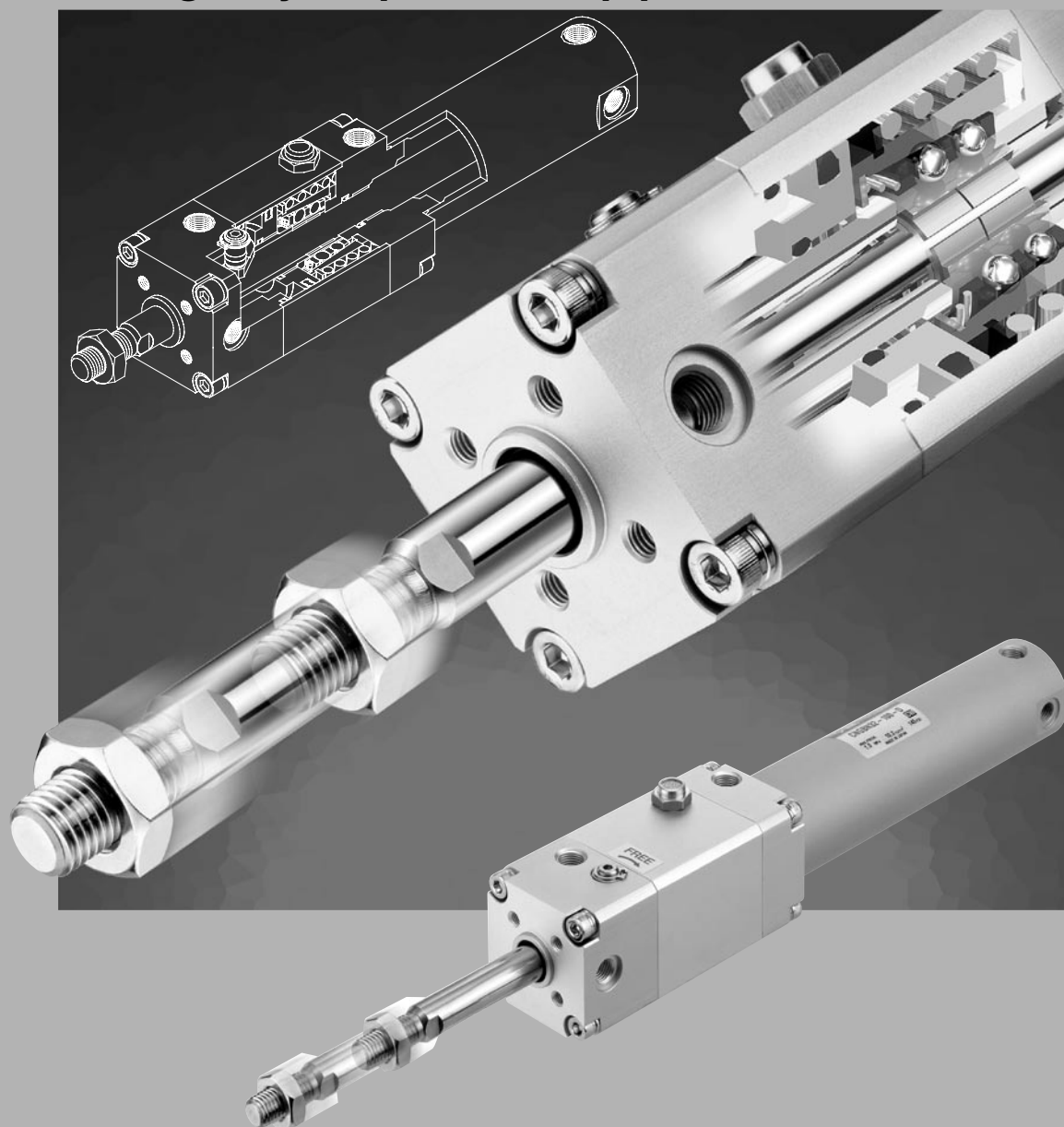




Cylinder with Lock

Series *CNG/* ø20, ø25, ø32, ø40

A locking cylinder ideal for intermediate stops, emergency stops and drop prevention.



