.95	20.05	20.35	21.45		0.034	3.21
φ180	20.15	24.65	32.15	27.55	28.05	28.25		0.038	4.21
φ200	27.68	33.38	41.38	37.18	37.38	39.48		0.040	5.08
φ250	48.51	56.91	74.41	72.51	67.01	77.21		0.045	7.60

(Example) Product weight of SCS2-LND-LB-125B-300-TOH-D

- Product weight for S = 0 mm stroke length ... 10.52 kg
- Additional weight for S = 300 mm stroke length ...  $2.17 \times \frac{300}{100} = 6.51$  kg
- Weight of 2 switches (TOH-D) ...  $0.018 \times 2 = 0.036$  kg
- Product weight with 2 switch brackets ...  $0.028 \times 2 = 0.056$  kg
- Product weight ...  $10.52 + 6.51 + 0.036 + 0.056 = 17.122$  kg

### 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	0.8	0.9	1.0
φ125	Push/Pull	$1.15 \times 10^3$	$1.72 \times 10^3$	$2.29 \times 10^3$	$3.44 \times 10^3$	$4.59 \times 10^3$	$5.73 \times 10^3$	$6.88 \times 10^3$	$8.03 \times 10^3$	$9.17 \times 10^3$	$1.03 \times 10^4$	$1.15 \times 10^4$
φ140	Push/Pull	$1.46 \times 10^3$	$2.19 \times 10^3$	$2.92 \times 10^3$	$4.38 \times 10^3$	$5.84 \times 10^3$	$7.29 \times 10^3$	$8.75 \times 10^3$	$1.02 \times 10^4$	$1.17 \times 10^4$	$1.31 \times 10^4$	$1.46 \times 10^4$
φ160	Push/Pull	$1.88 \times 10^3$	$2.83 \times 10^3$	$3.77 \times 10^3$	$5.65 \times 10^3$	$7.54 \times 10^3$	$9.42 \times 10^3$	$1.13 \times 10^4$	$1.32 \times 10^4$	$1.51 \times 10^4$	$1.70 \times 10^4$	$1.88 \times 10^4$
φ180	Push/Pull	$2.39 \times 10^3$	$3.58 \times 10^3$	$4.77 \times 10^3$	$7.16 \times 10^3$	$9.54 \times 10^3$	$1.19 \times 10^4$	$1.43 \times 10^4$	$1.67 \times 10^4$	$1.91 \times 10^4$	$2.15 \times 10^4$	$2.39 \times 10^4$
φ200	Push/Pull	$2.95 \times 10^3$	$4.42 \times 10^3$	$5.89 \times 10^3$	$8.84 \times 10^3$	$1.18 \times 10^4$	$1.47 \times 10^4$	$1.77 \times 10^4$	$2.06 \times 10^4$	$2.36 \times 10^4$	$2.65 \times 10^4$	$2.95 \times 10^4$
φ250	Push/Pull	$4.63 \times 10^3$	$6.94 \times 10^3$	$9.25 \times 10^3$	$1.39 \times 10^4$	$1.85 \times 10^4$	$2.31 \times 10^4$	$2.78 \times 10^4$	$3.24 \times 10^4$	$3.70 \times 10^4$	$4.16 \times 10^4$	$4.63 \times 10^4$



# SCS2-D Series

- 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

## How to order

Without switch (lubrication) (without magnet for switch)

**SCS2-D** - **LB** - **125** - **B** - **50** - **J** **I**

With switch (no-lubrication) (built-in magnet for switch)

**SCS2-LND** - **LB** - **125** - **B** - **50** - **T0H** - **R** - **J** **I**

**A** Mounting  
\*1

**B** Bore size

**C** Port thread

**D** Cushion

**E** Stroke length  
\*2

**F** Switch model No.

**G** Switch quantity  
\*3

**H** Option  
\*4

\*5

## ⚠ Precautions for model No. selection

- \*1 : Hole trunnion is available as custom order for φ125 to 160 only. Contact CKD for details about dimensions.
- \*2 : Refer to page 633 for the min. stroke length with switch.
- \*3 : When selecting TA or TB as mounting, the number of switches is limited to "H" (1 on head side) for TA and TD, and "R" (1 on rod side) for TB.
- \*4 : The instantaneous max. temperature is the temperature when sparks, cutting chips, etc., instantaneously contact the bellows.
- \*5 : Refer to page 635 for the cushion needle position indication.

[Example of model No.]

### SCS2-LND-LB-125B-50-T0H-R-JY

Model: Large bore size cylinder double acting/double rod, with switch

- A** Mounting : Axial foot
- B** Bore size : φ125 mm
- C** Port thread : Rc thread
- D** Cushion : Both sides cushioned
- E** Stroke length : 50 mm
- F** Switch model No.: Reed T0H switch, lead wire 1 m
- G** Switch quantity : 1 on rod side
- H** Option : Bellows material for max. ambient temperature 60°C
- I** Accessory : Rod clevis

Code	Content
<b>A Mounting</b>	
00	Basic
LB	Axial foot
FA	Rod side flange
FB	Head side flange
TC	Intermediate trunnion
TA	Rod side trunnion
TB	Head side trunnion
TF	Intermediate supporting hole trunnion (custom order product)
TD	Rod side hole trunnion (custom order product)
TE	Head side hole trunnion (custom order product)

<b>B Bore size (mm)</b>	
125	φ125
140	φ140
160	φ160
180	φ180
200	φ200
250	φ250

<b>C Port thread</b>	
Blank	RC thread
N	NPT thread (custom order product)
G	G thread (custom order product)


<b>D Cushion</b>	
B	Both sides cushioned
R	Rod side cushioned
H	Head side cushioned
N	Without cushion

<b>E Stroke length (mm)</b>		
Bore size	Stroke length *2	Custom stroke length
φ125 to φ160	1 to 800	In 1 mm increments
φ180	1 to 900	
φ200	1 to 1000	
φ250	1 to 1200	

<b>F Switch model No.</b>						
Axial lead wire	Radial lead wire	Contact	Voltage		Display	Lead Line
			AC	DC		
T0H*	T0V*	Reed	●	●	1-color display	2-wire
T5H*	T5V*	●	●	Without indicator lamp	1-color display	
T8H*	T8V*	●	●	1-color display		
T1H*	T1V*	Proximity	●		1-color display	2-wire
T2H*	T2V*		●			
T3H*	T3V*		●		1-color display (PNP output) (custom)	3-wire
T3PH*	T3PV*		●			
T2WH*	T2WV*		●		2-color display	2-wire
T2YH*	T2YV*	●				
T3WH*	T3WV*	●		2-color display	3-wire	
T3YH*	T3YV*	●				
T2YD*	-	●	●	2-color display	2-wire	
T2YDT*	-	●	●	AC magnetic field		
T2JH*	T2JV*	●	●	1-color display off-delay	2-wire	

<b>* Lead wire length</b>	
Blank	1 m (standard)
3	3 m (option)
5	5 m (option)

<b>G Switch quantity</b>	
R	1 on rod side
H	1 on head side
D	2
T	3
4	4

<b>H Option</b>			
C2	With cushion section check valve		
J	Bellows	Max. ambient temp.	Instantaneous ambient temp.
K	Bellows	60°C	100°C
L	Bellows	100°C	200°C
M	Bellows	250°C	400°C
M	Piston rod material (stainless steel)		
Blank	Cushion needle position (standard)	Standard	
R	Cushion needle position R	T  R	
S	Cushion needle position S	S	
T	Cushion needle position T	T	
P6	Copper and PTFE free (custom order)		

<b>I Accessory</b>	
I	Rod eye
Y	Rod clevis (pin and snap ring attached)

### How to order switch

● Switch body + mounting bracket set

**SCS2-LN - T0H - 125**

Switch model No.  
(Item F on the previous page)

Bore size (Item B on the previous page)

● Switch body only

**SW - T0H**

Switch model No.  
(Item F on the previous page)

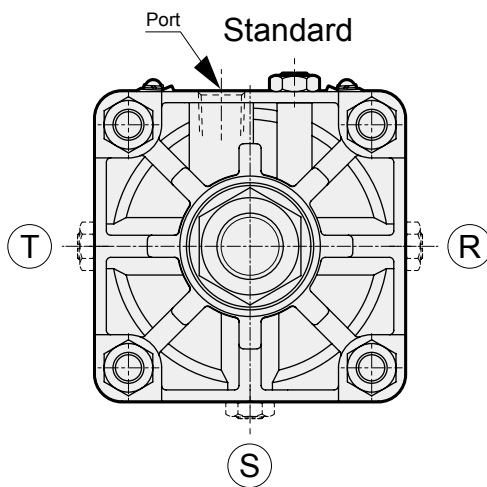
● Mounting bracket set

**SCS2-LN - TS - 125**

Bore size (Item B on the previous page)

Mounting bracket	
TS	T switch
T	T2YD switch

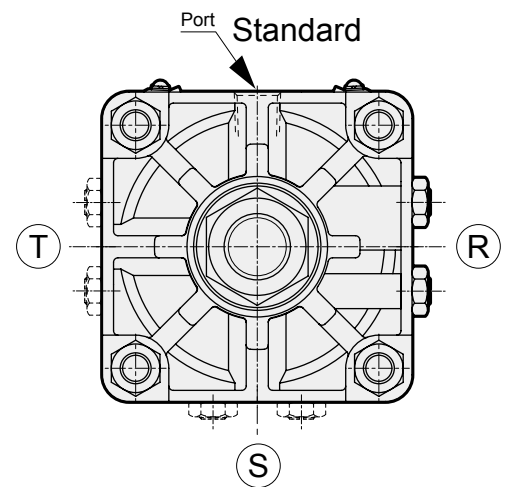
### Cushion needle position (needle position from rod direction with the port on the top side)



When selecting option R, S, or T for a certified class 2 pressure vessel, the port position should be in the center as shown in the figure on the right, and the needle position should be in the offset position.

Certified class 2 pressure vessel stroke length

Bore size	Stroke length
φ200	946 or more
φ250	752 or more



Class 2 pressure vessel certification options R, S, or T

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

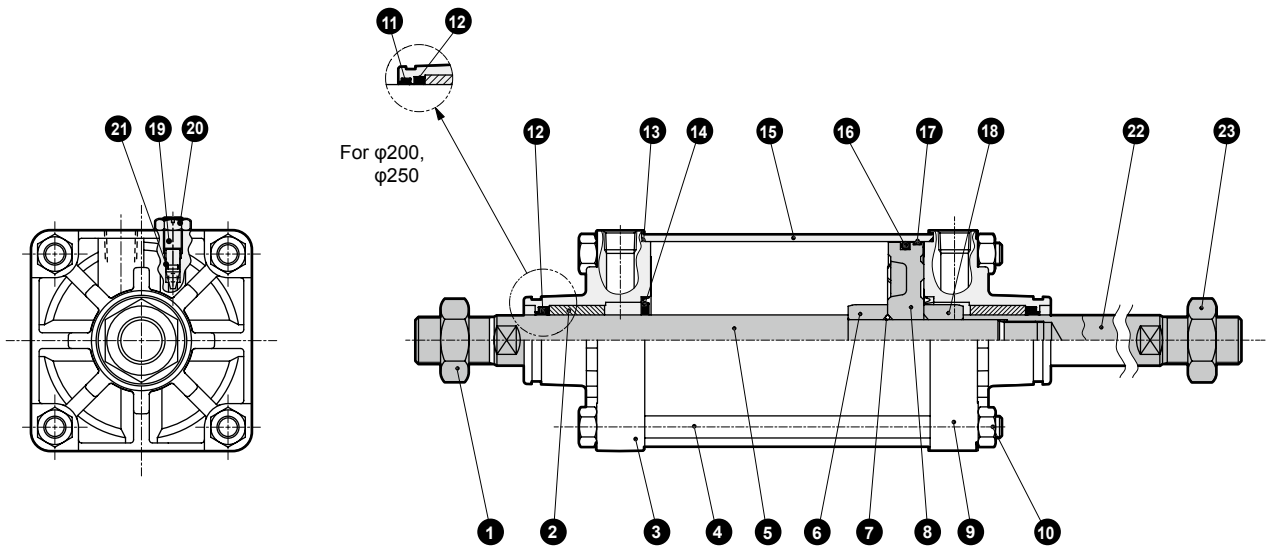
FK

Spd  
Contr

Ending

# SCS2-D Series

## Internal structure and parts list



● Note: 14, 19, 20 and 21 are not required for the type without cushion.

