




Air Cylinder Series CS1

ø125, ø140, ø160, ø180, ø200, ø250, ø300

Variations

Series	Action	Style	Basic style	Standard variations		Bore size (mm)	Page
				Rod boot	Copper free		
Standard Series CS1  Series CS1  Series CS1W	Double acting	Single rod Series CS1	Lube	•	•	125 140 160 180 200 250 300	1.10-2
			Non-lube	•	•	(ø125 to ø160 Only)	
			Air-hydro	•	•	125 140 160	
		Double rod Series CS1W	Lube	•	•	125 140 160 180 200 250 300	1.10-21
			Non-lube	•	•	125 140 160	
			Air-hydro	•	•	125 140 160	
Low friction Series CS1□Q 	Double acting	Single rod Series CS1□Q	Non-lube	•	•	125 140 160	1.10-30

- CJ1
- CJP
- CJ2
- CM2
- C85
- CG1
- MB
- C95
- CA1
- CS1**

Applicable Auto Switch (Applicable bore size: ø125 to ø200 only)

Reed switch	Band mounting	D-A3/A4
	Tie rod mounting	D-A5/A6, D-A59W
Solid state switch	Band mounting	D-G3/K3
	Tie rod mounting	D-F5□/J5□, D-F5NT, D-F5□W/J59W, D-F5BA, D-F5□F

Made to Order

Refer to p.5.4-1 for made to order specifications for series CS1.

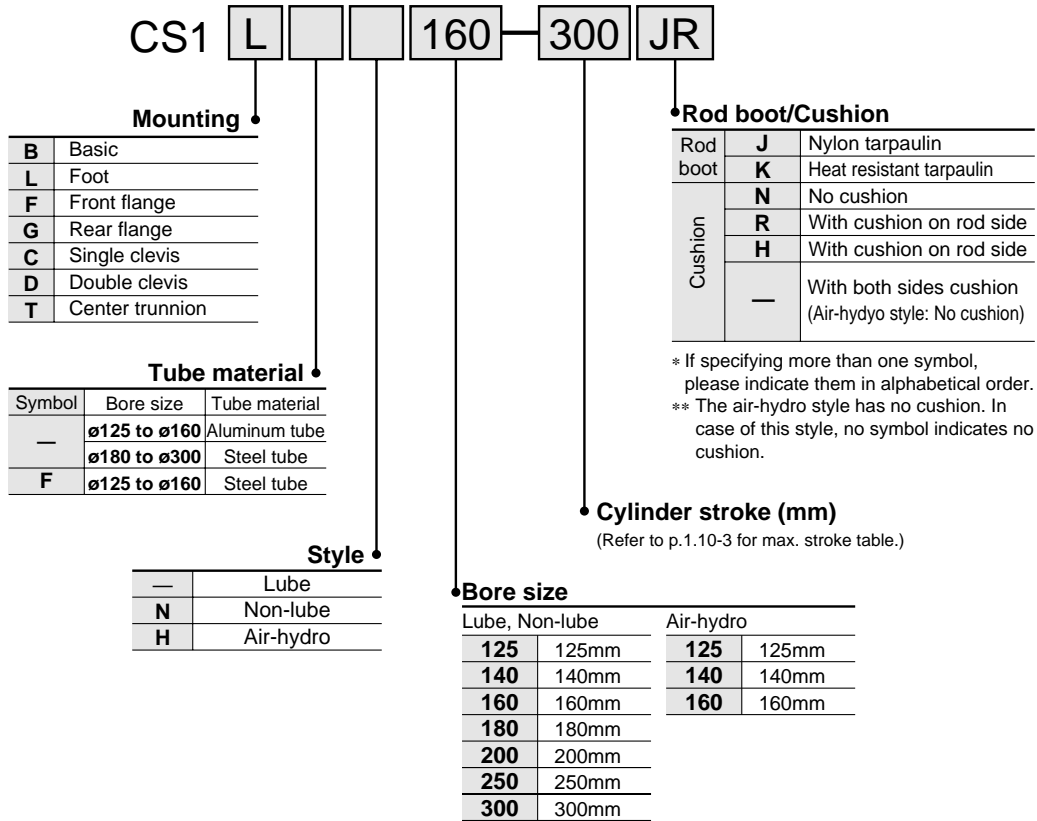
Air Cylinder/Standard

Series CS1

Lube, Non-lube: \varnothing 125, \varnothing 140, \varnothing 160, \varnothing 180, \varnothing 200, \varnothing 250, \varnothing 300

Air-hydro: \varnothing 125, \varnothing 140, \varnothing 160

How to Order



Mounting Bracket Part No.

Bore size (mm)	125	140	160	180	200	250	300
Foot*	CS1-L12	CS1-L14	CS1-L16	CS1-L18	CS1-L20	CS1-L25	CS1-L30
Flange	CS1-F12	CS1-F14	CS1-F16	CS1-F18	CS1-F20	CS1-F25	CS1-F30
Single clevis	CS1-C12	CS1-C14	CS1-C16	CS1-C18	CS1-C20	CS1-C25	CS1-C30
Double clevis**	CS1-D12	CS1-D14	CS1-D16	CS1-D18	CS1-D20	CS1-D25	CS1-D30

Refer to p.1.10-7 for How to Order Auto Switches Style.



* Order 2 foot brackets for one cylinder.

** When ordering the double clevis, the clevis pin and the cotter pin (2 pcs.) are attached.

Air Cylinder/Standard *Series CS1*



Specifications

Style	Lube, Non-lube	Air-hydro
Fluid	Air	Turbine oil
Proof pressure	1.57MPa	
Max. operating pressure	0.97MPa	
Min. operating pressure	0.05MPa	0.06MPa
Piston speed	50 to 500 mm/s	0.5 to 200 mm/s
Cushion	With	Without
Ambient and fluid temperature	0 to 70°C (No freezing), Air-hydro: 5 to 60°C	
Thread tolerance	JIS class 2	
Stroke length tolerance (mm)	250 or less: $^{+1.0}_0$, 251 to 1,000: $^{+1.4}_0$, 1,001 to 1,500: $^{+1.8}_0$ 1501 to 2000: $^{+2.2}_0$, 2001 to 2400: $^{+2.6}_0$	
Mounting	Basic, Foot, Front flange, Rear flange, Single clevis, Double clevis, Center trunnion	

CJ1

CJP

CJ2

CM2

C85

CG1

MB

C95

CA1

CS1

Accessories

Mounting		Basic	Foot	Front flange	Rear flange	Single clevis	Double clevis	Center trunnion
Standard	Clevis pin, Cotter pin	—	—	—	—	—	●	—
	Rod end nut	●	●	●	●	●	●	●
Accessory	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (Knuckle pin, Cotter pin)	●	●	●	●	●	●	●
	Rod boot	●	●	●	●	●	●	●

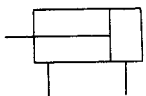
* Refer to p.1.10-19 in case of using rod end nut together with double knuckle joint.

Max. Stroke

(mm)

Tube material	Aluminum alloy		Carbon steel tube	
	Basic Rear flange Single clevis Double clevis Center trunnion	Foot Front flange	Basic Rear flange Single clevis Double clevis	Foot Front flange
125	1000 or less	1400 or less	1000 or less	1600 or less
140	1000 or less	1400 or less	1000 or less	1600 or less
160	1200 or less	1400 or less	1200 or less	1600 or less
180	—	—	1200 or less	2000 or less
200	—	—	1200 or less	2000 or less
250	—	—	1200 or less	2400 or less
300	—	—	1200 or less	2400 or less

JIS system Double acting style



Made to Order

Refer to p.5.4-1 for made to order specifications for series CS1.

Second Class Pressure Vessel

In case of exceeding the following strokes, the cylinder is in the scope of the second class pressure vessel.

Bore size (mm)	Stroke (mm)
180	1,569
200	998
250	813
300	564

Rod Boot Materials

Symbol	Material	Max. ambient temp.
J	Nylon tarpaulin	60°C
K	Heat resistant tarpaulin	110°C*

* Max. ambient temperature for the rod boot itself.

