

Air Cylinder

Series CS2

ø125, ø140, ø160

How to Order

Without auto switch CS2 L 125 [] - 300 []

With auto switch CDS2 L 125 [] - 300 [] - M9BW []

With auto switch (Built-in magnet)

Mounting

B	Basic
L	Foot
F	Rod flange
G	Head flange
C	Single clevis
D	Double clevis
T	Center trunnion

Bore size

125	125 mm
140	140 mm
160	160 mm

Number of auto switches

Nil	2 pcs.
3	3 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

Nil	Without auto switch
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* For applicable auto switch models, refer to the below table.

Suffix for cylinder

Rod boot	Nil	None
	J	Nylon tarpaulin
	K	Heat resistant tarpaulin

* With air cushions on both sides only.

Cylinder stroke (mm)
(Maximum stroke → Refer to page 2.)

Port thread

Nil	Rc
TN	NPT
TF	G

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without auto switch is required, there is no need to enter the symbol for auto switch. (Example) CDS2B125-200

Applicable Auto Switches / For detailed auto switch specifications, refer to page 14 through to 25

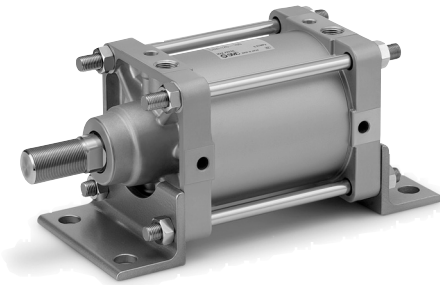
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)				Pre-wired connector	Applicable load					
					DC	AC	Tie-rod mounting	Band mounting	0.5 (Nil)	1 (M)	3 (L)	5 (Z)		IC circuit	Relay, PLC				
Reed switch	—	—	Yes	3-wire (NPN equivalent)	24 V	5 V	—	A96	—	●	—	●	—			—	—	—	
						12 V	100 V	A93	—	●	—	●	—	—	—				
				2-wire	24 V	5 V, 12 V	100 V or less	A90	—	●	—	●	—	—	—	—	—	—	
						100 V, 200 V	A54	—	●	—	●	●	—	—	—	—			
				Terminal conduit	Yes	24 V	12 V	100 V, 200 V	—	—	A33	—	—	—	—	—	—	—	—
									—	—	A34	—	—	—	—	—	—	—	—
DIN terminal	—	—	—	—	—	—	A44	—	—	—	—	—	—	—	—				
Diagnostic indication (2-color indication)	Grommet	—	—	—	—	—	A59W	—	●	—	●	—	—	—	—				
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9N	—	●	—	●	○	○	—	—			
				3-wire (PNP)				M9P	—	●	—	●	○	○	—	—			
				2-wire	24 V	12 V	100 V, 200 V	J51	—	●	—	●	○	—	—	—	—		
				3-wire (NPN)				M9B	—	●	—	●	○	○	—	—			
				Terminal conduit	Yes	24 V	12 V	100 V, 200 V	—	—	G39	—	—	—	—	—	—	—	—
									2-wire	—	—	K39	—	—	—	—	—	—	—
				Diagnostic indication (2-color indication)	Grommet	24 V	5 V, 12 V	—	—	—	M9NW	—	●	●	●	○	○	—	—
									3-wire (PNP)	M9PW	—	●	●	●	○	○	—	—	
				Water resistant (2-color indication)	Grommet	24 V	12 V	—	—	—	M9BW	—	●	●	●	○	○	—	—
									2-wire	F9BA	—	—	—	●	○	○	—	—	
Diagnostic indication (2-color indication)	Grommet	—	—	—	—	—	F59F	—	●	—	●	○	○	—	—				
4-wire (NPN)	—	5 V, 12 V	—	—	—	—	F59F	—	●	—	●	○	○	—	—				

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
 m M (Example) M9NWM
 3 m l (Example) M9NWI
 5 m 7 (Example) M9NW7

* Solid state switches marked with "○" are produced upon receipt of order
 * m (M): D M9NW only

* Since there are applicable auto switches other than listed, refer to page 13 for details.
 * For details about auto switches with pre-wired connector, refer to "Best Pneumatics 2004" Vol. 6 catalog.
 * D A9□, M9□, M9□W, F9BA are shipped together (but not assembled). (Only switch mounting bracket is assembled at the time of shipment.)

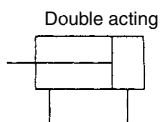
Specifications



Model	CS2	
Type	Pneumatic (Non-lube)	
Fluid	Air	
Proof pressure	1.57 MPa	
Maximum operating pressure	0.97 MPa	
Minimum operating pressure	0.05 MPa	
Piston speed	50 to 500 mm/s	
Cushion	Air cushion	
Ambient and fluid temperature	0 to 70°C (No freezing) (Built-in magnet / With auto switch: 0 to 60°C)	
Thread tolerance	JIS Class 2	
Stroke length tolerance (mm)	Stroke	Tolerance
	250 or less	+1.0 0
	251 to 1000	+1.2 0
	1001 to 1200	+1.4 0
	1201 to 1400	+1.6 0
1401 to 1600	+1.8 0	
Mounting	Basic, Foot, Rod flange, Head flange, Single clevis, Double clevis, Center trunnion	

Accessory

JIS Symbol



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

Rod Boot Material

Symbol	Material	Max. ambient temperature
J	Nylon tarpaulin	70°C
K	Heat resistant tarpaulin	110°C*

* Maximum ambient temperature for the rod boot itself.

Maximum Stroke

Mounting bracket	Maximum stroke (mm)	
	Basic, Head flange, Single clevis, Double clevis, Center trunnion	Foot, Rod flange
Bore size		
125	1000 or less	1600 or less
140		
160	1200 or less	

Mounting Bracket Part No.

Bore size (mm)	125	140	160
Foot*	CS2-L12	CS2-L14	CS2-L16
Flange	CS2-F12	CS2-F14	CS2-F16
Single clevis	CS2-C12	CS2-C14	CS2-C16
Double clevis**	CS2-D12	CS2-D14	CS2-D16

* Order two foot brackets per cylinder.