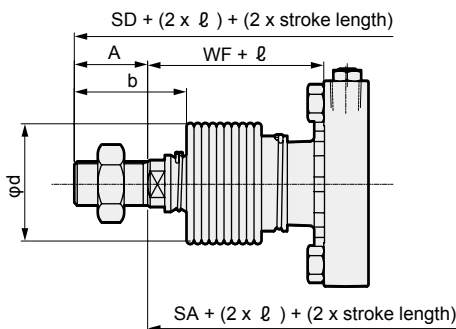
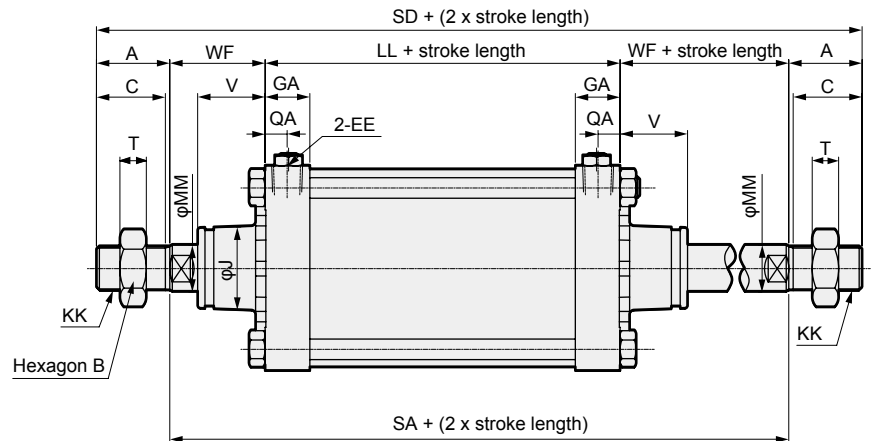
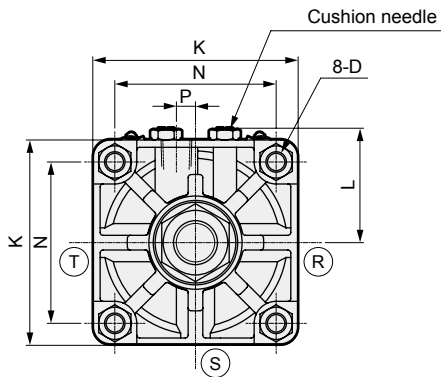
No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon nut	Steel	Zinc chromate	13	Cylinder gasket	Nitrile rubber	
2	Bush	Iron-copper oil-impregnated bearing alloy		14	Cushion packing	Nitrile rubber/steel	
3	Rod cover	Aluminum alloy casting	Chromate	15	Cylinder tube	Aluminum alloy	Hard alumite
4	Tie rod	Steel	Zinc chromate	16	Piston packing	Nitrile rubber	
5	Piston rod A	Steel	Industrial chrome plating	17	Wear ring	Polyacetal resin	
6	Cushion ring A	Steel	Zinc chromate	18	Cushion ring B	Steel	Zinc chromate
7	Piston gasket	Nitrile rubber		19	Cushion needle	Copper alloy (φ125 to φ180) Steel (φ200, 250)	Zinc chromate
8	Piston	Aluminum alloy casting		20	Hexagon nut	Steel	Zinc chromate
9	Head cover	Aluminum alloy casting	Chromate	21	Needle gasket	Nitrile rubber	
10	Hexagon nut	Steel	Zinc chromate	22	Piston rod B	Steel	Industrial chrome plating
11	Dust wiper	Nitrile rubber	φ200 and φ250 only	23	Hexagon nut	Steel	Zinc chromate
12	Rod packing	Nitrile rubber					

## Repair parts list

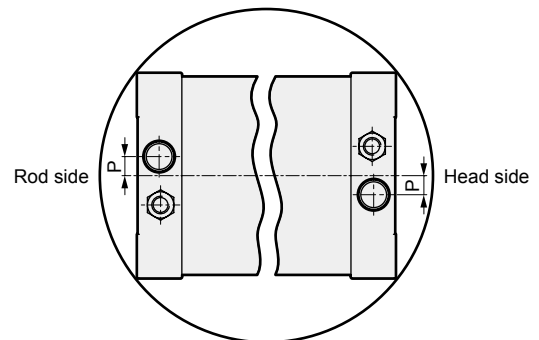
Bore size (mm)	Kit No.	Repair parts No.
φ125	SCS2-D-125K	
φ140	SCS2-D-140K	
φ160	SCS2-D-160K	12 13 14 16 17 21
φ180	SCS2-D-180K	
φ200	SCS2-D-200K	
φ250	SCS2-D-250K	11 12 13 14 16 17 21

### Dimensions

● Basic (00)



[With bellows]



Port position diagram (A View)

\*1: ⓑ, Ⓢ and Ⓣ indicate the cushion needle position.  
 \*2: The positions for the left and right tang hexagon unspecified.

Code	Basic (00) basic dimensions										
Bore size (mm)	A	B	C	D	EE	GA	J	K	KK	L	LL
φ125	50	46	47	M14 × 1.5	Rc1/2	32	57	140	M30 × 1.5	78 to 82	92
φ140	50	46	47	M14 × 1.5	Rc3/4	36	57	157	M30 × 1.5	86.5 to 91	103
φ160	56	55	53	M16 × 1.5	Rc3/4	38.5	62	177	M36 × 1.5	96.5 to 101	106
φ180	63	60	60	M18 × 1.5	Rc3/4	39.5	68	200	M40 × 1.5	108 to 112	110
φ200	72	70	69	M20 × 1.5	Rc3/4	44.5	75	220	M45 × 1.5	120.5 to 129	123
φ250	88	85	84	M24 × 1.5	Rc1	49.5	93	274	M56 × 2	147.5 to 156	141

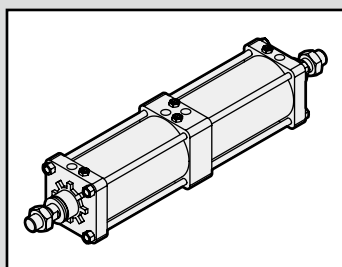
  

Code	With bellows									
Bore size (mm)	MM	N	P	QA	SA	SD	T	V	WF	l
φ125	32	110	13	15	222	322	18	45.5	65	(Stroke length/4.55) + 11
φ140	32	124	15	17	237	337	18	45.5	67	(Stroke length/4.55) + 9
φ160	40	142	15	17	248	360	21	48	71	(Stroke length/5.15) + 9
φ180	45	160	15	17	266	392	24	53	78	(Stroke length/5.15) + 9
φ200	50	175	20	18	299	443	27	60	88	(Stroke length/5.30) + 9
φ250	60	216	22	21	329	505	34	64	94	(Stroke length/6.40) + 9

\* Dimensions of other mounting are the same as those of the double acting SCS2 Series. Refer to pages 615 to 622.

\* For the dimensions of the accessories, refer to page 623.

- 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

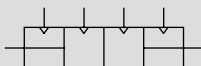


Large bore size cylinder  
Double acting/back to back

# SCS2-B Series

● Bore size: φ125/φ140/φ160/φ180/φ200/φ250

JIS symbol



\* Custom order product.

## Specifications

Descriptions		SCS2-B (back to back)					
Bore size	mm	φ125	φ140	φ160	φ180	φ200	φ250
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0 (≈150 psi, 10 bar)					
Min. working pressure	MPa	0.05 (≈7.3 psi, 0.5 bar)					
Proof pressure	MPa	1.6 (≈230 psi, 16 bar)					
Ambient temperature	°C	-5 (23°F) to 60 (140°F) (no freezing)					
Port size		Rc1/2	Rc3/4			Rc1	
Stroke tolerance	mm	<sup>+1.0</sup> <sub>0</sub> (to 300), <sup>+1.4</sup> <sub>0</sub> (to 1000), <sup>+1.8</sup> <sub>0</sub> (to 1200)					
Working piston speed	mm/s	20 to 1000 (Operate within the absorbed energy.)					
Cushion		Air cushion					
Effective air cushion length	mm	21.6	21.6	21.6	21.6	26.6	26.6
Lubrication		Required (use turbine oil class 1 ISO VG32 for lubrication)					
Allowable absorbed energy	Cushioned	63.5	91.5	116	152	233	362
	Without cushion	0.371	0.386	0.386	0.958	1.08	2.32
Without any cushion, this product cannot absorb large energy generated by an external load. We recommend using an external shock absorber.							

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Trunnion, min. stroke (mm)
φ125	50/75/100/150/ 200/250/300	800	1	23
φ140				25
φ160				27
φ180				28
φ200				28
φ250	28			

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

## Cylinder weight

(Unit: kg)

Item/mounting	Product weight when stroke length (S) = 0 mm						Additional weight per S = 100 mm
	Basic (00)	Axial foot (LB)	Flange (FA/FB)	Eye bracket (CA)	Clevis bracket (CB)	Trunnion (TA/TB/TC)	
φ125	14.44	15.94	17.74	17.44	17.54	17.84	1.54
φ140	18.70	20.70	24.10	22.50	22.70	21.90	1.78
φ160	24.70	27.80	31.60	29.70	30.00	31.10	2.22
φ180	33.50	38.00	45.50	40.90	41.40	41.60	2.96
φ200	45.56	51.26	59.26	55.06	55.26	57.36	3.54
φ250	81.02	89.42	106.92	105.02	99.52	109.72	5.38

(Example) Product weight of SCS2-B-LB-125B-300-300

- Product weight for S = 0 mm stroke length ..... 15.94 kg
- Additional weight for S = 300 mm stroke length ...  $2 \times 1.54 \times \frac{300}{100} = 9.24$  kg
- Product weight .....  $15.94 + 9.24 = 25.18$  kg