■ Series variations

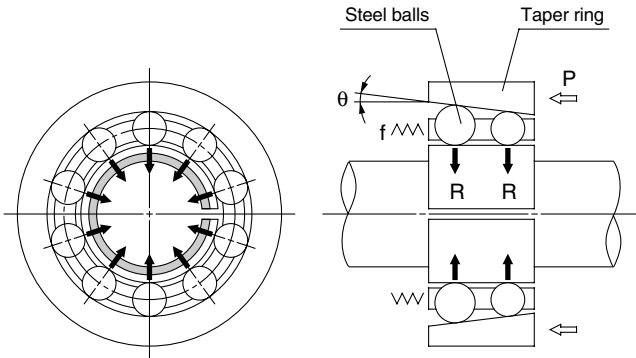
Series	Action	Cushion type		Standard variations		Bore size (mm)	Standard stroke (mm)
		Rubber bumper	Air cushion	Built-in auto switch magnets	With rod boot		
Cylinder with lock Series CNG	Double acting Single rod	●	●	●	●	20	Maximum to 800
		●	●	●	●	25	
		●	●	●	●	32	
		●	●	●	●	40	

CL
MLG
CNA
CNG
MNB
CNS
CLS
CB
CV/MVG
CXW
CXS
CXT
MX
MXU
MXH
MXS
MXQ
MXF
MXW
MXP
MG
MGP
MGQ
MGG
MGC
MGF
MGZ
CY
MY

A locking cylinder ideal for emergency stops and

Simple construction

A force magnifying mechanism is employed based on the wedge effect of a taper ring and steel balls.