** When ordering the double clevis style, the clevis pin and 2 cotter pins are included as accessories.

Series CS2

Weight

Bore size (mm)		125	140	160
Basic weight	Basic	5.46	6.50	9.07
	Foot	7.49	9.50	12.45
	Rod flange	8.51	12.03	15.80
	Head flange	8.51	12.03	15.80
	Single clevis	8.53	10.79	14.56
	Double clevis	8.99	11.54	15.41
	Trunnion	9.59	12.23	15.47
Additional weight with magnet (With built-in magnet and auto switch)		0.07	0.07	0.08
Additional weight per each 100 mm of stroke		1.55	1.67	2.23
Accessory bracket	Single knuckle	0.91	1.16	1.56
	Double knuckle (With Knuckle pin, Cotter pin)	1.37	1.81	2.48
	Rod end nut	0.16	0.16	0.23

Calculation: (Example)

CS2L160-500

- Basic weight 12.45 (kg)
- Additional weight 2.23 (kg/100 mm)
- Cylinder stroke 500 (mm)

[Calculation] $12.45 + 2.23 \times 500/100 = 23.60$ (kg)

⚠ Precautions

Be sure to read this before handling. For Safety Instructions, refer to the back of page 1. For Common Precautions refer to "Precautions for Handling Pneumatic Devices" (M-03-E3A).

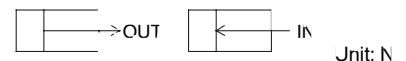
⚠ Warning

- 1 Do not use the cylinder as a shock absorber. Using the cylinder as a shock absorber may cause damage.
- 2 Do not open the cushion valve beyond the stopper. As a retaining mechanism for the cushion valve, retaining ring is installed, and the cushion valve should not be opened beyond that point. If not operated in accordance with the above precautions, the cushion valve may be ejected from the cover when air pressure is supplied.
- 3 Use the air cushion at the end of cylinder stroke.

⚠ Caution

1. Regarding the installation of a knuckle joint
Please contact SMC if a knuckle joint must be installed on the piston rod by using the rod end nut.

Theoretical Output / Double Acting




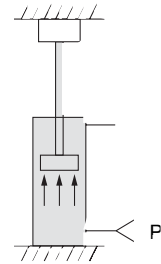
Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)								
				0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
125	32	OUT	12300	2460	3690	4920	6150	7380	8610	9840	11100	12300
		IN	11500	2300	3450	4600	5750	6900	8050	9200	10400	11500
140	32	OUT	15400	3080	4620	6160	7700	9240	10800	12300	13900	15400
		IN	14600	2920	4380	5840	7300	8760	10200	11700	13100	14600
160	38	OUT	20100	4020	6030	8040	10100	12100	14100	16100	18100	20100
		IN	19000	3800	5700	7600	9500	11400	13300	15200	17100	19000

Relationship between Cylinder Size and Maximum Stroke

The below table shows the applicable maximum stroke (in cm units), found by calculation assuming the case where the force generated by the cylinder itself acts as buckling force or the piston rod, or piston rod and cylinder tube.

Therefore, it is possible to find the applicable maximum stroke for each cylinder size using the relationship between the size of the operating pressure and the cylinder support type, regardless of the load ratio.

 [Reference] If it is stopped with the external stopper on the cylinder extension side even with a light load, the maximum generated force of the cylinder will act on the cylinder itself.



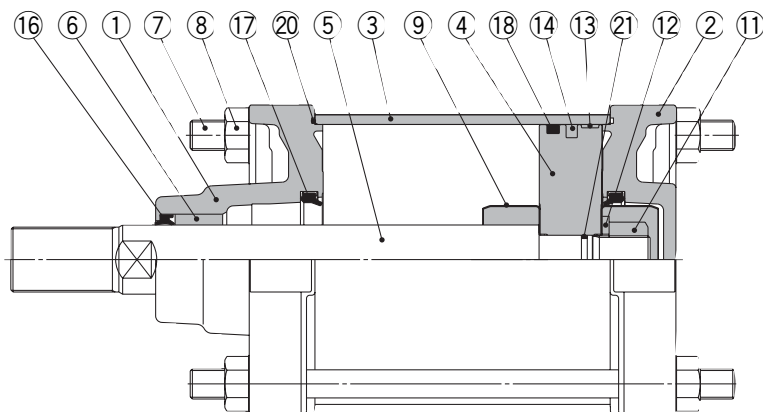
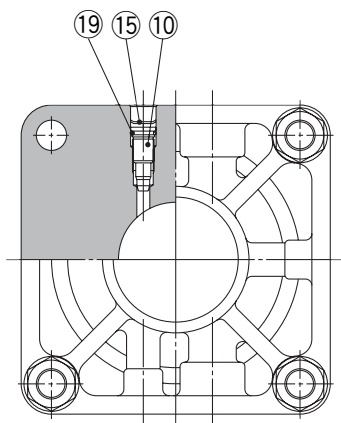
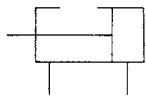
Mounting			Operating pressure (MPa)	Applicable max. stroke according to buckling strength			
Support bracket nominal symbol and schematic diagram		Nominal symbol		125	140	160	
Foot: L	Rod flange: F	Head flange: G	0.3	103	92	113	
		L, F	0.5	79	70	86	
			0.7	66	58	72	
			G	0.3	45	38	47
0.5	33	27		34			
0.7	26	22		27			
Head side trunnion: U	Center trunnion: U		0.3	96	83	106	
	CA1, CS1 type only		C, D	0.5	71	61	76
				0.7	59	50	62
				T	0.3	135	119
0.5	101	89	111				
0.7	84	74	91				
Foot: L	Rod flange: F	Head flange: G	0.3	301	267	330	
		L, F	0.5	231	207	253	
			0.7	193	172	212	
			G	0.3	144	126	156
0.5	109	94		118			
0.7	90	78		97			
Foot: L	Rod flange: F	Head flange: G	0.3	433	386	476	
		L, F	0.5	334	297	367	
			0.7	281	250	309	
			G	0.3	210	185	229
		0.5		160	141	175	
		0.7	134	117	129		

(cm)

Series CS2

Construction

JIS Symbol



Component Parts

No.	Description	Material	Note
	Rod cover	Aluminum die-cast	
2	Head cover	Aluminum die-cast	
3	Cylinder tube	Aluminum alloy	Hard anodized
4	Piston	Aluminum alloy	Chromated
5	Piston rod	Carbon steel	Hard chrome plated
6	Bushing	Oil-impregnated sintered alloy	
7	Tie-rod	Carbon steel	Zinc chromated
8	Tie-rod nut	Rolled steel	Nickel plated
9	Cushion ring	Stainless steel	
10	Cushion valve	Rolled steel	Electroless nickel plated
	Piston nut	Carbon steel	Nickel plated
12	Flain washer	Carbon steel	Nickel plated
13	Wear ring	Resin	
14	Magnet*	Magnet material	
15	Retaining ring	Spring steel	Phosphate coated

