

Large bore size cylinder SCS2 Series



LARGE BORE SIZE CYLINDER SCS2 SERIES

Large Mass Reduction!

50% mass reduction by using aluminum
for covers and tubes



Large Mass Reduction!

50% mass reduction by using aluminum for covers and tubes

Comparing with the conventional products

Reduced by up to 50%



SCS2 Series

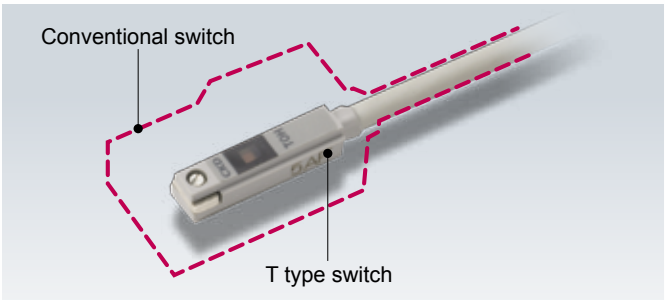
New large-bore cylinder

Small switch is equipped

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

Magnet provided as standard (SCS2-LN/LH)

Incorporating a ø250 switch additionally. Switches can be additionally mounted on all products (LN/LH).



Port and needle installation on the same plane

The air supply/exhaust ports and the cushion needle have been installed on the same plane. Cylinder attachment and adjustment have become easier.



Compatibility of attachment dimensions (LH excluded)

The attachment dimensions are compatible with the previous product (SCS), so that maintenance works are eased.

* The location of the piping port has been changed.

Adopting aluminum color

Sliver (aluminum color, no coating) has been adopted for the product surface color to match various devices.

SCS2 series variation

Series variation		Bore size						Standard stroke length
		ø125	ø140	ø160	ø180	ø200	ø250	(mm) 50 to 300
Double acting/ lubrication type	SCS2	●	●	●	●	●	●	●
Double acting/ non-lubrication type	SCS2-N	●	●	●	●	●	●	●
Double acting/ stroke adjustable type	SCS2-P	●	●	●	●	●	●	●
Double acting/ heat resistant type	SCS2-T	●	●	●	●	●	●	●
Double acting/ double rod type	SCS2-D	●	●	●	●	●	●	●
Double acting/ back to back type	SCS2-B	●	●	●	●	●	●	●
Double acting/ two stage type	SCS2-W	●	●	●	●	●	●	●
Double acting/ low hydraulic type	SCS2-H	●	●	●	●	●	●	●
Double acting/ rubber scraper type	SCS2-G	●	●	●	●	●	●	●

●: Standard ◎: Semi-standard ○: Custom order ■: Not producible

Variation	Model no. JIS symbol	Bore size (mm)	Standard stroke length (mm)							Min. stroke length (mm)	Max. stroke length (mm)	Available stroke length (mm)	Custom stroke length (mm)	Mounting style						Mounting style				Cushion				Option								Accessory				Switch	Page																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
														Basic type	Axial foot type	Rod end flange type	Head end flange type	Eye bracket type		Clevis bracket type	Center trunnion type	Rod end trunnion type	Head end trunnion type	Intermediate supporting hole	Rod end supporting hole	Head end supporting hole	No cushion	Both sides cushion	Rod end cushion	Head end cushion	With check valve for cushion	Bellows (60°C)	Bellows (100°C)	Bellows (250°C)	Piston rod material change (Stainless steel)	Cushion needle position S	Cushion needle position T	Copper and PTFE free	Rod eye			Rod clevis	Eye bracket	Clevis bracket																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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Double acting/ lubrication type		SCS2	ø125•ø140•ø160	●	●	●	●	●	●	1	800	2000	1	●	●	●	●	●			●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Variation and option selection table

- : Standard
- ◎: Option
- : Producible (custom order product)
- △: Available depending on conditions. (Consult with CKD.)
- ×: Not available

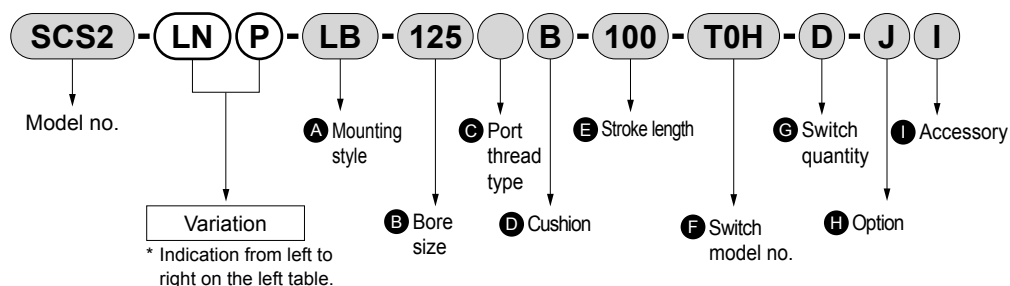
Category		Category	Variation											Port thread			Option							
			Double acting/lubrication type	Double acting/non-lubrication type	Double acting/with switch	Double acting/double rod type	Back to back type	Two stage type	Stroke adjustable extended type	Low hydraulic type	Heat resistant type (120°C)	Rubber scraper type	NPT	G		With check valve for cushion	Nylon tarpaulin with bellows	Neoprene with bellows	Silicon rubber with bellows	Piston rod material	Stainless steel	Cushion needle position designation	Copper and PTFE free type	Piston rod tip designation
		Symbol	none	N	LN	D	B	W	P	H	T	G	N	G		C2	J	K	L	M	R, S, T	P6	N*	
Variation	Double acting/lubrication type	Blank																						
	Double acting/non-lubrication type	N																						
	Double acting/with switch	LN																						
	Double acting/double rod type	D																						
	Back to back type	B																						
	Two stage type	W																						
	Stroke adjustable extended type	P																						
	Low hydraulic type	H																						
	Heat resistant type (120°C)	T																						
	Rubber scraper type	G																						
Port thread	NPT	N																						
	G	G																						
Option	With check valve for cushion	C2																						
	Nylon tarpaulin with bellows	J																						
	Neoprene with bellows	K																						
	Silicon rubber with bellows	L																						
	Piston rod material Stainless steel	M																						
	Cushion needle position designation	R.S.T.																						
	Copper and PTFE free type	P6																						
	Piston rod tip designation	N*																						
Accessory																								
	Cylinder switch	Separate notice																						
	Rod eye	I																						
	Rod clevis	Y																						
	Eye bracket	B1																						
	Clevis bracket	B2																						

Note 1: Heat-resistant type T does not allow lubrication (non-lubrication only).

△1: Can be handled only for the S2 side.

△2: Can be handled for 100° or less operating temperature.

<Example of model number>



Model number: Large bore size cylinder

- Variation : With switch/stroke adjustable type
- **A** Mounting style : Axial foot type
- **B** Bore size : ø125 mm
- **C** Port thread type : Rc thread
- **D** Cushion : Both sides cushion
- **E** Stroke length : 100 mm
- **F** Switch model no.: Reed T0H switch, lead wire 1 m
- **G** Switch quantity : Two
- **H** Option : Bellows material/for maximum ambient temperature 60°C
- **I** Accessory : Rod clevis

Note 1: Back to back type has two cylinders. When specifying individual variations, follow the procedure below:

When variations are applied only for S1, indicate the variation symbol before the S1 stroke.

(Example) SCS2-B-125-H50-75: Only S1 is of the low hydraulic type.

When variations are applied only for S2, indicate the variation symbol before the S2 stroke.

(Example) SCS2-B-125-50-H75: Only S2 is of the low hydraulic type.

When the same variations are applied for both S1 and S2, insert the variation symbol before the port size.

(Example) SCS2-BH-125-50-75: Both S1 and S2 are of the low hydraulic type.



Large bore size cylinder
Double acting/single rod/lubrication type/non-lubrication type

SCS2 Series

● Bore size: $\phi 125$, $\phi 140$, $\phi 160$, $\phi 180$, $\phi 200$, $\phi 250$

JIS symbol



RoHS

Specifications

Descriptions		SCS2/SCS2-N/SCS2-LN					
Bore size	mm	ø125	ø140	ø160	ø180	ø200	ø250
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0					
Min. working pressure	MPa	0.05					
Proof pressure	MPa	1.6					
Ambient temperature		-5 to 60 (no freezing)					
Port size		Rc 1/2	Rc 3/4				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 (Use within the allowable energy absorption range.)					
Cushion		Air cushion					
Effective air cushion length	mm	21.6	21.6	21.6	21.6	26.6	26.6
Lubrication		Required (when lubricating, use turbine oil Class 1 ISO VG32.); for SCS-N/LN, not required					
Allowable energy absorption J	With cushion	63.5	91.5	116	152	233	362
		0.371	0.386	0.386	0.958	1.08	2.32
	No cushion	The type without cushioning cannot absorb a large energy generated by an external load. We recommend to install 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 type min. stroke length (mm)
$\phi 125$	50•75•100•150• 200•250•300	800	2000	1	23
$\phi 140$					25
$\phi 160$					27
$\phi 180$		900			28
$\phi 200$		1,000			28
$\phi 250$		1,200			28

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

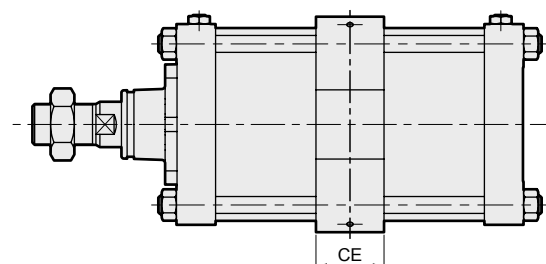
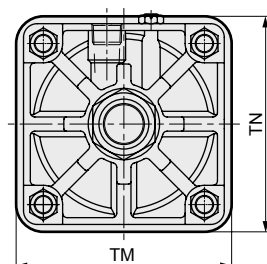
Note 2: If the max. stroke is exceeded, product specifications may not be met, depending on operating conditions. Contact CKD for details.

● Center-holding head

For the stroke shown in the table below, a center-holding head is added to the middle of the cylinder.

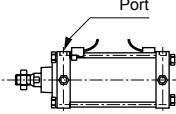
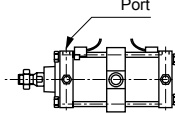
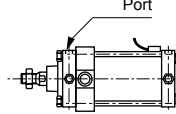
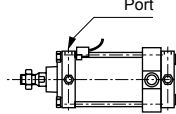
Center-holding head addition stroke

Bore size (mm)	Stroke length
$\phi 125$	1801 to 2000
$\phi 140$	



Symbol	TM	TN	CE
Bore size (mm)			
$\phi 125$	150	150	50
$\phi 140$	190	170	55

Min. stroke length with switch

Descriptions Bore size (mm)		Stroke length with same surface installation	Stroke length of intermediate supporting hole	Stroke length of rod end supporting hole	Stroke length of head end supporting hole
Switch type	Diagram				
	Bore			The position cannot be detected at the rod side stroke end.	The position cannot be detected at the head side stroke end.
Reed switch (T*)	ø125	20 and over	120 and over	70 and over	
	ø140		125 and over	75 and over	
	ø160		130 and over	80 and over	
	ø180		135 and over	85 and over	
	ø200		140 and over	90 and over	
	ø250		150 and over	100 and over	

Switch specifications

● 1-color/2-color indicator type, strong 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 order)	T3YH/ T3YV	T3WH/ T3WV	T0H/T0V		T5H/T5V		T8H/T8V			T2YD/ T2YDT
Applications	Programmable controller relay, small solenoid valve	Programmable controller			Programmable controller, relay				Programmable controller, relay		Programmable controller, relay IC circuit (without indicator light), serial connection		Programmable controller, relay			Programmable controller
Output method	-				NPN output	PNP output	NPN output	NPN output	-							
Power voltage	-				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 (Note 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 light	LED (ON lighting)	LED (ON lighting)	Red/green LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Yellow LED (ON lighting)	Red/green LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)		Without indicator light		LED (ON lighting)			Red/green LED (ON lighting)
Leakage current	For 100 VAC, 1 mA or less; for 200 VAC, 2 mA or less	1 mA or less			10 µA or less				0 mA							1 mA or less
Weight g	1 m: 33 3 m: 87 5 m: 142	1 m: 18 3 m: 49 5 m: 80	1 m: 33 3 m: 87 5 m: 142	1 m: 18 3 m: 49 5 m: 80	1 m: 18 3 m: 49 5 m: 80		1 m: 33 3 m: 87 5 m: 142	1 m: 18 3 m: 49 5 m: 80	1 m: 18 3 m: 49 5 m: 80				1 m: 33 3 m: 87 5 m: 142			1 m: 61 3 m: 166 5 m: 272

Note 1: Above-mentioned load current's maximum value 20 mA is for 25°C. The current will be lower than 20 mA if ambient temperature around the switch is higher than 25°C.
(5 to 10 mA when 60°C.)

Note 2: A strong magnetic field proof switch (T2YD) cannot be used in environments with direct current magnetic fields.

Cylinder mass

(Unit: kg)

Descriptions/Mounting style	Weight when stroke length (S) = 0 mm						Switch weight		Additional weight per S = 100 mm
	Basic type (00)	Axial foot type (LB)	Flange type (FA/FB)	Eye bracket type (CA)	Clevis bracket type (CB)	Trunnion type (TA/TB/TC)	Switch	Mounting bracket	
ø125	7.22	8.72	10.52	10.22	10.32	10.62	See the mass presented in the Switch Specifications.	0.028	1.54
ø140	9.35	11.35	14.75	13.15	13.35	12.55		0.030	1.78
ø160	12.35	15.45	19.25	17.35	17.65	18.75		0.034	2.22
ø180	16.75	21.25	28.75	24.15	24.65	24.85		0.038	2.96
ø200	22.78	28.48	36.48	32.28	32.48	34.58		0.040	3.54
ø250	40.51	48.91	66.41	64.51	59.01	69.21		0.045	5.38

(Example)

Weight of SCS2-LN-LB-125B-300-T0H-D

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

How to order

No lubrication type without switch

SCS2 — LB — 125 — B — 50 — J — Y

No non-lubrication type without switch

SCS2-N — LB — 125 — B — 50 — J — Y

Non-lubrication type with switch

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

Model no.

A Mounting style
Note 1

B Bore size

C Port thread type

D Cushion

E Stroke length

F Switch model no.

Note on model no. selection

Note 1 : For hole type trunnions, ø125 to 160 only will be available through custom order. For information such as external dimensions, consult as necessary.

Note 2 : Refer to page 2 for min. stroke length with switch.

Note 3 : When selecting TA or TB for mounting, the number of switches is limited to "H" (one on head side) for TA, and "R" (one on rod side) for TB.

Note 4 : The instantaneous max. temperature is that at which sparks, swarf, etc., temporarily contact bellows.

Note 5 : For the cushion needle position indication, check the following.

Note 6 : "I" and "Y" cannot be selected at the same time.

<Example of model number>

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

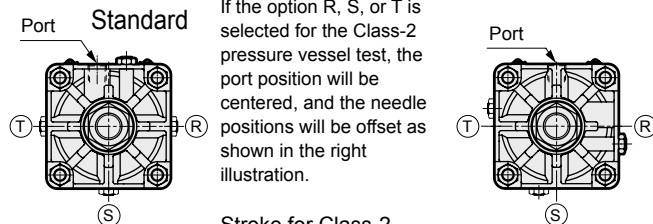
Model: Large bore size cylinder, double acting/lubrication type/non-lubrication type

Model number : Non-lubrication type with switch

- A Mounting style : Axial foot type
- B Bore size : ø125 mm
- C Port thread type : Rc thread
- D Cushion : Both sides cushion
- E Stroke length : 50 mm
- F Switch model : Reed T0H, lead wire 1 m
- G Switch quantity : One on rod end
- H Option : Bellows (maximum ambient temperature 60°C)
- I Accessory : Rod clevis

Cushion needle position

(Needle position with the port faced upward, from the rod direction)



Stroke for Class-2 pressure vessel test

Bore size	Stroke length
ø160	1948 and over
ø180	1526 and over
ø200	946 and over
ø250	752 and over

Options R, S, and T for Class-2 pressure vessel test

Symbol	Descriptions
A Mounting style	
00	Basic type
LB	Axial foot type
FA	Rod end flange type
FB	Head end flange type
CA	Eye bracket type
CB	Clevis bracket type (with a pin and a snap ring)
TC	Center trunnion type
TA	Rod end trunnion type
TB	Head end trunnion type
TF	Intermediate supporting hole (Custom order)
TD	Rod end supporting hole (Custom order)
TE	Head end supporting hole (Custom order)

B Bore size (mm)	
125	ø125
140	ø140
160	ø160
180	ø180
200	ø200
250	ø250

C Port thread type	
Blank	Rc thread
N	NPT thread (Custom order)
G	G thread (Custom order)

D Cushion	
B	Both sides cushion
R	Rod end cushion
H	Head end cushion
N	No cushion

E Stroke length (mm)			
Bore size	Stroke length	Note 2 Available stroke length	Custom stroke length
ø125 to ø160	1 to 800	2000	By 1 mm increment
ø180	1 to 900	2000	
ø200	1 to 1000	2000	
ø250	1 to 1200	2000	

F Switch model no.					
Rectilinear wire	L type wire	Contact	Voltage	Indicator	Lead wire
T0H*	T0V*	Reed	AC DC	1 color indicator type	2 wire
T5H*	T5V*	Reed	AC DC	Without indicator light	
T8H*	T8V*	Reed	AC DC	1 color indicator type	
T1H*	T1V*	Proximity	AC DC	1 color indicator type	2 wire
T2H*	T2V*		AC DC	1 color indicator type	3 wire
T3H*	T3V*		AC DC	1 color indicator type (PNP output) (custom order)	3 wire
T3PH*	T3PV*		AC DC	2 color indicator type	2 wire
T2WH*	T2WV*		AC DC	2 color indicator type	3 wire
T2YH*	T2YV*		AC DC	2 color indicator type	3 wire
T3WH*	T3WV*		AC DC	2 color indicator type	3 wire
T3YH*	T3YV*		AC DC	2 color indicator type	3 wire
T2YD*	-		AC DC	For strong magnetic fields (Exclusively for AC magnetic fields)	2 wire
T2YDT*	-		AC DC	Off delay type	2 wire
T2JH*	T2JV*		AC DC	Off delay type	2 wire

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

G Switch quantity	
R	One on rod end
H	One on head end
D	Two
T	Three
4	Four

H Option	
C2	With a check valve on the cushion part
J	Bellows
K	Bellows
L	Bellows
M	Piston rod material (Stainless steel)

Blank	Cushion needle position standard	Standard
R	Cushion needle position R	
S	Cushion needle position S	
T	Cushion needle position T	
P6	Copper and PTFE free (custom order)	

I Accessory	
I	Rod eye
Y	Rod clevis (with a pin and a snap ring)
B1	Eye bracket
B2	Clevis bracket (with a pin and a snap ring)

How to order switch

- Switch body + mounting bracket set

SCS2-LN - T0H - 125

Switch model no.
(Previous page, item (F))

Bore size
(Previous page, item (B))

- Only switch body

SW - T0H

Switch model no.
(Previous page, item (F))

- Mounting bracket set

SCS2-LN - TS - 125

Mounting bracket

TS	T type switch
T	T2YD type switch

Bore size
(Previous page, item (B))

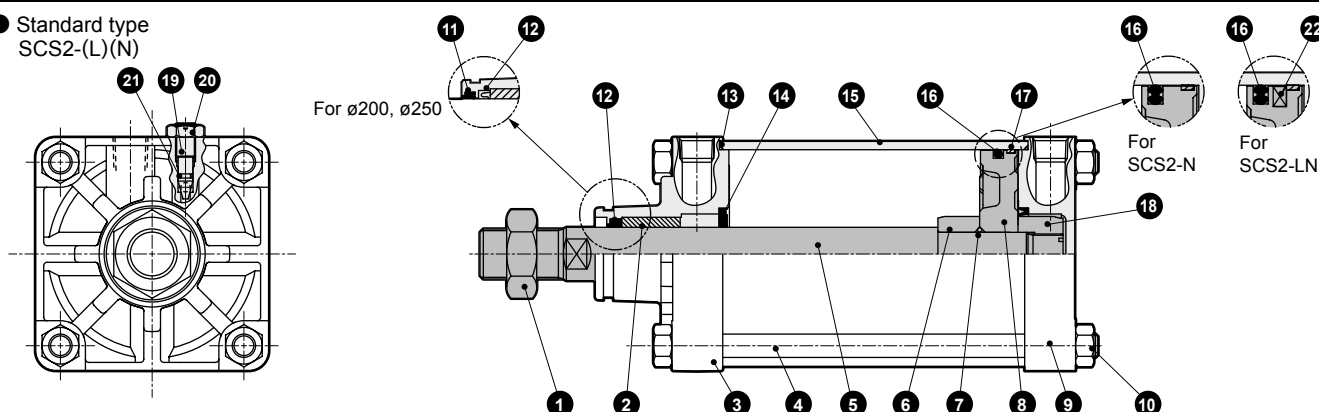
Theoretical thrust table

(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
ø125	Push	1.23×10^3	1.84×10^3	2.45×10^3	3.68×10^3	4.91×10^3	6.14×10^3	7.36×10^3	8.59×10^3	9.82×10^3	1.10×10^4	1.23×10^4
	Pull	1.13×10^3	1.70×10^3	2.26×10^3	3.39×10^3	4.52×10^3	5.65×10^3	6.79×10^3	7.92×10^3	9.05×10^3	1.02×10^4	1.13×10^4
ø140	Push	1.54×10^3	2.31×10^3	3.08×10^3	4.62×10^3	6.16×10^3	7.70×10^3	9.24×10^3	1.08×10^4	1.23×10^4	1.39×10^4	1.54×10^4
	Pull	1.44×10^3	2.16×10^3	2.89×10^3	4.33×10^3	5.77×10^3	7.22×10^3	8.66×10^3	1.01×10^4	1.15×10^4	1.30×10^4	1.44×10^4
ø160	Push	2.01×10^3	3.02×10^3	4.02×10^3	6.03×10^3	8.04×10^3	1.01×10^4	1.21×10^4	1.41×10^4	1.61×10^4	1.81×10^4	2.01×10^4
	Pull	1.88×10^3	2.83×10^3	3.77×10^3	5.65×10^3	7.54×10^3	9.42×10^3	1.13×10^4	1.32×10^4	1.51×10^4	1.70×10^4	1.88×10^4
ø180	Push	2.54×10^3	3.82×10^3	5.09×10^3	7.63×10^3	1.02×10^4	1.27×10^4	1.53×10^4	1.78×10^4	2.04×10^4	2.29×10^4	2.54×10^4
	Pull	2.39×10^3	3.58×10^3	4.77×10^3	7.16×10^3	9.54×10^3	1.19×10^4	1.43×10^4	1.67×10^4	1.91×10^4	2.15×10^4	2.39×10^4
ø200	Push	3.14×10^3	4.71×10^3	6.28×10^3	9.42×10^3	1.26×10^4	1.57×10^4	1.88×10^4	2.20×10^4	2.51×10^4	2.83×10^4	3.14×10^4
	Pull	2.95×10^3	4.42×10^3	5.89×10^3	8.84×10^3	1.18×10^4	1.47×10^4	1.77×10^4	2.06×10^4	2.36×10^4	2.65×10^4	2.95×10^4
ø250	Push	4.91×10^3	7.36×10^3	9.82×10^3	1.47×10^4	1.96×10^4	2.45×10^4	2.95×10^4	3.44×10^4	3.93×10^4	4.42×10^4	4.91×10^4
	Pull	4.63×10^3	6.94×10^3	9.25×10^3	1.39×10^4	1.85×10^4	2.31×10^4	2.78×10^4	3.24×10^4	3.70×10^4	4.16×10^4	4.63×10^4

Internal structure and parts list

- Standard type
SCS2-(L)(N)



Note: 14, 19, 20, 21 are only for cushion type.