Cylinder with Lock

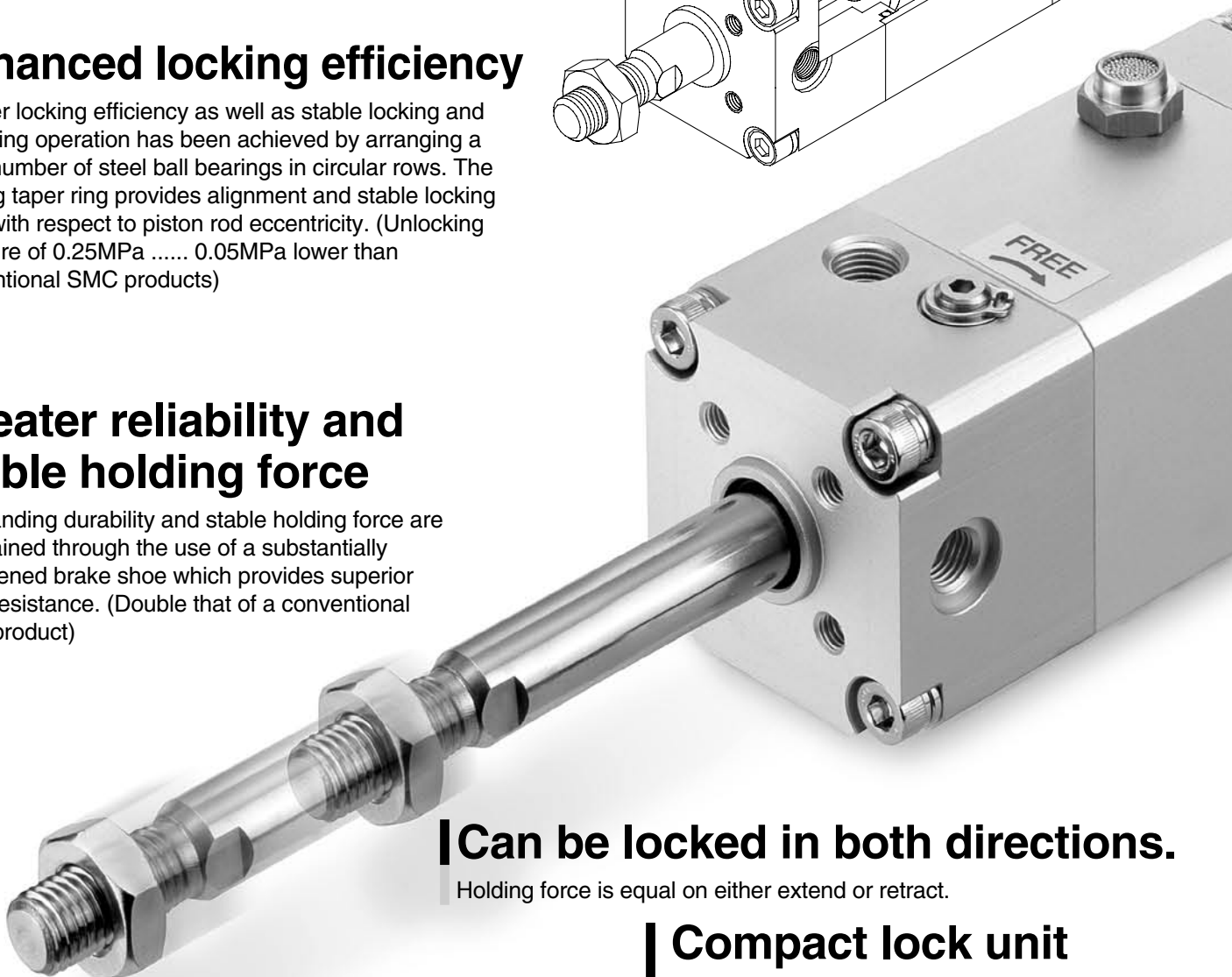
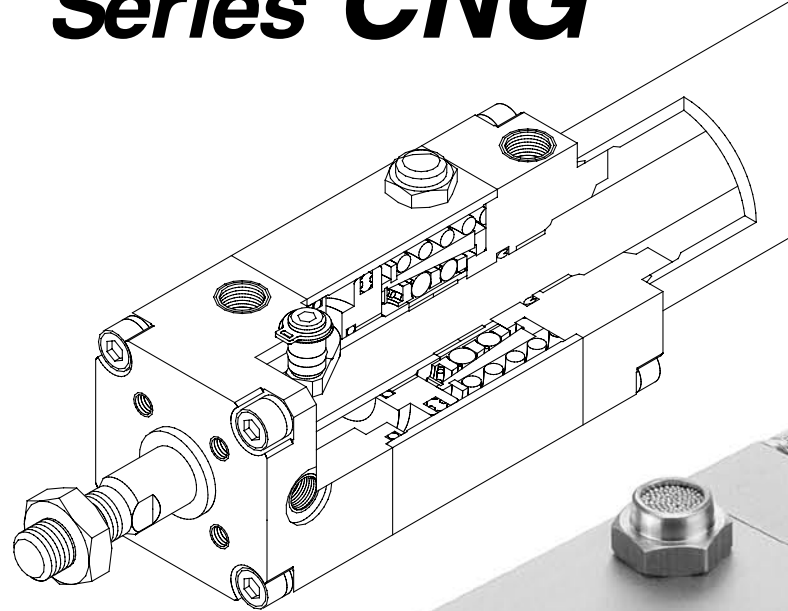
Series CNG

Enhanced locking efficiency

Greater locking efficiency as well as stable locking and unlocking operation has been achieved by arranging a large number of steel ball bearings in circular rows. The floating taper ring provides alignment and stable locking force with respect to piston rod eccentricity. (Unlocking pressure of 0.25MPa 0.05MPa lower than conventional SMC products)

Greater reliability and stable holding force

Outstanding durability and stable holding force are maintained through the use of a substantially lengthened brake shoe which provides superior wear resistance. (Double that of a conventional SMC product)



Can be locked in both directions.

Holding force is equal on either extend or retract.

Compact lock unit saves space

The lock unit is extremely compact, without a large overhang.

for intermediate stops, and drop prevention.

Maximum piston speed: 1000mm/s

Within the allowable kinetic energy range, speeds between 50 to 1000mm/s can be achieved.