* Built-in magnet type with auto switch

Seal Lists

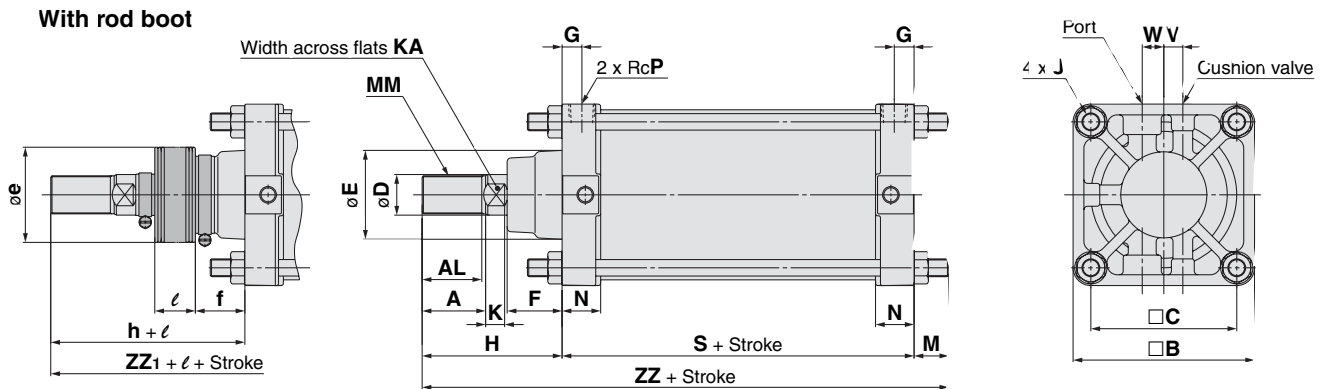
No.	Description	Material	Note
16	Rod seal	NBR	
17	Cushion seal	Urethane	
18	Piston seal	NBR	
19	Valve seal	NBR	
20	Tube gasket	NBR	
21	Piston gasket	NBR	

Replacement Parts (Seal Kit)

Bore size (mm)	Kit no.
125	CS2-125A-PS
140	CS2-140A-PS
160	CS2-160A-PS

Dimensions

Basic: CS2B



(mm)

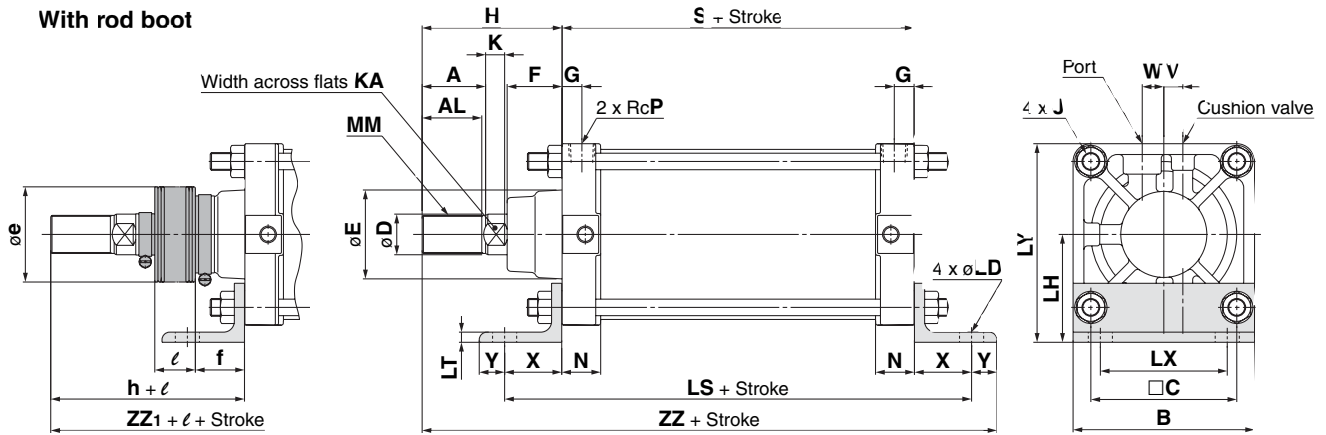
Bore size (mm)	Stroke range (mm)	A	AL	□B	□C	D	E	F	G	J	V	W	K	KA	M	MM
125	Up to 1000	50	47	143	115	32	71	43	15	M14 x 1.5	15	17	15	27	27	M30 x .5
140	Up to 1000	50	47	157	128	32	71	43	15	M14 x 1.5	15	17	15	27	27	M30 x 1.5
160	Up to 1200	56	53	177	144	38	78.5	42	18	M16 x 1.5	15	20	17	34	30.5	M36 x .5

(mm)

Bore size (mm)	N	P	S	Without rod boot		With rod boot				
				H	ZZ	e	f	h	ℓ	ZZ ₁
125	30.5	1/2	98	110	235	75	40	133	0.2 stroke	258
140	30.5	1/2	98	110	235	75	40	133	0.2 stroke	258
160	34.5	3/4	106	120	256.5	75	40	141	0.2 stroke	277.5

- * The minimum stroke with rod boot is 30 mm or more.
- ** For auto switch mounting position and its mounting height, refer to page 11.
- *** Refer to "Minimum Stroke for Auto Switch Mounting" on page 12.

Foot: CS2L



(mm)

Bore size (mm)	Stroke range (mm)	A	AL	B	□C	D	E	F	G	J	V	W	K	KA	LD	LH	LS
125	Up to 1600	50	47	145	115	32	71	43	15	M14 x 1.5	15	17	15	27	19	85	188
140	Up to 1600	50	47	161	128	32	71	43	15	M14 x 1.5	15	17	15	27	19	100	188
160	Up to 1600	56	53	182	144	38	78.5	42	18	M16 x 1.5	15	20	17	34	19	106	206

(mm)