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 metal		14	Cushion packing	Nitrile rubber/steel	
3	Rod cover	Aluminum alloy cast metal	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 (ø125 to ø180) Copper (ø200, 250)	Zinc chromate
8	Piston	Aluminum alloy cast metal		20	Hexagon nut	Steel	Zinc chromate
9	Head cover	Aluminum alloy cast metal	Chromate	21	Needle gasket	Nitrile rubber	
10	Hexagon nut	Steel	Zinc chromate	22	Magnet	Rubber	SCS2-LN only
11	Dust wiper	Nitrile rubber	ø200, 250 only				
12	Rod packing	Nitrile rubber					

Repair parts list

Bore size (mm)	SCS2 (Lubrication type)	SCS2-(L)(N) (Non-lubrication type)	Repair parts no.
	Kit no.	Kit no.	
ø125	SCS2-125K	SCS2-N-125K	12 13 14 16 17 21
ø140	SCS2-140K	SCS2-N-140K	
ø160	SCS2-160K	SCS2-N-160K	
ø180	SCS2-180K	SCS2-N-180K	
ø200	SCS2-200K	SCS2-N-200K	11 12 13 14 16 17 21
ø250	SCS2-250K	SCS2-N-250K	

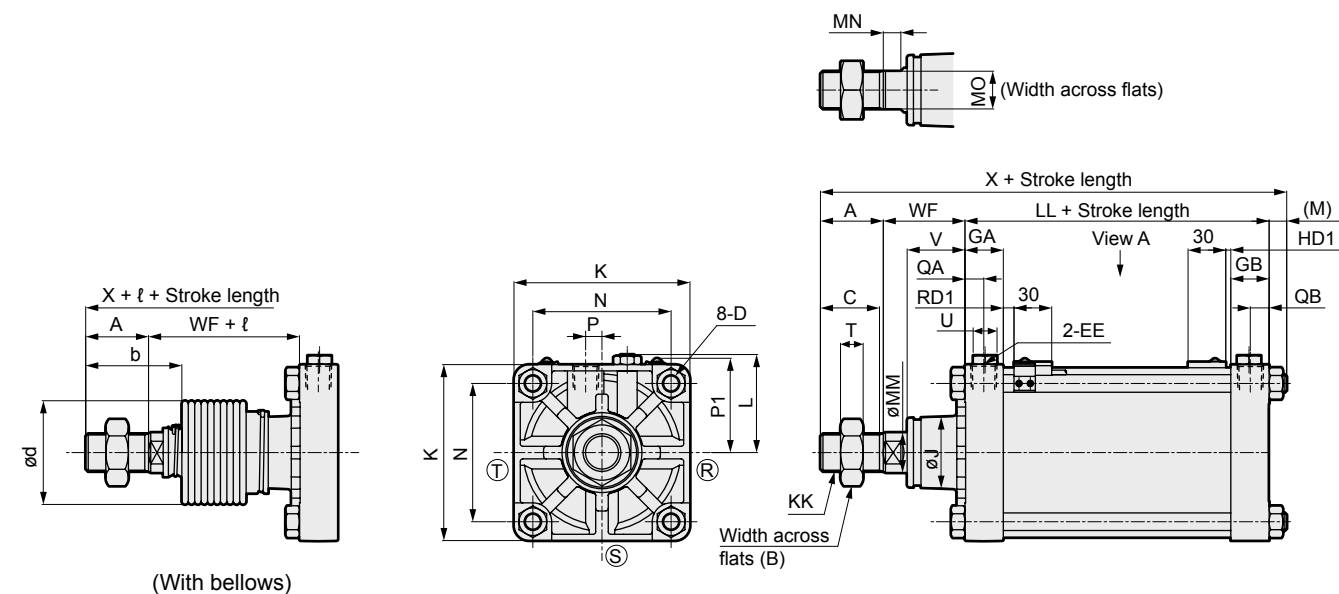
Note 1: The piston packing of non-lubrication type is different from the one of lubrication type.

Material of the mounting bracket

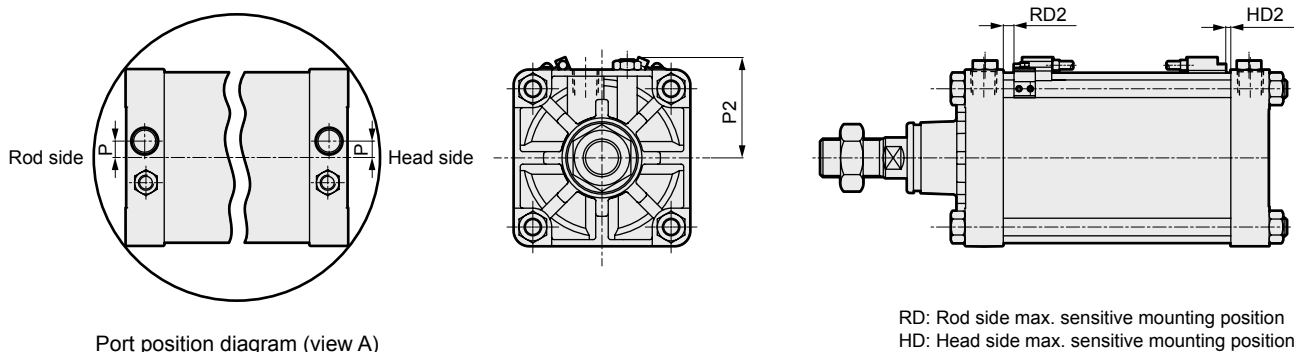
Mounting style	Material	Remarks
LB	Steel	Coating
FA, FB	Steel	Coating
CA, CB	Cast iron	Coating
TA, TB, TC	Cast iron	Coating

Dimensions

● SCS2 basic type (00)



● 2-color indicator, strong magnetic field, with switch.



Note 1: (R)(S)(T) indicate the positions of cushion needles.

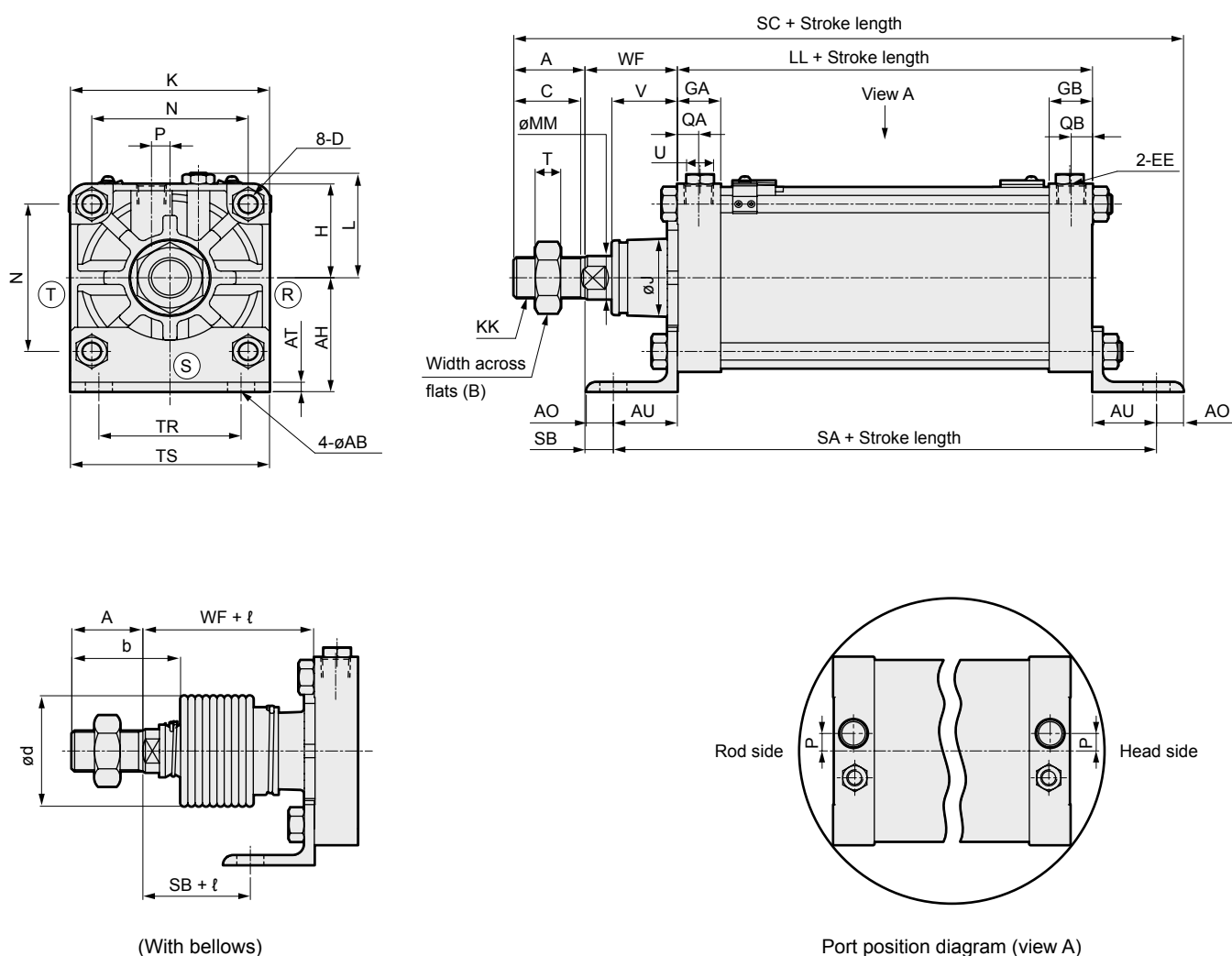
Note 2: For the l dimensions, the decimal places have been rounded out.

Note 3: Refer to dimensions on page 14 for the accessories.

Symbol	Basic type (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
ø125	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
ø140	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
ø160	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
ø180	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
ø200	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
ø250	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
Symbol						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	RD2	HD2	
ø125	18	19	45.5	65	220.5	74	75	(Stroke/4.55) + 11		76	80	8.5	4.0	10.5	5.5	7.5	2.5	2.5	0.0	
ø140	18	19	45.5	67	233.5	74	75	(Stroke/4.55) + 9		82	86	8.5	7.0	10.5	8.5	7.5	5.5	2.5	0.5	
ø160	21	19	48	71	248.5	81	80	(Stroke/5.15) + 9		90	95	10.5	8.0	12.5	10.0	9.5	7.0	4.5	1.5	
ø180	24	19	53	78	268.5	90	90	(Stroke/5.15) + 9		98	103	13.0	9.5	14.5	11.5	11.5	8.5	6.5	3.5	
ø200	27	24	60	88	301.5	102	95	(Stroke/5.30) + 9		106	111	17.5	13.0	19.0	15.0	16.0	12.0	11.0	7.0	
ø250	34	24	64	94	344.5	120	120	(Stroke/6.40) + 9		126	130	18.5	19.0	20.5	20.5	17.5	17.5	12.5	12.5	

Dimensions

● Axial foot type (LB)



Note 1: Refer to dimensions of switch on page 5 for with switch.

Note 2: (R)(S)(T) indicate the positions of cushion needles.

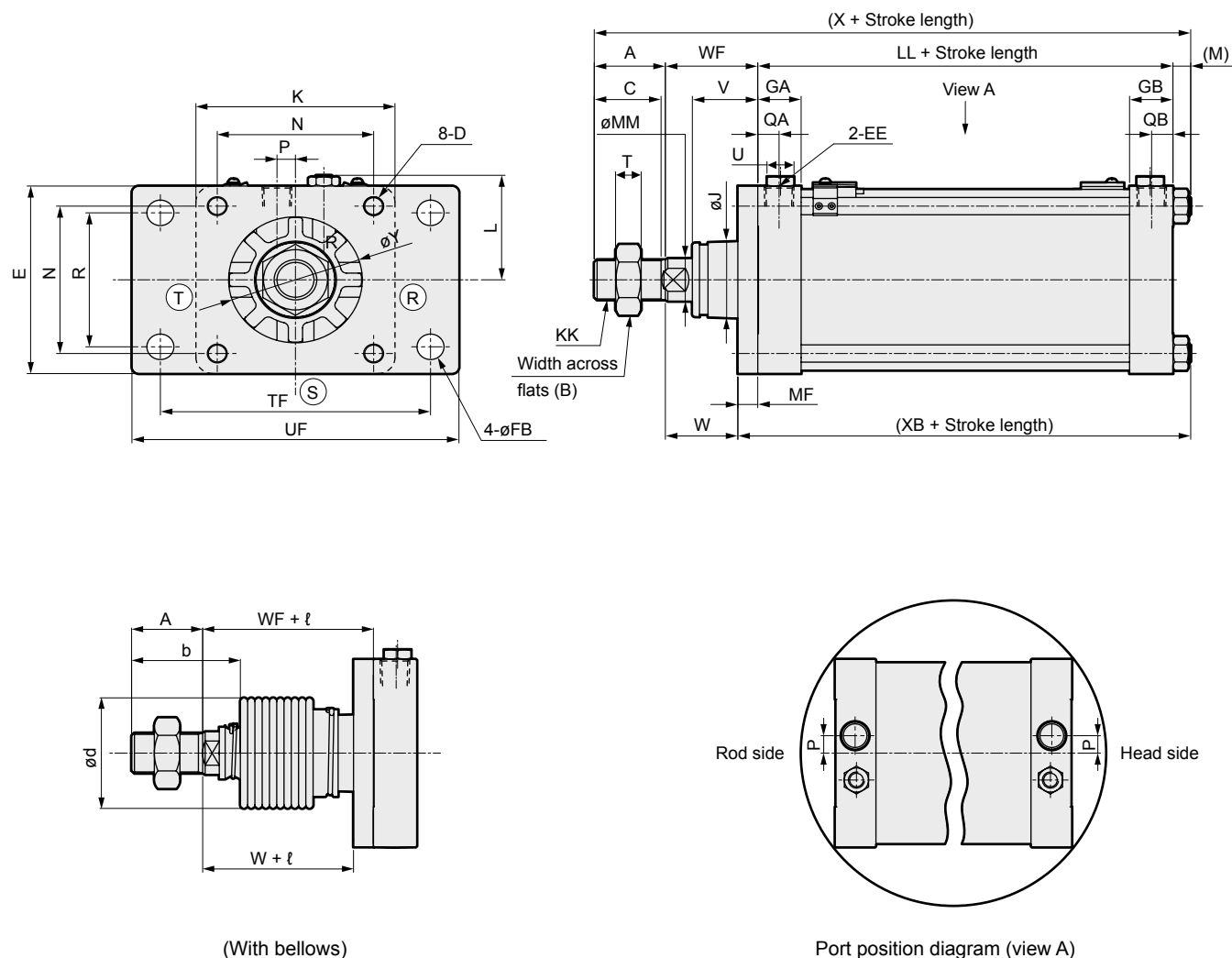
Note 3: For the l dimensions, the decimal places have been rounded out.

Note 4: Refer to dimensions on page 14 for the accessories.

Symbol	Axial foot type (LB) basic dimensions																		
Bore size (mm)	A	AB	AH	AT	AO	AU	B	C	D	EE	GA	GB	J	K	KK	L	LL	MM	
ø125	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	
ø140	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	
ø160	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	
ø180	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	
ø200	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	
ø250	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	
Symbol																	With bellows		
Bore size (mm)	MN	MO	N	P	QA	QB	SA	SB	SC	T	TR	TS	U	V	WF	X	b	d	l
ø125	15	27	110	13	15	15	182	20	271	18	100	140	19	45.5	65	222	74	75	(Stroke length/4.55) + 11
ø140	15	27	124	15	17	17	203	17	290	18	112	157	19	45.5	67	235	74	75	(Stroke length/4.55) + 9
ø160	16	36	142	15	17	17	212	18	306	21	118	177	19	48	71	250	81	80	(Stroke length/5.15) + 9
ø180	18	41	160	15	17	17	230	18	338	24	132	200	19	53	78	270	90	90	(Stroke length/5.15) + 9
ø200	20	46	175	20	18	18	247	26	372	27	150	220	24	60	88	303	102	95	(Stroke length/5.30) + 9
ø250	22	55	216	22	21	21	281	24	421	34	180	274	24	64	94	346	120	120	(Stroke length/6.40) + 9

Dimensions

● Rod end flange type (FA)



(With bellows)

Port position diagram (view A)

Note 1: Refer to dimensions of switch on page 5 for with switch.

Note 2: (R)(S)(T) indicate the positions of cushion needles.

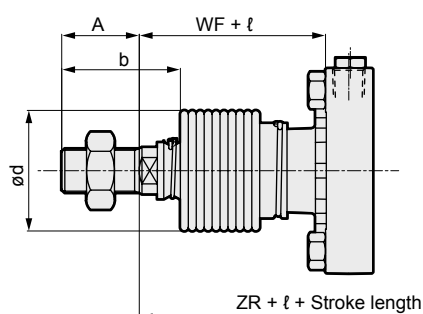
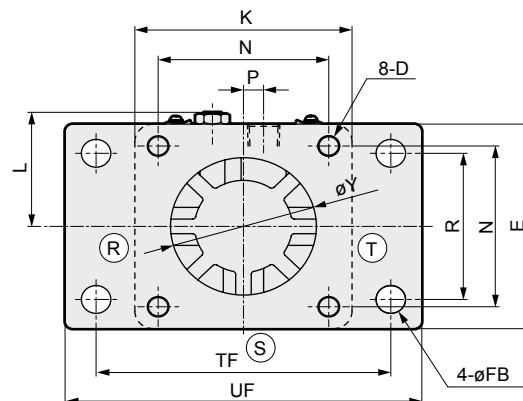
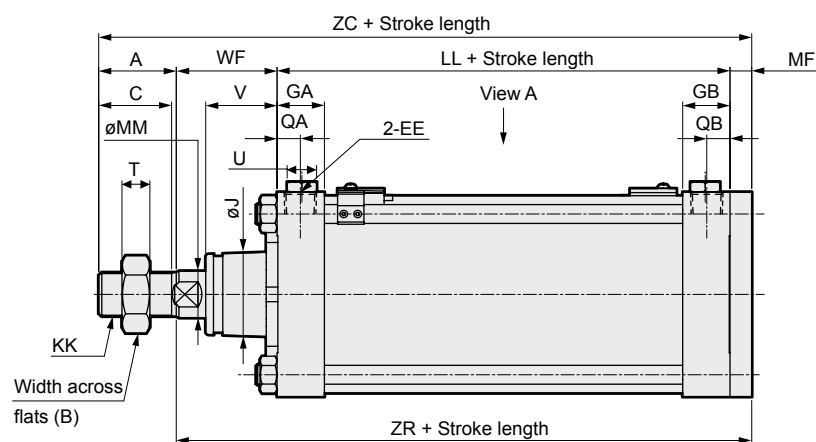
Note 3: For the l dimensions, the decimal places have been rounded out.

Note 4: Refer to dimensions on page 14 for the accessories.

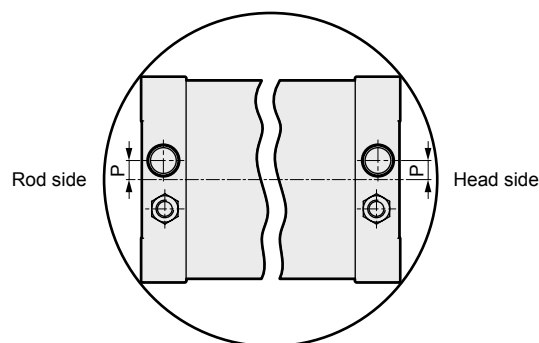
Symbol	Rod end flange type (FA) basic dimensions																
Bore size (mm)	A	B	C	D	E	EE	FB	GA	GB	J	K	KK	L	LL	M	MF	MM
ø125	50	46	47	M14 × 1.5	140	Rc1/2	19	30.5	30.5	57	140	M30 × 1.5	78 to 82	92	11	14	32
ø140	50	46	47	M14 × 1.5	157	Rc3/4	19	34.5	34.5	57	157	M30 × 1.5	86.5 to 91	103	11	19	32
ø160	56	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
ø180	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
ø200	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
ø250	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
Symbol																With bellows	
Bore size (mm)	N	QA	QB	P	R	T	TF	UF	U	V	W	WF	X	XB	Y	b	d
ø125	110	15	15	13	100	18	190	230	19	45.5	51	65	218	117	94	74	75
ø140	124	17	17	15	112	18	212	250	19	45.5	48	67	231	133	94	74	75
ø160	142	17	17	15	118	21	236	280	19	48	52	71	246	138	107	81	80
ø180	160	17	17	15	132	24	265	310	19	53	53	78	266	150	113	90	90
ø200	175	18	18	20	150	27	280	330	24	60	63	88	299	164	131	102	95
ø250	216	21	21	22	180	34	355	415	24	64	64	94	342	190	153	120	120
																	ℓ
																	(Stroke length/4.55) + 11
																	(Stroke length/4.55) + 9
																	(Stroke length/5.15) + 9
																	(Stroke length/5.15) + 9
																	(Stroke length/5.30) + 9
																	(Stroke length/6.40) + 9

Dimensions

● Head end flange type (FB)



(With bellows)



Port position diagram (view A)

Note 1: Refer to dimensions of switch on page 5 for with switch.

Note 2: (R)(S)(T) indicate the positions of cushion needles.

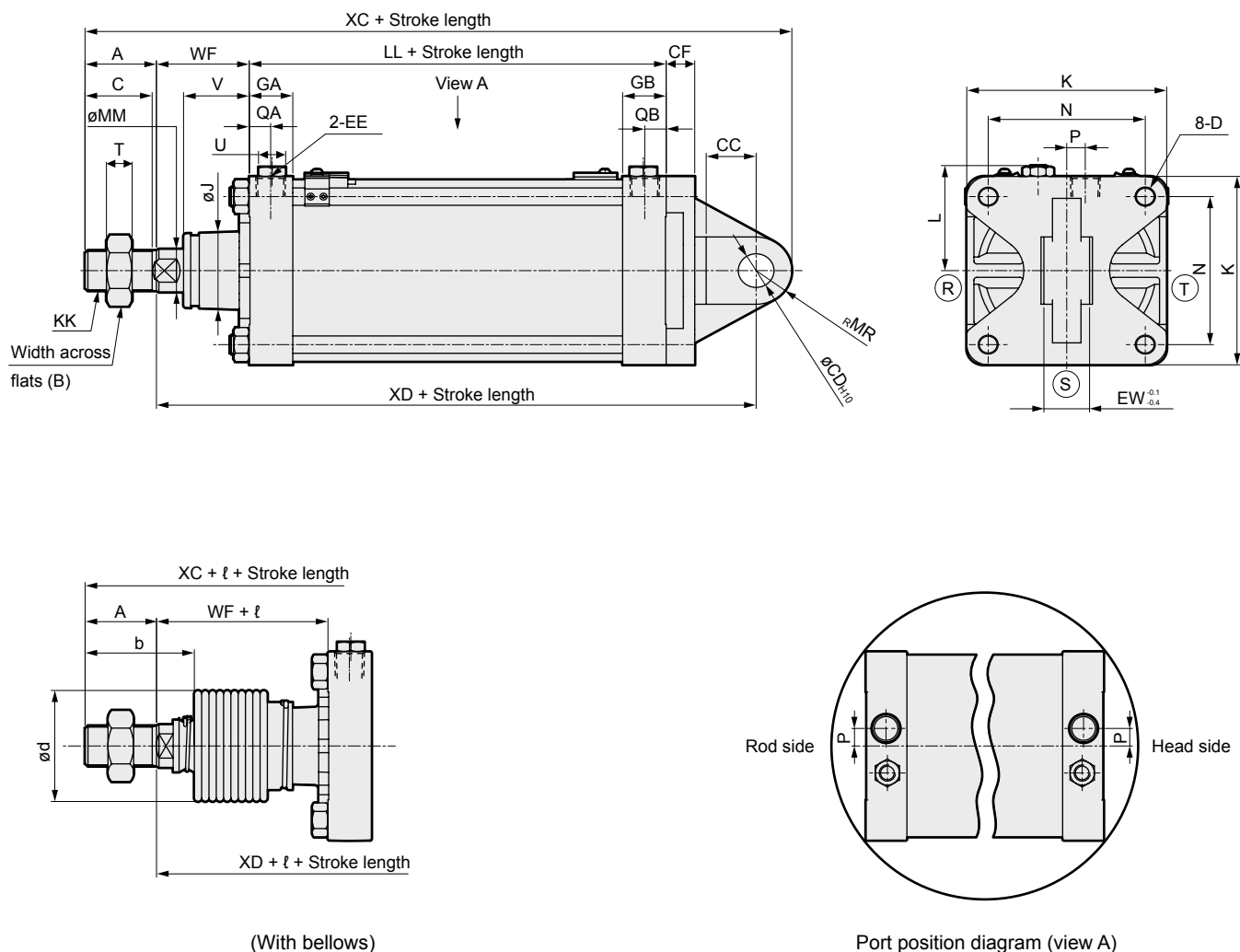
Note 3: For the l dimensions, the decimal places have been rounded out.

Note 4: Refer to dimensions on page 14 for the accessories.

Symbol	Head end flange type (FB) basic dimensions															
Bore size (mm)	A	B	C	D	E	EE	FB	GA	GB	J	K	KK	L	LL	MF	MM
ø125	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
ø140	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
ø160	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
ø180	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
ø200	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
ø250	88	85	84	M24 × 1.5	274	Rc1	29	42.5	42.5	93	274	M56 × 2	147.5 to 156	141	30	60
Symbol														With bellows		
Bore size (mm)	N	QA	QB	P	R	T	TF	U	UF	V	WF	Y	ZC	ZR	b	d
ø125	110	15	15	13	100	18	190	19	230	45.5	65	94	221	171	74	75
ø140	124	17	17	15	112	18	212	19	250	45.5	67	94	239	189	74	75
ø160	142	17	17	15	118	21	236	19	280	48	71	107	252	196	81	80
ø180	160	17	17	15	132	24	265	19	310	53	78	113	276	213	90	90
ø200	175	18	18	20	150	27	280	24	330	60	88	131	308	236	102	95
ø250	216	21	21	22	180	34	355	24	415	64	94	153	353	265	120	120
																l
																(Stroke length/4.55) + 11
																(Stroke length/4.55) + 9
																(Stroke length/5.15) + 9
																(Stroke length/5.15) + 9
																(Stroke length/5.30) + 9
																(Stroke length/6.40) + 9

Dimensions

● Eye bracket type (CA)



Note 1: Refer to dimensions of switch on page 5 for with switch.

Note 2: (R)(S)(T) indicate the positions of cushion needles.