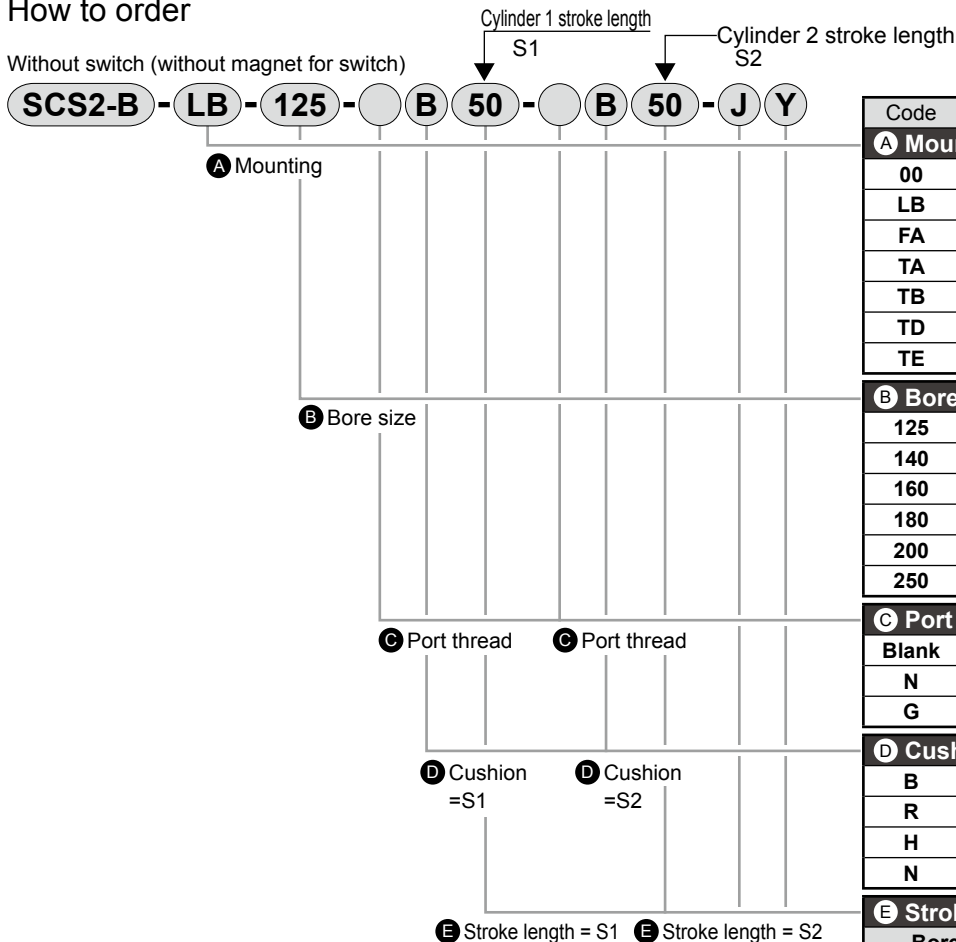
## Theoretical thrust table

(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	0.8	0.9	1.0
φ125	Push	$1.23 \times 10^3$	$1.84 \times 10^3$	$2.45 \times 10^3$	$3.68 \times 10^3$	$4.91 \times 10^3$	$6.14 \times 10^3$	$7.36 \times 10^3$	$8.59 \times 10^3$	$9.82 \times 10^3$	$1.10 \times 10^4$	$1.23 \times 10^4$
	Pull	$1.15 \times 10^3$	$1.72 \times 10^3$	$2.29 \times 10^3$	$3.44 \times 10^3$	$4.59 \times 10^3$	$5.73 \times 10^3$	$6.88 \times 10^3$	$8.03 \times 10^3$	$9.17 \times 10^3$	$1.03 \times 10^4$	$1.15 \times 10^4$
φ140	Push	$1.54 \times 10^3$	$2.31 \times 10^3$	$3.08 \times 10^3$	$4.62 \times 10^3$	$6.16 \times 10^3$	$7.70 \times 10^3$	$9.24 \times 10^3$	$1.08 \times 10^4$	$1.23 \times 10^4$	$1.39 \times 10^4$	$1.54 \times 10^4$
	Pull	$1.46 \times 10^3$	$2.19 \times 10^3$	$2.92 \times 10^3$	$4.38 \times 10^3$	$5.84 \times 10^3$	$7.29 \times 10^3$	$8.75 \times 10^3$	$1.02 \times 10^4$	$1.17 \times 10^4$	$1.31 \times 10^4$	$1.46 \times 10^4$
φ160	Push	$2.01 \times 10^3$	$3.02 \times 10^3$	$4.02 \times 10^3$	$6.03 \times 10^3$	$8.04 \times 10^3$	$1.01 \times 10^4$	$1.21 \times 10^4$	$1.41 \times 10^4$	$1.61 \times 10^4$	$1.81 \times 10^4$	$2.01 \times 10^4$
	Pull	$1.88 \times 10^3$	$2.83 \times 10^3$	$3.77 \times 10^3$	$5.65 \times 10^3$	$7.54 \times 10^3$	$9.42 \times 10^3$	$1.13 \times 10^4$	$1.32 \times 10^4$	$1.51 \times 10^4$	$1.70 \times 10^4$	$1.88 \times 10^4$
φ180	Push	$2.54 \times 10^3$	$3.82 \times 10^3$	$5.09 \times 10^3$	$7.63 \times 10^3$	$1.02 \times 10^4$	$1.27 \times 10^4$	$1.53 \times 10^4$	$1.78 \times 10^4$	$2.04 \times 10^4$	$2.29 \times 10^4$	$2.54 \times 10^4$
	Pull	$2.39 \times 10^3$	$3.58 \times 10^3$	$4.77 \times 10^3$	$7.16 \times 10^3$	$9.54 \times 10^3$	$1.19 \times 10^4$	$1.43 \times 10^4$	$1.67 \times 10^4$	$1.91 \times 10^4$	$2.15 \times 10^4$	$2.39 \times 10^4$
φ200	Push	$3.14 \times 10^3$	$4.71 \times 10^3$	$6.28 \times 10^3$	$9.42 \times 10^3$	$1.26 \times 10^4$	$1.57 \times 10^4$	$1.88 \times 10^4$	$2.20 \times 10^4$	$2.51 \times 10^4$	$2.83 \times 10^4$	$3.14 \times 10^4$
	Pull	$2.95 \times 10^3$	$4.42 \times 10^3$	$5.89 \times 10^3$	$8.84 \times 10^3$	$1.18 \times 10^4$	$1.47 \times 10^4$	$1.77 \times 10^4$	$2.06 \times 10^4$	$2.36 \times 10^4$	$2.65 \times 10^4$	$2.95 \times 10^4$
φ250	Push	$4.91 \times 10^3$	$7.36 \times 10^3$	$9.82 \times 10^3$	$1.47 \times 10^4$	$1.96 \times 10^4$	$2.45 \times 10^4$	$2.95 \times 10^4$	$3.44 \times 10^4$	$3.93 \times 10^4$	$4.42 \times 10^4$	$4.91 \times 10^4$
	Pull	$4.63 \times 10^3$	$6.94 \times 10^3$	$9.25 \times 10^3$	$1.39 \times 10^4$	$1.85 \times 10^4$	$2.31 \times 10^4$	$2.78 \times 10^4$	$3.24 \times 10^4$	$3.70 \times 10^4$	$4.16 \times 10^4$	$4.63 \times 10^4$

### How to order

Without switch (without magnet for switch)



Code	Content
<b>A Mounting</b>	
00	Basic
LB	Axial foot
FA	Rod side flange
TA	Rod side trunnion
TB	Head side trunnion
TD	Rod side hole trunnion (custom order product)
TE	Head side hole trunnion (custom order product)

<b>B Bore size (mm)</b>	
125	φ125
140	φ140
160	φ160
180	φ180
200	φ200
250	φ250

<b>C Port thread</b>	
Blank	Rc thread
N	NPT thread(custom order product)
G	G thread (custom order product)

<b>D Cushion</b>	
B	Both sides cushioned
R	Rod side cushioned
H	Head side cushioned
N	Without cushion

<b>E Stroke length (mm)</b>		
Bore size	Stroke length	Custom stroke length
φ125 to φ160	1 to 800	In 1 mm increments
φ180	1 to 900	
φ200	1 to 1000	
φ250	1 to 1200	

<b>F Option</b>			
C2	With cushion section check valve		
		Max. ambient temp.	Instantaneous ambient temp
J	Bellows	60°C	100°C
K	Bellows	100°C	200°C
L	Bellows	250°C	400°C
M	Piston rod material (stainless steel)		
Blank	Cushion needle position (standard)		Standard
R	Cushion needle position R		T
S	Cushion needle position S		S
T	Cushion needle position T		R
P6	Copper and PTFE free (custom order)		

<b>G Accessory</b>	
I	Rod eye
Y	Rod clevis (pin and snap ring attached)

### ⚠ Precautions for model No. selection

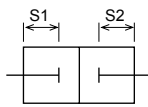
- \*1: Hole trunnion is available as custom order for φ125 to 160 only. Contact CKD for details about dimensions.
- \*2: The instantaneous max. temperature is the temperature when sparks, cutting chips, etc., instantaneously contact the bellows.
- \*3: Check the figures below for the cushion needle position indication.

[Example of model No.]

### SCS2-B-LB-125-B50-B50-JY

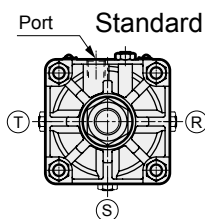
Model: Large bore size cylinder, double acting/back to back

- A** Mounting : Axial foot
  - B** Bore size : φ125 mm
  - C** Port thread : Rc thread
  - D** Cushion : With two-sided air cushion
  - E** Stroke length S1: 50 mm
  - F** Option : Bellows material for max. ambient temperature 60°C
  - G** Accessory : Rod clevis
- Cylinder 1 stroke length 50 mm (S1)  
 + Cylinder 2 stroke length 50 mm (S2)  
 Total stroke length 100 mm (S1 + S2)



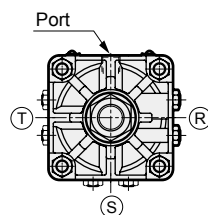
### Cushion needle position

(Needle position with the port on the top when viewed from the rod end)



When selecting option R, S, or T for a certified class 2 pressure vessel, the port position should be in the center as shown in the figure on the right, and the needle position should be in the offset position.

Bore size	S1 + S2 stroke length
φ180	1481 or more
φ200	892 or more
φ250	690 or more



Class 2 pressure vessel certification options R, S, or T

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

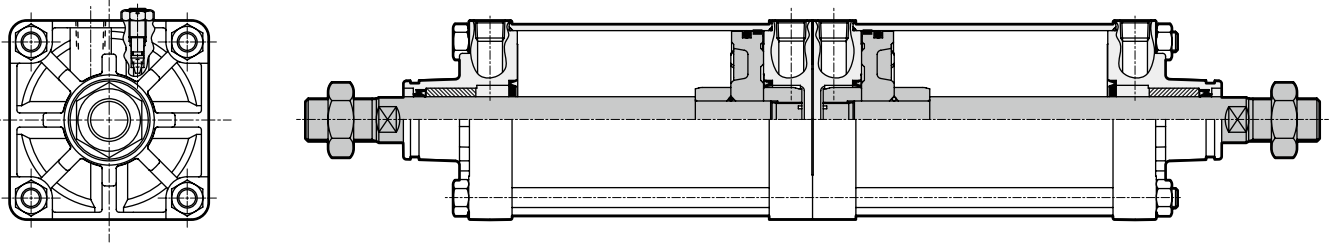
FK

Spd Contr

Ending

SCP\*3 Internal structure

CMK2  
CMA2  
SCM  
SCG  
SCA2



**SCS2**

Note: The parts list is common with double acting SCS2 Series. Two sets of the parts are required. Refer to page 613.

CKV2  
CAV2/  
COVPIN2

Repair parts list

SSD2

The parts are common with SCS2 Series and two sets of them are required. Refer to page 613.

SSG

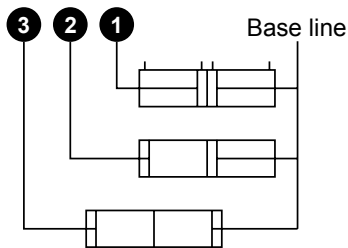
SSD

Applications

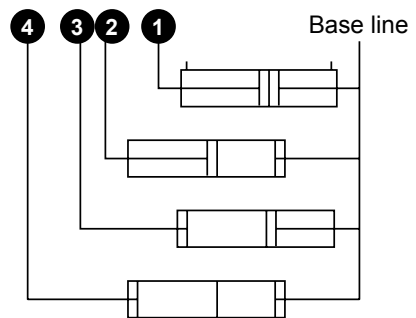
CAT

MDC2

When the same stroke lengths are combined, 3 positions are available.



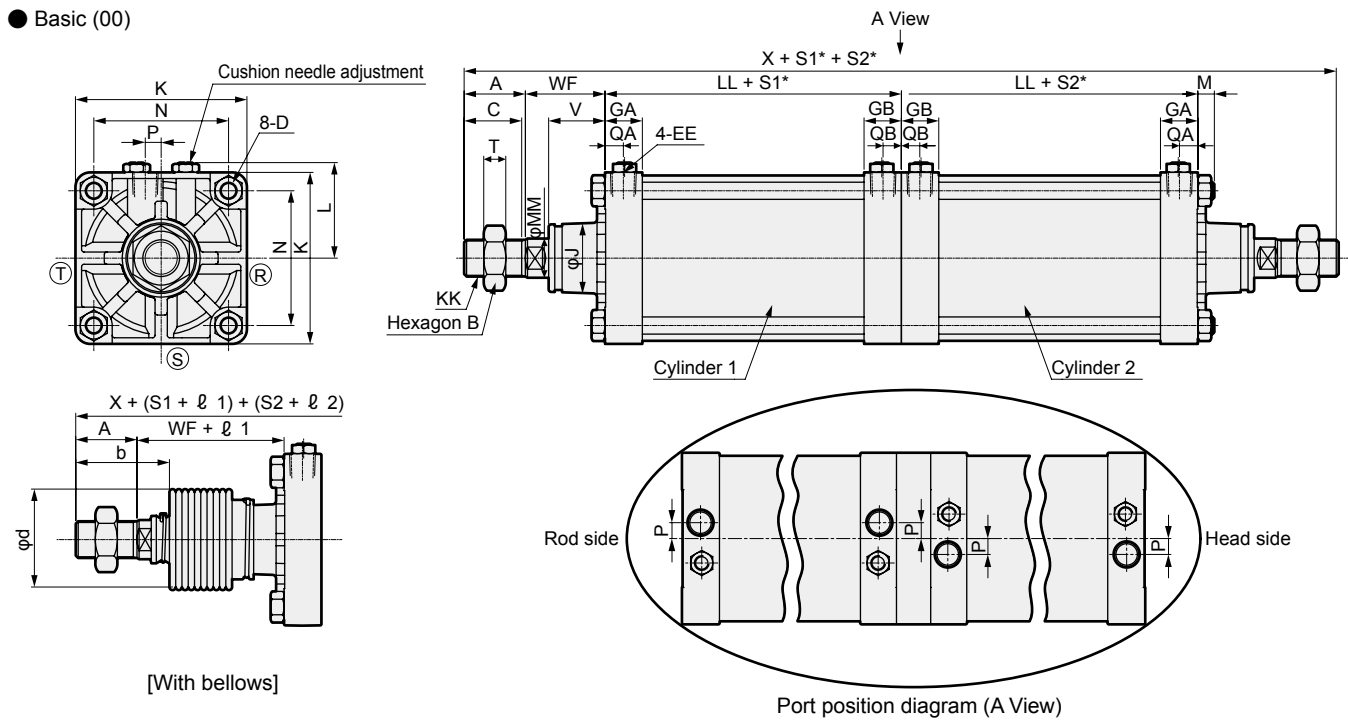
When different stroke lengths are combined, 4 positions are available.



MVC  
SMG  
MSD/  
MSDG  
FC\*  
STK  
SRL3  
SRG3  
SRM3  
SRT3  
MRL2  
MRG2  
SM-25  
ShkAbs  
FJ  
FK  
Spd  
Contr  
Ending

### Dimensions

● Basic (00)



\*1: ⑧, ⑨ and ⑩ indicate the cushion needle position.