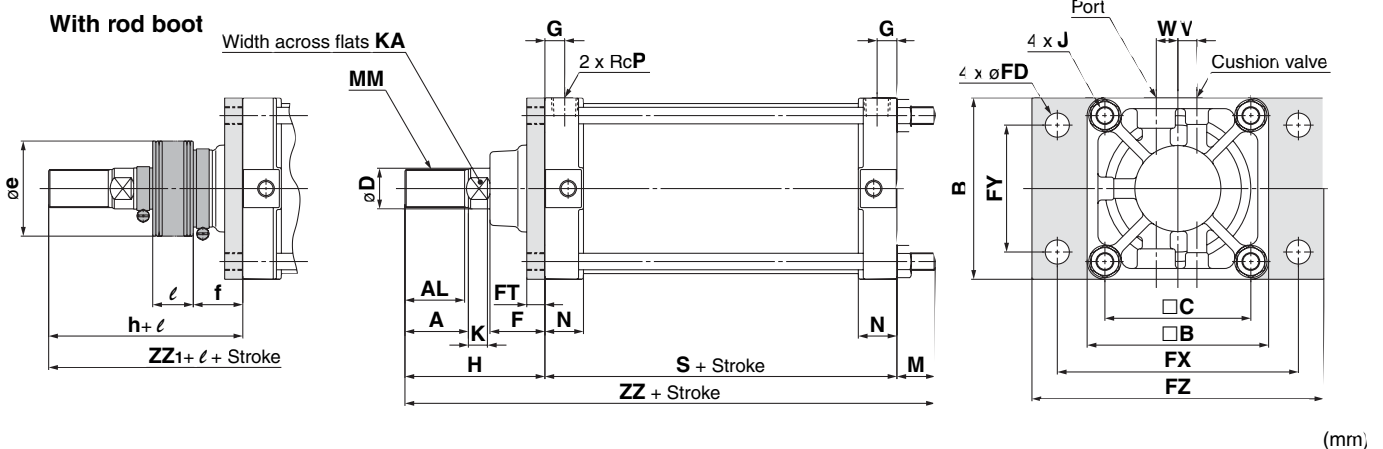
Bore size (mm)	LT	LX	LY	MM	N	P	S	X	Y	Without rod boot		With rod boot				
										H	ZZ	e	f	h	ℓ	ZZ ₁
125	8	100	156.5	M30 x 1.5	30.5	1/2	98	45	20	110	273	75	40	133	0.2 stroke	296
140	9	112	178.5	M30 x 1.5	30.5	1/2	98	45	30	110	283	75	40	133	0.2 stroke	306
160	9	118	194.5	M36 x 1.5	34.5	3/4	106	50	25	120	301	75	40	141	0.2 stroke	322

- * The minimum stroke with rod boot is 30 mm or more.
- ** For auto switch mounting position and its mounting height, refer to page 11.
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Series CS2

Dimensions

Rod flange: CS2F

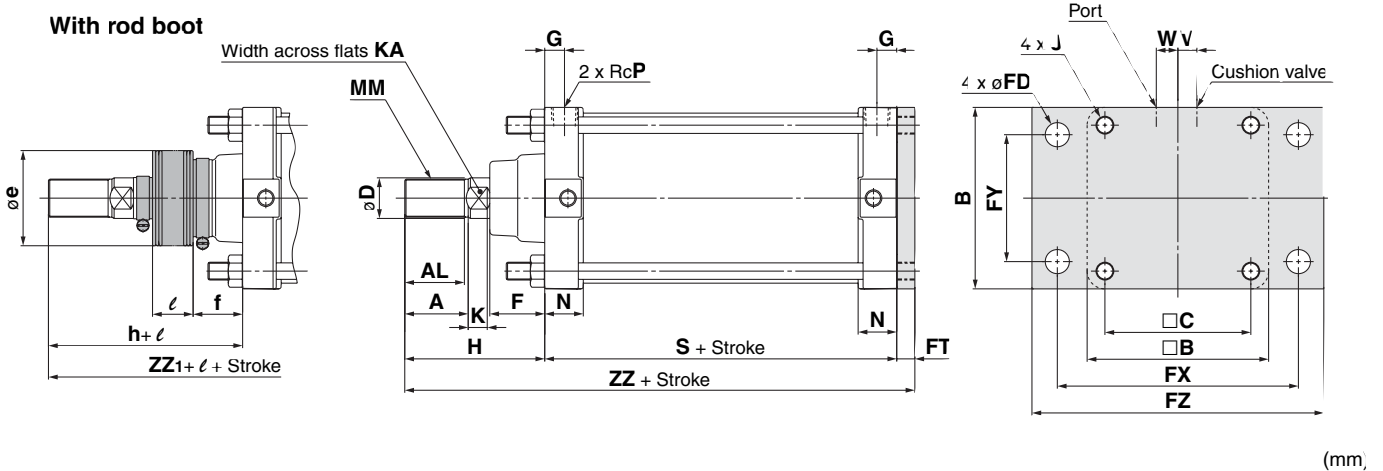


Bore size (mm)	Stroke range (mm)	A	AL	□B	B	□C	D	E	F	FD	FT	FX	FY	FZ	G	J	V
125	Up to 1600	50	47	143	145	115	32	71	43	19	14	190	100	230	15	M14 x 1.5	15
140	Up to 1600	50	47	157	160	128	32	71	43	19	20	212	112	255	15	M14 x 1.5	15
160	Up to 1600	56	53	177	180	144	38	78.5	42	19	20	236	118	275	18	M16 x 1.5	15

Bore size (mm)	W	K	KA	M	MM	N	P	S	Without rod boot		With rod boot				
									H	ZZ	e	f	h	ℓ	ZZ1
125	17	15	27	13	M30 x 1.5	30.5	1/2	98	110	221	75	40	133	0.2 stroke	244
140	17	15	27	13	M30 x 1.5	30.5	1/2	98	110	221	75	40	133	0.2 stroke	244
160	20	17	34	15	M36 x 1.5	34.5	3/4	106	120	241	75	40	141	0.2 stroke	262

* The minimum stroke with rod boot is 30 mm or more.
 ** For auto switch mounting position and its mounting height, refer to page 11.
 *** Refer to "Minimum Stroke for Auto Switch Mounting" on page 12.