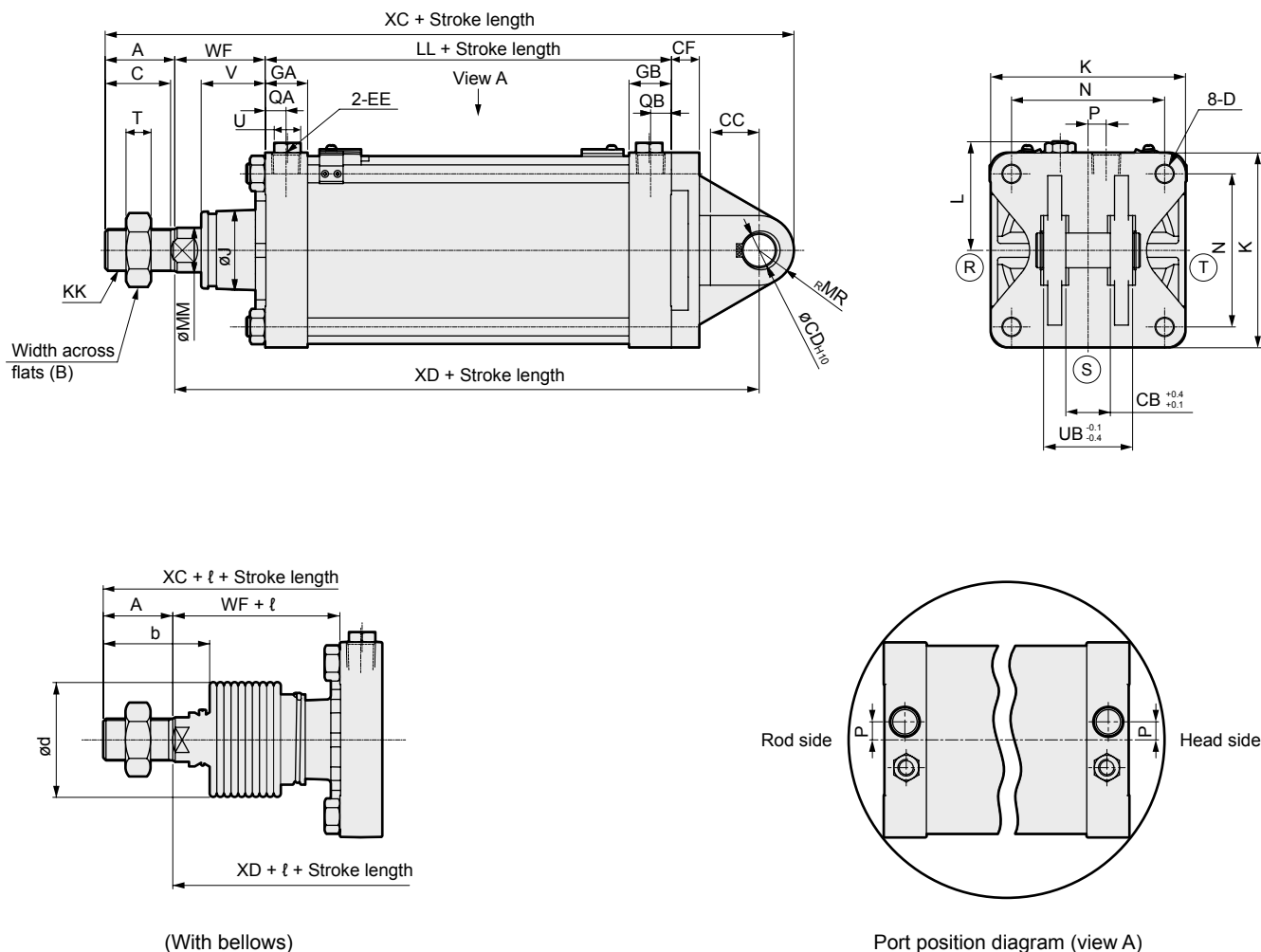
Note 3: For the l dimensions, the decimal places have been rounded out.

Note 4: Refer to dimensions on page 14 for the accessories.

Symbol	Eye bracket type (CA) basic dimensions																
Bore size (mm)	A	B	C	D	CC	CD	CF	EE	EW	GA	GB	J	K	KK	L	LL	MM
Ø125	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
Ø140	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
Ø160	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
Ø180	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
Ø200	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
Ø250	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
Symbol													With bellows				
Bore size (mm)	MR	N	P	QA	QB	T	U	V	WF	XC	XD	b	d	ℓ			
Ø125	25	110	13	15	15	18	19	45.5	65	295	220	74	75	(Stroke length/4.55) + 11			
Ø140	28	124	15	17	17	18	19	45.5	67	323	245	74	75	(Stroke length/4.55) + 9			
Ø160	32	142	15	17	17	21	19	48	71	340	252	81	80	(Stroke length/5.15) + 9			
Ø180	40	160	15	17	17	24	19	53	78	381	278	90	90	(Stroke length/5.15) + 9			
Ø200	40	175	20	18	18	27	24	60	88	413	301	102	95	(Stroke length/5.30) + 9			
Ø250	50	216	22	21	21	34	24	64	94	483	345	120	120	(Stroke length/6.40) + 9			

Dimensions

● Clevis bracket type (CB)



Note 1: Refer to dimensions of switch on page 5 for with switch.

Note 2: (R)(S)(T) indicate the positions of cushion needles.

Note 3: For the l dimensions, the decimal places have been rounded out.

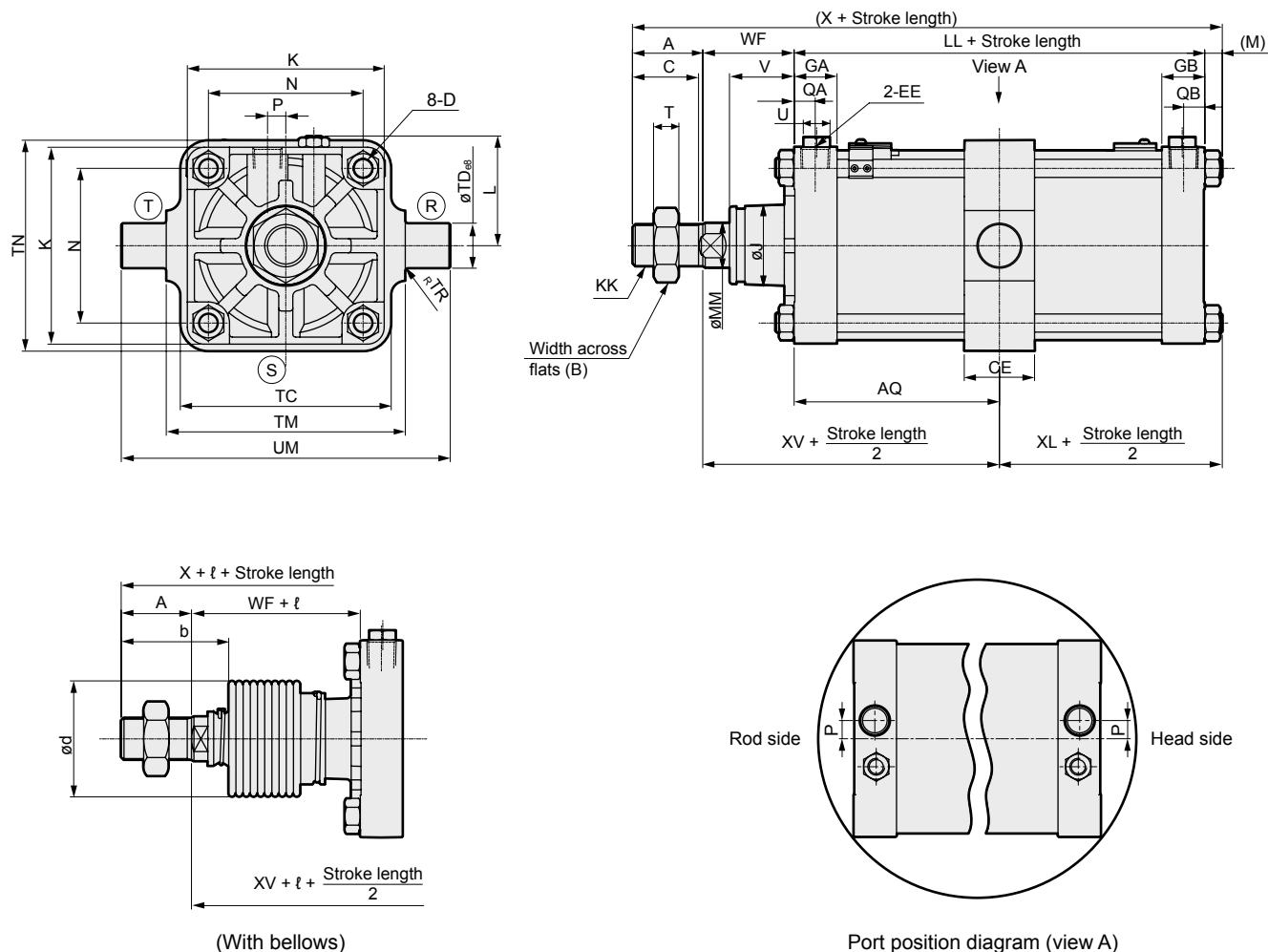
Note 4: Refer to dimensions on page 14 for the accessories.

Note 5: A pin and a snap ring are attached.

Symbol	Clevis bracket type (CB) basic dimensions															
Bore size (mm)	A	B	C	D	CB	CC	CD	CF	EE	GA	GB	J	K	KK	L	LL
ø125	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
ø140	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
ø160	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
ø180	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
ø200	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
ø250	88	85	84	M24 × 1.5	63	65	50	35	Rc1	42.5	42.5	93	274	M56 × 2	147.5 to 156	141
Symbol													With bellows			
Bore size (mm)	MM	MR	N	P	QA	QB	T	U	UB	V	WF	XC	XD	b	d	ℓ
ø125	32	25	110	13	15	15	18	19	64	45.5	65	295	220	74	75	(Stroke length/4.55) + 11
ø140	32	28	124	15	17	17	18	19	72	45.5	67	323	245	74	75	(Stroke length/4.55) + 9
ø160	40	32	142	15	17	17	21	19	80	48	71	340	252	81	80	(Stroke length/5.15) + 9
ø180	45	40	160	15	17	17	24	19	100	53	78	381	278	90	90	(Stroke length/5.15) + 9
ø200	50	40	175	20	18	18	27	24	100	60	88	413	301	102	95	(Stroke length/5.30) + 9
ø250	60	50	216	22	21	21	34	24	126	64	94	483	345	120	120	(Stroke length/6.40) + 9

Dimensions

● Center trunnion type (TC)



Note 1: Refer to dimensions of switch on page 5 for with switch.

Note 2: (R)(S)(T) indicate the positions of cushion needles.

Note 3: For the ℓ dimensions, the decimal places have been rounded out.

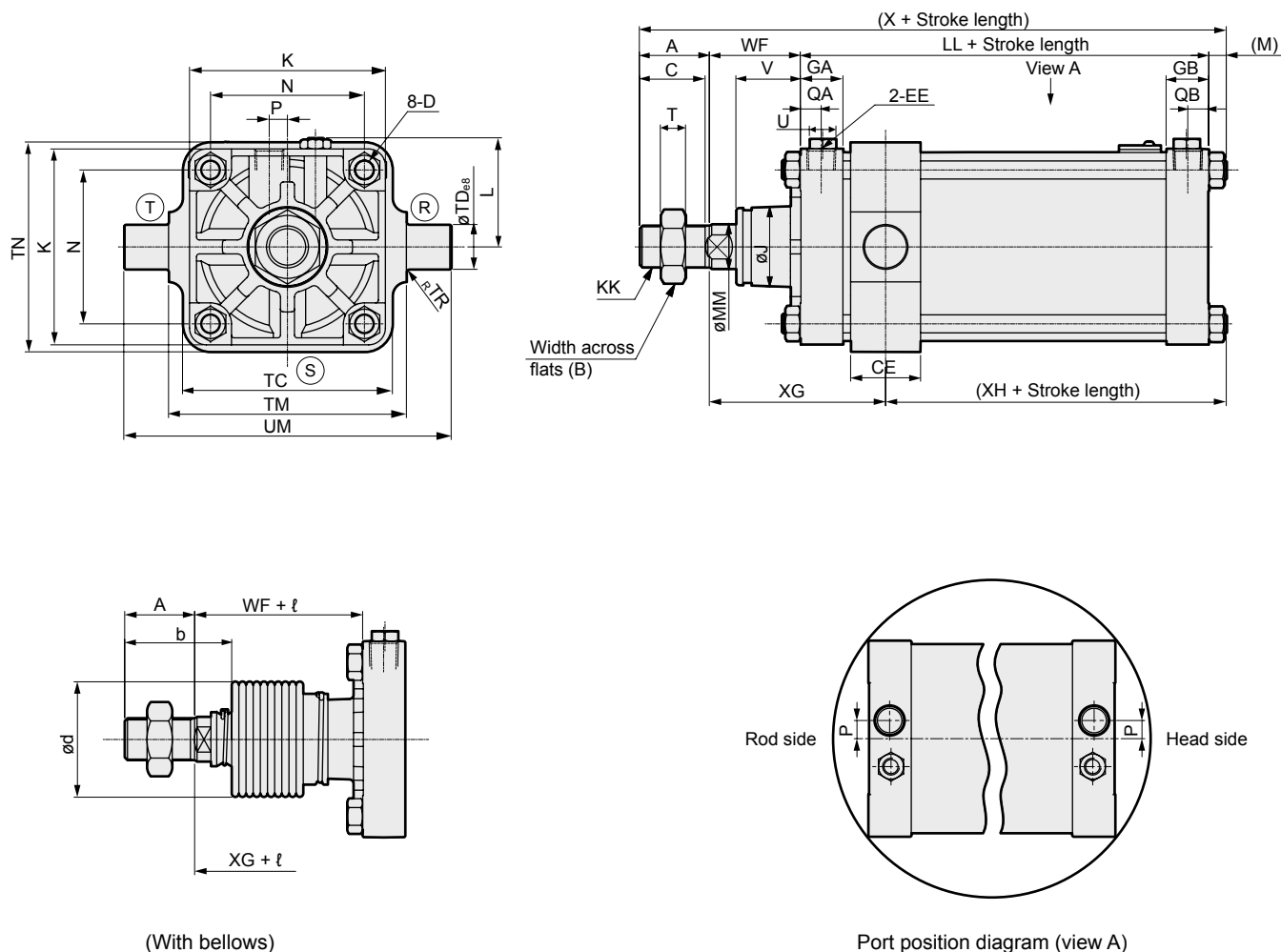
Note 4: Refer to dimensions on page 14 for the accessories.

Note 5: Refer to min. stroke length on page 1.

Symbol	Center trunnion type (TC) basic dimensions																	
Bore size (mm)	A	AQ	B	C	CE	D	EE	GA	GB	J	K	KK	L	LL	M	MM	N	P
ø125	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
ø140	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
ø160	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
ø180	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
ø200	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
ø250	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
Symbol														With bellows				
Bore size (mm)	QA	QB	T	TC	TD	TM	TN	TR	U	UM	V	WF	X	XV	XL	b	d	ℓ
ø125	15	15	18	150	32	170	150	2	19	234	45.5	65	218	111	57	74	75	(Stroke length/4.55) + 11
ø140	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
ø160	17	17	21	190	40	212	190	2	19	292	48	71	246	124	66	81	80	(Stroke length/5.15) + 9
ø180	17	17	24	210	45	236	210	2	19	326	53	78	266	133	70	90	90	(Stroke length/5.15) + 9
ø200	18	18	27	242	45	265	242	2	24	355	60	88	299	149.5	77.5	102	95	(Stroke length/5.30) + 9
ø250	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 end trunnion type (TA)



(With bellows)

Port position diagram (view A)

Note 1: Refer to dimensions of switch on page 5 for with switch.

Note 2: (R)(S)(T) indicate the positions of cushion needles.

Note 3: For the ℓ dimensions, the decimal places have been rounded out.

Note 4: Refer to dimensions on page 14 for the accessories.

Note 5: Refer to min. stroke length on page 1.

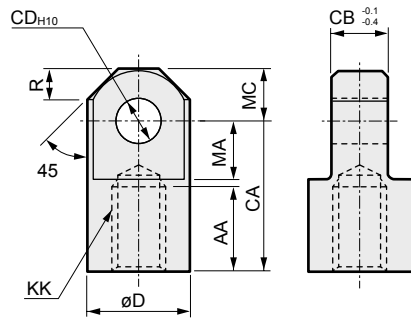
Note 6: The position cannot be detected at the stroke end of rod side.

Symbol	Rod end trunnion type (TA) basic dimensions																	
Bore size (mm)	A	B	C	CE	D	EE	GA	GB	J	K	KK	L	LL	M	MM	N	P	
ø125	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	
ø140	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	
ø160	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	
ø180	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	
ø200	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	
ø250	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	
Symbol															With bellows			
Bore size (mm)	QA	QB	T	TC	TD	TM	TN	TR	U	UM	V	WF	X	XG	XH	b	d	ℓ
ø125	15	15	18	150	32	170	150	2	19	234	45.5	65	218	126	42	74	75	(Stroke length/4.55) + 11
ø140	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
ø160	17	17	21	190	40	212	190	2	19	292	48	71	246	141	49	81	80	(Stroke length/5.15) + 9
ø180	17	17	24	210	45	236	210	2	19	326	53	78	266	150.5	52.5	90	90	(Stroke length/5.15) + 9
ø200	18	18	27	242	45	265	242	2	24	355	60	88	299	168	59	102	95	(Stroke length/5.30) + 9
ø250	21	21	34	300	56	335	300	2	24	447	64	94	342	184	70	120	120	(Stroke length/6.40) + 9

SCS2 Series common accessory dimensions

● Rod eye for SCS2 (I)

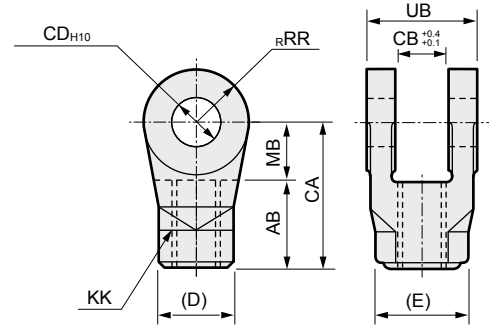
Material: Steel



Symbol 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)

Material: Cast iron

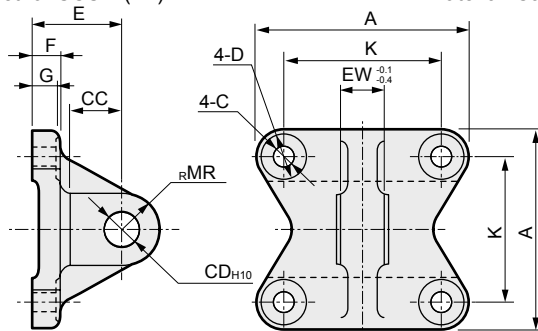


Symbol Model no.	AB	CA	CB	CD	D	E	KK	MB	RR	UB	Weight (kg)
SCS2-125-Y	50	85	32	25 ^{+0.084} ₀	46	53.1	M30 × 1.5	35	27.5	64	1.30
SCS2-140-Y	50	90	36	28 ^{+0.084} ₀	46	53.1	M30 × 1.5	40	30	72	1.65
SCS2-160-Y	60	105	40	32 ^{+0.100} ₀	55	63.5	M36 × 1.5	45	35	80	2.55
SCS2-180-Y	65	115	50	40 ^{+0.100} ₀	60	69.3	M40 × 1.5	50	42.5	100	4.40
SCS2-200-Y	75	125	50	40 ^{+0.100} ₀	70	80.8	M45 × 1.5	50	42.5	100	4.85
SCS2-250-Y	88	150	63	50 ^{+0.100} ₀	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)

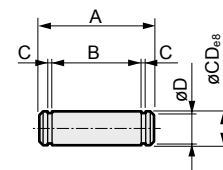
Material: Cast iron



Symbol 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)

Material: Steel

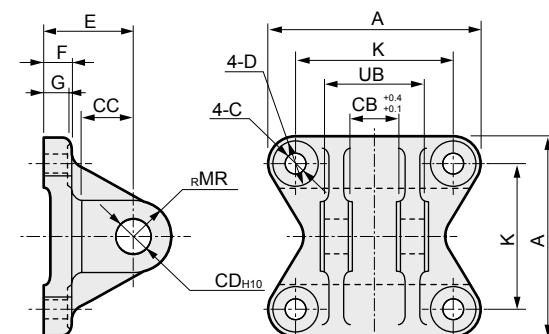


Symbol Model no.	A	B	C	CD	D	Snap ring	Weight (kg)	Applicable model
SCS2-125-P	75	66.3	1.35	25	23.9	C type 25 for axes	0.25	SCS-125
SCS2-140-P	84	74.7	1.65	28	26.6	C type 28 for axes	0.40	SCS-140
SCS2-160-P	92	82.7	1.65	32	30.3	C type 32 for axes	0.50	SCS-160
SCS2-180-P	115	103.2	1.9	40	38	C type 40 for axes	1.15	SCS-180
SCS2-250-P	144	129.6	2.2	50	47	C type 50 for axes	2.25	SCS-250

Note: For the clevis type, clevis bracket, and rod clevis, pins and snap rings have been attached.

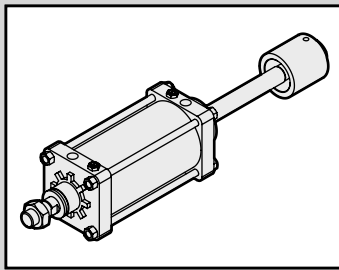
● Clevis bracket for SCS2 (B2)

Material: Cast iron



Symbol 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.



Large bore size cylinder
Double acting/stroke adjustable type

SCS2-P Series

● Bore size: ø125, ø140, ø160, ø180, ø200, ø250

JIS symbol



* Custom order

Specifications

Descriptions		SCS2-P (Stroke adjustable type)					
Bore size	mm	ø125	ø140	ø160	ø180	ø200	ø250
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0					
Min. working pressure	MPa	0.1					
Proof pressure	MPa	1.6					
Ambient temperature		-5 to 60 (no freezing)					
Port size		Rc 1/2	Rc 3/4				Rc1
Stroke tolerance		+1.0 (to 300), +1.4 (to 1000), +1.8 (to 1200)					
Working piston speed		mm/s 20 to 1000 (Use within the allowable energy absorption range.)					
Cushion		Air cushion (Note that the rod side cushion does not function during stroke adjustment.)					
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 (when lubricating, use turbine oil Class 1 ISO VG32.)					
Allowable energy absorption	With cushion	63.5	91.5	116	152	233	362
	No cushion	0.371	0.386	0.386	0.958	1.08	2.32
		The type without cushioning cannot absorb a large energy generated by an external load. We recommend to install an external shock absorber.					

Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Trunnion type min. stroke length (mm)
ø125	50•75•100•150• 200•250•300	800	25	23
ø140				25
ø160		900		27
ø180				28
ø200				28
ø250		1,200		28

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

Note 2: If the max. stroke is exceeded, product specifications may not be met, depending on operating conditions. Contact CKD for details.

Cylinder mass

(Unit: kg)

Descriptions/Mounting style	Weight when stroke length (S) = 0 mm, adjustable stroke (S) = 25 mm							Additional weight per S = 100 mm
	Basic type (00)	Axis foot type (LB)	Flange type (FA/FB)	Eye bracket type (CA)	Clevis bracket type (CB)	Trunnion type (TA/TB/TC)	Weight per 25 mm adjustable stroke (S)	
ø125	11.42	12.92	14.72	14.42	14.52	14.82	0.51	2.17
ø140	13.35	15.35	18.75	17.15	17.35	16.55	0.51	2.41
ø160	18.45	21.55	25.35	23.45	23.75	24.85	0.72	3.21
ø180	24.65	29.15	36.65	32.05	32.55	32.75	0.93	4.21
ø200	33.98	39.68	47.68	43.48	43.68	45.78	1.09	5.08
ø250	57.81	66.21	83.71	81.81	76.31	86.51	1.53	7.60

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

- Weight when S = 0 mm 12.92 kg
- Additional weight when S = 300 mm $1.54 \times \frac{300}{100} = 4.62$ kg
- Weight when the adjustable stroke is 25 mm 0.51 kg
- 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
ø125	Push/Pull	1.13×10^3	1.70×10^3	2.26×10^3	3.39×10^3	4.52×10^3	5.65×10^3	6.79×10^3	7.92×10^3	9.05×10^3	1.02×10^4	1.13×10^4
ø140	Push/Pull	1.44×10^3	2.16×10^3	2.89×10^3	4.33×10^3	5.77×10^3	7.22×10^3	8.66×10^3	1.01×10^4	1.15×10^4	1.30×10^4	1.44×10^4
ø160	Push/Pull	1.88×10^3	2.83×10^3	3.77×10^3	5.65×10^3	7.54×10^3	9.42×10^3	1.13×10^4	1.32×10^4	1.51×10^4	1.70×10^4	1.88×10^4
ø180	Push/Pull	2.39×10^3	3.58×10^3	4.77×10^3	7.16×10^3	9.54×10^3	1.19×10^4	1.43×10^4	1.67×10^4	1.91×10^4	2.15×10^4	2.39×10^4
ø200	Push/Pull	2.95×10^3	4.42×10^3	5.89×10^3	8.84×10^3	1.18×10^4	1.47×10^4	1.77×10^4	2.06×10^4	2.36×10^4	2.65×10^4	2.95×10^4
ø250	Push/Pull	4.63×10^3	6.94×10^3	9.25×10^3	1.39×10^4	1.85×10^4	2.31×10^4	2.78×10^4	3.24×10^4	3.70×10^4	4.16×10^4	4.63×10^4

How to order

Without switch

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

A Mounting style
Note 1

B Bore size

C Port thread type

D Cushion

E Stroke length

F Adjustable stroke range

G Option
Note 2

Note 3

H Accessory
Note 4

⚠ Note on model no. selection

Note 1: For hole type trunnions, ø125 to 160 only will be available through custom order. For information such as external dimensions, consult as necessary.

Note 2: The instantaneous max. temperature is that at which sparks, swarf, etc., temporarily contact bellows.

Note 3: For the cushion needle position indication, check the drawing below.

Note 4: "I" and "Y" cannot be selected at the same time.