Series CS1

Major Material and Surface Treatments

Description		Material	Note
Cover		Rolled steel plate	Black coated
Tube	ø125, ø140, ø160	Aluminum alloy	Hard anodized
		Carbon steel tube	Inside: Hard chrome plated
	ø180, ø200, ø250, ø300	Carbon steel tube	Inside: Hard chrome plated
Sliding seals	Lube	NBR	JIS B2401 O ring
	Non-lube	NBR	PNY, NLP
	Air-hydro	NBR	SKY, RPS
Piston rod		Carbon steel	Hard chrome plated
Piston	Lube	Cast iron	
	Non-lube	Aluminum alloy cast (Steel tubing: Cast iron)	Chromated (In case of aluminum alloy cast iron)
	Air-hydro	Aluminum alloy cast (Steel tubing: Cast iron)	Chromated (In case of aluminum alloy cast iron)

Weight/Aluminum tube: Lube style (Non-lube style, Air-hydro style) (kg)

Bore size (mm)		ø125	ø140	ø160
Basic weight	Basic	14.85 (13.73)	17.98 (16.57)	24.77 (23.03)
	Foot	16.48 (15.36)	20.50 (19.09)	27.57 (25.83)
	Front flange	17.53 (16.41)	22.98 (21.57)	31.16 (29.42)
	Rear flange	17.53 (16.41)	22.98 (21.57)	31.16 (29.42)
	Single clevis	17.92 (16.80)	22.27 (20.86)	30.26 (28.52)
	Double clevis (Clevis pin, Cotter pin)	18.38 (17.26)	23.02 (21.61)	31.11 (29.37)
	Trunnion	18.98 (17.86)	23.71 (22.30)	32.17 (30.43)
Additional weight per 100 stroke		1.77	1.96	2.39
Accessories	Single knuckle joint	0.91	1.16	1.56
	Double knuckle joint (Clevis pin, Cotter pin)	1.37	1.81	2.48
	Rod end nut	0.16	0.16	0.23

* () shows the weight of non-lube and air-hydro style.

Calculation example: CS1L160-500

- Basic weight.....27.57 (Foot style, ø160)
 - Additional weight.....2.39/100 stroke
 - Cylinder stroke.....500 stroke
- $$27.57 + 2.39 \times 500/100 = 39.52\text{kg}$$

Weight/Steel tubing (kg)

Bore size (mm)		ø125	ø140	ø160	ø180	ø200	ø250	ø300
Standard weight	Basic	15.20	18.38	25.24	34.16	42.66	79.78	115.94
	Foot	16.83	20.90	28.04	38.36	47.54	89.28	133.22
	Front flange	17.88	23.38	31.63	43.99	54.57	101.62	146.14
	Rear flange	17.88	23.38	31.63	43.99	54.57	101.62	146.14
	Single clevis	18.27	22.67	30.73	42.55	52.56	98.17	149.22
	Double clevis (Clevis pin, Cotter pin)	18.73	23.42	31.58	44.23	54.59	101.36	154.96
	Trunnion	19.33	24.11	32.64	44.78	56.65	107.62	156.37
Additional weight per 100 stroke		2.66	3.01	3.58	4.95	5.75	9.08	12.15
Accessory	Single knuckle joint	0.91	1.16	1.56	3.07	2.90	5.38	10.82
	Double knuckle joint (Clevis pin, Cotter pin)	1.37	1.81	2.48	4.74	4.59	9.22	17.17
	Trunnion	0.16	0.16	0.23	0.32	0.85	1.26	1.43



Precautions

Be sure to read before handling.
Refer to p.0-39 to 0-43 for
Safety Instructions and
common precautions.

Warning

Do not use the cylinder as a shock absorber.

- Using the cylinder as a shock absorber may cause damage.

Caution

Do not open the cushion valve excessively.

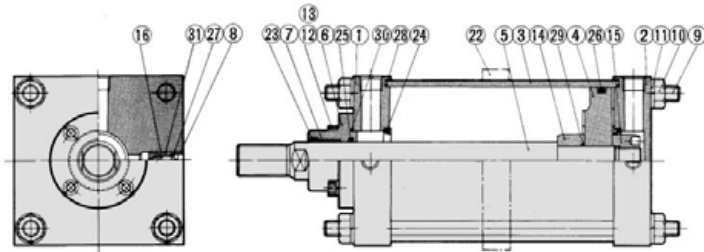
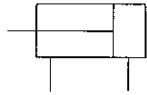
- If the cushion valve is rotated excessively in the opening direction could be damaged because the portion of the threads that is engaged (counterclockwise), be aware that the valve could slip out, or the threads becomes too short.

Regarding the installation of a knuckle joint:

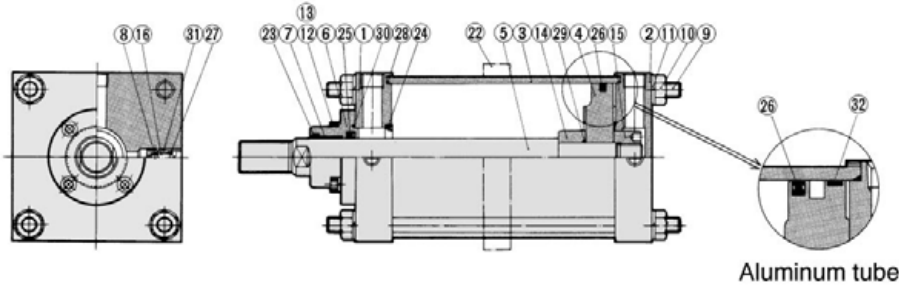
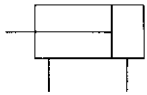
- Contact SMC if a knuckle joint must be installed on the piston rod by using the rod end nut.

Construction

Lube

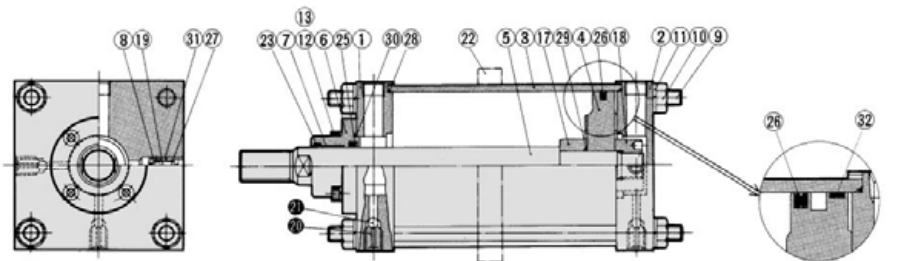
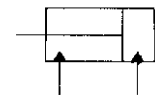


Non-lube



Aluminum tube

Air-hydro



Aluminum tube

Component Parts

No.	Description	Material	Note
①	Rod cover	Rolled steel plate	Black coated
②	Head cover	Rolled steel plate	Black coated
③	Cylinder tube	∅125 to ∅160	Aluminum alloy
		∅125 to ∅300	Carbon steel pipe
			Inside: Hard chrome plated
④	Piston	Cast iron **	
⑤	Piston rod	Carbon steel	Hard chrome plated
⑥	Holder plate	Cast iron	Black coating
⑦	Bushing	Lead bronze casting	
⑧	Valve guide	Brass	
⑨	Tie rod	Carbon steel	Chromated
⑩	Tie rod nut	Rolled steel	Black zinc chromated
⑪	Spring washer	Steel wire	Black zinc chromated
⑫	Holder plate bolt	Chrome-molybdenum steel	Black zinc chromated
⑬	Spring washer	Steel wire	Black zinc chromated
⑭	Cushion ring A	Rolled steel	Zinc chromated
⑮	Cushion ring B	Rolled steel	Zinc chromated
⑯	Cushion valve	Rolled steel	Electroless nickel plated
⑰	Spacer A	Rolled steel	Zinc chromated
⑱	Spacer B	Rolled steel	Zinc chromated
⑲	Air releasing valve B	Rolled steel	Zinc chromated
⑳	Air releasing valve A	Chrome-molybdenum steel	
㉑	Check ball	Chrome bearing steel	
㉒	Tie rod reinforcement ring*	Rolled steel	Black coated
㉓	Wear ring	Resin	

* In case of long strokes

** Aluminum tube material of non-lube and air-hydro style is an aluminum alloy die cast.

Seal List

No.	Description	Mat'l	Part No.					
			125	140	160	180	200	250

Lube style

㉓	Wiper ring	NBR	SDR-36	SDR-36	SDR-40	SDR-45	SDR-50	SDR-60	SDR-70
㉔**	Cushion seal		DSM-50S	DSM-50S	DSM-50S	DSM-60S	DSM-60S	DSM-75S	PCS-85(R) DSM-75S(H)
㉕	Rod seal		P36	P36	P40	P45	P50A	P60	P70
㉖	Piston seal		P115	P130	P150	P165	P185	P235	P285
㉗	Valve seal		P7	P7	P7	P7	P7	P7	P7
㉘	Tube gasket		C120	C135	C155	C175	C195	CS160-1618-G4	CS160-1618-G5
㉙**	Piston seal		G25	G25	G25	G35	G35	G45	G45
㉚	Holder gasket		G55	G55	G55	G65	G65	G80	G90
㉛**	Guide gasket		N-12.5-1.5	N-12.5-1.5	N-12.5-1.5	N-12.5-1.5	N-12.5-1.5	N-12.5-1.5	N-12.5-1.5

Non-lube style Seals except ㉕ and ㉖ are the same as for the lube-style.

㉕	Rod seal	NBR	PNY-36	PNY-36	PNY-40	PNY-45	PNY-50	PNY-60	PNY-70
㉖	Piston seal		NLP-125A	NLP-140A	NLP-160A	NLP-180A	NLP-200A	NLP-250A	NLP-300A

Air-hydro style Seals except ㉕ and ㉖ are the same as for the lube-style. (Except cushion seal)

㉕	Rod seal	NBR	SKY-36	SKY-36	SKY-40
㉖	Piston seal		RPS-125	RPS-140	RPS-160

Replacement Parts (Seal kits)

• Refer to p.1.10-6 for replacement part no. for air cylinder standard style series CS1.
** Seal kits does not include cushion seal, piston seal and guide gasket because they are not replacement parts.

