

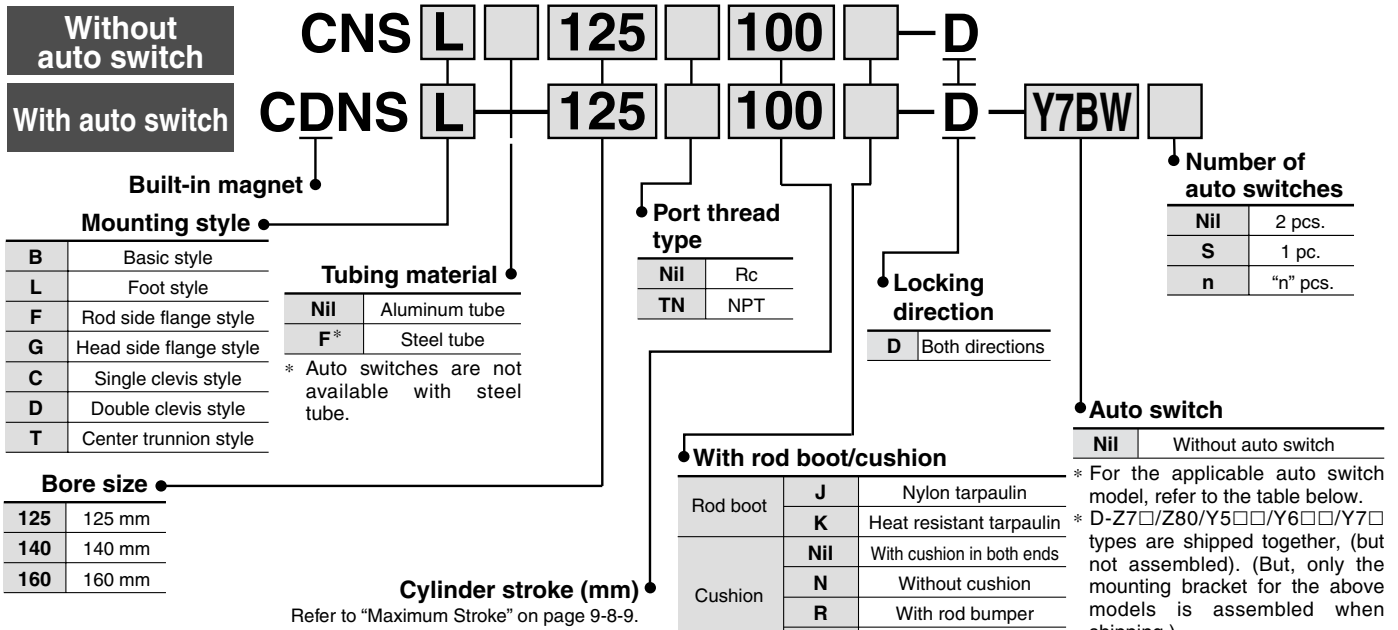
Cylinder with Lock

Double Acting, Single Rod

Series CNS

ø125, ø140, ø160

How to Order



Built-in Magnet Cylinder Model

In the case of built-in magnet without auto switch, the symbol for auto switch is "Nil".
(Example) CDNSL140-100

* In the case of one side, it is in the lock side.
** When the symbols are two or more, indicate them alphabetically.

Applicable Auto Switch/Refer to page 9-15-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m) *			Pre-wire connector	Applicable load		
					DC	AC	Tie-rod mounting	Band mounting	0.5 (Nil)	3 (L)	5 (Z)				
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	Z76	—	●	●	—	—	IC circuit	—
				2-wire		12 V	100 V	Z73	—	●	●	●	—	—	Relay, PLC
		100 V, 200 V			A54	—	●	●	●	—	—	PLC			
		—			—	A33	—	—	—	—		—	Relay, PLC		
	DIN terminal	100 V, 200 V	—	A34	—	—	—	—	—	—					
Diagnostic indication (2-color indication)	Grommet	—	—	—	—	—	A44	—	—	—	—	—	—	—	
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y59A	—	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				Y7P	—	●	●	○	○		
				2-wire	100 V, 200 V	J51	—	●	●	○	○	—			
		12 V				Y59B	—	●	●	○	○				
		5 V, 12 V			—	G39	—	—	—	—	IC circuit				
		Terminal conduit		24 V	5 V, 12 V	—	2-wire	12 V	—	K39	—	—	—	—	
	3-wire (NPN)		—				Y7NW	—	●	●	○	○	IC circuit		
	2-wire		12 V				—	Y7PW	—	●	●	○		○	
	Diagnostic indication (2-color indication)	Grommet	24 V	5 V, 12 V	—	3-wire (NPN)	—	Y7BW	—	●	●	○	○	—	
						3-wire (PNP)	—	Y7BA	—	—	●	○	○		
						2-wire	12 V	—	—	—	●	○	○		
	Water resistant (2-color indication)	Grommet	24 V	5 V, 12 V	—	4-wire (NPN)	5 V, 12 V	—	F59F	—	●	●	○	○	IC circuit
With diagnostic output (2-color indication)	—					—	—	—	—	—	—	—			

* Lead wire length symbols: 0.5 m Nil (Example) A54
3 m L (Example) A54L
5 m Z (Example) A54Z

* Solid state switches marked with "○" are produced upon receipt of order.

- There are other applicable auto switches than listed above. For details, refer to page 9-8-22.
- For details about auto switches with pre-wire connector, refer to page 9-15-66.

Cylinder with Lock Double Acting, Single Rod **Series CNS**



Model

Series	Type	Action	Bore size (mm)	Lock operation
CNS □	Non-lube	Double acting	125, 140, 160	Spring locking
CDNS □				

Cylinder Specifications

Type	Non-lube
Fluid	Air
Proof pressure	1.46 MPa
Max. operating pressure	0.97 MPa
Min. operating pressure	0.08 MPa
Piston speed	50 to 500 mm/s *
Ambient and fluid temperature	Without auto switch: 0 to 70°C (No freezing) With auto switch: 0 to 60°C (No freezing)
Cushion	Yes
Stroke length tolerance	Up to 250: $^{+1.0}_0$, 251 to 1000: $^{+1.4}_0$, 1001 to 1500: $^{+1.8}_0$, 1501 to 1600: $^{+2.2}_0$
Mounting	Basic style, Axial foot style, Rod side flange style, Center trunnion style, Single clevis style, Double clevis style, Center trunnion style

* Load limits exist depending upon piston speed when locked, mounting direction and operating pressure.

Lock Specifications

Locking action	Spring locking (Exhaust lock)
Unlocking pressure	0.25 MPa or more
Lock starting pressure	0.20 MPa or less
Operating pressure range	0.25 to 0.7 MPa
Locking direction	Both directions

Maximum Stroke () : Denotes for steel tube.

Bore size (mm)	Maximum stroke	
	Basic style, Head side flange style, Single clevis style, Double clevis style, Center trunnion style	Foot style, Rod side flange style
125, 140	Up to 1000 (Up to 1000)	Up to 1400 (Up to 1600)
160	Up to 1200 (Up to 1200)	Up to 1400 (Up to 1600)

* Auto switches are not available with iron tube.

Stopping Accuracy

Lock type	Piston speed (mm/s)		
	100	300	500
Spring locking	±0.5	±1.0	±2.0

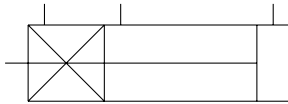
Condition: Lateral, Supply pressure P = 0.5 MPa
 Load weight Upper limit of allowed value
 Solenoid valve for locking Mounted directly to unlocking port
 Maximum value of stopping position dispersion from 100 measurements

Holding Force of Spring Locking (Maximum static load)

Bore size (mm)	125	140	160
Holding force (KN)	8.4	10.5	13.8

* Be sure to make cylinder selections in accordance with the method given on page 9-8-6.

JIS Symbol



Made to Order Specifications
(For details, refer to page 9-16-1.)

Symbol	Specifications
-XA □	Change of rod end shape
-XC14	Change of trunnion bracket mounting position

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

20-

Data

Series CNS

Mounting Bracket Part No.