<Example of model number>

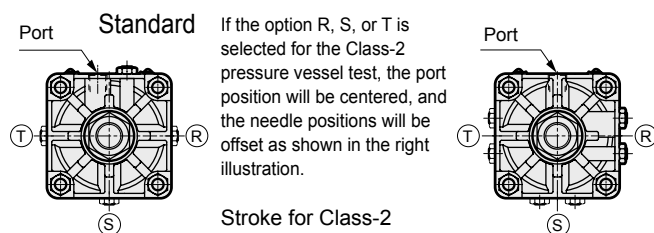
SCS2-P-LB-125B-50-25-JY

Model: Large bore size cylinder stroke adjustable type

- A** Mounting style : Axial foot type
- B** Bore size : ø125 mm
- C** Port thread type : Rc thread
- D** Cushion : Both sides 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 faced upward, from the rod direction)



Bore size	Stroke length
ø200	946 and over
ø250	752 and over

Options R, S, and T for Class-2 pressure vessel test

Symbol	Descriptions
A Mounting style	
00	Basic type
LB	Axial foot type
FA	Rod end flange type
FB	Head end flange type
TC	Center trunnion type
TA	Rod end trunnion type
TB	Head end trunnion type
TF	Intermediate supporting hole (Custom order)
TD	Rod end supporting hole (Custom order)
TE	Head end supporting hole (Custom order)

B Bore size (mm)	
125	ø125
140	ø140
160	ø160
180	ø180
200	ø200
250	ø250

C Port thread type	
Blank	Rc thread
N	NPT thread (Custom order)
G	G thread (Custom order)

D Cushion	
B	Both sides cushion
R	Rod end cushion
H	Head end cushion
N	No cushion

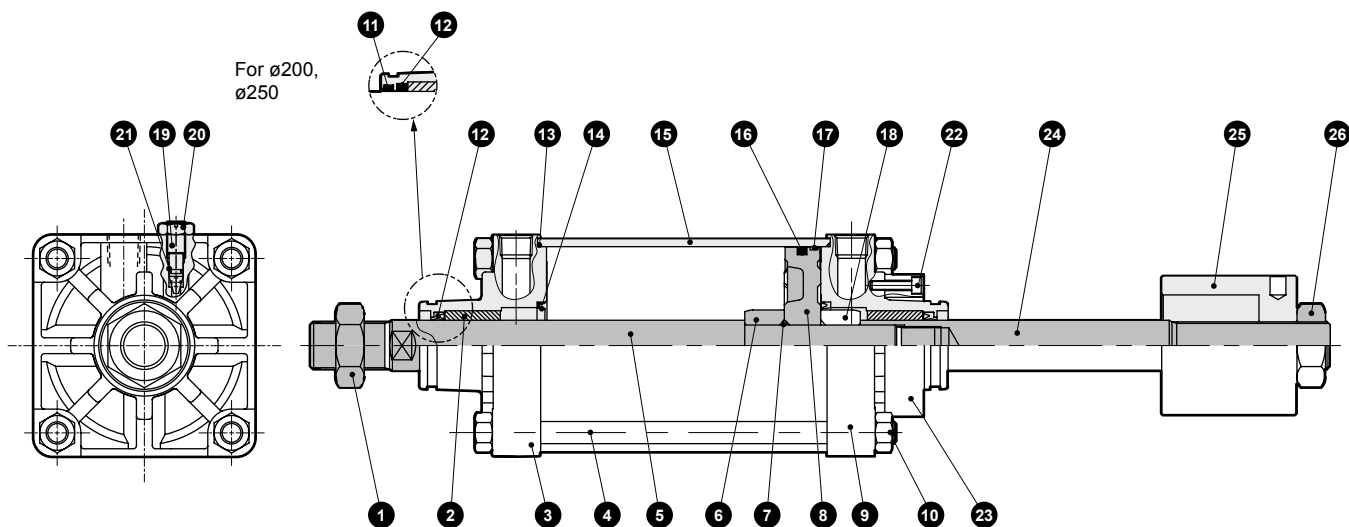
E Stroke length (mm)		
Bore size	Stroke length	Custom stroke length
ø125 to ø160	25 to 800	By 1 mm increment
ø180	25 to 900	
ø200	25 to 1000	
ø250	25 to 1200	

F Adjustable stroke range (mm)	
25	25
50	50
75	75
100	100

G Option			
C2	With a check valve on the cushion part		
		Max. ambient temperature	Instantaneous ambient temperature
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		
S	Cushion needle position S		
T	Cushion needle position T		
P6	Copper and PTFE free (custom order)		

H Accessory	
I	Rod eye
Y	Rod clevis (with a pin and a snap ring)
B1	Eye bracket
B2	Clevis bracket (with a pin and a snap ring)

Internal structure and parts list



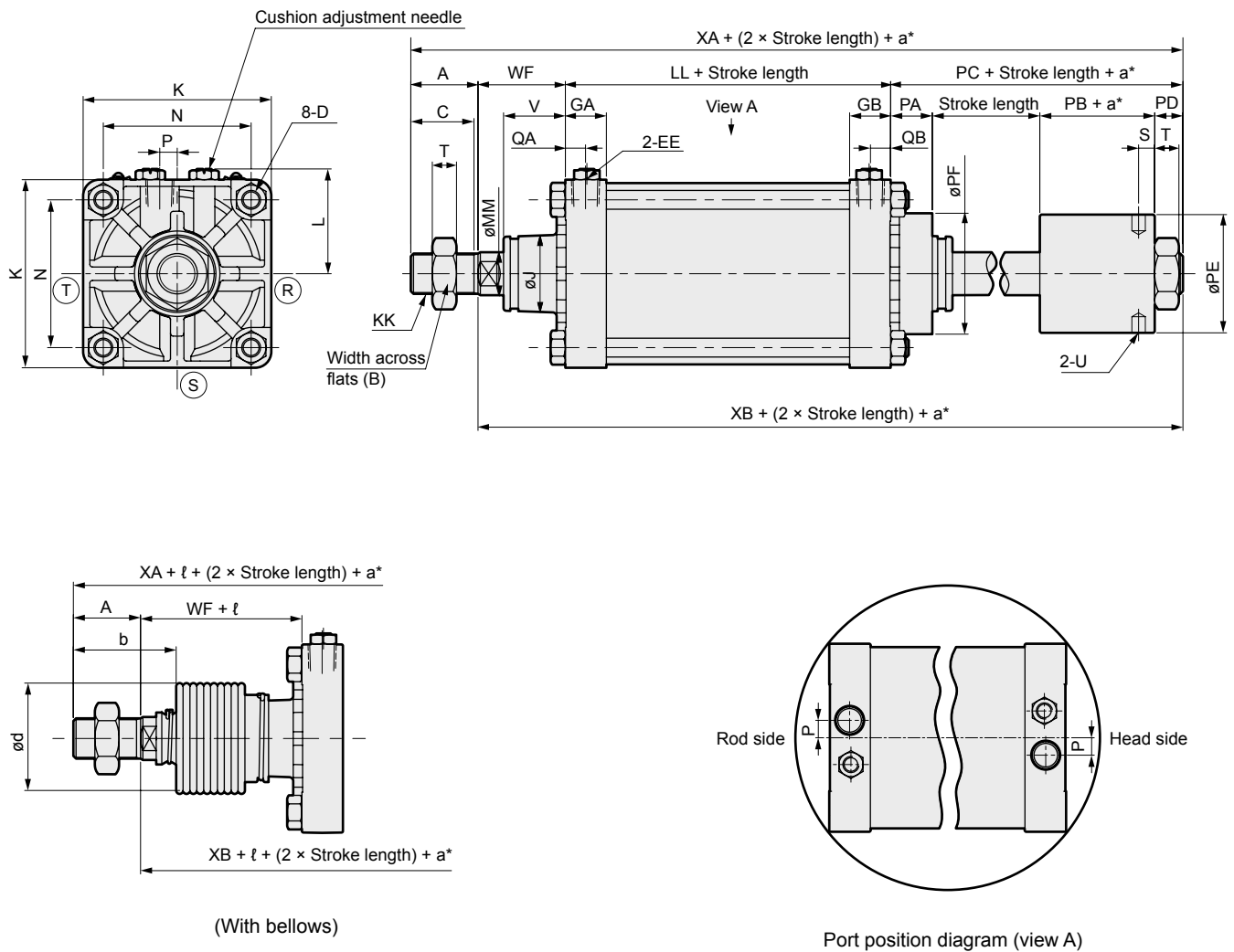
Note: 14 19 20 21 are only for cushion type.

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 metal		15	Cylinder tube	Aluminum alloy	Hard alumite
3	Rod cover	Aluminum alloy cast metal	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 (ø125 to ø180) Steel (ø200, 250)	Zinc chromate
7	Piston gasket	Nitrile rubber		20	Hexagon nut	Steel	Zinc chromate
8	Piston	Aluminum alloy cast metal		21	Needle gasket	Nitrile rubber	
9	Head cover	Aluminum alloy cast metal	Chromate	22	Hexagon socket head cap bolt	Steel	Black oxide finish
10	Hexagon nut	Steel	Zinc chromate	23	Stopper ring	Steel	Phosphoric acid zinc processing
11	Dust wiper	Nitrile rubber	ø200, 250 only	24	Piston rod B	Steel	Industrial chrome plating
12	Rod packing	Nitrile rubber		25	Stopper	Steel	Phosphoric acid zinc processing
13	Cylinder gasket	Nitrile rubber		26	Hexagon nut	Steel	Zinc chromate

Repair parts list

Same as for the SCS2-D Series. Refer to page 27.

Dimensions



(With bellows)

Port position diagram (view A)

Note 1: (R)(S)(T) indicate the positions of cushion needles.

Note 2: Refer to dimensions on page 14 for the accessories.

*a: stroke adjustable

Symbol	A	B	C	D	EE	GA	J	K	KK	L	LL	MM	P	PA	PB	PC
Bore size (mm)																
ø125	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
ø140	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
ø160	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
ø180	63	60	60	M18 × 1.5	Rc3/4	34.5	68	200	M40 × 1.5	108 to 112	110	45	15	34	52	115
ø200	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
ø250	88	85	84	M24 × 1.5	Rc1	42.5	93	274	M56 × 2	147.5 to 156	141	60	22	60	58	157
Symbol	PD	PE	PF	QA	S	T	U	V	WF	XA	XB	With bellows				
Bore size (mm)												b	d	l		
ø125	21	88	90	15	12	18	ø10, depth 10	45.5	65	299.5	249.5	74	75	(Stroke length/4.55) + 11		
ø140	21	88	90	17	12	18	ø10, depth 10	45.5	67	312.5	262.5	74	75	(Stroke length/4.55) + 9		
ø160	26	98	104	17	14.5	21	ø14, depth 15	48	71	339	283	81	80	(Stroke length/5.15) + 9		
ø180	29	108	110	17	16	24	ø14, depth 15	53	78	366	303	90	90	(Stroke length/5.15) + 9		
ø200	32	120	128	18	18	27	ø14, depth 15	60	88	420	348	102	95	(Stroke length/5.30) + 9		
ø250	39	141	150	21	22.5	34	ø14, depth 15	64	94	480	392	120	120	(Stroke length/6.40) + 9		

Note: The dimensions of the individual mounting styles are the same as those of the double acting SCS2 Series. Refer to page 6 to 13.



Large bore size cylinder
Double acting/heat resistant type

SCS2-T Series

● Bore size: ø125, ø140, ø160, ø180, ø200, ø250

JIS symbol



RoHS

Specifications

Descriptions		SCS2-T (heat-resistant type)					
Bore size	mm	ø125	ø140	ø160	ø180	ø200	ø250
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0					
Min. working pressure	MPa	0.05					
Proof pressure	MPa	1.6					
Ambient temperature		5 to 120 (Note 1)					
Port size		Rc 1/2	Rc 3/4				Rc1
Stroke tolerance	mm	$+1.0^{+0.0}_{-0.0}$ (to 300), $+1.4^{+0.0}_{-0.0}$ (to 1000), $+1.8^{+0.0}_{-0.0}$ (to 1200)					
Working piston speed	mm/s	20 to 1000 (Use within the allowable energy absorption range.)					
Cushion		Air cushion					
Effective air cushion length	mm	21.6	21.6	21.6	21.6	26.6	26.6
Lubrication		Not allowed (Note 2)					
Allowable energy absorption J	With cushion	63.5	91.5	116	152	233	362
	No cushion	0.371	0.386	0.386	0.958	1.08	2.32
		The type without cushioning cannot absorb a large energy generated by an external load. We recommend to install an external shock absorber.					

Note 1: Ambient temperature of the products below is 5 to 100°C.

Bore size	Stroke length
ø160	1948 and over
ø180	1526 and over
ø200	946 and over
ø250	752 and over

Production is possible when the ambient temperature for use is 5 to 120°C. Contact CKD separately.

Note 2: Heat resistant grease must be applied periodically.

Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Trunnion type min. stroke length (mm)
ø125	50•75•100•150• 200•250•300	800	1	23
ø140				25
ø160		900		27
ø180		1000		28
ø200		1200		28
ø250				28

Note 3: Custom stroke length is available per 1 mm increment.

Note 4: If the max. stroke is exceeded, product specifications may not be met, depending on operating conditions. Contact CKD for details.

Cylinder mass

(Unit: kg)

Bore size (mm)	Weight when stroke length (S) = 0 mm						Additional weight per S = 100 mm
	Basic type (00)	Axial foot type (LB)	Flange type (FA/FB)	Eye bracket type (CA)	Clevis bracket type (CB)	Trunnion type (TA/TB/TC)	
ø125	7.22	8.72	10.52	10.22	10.32	10.62	1.54
ø140	9.35	11.35	14.75	13.15	13.35	12.55	1.78
ø160	12.35	15.45	19.25	17.35	17.65	18.75	2.22
ø180	16.75	21.25	28.75	24.15	24.65	24.85	2.96
ø200	22.78	28.48	36.48	32.28	32.48	34.58	3.54
ø250	40.51	48.91	66.41	64.51	59.01	69.21	5.38

(Example) Weight of SCS2-T-LB-125B-300 ————— { ● Weight when S = 0 mm 8.72 kg
● Additional weight when S = 300 mm $1.54 \times \frac{300}{100} = 4.62$ kg
● 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
ø125	Push	1.23 × 10 ³	1.84 × 10 ³	2.45 × 10 ³	3.68 × 10 ³	4.91 × 10 ³	6.14 × 10 ³	7.36 × 10 ³	8.59 × 10 ³	9.82 × 10 ³	1.10 × 10 ⁴	1.23 × 10 ⁴
	Pull	1.13 × 10 ³	1.70 × 10 ³	2.26 × 10 ³	3.39 × 10 ³	4.52 × 10 ³	5.65 × 10 ³	6.79 × 10 ³	7.92 × 10 ³	9.05 × 10 ³	1.02 × 10 ⁴	1.13 × 10 ⁴
ø140	Push	1.54 × 10 ³	2.31 × 10 ³	3.08 × 10 ³	4.62 × 10 ³	6.16 × 10 ³	7.70 × 10 ³	9.24 × 10 ³	1.08 × 10 ⁴	1.23 × 10 ⁴	1.39 × 10 ⁴	1.54 × 10 ⁴
	Pull	1.44 × 10 ³	2.16 × 10 ³	2.89 × 10 ³	4.33 × 10 ³	5.77 × 10 ³	7.22 × 10 ³	8.66 × 10 ³	1.01 × 10 ⁴	1.15 × 10 ⁴	1.30 × 10 ⁴	1.44 × 10 ⁴
ø160	Push	2.01 × 10 ³	3.02 × 10 ³	4.02 × 10 ³	6.03 × 10 ³	8.04 × 10 ³	1.01 × 10 ⁴	1.21 × 10 ⁴	1.41 × 10 ⁴	1.61 × 10 ⁴	1.81 × 10 ⁴	2.01 × 10 ⁴
	Pull	1.88 × 10 ³	2.83 × 10 ³	3.77 × 10 ³	5.65 × 10 ³	7.54 × 10 ³	9.42 × 10 ³	1.13 × 10 ⁴	1.32 × 10 ⁴	1.51 × 10 ⁴	1.70 × 10 ⁴	1.88 × 10 ⁴
ø180	Push	2.54 × 10 ³	3.82 × 10 ³	5.09 × 10 ³	7.63 × 10 ³	1.02 × 10 ⁴	1.27 × 10 ⁴	1.53 × 10 ⁴	1.78 × 10 ⁴	2.04 × 10 ⁴	2.29 × 10 ⁴	2.54 × 10 ⁴
	Pull	2.39 × 10 ³	3.58 × 10 ³	4.77 × 10 ³	7.16 × 10 ³	9.54 × 10 ³	1.19 × 10 ⁴	1.43 × 10 ⁴	1.67 × 10 ⁴	1.91 × 10 ⁴	2.15 × 10 ⁴	2.39 × 10 ⁴
ø200	Push	3.14 × 10 ³	4.71 × 10 ³	6.28 × 10 ³	9.42 × 10 ³	1.26 × 10 ⁴	1.57 × 10 ⁴	1.88 × 10 ⁴	2.20 × 10 ⁴	2.51 × 10 ⁴	2.83 × 10 ⁴	3.14 × 10 ⁴
	Pull	2.95 × 10 ³	4.42 × 10 ³	5.89 × 10 ³	8.84 × 10 ³	1.18 × 10 ⁴	1.47 × 10 ⁴	1.77 × 10 ⁴	2.06 × 10 ⁴	2.36 × 10 ⁴	2.65 × 10 ⁴	2.95 × 10 ⁴
ø250	Push	4.91 × 10 ³	7.36 × 10 ³	9.82 × 10 ³	1.47 × 10 ⁴	1.96 × 10 ⁴	2.45 × 10 ⁴	2.95 × 10 ⁴	3.44 × 10 ⁴	3.93 × 10 ⁴	4.42 × 10 ⁴	4.91 × 10 ⁴
	Pull	4.63 × 10 ³	6.94 × 10 ³	9.25 × 10 ³	1.39 × 10 ⁴	1.85 × 10 ⁴	2.31 × 10 ⁴	2.78 × 10 ⁴	3.24 × 10 ⁴	3.70 × 10 ⁴	4.16 × 10 ⁴	4.63 × 10 ⁴

How to order

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

A Mounting style
Note 1

B Bore size

C Port thread type

D Cushion

E Stroke length

F Option
Note 2

G Accessory
Note 4

⚠ Note on model no. selection

Note 1: For hole type trunnions, ø125 to 160 only will be available through custom order. For information such as external dimensions, consult as necessary.

Note 2: The instantaneous max. temperature is that at which sparks, swarf, etc., temporarily contact bellows.

Note 3: For the cushion needle position indication, check the drawing below.

Note 4: "I" and "Y" cannot be selected at the same time.

<Example of model number>

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

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

A Mounting style : Axial foot type

B Bore size : ø125 mm

C Port thread type : Rc thread

D Cushion : Both sides cushion

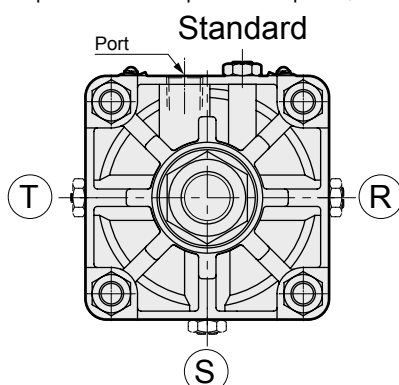
E Stroke length : 50 mm

F Option : Piston rod material change(Stainless steel)

G Accessory : Rod clevis

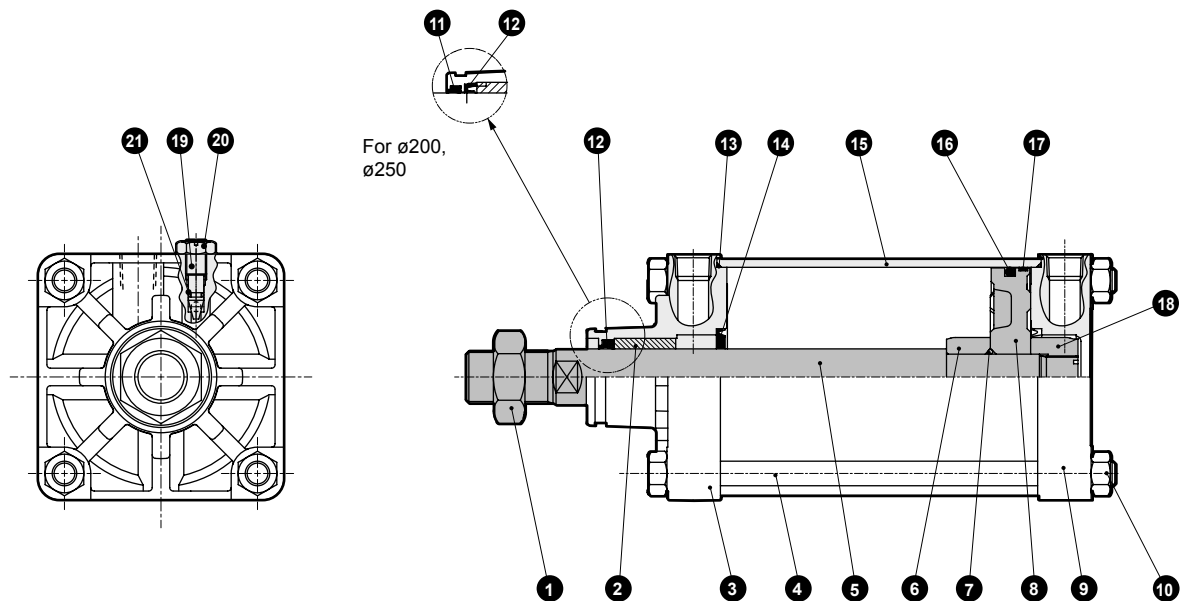
Cushion needle position

(Needle position with the port faced upward, from the rod direction)



Symbol	Descriptions	
A Mounting style		
00	Basic type	
LB	Axial foot type	
FA	Rod end flange type	
FB	Head end flange type	
CA	Eye bracket type	
CB	Clevis bracket type (with a pin and a snap ring)	
TC	Center trunnion type	
TA	Rod end trunnion type	
TB	Head end trunnion type	
TF	Intermediate supporting hole (Custom order)	
TD	Rod end supporting hole (Custom order)	
TE	Head end supporting hole (Custom order)	
B Bore size (mm)		
125	ø125	
140	ø140	
160	ø160	
180	ø180	
200	ø200	
250	ø250	
C Port thread type		
Blank	Rc thread	
N	NPT thread (Custom order)	
G	G thread (Custom order)	
D Cushion		
B	Both sides cushion	
R	Rod end cushion	
H	Head end cushion	
N	No cushion	
E Stroke length (mm)		
Bore size	Stroke length	Custom stroke length
ø125 to ø160	1 to 800	By 1 mm increment
ø180	1 to 900	
ø200	1 to 1000	
ø250	1 to 1200	
F Option		
C2	With a check valve on the cushion part	
L	Bellows	Max. ambient temperature 250°C Instantaneous max. temperature 400°C
M	Piston rod material (Stainless steel)	
Blank	Cushion needle position standard	Standard TR S
R	Cushion needle position R	
S	Cushion needle position S	
T	Cushion needle position T	
G Accessory		
I	Rod eye	
Y	Rod clevis (with a pin and a snap ring)	
B1	Eye bracket	
B2	Clevis bracket (with a pin and a snap ring)	

Internal structure and parts list



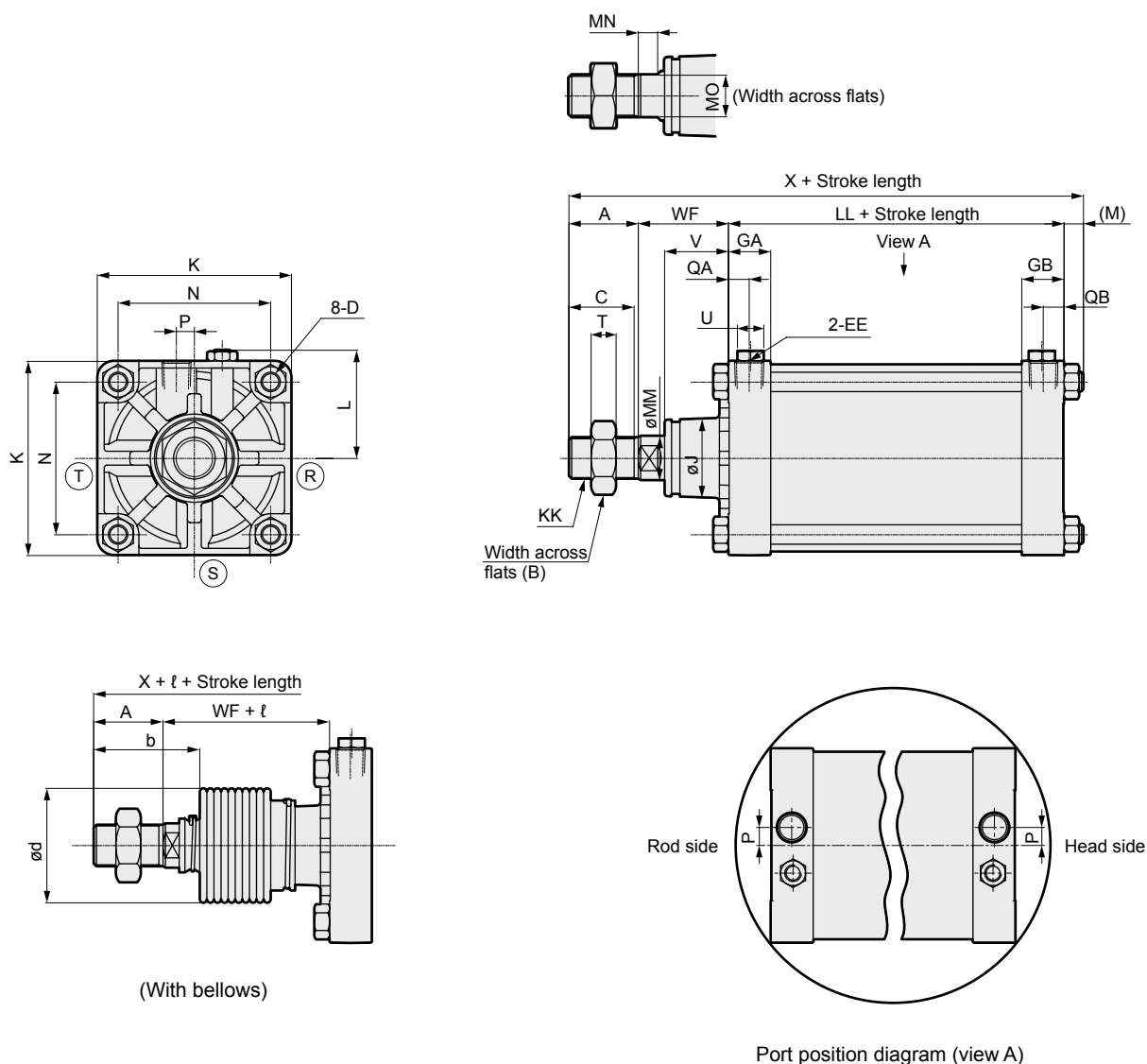
● Note: 14 19 20 21 are only for cushion type.