Head flange: CS2G



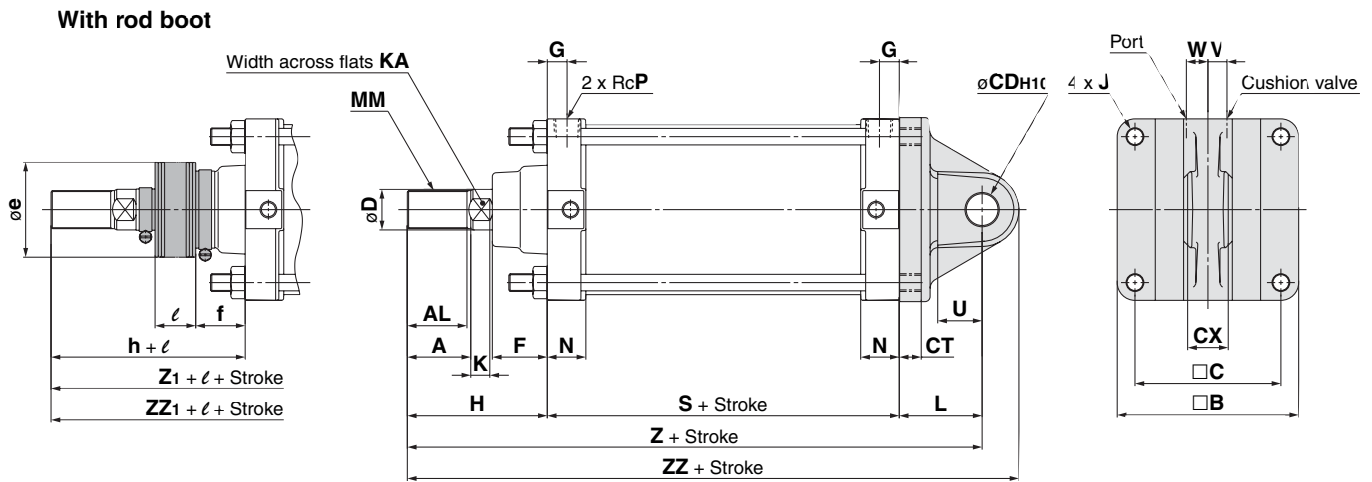
Bore size (mm)	Stroke range (mm)	A	AL	□B	B	□C	D	E	F	FD	FT	FX	FY	FZ	G	J	V
125	Up to 1000	50	47	143	145	115	32	71	43	19	14	190	100	230	15	M14 x 1.5	15
140	Up to 1000	50	47	157	160	128	32	71	43	19	20	212	112	255	15	M14 x 1.5	15
160	Up to 1200	56	53	177	180	144	38	78.5	42	19	20	236	118	275	18	M16 x 1.5	15

Bore size (mm)	W	K	KA	MM	N	P	S	Without rod boot		With rod boot				
								H	ZZ	e	f	h	ℓ	ZZ1
125	17	15	27	M30 x 1.5	30.5	1/2	98	110	222	75	40	133	0.2 stroke	245
140	17	15	27	M30 x 1.5	30.5	1/2	98	110	228	75	40	133	0.2 stroke	251
160	20	17	34	M36 x 1.5	34.5	3/4	106	120	246	75	40	141	0.2 stroke	267

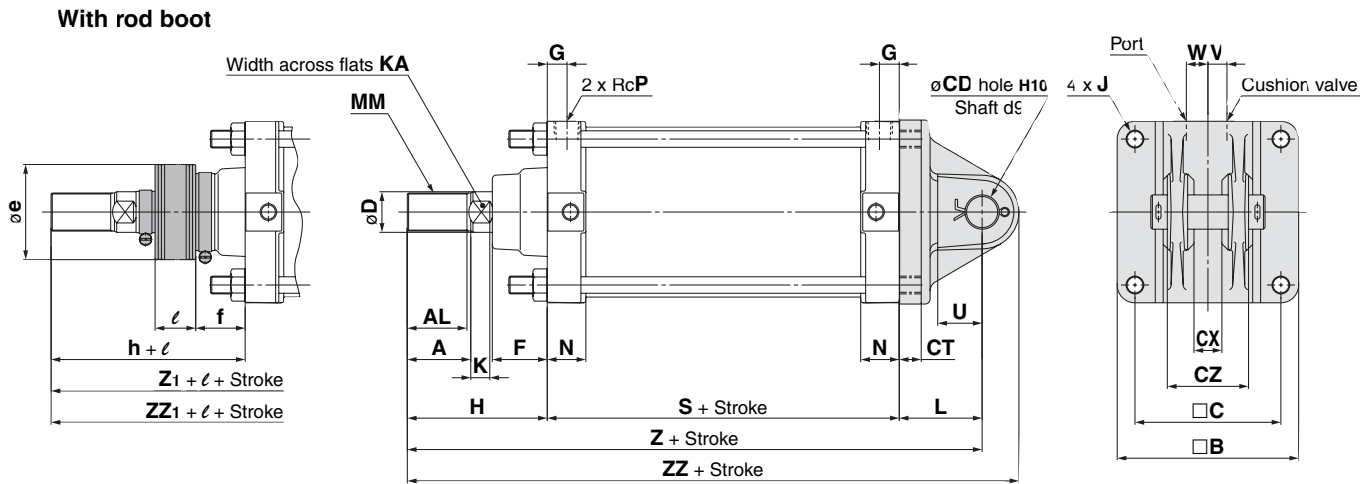
* The minimum stroke with rod boot is 30 mm or more.
 ** For auto switch mounting position and its mounting height, refer to page 11.
 *** Refer to "Minimum Stroke for Auto Switch Mounting" on page 12.

Dimensions

Single clevis: CS2C



Double clevis: CS2D



(mm)

Bore size (mm)	Stroke range (mm)	A	AL	□B	□C	CDH10	CT	Single clevis			Double clevis			D	E	F	G	J	V	W
								CX	CX	CZ	CX	CX	CZ							
125	Up to 1000	50	47	143	115	25 ^{+0.084} ₀	17	32 ^{-0.1} _{-0.3}	32 ^{+0.3} _{-0.1}	64 ⁰ _{-0.2}	32	71	43	15	M14 x 1.5	15	17			
140	Up to 1000	50	47	157	128	28 ^{+0.084} ₀	17	36 ^{-0.1} _{-0.3}	36 ^{+0.3} _{-0.1}	72 ⁰ _{-0.2}	32	71	43	15	M14 x 1.5	15	17			
160	Up to 1200	56	53	177	144	32 ^{+0.100} ₀	20	40 ^{-0.1} _{-0.3}	40 ^{+0.3} _{-0.1}	80 ⁰ _{-0.2}	38	78.5	42	18	M16 x 1.5	15	20			

(mm)

Bore size (mm)	K	KA	L	MM	N	P	S	U	RR	Without rod boot			With rod boot					
										H	Z	ZZ	e	f	h	l	Z1	ZZ1
125	15	27	65	M30 x 1.5	30.5	1/2	98	35	29	110	273	302	75	40	133	0.2 stroke	296	325
140	15	27	75	M30 x 1.5	30.5	1/2	98	40	32	110	283	315	75	40	133	0.2 stroke	306	338
160	17	34	80	M36 x 1.5	34.5	3/4	106	45	36	120	306	342	75	40	141	0.2 stroke	327	363