Bore size (mm)	125	140	160
Foot ⁽¹⁾	CS1-L12	CS1-L14	CS1-L16
Flange ⁽²⁾	CS1-F12	CS1-F14	CS1-F16
Single clevis	CS1-C12	CS1-C14	CS1-C16
Double clevis ⁽³⁾	CS1-D12	CS1-D14	CS1-D16

Note 1) When ordering foot bracket, order 2 pieces per cylinder.

Note 2) ø125 to ø160 rod side flange styles use Series CS1 long stroke flanges.

Note 3) Clevis pin, plain washer, and cotter pin are shipped together with double clevis style.

Accessory

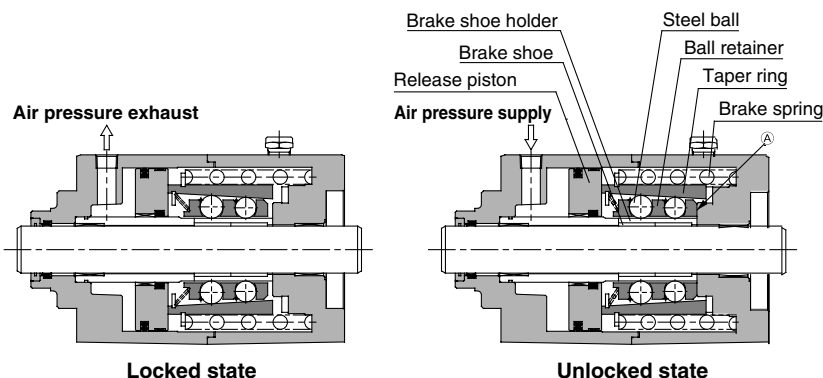
Mounting bracket		Basic style	Foot style	Rod side style Flange side style	Head side flange style	Single clevis style	Double clevis style	Center trunnion style
Standard equipment	Clevis pin	—	—	—	—	—	●	—
Option	Rod end nut	●	●	●	●	●	●	●
	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (With pin)	●	●	●	●	●	●	●
	With rod boot	●	●	●	●	●	●	●

Weight/(): Denotes the values for steel tube.

Bore size (mm)		125	140	160
Lock unit weight		14.40	20.20	30.60
Basic weight	Basic style	28.79 (30.26)	37.67 (39.48)	55.31 (57.52)
	Foot style	30.42 (31.89)	40.19 (42.00)	58.11 (60.32)
	Flange style	31.47 (32.94)	42.67 (44.48)	61.70 (63.91)
	Single clevis style	31.86 (33.33)	41.96 (43.77)	60.80 (63.01)
	Double clevis style (Including clevis pin and cotter pin)	32.32 (33.79)	42.71 (44.52)	61.65 (63.86)
	Trunnion style	32.92 (34.39)	43.40 (45.21)	62.71 (64.92)
Additional weight per each 100 mm of stroke		1.77 (2.66)	1.96 (3.01)	2.39 (3.58)
Accessory bracket	Single knuckle joint	0.91	1.16	1.56
	Double knuckle joint (With pin)	1.37	1.81	2.48
	Rod end nut	0.16	0.16	0.23

Calculation: (Example) CNSL140-100 Basic weight..... 40.19 (Foot style, ø140)
 Additional weight 1.96/100 stroke
 Cylinder stroke 100 stroke
 $40.19 + 1.96 \times 100/100 = 42.15 \text{ kg}$

Construction Principle



Spring locking (Exhaust lock)

The spring force which acts upon the taper ring is magnified by a wedge effect, and is conveyed to all of the numerous steel balls which are arranged in two circles. These act on the brake shoe holder and brake, which locks the piston rod by tightening against it with a large force.

Unlocking is accomplished when air pressure is supplied to the unlocking port. The release piston and taper ring oppose the spring force, moving to the right side, and the ball retainer strikes the cover section A. The braking force is released as the steel balls are removed from the taper ring by the ball retainer.

Rod Boot Material

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

* Maximum ambient temperature for the rod boot itself.

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)		
	125	140	160
D-A5/A6/A59W/F5□/J5□/F5NTL D-F5□W/J59W/F5BAL/F59F	BT-12	BT-12	BT-16
D-A3/A44/G39/K39	BS1-125	BS1-140	BS1-160
D-Z7□/Z80/Y59□/Y69□/Y7□	BS4-125	BS4-125	BS4-160

* Mounting screws set made of stainless steel

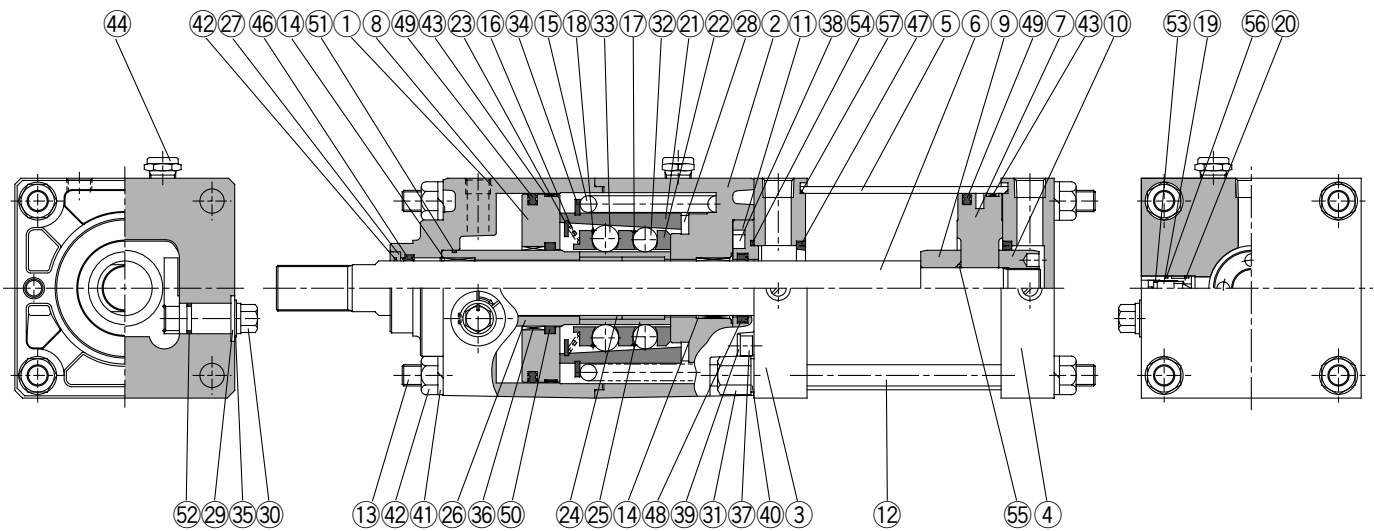
The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment. (Please order the mounting band separately, since it is not included.)

BBA1: For D-A5/A6/F5/J5

"D-G5BAL" switch is set on the cylinder with the stainless steel screws above when shipped. When the switches are shipped as individual parts, the BBA1 is included.

Cylinder with Lock Double Acting, Single Rod Series CNS

Construction



Component Parts

No.	Description	Material	Note
①	Cover A	Aluminum alloy	Hard anodized and painted
②	Cover B	Aluminum alloy	Hard anodized and painted
③	Rod cover	Rolled steel plate	Black painted
④	Head cover	Rolled steel plate	Black painted
⑤	Cylinder tube	Aluminum alloy	Hard anodized
⑥	Piston rod	Carbon steel	Hard chrome plated
⑦	Piston	Aluminum alloy casted	Chromated
⑧	Release piston	Aluminum alloy	Chromated
⑨	Cushion ring A	Rolled steel	Zinc chromated
⑩	Cushion ring B	Rolled steel	Zinc chromated
⑪	Retaining plate B	Bronze casted	
⑫	Tie-rod A	Carbon steel	Chromated
⑬	Unit holding tie-rod	Carbon steel	Chromated
⑭	Bushing	Lead-bronze casted	
⑮	Brake spring	Steel wire	Black painted
⑯	Pre-load spring	Steel wire	Zinc chromated
⑰	Clip A	Stainless steel wire	
⑱	Clip B	Stainless steel wire	
⑲	Cushion valve	Rolled steel	Electroless nickel plated
⑳	Valve guide	Brass	
㉑	Taper ring	Carbon steel	Heat treated
㉒	Ball retainer	Aluminum alloy	
㉓	Tooth ring	Stainless steel	
㉔	Brake shoe	Special friction material	
㉕	Brake shoe holder	Special steel	Heat treated
㉖	Piston guide	Carbon steel	Zinc chromated
㉗	Coil scraper mounting plate	Aluminum alloy	Anodized
㉘	Bumper	Polyurethane rubber	
㉙	Washer	Carbon steel	Black zinc chromated