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-impregnated bearing metal		14	Cushion packing	Fluoro rubber, steel	
3	Rod cover	Aluminum alloy cast metal	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 phenol 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 (ø125 to ø180) Steel (ø200, 250)	Zinc chromate
8	Piston	Aluminum alloy cast metal		20	Hexagon nut	Steel	Zinc chromate
9	Head cover	Aluminum alloy cast metal	Chromate	21	Needle gasket	Fluoro rubber	
10	Hexagon nut	Steel	Zinc chromate				
11	Dust wiper	Fluoro rubber	ø200, 250 only				
12	Rod packing	Fluoro rubber					

Repair parts list

Bore size (mm)	Kit no.	Repair parts no.
ø125	SCS2-T-125K	
ø140	SCS2-T-140K	
ø160	SCS2-T-160K	12 13 14 16 17 21
ø180	SCS2-T-180K	
ø200	SCS2-T-200K	
ø250	SCS2-T-250K	11 12 13 14 16 17 21

Dimensions



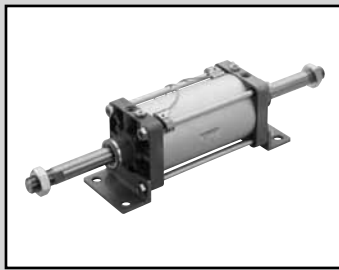
Note 1: (R)(S)(T) indicate the positions of cushion needles.

Note 2: For the l dimensions, the decimal places have been rounded out.

Note 3: Refer to dimensions on page 14 for the accessories.

Symbol	Basic type (00) Basic dimensions																
Bore size (mm)	A	B	C	D	EE	GA	GB	J	K	KK	L	LL	M	MM	MN	MO	N
ø125	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
ø140	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
ø160	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
ø180	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
ø200	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
ø250	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
Symbol										With bellows							
Bore size (mm)	P	QA	QB	T	U	V	WF	X	b	d	ℓ						
ø125	13	15	15	18	19	45.5	65	220.5	74	75	(Stroke length/4.55) + 11						
ø140	15	17	17	18	19	45.5	67	233.5	74	75	(Stroke length/4.55) + 9						
ø160	15	17	17	21	19	48	71	248.5	81	80	(Stroke length/5.15) + 9						
ø180	15	17	17	24	19	53	78	268.5	90	90	(Stroke length/5.15) + 9						
ø200	20	18	18	27	24	60	88	301.5	102	95	(Stroke length/5.30) + 9						
ø250	22	21	21	34	24	64	94	344.5	120	120	(Stroke length/6.40) + 9						

Note: The dimensions of the individual mounting styles are the same as those of the double acting SCS2 Series. Refer to page 6 to 13.

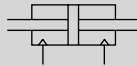


Large bore size cylinder
Double acting/double rod/lubrication type/non-lubrication type

SCS2-D Series

● Bore size: $\phi 125$, $\phi 140$, $\phi 160$, $\phi 180$, $\phi 200$, $\phi 250$

JIS symbol



RoHS

* Custom order

Specifications

Descriptions		SCS2-D/SCS2-LND(Double rod type)						
Bore size	mm	ø125	ø140	ø160	ø180	ø200	ø250	
Actuation		Double acting						
Working fluid		Compressed air						
Max. working pressure	MPa	1.0						
Min. working pressure	MPa	0.1						
Proof pressure	MPa	1.6						
Ambient temperature		-5 to 60 (no freezing)						
Port size		Rc 1/2	Rc 3/4				Rc1	
Stroke tolerance		+1.0 (to 300), +0.4 (to 1000), +0.8 (to 1200)						
Working piston speed		20 to 1000 (Use within the allowable energy absorption range.)						
Cushion		Air cushion						
Effective air cushion length		mm	21.6	21.6	21.6	21.6	26.6	26.6
Lubrication		For SCS-D, required (when lubricating, use turbine oil Class 1 ISO VG32.); for SCS-LND, not required						
Allowable energy absorption	With cushion	J	63.5	91.5	116	152	233	362
		J	0.371	0.386	0.386	0.958	1.08	2.32
	No cushion	The type without cushioning cannot absorb a large energy generated by an external load. We recommend to install an external shock absorber.						

Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Trunnion type min. stroke length (mm)
ø125	50•75•100•150• 200•250•300	800	1	23
ø140				25
ø160		900		27
ø180				28
ø200		1,000		28
ø250		1,200		28

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

Note 2: If the max. stroke is exceeded, product specifications may not be met, depending on operating conditions. Contact CKD for details.

Min. stroke length with switch

Descriptions		Stroke length with same surface installation	Stroke length of intermediate supporting hole	Stroke length of rod end supporting hole	Stroke length of head end supporting hole
Bore size (mm)	Diagram				
Switch type	Bore				
Reed switch (T*)	$\phi 125$	20 and over	120 and over	70 and over	
	$\phi 140$		125 and over	75 and over	
	$\phi 160$		130 and over	80 and over	
	$\phi 180$		135 and over	85 and over	
	$\phi 200$		140 and over	90 and over	
	$\phi 250$		150 and over	100 and over	

Switch specifications

- 1-color/2-color indicator type, strong 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 order)	T3YH/ T3YV	T3WH/ T3WV	T0H/T0V		T5H/T5V		T8H/T8V			T2YD T2YDT
Applications	Programmable controller relay, small solenoid valve	Programmable controller			Programmable controller, relay				Programmable controller, relay		Programmable controller, relay IC circuit (without indicator light), serial connection		Programmable controller, relay			Programmable controller
Output method	-				NPN output	PNP output	NPN output	NPN output	-							
Power voltage	-				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 (Note 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 light	LED (ON lighting)	LED (ON lighting)	Red/green LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Yellow LED (ON lighting)	Red/green LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)		Without indicator light		LED (ON lighting)			Red/green LED (ON lighting)
Leakage current	For 100 VAC, 1 mA or less; for 200 VAC, 2 mA or less	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 3m: 49 5m: 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: 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: 272

Note 1: Above-mentioned load current's max. value 20 mA is for 25°C. The current will be lower than 20 mA if ambient temperature around the switch is higher than 25°C.
(5 to 10 mA when 60°C.)

Note 2: A strong magnetic field proof switch (T2YD) cannot be used in environments with direct current magnetic fields.

Cylinder mass

(Unit: kg)

Descriptions/Mounting style	Weight when stroke length (S) = 0 mm						Switch weight		Additional weight per S = 100 mm
	Basic type (00)	Axial foot type (LB)	Flange type (FA/FB)	Eye bracket type (CA)	Clevis bracket type (CB)	Trunnion type (TA/TB/TC)	Switch	Mounting bracket	
ø125	9.02	10.52	12.32	12.02	12.12	12.42	Switch Refer to the mass shown in the specifications.	0.028	2.17
ø140	10.95	12.95	16.35	14.75	14.95	14.15		0.030	2.41
ø160	15.05	18.15	21.95	20.05	20.35	21.45		0.034	3.21
ø180	20.15	24.65	32.15	27.55	28.05	28.25		0.038	4.21
ø200	27.68	33.38	41.38	37.18	37.38	39.48		0.040	5.08
ø250	48.51	56.91	74.41	72.51	67.01	77.21		0.045	7.60

(Example)

Weight of SCS2-LND-LB-125B-300-TOH-D

- Weight when S = 0 mm 10.52 kg
- Additional weight when S = 300 mm $2.17 \times \frac{300}{100} = 6.51$ kg
- Weight of two switches (TOH-D) $0.018 \times 2 = 0.036$ kg
- Weight of two switch brackets 0.028×0.056 kg
- 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
ø125	Push/Pull	1.13×10^3	1.70×10^3	2.26×10^3	3.39×10^3	4.52×10^3	5.65×10^3	6.79×10^3	7.92×10^3	9.05×10^3	1.02×10^4	1.13×10^4
ø140	Push/Pull	1.44×10^3	2.16×10^3	2.89×10^3	4.33×10^3	5.77×10^3	7.22×10^3	8.66×10^3	1.01×10^4	1.15×10^4	1.30×10^4	1.44×10^4
ø160	Push/Pull	1.88×10^3	2.83×10^3	3.77×10^3	5.65×10^3	7.54×10^3	9.42×10^3	1.13×10^4	1.32×10^4	1.51×10^4	1.70×10^4	1.88×10^4
ø180	Push/Pull	2.39×10^3	3.58×10^3	4.77×10^3	7.16×10^3	9.54×10^3	1.19×10^4	1.43×10^4	1.67×10^4	1.91×10^4	2.15×10^4	2.39×10^4
ø200	Push/Pull	2.95×10^3	4.42×10^3	5.89×10^3	8.84×10^3	1.18×10^4	1.47×10^4	1.77×10^4	2.06×10^4	2.36×10^4	2.65×10^4	2.95×10^4
ø250	Push/Pull	4.63×10^3	6.94×10^3	9.25×10^3	1.39×10^4	1.85×10^4	2.31×10^4	2.78×10^4	3.24×10^4	3.70×10^4	4.16×10^4	4.63×10^4

How to order

Without switch (Lubrication type)

SCS2-D — LB — 125 — B — 50 — J — I

With switch (Non-lubrication type)

SCS2-LND — LB — 125 — B — 50 — R0 — R — J — I

A Mounting style
Note 1

B Bore size

C Port thread type

D Cushion

E Stroke length
Note 2

F Switch model no.

Note on model no. selection

Note 1: For hole type trunnions, ø125 to 160 only will be available through custom order. For information such as external dimensions, consult as necessary.

Note 2: Refer to page 23 for min. stroke length with switch. When selecting TA or TB for mounting, the number of switches is limited to "H" (one on head side) for TA, and "R" (one on rod side) for TB.

Note 4: The instantaneous max. temperature is that at which sparks, swarf, etc., temporarily contact bellows.

Note 5: For the cushion needle position indication, refer to page 26.

<Example of model number>

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

Model: Large bore size cylinder, double acting/double rod type switch-fitted

- A Mounting style : Axial foot type
- B Bore size : ø125 mm
- C Port thread type : Rc thread
- D Cushion : Both sides cushion
- E Stroke length : 50 mm
- F Switch model no. : Reed T0H, lead wire 1 m
- G Switch quantity : One on rod end
- H Option : Bellows material/for maximum ambient temperature 60°C
- I Accessory : Rod clevis

G Switch quantity
Note 3

H Option
Note 4

I Accessory

Symbol	Descriptions
A Mounting style	
00	Basic type
LB	Axial foot type
FA	Rod end flange type
FB	Head end flange type
TC	Center trunnion type
TA	Rod end trunnion type
TB	Head end trunnion type
TF	Intermediate supporting hole (Custom order)
TD	Rod end supporting hole (Custom order)
TE	Head end supporting hole (Custom order)

B Bore size (mm)	
125	ø125
140	ø140
160	ø160
180	ø180
200	ø200
250	ø250

C Port thread type	
Blank	Rc thread
N	NPT thread (Custom order)
G	G thread (Custom order)

D Cushion	
B	Both sides cushion
R	Rod end cushion
H	Head end cushion
N	No cushion

E Stroke length (mm)		
Bore size	Stroke length Note 2	Custom stroke length
ø125 to ø160	1 to 800	By 1 mm increment
ø180	1 to 900	
ø200	1 to 1000	
ø250	1 to 1200	

F Switch model no.						
Rectilinear wire	L type wire	Contact	Voltage AC DC		Indicator	Lead wire
T0H*	T0V*	Reed	●	●	1 color indicator type	2 wire
T5H*	T5V*		●	●	Without indicator light	
T8H*	T8V*		●	●	1 color indicator type	
T1H*	T1V*	Proximity	●		1 color indicator type	2 wire
T2H*	T2V*			●		
T3H*	T3V*			●		
T3PH*	T3PV*			●	1 color indicator type (PNP output) (custom order)	3 wire
T2WH*	T2WV*			●		
T2YH*	T2YV*			●	2 color indicator	2 wire
T3WH*	T3WV*			●		
T3YH*	T3YV*			●		
T2YD*	-			●	For strong magnetic fields (exclusively for AC magnetic fields)	2 wire
T2YD†*	-			●		
T2JH*	T2JV*			●	Off delay type	2 wire

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

G Switch quantity	
R	One on rod end
H	One on head end
D	Two
T	Three
4	Four

H Option	
C2	With a check valve on the cushion part
J	Bellows
K	Bellows
L	Bellows
M	Piston rod material (Stainless steel)
Blank	Cushion needle position standard
R	Cushion needle position R
S	Cushion needle position S
T	Cushion needle position T
P6	Copper and PTFE free (custom order)

I Accessory	
I	Rod eye
Y	Rod clevis (with a pin and a snap ring)
B1	Eye bracket
B2	Clevis bracket (with a pin and a snap ring)

How to order switch

● Switch body + mounting bracket set

SCS2-LN - T0H - 125

Switch model no.
(Previous page, section ⑤)

Bore size
(Previous page, section ③)

● Switch body only

SW - T0H

Switch model no.
(Previous page, section ⑤)

● Mounting bracket set

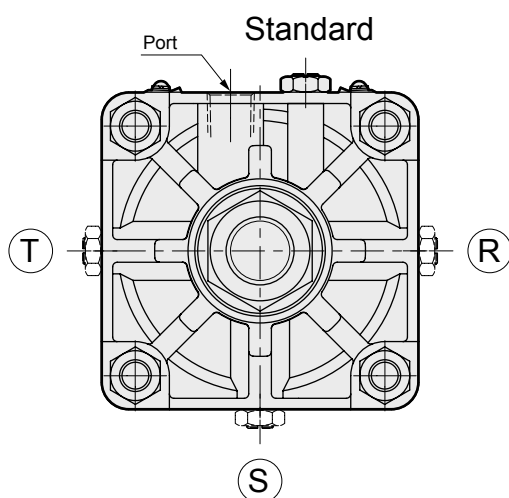
SCS2-LN - TS - 125

Bore size
(Previous page, section ③)

Mounting bracket

TS	T type switch
T	T2YD type switch

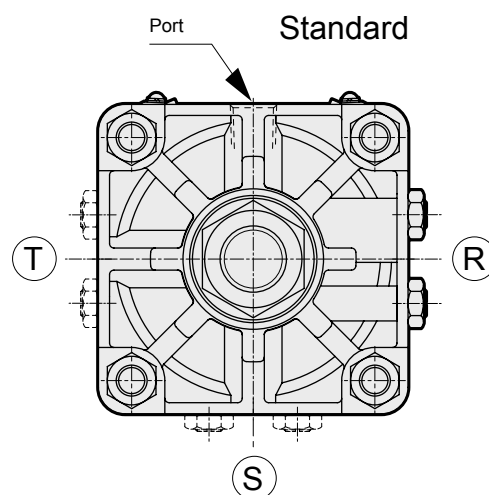
Cushion needle position (Needle position with the port faced upward, from the rod direction)



If the option R, S, or T is selected for the Class-2 pressure vessel test, the port position will be centered, and the needle positions will be offset as shown in the right illustration.

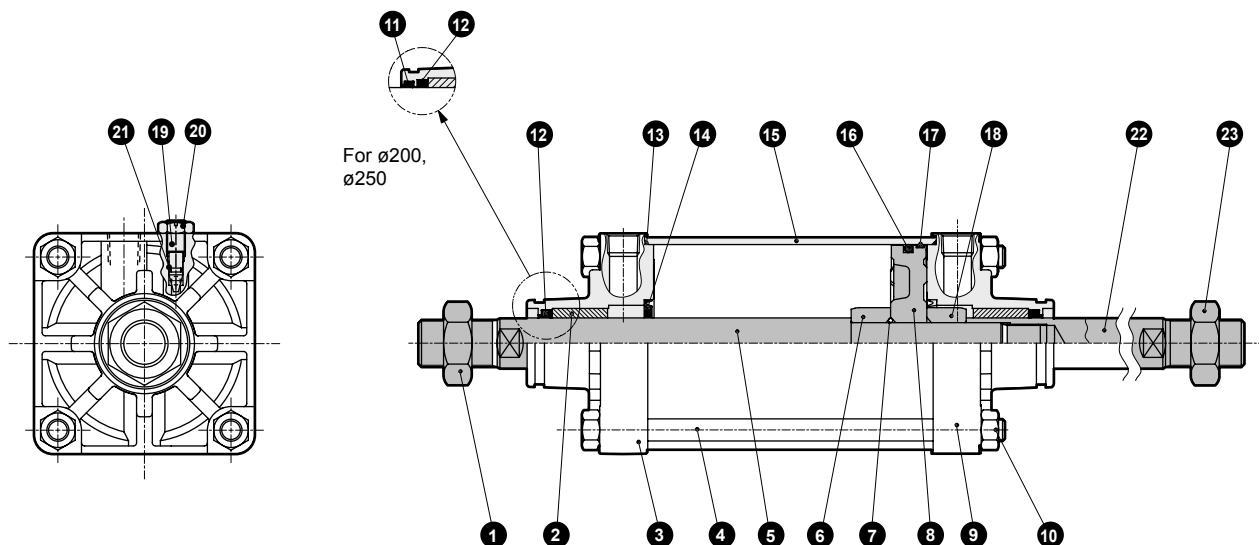
Stroke for Class-2 pressure vessel test

Bore size	Stroke length
ø200	946 and over
ø250	752 and over



Options R, S, and T for Class-2 pressure vessel test

Internal structure and parts list



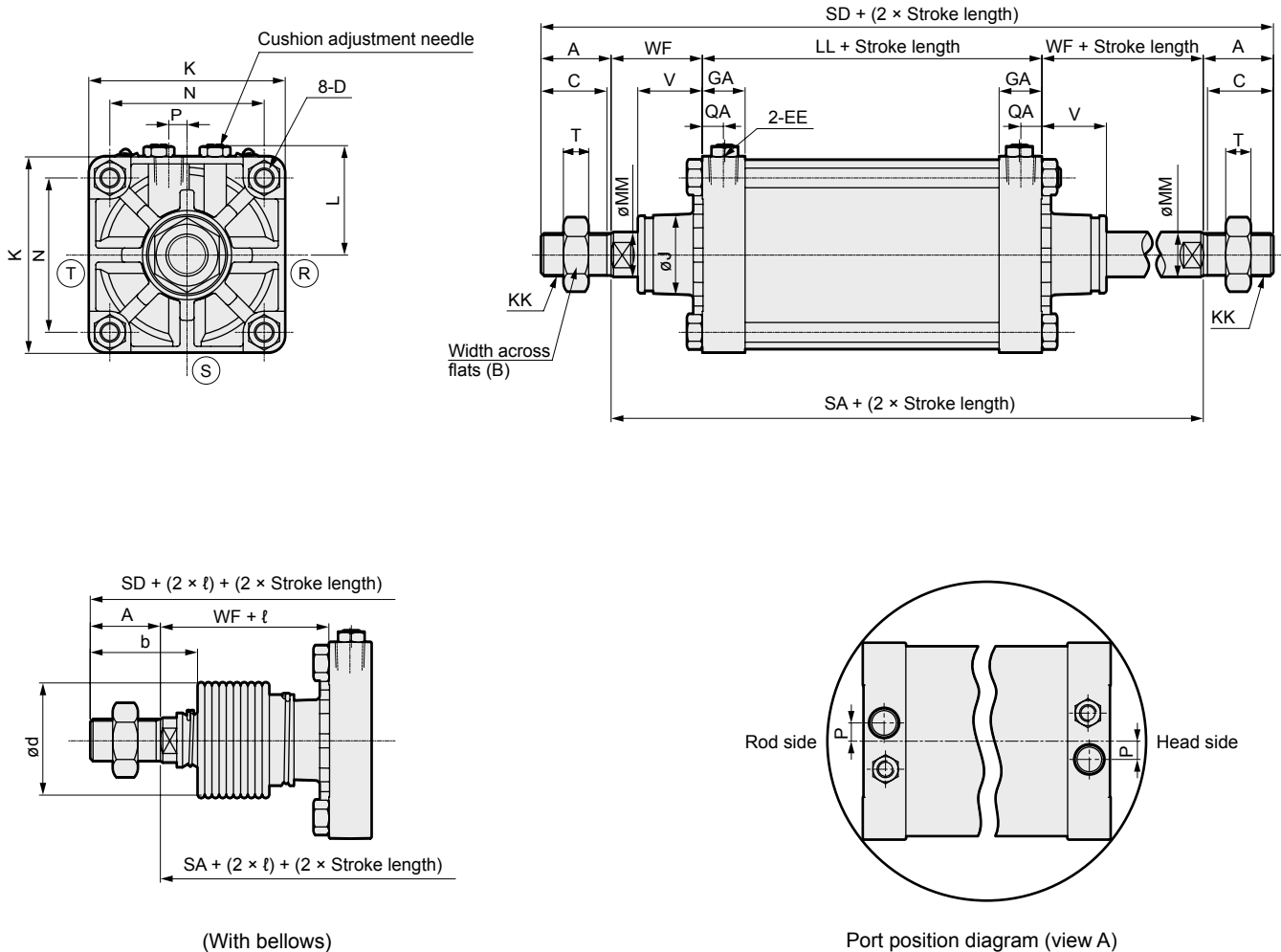
● Note: 14 19 20 21 are only for cushion type.

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 metal		14	Cushion packing	Nitrile rubber/steel	
3	Rod cover	Aluminum alloy cast metal	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 (ø125 to ø180) Copper (ø200, 250)	Zinc chromate
8	Piston	Aluminum alloy cast metal		20	Hexagon nut	Steel	Zinc chromate
9	Head cover	Aluminum alloy cast metal	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	ø200, 250 only	23	Hexagon nut	Steel	Zinc chromate
12	Rod packing	Nitrile rubber					

Repair parts list

Bore size (mm)	Kit no.	Repair parts no.
ø125	SCS2-D-125K	
ø140	SCS2-D-140K	
ø160	SCS2-D-160K	12 13 14 16 17 21
ø180	SCS2-D-180K	
ø200	SCS2-D-200K	
ø250	SCS2-D-250K	11 12 13 14 16 17 21

Dimensions



Note 1: (R)(S)(T) indicate the positions of cushion needles.

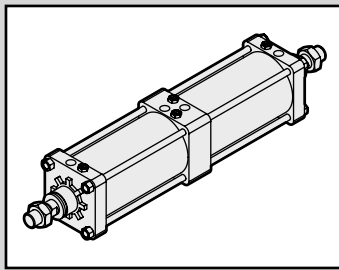
Note 2: The position of the width across flats for the right and left wrench hanging has not been specially determined.

Note 3: Refer to dimensions on page 14 for the accessories.

Symbol	Basic type (00) Basic dimensions										
Bore size (mm)	A	B	C	D	EE	GA	J	K	KK	L	LL
ø125	50	46	47	M14 × 1.5	Rc1/2	32	57	140	M30 × 1.5	78 to 82	92
ø140	50	46	47	M14 × 1.5	Rc3/4	36	57	157	M30 × 1.5	86.5 to 91	103
ø160	56	55	53	M16 × 1.5	Rc3/4	38.5	62	177	M36 × 1.5	96.5 to 101	106
ø180	63	60	60	M18 × 1.5	Rc3/4	39.5	68	200	M40 × 1.5	108 to 112	110
ø200	72	70	69	M20 × 1.5	Rc3/4	44.5	75	220	M45 × 1.5	120.5 to 129	123
ø250	88	85	84	M24 × 1.5	Rc1	49.5	93	274	M56 × 2	147.5 to 156	141

Symbol										With bellows		
Bore size (mm)	MM	N	P	QA	SA	SD	T	V	WF	b	d	ℓ
ø125	32	110	13	15	222	322	18	45.5	65	74	75	(Stroke length/4.55) + 11
ø140	32	124	15	17	237	337	18	45.5	67	74	75	(Stroke length/4.55) + 9
ø160	40	142	15	17	248	360	21	48	71	81	80	(Stroke length/5.15) + 9
ø180	45	160	15	17	266	392	24	53	78	90	90	(Stroke length/5.15) + 9
ø200	50	175	20	18	299	443	27	60	88	102	95	(Stroke length/5.30) + 9
ø250	60	216	22	21	329	505	34	64	94	120	120	(Stroke length/6.40) + 9

Note: The dimensions of the individual mounting styles are the same as those of the double acting SCS2 Series.
Refer to page 6 to 13.