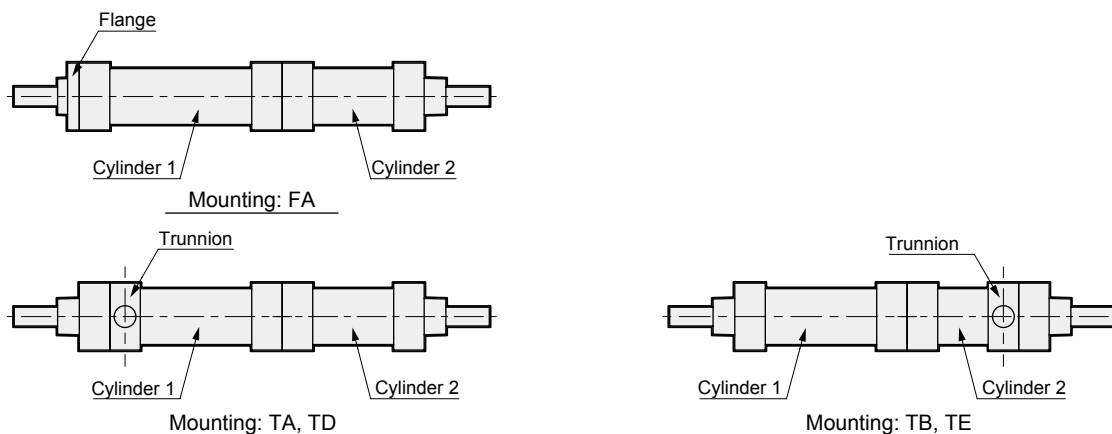
\*: S1 = Cylinder 1 stroke length, S2 = Cylinder 2 stroke length

Code	A	B	C	D	EE	GA	GB	J	K	KK	L	LL	M	MM	N	T
φ125	50	46	47	M14 × 1.5	Rc1/2	30.5	30.5	57	140	M30 × 1.5	78 to 82	92	13.5	32	110	18
φ140	50	46	47	M14 × 1.5	Rc3/4	34.5	34.5	57	157	M30 × 1.5	86.5 to 91	103	13.5	32	124	18
φ160	56	55	53	M16 × 1.5	Rc3/4	34.5	34.5	62	177	M36 × 1.5	96.5 to 101	106	15.5	40	142	21
φ180	63	60	60	M18 × 1.5	Rc3/4	34.5	34.5	68	200	M40 × 1.5	108 to 112	110	17.5	45	160	24
φ200	72	70	69	M20 × 1.5	Rc3/4	37.5	37.5	75	220	M45 × 1.5	120.5 to 129	123	18.5	50	175	27
φ250	88	85	84	M24 × 1.5	Rc1	42.5	42.5	93	274	M56 × 2	147.5 to 156	141	21.5	60	216	34

Code	P	QA	QB	V	WF	X	With bellows		
							b	d	ℓ
φ125	13	15	15	45.5	65	414	74	75	(Stroke length/4.55) + 11
φ140	15	17	17	45.5	67	440	74	75	(Stroke length/4.55) + 9
φ160	15	17	17	48	71	466	81	80	(Stroke length/5.15) + 9
φ180	15	17	17	53	78	502	90	90	(Stroke length/5.15) + 9
φ200	20	18	18	60	88	566	102	95	(Stroke length/5.30) + 9
φ250	22	21	21	64	94	646	120	120	(Stroke length/6.40) + 9

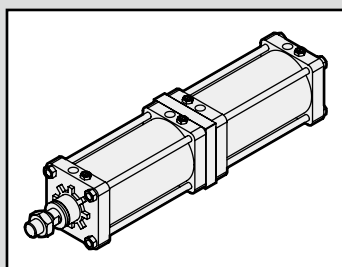
Note: Dimensions of other mounting are the same as those of double acting SCS2 Series. Refer to pages 615 to 622. Installation positions of the flange (mounting: FA) and trunnion (mounting: TA/TB/TD/TE) are as below.



\* For the dimensions of the accessories, refer to page 623.

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





Large bore size cylinder  
Double acting/two-stage

# SCS2-W Series

● Bore size: φ125/φ140/φ160/φ180/φ200/φ250



\* Custom order product.

## Specifications

Descriptions		SCS2-W (two-stage)					
Bore size	mm	φ125	φ140	φ160	φ180	φ200	φ250
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0 (≈150 psi, 10 bar)					*1
Min. working pressure	MPa	0.1 (≈15 psi, 1 bar)					
Proof pressure	MPa	1.6 (≈230 psi, 16 bar)					
Ambient temperature	°C	-5 (23°F) to 60 (140°F) (no freezing)					
Port size		Rc1/2	Rc3/4			Rc1	
Stroke tolerance	mm	$^{+1.0}_0$ (to 300), $^{+1.4}_0$ (to 1000), $^{+1.8}_0$ (to 1200)					
Working piston speed	mm/s	20 to 1000 (Operate within the absorbed energy.)					
Cushion		Air cushion					
Effective air cushion length	mm	21.6	21.6	21.6	21.6	26.6	26.6
Lubrication		Required (use turbine oil class 1 ISO VG32 for lubrication)					
Allowable absorbed energy	Cushioned	63.5	91.5	116	152	233	362
	Without cushion	0.371	0.386	0.386	0.958	1.08	2.32
Without any cushion, this product cannot absorb large energy generated by an external load. We recommend using an external shock absorber.							

\*1: Max. working pressure is 0.5 MPa when S1 and S2 are the same value.

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Trunnion min. stroke (mm)
φ125	50/75/100/150/ 200/250/300	800	2 (Total stroke)	23
φ140				25
φ160				27
φ180				28
φ200				28
φ250				28

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

## Cylinder weight

(Unit: kg)

Item/mounting	Product weight when stroke length (S) = 0 mm						Additional weight per S = 100 mm
	Basic (00)	Axial foot (LB)	Flange (FA/FB)	Eye bracket (CA)	Clevis bracket (CB)	Trunnion (TA/TB/TC)	
φ125	18.62	20.12	21.92	21.62	21.72	22.02	1.54
φ140	23.99	25.99	29.39	27.79	27.99	27.19	1.78
φ160	31.38	34.48	38.28	36.38	36.68	37.78	2.22
φ180	43.50	48.00	55.50	50.90	51.40	51.60	2.96
φ200	58.38	64.08	72.08	67.88	68.08	70.18	3.54
φ250	103.53	111.93	129.43	127.53	122.03	132.23	5.38

(Example) Product weight of SCS2-W-LB-125B-300-300 —————

- Product weight for S = 0 mm stroke length ... 20.12 kg
- Additional weight for S = 300 mm stroke length ...  $2 \times 1.54 \times \frac{300}{100} = 9.24$  kg
- Product weight ... 20.12 + 9.24 = 29.36 kg

### How to order

Without switch (without magnet for switch)

SCS2-W-LB-125-B-200-B-50-J-Y

A Mounting  
\*1

B Bore size

C Port thread C Port thread

D Cushion =S1 D Cushion =S2

E Stroke length = S1 E Stroke length = S2  
\*2

F Option  
\*3

\*4

G Accessory

Code	Content
<b>A Mounting</b>	
00	Basic
LB	Axial foot
FA	Rod side flange
FB	Head side flange
CA	Eye bracket
CB	Clevis bracket (pin and snap ring attached)
TA	Rod side trunnion
TB	Head side trunnion
TD	Rod side hole trunnion (custom order product)
TE	Head side hole trunnion (custom order product)

<b>B Bore size (mm)</b>	
125	φ125
140	φ140
160	φ160
180	φ180
200	φ200
250	φ250

<b>C Port thread</b>	
Blank	Rc thread
N	NPT thread (custom order product)
G	G thread (custom order product)

<b>D Cushion</b>	
B	Both sides cushioned
R	Rod side cushioned
H	Head side cushioned
N	Without cushion

<b>E Stroke length (mm)</b>		
Bore size	Stroke length	Custom stroke length
φ125 to φ160	2 to 800	In 1 mm increments
φ180	2 to 900	
φ200	2 to 1000	
φ250	2 to 1200	

<b>F Option</b>		
C2	With cushion section check valve	
	Max. ambient temp.	Instantaneous ambient temp
J	Bellows	60°C 100°C
K	Bellows	100°C 200°C
L	Bellows	250°C 400°C
M	Piston rod material (stainless steel)	
Blank	Cushion needle position (standard)	Standard
R	Cushion needle position R	T R
S	Cushion needle position S	S
T	Cushion needle position T	
P6	Copper and PTFE free (custom order)	

<b>G Accessory</b>	
I	Rod eye
Y	Rod clevis (pin and snap ring attached)
B1	Eye bracket
B2	Clevis bracket (pin and snap ring attached)

### ⚠ Precautions for model No. selection

- \*1: Hole trunnion is available as custom order for φ125 to 160 only. Contact CKD for details about dimensions.
- \*2: The max. stroke length of S2 (1st stage) is 200 mm.
- \*3: The instantaneous max. temperature is the temperature when sparks, cutting chips, etc., instantaneously contact the bellows.
- \*4: Check the figures below for the cushion needle position indication.

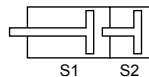
### [Example of model No.]

#### SCS2-W-LB-125-B200-B50-JY

Model: Large bore size cylinder, double acting/two-stage

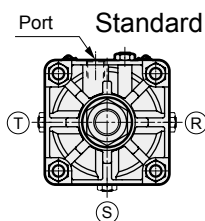
- A Mounting : Axial foot
- B Bore size : φ125 mm
- C Port thread : Rc thread
- D Cushion : Both sides cushioned
- E Stroke length S1: Total stroke length 200 mm
- C Port thread : Rc thread
- D Cushion : Both sides cushioned
- E Stroke length S2: 1st stage stroke length 50 mm
- F Option : Bellows material for max. ambient temperature 60°C
- G Accessory : Rod clevis

1st stage stroke length 50 mm (S2)  
+ 2nd stage stroke length 150 mm  
Total stroke length 200 mm (S1)



### Cushion needle position

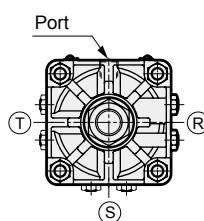
(Needle position with the port on the top when viewed from the rod end)



When selecting option R, S, or T for a certified class 2 pressure vessel, the port position should be in the center as shown in the figure on the right, and the needle position should be in the offset position.

Certified class 2 pressure vessel stroke length

Bore size	S1 + S2 stroke length
φ200	892 or more
φ250	690 or more



Class 2 pressure vessel certification options R, S, or T

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

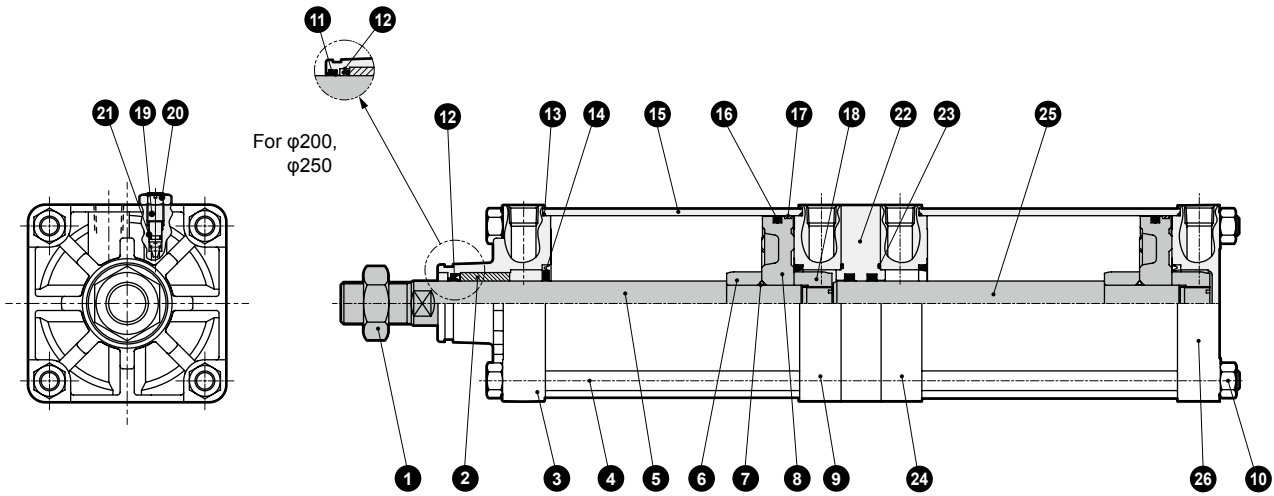
FK

Spd Contr

Ending

# SCS2-W Series

## SCP\*3 Internal structure and parts list



● Note: 14, 19, 20 and 21 are not required for the type without cushion.