CJ1

CJP

CJ2

CM2

C85

CG1

MB

C95

CA1

CS1

Series CS1

Standard Style/Replacement Parts (Seal kits)

When ordering the replacement parts (seal kits) for standard style Series CS1 air cylinders, indicate the order number listed in the table on the right. Each set of replacement parts contains the following: wiper ring, rod seal, piston seal, valve seal, tube gasket, and push plate gasket (for 1 cylinder).

Standard style (Lube)

Bore (mm)	Kit No.	23	25	26	27	28	30
		Wiper ring	Rod seal	Piston seal	Valve seal	Tube gasket	Holder gasket
125	CS1-125A-PS	SDR-36	P36	P115	P7	C120	G55
140	CS1-140A-PS	SDR-36	P36	P130	P7	C135	G55
160	CS1-160A-PS	SDR-40	P40	P150	P7	C155	G55
180	CS1-180A-PS	SDR-45	P45	P165	P7	C175	G65
200	CS1-200A-PS	SDR-50	P50A	P185	P7	C195	G65
250	CS1-250A-PS	SDR-60	P60	P235	P7	CS160-1618-G4	G80
300	CS1-300A-PS	SDR-70	P70	P285	P7	CS160-1618-G5	G90

Standard (Non-lube)

Bore (mm)	Kit No.	23	25	26	27	28	30
		Wiper ring	Rod seal	Piston seal	Valve seal	Tube gasket	Holder gasket
125	CS1N125A-PS	SDR-36	PNY-36	NLP-125A	P7	C120	G55
140	CS1N140A-PS	SDR-36	PNY-36	NLP-140A	P7	C135	G55
160	CS1N160A-PS	SDR-40	PNY-40	NLP-160A	P7	C155	G55
180	CS1N180A-PS	SDR-45	PNY-45	NLP-180A	P7	C175	G65
200	CS1N200A-PS	SDR-50	PNY-50	NLP-200A	P7	C195	G65
250	CS1N250A-PS	SDR-60	PNY-60	NLP-250A	P7	CS160-1618-G4	G80
300	CS1N300A-PS	SDR-70	PNY-70	NLP-300A	P7	CS160-1618-G5	G90

Air-hydro

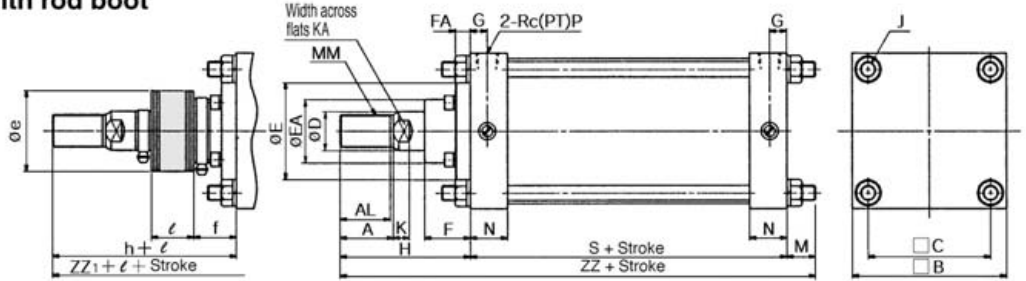
Bore (mm)	Kit No.	Wiper ring	Rod seal	Piston seal	Valve seal	Tube gasket	Holder gasket
125	CS1H125A-PS	SDR-36	SKY-36	RPS-125	P7	C120	G55
140	CS1H140A-PS	SDR-36	SKY-36	RPS-140	P7	C135	G55
160	CS1H160A-PS	SDR-40	SKY-40	RPS-160	P7	C155	G55

Series C□S1

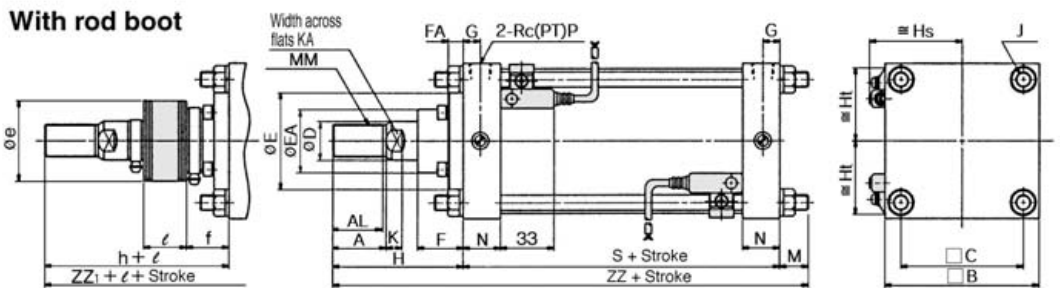
Basic/CS1B 

Lube (CS1B), Non-lube (CS1BN), Air-hydro (CS1BH)

With rod boot




With auto switch/CDS1B



Style	Bore (mm)	Stroke range (mm)*	A	AL	□B	□C	D	E	EA	F	FA	G	J	K	KA	M	MM	N	P	S
Lube	125	to 1000	50	47	145	115	36	90	59	43	14	16	M14 X 1.5	15	31	27	M30 X 1.5	35	1/2	98
Non-lube	140	to 1000	50	47	161	128	36	90	59	43	14	16	M14 X 1.5	15	31	27	M30 X 1.5	35	1/2	98
Air-hydro	160	to 1200	56	53	182	144	40	90	59	43	14	18.5	M16 X 1.5	17	36	30.5	M36 X 1.5	39	3/4	106
Lube	180	to 1200	63	60	204	162	45	115	70	48	17	18.5	M18 X 1.5	20	41	35	M40 X 1.5	39	3/4	111
Non-lube	200	to 1200	63	60	226	182	50	115	74	48	17	18.5	M20 X 1.5	20	46	35	M45 X 1.5	39	3/4	111
	250	to 1200	71	67	277	225	60	140	86	60	20	23	M24 X 1.5	25	56	41.5	M56 X 2	49	1	141
	300	to 1200	80	76	330	270	70	140	96	60	20	23	M30 X 1.5	30	65	51.5	M64 X 2	49	1	146

Style	Bore (mm)	W/o rod boot		W/ rod boot				
		H	ZZ	e	f	h	ℓ	ZZ ₁
Lube	125	110	235	75	40	133	0.2 Stroke	258
Non-lube	140	110	235	75	40	133	0.2 Stroke	258
Air-hydro	160	120	256.5	75	40	141	0.2 Stroke	277.5
Lube	180	135	281	85	45	153	0.2 Stroke	299
Non-lube	200	135	281	90	45	153	0.2 Stroke	299
	250	160	342.5	105	55	176	0.17 Stroke	358.5
	300	175	372.5	115	55	190	0.17 Stroke	387.5

* In case of rod boot style, min. stroke is 30mm or more.

-  CS1B125.....SCS1125, #1
- CS1B140.....SCS1140, #1
- CS1B160.....SCS1160, #1
- CS1B180.....SCS1180, #1
- CS1B200.....SCS1200, #1
- CS1B250.....SCS1250, #1
- CS1B300.....SCS1300, #1

* The drawing shows with an auto switch. Eliminate the unnecessary parts.

Style	Bore (mm)	Stroke range (mm)*	S	W/o rod boot		W/ rod boot	
				ZZ	ZZ ₁		
Lube	125	to 1000	98	235	258		
Non-lube	140	to 1000	98	235	258		
Air-hydro	160	to 1200	106	256.5	277.5		
Lube	180	to 1200	115	285	303		
Non-lube	200	to 998	120	290	308		

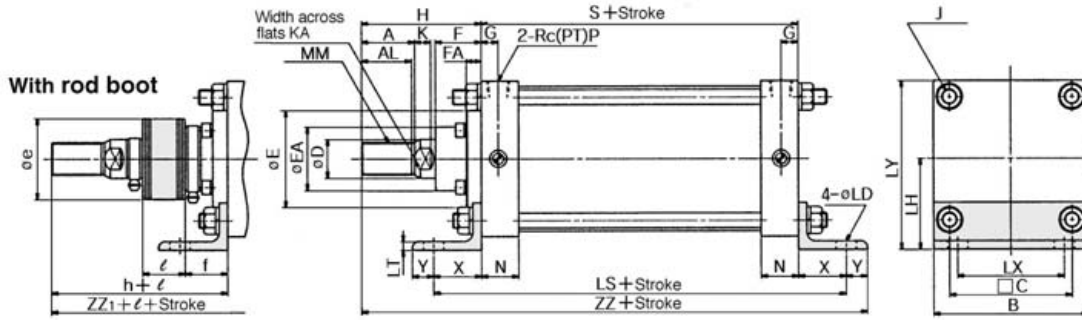
* Other dimensions are the same as standard style.