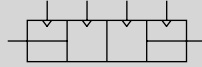


Large bore size cylinder
Double acting/back to back type

SCS2-B Series

● Bore size: ø125, ø140, ø160, ø180, ø200, ø250

JIS symbol



RoHS

* Custom order

Specifications

Descriptions		SCS2-B (Back to back type)					
Bore size	mm	ø125	ø140	ø160	ø180	ø200	ø250
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0					
Min. working pressure	MPa	0.05					
Proof pressure	MPa	1.6					
Ambient temperature		-5 to 60 (no freezing)					
Port size		Rc 1/2	Rc 3/4				Rc1
Stroke tolerance		$^{+1.0}_0$ (to 300), $^{+1.4}_0$ (to 1000), $^{+1.8}_0$ (to 1200)					
Working piston speed		20 to 1000 (Use within the allowable energy absorption range.)					
Cushion		Air cushion					
Effective air cushion length		mm	21.6	21.6	21.6	21.6	26.6
Lubrication		Required (when lubricating, use turbine oil Class 1 ISO VG32.)					
Allowable energy absorption J	With cushion	63.5	91.5	116	152	233	362
	No cushion	0.371	0.386	0.386	0.958	1.08	2.32
		The type without cushioning cannot absorb a large energy generated by an external load. We recommend to install an external shock absorber.					

Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Trunnion type min. stroke length (mm)
ø125	50•75•100•150• 200•250•300	800	1	23
ø140				25
ø160				27
ø180		900		28
ø200		1,000		28
ø250		1,200		28

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

Cylinder mass

(Unit: kg)

Descriptions/Mounting style	Weight when stroke length (S) = 0 mm						Additional weight per S = 100 mm
	Basic type (00)	Axial foot type (LB)	Flange type (FA/FB)	Eye bracket type (CA)	Clevis bracket type (CB)	Trunnion type (TA/TB/TC)	
ø125	14.44	15.94	17.74	17.44	17.54	17.84	1.54
ø140	18.70	20.70	24.10	22.50	22.70	21.90	1.78
ø160	24.70	27.80	31.60	29.70	30.00	31.10	2.22
ø180	33.50	38.00	45.50	40.90	41.40	41.60	2.96
ø200	45.56	51.26	59.26	55.06	55.26	57.36	3.54
ø250	81.02	89.42	106.92	105.02	99.52	109.72	5.38

(Example) Weight of SCS2-B-LB-125B-300-300

- Weight when S = 0 mm 15.94 kg
- Additional weight when S = 300 mm $2 \times 1.54 \times \frac{300}{100} = 9.24$ kg
- Weight $15.94 + 9.24 = 25.18$ kg

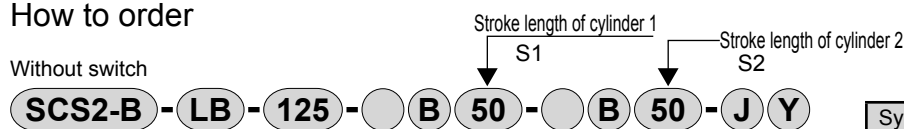
Theoretical thrust table

(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
ø125	Push	1.23×10^3	1.84×10^3	2.45×10^3	3.68×10^3	4.91×10^3	6.14×10^3	7.36×10^3	8.59×10^3	9.82×10^3	1.10×10^4	1.23×10^4
	Pull	1.13×10^3	1.70×10^3	2.26×10^3	3.39×10^3	4.52×10^3	5.65×10^3	6.79×10^3	7.92×10^3	9.05×10^3	1.02×10^4	1.13×10^4
ø140	Push	1.54×10^3	2.31×10^3	3.08×10^3	4.62×10^3	6.16×10^3	7.70×10^3	9.24×10^3	1.08×10^4	1.23×10^4	1.39×10^4	1.54×10^4
	Pull	1.44×10^3	2.16×10^3	2.89×10^3	4.33×10^3	5.77×10^3	7.22×10^3	8.66×10^3	1.01×10^4	1.15×10^4	1.30×10^4	1.44×10^4
ø160	Push	2.01×10^3	3.02×10^3	4.02×10^3	6.03×10^3	8.04×10^3	1.01×10^4	1.21×10^4	1.41×10^4	1.61×10^4	1.81×10^4	2.01×10^4
	Pull	1.88×10^3	2.83×10^3	3.77×10^3	5.65×10^3	7.54×10^3	9.42×10^3	1.13×10^4	1.32×10^4	1.51×10^4	1.70×10^4	1.88×10^4
ø180	Push	2.54×10^3	3.82×10^3	5.09×10^3	7.63×10^3	1.02×10^4	1.27×10^4	1.53×10^4	1.78×10^4	2.04×10^4	2.29×10^4	2.54×10^4
	Pull	2.39×10^3	3.58×10^3	4.77×10^3	7.16×10^3	9.54×10^3	1.19×10^4	1.43×10^4	1.67×10^4	1.91×10^4	2.15×10^4	2.39×10^4
ø200	Push	3.14×10^3	4.71×10^3	6.28×10^3	9.42×10^3	1.26×10^4	1.57×10^4	1.88×10^4	2.20×10^4	2.51×10^4	2.83×10^4	3.14×10^4
	Pull	2.95×10^3	4.42×10^3	5.89×10^3	8.84×10^3	1.18×10^4	1.47×10^4	1.77×10^4	2.06×10^4	2.36×10^4	2.65×10^4	2.95×10^4
ø250	Push	4.91×10^3	7.36×10^3	9.82×10^3	1.47×10^4	1.96×10^4	2.45×10^4	2.95×10^4	3.44×10^4	3.93×10^4	4.42×10^4	4.91×10^4
	Pull	4.63×10^3	6.94×10^3	9.25×10^3	1.39×10^4	1.85×10^4	2.31×10^4	2.78×10^4	3.24×10^4	3.70×10^4	4.16×10^4	4.63×10^4

How to order

Without switch



A Mounting style

B Bore size

C Port thread type

C Port thread type

D Cushion
= S1

D Cushion
= S2

E Stroke length = S1

E Stroke length = S2

F Option
Note 2

Note on model no. selection

Note 1: For hole type trunnions, ø125 to 160 only will be available through custom order. For information such as external dimensions, consult as necessary.

Note 2: The instantaneous max. temperature is that at which sparks, swarf, etc., temporarily contact bellows.

Note 3: For the cushion needle position indication, check the drawing below.

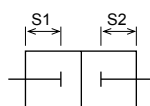
<Example of model number>

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

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

- A Mounting style : Axial foot type
- B Bore size : ø125 mm
- C Port thread type : Rc thread
- D Cushion : Both sides air cushion
- E Stroke length S1 : 50 mm
- F Port thread type : Rc thread
- G Cushion : Both sides air cushion
- H Stroke length S2 : 50 mm
- I Option : Bellow material/for max. ambient temperature 60°C
- J Accessory : Rod clevis

Indication of the stroke length of cylinder 1 with 50 mm S1
+ Indication of the stroke length of cylinder 2 with 50 mm S2
Total stroke length: 100 mm S1 + S2



Note 3

G Accessory

Symbol	Descriptions
A Mounting style	
00	Basic type
LB	Axial foot type
FA	Rod end flange type
TA	Rod end trunnion type
TB	Head end trunnion type
TD	Rod end supporting hole (Custom order)
TE	Head end supporting hole (Custom order)

B Bore size (mm)	
125	ø125
140	ø140
160	ø160
180	ø180
200	ø200
250	ø250

C Port thread type	
Blank	Rc thread
N	NPT thread (Custom order)
G	G thread (Custom order)

D Cushion	
B	Both sides cushion
R	Rod end cushion
H	Head end cushion
N	No cushion

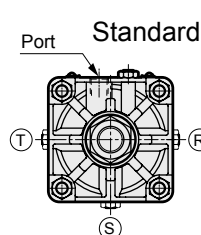
E Stroke length (mm)		
Bore size	Stroke length	Custom stroke length
ø125 to ø160	1 to 800	By 1 mm increment
ø180	1 to 900	
ø200	1 to 1000	
ø250	1 to 1200	

F Option			
C2	With a check valve on the cushion part		
		Max. ambient temperature	Instantaneous ambient temperature
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 TR S
R	Cushion needle position R		
S	Cushion needle position S		
T	Cushion needle position T		

G Accessory	
I	Rod eye
Y	Rod clevis (with a pin and a snap ring)
B1	Eye bracket
B2	Clevis bracket (with a pin and a snap ring)

Cushion needle position

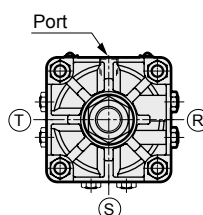
(Needle position with the port faced upward, from the rod direction)



If the option R, S, or T is selected for the Class-2 pressure vessel test, the port position will be centered, and the needle positions will be offset as shown in the right illustration.

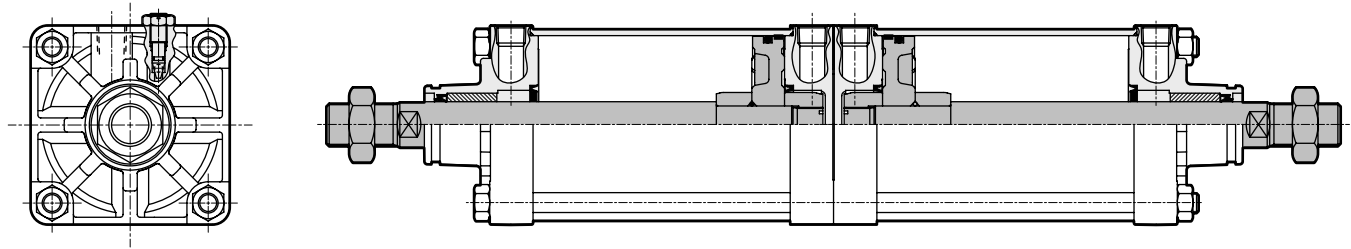
Stroke for Class-2 pressure vessel test

Bore size	Stroke length
ø180	1481 and over
ø200	892 and over
ø250	690 and over



Options R, S, and T for Class-2 pressure vessel test

Internal structure



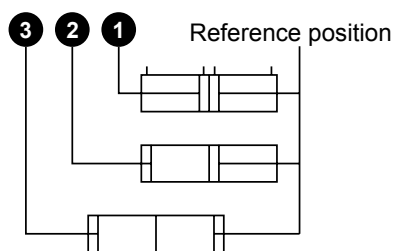
Note: Parts list is the same as those of the double acting SCS2 and two sets are needed. Refer to page 4.

Repair parts list

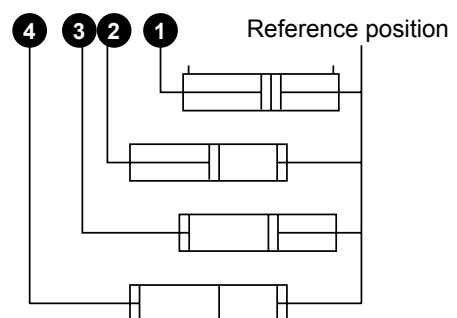
Same as those of the SCS2 Series. (Two sets are needed.) Refer to page 4.

Usage example

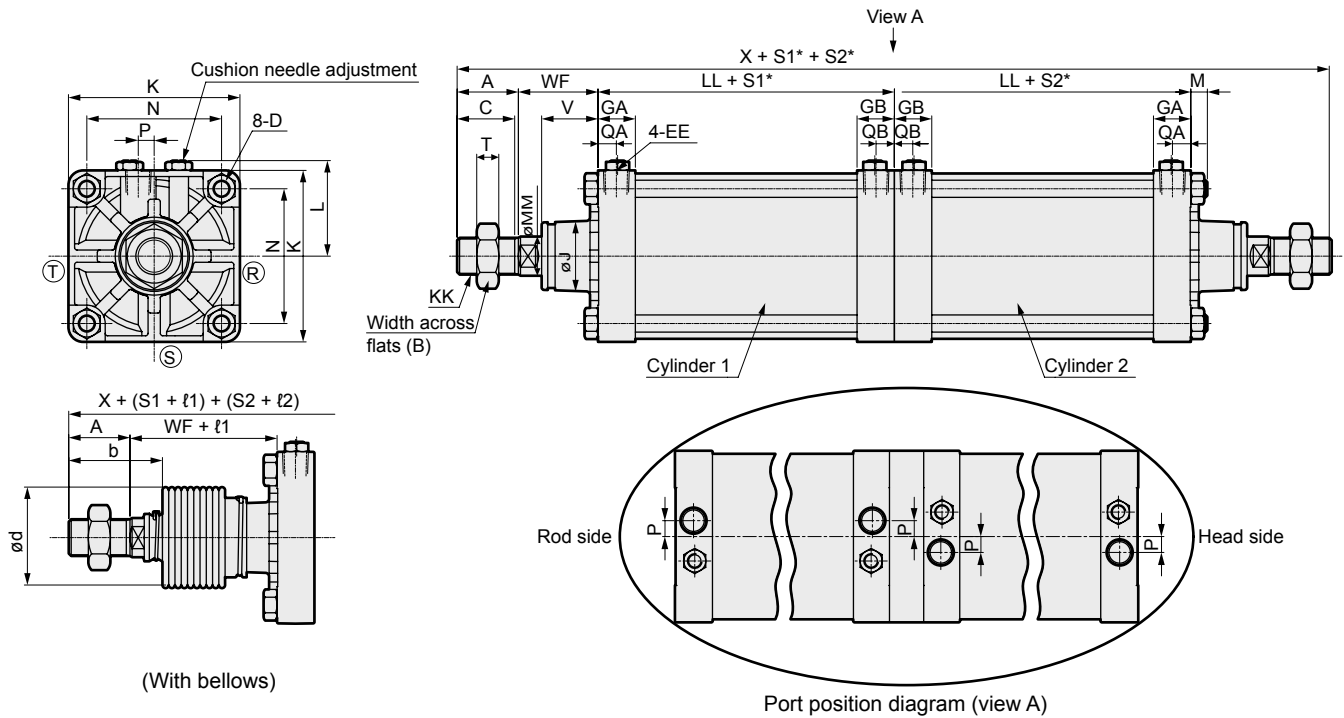
When combined with the same stroke length Three positions are available.



When combined with a different stroke length Four positions are available.



Dimensions



Note 1: (R)(S)(T) indicate the positions of cushion needles.

Note 2: Refer to dimensions on page 14 for the accessories.

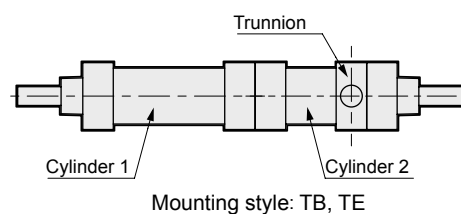
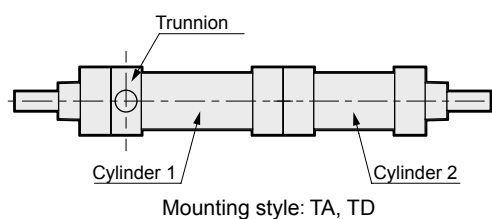
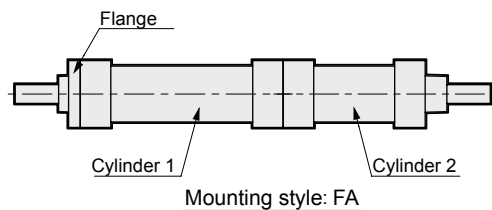
*For S1, stroke length of cylinder 1; for S2, stroke length of cylinder 2

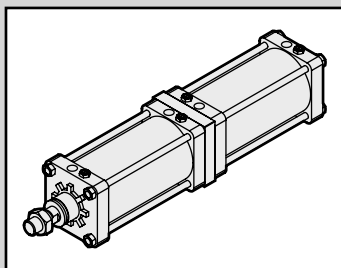
Symbol	A	B	C	D	EE	GA	GB	J	K	KK	L	LL	M	MM	N	T
Bore size (mm)																
ø125	50	46	47	M14 × 1.5	Rc1/2	30.5	30.5	57	140	M30 × 1.5	78 to 82	92	13.5	32	110	18
ø140	50	46	47	M14 × 1.5	Rc3/4	34.5	34.5	57	157	M30 × 1.5	86.5 to 91	103	13.5	32	124	18
ø160	56	55	53	M16 × 1.5	Rc3/4	34.5	34.5	62	177	M36 × 1.5	96.5 to 101	106	15.5	40	142	21
ø180	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
ø200	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
ø250	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

Symbol	P	QA	QB	V	WF	X	With bellows			
Bore size (mm)							b	d	ℓ	
ø125	13	15	15	45.5	65	414	74	75	(Stroke length/4.55) + 11	
ø140	15	17	17	45.5	67	440	74	75	(Stroke length/4.55) + 9	
ø160	15	17	17	48	71	466	81	80	(Stroke length/5.15) + 9	
ø180	15	17	17	53	78	502	90	90	(Stroke length/5.15) + 9	
ø200	20	18	18	60	88	566	102	95	(Stroke length/5.30) + 9	
ø250	22	21	21	64	94	646	120	120	(Stroke length/6.40) + 9	

Note: The dimensions of the individual mounting styles are the same as those of the double acting SCS2 Series.

Refer to page 6 to 13. For the flange type (mounting style: FA) and trunnion type (mounting style: TA/TB/TD/TE), the mounting positions are as shown below:





Large bore size cylinder
Double acting/two stage type

SCS2-W Series

● Bore size: ø125, ø140, ø160, ø180, ø200, ø250

RoHS

* Custom order

Specifications

Descriptions		SCS2-W (Two stage type)					
Bore size	mm	ø125	ø140	ø160	ø180	ø200	ø250
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0					
Min. working pressure	MPa	0.1					
Proof pressure	MPa	1.6					
Ambient temperature		-5 to 60 (no freezing)					
Port size		Rc 1/2	Rc 3/4				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 (Use within the allowable energy absorption range.)					
Cushion		Air cushion					
Effective air cushion length	mm	21.6	21.6	21.6	21.6	26.6	26.6
Lubrication		Required (when lubricating, use turbine oil Class 1 ISO VG32.)					
Allowable energy absorption J	With cushion	63.5	91.5	116	152	233	362
	No cushion	0.371	0.386	0.386	0.958	1.08	2.32
		The type without cushioning cannot absorb a large energy generated by an external load. We recommend to install an external shock absorber.					

Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Trunnion type min. stroke length (mm)
ø125	50•75•100•150• 200•250•300	800	2 (Total stroke length)	23
ø140				25
ø160		900		27
ø180				28
ø200				28
ø250				28

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

Cylinder mass

(Unit: kg)

Descriptions/Mounting style	Weight when stroke length (S) = 0 mm						Additional weight per S = 100 mm
	Basic type (00)	Axial foot type (LB)	Flange type (FA/FB)	Eye bracket type (CA)	Clevis bracket type (CB)	Trunnion type (TA/TB/TC)	
ø125	18.62	20.12	21.92	21.62	21.72	22.02	1.54
ø140	23.99	25.99	29.39	27.79	27.99	27.19	1.78
ø160	31.38	34.48	38.28	36.38	36.68	37.78	2.22
ø180	43.50	48.00	55.50	50.90	51.40	51.60	2.96
ø200	58.38	64.08	72.08	67.88	68.08	70.18	3.54
ø250	103.53	111.93	129.43	127.53	122.03	132.23	5.38

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

- Weight when S = 0 mm..... 20.12 kg
- Additional weight when S = 300 mm... $2 \times 1.54 \times \frac{300}{100} = 9.24$ kg
- Weight..... $20.12 + 9.24 = 29.36$ kg

How to order

Without switch

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

Total stroke length

S1

1st stage stroke length

S2

A Mounting style
Note 1

B Bore size

C Port thread type C Port thread type

D Cushion
= S1

D Cushion
= S2

E Stroke length = S1

E Stroke length = S2
Note 2

F Option
Note 3

Note 4

G Accessory

⚠ Note on model no. selection

Note 1: For hole type trunnions, ø125 to 160 only will be available through custom order. For information such as external dimensions, consult as necessary.

Note 2: The max. stroke length of S2 (1st stage) is 200 mm.

Note 3: The instantaneous max. temperature is that at which sparks, swarf, etc., temporarily contact bellows.

Note 4: For the cushion needle position indication, check the drawing below.

<Example of model number>

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

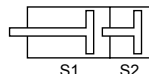
Model: Large bore size cylinder double acting/two stage type

- A Mounting style : Axial foot type
- B Bore size : ø125 mm
- C Port thread type : Rc thread
- D Cushion : Both sides cushion
- E Stroke length S1 : Total stroke length 200 mm
- F Port thread type : Rc thread
- G Cushion : Both sides cushion
- H Stroke length S2 : 1st stage stroke length 50 mm
- I Option : Bellows material/for max. ambient temperature 60°C
- J Accessory : Rod clevis

Cylinder 1

Cylinder 2

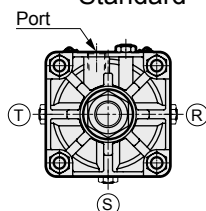
Indication of the 1st stage stroke length with 50 mm S2
+ Indication of the 2nd stage stroke length with 150 mm
Total stroke length: Indication with 200 mm S1



Cushion needle position

(Needle position with the port faced upward, from the rod direction)

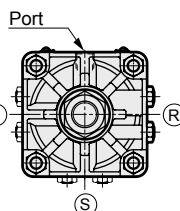
Standard



If the option R, S, or T is selected for the Class-2 pressure vessel test, the port position will be centered, and the needle positions will be offset as shown in the right illustration.

Stroke for Class-2 pressure vessel test

Bore size	Stroke length
ø200	892 and over
ø250	690 and over



Options R, S, and T for Class-2 pressure vessel test

Symbol	Descriptions
A Mounting style	
00	Basic type
LB	Axial foot type
FA	Rod end flange type
FB	Head end flange type
CA	Eye bracket type
CB	Clevis bracket type (with a pin and a snap ring)
TA	Rod end trunnion type
TB	Head end trunnion type
TD	Rod end supporting hole (Custom order)
TE	Head end supporting hole (Custom order)

B Bore size (mm)	
125	ø125
140	ø140
160	ø160
180	ø180
200	ø200
250	ø250

C Port thread type	
Blank	Rc thread
N	NPT thread (Custom order)
G	G thread (Custom order)

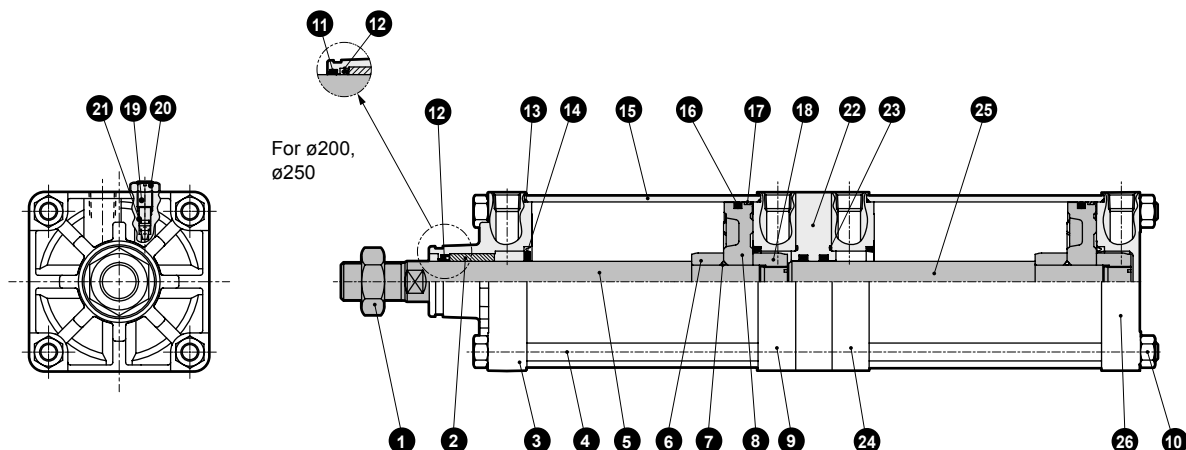
D Cushion	
B	Both sides cushion
R	Rod end cushion
H	Head end cushion
N	No cushion

E Stroke length (mm)		
Bore size	Stroke length	Custom stroke length
ø125 to ø160	2 to 800	By 1 mm increment
ø180	2 to 900	
ø200	2 to 1000	
ø250	2 to 1200	

F Option		
C2	With a check valve on the cushion part	
	Max. ambient temperature	Instantaneous ambient temperature
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	
S	Cushion needle position S	
T	Cushion needle position T	

G Accessory	
I	Rod eye
Y	Rod clevis (with a pin and a snap ring)
B1	Eye bracket
B2	Clevis bracket (with a pin and a snap ring)

Internal structure and parts list



● Note: 14 19 20 21 are only for cushion type.

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 metal		15	Cylinder tube	Aluminum alloy	Hard alumite
3	Rod cover	Aluminum alloy cast metal	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 (ø125 to ø180) Steel (ø200, 250)	Zinc chromate
7	Piston gasket	Nitrile rubber		20	Hexagon nut	Steel	Zinc chromate
8	Piston	Aluminum alloy cast metal		21	Needle gasket	Nitrile rubber	
9	Middle cover (1)	Aluminum alloy cast metal	Chromate	22	Middle plate	Cast iron	Coating
10	Hexagon nut	Steel	Zinc chromate	23	Metal gasket	Nitrile rubber	
11	Dust wiper	Nitrile rubber	ø200, 250 only	24	Middle cover (2)	Aluminum alloy cast metal	Chromate
12	Rod packing	Nitrile rubber		25	Piston rod B	Steel	Industrial chrome plating
13	Cylinder gasket	Nitrile rubber		26	Head cover	Aluminum alloy cast metal	Chromate

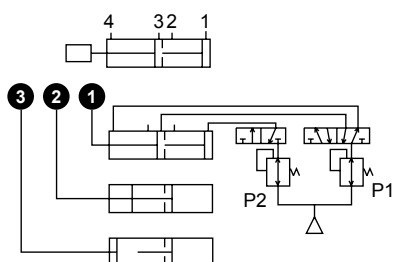
Repair parts list

Bore size (mm)	Kit no.	Repair parts no.
ø125	SCS2-W-125K	
ø140	SCS2-W-140K	12 13 14 16 17 21 23
ø160	SCS2-W-160K	
ø180	SCS2-W-180K	
ø200	SCS2-W-200K	11 12 13 14 16 17 21 23
ø250	SCS2-W-250K	

Usage example

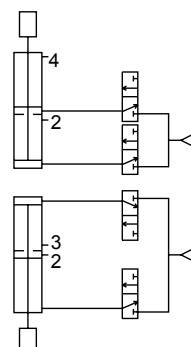
Pressure setting: P2>P1

- 1st stage push-out
With port 4 applied with pressure, apply pressure to port 1.
- 2nd stage push-out
With port 1 applied with pressure, apply pressure to port 3.