No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon nut	Steel	Zinc chromate	14	Cushion packing	Nitrile rubber/steel	
2	Bush	Iron-copper oil-impregnated bearing alloy		15	Cylinder tube	Aluminum alloy	Hard alumite
3	Rod cover	Aluminum alloy casting	Chromate	16	Piston packing	Nitrile rubber	
4	Tie rod	Steel	Zinc chromate	17	Wear ring	Polyacetal resin	
5	Piston rod A	Steel	Industrial chrome plating	18	Cushion ring B	Steel	Zinc chromate
6	Cushion ring A	Steel	Zinc chromate	19	Cushion needle	Copper alloy (φ125 to φ180) Steel (φ200, 250)	Zinc chromate
7	Piston gasket	Nitrile rubber		20	Hexagon nut	Steel	Zinc chromate
8	Piston	Aluminum alloy casting		21	Needle gasket	Nitrile rubber	
9	Intermediate cover (1)	Aluminum alloy casting	Chromate	22	Intermediate plate	Cast iron	Paint
10	Hexagon nut	Steel	Zinc chromate	23	Metal gasket	Nitrile rubber	
11	Dust wiper	Nitrile rubber	φ200 and φ250 only	24	Intermediate cover (2)	Aluminum alloy casting	Chromate
12	Rod packing	Nitrile rubber		25	Piston rod B	Steel	Industrial chrome plating
13	Cylinder gasket	Nitrile rubber		26	Head cover	Aluminum alloy casting	Chromate

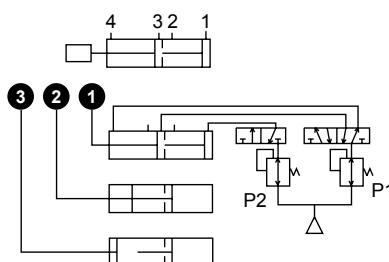
## Repair parts list

Bore size (mm)	Kit No.	Repair parts No.
φ125	SCS2-W-125K	
φ140	SCS2-W-140K	
φ160	SCS2-W-160K	12 13 14 16 17 21 23
φ180	SCS2-W-180K	
φ200	SCS2-W-200K	
φ250	SCS2-W-250K	11 12 13 14 16 17 21 23

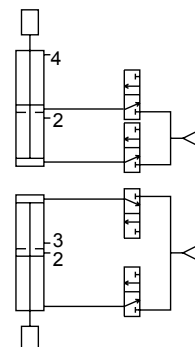
## Applications

Pressure setting: P2 > P1

- 1st stage push  
Keeping port 4 pressurized, pressurize port 1.
- 2nd stage push  
Keeping port 1 pressurized, pressurize port 3.

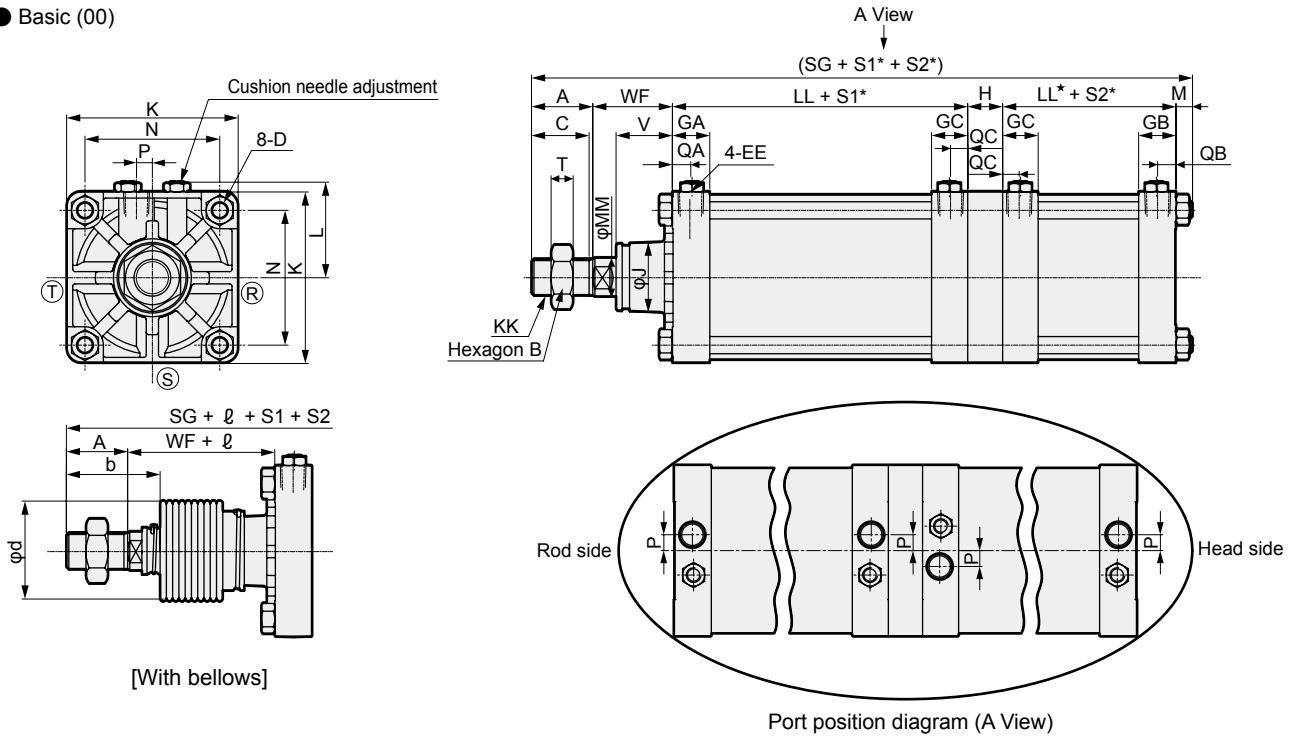


P2 = P1 is allowed depending on the load direction. When using a single acting cylinder with free fall load, ports 2 and 4 in the upper figure and ports 2 and 3 in the lower figure are breathing holes. Cushion performance will be better when all ports are piped even if piping them is not necessary (port 2 in this case).



## Dimensions

● Basic (00)



\*1: ㊸, ㊹ and ㊺ indicate the cushion needle position.

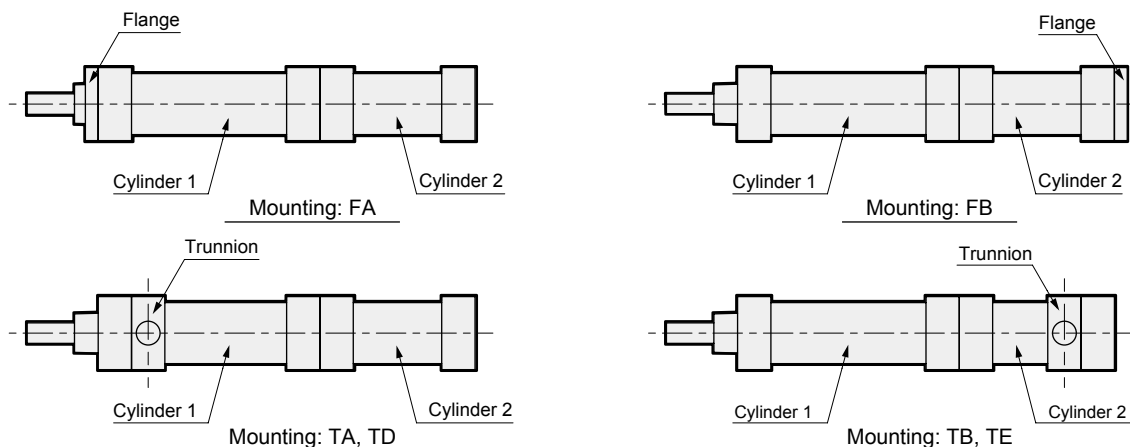
\*: S1 = Cylinder 1 stroke length, S2 = Cylinder 2 stroke length

Code	Basic (00) basic dimensions												
Bore size (mm)	A	B	C	D	EE	GA	GB	GC	H	J	K	KK	L
φ125	50	46	47	M14 × 1.5	Rc1/2	30.5	30.5	29.5	28	57	140	M30 × 1.5	78 to 82
φ140	50	46	47	M14 × 1.5	Rc3/4	34.5	34.5	33.5	28	57	157	M30 × 1.5	86.5 to 91
φ160	56	55	53	M16 × 1.5	Rc3/4	34.5	34.5	33.5	28	62	177	M36 × 1.5	96.5 to 101
φ180	63	60	60	M18 × 1.5	Rc3/4	34.5	34.5	33.5	33	68	200	M40 × 1.5	108 to 112
φ200	72	70	69	M20 × 1.5	Rc3/4	37.5	37.5	36.5	35	75	220	M45 × 1.5	120.5 to 129
φ250	88	85	84	M24 × 1.5	Rc1	42.5	42.5	41.5	39	93	274	M56 × 2	147.5 to 156

Code	With bellows															
Bore size (mm)	LL	LL*	MM	M	P	QA	QB	QC	N	SG	T	V	WF	b	d	ℓ
φ125	91	92	32	13.5	13	15	15	14	110	339.5	18	45.5	65	74	75	(Stroke length/4.55) + 11
φ140	102	103	32	13.5	15	17	17	16	124	363.5	18	45.5	67	74	75	(Stroke length/4.55) + 9
φ160	105	106	40	15.5	15	17	17	16	142	381.5	21	48	71	81	80	(Stroke length/5.15) + 9
φ180	109	110	45	17.5	15	17	17	16	160	410.5	24	53	78	90	90	(Stroke length/5.15) + 9
φ200	122	123	50	18.5	20	18	18	17	175	458.5	27	60	88	102	95	(Stroke length/5.30) + 9
φ250	140	141	60	21.5	22	21	21	20	216	523.5	34	64	94	120	120	(Stroke length/6.40) + 9

Note: Dimensions of other mounting are the same as those of double acting SCS2 Series. Refer to pages 615 to 622. Installation positions of the flange (mounting: FA/FB) and trunnion (mounting: TA/TB/TE) are as below.



\* For the dimensions of the accessories, refer to page 623.

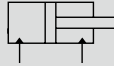


Large bore size cylinder  
Double acting/low hydraulic

# SCS2-H Series

● Bore size: φ125/φ140/φ160/φ180/φ200/φ250

JIS symbol



\* Custom order product.

## Specifications

Descriptions		SCS2-H/SCS2-LH (low hydraulic)					
Bore size	mm	φ125	φ140	φ160	φ180	φ200	φ250
Actuation		Double acting					
Working fluid		Hydraulic fluid					
Max. working pressure	MPa	1.0 (≈150 psi, 10 bar)					
Min. working pressure	MPa	0.1 (≈15 psi, 1 bar)					
Proof pressure	MPa	1.6 (≈230 psi, 16 bar)					
Ambient temperature	°C	5 (41°F) to 50 (122°F)					
Port size		Rc1/2	Rc3/4			Rc1	
Stroke tolerance	mm	<sup>+1.0</sup> <sub>0</sub> (to 300), <sup>+1.4</sup> <sub>0</sub> (to 1000), <sup>+1.8</sup> <sub>0</sub> (to 1200)					
Cushion		Air cushion					
Effective air cushion length	mm	21.6	21.6	21.6	21.6	26.6	26.6
Allowable absorbed energy	Cushioned	The cushioning of the low hydraulic cylinder cannot absorb large energy. We recommend using an external shock absorber.					
	Without cushion	0.371	0.386	0.386	0.958	1.08	2.32
		Without any cushion, this product cannot absorb large energy generated by an external load. We recommend using an external shock absorber.					

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Trunnion min. stroke (mm)
φ125	50/75/100/150/ 200/250/300	800	20	23
φ140				25
φ160				27
φ180				28
φ200				28
φ250				28

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

## Min. stroke length with switch

Descriptions		Stroke length when mounted on the same surface	Stroke of intermediate supporting hole trunnion	Stroke length of rod side supporting hole trunnion	Stroke of head side supporting hole trunnion
Switch	Sketch				
	Bore size			Position cannot be detected at the rod side stroke end.	Position cannot be detected at the head side stroke end.
Reed switch (T*)	φ125	20 or more	120 or more	70 or more	
	φ140		125 or more	75 or more	
	φ160		130 or more	80 or more	
	φ180		135 or more	85 or more	
	φ200		140 or more	90 or more	
φ250	150 or more	100 or more			

### 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				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 T2YDT																
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				-		-		-		-													
Pwr. supp. V.	-		10 to 30 VDC				10 to 28 VDC				-		-		-		-													
Load voltage	85 to 265 VAC		10 to 30 VDC				24 VDC ±10%				30 VDC or less				12/24 VDC		100/110 VAC		5/12/24 VDC		100/110 VAC		12/24 VDC		110 VAC		220 VAC		24 VDC ±10%	
Load current	5 to 100 mA		5 to 20 mA (*1)				100 mA or less				50 mA or less				5 to 50 mA		7 to 20 mA		50 mA or less		20 mA or less		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				0 mA		0 mA		0 mA		1 mA or less									
Weight g	1 m:33		1 m:18		1 m:33		1 m:18		1 m:18		1 m:33		1 m:18		1 m:18		1 m:18		3 m:49		5 m:80		1 m:33		1 m:61					
	3 m:87		3 m:49		3 m:87		3 m:49		3 m:49		3 m:87		3 m:49		1 m:18		3 m:49		5 m:80		3 m:87		3 m:166							
	5 m:142		5 m:80		5 m:142		5 m:80		5 m:80		5 m:142		5 m:80		5 m:142		5 m:80		5 m:142		5 m:142		5 m:272							

\*1 : 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)

\*2 : Switch for AC magnetic field (T2YD) cannot be used in DC magnetic field.