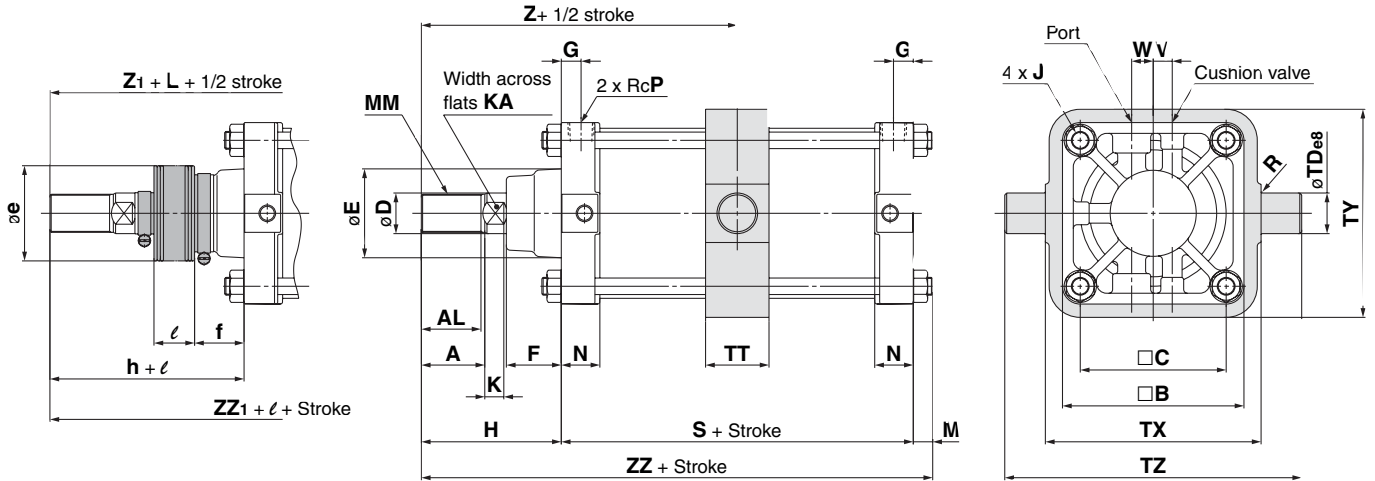
* The minimum stroke with rod boot is 30 mm or more.
 ** For auto switch mounting position and its mounting height, refer to page 11.
 *** Refer to "Minimum Stroke for Auto Switch Mounting" on page 12.

Series CS2

Dimensions

Center trunnion: CS2T

With rod boot



Bore size (mm)	Stroke range (mm)	A	AL	□B	□C	D	E	F	G	J	V	W	K	KA	M	MM	N
125	25 to 1000	50	47	143	115	32	71	43	15	M14 x 1.5	15	17	15	27	13	M30 x 1.5	30.5
140	30 to 1000	50	47	157	128	32	71	43	15	M14 x 1.5	15	17	15	27	13	M30 x 1.5	30.5
160	35 to 1200	56	53	177	144	38	78.5	42	18	M16 x 1.5	15	20	17	34	15	M36 x 1.5	34.5

Bore size (mm)	P	R	S	TD _{e8}	TT	TX	TY	TZ	Without rod boot			With rod boot					
									H	Z	ZZ	e	f	h	ℓ	Z ₁	ZZ ₁
125	1/2	1	98	32 ^{-0.050} _{-0.089}	50	170	164	234	110	159	221	75	40	133	0.2 stroke	182	244
140	1/2	1.5	98	36 ^{-0.050} _{-0.089}	55	190	184	262	110	159	221	75	40	133	0.2 stroke	182	244
160	3/4	1.5	106	40 ^{-0.050} _{-0.089}	60	212	204	292	120	173	241	75	40	141	0.2 stroke	194	262

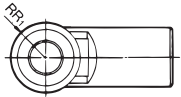
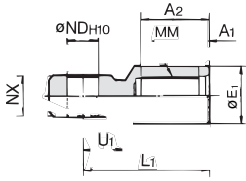
* The minimum stroke with rod boot is 30 mm or more for ø125, ø140, and 35 mm or more for ø160

** For auto switch mounting position and its mounting height, refer to page 11.

*** Refer to "Minimum Stroke for Auto Switch Mounting" on page 12.

Air Cylinder / Series CS2 Accessory Bracket

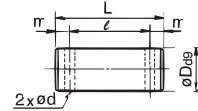
Type Single Knuckle Joint*



Material: Cast iron

Part no.	Applicable bore size (mm)	A ₁	A ₂	E ₁	L ₁	MM	ND _{H10}	NX	RR ₁	U ₁
I-12A	125	8	54	46	100	M30 x 1.5	25 ^{+0.084} ₀	32 ^{-0.1} _{-0.3}	27	∅
I-14A	140	8	54	48	105	M30 x 1.5	28 ^{+0.084} ₀	36 ^{-0.1} _{-0.3}	30	39
I-16A	160	8	60	55	110	M36 x 1.5	32 ^{+0.1} ₀	40 ^{-0.1} _{-0.3}	34	∅

Knuckle Pin / Clevis Pin

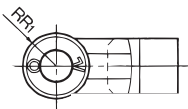
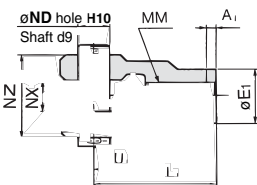


Material: Carbor. steel

Part no.	Applicable bore size (mm)	D _{d9}	L	ℓ	m	d (Drill through)	Applicable 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

* Cotter pin is included.

Y Type Double Knuckle Joint*

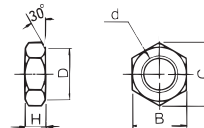


Material: Cast iron.

Part no.	Applicable bore size (mm)	A ₁	E ₁	L ₁	MM	ND _{H10}	NX	NZ	RR ₁	U ₁
Y-12A	125	8	46	100	M30 x 1.5	25 ^{+0.084} ₀	32 ^{+0.3} _{+0.1}	64 ^{-0.1} _{-0.3}	27	∅
Y-14A	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-16A	160	8	55	110	M36 x 1.5	32 ^{+0.1} ₀	40 ^{+0.3} _{+0.1}	80 ^{-0.1} _{-0.3}	34	46

- * Use a single knuckle joint or a double knuckle joint individually.
(Screw it entirely over the rod end threads and tighten it.)
- * Extend the dimensions of A, H when using a single/double knuckle joint together with a rod end nut
(To extend dimensions A, H, refer to the below table, and specify the product as made-to-order -XAO.)
- * A pin and cotter pin are included with the double knuckled joint