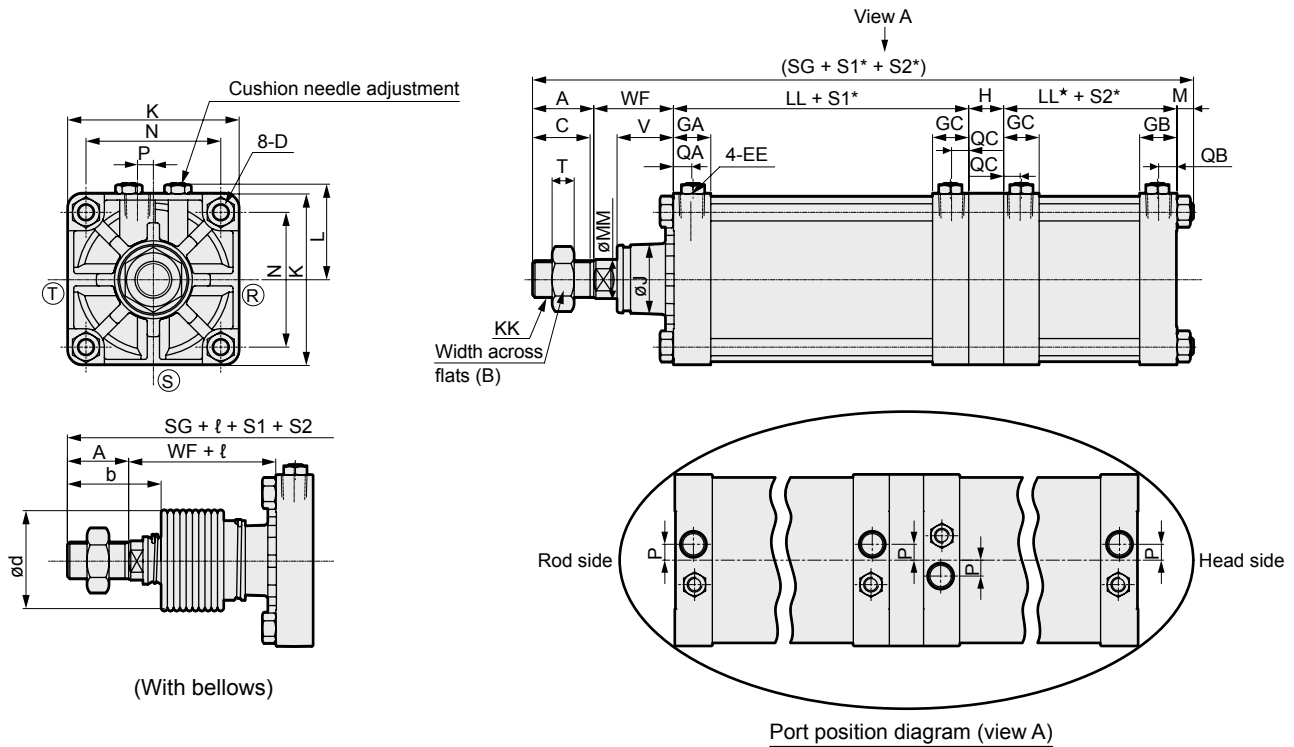


Depending on the load direction, P2 may equal to P1.

When using a single acting cylinder with a load which drops by its own weight, for the drawing above, port 2 and 4 are used as bleed holes, while for the drawing below, port 2 and 3 are used as bleed holes. Basically, the cushion works well if piping is also performed for the port (port 2) which does not need piping.



Dimensions



Note 1: (R)(S)(T) indicate the positions of cushion needles.

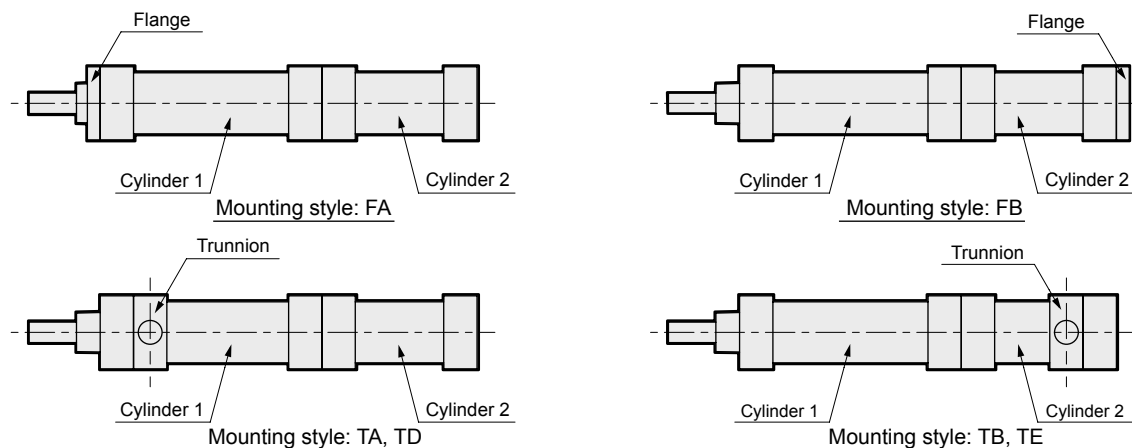
Note 2: Refer to dimensions on page 14 for the accessories.

*For S1, stroke length of cylinder 1; for S2, stroke length of cylinder 2

Symbol	Basic type (00) Basic dimensions												
Bore size (mm)	A	B	C	D	EE	GA	GB	GC	H	J	K	KK	L
ø125	50	46	47	M14 × 1.5	Rc1/2	30.5	30.5	29.5	28	57	140	M30 × 1.5	78 to 82
ø140	50	46	47	M14 × 1.5	Rc3/4	34.5	34.5	33.5	28	57	157	M30 × 1.5	86.5 to 91
ø160	56	55	53	M16 × 1.5	Rc3/4	34.5	34.5	33.5	28	62	177	M36 × 1.5	96.5 to 101
ø180	63	60	60	M18 × 1.5	Rc3/4	34.5	34.5	33.5	33	68	200	M40 × 1.5	108 to 112
ø200	72	70	69	M20 × 1.5	Rc3/4	37.5	37.5	36.5	35	75	220	M45 × 1.5	120.5 to 129
ø250	88	85	84	M24 × 1.5	Rc1	42.5	42.5	41.5	39	93	274	M56 × 2	147.5 to 156

Symbol														With bellows		
Bore size (mm)	LL	LL*	MM	M	P	QA	QB	QC	N	SG	T	V	WF	b	d	ℓ
ø125	91	92	32	13.5	13	15	15	14	110	339.5	18	45.5	65	74	75	(Stroke length/4.55) + 11
ø140	102	103	32	13.5	15	17	17	16	124	363.5	18	45.5	67	74	75	(Stroke length/4.55) + 9
ø160	105	106	40	15.5	15	17	17	16	142	381.5	21	48	71	81	80	(Stroke length/5.15) + 9
ø180	109	110	45	17.5	15	17	17	16	160	410.5	24	53	78	90	90	(Stroke length/5.15) + 9
ø200	122	123	50	18.5	20	18	18	17	175	458.5	27	60	88	102	95	(Stroke length/5.30) + 9
ø250	140	141	60	21.5	22	21	21	20	216	523.5	34	64	94	120	120	(Stroke length/6.40) + 9

Note: The dimensions of the individual mounting styles are the same as those of the double acting SCS2 Series. Refer to page 6 to 13. For the flange type (mounting style: FA/FB) and trunnion type (mounting style: TA/TB/TD/TE), the mounting positions are as shown below:





Large bore size cylinder
Double acting/low hydraulic type

SCS2-H Series

● Bore size: ø125, ø140, ø160, ø180, ø200, ø250

JIS symbol



* Custom order

Specifications

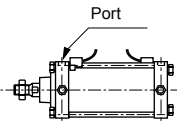
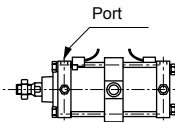
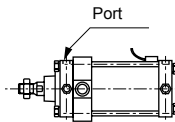
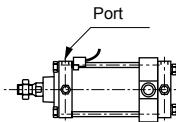
Descriptions		SCS2-H/SCS2-LH (Low hydraulic type)						
Bore size	mm	ø125	ø140	ø160	ø180	ø200	ø250	
Actuation		Double acting						
Working fluid		Hydraulic oil						
Max. working pressure	MPa	1.0						
Min. working pressure	MPa	0.1						
Proof pressure	MPa	1.6						
Ambient temperature	°C	5 to 50						
Port size		Rc 1/2	Rc 3/4				Rc1	
Stroke tolerance	mm	^{+1.0} ₀ (to 300), ^{+1.4} ₀ (to 1000), ^{+1.8} ₀ (to 1200)						
Cushion		Air cushion						
Effective air cushion length		mm	21.6	21.6	21.6	21.6	26.6	26.6
Allowable energy absorption	With cushion	The cushion of the low hydraulic cylinder is not able to absorb a large amount of energy. We recommend to install an external shock absorber.						
		0.371	0.386	0.386	0.958	1.08	2.32	
	No cushion	The type without cushioning cannot absorb a large energy generated by an external load. We recommend to install an external shock absorber.						

Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Trunnion type min. stroke length (mm)
ø125	50•75•100•150• 200•250•300	800	20	23
ø140				25
ø160				27
ø180		900		28
ø200		1,000		28
ø250		1,200		28

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

Min. stroke length with switch

Descriptions		Stroke length with same surface instlation	Stroke length of intermediate supporting hole	Stroke length of rod end supporting hole	Stroke length of head end supporting hole
Bore size (mm)					
Switch type	Diagram				
	Bore			The position cannot be detected at the rod side stroke end.	The position cannot be detected at the head side stroke end.
Reed switch (T*)	ø125	20 and over	120 and over	70 and over	
	ø140		125 and over	75 and over	
	ø160		130 and over	80 and over	
	ø180		135 and over	85 and over	
	ø200		140 and over	90 and over	
	ø250		150 and over	100 and over	

Switch specifications

- 1-color/2-color indicator type, strong 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 order)	T3YH/ T3YV	T3WH/ T3WV	T0H/T0V	T5H/T5V	T8H/T8V			T2YD T2YDT		
Applications	Programmable controller relay, small solenoid valve	Programmable controller			Programmable controller, relay				Programmable controller, relay	Programmable controller, relay IC circuit (without indicator light), serial connection		Programmable controller, relay			Programmable controller	
Output method	-				NPN output	PNP output	NPN output	NPN output	-							
Power voltage	-				10 to 28 VDC				-							
Load voltage	85 to 265 VAC	10 to 30 VDC		24VDC ±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 (Note 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 light	LED (ON lighting)	LED (ON lighting)	Red/green LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Yellow LED (ON lighting)	Red/green LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Without indicator light		LED (ON lighting)			Red/green LED (ON lighting)	
Leakage current	For 100 VAC, 1 mA or less; for 200 VAC, 2 mA or less	1 mA or less			10 µA or less				0 mA						1 mA or less	
Weight	1 m: 33 3 m: 87 5 m: 142	1 m: 18 3 m: 49 5 m: 80	1 m: 33 3 m: 87 5 m: 142	1 m: 18 3 m: 49 5 m: 80	1 m: 18 3 m: 49 5 m: 80		1 m: 33 3 m: 87 5 m: 142	1 m: 18 3 m: 49 5 m: 80	1 m: 18 3 m: 49 5 m: 80			1 m: 33 3 m: 87 5 m: 142			1 m: 61 3 m: 166 5 m: 272	

Note 1: Above-mentioned load current's max. value 20 mA is for 25°C The current will be lower than 20 mA if ambient temperature around the switch is higher than 25°C.

(5 to 10 mA when 60°C.)

Note 2: A strong magnetic field proof switch (T2YD) cannot be used in environments with direct current magnetic fields.

Cylinder mass

(Unit: kg)

Descriptions/Mounting style	Weight when stroke length (S) = 0 mm						Switch weight		Additional weight per S = 100 mm
	Basic type (00)	Axial foot type (LB)	Flange type (FA/FB)	Eye bracket type (CA)	Clevis bracket type (CB)	Trunnion type (TA/TB/TC)	Switch	Mounting bracket	
ø125	7.22	8.72	10.52	10.22	10.32	10.62	See the mass presented in the Switch Specifications.	0.028	1.54
ø140	9.35	11.35	14.75	13.15	13.35	12.55		0.030	1.78
ø160	12.35	15.45	19.25	17.35	17.65	18.75		0.034	2.22
ø180	16.75	21.25	28.75	24.15	24.65	24.85		0.038	2.96
ø200	22.78	28.48	36.48	32.28	32.48	34.58		0.040	3.54
ø250	40.51	48.91	66.41	64.51	59.01	69.21		0.045	5.38

(Example)

Weight of SCS2-LH-LB-125B-300-TOH-D

- Weight when S = 0 mm.....8.72 kg
- Additional weight when S = 300 mm..... $1.54 \times \frac{300}{100} = 4.62$ kg
- Weight of two switches (TOH-D)..... $0.018 \times 2 = 0.036$ kg
- Weight of two switch brackets..... 0.028×0.056 kg
- 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
ø125	Push	1.23×10^3	1.84×10^3	2.45×10^3	3.68×10^3	4.91×10^3	6.14×10^3	7.36×10^3	8.59×10^3	9.82×10^3	1.10×10^4	1.23×10^4
	Pull	1.13×10^3	1.70×10^3	2.26×10^3	3.39×10^3	4.52×10^3	5.65×10^3	6.79×10^3	7.92×10^3	9.05×10^3	1.02×10^4	1.13×10^4
ø140	Push	1.54×10^3	2.31×10^3	3.08×10^3	4.62×10^3	6.16×10^3	7.70×10^3	9.24×10^3	1.08×10^4	1.23×10^4	1.39×10^4	1.54×10^4
	Pull	1.44×10^3	2.16×10^3	2.89×10^3	4.33×10^3	5.77×10^3	7.22×10^3	8.66×10^3	1.01×10^4	1.15×10^4	1.30×10^4	1.44×10^4
ø160	Push	2.01×10^3	3.02×10^3	4.02×10^3	6.03×10^3	8.04×10^3	1.01×10^4	1.21×10^4	1.41×10^4	1.61×10^4	1.81×10^4	2.01×10^4
	Pull	1.88×10^3	2.83×10^3	3.77×10^3	5.65×10^3	7.54×10^3	9.42×10^3	1.13×10^4	1.32×10^4	1.51×10^4	1.70×10^4	1.88×10^4
ø180	Push	2.54×10^3	3.82×10^3	5.09×10^3	7.63×10^3	1.02×10^4	1.27×10^4	1.53×10^4	1.78×10^4	2.04×10^4	2.29×10^4	2.54×10^4
	Pull	2.39×10^3	3.58×10^3	4.77×10^3	7.16×10^3	9.54×10^3	1.19×10^4	1.43×10^4	1.67×10^4	1.91×10^4	2.15×10^4	2.39×10^4
ø200	Push	3.14×10^3	4.71×10^3	6.28×10^3	9.42×10^3	1.26×10^4	1.57×10^4	1.88×10^4	2.20×10^4	2.51×10^4	2.83×10^4	3.14×10^4
	Pull	2.95×10^3	4.42×10^3	5.89×10^3	8.84×10^3	1.18×10^4	1.47×10^4	1.77×10^4	2.06×10^4	2.36×10^4	2.65×10^4	2.95×10^4
ø250	Push	4.91×10^3	7.36×10^3	9.82×10^3	1.47×10^4	1.96×10^4	2.45×10^4	2.95×10^4	3.44×10^4	3.93×10^4	4.42×10^4	4.91×10^4
	Pull	4.63×10^3	6.94×10^3	9.25×10^3	1.39×10^4	1.85×10^4	2.31×10^4	2.78×10^4	3.24×10^4	3.70×10^4	4.16×10^4	4.63×10^4

SCS2-H Series

How to order

Without switch

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

With switch

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

A Mounting style
Note 1

B Bore size

C Port thread type

D Cushion

E Stroke length

F Switch model no.

G Switch quantity
Note 3

H Option
Note 4

I Accessory
Note 6

Note on model no. selection

Note 1: For hole type trunnions, ø125 to 160 only will be available through custom order. For information such as external dimensions, consult as necessary.

Note 2: Refer to page 37 for min. stroke length with switch.

Note 3: When selecting TA or TB for mounting, the number of switches is limited to "H" (one on head side) for TA, and "R" (one on rod side) for TB.

Note 4: The instantaneous max. temperature is that at which sparks, swarf, etc., temporarily contact bellows.

Note 5: For the cushion needle position indication, check the drawing below.

Note 6: "I" and "Y" cannot be selected at the same time.

Note 7: Refer to page 42 for the details.

<Example of model number>

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

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

A Mounting style : Axial foot type

B Bore size : ø125 mm

C Port thread type : Rc thread

D Cushion : Both sides air cushion

E Stroke length : 50 mm

F Switch model no. : Proximity T0H, 1 m wire length

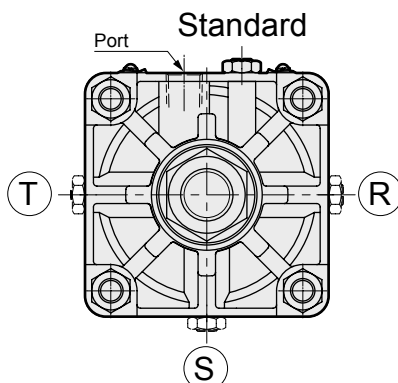
G Switch quantity : One on rod end

H Option : Bellows material/for max. ambient temperature 60°C

I Accessory : Rod clevis

Cushion needle position

(Needle position with the port faced upward, from the rod direction)



Symbol	Descriptions
A Mounting style	
00	Basic type
LB	Axial foot type
FA	Rod end flange type
FB	Head end flange type
CA	Eye bracket type
CB	Clevis bracket type (with a pin and a snap ring)
TC	Center trunnion type
TA	Rod end trunnion type
TB	Head end trunnion type
TF	Intermediate supporting hole (Custom order)
TD	Rod end supporting hole (Custom order)
TE	Head end supporting hole (Custom order)

B Bore size (mm)	
125	ø125
140	ø140
160	ø160
180	ø180
200	ø200
250	ø250

C Port thread type	
Blank	Rc thread
N	NPT thread (Custom order)
G	G thread (Custom order)

D Cushion	
B	Both sides cushion
R	Rod end cushion
H	Head end cushion
N	No cushion

E Stroke length (mm)		
Bore size	Stroke length Note 2	Custom stroke length
ø125 to ø160	20 to 800	By 1 mm increment
ø180	20 to 900	
ø200	20 to 1000	
ø250	20 to 1200	

F Switch model no.					
Rectilinear wire	L type wire	Contact	Voltage	Indicator	Lead wire
AC	DC				
T0H*	T0V*	Reed	● ●	1 color indicator type	2 wire
T5H*	T5V*		● ●	Without indicator light	
T8H*	T8V*		● ●	1 color indicator type	
T1H*	T1V*	Proximity	●	1 color indicator type	2 wire
T2H*	T2V*		●		
T3H*	T3V*		●		
T3PH*	T3PV*		●	1 color indicator type (PNP output) (custom order)	3 wire
T2WH*	T2WV*		●		
T2YH*	T2YV*		● ●	2 color indicator	2 wire
T3WH*	T3WV*		● ●		
T3YH*	T3YV*		● ●		
T2YD*	-		●	For strong magnetic fields (exclusively for AC magnetic fields)	2 wire
T2YDT*	-		●		
T2JH*	T2JV*		●	Off delay type	2 wire

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

G Switch quantity	
R	One on rod end
H	One on head end
D	Two
T	Three
4	Four

H Option	
C2	With a check valve on the cushion part
J	Bellows
K	Bellows
L	Bellows
M	Piston rod material (Stainless steel)

Blank	Cushion needle position standard	Standard T R S
R	Cushion needle position R	
S	Cushion needle position S	
T	Cushion needle position T	

I Accessory	
I	Rod eye
Y	Rod clevis (with a pin and a snap ring)
B1	Eye bracket
B2	Clevis bracket (with a pin and a snap ring)

Customization code	
-S092	SCS-LH Mounting dimension compatible type

How to order switch

● Switch body + mounting bracket set

SCS2-LN - T0H - 125

Switch model no.
(Previous page, item ⑤)

Bore size
(Previous page, item ⑥)

● Switch body only

SW - T0H

Switch model no.
(Previous page, item ⑤)

● Mounting bracket set

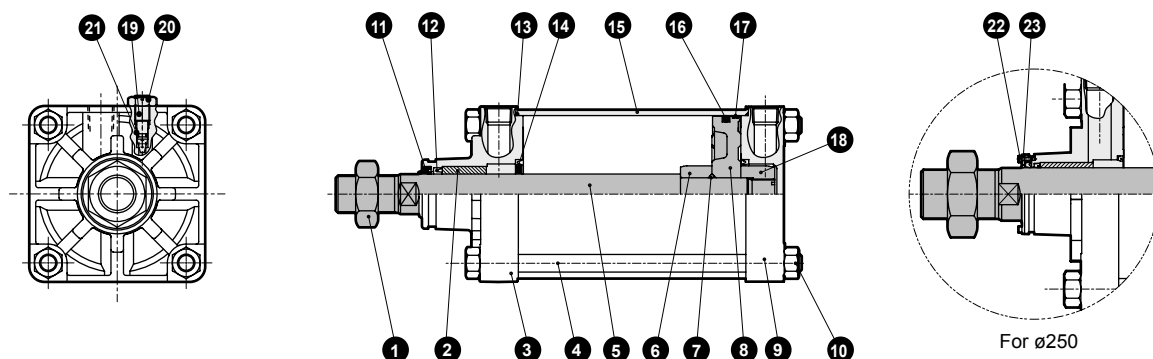
SCS2-LN - TS - 125

Bore size
(Previous page, item ⑥)

Mounting bracket

TS	T type switch
T	T2YD type switch

Internal structure and parts list

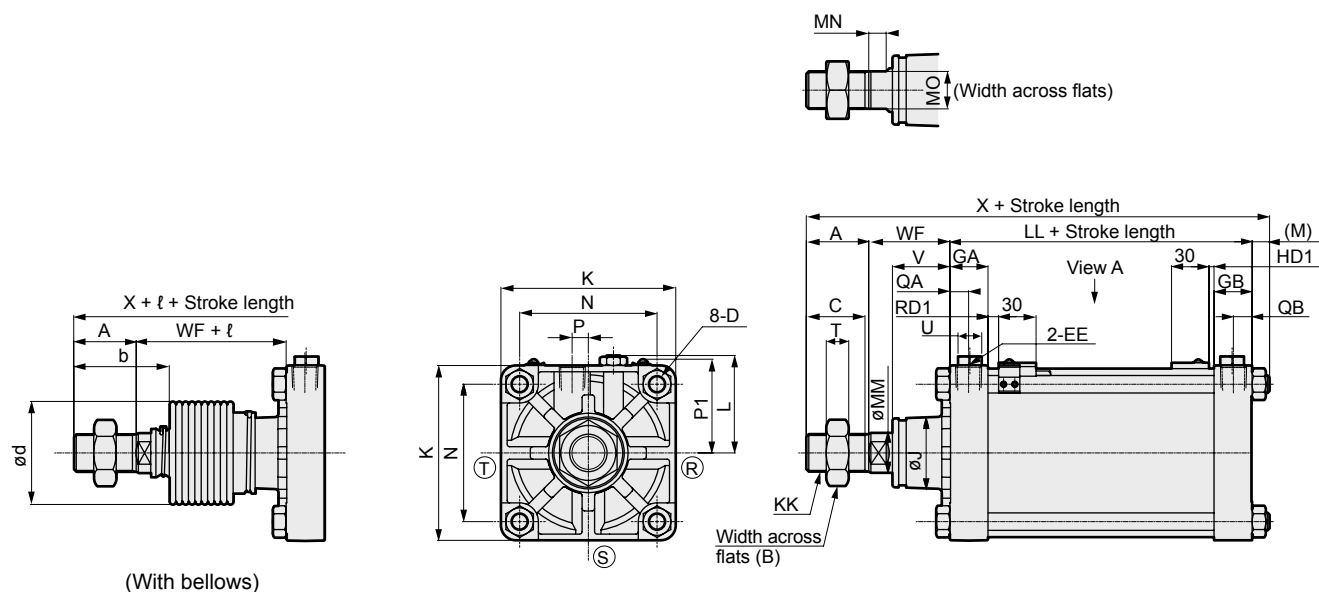


No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon nut	Steel	Zinc chromate	13	Cylinder gasket	Nitrile rubber	
2	Bush	Icon-copper oil-impregnated bearing metal		14	Cushion packing	Nitrile rubber/steel	
3	Rod cover	Aluminum alloy cast metal	Chromate	15	Cylinder tube	Aluminum alloy	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 (ø125 to ø180) Steel (ø200, 250)	Zinc chromate
8	Piston	Aluminum alloy cast metal		20	Hexagon nut	Steel	Zinc chromate
9	Head cover	Aluminum alloy cast metal	Chromate	21	Needle gasket	Nitrile rubber	
10	Hexagon nut	Steel	Zinc chromate	22	Scraper holding plate	Steel	Manganese phosphate
11	Dust wiper	Nitrile rubber		23	Hexagon socket head cap bolt	Steel	Black oxide finish
12	Rod packing	Nitrile rubber					

Repair parts list

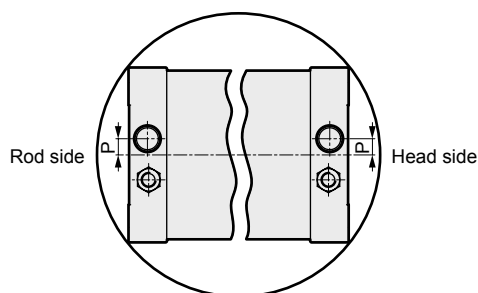
Bore size (mm)	Kit no.	Repair parts no.
ø125	SCS2-H-125K	
ø140	SCS2-H-140K	
ø160	SCS2-H-160K	
ø180	SCS2-H-180K	11 12 13 14 16 17 21
ø200	SCS2-H-200K	
ø250	SCS2-H-250K	

Dimensions

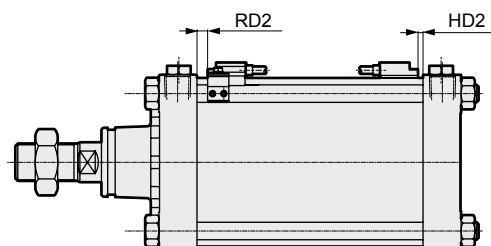


(With bellows)

● 2-color indicator, strong magnetic field switch fitted



Port position diagram (view A)



RD: Rod side max. sensitive mounting position
HD: Head side max. sensitive mounting position

Note 1: (R)(S)(T) indicate the positions of cushion needles.