\*3 : Dimensions depend on switch model No. Refer to Ending Page 18 for details.

### Cylinder weight

(Unit: kg)

Item/mounting	Product weight when stroke length (S) = 0 mm						Switch weight		Additional weight per S = 100 mm
	Bore size (mm)	Basic (00)	Axial foot (LB)	Flange (FA/FB)	Eye bracket (CA)	Clevis bracket (CB)	Trunnion (TA/TB/TC)	Switch	
φ125	7.22	8.72	10.52	10.22	10.32	10.62	Refer to the weight in the switch specifications.	0.028	1.54
φ140	9.35	11.35	14.75	13.15	13.35	12.55		0.030	1.78
φ160	12.35	15.45	19.25	17.35	17.65	18.75		0.034	2.22
φ180	16.75	21.25	28.75	24.15	24.65	24.85		0.038	2.96
φ200	22.78	28.48	36.48	32.28	32.48	34.58		0.040	3.54
φ250	40.51	48.91	66.41	64.51	59.01	69.21		0.045	5.38

(Example) Product weight of SCS2-LH-LB-125B-300-TOH-D

- Product weight for S = 0 mm stroke length ... 8.72 kg
- Additional weight for S = 300 mm stroke length ...  $1.54 \times \frac{300}{100} = 4.62$  kg
- Weight of 2 switches (TOH-D) ...  $0.018 \times 2 = 0.036$  kg
- Product weight with 2 switch brackets ...  $0.028 \times 2 = 0.056$  kg
- Product weight ...  $8.72 + 4.62 + 0.036 + 0.056 = 13.432$  kg

### 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	0.8	0.9	1.0
φ125	Push	$1.23 \times 10^3$	$1.84 \times 10^3$	$2.45 \times 10^3$	$3.68 \times 10^3$	$4.91 \times 10^3$	$6.14 \times 10^3$	$7.36 \times 10^3$	$8.59 \times 10^3$	$9.82 \times 10^3$	$1.10 \times 10^4$	$1.23 \times 10^4$
	Pull	$1.15 \times 10^3$	$1.72 \times 10^3$	$2.29 \times 10^3$	$3.44 \times 10^3$	$4.59 \times 10^3$	$5.73 \times 10^3$	$6.88 \times 10^3$	$8.03 \times 10^3$	$9.17 \times 10^3$	$1.03 \times 10^4$	$1.15 \times 10^4$
φ140	Push	$1.54 \times 10^3$	$2.31 \times 10^3$	$3.08 \times 10^3$	$4.62 \times 10^3$	$6.16 \times 10^3$	$7.70 \times 10^3$	$9.24 \times 10^3$	$1.08 \times 10^4$	$1.23 \times 10^4$	$1.39 \times 10^4$	$1.54 \times 10^4$
	Pull	$1.46 \times 10^3$	$2.19 \times 10^3$	$2.92 \times 10^3$	$4.38 \times 10^3$	$5.84 \times 10^3$	$7.29 \times 10^3$	$8.75 \times 10^3$	$1.02 \times 10^4$	$1.17 \times 10^4$	$1.31 \times 10^4$	$1.46 \times 10^4$
φ160	Push	$2.01 \times 10^3$	$3.02 \times 10^3$	$4.02 \times 10^3$	$6.03 \times 10^3$	$8.04 \times 10^3$	$1.01 \times 10^4$	$1.21 \times 10^4$	$1.41 \times 10^4$	$1.61 \times 10^4$	$1.81 \times 10^4$	$2.01 \times 10^4$
	Pull	$1.88 \times 10^3$	$2.83 \times 10^3$	$3.77 \times 10^3$	$5.65 \times 10^3$	$7.54 \times 10^3$	$9.42 \times 10^3$	$1.13 \times 10^4$	$1.32 \times 10^4$	$1.51 \times 10^4$	$1.70 \times 10^4$	$1.88 \times 10^4$
φ180	Push	$2.54 \times 10^3$	$3.82 \times 10^3$	$5.09 \times 10^3$	$7.63 \times 10^3$	$1.02 \times 10^4$	$1.27 \times 10^4$	$1.53 \times 10^4$	$1.78 \times 10^4$	$2.04 \times 10^4$	$2.29 \times 10^4$	$2.54 \times 10^4$
	Pull	$2.39 \times 10^3$	$3.58 \times 10^3$	$4.77 \times 10^3$	$7.16 \times 10^3$	$9.54 \times 10^3$	$1.19 \times 10^4$	$1.43 \times 10^4$	$1.67 \times 10^4$	$1.91 \times 10^4$	$2.15 \times 10^4$	$2.39 \times 10^4$
φ200	Push	$3.14 \times 10^3$	$4.71 \times 10^3$	$6.28 \times 10^3$	$9.42 \times 10^3$	$1.26 \times 10^4$	$1.57 \times 10^4$	$1.88 \times 10^4$	$2.20 \times 10^4$	$2.51 \times 10^4$	$2.83 \times 10^4$	$3.14 \times 10^4$
	Pull	$2.95 \times 10^3$	$4.42 \times 10^3$	$5.89 \times 10^3$	$8.84 \times 10^3$	$1.18 \times 10^4$	$1.47 \times 10^4$	$1.77 \times 10^4$	$2.06 \times 10^4$	$2.36 \times 10^4$	$2.65 \times 10^4$	$2.95 \times 10^4$
φ250	Push	$4.91 \times 10^3$	$7.36 \times 10^3$	$9.82 \times 10^3$	$1.47 \times 10^4$	$1.96 \times 10^4$	$2.45 \times 10^4$	$2.95 \times 10^4$	$3.44 \times 10^4$	$3.93 \times 10^4$	$4.42 \times 10^4$	$4.91 \times 10^4$
	Pull	$4.63 \times 10^3$	$6.94 \times 10^3$	$9.25 \times 10^3$	$1.39 \times 10^4$	$1.85 \times 10^4$	$2.31 \times 10^4$	$2.78 \times 10^4$	$3.24 \times 10^4$	$3.70 \times 10^4$	$4.16 \times 10^4$	$4.63 \times 10^4$

# SCS2-H Series

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

## How to order

Without switch (without magnet for switch)

**SCS2-H - LB - 125 - B - 50 - J - Y**

With switch (built-in magnet for switch)

**SCS2-LH - LB - 125 - B - 50 - T0H - R - J - Y**

**A** Mounting  
\*1

**B** Bore size

**C** Port thread

**D** Cushion

**E** Stroke length

**F** Switch model No.

**G** Switch quantity  
\*3

**H** Option  
\*4

**I** Accessory  
\*6

## ⚠ Precautions for model No. selection

\*1 : Hole trunnion is available as custom order for  $\phi 125$  to 160 only. Contact CKD for details about dimensions.

\*2 : Refer to page 646 for the min. stroke length with switch.

\*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 : The instantaneous max. temperature is the temperature when sparks, cutting chips, etc., instantaneously contact the bellows.

\*5 : Check the figures below for the cushion needle position indication.

\*6 : "I" and "Y" cannot be selected together.

\*7 : Refer to page 651 for details.

[Example of model No.]

**SCS2-LH-LB-125B-50-T0H-R-JY**

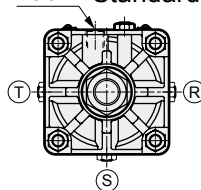
Model: Large bore size cylinder, double acting/low hydraulic with switch

- A** Mounting : Axial foot
- B** Bore size :  $\phi 125$  mm
- C** Port thread : Rc thread
- D** Cushion : With two-sided air cushion
- E** Stroke length : 50 mm
- F** Switch model No.: Proximity T0H switch, lead wire 1 m
- G** Switch quantity : 1 on rod side
- H** Option : Bellows material for max. ambient temperature 60°C
- I** Accessory : Rod clevis

## Cushion needle position

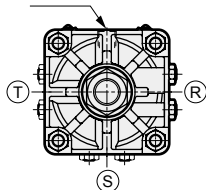
(Needle position with the port on the top when viewed from the rod end)

Port **Standard**



When selecting option R, S, or T for a certified class 2 pressure vessel, the port position should be in the center as shown in the figure on the right, and the needle position should be in the offset position.

Port



Certified class 2 pressure vessel stroke length

Bore size	Stroke length
$\phi 200$	946 or more
$\phi 250$	752 or more

Class 2 pressure vessel certification options  
R, S, or T

Code	Content
<b>A Mounting</b>	
<b>00</b>	Basic
<b>LB</b>	Axial foot
<b>FA</b>	Rod side flange
<b>FB</b>	Head side flange
<b>CA</b>	Eye bracket
<b>CB</b>	Clevis bracket (pin and snap ring attached)
<b>TC</b>	Intermediate trunnion
<b>TA</b>	Rod side trunnion
<b>TB</b>	Head side trunnion
<b>TF</b>	Intermediate supporting hole trunnion (custom order product)
<b>TD</b>	Rod side hole trunnion (custom order product)
<b>TE</b>	Head side hole trunnion (custom order product)

<b>B Bore size (mm)</b>	
<b>125</b>	$\phi 125$
<b>140</b>	$\phi 140$
<b>160</b>	$\phi 160$
<b>180</b>	$\phi 180$
<b>200</b>	$\phi 200$
<b>250</b>	$\phi 250$

<b>C Port thread</b>	
<b>Blank</b>	Rc thread
<b>N</b>	NPT thread (custom order product)
<b>G</b>	G thread (custom order product)

<b>D Cushion</b>	
<b>B</b>	Both sides cushioned
<b>R</b>	Rod side cushioned
<b>H</b>	Head side cushioned
<b>N</b>	Without cushion

<b>E Stroke length (mm)</b>		
Bore size	Stroke length *2	Custom stroke length
$\phi 125$ to $\phi 160$	<b>20 to 800</b>	In 1 mm increments
$\phi 180$	<b>20 to 900</b>	
$\phi 200$	<b>20 to 1000</b>	
$\phi 250$	<b>20 to 1200</b>	

<b>F Switch model No.</b>					
Axial lead wire	Radial lead wire	Contact	Voltage		Lead wire
			AC	DC	
<b>T0H*</b>	<b>T0V*</b>	Reed	●	●	1-color display
<b>T5H*</b>	<b>T5V*</b>		●	●	Without indicator lamp
<b>T8H*</b>	<b>T8V*</b>		●	●	1-color display
<b>T1H*</b>	<b>T1V*</b>	Proximity	●	●	2-wire
<b>T2H*</b>	<b>T2V*</b>		●	●	
<b>T3H*</b>	<b>T3V*</b>		●	●	3-wire
<b>T3PH*</b>	<b>T3PV*</b>		●	●	
<b>T2WH*</b>	<b>T2WV*</b>		●	●	2-wire
<b>T2YH*</b>	<b>T2YV*</b>		●	●	
<b>T3WH*</b>	<b>T3WV*</b>		●	●	3-wire
<b>T3YH*</b>	<b>T3YV*</b>		●	●	
<b>T2YD*</b>	-		●	●	2-color display
<b>T2YDT*</b>	-		●	●	AC magnetic field
<b>T2JH*</b>	<b>T2JV*</b>	●	●	1-color display off-delay	

<b>* Lead wire length</b>	
<b>Blank</b>	1 m (standard)
<b>3</b>	3 m (option)
<b>5</b>	5 m (option)

<b>G Switch quantity</b>	
<b>R</b>	1 on rod side
<b>H</b>	1 on head side
<b>D</b>	2
<b>T</b>	3
<b>4</b>	4

<b>H Option</b>	
<b>C2</b>	With cushion section check valve
<b>J</b>	Bellows
<b>K</b>	Bellows
<b>L</b>	Bellows
<b>M</b>	Piston rod material (stainless steel)

<b>I Accessory</b>	
<b>I</b>	Rod eye
<b>Y</b>	Rod clevis (pin and snap ring attached)
<b>B1</b>	Eye bracket
<b>B2</b>	Clevis bracket (pin and snap ring attached)

<b>Custom order product code</b> *7	
<b>-S092</b>	SCS-LH compatible mounting dimensions

### How to order switch

● Switch body + mounting bracket set

**SCS2-LN - T0H - 125**

Bore size (Item ② on the previous page)  
Switch model No. (Item ⑤ on the previous page)