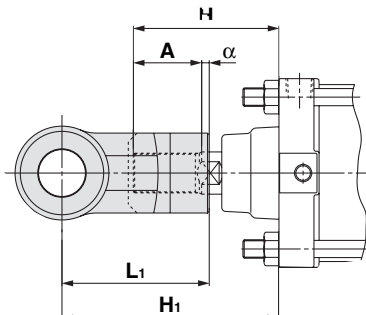
Rod End Nut



Material: Roller steel

Part no.	Applicable bore size (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

Single/Double Knuckle Joint



Bore size (mm)	Symbol	H	A	α	L ₁	H ₁	Applicable knuckle joint part number	
							I type single knuckle	Y type double knuckle
125		110	50	3.5	100	156.5	I-12A	Y-12A
140		110	50	3.5	105	161.5	I-14A	Y-14A
160		120	56	3.5	110	170.5	I-16A	Y-16A

A, H Dimensions when Mounting a Single/Double Knuckle Joint together with a Rod End Nut

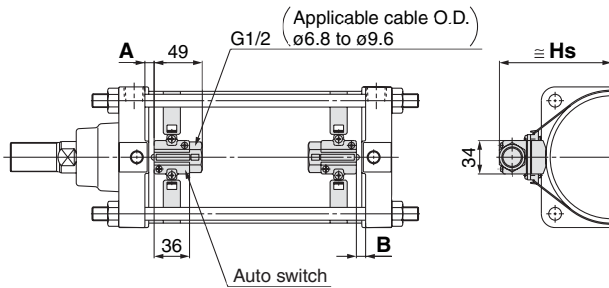
Bore size (mm)	A	H
125	65	125
140	65	125
160	76	140

Series CS2

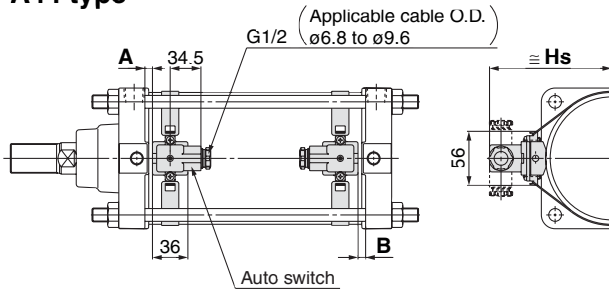
Auto Switch Proper Mounting Position (Detection at stroke end) and Its Mounting Height

<Band mounting>

D-A3□ type
D-G3/K3 type



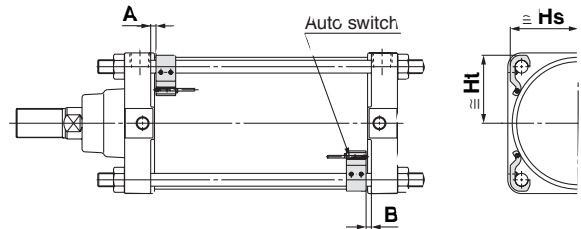
D-A44 type



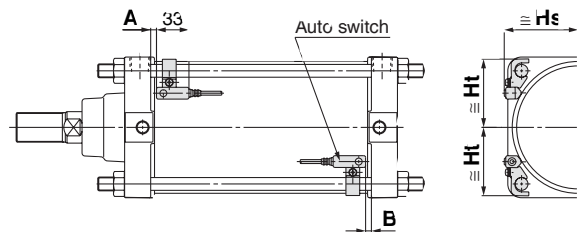
* The indicator light faces the inside.

<Tie-rod mounting>

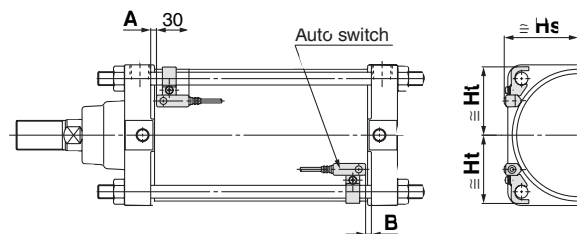
D-A9□/A9□V type D-Z7□/Z80 type
D-M9□/M9□V type D-Y59□/Y69□/Y7P/Y7PV type
D-M9□W/M9□WV type D-Y7□W/Y7□WV type
D-F9BAL type D-Y7BAL type



D-A5□/A6□ type



D-F5□/J5□/D-F5NTL type
D-F5BAL/F59F type
D-F5□W/J59W type



Auto Switch Proper Mounting Position

(mm)

Auto switch model	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV		D-F9BAL		D-Z7□/Z80 D-Y5□/Y6□ D-Y7P/Y7PV D-Y7□W D-Y7□WV D-Y7BAL		D-A3□ D-A5□ D-A6□ D-A44 D-G39 D-K39		D-A59W		D-F5□W D-J59W D-F5BAL D-F5□ D-J5□ D-F59F		D-F5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Bore size 125	9	8	13	12	12	11	6.5	5.5	3	2	7	6	9.5	8.5	14.5	13.5
140	9	8	13	12	12	11	6.5	5.5	3	2	7	6	9.5	8.5	14.5	13.5
160	9	8	13	12	12	11	6.5	5.5	3	2	7	6	9.5	8.5	14.5	13.5

* Provided as guidelines for auto switch proper mounting position (detection at stroke end) When setting an auto switch, confirm the operation and adjust its mounting position.

Auto Switch Mounting Height

(mm)

Auto switch model	D-A9□(V) D-M9□ D-M9□W D-F9BAL		D-M9□V D-M9□WV		D-Z7□/Z80 D-Y5□/Y6□ D-Y7P D-Y7PV D-Y7□W D-Y7□WV D-Y7BAL		D-A3□ D-G39 D-K39	D-A44	D-A5□ D-A6□ D-A59W		D-F5□ D-J5□ D-F5□W D-J59W D-F5BAL D-F59F D-F5NTL	
	Hs	Ht	Hs	Ht	Hs	Ht	Hs	Hs	Hs	Ht	Hs	Ht
Bore size 125	69	69.5	71.5	69.5	69	69.5	116	126	75.5	69.5	74.5	70
140	76	76	77.5	76	76	76	124	134	81	76.5	80	76.5
160	85	85	86	85	85	85	134.5	144.5	89	87.5	88	87.5

Minimum Stroke for Auto Switch Mounting

n: Number of auto switches (mm)