Note 2: For the t dimensions, the decimal places have been rounded out.

Note 3: Refer to dimensions on page 14 for the accessories.

Symbol	Basic type (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
ø125	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
ø140	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
ø160	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
ø180	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
ø200	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
ø250	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
Symbol						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	RD2	HD2	
ø125	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	
ø140	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	
ø160	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	
ø180	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	
ø200	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	
ø250	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	

Note: The dimensions of the individual mounting styles are the same as of those of the double acting SCS2 Series. Refer to page 6 to 13.

The dimensions of SCS2-LH (switch-fitted) and those of SCS-LH (switch-fitted) are not compatible. If the same dimensions (shortened overall length) are needed, refer to the mounting compatible type on the next page.

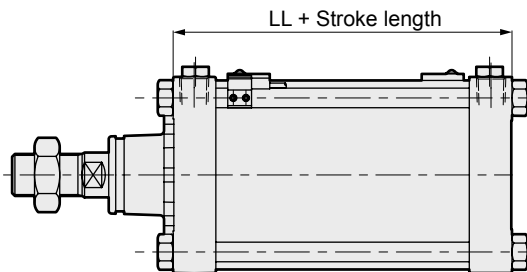
Introduction of custom order

■ SCS-LH mounting dimensions compatible type

Model number indication

When making an order, add "-SO92" to the end of the model number.

Dimensions



Symbol	Dimensions table
Bore size (mm)	LL
ø125	111.5
ø140	122.5
ø160	122.5
ø180	124.5
ø200	143.5
ø250	

Note 1: The center trunnion is to be mounted at the middle between the covers.

Note 2: The LL dimensions presented in the dimension table above is as shown to the right.



Large bore size cylinder
Double acting/rubber scraper type

SCS2-G Series

● Bore size : $\phi 125$, $\phi 140$, $\phi 160$, $\phi 180$, $\phi 200$, $\phi 250$

JIS symbol



* Custom order

Specifications

Descriptions		SCS2-G (rubber scraper type)					
Bore size	mm	ø125	ø140	ø160	ø180	ø200	ø250
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0					
Min. working pressure	MPa	0.05					
Proof pressure	MPa	1.6					
Ambient temperature		-5 to 60 (no freezing)					
Port size		Rc 1/2	Rc 3/4				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 (Use within the allowable energy absorption range.)					
Cushion		Air cushion					
Effective air cushion length	mm	21.6	21.6	21.6	21.6	26.6	26.6
Lubrication		Required (when lubricating, use turbine oil Class 1 ISO VG32.)					
Allowable energy absorption J	With cushion	63.5	91.5	116	152	233	362
	No cushion	0.371	0.386	0.386	0.958	1.08	2.32
The type without cushioning cannot absorb a large energy generated by an external load. We recommend to install an external shock absorber.							

The type without cushioning cannot absorb a large energy generated by an external load. We recommend to install an external shock absorber.

Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Trunnion type min. stroke length (mm)
$\phi 125$	50•75•100•150• 200•250•300	800	1	23
$\phi 140$				25
$\phi 160$				27
$\phi 180$		900		28
$\phi 200$		1000		28
$\phi 250$		1200		28

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

Note 2: If the max. stroke is exceeded, product specifications may not be met, depending on operating conditions. Contact CKD for details.

Cylinder mass

(Unit: kg)

Descriptions/Mounting style	Weight when stroke length (S) = 0 mm						Additional weight per S = 100 mm
	Basic type (00)	Axial foot type (LB)	Flange type (FA/FB)	Eye bracket type (CA)	Clevis bracket type (CB)	Trunnion type (TA/TB/TC)	
Bore size (mm)							
$\phi 125$	7.22	8.72	10.52	10.22	10.32	10.62	1.54
$\phi 140$	9.35	11.35	14.75	13.15	13.35	12.55	1.78
$\phi 160$	12.35	15.45	19.25	17.35	17.65	18.75	2.22
$\phi 180$	16.75	21.25	28.75	24.15	24.65	24.85	2.96
$\phi 200$	22.78	28.48	36.48	32.28	32.48	34.58	3.54
$\phi 250$	40.51	48.91	66.41	64.51	59.01	69.21	5.38

(Example) Weight of SCS2-G-LB-125B-300

- Weight when S = 0 mm 8.72 kg
- Additional weight when S = 300 mm ... $1.54 \times \frac{300}{100} = 4.62$ kg
- 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
$\phi 125$	Push	1.23×10^3	1.84×10^3	2.45×10^3	3.68×10^3	4.91×10^3	6.14×10^3	7.36×10^3	8.59×10^3	9.82×10^3	1.10×10^4	1.23×10^4
	Pull	1.13×10^3	1.70×10^3	2.26×10^3	3.39×10^3	4.52×10^3	5.65×10^3	6.79×10^3	7.92×10^3	9.05×10^3	1.02×10^4	1.13×10^4
$\phi 140$	Push	1.54×10^3	2.31×10^3	3.08×10^3	4.62×10^3	6.16×10^3	7.70×10^3	9.24×10^3	1.08×10^4	1.23×10^4	1.39×10^4	1.54×10^4
	Pull	1.44×10^3	2.16×10^3	2.89×10^3	4.33×10^3	5.77×10^3	7.22×10^3	8.66×10^3	1.01×10^4	1.15×10^4	1.30×10^4	1.44×10^4
$\phi 160$	Push	2.01×10^3	3.02×10^3	4.02×10^3	6.03×10^3	8.04×10^3	1.01×10^4	1.21×10^4	1.41×10^4	1.61×10^4	1.81×10^4	2.01×10^4
	Pull	1.88×10^3	2.83×10^3	3.77×10^3	5.65×10^3	7.54×10^3	9.42×10^3	1.13×10^4	1.32×10^4	1.51×10^4	1.70×10^4	1.88×10^4
$\phi 180$	Push	2.54×10^3	3.82×10^3	5.09×10^3	7.63×10^3	1.02×10^4	1.27×10^4	1.53×10^4	1.78×10^4	2.04×10^4	2.29×10^4	2.54×10^4
	Pull	2.39×10^3	3.58×10^3	4.77×10^3	7.16×10^3	9.54×10^3	1.19×10^4	1.43×10^4	1.67×10^4	1.91×10^4	2.15×10^4	2.39×10^4
$\phi 200$	Push	3.14×10^3	4.71×10^3	6.28×10^3	9.42×10^3	1.26×10^4	1.57×10^4	1.88×10^4	2.20×10^4	2.51×10^4	2.83×10^4	3.14×10^4
	Pull	2.95×10^3	4.42×10^3	5.89×10^3	8.84×10^3	1.18×10^4	1.47×10^4	1.77×10^4	2.06×10^4	2.36×10^4	2.65×10^4	2.95×10^4
$\phi 250$	Push	4.91×10^3	7.36×10^3	9.82×10^3	1.47×10^4	1.96×10^4	2.45×10^4	2.95×10^4	3.44×10^4	3.93×10^4	4.42×10^4	4.91×10^4
	Pull	4.63×10^3	6.94×10^3	9.25×10^3	1.39×10^4	1.85×10^4	2.31×10^4	2.78×10^4	3.24×10^4	3.70×10^4	4.16×10^4	4.63×10^4

How to order

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

A Mounting style
Note 1

B Bore size

C Port thread type

D Cushion

E Stroke

F Option
Note 2

G Accessory

⚠ Note on model no. selection

Note 1: For hole type trunnions, ø125 to 160 only will be available through custom order. For information such as external dimensions, consult as necessary.

Note 2: The instantaneous max. temperature is that at which sparks, swarf, etc., temporarily contact bellows.

Note 3: For the cushion needle position indication, refer to the drawing below.

<Example of model number>

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

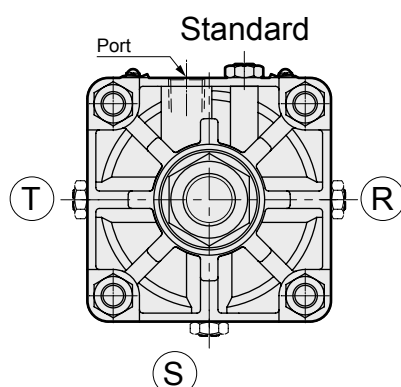
Model: Large bore size cylinder rubber scraper type

- A Mounting style : Axial foot type
- B Bore size : ø125 mm
- C Port thread type : Rc thread
- D Cushion : Both sides cushion
- E Stroke length : 50 mm
- F Option : Bellow material/for max. ambient temperature 60°C
- G Accessory : Rod clevis

Symbol	Descriptions		
A Mounting style			
00	Basic type		
LB	Axial foot type		
FA	Rod end flange type		
FB	Head end flange type		
CA	Eye bracket type		
CB	Clevis bracket type (with a pin and a snap ring)		
TC	Center trunnion type		
TA	Rod end trunnion type		
TB	Head end trunnion type		
TF	Intermediate supporting hole (Custom order)		
TD	Rod end supporting hole (Custom order)		
TE	Head end supporting hole (Custom order)		
B Bore size (mm)			
125	ø125		
140	ø140		
160	ø160		
180	ø180		
200	ø200		
250	ø250		
C Port thread type			
Blank	Rc thread		
N	NPT thread (Custom order)		
G	G thread (Custom order)		
D Cushion			
B	Both sides cushion		
R	Rod end cushion		
H	Head end cushion		
N	No cushion		
E Stroke length (mm)			
Bore size	Stroke length	Custom stroke length	
ø125 to ø160	1 to 800	By 1 mm increment	
ø180	1 to 900		
ø200	1 to 1000		
ø250	1 to 1200		
F Option			
C2	With a check valve on the cushion part		
J K L M	Bellows	Max. ambient temperature	Instantaneous ambient temperature
		60°C	100°C
		100°C	200°C
		250°C	400°C
M	Piston rod material (Stainless steel)		
Blank	Cushion needle position standard	Standard 	
R	Cushion needle position R		
S	Cushion needle position S		
T	Cushion needle position T		
G Accessory			
I	Rod eye		
Y	Rod clevis (with a pin and a snap ring)		
B1	Eye bracket		
B2	Clevis bracket (with a pin and a snap ring)		

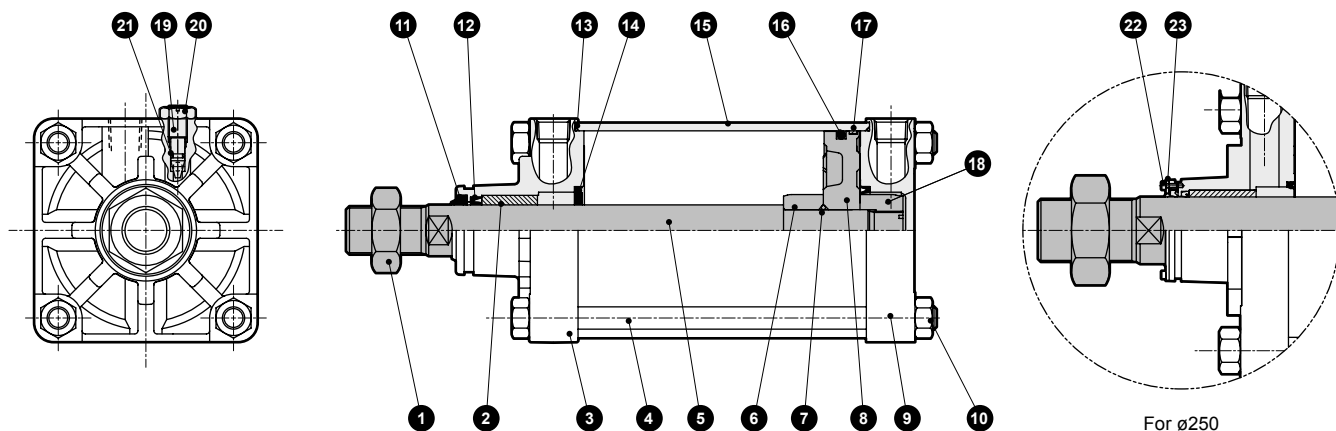
Cushion needle position

(Needle position with the port faced upward, from the rod direction)



Internal structure and parts list

- Standard type
SCS2-G



Note: 14 19 20 21 are only for cushion type.

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 metal		14	Cushion packing	Nitrile rubber/steel	
3	Rod cover	Aluminum alloy cast metal	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 (ø125 to ø180) Steel (ø200, 250)	Zinc chromate
8	Piston	Aluminum alloy cast metal		20	Hexagon nut	Steel	Zinc chromate
9	Head cover	Aluminum alloy cast metal	Chromate	21	Needle gasket	Nitrile rubber	
10	Hexagon nut	Steel	Zinc chromate	22	Hexagon socket head bolt	Steel (Black oxide finish)	ø250 only
11	Dust wiper	Nitrile rubber/Steel		23	Holding plate	Steel (Manganese phosphate)	ø250 only
12	Rod packing	Nitrile rubber					

Repair parts list

Bore size (mm)	Kit no.	Repair parts no.
ø125	SCS2-G-125K	11 12 13 14 16 17 21
ø140	SCS2-G-140K	
ø160	SCS2-G-160K	
ø180	SCS2-G-180K	
ø200	SCS2-G-200K	
ø250	SCS2-G-250K	

Dimensions

Same as of double acting/standard single rod type SCS2. Refer to page 5 to 13.



Safety Precautions

Always read this section before starting use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured.

It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely.

Observe warnings and precautions to ensure device safety.

Check that device safety is ensured, and manufacture a safe device.



WARNING

- 1** This product is designed and manufactured as a general industrial machine part.
It must be handled by an operator having sufficient knowledge and experience in handling.
 - 2** Use this product in accordance with specifications.
This product must be used within its stated specifications. Do not attempt to modify or additionally machine the product. This product's applied scope is for use as equipment and parts for general industrial machinery. Therefore, outdoor (except for outdoor specifications) use as well as the following conditions and environments shall be considered outside of the applied scope.
(If you consult CKD upon adoption and consent to CKD product specification, it will be applicable; however, safeguards should be adopted that will circumvent dangers in the event of failure.)
 - ①** Use for special applications requiring safety including nuclear energy, railroad, aviation, ship, vehicle, medical equipment, equipment or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
 - ②** Use for applications where life or assets could be adversely affected, and special safety measures are required.
 - 3** Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.
ISO 4414, JIS B 8370 (pneumatic system rules)
JFPS 2008 (Principles for pneumatic cylinder selection and use)
Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, body standards and regulations, etc.
 - 4** Do not handle, pipe, or remove devices before confirming safety.
 - ①** Inspect and service the machine and devices after confirming safety of the entire system related to this product.
 - ②** Note that there may be hot or charged sections even after operation is stopped.
 - ③** When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power to the facility. Discharge any compressed air from the system, and pay attention to possible water leakage and leakage of electricity.
 - ④** When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.
 - 5** Observe warnings and cautions on the pages below to prevent accidents.
- The safety cautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.



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



WARNING: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.



CAUTION: When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation. In any case, important information that must be observed is explained.

Disclaimer

- 1** Warranty period
"Warranty Period" is one (1) year from the first delivery to the customer.
- 2** Scope of warranty
In case any defect attributable to CKD is found during the Warranty Period, CKD shall, at its own discretion, repair the defect or replace the relevant product in whole or in part, according to its own judgment.
Note that the following faults are excluded from the warranty term:
 - (1) Product abuse/misuse contrary to conditions/environment recommended in its catalogs/specifications
 - (2) Failure caused by other than the delivered product
 - (3) Use other than original design purposes.
 - (4) Third-party repair/modification
 - (5) Faults caused by reason that is unforeseeable with technology put into practical use at the time of delivery.
 - (6) Failure attributable to force majeure.The warranty mentioned here covers the discrete delivered product. Only the scope of warranty shall not cover losses induced by the failure of the delivered product.
- 3** Compatibility confirmation
In no event shall CKD be liable for merchantability or fitness for a particular purpose, notwithstanding any disclosure to CKD of the use to which the product is to be put.



Pneumatic components

Safety Precautions

Be sure to read the instructions before use.

Refer to Pneumatic Cylinders No. CB-029S for general details on cylinders and cylinder switch.

Discrete notes: Large bore size cylinder SCS2 Series

Design & Selection

1. Common

CAUTION

■ Second class pressure container test

Following regulations issued by the Ministry of Health, Labor and Welfare, the following cylinders must be certified by the Japan Boiler Association:

- (1) Cylinders having rated pressure exceeding 0.196 MPa and cylinders content volume exceeding 0.04 m³.
- (2) Cylinders with rated pressure exceeding 0.196 Mpa, bore size exceeding 200 mm and body length (cylinder tube length) exceeding 1000 mm.

$$V = \frac{D^2 \times S \times 3.14}{4 \times 10^9}$$

V: Cylinder volume (m³)
D: Cylinder bore diameter (mm)
S: Stroke length (cylinder tube length) (mm)

■ With a check valve on the cushion part (C2)

When the load is large, the cylinder initiation time delay is large. To reduce the initiation time, use the cushion fitted with a check valve (C2).

Installation & Adjustment

1. Stroke adjustment type SCS2-P

CAUTION

- The cushion has no effect when adjusting the stroke.

2. Heat-resistant type SCS2-T

CAUTION

- The magnet is not integrated.

Relational values between mounting style dimensions and max. stroke length (L)

1 For both-end pin joint

Four diagrams (a, b, c, d) illustrating hydraulic cylinder mounting for both-end pin joints. Each diagram shows a cylinder with a pin joint at the rod end. (a) Double-acting cylinder, both ends fixed, stroke L . (b) Single-acting cylinder, both ends fixed, stroke L . (c) Double-acting cylinder, one end fixed, one end guided, stroke $2L$. (d) Single-acting cylinder, one end fixed, one end guided, stroke L .

2 For free load end

Four diagrams (a, b, c, d) illustrating hydraulic cylinder mounting for a free load end. Each diagram shows a cylinder with a pin joint at the rod end. (a) Double-acting cylinder, one end fixed, one end free, stroke L . (b) Single-acting cylinder, one end fixed, one end free, stroke L . (c) Double-acting cylinder, one end fixed, one end free, stroke L . (d) Single-acting cylinder, one end fixed, one end free, stroke L .

3 For the rod end guide (pin joint)

Four diagrams (a, b, c, d) illustrating hydraulic cylinder mounting for a rod end guide (pin joint). Each diagram shows a cylinder with a pin joint at the rod end. (a) Double-acting cylinder, both ends fixed, stroke $1.4L$. (b) Single-acting cylinder, both ends fixed, stroke $1.4L$. (c) Double-acting cylinder, one end fixed, one end guided, stroke $0.7L$. (d) Single-acting cylinder, one end fixed, one end guided, stroke $1.4L$.

4 For the cylinder fixed rod end guide

Four diagrams (a, b, c, d) illustrating hydraulic cylinder mounting for a cylinder fixed rod end guide. Each diagram shows a cylinder with a pin joint at the rod end. (a) Double-acting cylinder, both ends fixed, stroke $2L$. (b) Single-acting cylinder, both ends fixed, stroke $2L$. (c) Double-acting cylinder, one end fixed, one end guided, stroke L . (d) Single-acting cylinder, one end fixed, one end guided, stroke $2L$.

Max. stroke length

D: Cylinder bore diameter (mm)

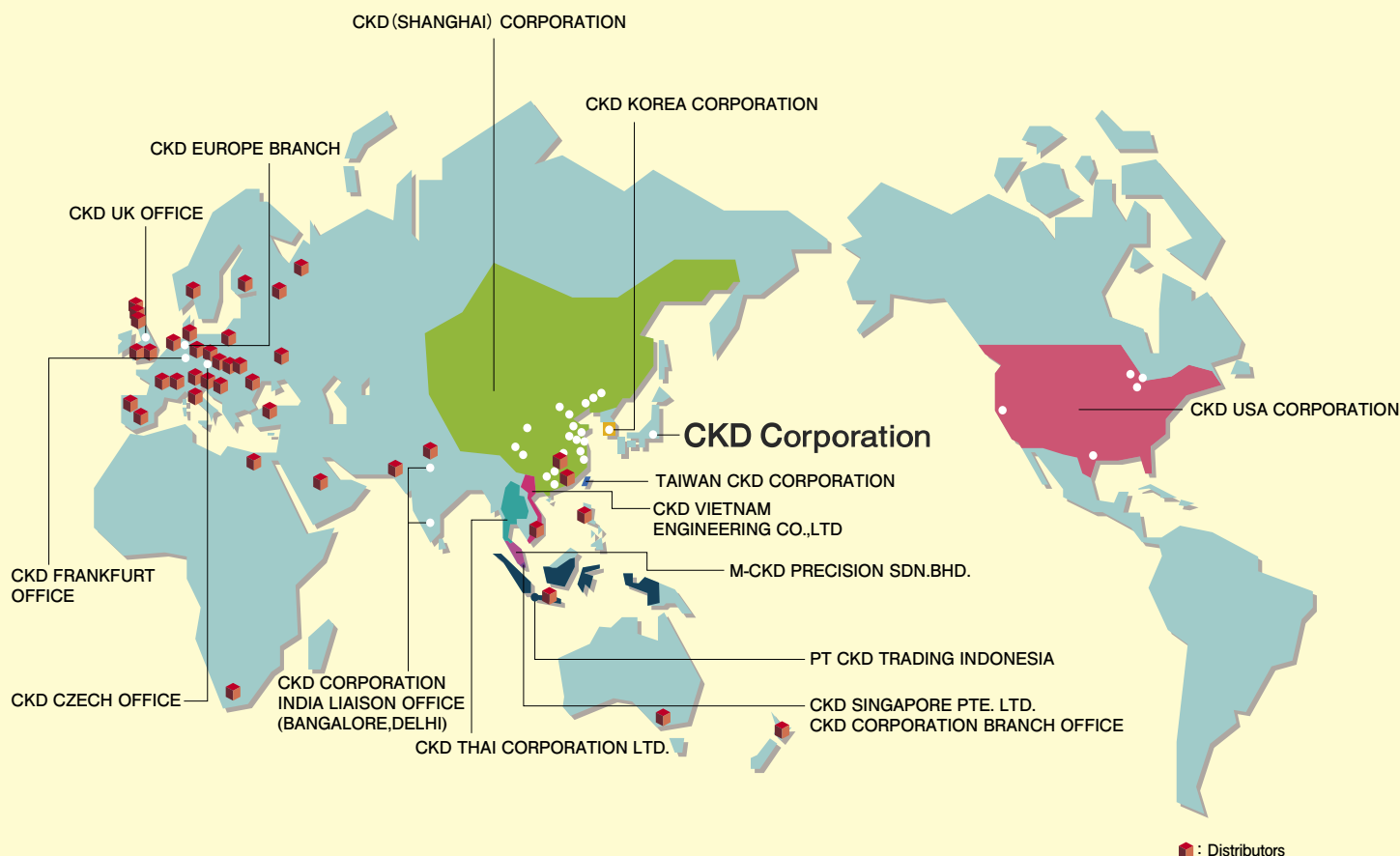
F0: Load (N)

L: Max. stroke length (mm)

Remarks

The numeric values in the table are the resultant from calculations. When exceeding the max. stroke length that is specified for each model, consult with CKD.

SCS2						
D (mm)	ø125	ø140	ø160	ø180	ø200	ø250
F0 (N)						
1500	3700	3700				
2000	3200	3200				
2500	2900	2900	4600			
3000	2600	2600	4100	5300		
3500	2400	2400	3800	5000	5900	
4000	2300	2300	3600	4600	5600	
5000	2000	2000	3200	4100	5000	7400
6000	1900	1900	2900	3800	4600	6800
7000	1700	1700	2700	3500	4200	6200
8000		1600	2500	3300	3900	5800
9000		1500	2400	3100	3700	5500
10000			2300	2900	3500	5200
15000				2400	2900	4200
20000					2500	3600
25000						3300
30000						3000



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