** Refer to p.1.10-20 for dimensions of auto switch setting position and mounting height.

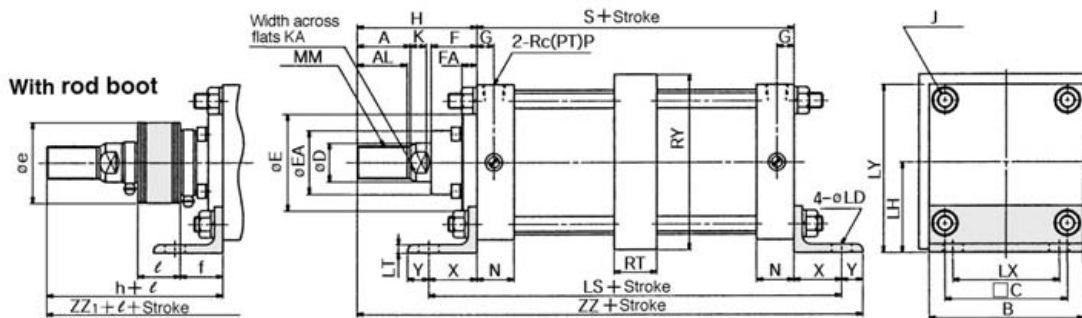
*** Refer to p.1.10-8 for auto switch min. mountable stroke.



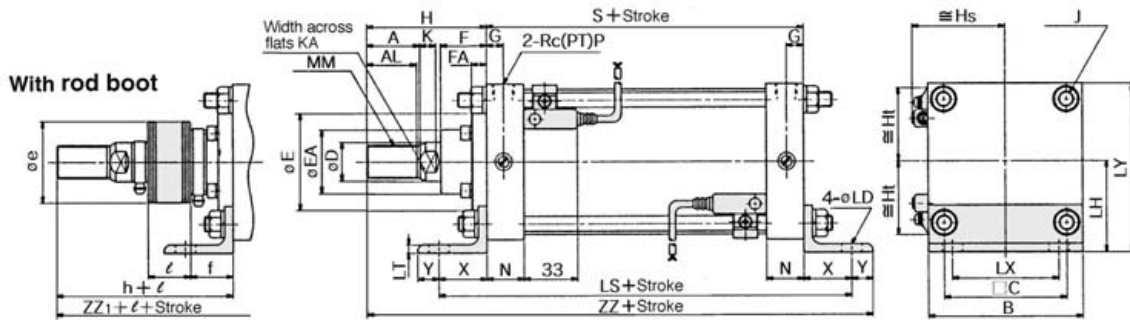
Lube (CS1L), Non-lube (CS1LN), Air-hydro (CS1LH)



Long stroke



With auto switch/CDS1L



Style	Bore (mm)	Stroke range (mm)*	Long stroke range (mm)	A	AL	B	□C	D	E	EA	F	FA	G	J	K	KA	LD	LH	LS	LT	LX	LY	MM	N	P	RT
Lube	125	to 1400	1401 to 1600	50	47	145	115	36	90	59	43	14	16	M14 X 1.5	15	31	19	85	188	8	100	157.5	M30 X 1.5	35	1/2	36
Non-lube	140	to 1400	1401 to 1600	50	47	161	128	36	90	59	43	14	16	M14 X 1.5	15	31	19	100	188	9	112	180.5	M30 X 1.5	35	1/2	36
Air-hydro	160	to 1400	1401 to 1600	56	53	182	144	40	90	59	43	14	18.5	M16 X 1.5	17	36	19	106	206	9	118	197	M36 X 1.5	39	3/4	45
Lube Non-lube	180	to 1800	1801 to 2000	63	60	204	162	45	115	70	48	17	18.5	M18 X 1.5	20	41	24	125	231	10	132	227	M40 X 1.5	39	3/4	45
	200	to 1800	1801 to 2000	63	60	226	182	50	115	74	48	17	18.5	M20 X 1.5	20	46	24	132	231	10	150	245	M45 X 1.5	39	3/4	45
	250	to 2000	2001 to 2400	71	67	277	225	60	140	86	60	20	23	M24 X 1.5	25	56	29	160	301	12	180	298.5	M56 X 2	49	1	55
	300	to 2000	2001 to 2400	80	76	330	270	70	140	96	60	20	23	M30 X 1.5	30	65	33	200	326	15	212	365	M64 X 2	49	1	55

Style	Bore (mm)	RY	S	X	Y	W/o rod boot						W/ rod boot		
						H	ZZ	e	f	h	ℓ	ZZ ₁	ℓ	ZZ ₁
Lube	125	164	98	45	20	110	273	75	40	133	0.2 Stroke	296		
Non-lube	140	184	98	45	30	110	283	75	40	133	0.2 Stroke	306		
Air-hydro	160	204	106	50	25	120	301	75	40	141	0.2 Stroke	322		
Lube Non-lube	180	228	111	60	30	135	336	85	45	153	0.2 Stroke	354		
	200	257	111	60	30	135	336	90	45	153	0.2 Stroke	354		
	250	325	141	80	40	160	421	105	55	176	0.17 Stroke	437		
	300	390	146	90	40	175	451	115	55	190	0.17 Stroke	466		

Style	Bore (mm)	Stroke range (mm)	S	LS	W/o rod boot		W/ rod boot	
					ZZ	ZZ ₁	ZZ	ZZ ₁
Lube	125	to 1400	98	188	273	296		
Non-lube	140	to 1400	98	188	283	306		
Air-hydro	160	to 1400	106	206	301	322		
Lube	180	to 1500	115	235	340	358		
Non-lube	200	to 998	120	240	345	363		

* In case of rod boot style, min. stroke is 30 mm or more.

- CS1L125.....SCS1125, #2
- CS1L140.....SCS1140, #2
- CS1L160.....SCS1160, #2
- CS1L180.....SCS1180, #2
- CS1L200.....SCS1200, #2
- CS1L250.....SCS1250, #2
- CS1L300.....SCS1300, #2

* The drawing shows with an auto switch. Eliminate the unnecessary parts.

* Other dimensions are the same as standard style.

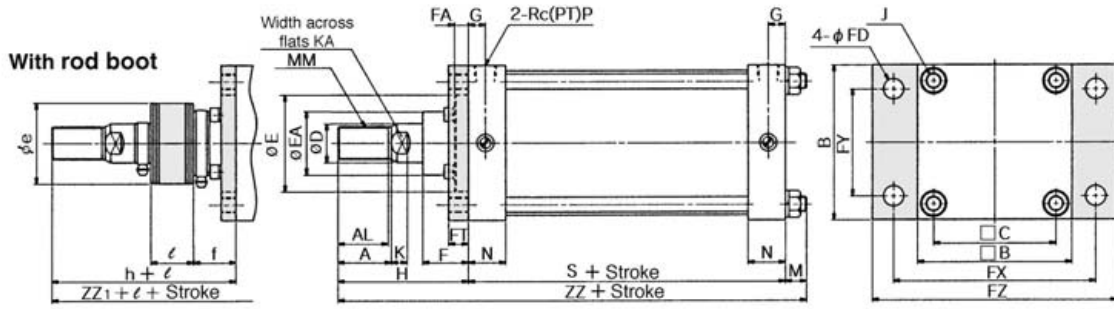
** Refer to p.1.10-20 for dimensions of auto switch setting position and mounting height.

*** Refer to p.1.20-8 for auto switch min. mountable stroke.

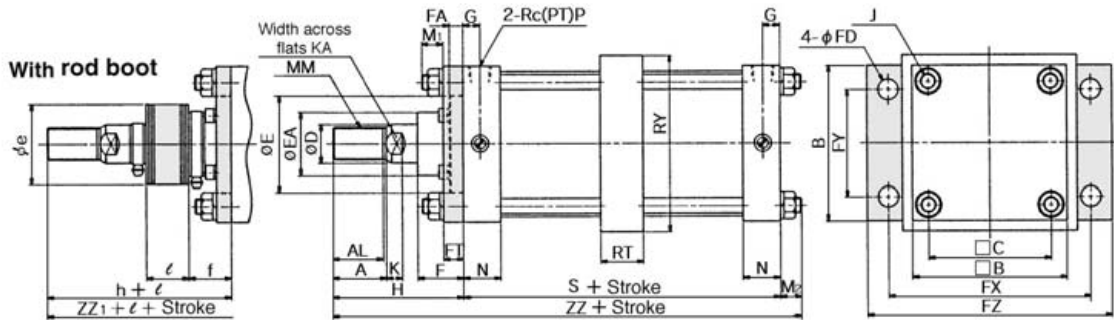
Series C□S1

Front Flange/CS1F 

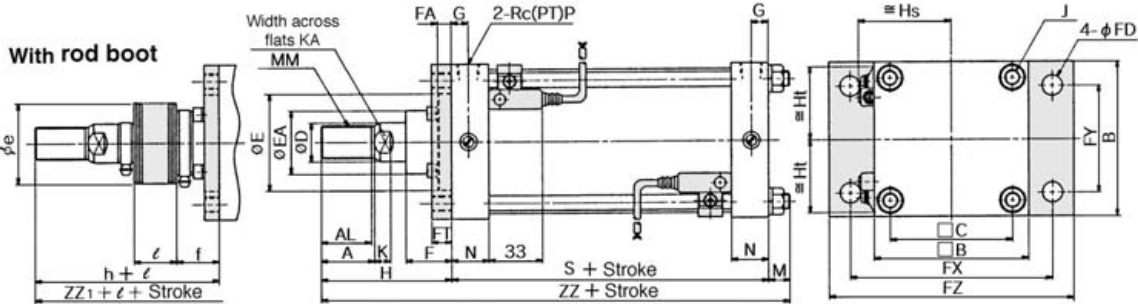
Lube (CS1F), Non-lube (CS1FN), Air-hydro (CS1FH)