● Switch body only

**SW - T0H**

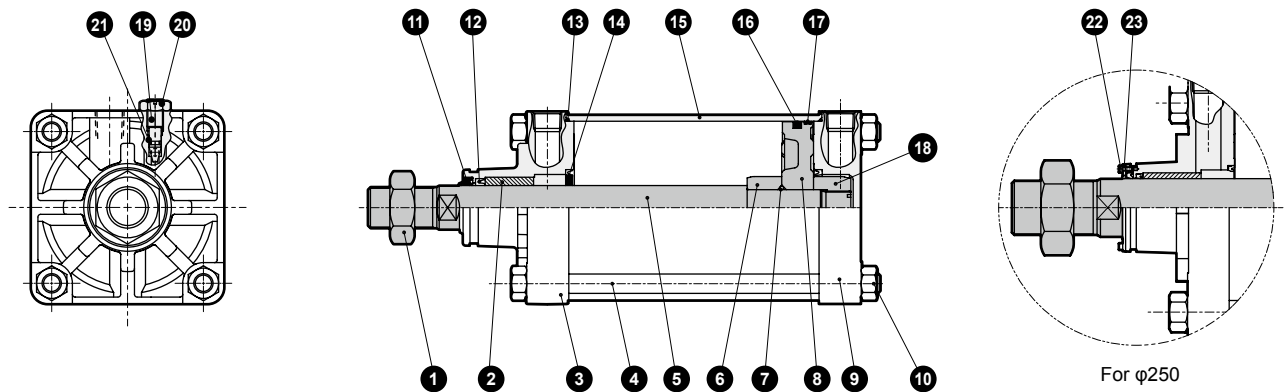
Switch model No. (Item ⑤ on the previous page)

● Mounting bracket set

**SCS2-LN - TS - 125**

Bore size (Item ② on the previous page)  
**Mounting bracket**  
TS | T switch  
T | T2YD switch

### Internal structure and parts list



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon nut	Steel	Zinc chromate	13	Cylinder gasket	Nitrile rubber	
2	Bush	Iron-copper oil-impregnated bearing alloy		14	Cushion packing	Nitrile rubber/steel	
3	Rod cover	Aluminum alloy casting	Chromate	15	Cylinder tube	Aluminum alloy	Hard alumite
4	Tie rod	Steel	Zinc chromate	16	Piston packing	Nitrile rubber	
5	Piston rod	Steel	Industrial chrome plating	17	Wear ring	Polyacetal resin	
6	Cushion ring A	Steel	Zinc chromate	18	Cushion ring B	Steel	Zinc chromate
7	Piston gasket	Nitrile rubber		19	Cushion needle	Copper alloy (φ125 to φ180) Steel (φ200, 250)	Zinc chromate
8	Piston	Aluminum alloy casting		20	Hexagon nut	Steel	Zinc chromate
9	Head cover	Aluminum alloy casting	Chromate	21	Needle gasket	Nitrile rubber	
10	Hexagon nut	Steel	Zinc chromate	22	Scraper retainer plate	Steel	Manganese phosphate
11	Dust wiper	Nitrile rubber		23	Hexagon socket head cap screw	Steel	Black finish
12	Rod packing	Nitrile rubber					

### Repair parts list

Bore size (mm)	Kit No.	Repair parts No.
φ125	SCS2-H-125K	
φ140	SCS2-H-140K	
φ160	SCS2-H-160K	
φ180	SCS2-H-180K	11 12 13 14 16 17 21
φ200	SCS2-H-200K	
φ250	SCS2-H-250K	

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

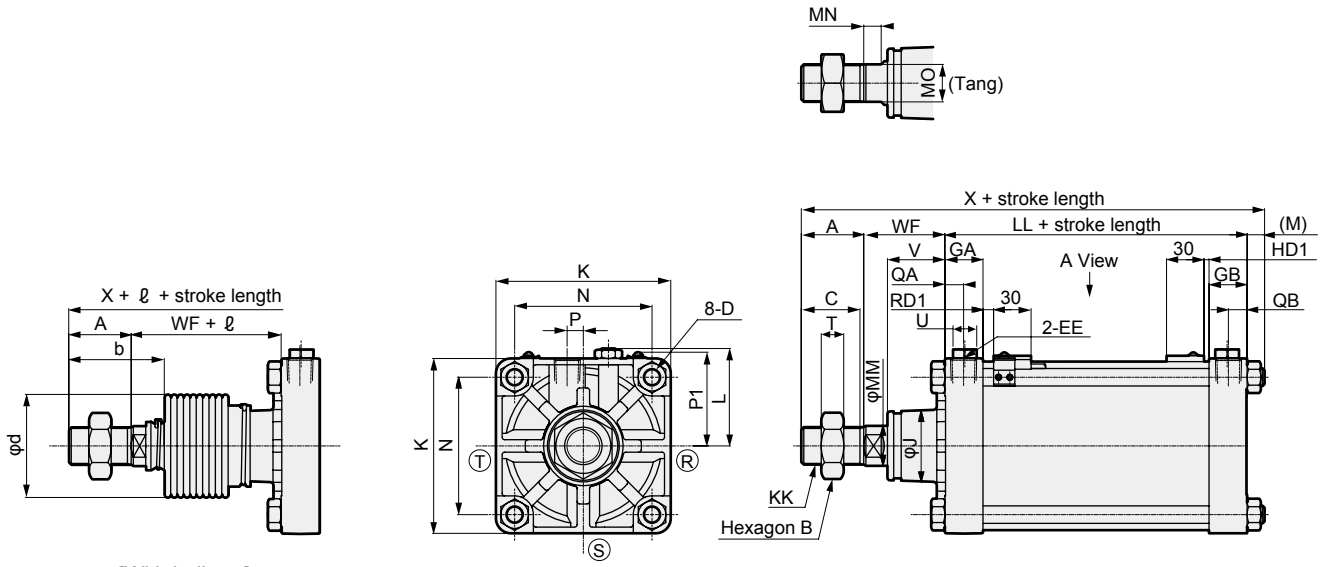
Ending



# SCS2-H Series

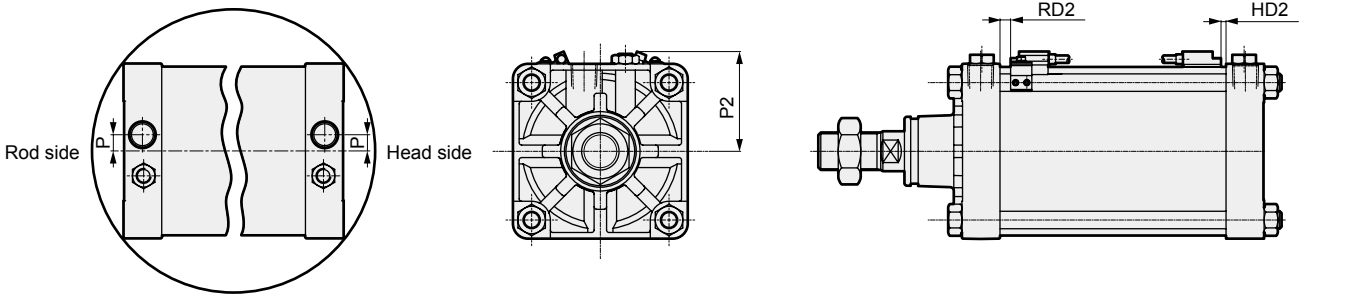
## Dimensions

### ● Basic (00)



[With bellows]

### ● 2-color display with strong magnetic field proof switch



Port position diagram (A View)

RD: Rod side max. sensitivity position  
HD: Head side max. sensitivity position

\*1: (R), (S) and (T) indicate the cushion needle position.  
\*2: l dimensions below decimal point are rounded up.

Code	Basic (00) basic dimensions																			
Bore size (mm)	A	B	C	D	EE	GA	GB	J	K	KK	L	LL	M	MM	MN	MO	N	P	QA	QB
φ125	50	46	47	M14×1.5	Rc1/2	30.5	30.5	57	140	M30×1.5	78 to 82	92	13.5	32	15	27	110	13	15	15
φ140	50	46	47	M14×1.5	Rc3/4	34.5	34.5	57	157	M30×1.5	86.5 to 91	103	13.5	32	15	27	124	15	17	17
φ160	56	55	53	M16×1.5	Rc3/4	34.5	34.5	62	177	M36×1.5	96.5 to 101	106	15.5	40	16	36	142	15	17	17
φ180	63	60	60	M18×1.5	Rc3/4	34.5	34.5	68	200	M40×1.5	108 to 112	110	17.5	45	18	41	160	15	17	17
φ200	72	70	69	M20×1.5	Rc3/4	37.5	37.5	75	220	M45×1.5	120.5 to 129	123	18.5	50	20	46	175	20	18	18
φ250	88	85	84	M24×1.5	Rc1	42.5	42.5	93	274	M56×2	147.5 to 156	141	21.5	60	22	55	216	22	21	21

Code	With bellows						With switch		T0, T5, T2, T3		T2W, T3W		T2Y, T3Y, T2YD, T1, T2J		T8	
Bore size (mm)	T	U	V	WF	X	b	d	l	P1	P2	RD1	HD1	RD1	HD1	RD2	HD2
φ125	18	19	45.5	65	220.5	74	75	(Stroke length/4.55) + 11	76	80	8.5	4.0	10.5	5.5	7.5	2.5
φ140	18	19	45.5	67	233.5	74	75	(Stroke length/4.55) + 9	82	86	8.5	7.0	10.5	8.5	7.5	5.5
φ160	21	19	48	71	248.5	81	80	(Stroke length/5.15) + 9	90	95	10.5	8.0	12.5	10.0	9.5	7.0
φ180	24	19	53	78	268.5	90	90	(Stroke length/5.15) + 9	98	103	13.0	9.5	14.5	11.5	11.5	8.5
φ200	27	24	60	88	301.5	102	95	(Stroke length/5.30) + 9	106	111	17.5	13.0	19.0	15.0	16.0	12.0
φ250	34	24	64	94	344.5	120	120	(Stroke length/6.40) + 9	126	130	18.5	19.0	20.5	20.5	17.5	17.5

Note: Dimensions of other mounting are the same as those of double acting SCS2 Series. Refer to pages 615 to 622.  
SCS2-LH (with switch) is not dimensionally compatible with SCS-LH (with switch). (All lengths shorter) If you need the same dimensions, use the dimensionally compatible mounting on the next page.

\* For the dimensions of the accessories, refer to page 623.

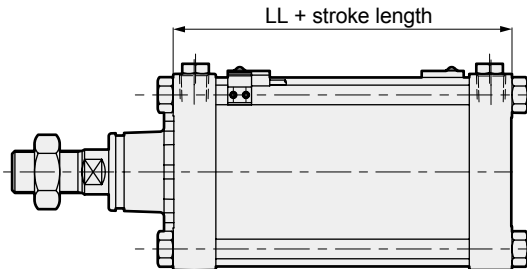
## Introduction of custom order products

### ■ SCS-LH compatible mounting dimensions

#### How to order

When placing an order, add "-SO92" at the end of the model No.

#### Dimensions



Code	Dimensions table
Bore size (mm)	LL
φ125	111.5
φ140	122.5
φ160	122.5
φ180	124.5
φ200	143.5
φ250	

\*1: The center trunnion should be installed at the middle point between the covers.

\*2: Refer to the right table for LL mentioned in the dimensions above.

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

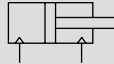


Large bore size cylinder  
Double acting/rubber scraper

# SCS2-G Series

● Bore size: φ125/φ140/φ160/φ180/φ200/φ250

JIS symbol



\* Custom order product.

## Specifications

Descriptions	SCS2-G (rubber scraper)						
Bore size mm	φ125	φ140	φ160	φ180	φ200	φ250	
Actuation	Double acting						
Working fluid	Compressed air						
Max. working pressure MPa	1.0 (≈150 psi, 10 bar)						
Min. working pressure MPa	0.05 (≈7.3 psi, 0.5 bar)						
Proof pressure MPa	1.6 (≈230 psi, 16 bar)						
Ambient temperature °C	-5 (23°F) to 60 (140°F) (no freezing)						
Port size	Rc1/2	Rc3/4			Rc1		
Stroke tolerance mm	<sup>+1.0</sup> <sub>0</sub> (to 300), <sup>+1.4</sup> <sub>0</sub> (to 1000), <sup>+1.8</sup> <sub>0</sub> (to 1200)						
Working piston speed mm/s	20 to 1000 (Operate within the absorbed energy.)						
Cushion	Air cushion						
Effective air cushion length mm	21.6	21.6	21.6	21.6	26.6	26.6	
Lubrication	Required (use turbine oil class 1 ISO VG32 for lubrication)						
Allowable absorbed energy	Cushioned	63.5	91.5	116	152	233	362
	Without cushion	0.371	0.386	0.386	0.958	1.08	2.32
Without any cushion, this product cannot absorb large energy generated by an external load. We recommend using an external shock absorber.							

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Trunnion min. stroke (mm)
φ125	50/75/100/150/ 200/250/300	800	1	23
φ140				25
φ160				27
φ180				28
φ200				28
φ250				28

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

\*2: If the max. stroke length is exceeded, product specifications may not be met, depending on operating conditions. Contact CKD in this case.