No.	Description	Material	Note
⑳	Unlocking cam	Carbon steel	Zinc chromated
㉑	Wing nut	Carbon steel	ø125, 140: Nickel plated ø160: Black zinc chromated
㉒	Steel ball A	Carbon steel	
㉓	Steel ball B	Carbon steel	
㉔	Type C snap ring for shaft (for taper ring)	Carbon steel	Black oxide finish
㉕	Type C snap ring for axis (for unlocking cam)	Carbon steel	Nickel plated
㉖	Bushing (for release piston)	Lead-bronze casted	
㉗	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
㉘	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
㉙	Conical spring washer	Spring steel	Nickel plated
㉚	Conical spring washer	Spring steel	Nickel plated
㉛	Spring washer	Steel wire	Black zinc chromated
㉜	Hexagon nut	Rolled steel	Black zinc chromated
㉝	Wear ring	Resin	
㉞	BC element		
㉟	Coil scraper	Phosphor bronze	
㊱	Wiper ring	NBR	
㊲	Cushion seal	NBR	
㊳	Rod seal	NBR	
㊴	Piston seal	NBR	
㊵	O-ring (for release piston)	NBR	
㊶	O-ring (for piston guide)	NBR	
㊷	O-ring (for unlocking cam)	NBR	
㊸	Valve seal	NBR	
㊹	Retaining plate gasket	NBR	
㊺	Piston gasket	NBR	
㊻	Guide gasket	NBR	
㊼	Tube gasket	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
125	CS1N125A-PS	Set of above nos. ④⑥, ④⑧, ④⑨, ⑤③, ⑤④, ⑤⑦
140	CS1N140A-PS	
160	CS1N160A-PS	

* Since the lock section for Series CNS is normally replaced as a unit, kits are for the cylinder section only. These can be ordered using the order number for each bore size.

* Seal kit includes ④⑥, ④⑧, ④⑨, ⑤③, ⑤④, ⑤⑦. Order the seal kit, based on each bore size.

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

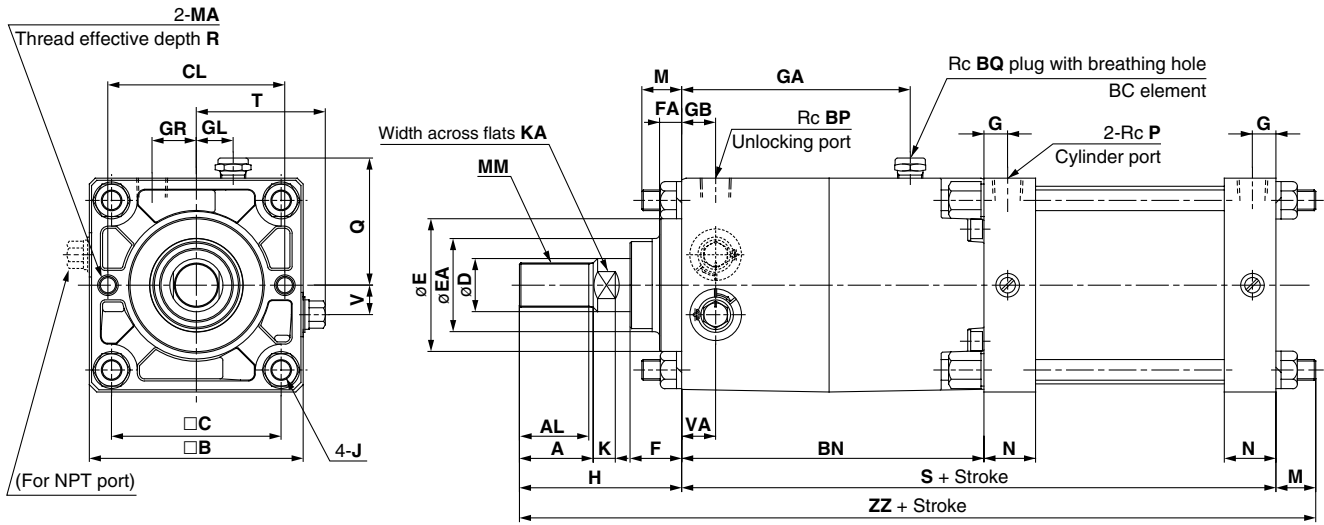
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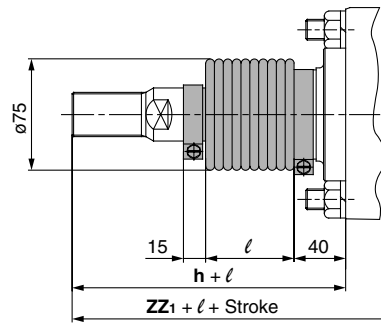
Series CNS

Dimensions

Basic style (B): CNSB



With rod boot



Bore size (mm)	Stroke range (mm)	A	AL	B	BN	BP	BQ	C	CL	D	E	EA	F	FA	G	GA	GB	GL	GR	J
125	Up to 1000	50	47	145	205	1/2	3/8	115	120	36	90	63	35	14	16	155	23	25	30	M14 x 1.5
140	Up to 1000	50	47	161	245	1/2	3/8	128	136	36	90	63	35	14	16	180	28	30	30	M14 x 1.5
160	Up to 1200	56	53	182	290	1/2	3/8	144	144	40	90	63	43	14	18.5	215	35	35	35	M16 x 1.5

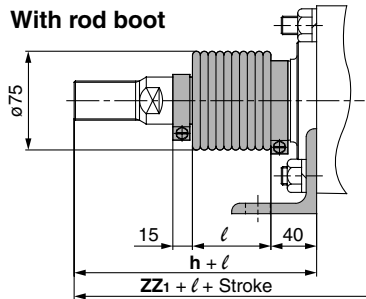
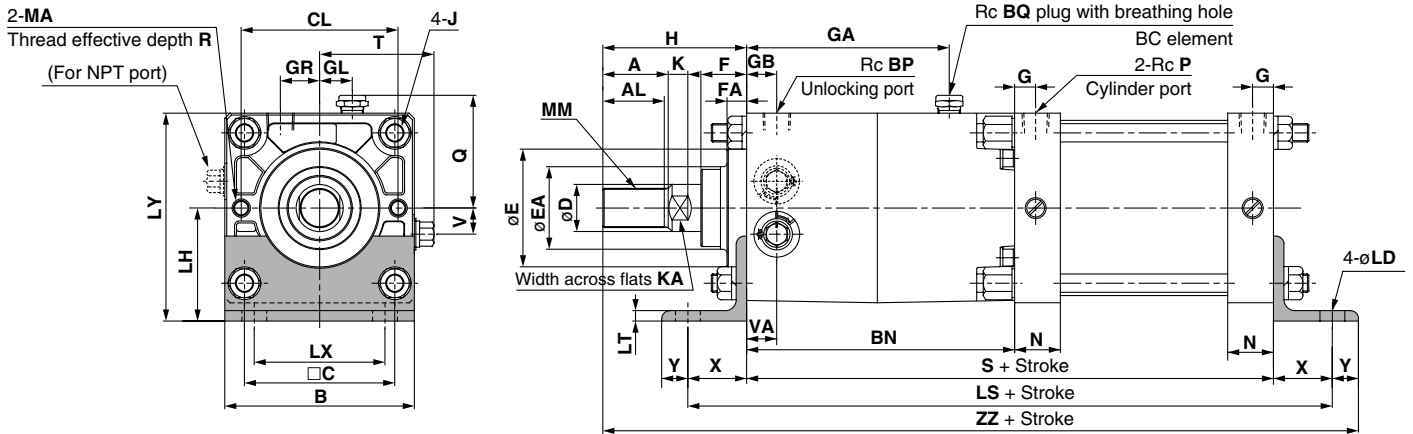
Bore size (mm)	K	KA	M	MA	MM	N	P	Q	R	S	T	V	VA	H	ZZ
125	15	31	27	M12 x 1.75	M30 x 1.5	35	1/2	85.5	25	303	87.5	20	23	110	440
140	15	31	27	M12 x 1.75	M30 x 1.5	35	1/2	93.5	25	343	95	20	28	110	480
160	17	36	30.5	M12 x 1.75	M36 x 1.5	39	3/4	104	25	396	109	25	35	120	546.5