Long stroke



With auto switch/CDS1F



Style	Bore (mm)	Stroke range (mm)*	A	AL	B	□B	□C	D	E	EA	F	FA	FD	FT	FX	FY	FZ	G	J	K	KA	M	S	N	P	MM	W/o rod boot		With rod boot				
																											H	ZZ	e	f	h	ℓ	ZZ ₁
Lube	125	to 1400	50	47	145	145	115	36	90	59	43	14	19	14	190	100	230	16	M14 X 1.5	15	31	30	98	35	1/2	M30 X 1.5	110	238	75	40	133	261	
Non-lube	140	to 1400	50	47	160	161	128	36	90	59	43	14	19	20	212	112	255	16	M14 X 1.5	15	31	24	98	35	1/2	M30 X 1.5	110	232	75	40	133	255	
Air-hydro	160	to 1400	56	53	180	182	144	40	90	59	43	14	19	20	236	118	275	18.5	M16 X 1.5	17	36	26	106	39	3/4	M36 X 1.5	120	252	75	40	141	273	
	180	to 1800	63	60	200	204	162	45	115	70	48	17	24	25	265	132	320	18.5	M18 X 1.5	20	41	31	111	39	3/4	M40 X 1.5	135	277	85	45	153	295	
Lube	200	to 1800	63	60	225	226	182	50	115	74	48	17	24	25	280	150	335	18.5	M20 X 1.5	20	46	31	111	39	3/4	M45 X 1.5	135	277	90	45	153	295	
Non-lube	250	to 2000	71	67	275	277	225	60	140	86	60	20	29	30	355	180	420	23	M24 X 1.5	25	56	35	141	49	1	M56 X 2	160	336	105	55	176	352	
	300	to 2000	80	76	330	330	270	70	140	96	60	20	33	30	400	212	475	23	M30 X 1.5	30	65	48	146	49	1	M64 X 2	175	369	115	55	190	384	

Long stroke (mm)

Style	Bore (mm)	Long stroke range (mm)	M ₁	M ₂	RT	RY	W/o rod boot		W/ rod boot	
							ZZ	ZZ ₁	ZZ	ZZ ₁
Lube	125	1401 to 1600	22	22	36	164	230	253		
Non-lube	140	1401 to 1600	19	19	36	184	227	250		
Air-hydro	160	1401 to 1600	22	22	45	204	248	269		
	180	1801 to 2000	26	26	45	228	272	290		
Lube	200	1801 to 2000	26	26	45	257	272	290		
Non-lube	250	2001 to 2400	30	30	55	325	331	347		
	300	2001 to 2400	36	36	55	390	357	372		

With auto switch/ø125 to ø200 only (mm)

Style	Bore (mm)	Stroke range (mm)	S	W/o rod boot		W/ rod boot	
				ZZ	ZZ ₁	ZZ	ZZ ₁
Lube	125	to 1400	98	238	261		
Non-lube	140	to 1400	98	232	255		
Air-hydro	160	to 1400	106	252	273		
Lube	180	to 1500	115	281	299		
Non-lube	200	to 998	120	286	304		

* In case of rod boot style, min. stroke is 30mm or more.



- CS1F125.....SCS1125, #3
- CS1F140.....SCS1140, #3
- CS1F160.....SCS1160, #3
- CS1F180.....SCS1180, #3
- CS1F200.....SCS1200, #3
- CS1F250.....SCS1250, #3
- CS1F300.....SCS1300, #3

* The drawing shows with an auto switch. Eliminate the unnecessary parts.

* Other dimensions are the same as standard style.

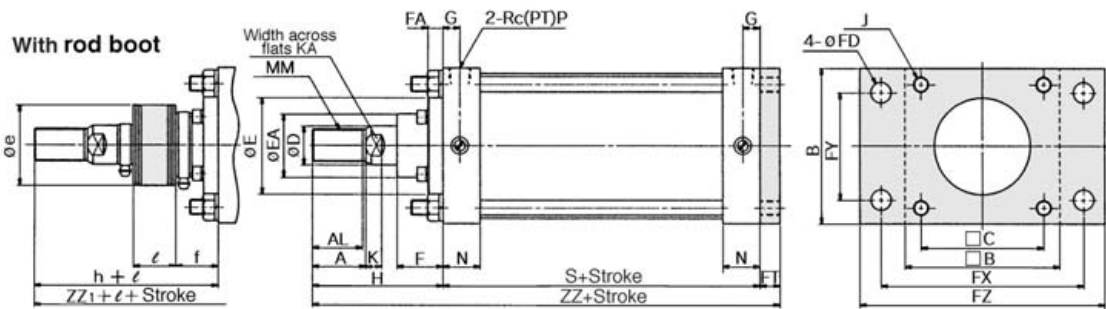
** Refer to p.1.10-20 for dimensions of auto switch setting position and mounting height.

*** Refer to p.1.10-8 for auto switch min. mountable stroke.

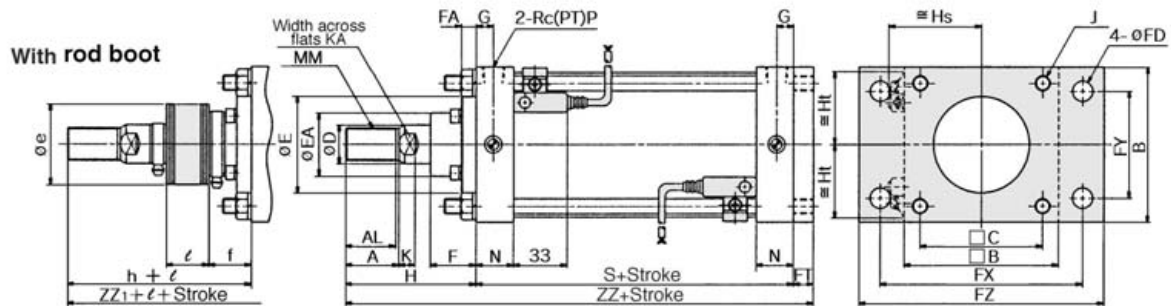
Rear Flange/CS1G



Lube (CS1G), Non-lube (CS1GN), Air-hydro (CS1GH)



With auto switch/CDS1G



- CJ1
- CJP
- CJ2
- CM2
- C85
- CG1
- MB
- C95
- CA1
- CS1

Style	Bore (mm)	Stroke range (mm)*	(mm)																					
			A	AL	B	□B	□C	D	E	EA	F	FA	FD	FT	FX	FY	FZ	G	J	K	KA	MM	N	P
Lube	125	to 1000	50	47	145	145	115	36	90	59	43	14	19	14	190	100	230	16	M14 X 1.5	15	31	M30 X 1.5	35	1/2
Non-lube	140	to 1000	50	47	160	161	128	36	90	59	43	14	19	20	212	112	255	16	M14 X 1.5	15	31	M30 X 1.5	35	1/2
Air-hydro	160	to 1200	56	53	180	182	144	40	90	59	43	14	19	20	236	118	275	18.5	M16 X 1.5	17	36	M36 X 1.5	39	3/4
Lube Non-lube	180	to 1200	63	60	200	204	162	45	115	70	48	17	24	25	265	132	320	18.5	M18 X 1.5	20	41	M40 X 1.5	39	3/4
	200	to 1200	63	60	225	226	182	50	115	74	48	17	24	25	280	150	335	18.5	M20 X 1.5	20	46	M45 X 1.5	39	3/4
	250	to 1200	71	67	275	277	225	60	140	86	60	20	29	30	355	180	420	23	M24 X 1.5	25	56	M56 X 2	49	1
300	to 1200	80	76	330	330	270	70	140	96	60	20	33	30	400	212	475	23	M30 X 1.5	30	65	M64 X 2	49	1	

Style	Bore (mm)	S	W/o rod boot		W/ rod boot				
			H	ZZ	e	f	h	ℓ	ZZ ₁
Lube	125	98	110	222	75	40	133	0.2 Stroke	245
Non-lube	140	98	110	228	75	40	133	0.2 Stroke	251
Air-hydro	160	106	120	246	75	40	141	0.2 Stroke	267
Lube Non-lube	180	111	135	271	85	45	153	0.2 Stroke	289
	200	111	135	271	90	45	153	0.2 Stroke	289
	250	141	160	331	105	55	176	0.17 Stroke	347
300	146	175	351	115	55	190	0.17 Stroke	366	

With auto switch/ø125 to ø200 only (mm)

Style	Bore (mm)	Stroke range (mm)	S	W/o rod boot	W/ rod boot
				ZZ	ZZ ₁
Lube	125	to 1000	98	222	245
Non-lube	140	to 1000	98	228	251
Air-hydro	160	to 1200	106	246	267
Lube	180	to 1200	115	275	293
Non-lube	200	to 998	120	280	298

* In case of rod boot style, min. stroke is 30mm or more.