## Cylinder weight

(Unit: kg)

Item/mounting	Product weight when stroke length (S) = 0 mm						Additional weight per S = 100mm
	Bore size (mm)	Basic (00)	Axial foot (LB)	Flange (FA/FB)	Eye bracket (CA)	Clevis bracket (CB)	
φ125	7.22	8.72	10.52	10.22	10.32	10.62	1.54
φ140	9.35	11.35	14.75	13.15	13.35	12.55	1.78
φ160	12.35	15.45	19.25	17.35	17.65	18.75	2.22
φ180	16.75	21.25	28.75	24.15	24.65	24.85	2.96
φ200	22.78	28.48	36.48	32.28	32.48	34.58	3.54
φ250	40.51	48.91	66.41	64.51	59.01	69.21	5.38

(Example) Product weight of SCS2-G-LB-125B-300

- Product weight for S = 0 mm stroke length ..... 8.72 kg
- Additional weight for S = 300 mm stroke length .....  $1.54 \times \frac{300}{100} = 4.62$  kg
- Product weight .....  $8.72 + 4.62 = 13.34$  kg

## 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	0.8	0.9	1.0
φ125	Push	$1.23 \times 10^3$	$1.84 \times 10^3$	$2.45 \times 10^3$	$3.68 \times 10^3$	$4.91 \times 10^3$	$6.14 \times 10^3$	$7.36 \times 10^3$	$8.59 \times 10^3$	$9.82 \times 10^3$	$1.10 \times 10^4$	$1.23 \times 10^4$
	Pull	$1.15 \times 10^3$	$1.72 \times 10^3$	$2.29 \times 10^3$	$3.44 \times 10^3$	$4.59 \times 10^3$	$5.73 \times 10^3$	$6.88 \times 10^3$	$8.03 \times 10^3$	$9.17 \times 10^3$	$1.03 \times 10^4$	$1.15 \times 10^4$
φ140	Push	$1.54 \times 10^3$	$2.31 \times 10^3$	$3.08 \times 10^3$	$4.62 \times 10^3$	$6.16 \times 10^3$	$7.70 \times 10^3$	$9.24 \times 10^3$	$1.08 \times 10^4$	$1.23 \times 10^4$	$1.39 \times 10^4$	$1.54 \times 10^4$
	Pull	$1.46 \times 10^3$	$2.19 \times 10^3$	$2.92 \times 10^3$	$4.38 \times 10^3$	$5.84 \times 10^3$	$7.29 \times 10^3$	$8.75 \times 10^3$	$1.02 \times 10^4$	$1.17 \times 10^4$	$1.31 \times 10^4$	$1.46 \times 10^4$
φ160	Push	$2.01 \times 10^3$	$3.02 \times 10^3$	$4.02 \times 10^3$	$6.03 \times 10^3$	$8.04 \times 10^3$	$1.01 \times 10^4$	$1.21 \times 10^4$	$1.41 \times 10^4$	$1.61 \times 10^4$	$1.81 \times 10^4$	$2.01 \times 10^4$
	Pull	$1.88 \times 10^3$	$2.83 \times 10^3$	$3.77 \times 10^3$	$5.65 \times 10^3$	$7.54 \times 10^3$	$9.42 \times 10^3$	$1.13 \times 10^4$	$1.32 \times 10^4$	$1.51 \times 10^4$	$1.70 \times 10^4$	$1.88 \times 10^4$
φ180	Push	$2.54 \times 10^3$	$3.82 \times 10^3$	$5.09 \times 10^3$	$7.63 \times 10^3$	$1.02 \times 10^4$	$1.27 \times 10^4$	$1.53 \times 10^4$	$1.78 \times 10^4$	$2.04 \times 10^4$	$2.29 \times 10^4$	$2.54 \times 10^4$
	Pull	$2.39 \times 10^3$	$3.58 \times 10^3$	$4.77 \times 10^3$	$7.16 \times 10^3$	$9.54 \times 10^3$	$1.19 \times 10^4$	$1.43 \times 10^4$	$1.67 \times 10^4$	$1.91 \times 10^4$	$2.15 \times 10^4$	$2.39 \times 10^4$
φ200	Push	$3.14 \times 10^3$	$4.71 \times 10^3$	$6.28 \times 10^3$	$9.42 \times 10^3$	$1.26 \times 10^4$	$1.57 \times 10^4$	$1.88 \times 10^4$	$2.20 \times 10^4$	$2.51 \times 10^4$	$2.83 \times 10^4$	$3.14 \times 10^4$
	Pull	$2.95 \times 10^3$	$4.42 \times 10^3$	$5.89 \times 10^3$	$8.84 \times 10^3$	$1.18 \times 10^4$	$1.47 \times 10^4$	$1.77 \times 10^4$	$2.06 \times 10^4$	$2.36 \times 10^4$	$2.65 \times 10^4$	$2.95 \times 10^4$
φ250	Push	$4.91 \times 10^3$	$7.36 \times 10^3$	$9.82 \times 10^3$	$1.47 \times 10^4$	$1.96 \times 10^4$	$2.45 \times 10^4$	$2.95 \times 10^4$	$3.44 \times 10^4$	$3.93 \times 10^4$	$4.42 \times 10^4$	$4.91 \times 10^4$
	Pull	$4.63 \times 10^3$	$6.94 \times 10^3$	$9.25 \times 10^3$	$1.39 \times 10^4$	$1.85 \times 10^4$	$2.31 \times 10^4$	$2.78 \times 10^4$	$3.24 \times 10^4$	$3.70 \times 10^4$	$4.16 \times 10^4$	$4.63 \times 10^4$

### How to order

Without switch (without magnet for switch)

**SCS2-G** - **LB** - **125** - **B** - **50** - **M** **Y**

**A** Mounting  
\*1

**B** Bore size

**C** Port thread

**D** Cushion

**E** Stroke length

**F** Option  
\*2

**G** Accessory

### ⚠ Precautions for model No. selection

- \*1: Hole trunnion is available as custom order for  $\phi 125$  to  $160$  only. Contact CKD for details about dimensions.
- \*2: The instantaneous max. temperature is the temperature when sparks, cutting chips, etc., instantaneously contact the bellows.
- \*3: Check the figures below for the cushion needle position indication.

[Example of model No.]

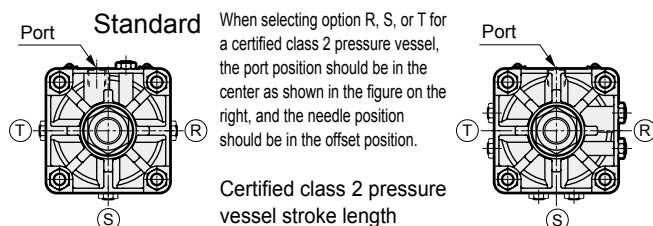
**SCS2-G-LB-125B-50-JY**

Model: Large bore size cylinder, rubber scraper

- A** Mounting : Axial foot
- B** Bore size :  $\phi 125$  mm
- C** Port thread : Rc thread
- D** Cushion : Both sides cushioned
- E** Stroke length : 50 mm
- F** Option : Bellows material for max. ambient temperature 60°C
- G** Accessory : Rod clevis




### Cushion needle position

(Needle position with the port on the top when viewed from the rod end)



Certified class 2 pressure vessel stroke length

Bore size	Stroke length	Class 2 pressure vessel certification options R, S, or T
$\phi 200$	946 or more	
$\phi 250$	752 or more	

Code	Content	
<b>A Mounting</b>		
00	Basic	
LB	Axial foot	
FA	Rod side flange	
FB	Head side flange	
CA	Eye bracket	
CB	Clevis bracket (pin and snap ring attached)	
TC	Intermediate trunnion	
TA	Rod side trunnion	
TB	Head side trunnion	
TF	Intermediate supporting hole trunnion (custom order product)	
TD	Rod side hole trunnion (custom order product)	
TE	Head side hole trunnion (custom order product)	
<b>B Bore size (mm)</b>		
125	$\phi 125$	
140	$\phi 140$	
160	$\phi 160$	
180	$\phi 180$	
200	$\phi 200$	
250	$\phi 250$	
<b>C Port thread</b>		
Blank	Rc thread	
N	NPT thread (custom order product)	
G	G thread (custom order product)	
<b>D Cushion</b>		
B	Both sides cushioned	
R	Rod side cushioned	
H	Head side cushioned	
N	Without cushion	
<b>E Stroke length (mm)</b>		
Bore size	Stroke length	Custom stroke length
$\phi 125$ to $\phi 160$	1 to 800	In 1 mm increments
$\phi 180$	1 to 900	
$\phi 200$	1 to 1000	
$\phi 250$	1 to 1200	
<b>F Option</b>		
C2	With cushion section check valve	
J	Bellows	Max. ambient temp. : 60°C ; Instantaneous ambient temp. : 100°C
K	Bellows	100°C ; 200°C
L	Bellows	250°C ; 400°C
M	Piston rod material (stainless steel)	
Blank	Cushion needle position (standard)	Standard
R	Cushion needle position R	T  R
S	Cushion needle position S	S  S
T	Cushion needle position T	T  T
P6	Copper and PTFE free (custom order)	
<b>G Accessory</b>		
I	Rod eye	
Y	Rod clevis (pin and snap ring attached)	
B1	Eye bracket	
B2	Clevis bracket (pin and snap ring attached)	

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

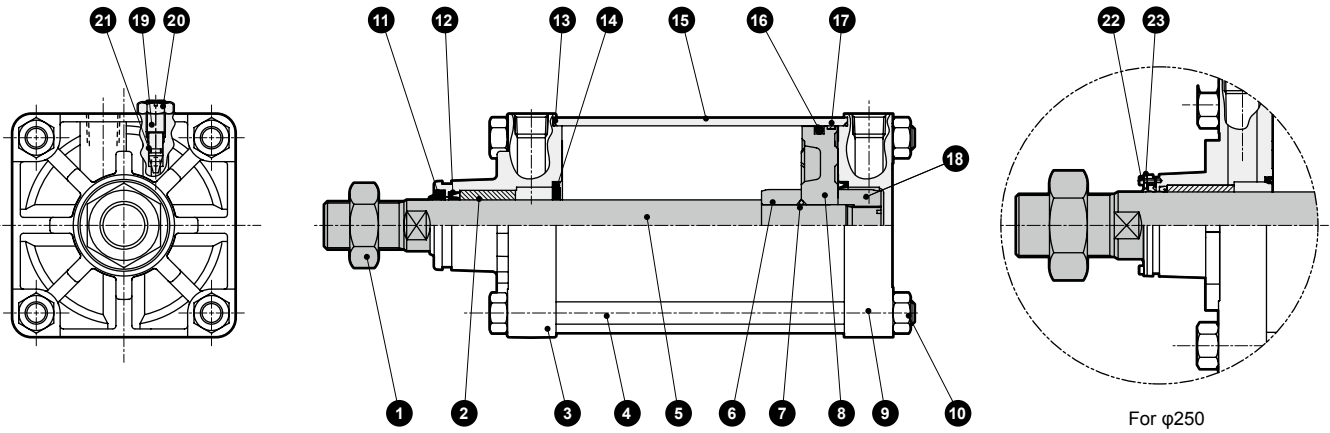
Spd  
Contr

Ending

# SCS2-G Series

## Internal structure and parts list

● Standard  
SCS2-G



Note: 14, 19, 20 and 21 are not required for the type without cushion.

No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon nut	Steel	Zinc chromate	13	Cylinder gasket	Nitrile rubber	
2	Bush	Iron-copper oil-impregnated bearing alloy		14	Cushion packing	Nitrile rubber/steel	
3	Rod cover	Aluminum alloy casting	Chromate	15	Cylinder tube	Aluminum alloy	Hard alumite
4	Tie rod	Steel	Zinc chromate	16	Piston packing	Nitrile rubber	
5	Piston rod	Steel	Industrial chrome plating	17	Wear ring	Polyacetal resin	
6	Cushion ring A	Steel	Zinc chromate	18	Cushion ring B	Steel	Zinc chromate
7	Piston gasket	Nitrile rubber		19	Cushion needle	Copper alloy (φ125 to φ180) Steel (φ200, 250)	Zinc chromate
8	Piston	Aluminum alloy casting		20	Hexagon nut	Steel	Zinc chromate
9	Head cover	Aluminum alloy casting	Chromate	21	Needle gasket	Nitrile rubber	
10	Hexagon nut	Steel	Zinc chromate	22	Hexagon socket head cap screw	Steel (black finish)	φ250 only
11	Dust wiper	Nitrile rubber/steel		23	Retainer plate	Steel (Manganese phosphate)	φ250 only
12	Rod packing	Nitrile rubber					

## Repair parts list

Bore size (mm)	Kit No.	Repair parts No.
φ125	SCS2-G-125K	
φ140	SCS2-G-140K	
φ160	SCS2-G-160K	11 12 13 14 16 17 21
φ180	SCS2-G-180K	
φ200	SCS2-G-200K	
φ250	SCS2-G-250K	

## Dimensions

Same as double acting/standard single rod SCS2. Refer to pages 614 to 622.