With Rod Boot

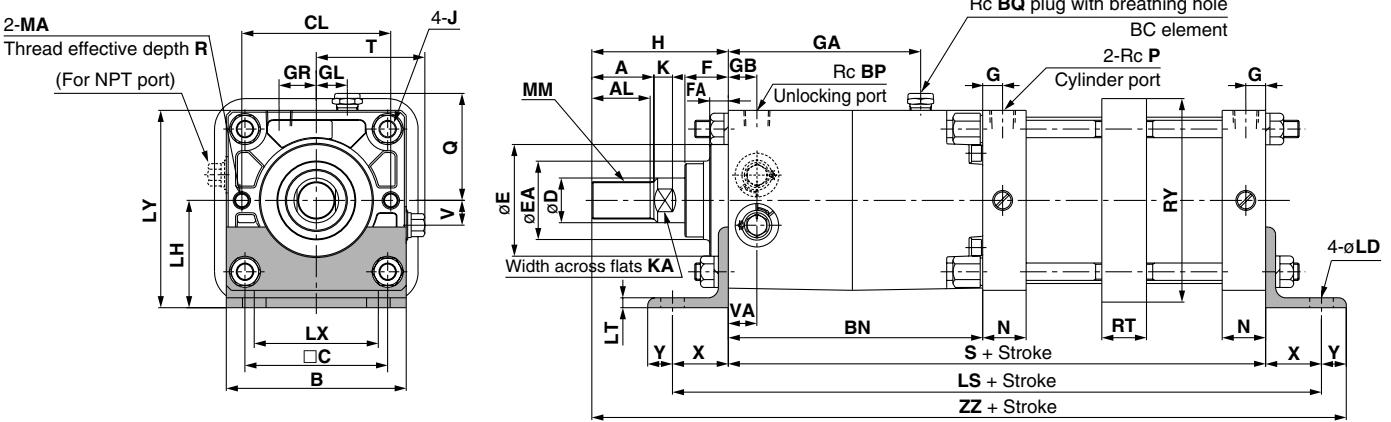
Bore size (mm)	Stroke range (mm)	ZZ ₁	ℓ	h
125	Up to 1000	463	0.2 stroke	133
140	Up to 1000	503	0.2 stroke	133
160	Up to 1200	567.5	0.2 stroke	141

Cylinder with Lock Double Acting, Single Rod **Series CNS**

Foot style (L): CNSL



Long stroke



Bore size (mm)	Stroke range (mm)	A	AL	B	BN	BP	BQ	C	CL	D	E	EA	F	FA	G	GA	GB	GL	GR	J
125	Up to 1400	50	47	145	205	1/2	3/8	115	120	36	90	63	35	14	16	155	23	25	30	M14 x 1.5
140	Up to 1400	50	47	161	245	1/2	3/8	128	136	36	90	63	35	14	16	180	28	30	30	M14 x 1.5
160	Up to 1400	56	53	182	290	1/2	3/8	144	144	40	90	63	43	14	18.5	215	35	35	35	M16 x 1.5

Bore size (mm)	K	KA	LD	LH	LS	LT	LX	LY	MA	MM	N	P	Q	R	S	T	V	VA	X	Y	H	ZZ
125	15	31	19	85	393	8	100	157.5	M12 x 1.75	M30 x 1.5	35	1/2	85.5	25	303	87.5	20	23	45	20	110	478
140	15	31	19	100	433	9	112	180.5	M12 x 1.75	M30 x 1.5	35	1/2	93.5	25	343	95	20	28	45	30	110	528
160	17	36	19	106	496	9	118	197	M12 x 1.75	M36 x 1.5	39	3/4	104	25	396	109	25	35	50	25	120	591

With Rod Boot

Bore size (mm)	Stroke range (mm)	ZZ ₁	l	h
125	Up to 1400	501	0.2 stroke	133
140	Up to 1400	551	0.2 stroke	133
160	Up to 1400	612	0.2 stroke	141

Long Stroke

Bore size (mm)	Stroke range (mm)	RT	RY
125	1401 to 1600	36	164
140	1401 to 1600	36	184
160	1401 to 1600	45	204

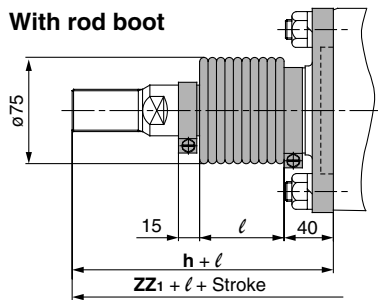
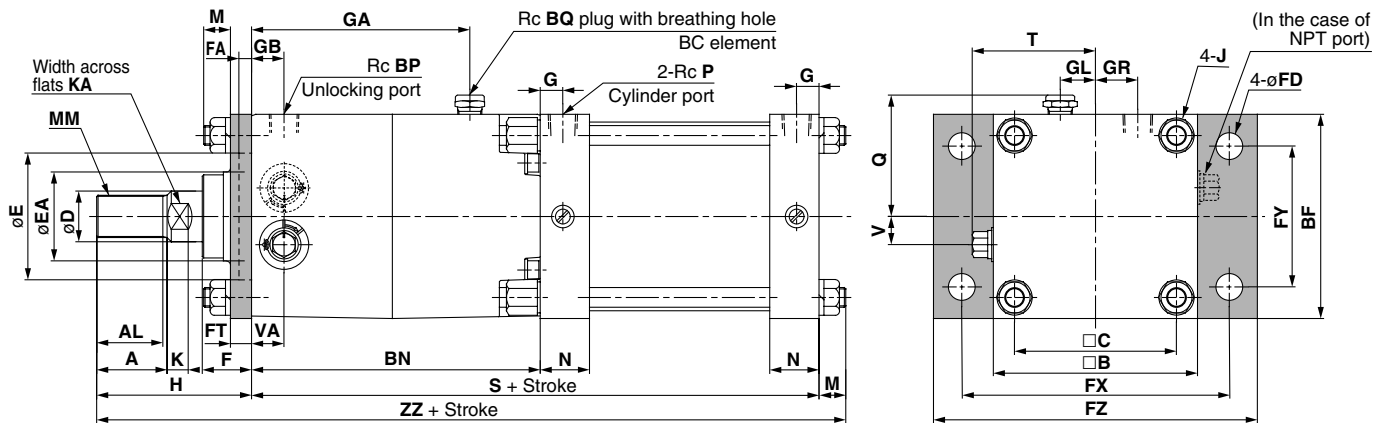
* Not available with auto switches.

- CL
- CL1
- MLGC
- CNG
- MNB
- CNA
- CNS**
- CLS
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data

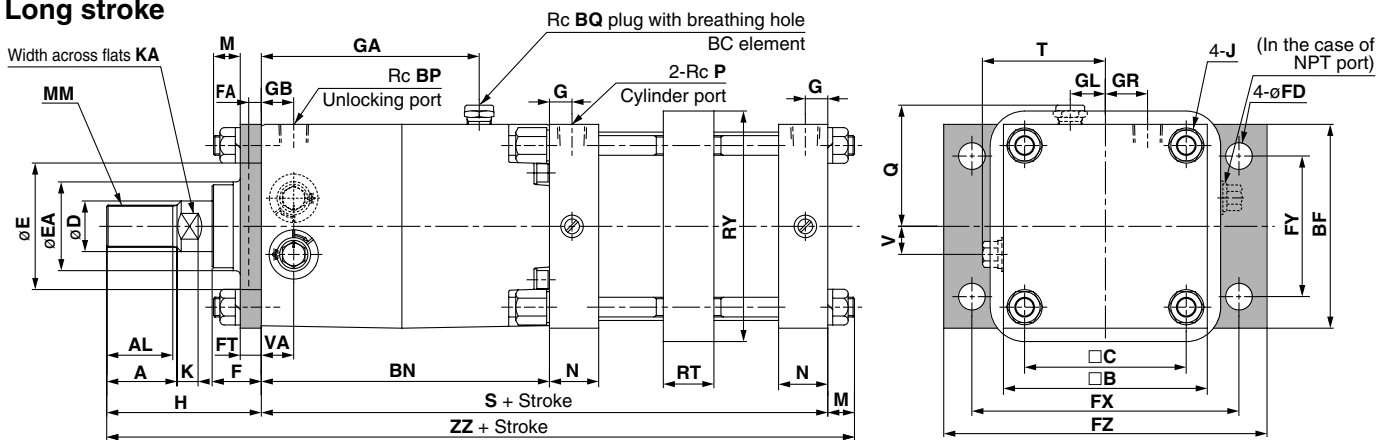
Series CNS

Dimensions

Rod side flange style (F): CNSF



Long stroke



Bore size (mm)	Stroke range (mm)	A	AL	B	BF	BN	BP	BQ	C	D	E	EA	F	FA	FD	FT	FX	FY	FZ	G	GA
125	Up to 1400	50	47	145	145	205	1/2	3/8	115	36	90	63	35	14	19	14	190	100	230	16	155
140	Up to 1400	50	47	161	160	245	1/2	3/8	128	36	90	63	35	14	19	20	212	112	255	16	180
160	Up to 1400	56	53	182	180	290	1/2	3/8	144	40	90	63	43	14	19	20	236	118	275	18.5	215