Auto switch model	Number of auto switches mounted	Mounting brackets other than center trunnion	Center trunnion		
			ø125	ø140	ø160
D-A9□	With 2 pcs. (Different side, Same side), With 1 pc.	15	100	105	110
	With n pcs.	$15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$100 + 35 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$105 + 35 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$110 + 35 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-A9□V	With 2 pcs. (Different side, Same side), With 1 pc.	10	75	80	85
	With n pcs.	$10 + 25 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$75 + 25 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$80 + 25 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$85 + 25 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-M9□ D-M9□W	With 2 pcs. (Different side, Same side), With 1 pc.	15	105	110	115
	With n pcs.	$15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$105 + 35 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$110 + 35 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$115 + 35 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-M9□V D-M9□WV	With 2 pcs. (Different side, Same side), With 1 pc.	10	80	85	90
	With n pcs.	$10 + 20 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$80 + 20 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$85 + 20 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$90 + 20 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-F9BAL	With 2 pcs. (Different side, Same side), With 1 pc.	25	120	125	130
	With n pcs.	$25 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$120 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$125 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$130 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5□W/J59W D-F5BAL/F59F	With 2 pcs. (Different side, Same side), With 1 pc.	25	125	135	
	With n pcs. (Same side)	$25 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$125 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$135 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	
D-F5NTL	With 2 pcs. (Different side, Same side), With 1 pc.	35	145	155	
	With n pcs. (Same side)	$35 + 55 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$145 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$155 + 55 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	
D-A3□ D-G39 D-K39	With 2 pcs.	Different sides	35	110	
		Same side	100	110	
	With n pcs.	Different sides	$35 + 30 (n-2)$	$110 + 30 (n-2)$ (n = 2, 4, 6, 8...)	
		Same side	$100 + 100 (n-2)$	$110 + 100 (n-2)$ (n = 2, 4, 6, 8...)	
With 1 pc.		15	110		
D-A44	With 2 pcs.	Different sides	35	110	
		Same side	55	110	
	With n pcs.	Different sides	$35 + 30 (n-2)$	$110 + 30 (n-2)$ (n = 2, 4, 6, 8...)	
		Same side	$55 + 55(n-2)$	$110 + 50 (n-2)$ (n = 2, 4, 6, 8...)	
With 1 pc.		15	110		
D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W	With 2 pcs. (Different side, Same side), With 1 pc.	15	105	110	115
	With n pcs.	$15 + 40 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$105 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$110 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$115 + 40 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-Y69□ D-Y7PV D-Y7□WV	With 2 pcs. (Different side, Same side), With 1 pc.	10	90	95	100
	With n pcs.	$10 + 30 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$90 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$95 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$100 + 30 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)
D-Y7BAL	With 2 pcs. (Different side, Same side), With 1 pc.	20	115	120	125
	With n pcs.	$20 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6, 8...)	$115 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$120 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)	$125 + 45 \frac{(n-4)}{2}$ (n = 4, 8, 12, 16...)

Operating Range

(mm)

Auto switch model	Bore size		
	125	140	160
D-A9□/A9□V	12	12.5	11.5
D-M9□/M9□V	4	4.5	4.5
D-M9□W/M9□WV	6	6.5	6.5
D-F9BAL	7	7.5	8
D-Z7□/Z80	14	14.5	13
D-A3□/A44	16	16	16
D-A5□/A6□	13.5	13.5	13.5
D-A59W	17	17	17
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BAL	12	13	7
D-F5□/J5□/F5□W D-J59W/F5BAL D-F5NTL/F59F	5	5	5.5
D-G39/K39	11	11	10

* Since this is a guideline including hysteresis, not meant to be guaranteed.
(Assuming approximately ±30% dispersion.)
There may be the case it will vary substantially depending on an ambient environment.

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)		
	ø125	ø140	ø160
D-A9□/A9□V D-M9□/M9□V D-M9□W/M9□WV D-F9BAL	BS5-125	BS5-125	BS5-160
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5NTL D-F5□W/J59W D-F5BAL/F59F	BT-12	BT-12	BT-16
D-A3□/A44 D-G39/K39	BS1-125	BS1-140	BS1-160
D-Z7□/Z80 D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BAL	BS4-125	BS4-125	BS4-160

[Mounting screws set made of stainless steel]

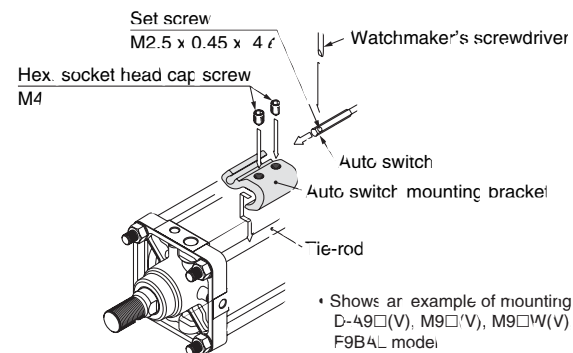
The following set of mounting screws made of stainless steel (including set screws) is also available. Use it in accordance with the operating environment. (Please order the switch mounting bracket separately, since it is not included.)

BB41: For D-A5, A6, F5, J5 type

"D-F5BAL" switch is set on the cylinder with the stainless steel screws above when shipped.

When only a switch is shipped independently "BB41" screws are attached

Note) When using the D-F9BAL or Y7BAL mode, do not use the steel set screw which is included with the switch mounting bracket in the above table (BS5-□□□, BS4-□□□). Please separately prepare the stainless steel screw set (BB41), and select and use the M4 x 8L stainless steel set screw included in BB41.



Other than the applicable auto switches listed in "How to Order" the following auto switches can be mounted. For detailed specifications, refer to "Best Pneumatics 2004" Vol. 6 catalog, etc.

Type	Model	Electrical entry (Direction)	Features
Reed switch	D-A90V	Grommet (Perpendicular)	Without indicator light
	D-A93V, A96V		—
	D-Z73, Z76		—
	D-A53, A56	Grommet (in-line)	Without indicator light
	D-A64, A67		—
	D-Z80		—
Solid state switch	D-F59, F5P, J59	Grommet (in-line)	—
	D-Y59A, Y59B, Y7P		—
	D-F59W, F5PW, J59W		2-color indication
	D-Y7NW, Y7PW, Y7BW		2-color indication, Water resistant
	D-F5BAL, Y7BAL		With timer
	D-F5NTL	Grommet (Perpendicular)	—
	D-M9NV, M9PV, M9BV		—
	D-Y69A, Y69B, Y7PV		—
	D-M9NWV, M9PWV, M9BWV		—
	D-Y7NWV, Y7PWV, Y7BWV		2-color indication

* With pre-wired connector is available for solid state auto switches. For details, refer to "Best Pneumatics 2004" Vol. 6 catalog

* Normally closed (NC = b contact), solid state switches (D-F9G, F9H, Y7G, Y7H type) are also available. For details, refer to "Best Pneumatics 2004" Vol. 6 catalog, etc.