CS1G125.....SCS1125, #4 CS1G140.....SCS1140, #4 CS1G160.....SCS1160, #4 CS1G180.....SCS1180, #4	CS1G200.....SCS1200, #4 CS1G250.....SCS1250, #4 CS1G300.....SCS1300, #4
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* The drawing shows with an auto switch. Eliminate the unnecessary parts.

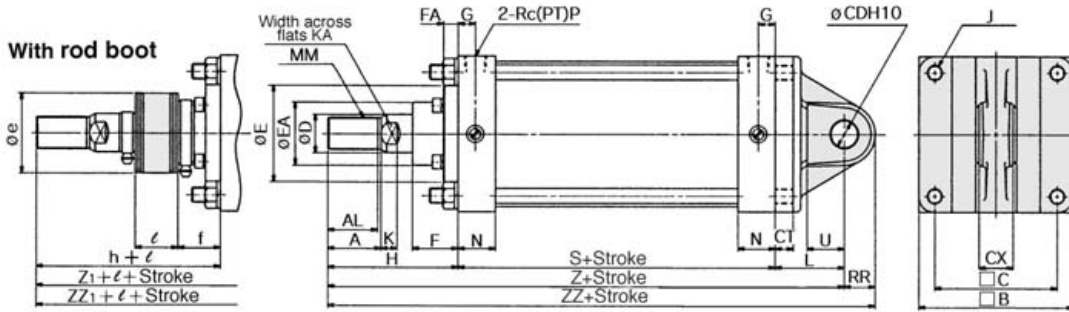
* Other dimensions are the same as standard style.
 ** Refer to p.1.10-20 for dimensions of auto switch setting position and mounting height.
 *** Refer to p.1.10-8 for auto switch min. mountable stroke.

Series C□S1

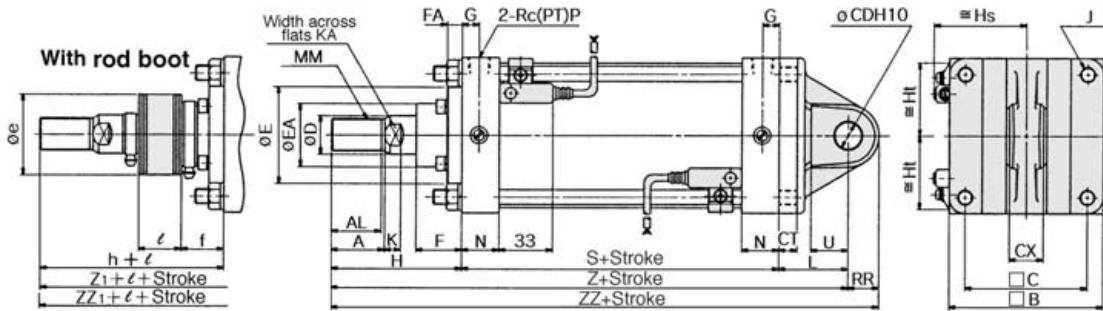
Single Clevis/CS1C



Lube (CS1C), Non-lube (CS1CN), Air-hydro (CS1CH)



With auto switch/CDS1C



Style	Bore (mm)	Stroke range (mm)*	A	AL	□B	□C	CDH10	CT	CX	D	E	EA	F	FA	G	J	K	KA	L	MM	N	P	RR
Lube	125	to 1000	50	47	145	115	25 ^{+0.084} ₀	17	32 ^{-0.1} _{-0.3}	36	90	59	43	14	16	M14 X 1.5	15	31	65	M30 X 1.5	35	1/2	29
Non-lube	140	to 1000	50	47	161	128	28 ^{+0.084} ₀	17	36 ^{-0.1} _{-0.3}	36	90	59	43	14	16	M14 X .5	15	31	75	M30 X 1.5	35	1/2	32
Air-hydro	160	to 1200	56	53	182	144	32 ^{+0.100} ₀	20	40 ^{-0.1} _{-0.3}	40	90	59	43	14	18.5	M16 X 1.5	17	36	80	M36 X 1.5	39	3/4	36
Lube Non-lube	180	to 1200	63	60	204	162	40 ^{+0.100} ₀	23	50 ^{-0.1} _{-0.3}	45	115	70	48	17	18.5	M18 X 1.5	20	41	90	M40 X 1.5	39	3/4	44
	200	to 1200	63	60	226	182	40 ^{+0.100} ₀	25	50 ^{-0.1} _{-0.3}	50	115	74	48	17	18.5	M20 X 1.5	20	46	90	M45 X 1.5	39	3/4	44
	250	to 1200	71	67	277	225	50 ^{+0.100} ₀	30	63 ^{-0.1} _{-0.3}	60	140	86	60	20	23	M24 X 1.5	25	56	110	M56 X 2	49	1	55
	300	to 1200	80	76	330	270	63 ^{+0.120} ₀	37	80 ^{-0.1} _{-0.3}	70	140	96	60	20	23	M30 X 1.5	30	65	130	M64 X 2	49	1	68

Style	Bore (mm)	S	U	(mm)									
				W/o rod boot			W/rod boot						
				H	Z	ZZ	e	f	h	l	Z1	ZZ1	
Lube	125	98	35	110	273	302	75	40	133	0.2 Stroke	296	325	
Non-lube	140	98	40	110	283	315	75	40	133	0.2 Stroke	306	338	
Air-hydro	160	106	45	120	306	342	75	40	141	0.2 Stroke	327	363	
Lube Non-lube	180	111	50	135	336	380	85	45	153	0.2 Stroke	354	398	
	200	111	50	135	336	380	90	45	153	0.2 Stroke	354	398	
	250	141	65	160	411	466	105	55	176	0.17 Stroke	427	482	
	300	146	80	175	451	519	115	55	190	0.17 Stroke	466	534	

* In case of rod boot style, min. stroke is 30mm or more.

With auto switch/ø125 to ø200 only (mm)

Style	Bore (mm)	Stroke range (mm)	S	W/rod boot			
				Z	ZZ	Z1	ZZ1
Lube	125	to 1000	98	273	302	296	325
Non-lube	140	to 1000	98	283	315	306	338
Air-hydro	160	to 1200	106	306	342	327	363
Lube	180	to 1200	115	340	384	358	402
Non-lube	200	to 998	120	345	389	363	407

* Other dimensions are the same as standard style.

** Refer to p.1.10-20 for dimensions of auto switch setting position and mounting height.

*** Refer to p.1.10-8 for auto switch min. mountable stroke.



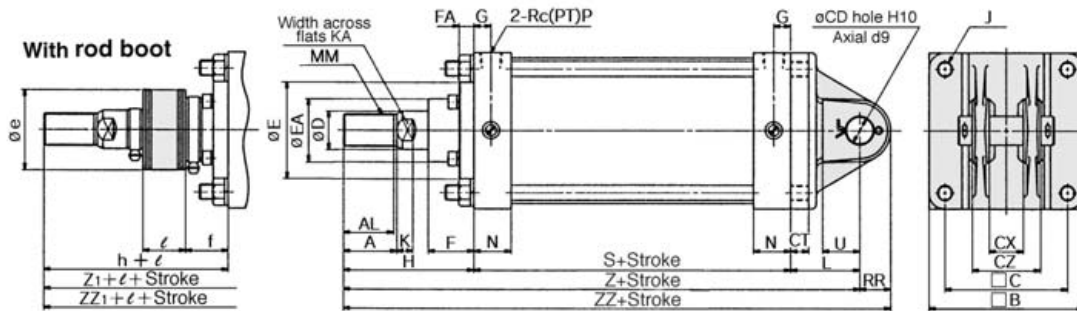
CS1C125.....SCS1125, #5 CS1C200.....SCS1200, #5
 CS1C140.....SCS1140, #5 CS1C250.....SCS1250, #5
 CS1C160.....SCS1160, #5 CS1C300.....SCS1300, #5
 CS1C180.....SCS1180, #5

* The drawing shows with an auto switch. Eliminate the unnecessary parts.