Bore size (mm)	GB	GL	GR	J	K	KA	M	MM	N	P	Q	S	T	V	VA	H	ZZ
125	23	25	30	M14 x 1.5	15	31	19	M30 x 1.5	35	1/2	85.5	303	87.5	20	23	110	432
140	28	30	30	M14 x 1.5	15	31	19	M30 x 1.5	35	1/2	93.5	343	95	20	28	110	472
160	35	35	35	M16 x 1.5	17	36	22	M36 x 1.5	39	3/4	104	396	109	25	35	120	538

With Rod Boot

Bore size (mm)	Stroke range (mm)	ZZ ₁	l	h
125	Up to 1400	455	0.2 stroke	133
140	Up to 1400	495	0.2 stroke	133
160	Up to 1400	559	0.2 stroke	141

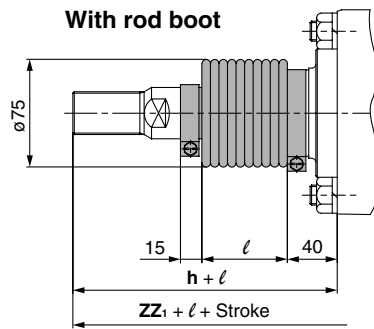
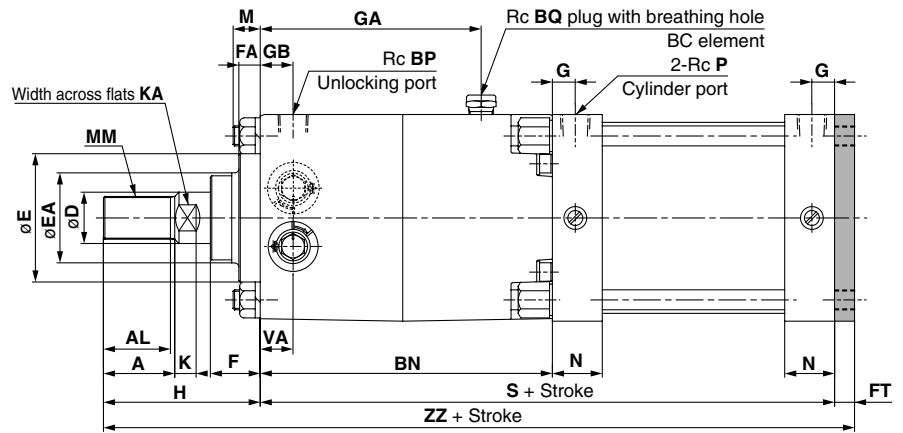
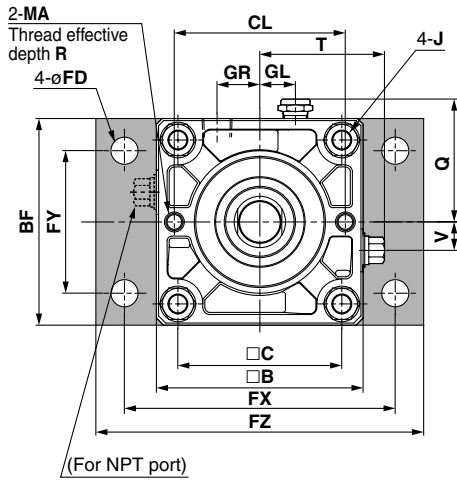
Long Stroke

Bore size (mm)	Stroke range (mm)	RT	RY
125	1401 to 1600	36	164
140	1401 to 1600	36	184
160	1401 to 1600	45	204

* Not available with auto switches.

Cylinder with Lock Double Acting, Single Rod **Series CNS**

Head side flange style (G): CNSG



- CL
- CL1
- MLGC
- CNG
- MNB
- CNA
- CNS**
- CLS
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data

Bore size (mm)	Stroke range (mm)	A	AL	□B	BF	BN	BP	BQ	□C	CL	D	E	EA	F	FA	FD	FT	FX	FY	FZ	G	GA
125	Up to 1000	50	47	145	145	205	1/2	3/8	115	120	36	90	63	35	14	19	14	190	100	230	16	155
140	Up to 1000	50	47	161	160	245	1/2	3/8	128	136	36	90	63	35	14	19	20	212	112	255	16	180
160	Up to 1200	56	53	182	180	290	1/2	3/8	144	144	40	90	63	43	14	19	20	236	118	275	18.5	215

Bore size (mm)	GB	GL	GR	J	K	KA	M	MA	MM	N	P	Q	R	S	T	V	VA	H	ZZ
125	23	25	30	M14 x 1.5	15	31	19	M12 x 1.75	M30 x 1.5	35	1/2	85.5	25	303	87.5	20	23	110	427
140	28	30	30	M14 x 1.5	15	31	19	M12 x 1.75	M30 x 1.5	35	1/2	93.5	25	343	95	20	28	110	473
160	35	35	35	M16 x 1.5	17	36	22	M12 x 1.75	M36 x 1.5	39	3/4	104	25	396	109	25	35	120	536

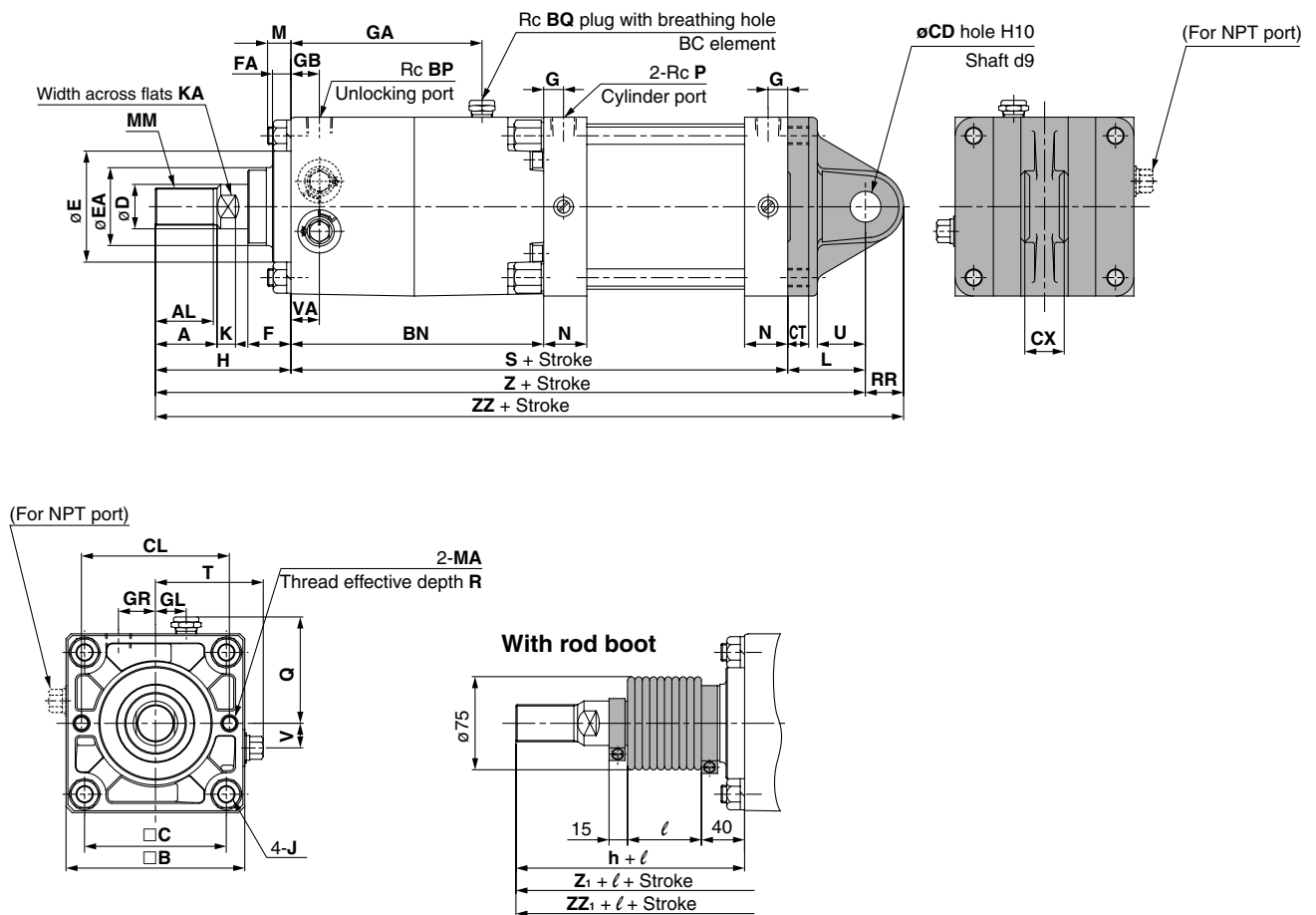
With Rod Boot

Bore size (mm)	Stroke range (mm)	ZZ ₁	ℓ	h
125	Up to 1000	450	0.2 stroke	133
140	Up to 1000	496	0.2 stroke	133
160	Up to 1200	557	0.2 stroke	141

Series CNS

Dimensions

Single clevis style (C): CNSC



Bore size (mm)	Stroke range (mm)	A	AL	B	BN	BP	BQ	C	CD _{H10}	CL	CT	CX	D	E	EA	F	FA	G	GA	GB	GL
125	Up to 1000	50	47	145	205	1/2	3/8	115	25 ^{+0.084} ₀	120	17	32 ^{-0.1} _{-0.3}	36	90	63	35	14	16	155	23	25
140	Up to 1000	50	47	161	245	1/2	3/8	128	28 ^{+0.084} ₀	136	17	36 ^{-0.1} _{-0.3}	36	90	63	35	14	16	180	28	30
160	Up to 1200	56	53	182	290	1/2	3/8	144	32 ^{+0.100} ₀	144	20	40 ^{-0.1} _{-0.3}	40	90	63	43	14	18.5	215	35	35

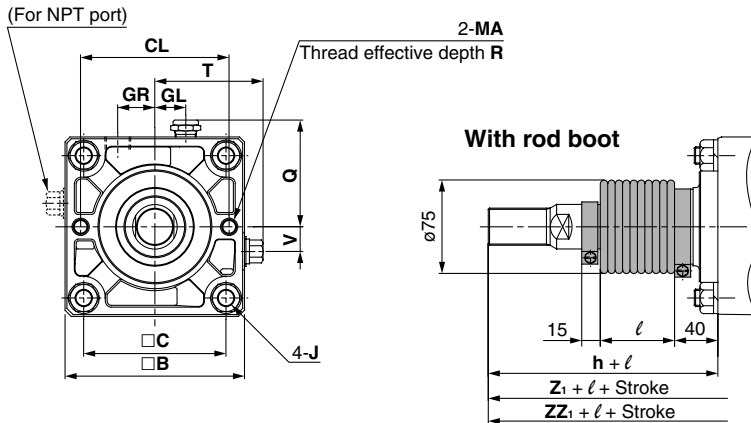
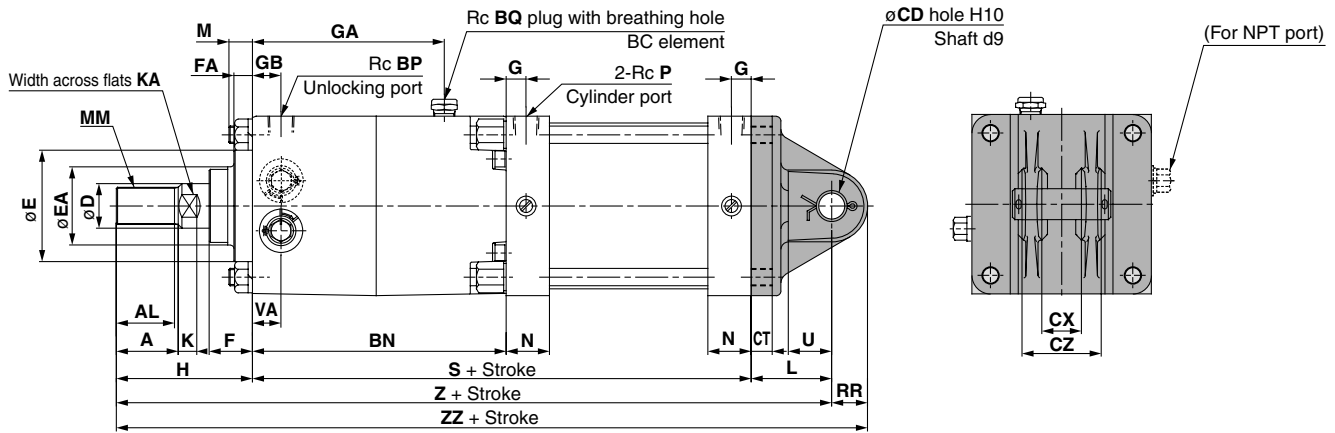
Bore size (mm)	GR	J	K	KA	L	M	MA	MM	N	P	Q	R	RR	S	T	U	V	VA	H	Z	ZZ
125	30	M14 x 1.5	15	31	65	19	M12 x 1.75	M30 x 1.5	35	1/2	85.5	25	29	303	87.5	35	20	23	110	478	507
140	30	M14 x 1.5	15	31	75	19	M12 x 1.75	M30 x 1.5	35	1/2	93.5	25	32	343	95	40	20	28	110	528	560
160	35	M16 x 1.5	17	36	80	22	M12 x 1.75	M36 x 1.5	39	3/4	104	25	36	396	109	45	25	35	120	596	632

With Rod Boot

Bore size (mm)	Stroke range (mm)	Z ₁	ZZ ₁	l	h
125	Up to 1000	501	530	0.2 stroke	133
140	Up to 1000	551	583	0.2 stroke	133
160	Up to 1200	617	653	0.2 stroke	141

Cylinder with Lock Double Acting, Single Rod Series CNS

Double clevis style (D): CNSD



- CL
- CL1
- MLGC
- CNG
- MNB
- CNA
- CNS**
- CLS
- CLQ
- MLGP
- RLQ
- MLU
- ML1C
- D-
- X
- 20-
- Data

Bore size (mm)	Stroke range (mm)	A	AL	B	BN	BP	BQ	C	CD _{H10}	CL	CT	CX	CZ	D	E	EA	F	FA
125	Up to 1000	50	47	145	205	1/2	3/8	115	25 ^{+0.084} ₀	120	17	32 ^{+0.3} _{+0.1}	64 ⁰ _{-0.2}	36	90	63	35	14
140	Up to 1000	50	47	161	245	1/2	3/8	128	28 ^{+0.084} ₀	136	17	36 ^{+0.3} _{+0.1}	72 ⁰ _{-0.2}	36	90	63	35	14
160	Up to 1200	56	53	182	290	1/2	3/8	144	32 ^{+0.100} ₀	144	20	40 ^{+0.3} _{+0.1}	80 ⁰ _{-0.2}	40	90	63	43	14

Bore size (mm)	G	GA	GB	GL	GR	J	K	KA	L	M	MA	MM	N	P	Q	R	RR	S	T
125	16	155	23	25	30	M14 x 1.5	15	31	65	19	M12 x 1.75	M30 x 1.5	35	1/2	85.5	25	29	303	87.5
140	16	180	28	30	30	M14 x 1.5	15	31	75	19	M12 x 1.75	M30 x 1.5	35	1/2	93.5	25	32	343	95
160	18.5	215	35	35	35	M16 x 1.5	17	36	80	22	M12 x 1.75	M36 x 1.5	39	3/4	104	25	36	396	109