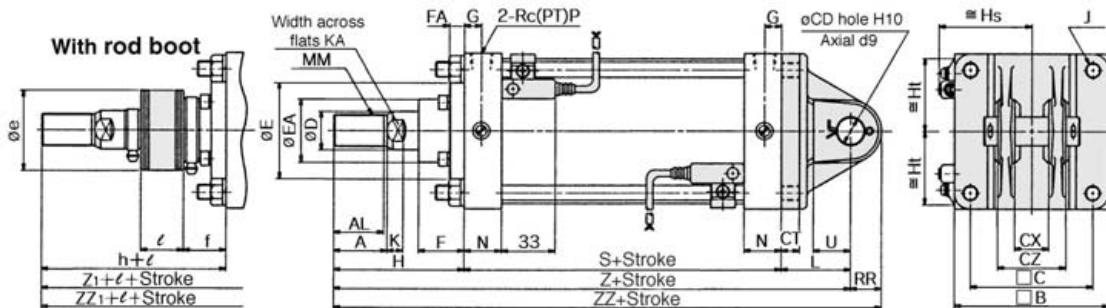
Double Clevis/CS1D



Lube (CS1D), Non-lube (CS1DN), Air-hydro (CS1DH)



With auto switch/CDS1D



- CJ1
- CJP
- CJ2
- CM2
- C85
- CG1
- MB
- C95
- CA1
- CS1**

Style	Bore (mm)	Stroke range (mm)*	□B □C		CDH10	CT	CX	CZ	D	E	EA	F	FA	G	J	K	KA	L	MM	N	P	RR		
			A	AL																				
Lube	125	to 1000	50	47	145	115	25 ^{+0.084} ₀	17	32 ^{+0.3} _{+0.1}	64 ⁰ _{-0.2}	36	90	59	43	14	16	M14 X 1.5	15	31	65	M30 X 1.5	35	1/2	29
Non-lube	140	to 1000	50	47	161	128	28 ^{+0.084} ₀	17	36 ^{+0.3} _{+0.1}	72 ⁰ _{-0.2}	36	90	59	43	14	16	M14 X 1.5	15	31	75	M30 X 1.5	35	1/2	32
Air-hydro	160	to 1200	56	53	182	144	32 ^{+0.100} ₀	20	40 ^{+0.3} _{+0.1}	80 ⁰ _{-0.2}	40	90	59	43	14	18.5	M16 X 1.5	17	36	80	M36 X 1.5	39	3/4	36
Lube Non-lube	180	to 1200	63	60	204	162	40 ^{+0.100} ₀	23	50 ^{+0.3} _{+0.1}	100 ^{-0.1} _{-0.3}	45	115	70	48	17	18.5	M18 X 1.5	20	41	90	M40 X 1.5	39	3/4	44
	200	to 1200	63	60	226	182	40 ^{+0.100} ₀	25	50 ^{+0.3} _{+0.1}	100 ^{-0.1} _{-0.3}	50	115	74	48	17	18.5	M20 X 1.5	20	46	90	M45 X 1.5	39	3/4	44
	250	to 1200	71	67	277	225	50 ^{+0.100} ₀	30	63 ^{+0.3} _{+0.1}	126 ^{-0.1} _{-0.3}	60	140	86	60	20	23	M24 X 1.5	25	56	110	M56 X 2	49	1	55
	300	to 1200	80	76	330	270	63 ^{+0.120} ₀	37	80 ^{+0.3} _{+0.1}	160 ^{-0.1} _{-0.3}	70	140	96	60	20	23	M30 X 1.5	30	65	130	M64 X 2	49	1	68

Style	Bore (mm)	S	U	(mm)										
				W/o rod boot				W/rod boot						
				H	Z	ZZ	e	f	h	ℓ	Z ₁	ZZ ₁		
Lube	125	98	35	110	273	302	75	40	133	0.2 Stroke	296	325		
Non-lube	140	98	40	110	283	315	75	40	133	0.2 Stroke	306	338		
Air-hydro	160	106	45	120	306	342	75	40	141	0.2 Stroke	327	363		
Lube Non-lube	180	111	50	135	336	380	85	45	153	0.2 Stroke	354	398		
	200	111	50	135	336	380	90	45	153	0.2 Stroke	354	398		
	250	141	65	160	411	466	105	55	176	0.17 Stroke	427	482		
	300	146	80	175	451	519	115	55	190	0.17 Stroke	466	534		

* In case of rod boot style, min. stroke is 30mm or more.

With auto switch/ø125 to ø200 only (mm)

Style	Bore (mm)	Stroke range (mm)	S	W/o rod boot				W/ rod boot	
				Z	ZZ	Z ₁	ZZ ₁		
Lube	125	to 1000	98	273	302	296	325		
Non-lube	140	to 1000	98	283	315	306	338		
Air-hydro	160	to 1200	106	306	342	327	363		
Lube	180	to 1200	115	340	384	358	402		
Non-lube	200	to 998	120	345	389	363	407		

* Other dimensions are the same as standard style.

** Refer to p.1.10-20 for dimensions of auto switch setting position and mounting height.

*** Refer to p.1.10-8 for auto switch min. mountable stroke.



- CS1D125.....SCS1125, #6
- CS1D140.....SCS1140, #6
- CS1D160.....SCS1160, #6
- CS1D180.....SCS1180, #6
- CS1D200.....SCS1200, #6
- CS1D250.....SCS1250, #6
- CS1D300.....SCS1300, #6

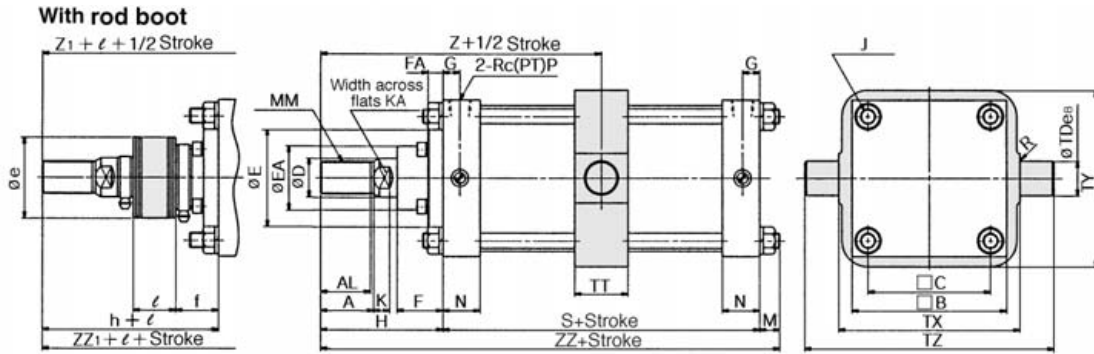
* The drawing shows with an auto switch. Eliminate the unnecessary parts.

Series C□S1

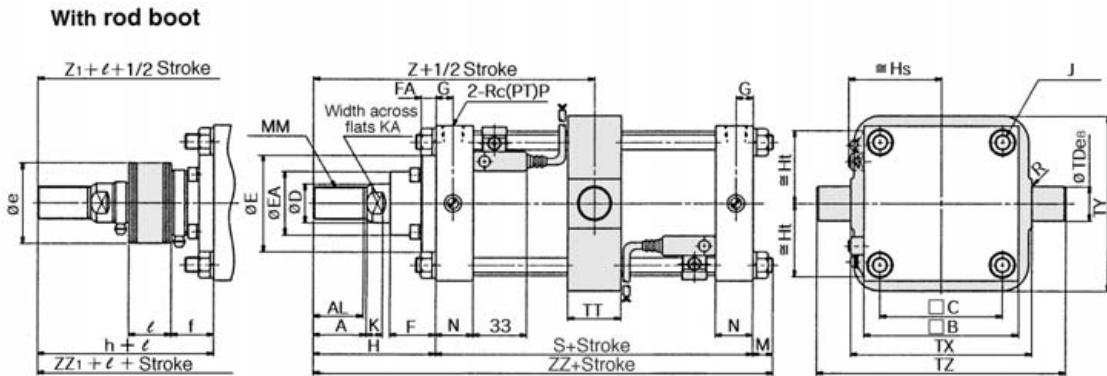
Center Trunnion/CS1T



Lube (CS1T), Non-lube (CS1TN), Air-hydro (CS1TH)



With auto switch/CDS1T



Style	Bore (mm)	Stroke range (mm)*	A	AL	□B	□C	D	E	EA	F	FA	G	J	K	KA	M	MM	N	P	R	S	TDes	TT	TX
Lube	125	25 to 1000	50	47	145	115	36	90	59	43	14	16	M14 X 1.5	15	31	19	M30 X 1.5	35	1/2	1	98	32 ^{-0.050} _{-0.089}	50	170
Non-lube	140	30 to 1000	50	47	161	128	36	90	59	43	14	16	M14 X 1.5	15	31	19	M30 X 1.5	35	1/2	1.5	98	36 ^{-0.050} _{-0.089}	55	190
Air-hydro	160	35 to 1200	56	53	182	144	40	90	59	43	14	18.5	M16 X 1.5	17	36	22	M36 X 1.5	39	3/4	1.5	106	40 ^{-0.050} _{-0.089}	60	212
Lube	180	30 to 1200	63	60	204	162	45	115	70	48	17	18.5	M18 X 1.5	20	41	26	M40 X 1.5	39	3/4	2	111	45 ^{-0.050} _{-0.089}	59	236
Non-lube	200	30 to 1200	63	60	226	182	50	115	74	48	17	18.5	M20 X 1.5	20	46	26	M45 X 1.5	39	3/4	2	111	45 ^{-0.050} _{-0.089}	59	265
	250	30 to 1200	71	67	277	225	60	140	86	60	20	23	M24 X 1.5	25	56	30	M56 X 2	49	1	3	141	56 ^{-0.060} _{-0.106}	69	335
	300	35 to 1200	80	76	330	270	70	140	96	60	20	23	M30 X 1.5	30	65	36	M64 X 2	49	1	4	146	67 ^{-0.060} _{-0.106}	79	400