With Rod Boot

Bore size (mm)	U	V	VA	H	Z	ZZ
125	35	20	23	110	478	507
140	40	20	28	110	528	560
160	45	25	35	120	596	632

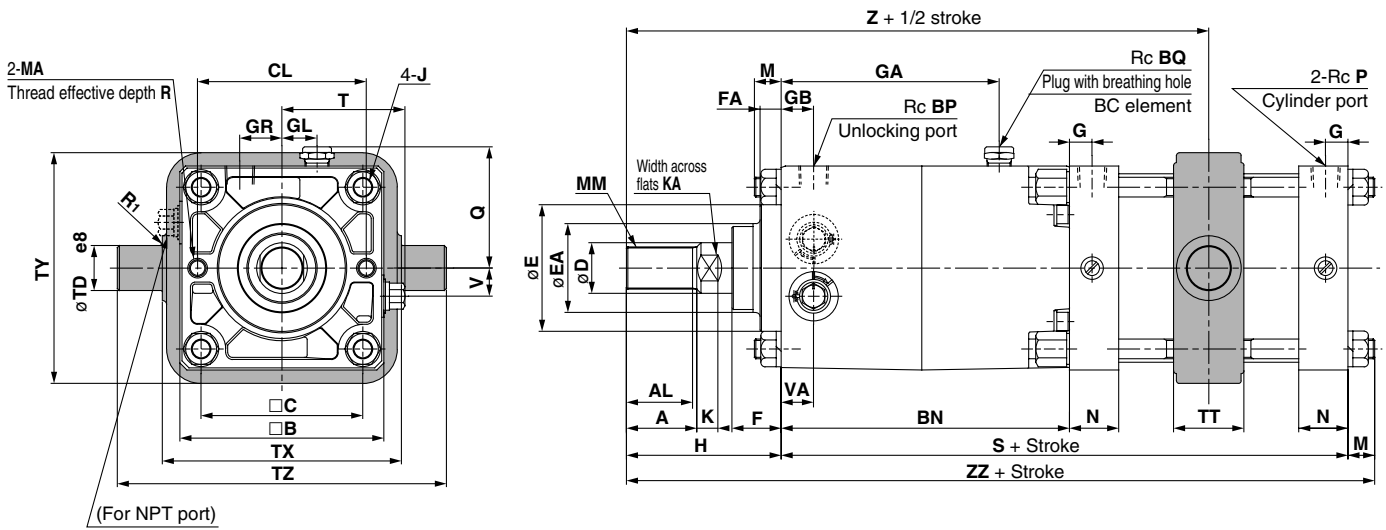
Bore size (mm)	Stroke range (mm)	Z ₁	ZZ ₁	l	h
125	Up to 1000	501	530	0.2 stroke	133
140	Up to 1000	551	583	0.2 stroke	133
160	Up to 1200	617	653	0.2 stroke	141

* Clevis pin, flat washer and cotter pin are shipped together.

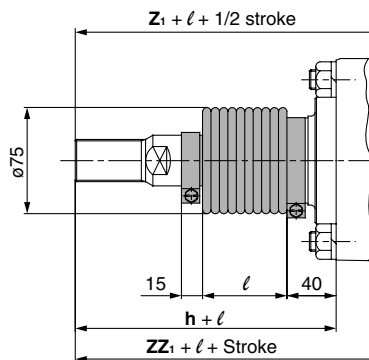
Series CNS

Dimensions

Center trunnion style (T): CNST



With rod boot



Bore size (mm)	Stroke range (mm)	A	AL	B	BN	BP	BQ	C	CL	D	E	EA	F	FA	G	GA	GB	GL	GR	J	K	KA
125	25 to 1000	50	47	145	205	1/2	3/8	115	120	36	90	63	35	14	16	155	23	25	30	M14 x 1.5	15	31
140	30 to 1000	50	47	161	245	1/2	3/8	128	136	36	90	63	35	14	16	180	28	30	30	M14 x 1.5	15	31
160	35 to 1200	56	53	182	290	1/2	3/8	144	144	40	90	63	43	14	18.5	215	35	35	35	M16 x 1.5	17	36

Bore size (mm)	M	MA	MM	N	P	Q	R	R ₁	S	T	TD _{e8}	TT	TX	TY	TZ	V	VA	H	Z	ZZ
125	19	M12 x 1.75	M30 x 1.5	35	1/2	85.5	25	1	303	87.5	32 ^{-0.050} _{-0.089}	50	170	164	234	20	23	110	364	432
140	19	M12 x 1.75	M30 x 1.5	35	1/2	93.5	25	1.5	343	95	36 ^{-0.050} _{-0.089}	55	190	184	262	20	28	110	404	472
160	22	M12 x 1.75	M36 x 1.5	39	3/4	104	25	1.5	396	109	40 ^{-0.050} _{-0.089}	60	212	204	292	25	35	120	463	538

With Rod Boot

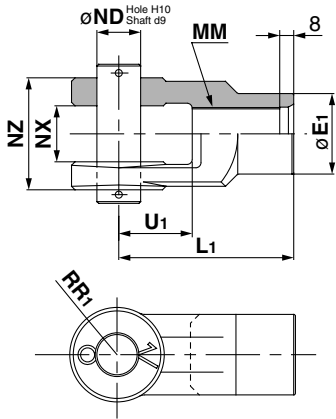
Bore size (mm)	Stroke range (mm)	Z ₁	ZZ ₁	l	h
125	25 to 1000	387	455	0.2 stroke	133
140	30 to 1000	427	495	0.2 stroke	133
160	35 to 1200	484	559	0.2 stroke	141

Series CNS

Accessory Bracket Dimensions

Y Type Double Knuckle Joint

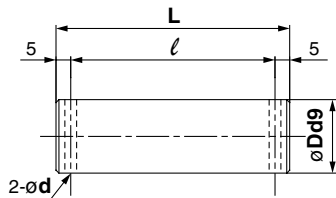
* Pin and snap ring are shipped together with double clevis and double knuckle joint.



Material: Cast iron

Part no.	Applicable bore size (mm)	E1	L1	MM	NDH10	NX	NZ	RR1	U1
Y-12	125	46	100	M30 x 1.5	25 ^{+0.084} ₀	32 ^{+0.3} _{+0.1}	25 ^{-0.1} _{-0.3}	27	42
Y-14	140	48	105	M30 x 1.5	28 ^{+0.084} ₀	36 ^{+0.3} _{+0.1}	28 ^{-0.1} _{-0.3}	30	47
Y-16	160	55	110	M36 x 1.5	32 ^{+0.100} ₀	40 ^{+0.3} _{+0.1}	32 ^{-0.1} _{-0.3}	34	46

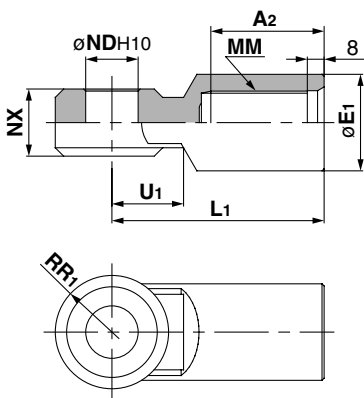
Clevis Pin/Knuckle Pin



Material: Carbon steel

Part no.	Applicable bore size (mm)	Dd9	L	l	Applicable cotter pin
IY-12	125	25 ^{-0.065} _{-0.117}	79.5	69.5	ø4 x 40ℓ
IY-14	140	28 ^{-0.065} _{-0.117}	86.5	76.5	ø4 x 40ℓ
IY-16	160	32 ^{-0.080} _{-0.142}	94.5	84.5	ø4 x 40ℓ

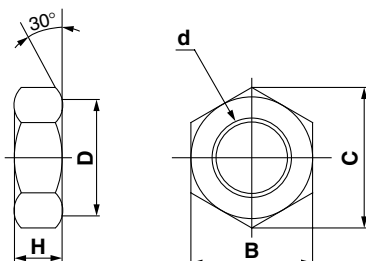
I Type Single Knuckle Joint



Material: Cast iron

Part no.	Applicable bore size (mm)	A2	E1	L1	MM	NDH10	NX	RR1	U1
I-12	125	54	46	100	M30 x 1.5	25 ^{+0.084} ₀	32 ^{-0.1} _{-0.3}	27	33
I-14	140	54	48	105	M30 x 1.5	28 ^{+0.084} ₀	36 ^{-0.1} _{-0.3}	30	39
I-16	160	60	55	110	M36 x 1.5	32 ^{+0.100} ₀	40 ^{-0.1} _{-0.3}	34	39

Rod End Nut



Material: Rolled 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

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

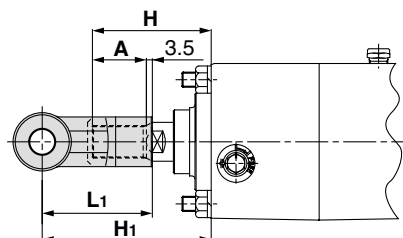
-X

20-

Data

Accessory Bracket Dimensions

Single/Double Knuckle Joint Mounting



Bore size (mm)	Symbol	H	A	L1	H1	Applicable knuckle joint part no.	
						I type single knuckle	Y type double knuckle
125		110	50	100	156.5	I-12	Y-12
140		110	50	105	161.5	I-14	Y-14
160		120	56	110	170.5	I-16	Y-16

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

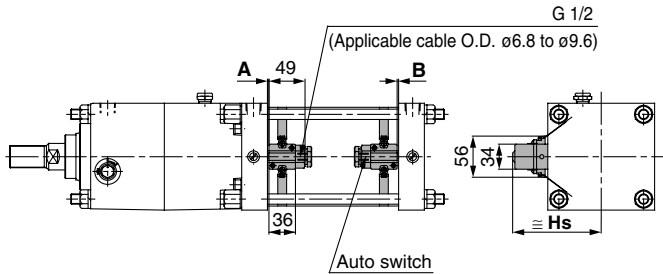
Bore size (mm)	A	H
125	65	125
140	65	125
160	76	140

- * Single knuckle joint and double knuckle joint should be used separately. (Fasten by screwing completely into the rod end threads.)
- * Extend the dimensions of **A** and **H**, when using a single/double knuckle joint together with a rod end nut. (For extension of the **A** and **H** dimensions, refer to the table above and specify the made-to-order product **-XAO**.)

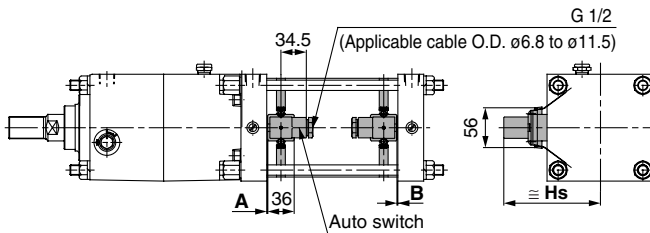
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

<Band mounting style>

D-A3
D-G3/K3

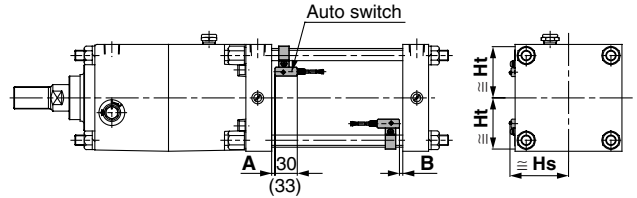


D-A4



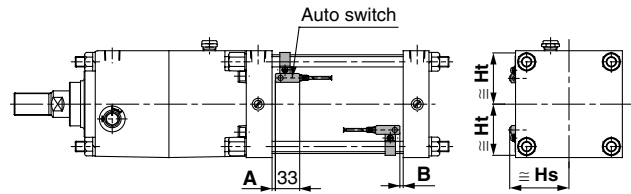
<Tie-rod mounting style>

D-F5□/J5□, D-F5NTL
D-F5BAL/F5IF
D-F5□W/J59W



(): Denotes the values of D-F5LF.

D-A5/A6



Proper Auto Switch Mounting Position

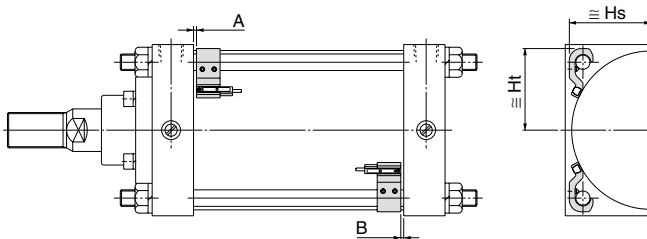
Auto switch model	D-A5/A6 D-A3 D-A44 D-G39 D-K39		D-A59W		D-F59F D-F5□W D-J59W D-F5BAL D-F5□ D-J5□		D-F5NTL	
	A	B	A	B	A	B	A	B
Bore size (mm)								
125	0	0	2	2	4.5	4.5	9.5	9.5
140	0	0	2	2	4.5	4.5	9.5	9.5
160	0	0	2	2	4.5	4.5	9.5	9.5

Auto Switch Mounting Height

Auto switch model	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	Hs	Hs	Ht	Hs	Ht	Hs	Ht
Bore size (mm)								
125	116	126	75.5	69.5	74.5	70		
140	124	134	81	76.5	80	76.5		
160	134.5	144.5	89	87.5	88	87.5		

<Tie-rod mounting style>

D-Z7□/Z80
D-Y59□/Y69□/Y7P/Y7PV
D-Y7□W/Y7□WV
D-Y7BAL



**Proper Auto Switch Mounting Position/
Auto Switch Mounting Height**

Bore size (mm)	Common for each auto switch		D-Z7/Z8 D-Y5/Y6 D-Y7□(W) D-Y7□(W)V		D-Y7BA	
	A	B	Hs	Ht	Hs	Ht
125	1.5	1.5	69	69.5	71	69.5
140	1.5	1.5	76	76	77	76
160	1.5	1.5	85	85	88.5	85

Operating Range

Auto switch model	Bore size (mm)		
	125	140	160
D-Z7□/Z80	14	14.5	13
D-A3□/A44 D-A5□/A6□	10	10	10
D-A59W	17	17	17
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV	12	13	7
D-Y7BAL	6	6	7
D-F59F/F5□/J5□ D-F5□W/J59W D-F5BAL/F5NTL	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

CL

CL1

MLGC

CNG

MNB

CNA

CNS

CLS

CLQ

MLGP

RLQ

MLU

ML1C

D-

-X

20-

Data

Minimum Stroke for Auto Switch Mounting

n: Quantity

Auto switch model	No. of auto switches mounted		Mounting brackets other than center trunnion	Center trunnion		
				ø125	ø140	ø160
D-A5□/A6□ D-A59W D-F5□/J5□ D-F5□W/J59W D-F5BAL D-F59F	2 (Different sides, Same side), 1		25	125	135	
	n (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	2 (Different sides, Same side), 1		35	145	155	
	n (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	2	Different sides	35	110		
		Same side	100	110		
	n	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...		
1		15	110			
D-A44	2	Different sides	35	110		
		Same side	55	110		
	n	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...		
1		15	110			
D-Z7□/Z80 D-Y59□/Y7P D-Y7□W	1, 2 ø125 to ø160		15	105	110	115
D-Y69□/Y7PV D-Y7□WV			10	90	95	100
D-Y7BAL			20	115	120	125

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted. For detailed specifications, refer to page 9-15-1.

Type	Model	Electrical entry (Fetching direction)	Features
Reed switch	D-A53/A56	Grommet (In-line)	—
	D-A64/A67		Without indicator light
	D-Z80		
Solid state switch	D-F59/F5P/J59	Grommet (In-line)	—
	D-F59W/F5PW/J59W		2-color indication
	D-F5BAL		Water resistant (2-color indication)
	D-F5NTL		With timer
	D-Y69A/Y69B/Y7PV	Grommet (Perpendicular)	—
D-Y7NWV/Y7PWV/Y7BWV	2-color indication		

* With pre-wire connector is available for solid state auto switches. For details, refer to page 9-15-68.

* Normally closed (NC = b contact), solid state switch (D-Y7G/Y7H type) are also available. For details, refer to page 9-15-42.