Style	Bore (mm)	TY	TZ	(mm)									
				W/o rod boot				W/rod boot					
				H	Z	ZZ	e	f	h	ℓ	Z ₁	ZZ ₁	
Lube	125	164	234	110	159	227	75	40	133	0.2 Stroke	182	250	
Non-lube	140	184	262	110	159	227	75	40	133	0.2 Stroke	182	250	
Air-hydro	160	204	292	120	173	248	75	40	141	0.2 Stroke	194	269	
Lube	180	228	326	135	190.5	272	85	45	153	0.2 Stroke	208.5	290	
Non-lube	200	257	355	135	190.5	272	90	45	153	0.2 Stroke	208.5	290	
	250	325	447	160	230.5	331	105	55	176	0.17 Stroke	246.5	347	
	300	390	534	175	248	357	115	55	190	0.17 Stroke	263	372	

* In case of rod boot style, min. stroke is 30mm or more.
 (In case of rod boot style of bore size ø160 and ø300, min. stroke is 35mm or more.)

Style	Bore (mm)	Stroke range (mm)	S	(mm)			
				W/o rod boot		W/ rod boot	
				Z	ZZ	Z ₁	ZZ ₁
Lube	125	to 1000	98	159	227	182	250
Non-lube	140	to 1000	98	159	227	182	250
Air-hydro	160	to 1200	106	173	248	194	269
Lube	180	to 1200	115	192.5	276	210.5	294
Non-lube	200	to 998	120	195	281	213	299

* Other dimensions are the same as standard style.
 ** Refer to p.1.10-20 for dimensions of auto switch setting position and mounting height.
 *** Refer to p.1.10-8 for auto switch min. mountable stroke.



CS1T125.....SCS1125, #7 CS1T200.....SCS1200, #7
 CS1T140.....SCS1140, #7 CS1T250.....SCS1250, #7
 CS1T160.....SCS1160, #7 CS1T300.....SCS1300, #7
 CS1T180.....SCS1180, #7

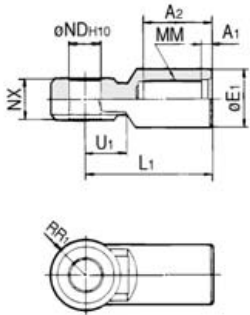
* The drawing shows with an auto switch. Eliminate the unnecessary parts.

Air Cylinder Series CS1 Accessory Dimensions

Accessories



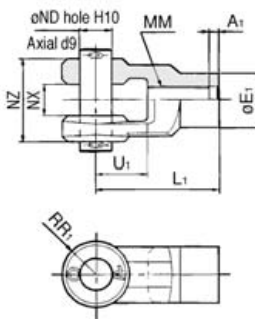
I type single knuckle joint*



Material: Cast iron

Part No.	Bore (mm)	A ₁	A ₂	E ₁	L ₁	MM	ND _{H10}	NX	RR ₁	U ₁
I-12	125	8	54	46	100	M30 X 1.5	25 ^{+0.084} ₀	32 ^{-0.1} _{-0.3}	27	33
I-14	140	8	54	48	105	M30 X 1.5	28 ^{+0.084} ₀	36 ^{-0.1} _{-0.3}	30	39
I-16	160	8	60	55	110	M36 X 1.5	32 ^{+0.1} ₀	40 ^{-0.1} _{-0.3}	34	39
I-18	180	8	67	70	125	M40 X 1.5	40 ^{+0.1} ₀	50 ^{-0.1} _{-0.3}	42.5	44
I-20	200	8	67	70	125	M45 X 1.5	40 ^{+0.1} ₀	50 ^{-0.1} _{-0.3}	42.5	44
I-25	250	9	75.5	86	160	M56 X 2	50 ^{+0.1} ₀	63 ^{-0.1} _{-0.3}	53	66
I-30	300	9	84.5	105	175	M64 X 2	63 ^{+0.12} ₀	80 ^{-0.1} _{-0.3}	66	71

Y type double knuckle joint *

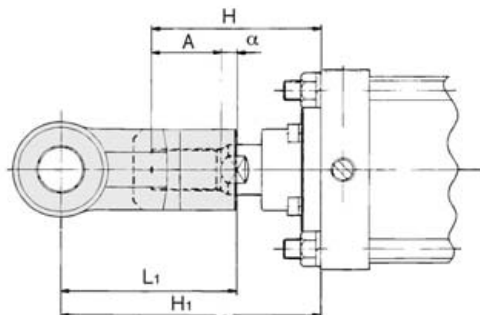


Material: Cast iron

Part No.	Bore (mm)	A ₁	E ₁	L ₁	MM	ND _{H10}	NX	NZ	RR ₁	U ₁
Y-12	125	8	46	100	M30 X 1.5	25 ^{+0.084} ₀	32 ^{+0.3} _{+0.1}	64 ^{-0.1} _{-0.3}	27	42
Y-14	140	8	48	105	M30 X 1.5	28 ^{+0.084} ₀	36 ^{+0.3} _{+0.1}	72 ^{-0.1} _{-0.3}	30	47
Y-16	160	8	55	110	M36 X 1.5	32 ^{+0.1} ₀	40 ^{+0.3} _{+0.1}	80 ^{-0.1} _{-0.3}	34	46
Y-18	180	8	70	125	M40 X 1.5	40 ^{+0.1} ₀	50 ^{+0.3} _{+0.1}	100 ^{-0.1} _{-0.3}	42.5	54
Y-20	200	8	70	125	M45 X 1.5	40 ^{+0.1} ₀	50 ^{+0.3} _{+0.1}	100 ^{-0.1} _{-0.3}	42.5	54
Y-25	250	9	86	160	M56 X 2	50 ^{+0.1} ₀	63 ^{+0.3} _{+0.1}	126 ^{-0.1} _{-0.3}	53	81
Y-30	300	9	105	175	M64 X 2	63 ^{+0.12} ₀	80 ^{+0.3} _{+0.1}	160 ^{-0.1} _{-0.3}	66	87

- * Use a single knuckle joint or a double knuckle joint individually.
(Screw it entirely over the rod end threads and tighten it.)
- * To use a single knuckle joint or a double knuckle joint concurrently with a rod end nut, extend dimensions A/H.
(To extend dimensions A/H, refer to the table below, and specify the product as Order Made -XAO.)

Single/Double knuckle joint mounting

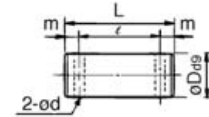


Symbol Bore (mm)	H	A	α	L ₁	H ₁	Applicable knuckle joint part No.	
						I type single knuckle	Y type double knuckle
125	110	50	3.5	100	156.5	I-12	Y-12
140	110	50	3.5	105	161.5	I-14	Y-14
160	120	56	3.5	110	170.5	I-16	Y-16
180 / 200	135	63	3.5	125	193.5	I-18, I-20	Y-18, Y-20
250	160	71	3.5	160	245.5	I-25	Y-25
300	175	80	3.5	175	266.5	I-30	Y-30

Accessory SCS1 Bore size #9



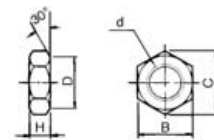
Knuckle pin, Clevis pin



Material: Carbon steel

Part No.	Bore (mm)	Dd9	L	l	m	d (Drill through)	Cotter pin
IY-12	125	25 ^{-0.065} _{-0.117}	79.5	69.5	5	4	ø4 X 40
IY-14	140	28 ^{-0.065} _{-0.117}	86.5	76.5	5	4	ø4 X 40
IY-16	160	32 ^{-0.080} _{-0.142}	94.5	84.5	5	4	ø4 X 40
IY-18	180/200	40 ^{-0.080} _{-0.142}	115	105	5	4	ø4 X 55
IY-25	250	50 ^{-0.080} _{-0.142}	144	132	6	5	ø5 X 65
IY-30	300	63 ^{-0.100} _{-0.174}	178	166	6	5	ø5 X 80

Rod end nut



Material: Rolled steel

Part No.	Bore (mm)	d	H	B	C	D
NT-12	125/140	M30 X 1.5	18	46	53.1	44
NT-16	160	M36 X 1.5	21	55	63.5	53
NT-18	180	M40 X 1.5	23	60	69.3	57
NT-20	200	M45 X 1.5	27	70	80.8	67
NT-25	250	M56 X 2	34	85	98.1	82
NT-30	300	M64 X 2	38	95	110.0	92

A, H dimensions at using both single/double knuckle joint and rod end nut

Bore (mm)	A	H
125	65	125
140	65	125
160	76	140
180	83	155
200	88	160
250	106	195
300	115	210