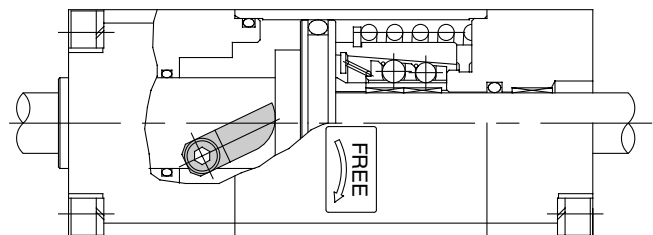


Enclosed construction minimizes influences of poor air quality

Separation of the lock mechanism and the unlocking piston chamber produces a structure which is resistant to moisture and drainage in compressed air.

Simple manual override

In the event that the air supply is cut off or unavailable, unlocking can be performed with a commercially available tool. The fail safe mechanism locks again when the manual override is released.



Series variations

Series	Action	Cushion type		Standard variations		Bore size (mm)	Standard stroke (mm)
		Rubber bumper	Air cushion	Built-in auto switch magnets	With rod boot		
Cylinder with lock Series CNG	Double acting Single rod	●	●	●	●	20	Maximum to 800
						25	
						32	
						40	

CL

MLG

CNA

CNG

MNB

CNS

CLS

CB

CV/MVG

CXW

CXS

CXT

MX

MXU

MXH

MXS

MXQ

MXF

MXW

MXP

MG

MGP

MGQ

MGG

MGC

MGF

MGZ

CY

MY

Cylinder
with Lock

Double
Acting:
Single Rod

Series CNG

Ø20, Ø25, Ø32, Ø40

How to Order

Standard Type CNG L N 32 100 D

With Auto Switch CDNG L N 32 100 D

With auto switch (with magnet) •

Mounting brackets •

B	Basic type
L	Axial foot type
F	Front flange type
G	Rear flange type
U	Front trunnion type
T	Rear trunnion type
D	Clevis type

* Brackets are packed together (not attached) when shipped.

Cushion type •

N	Non-lube/rubber bumper
A	Non-lube/air cushion

Bore size •

20	20mm
25	25mm
32	32mm
40	40mm

Number of auto switches

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

Auto Switch Type

Nil	Without auto switch
-----	---------------------

* Select applicable auto switch models from the table below.

Locking direction

D	Both directions
---	-----------------

Rod boot

Rod boot	Nil	None
	J	Nylon tarpaulin
	K	Heat resistant tarpaulin

* When equipped with rod boot, foot and front flange type brackets are attached before shipment.

Cylinder strokes (mm)

Refer to standard stroke table on page 3.4-5.

Applicable Auto Switches/Refer to page 5.3-2 for detailed auto switch specifications.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage		Auto switch model	Lead wire length (m)*				Applicable loads			
					DC	AC		0.5 (Nil)	3 (L)	5 (Z)	None (N)				
Reed switches	—	Grommet	Yes	3 wire (NPN equiv.)	24V	5V	—	C76	●	●	—	—	IC circuit	—	
				2 wire		12V	—	B53	●	●	●	—	—		PLC
			100V, 200V			B54	●	●	●	—	—	—			
			200V or less			B64	●	●	—	—					
		12V	100V			C73	●	●	●	—	IC circuit	—			
		5V, 12V	100V or less	C80		●	●	—	—						
	Connector	Yes	12V	—		C73C	●	●	●	●	—	—			
		No	5V, 12V	24V or less		C80C	●	●	●	●	IC circuit	—			
	Diagnostic indication (2 colour indicator)	Grommet	Yes	—		24V	5V, 12V	—	B59W	●	●	—	—		—
				3 wire (NPN)				H7A1	●	●	○	—	IC circuit		
Grommet		3 wire (PNP)	12V	H7A2			●	●	○	—	—				
		2 wire		H7B			●	●	○	—					
Solid state switches	Diagnostic indication (2 colour indicator)	Connector	Yes	3 wire (NPN)	5V, 12V		—	H7C	●	●	●	●	—		
				3 wire (PNP)				H7NW	●	●	○	—		IC circuit	
		Grommet	Yes	2 wire	12V		H7PW	●	●	○	—	—			
				3 wire (NPN)			H7BW	●	●	○	—				
				3 wire (PNP)			H7BA	—	●	○	—				
				2 wire			G5NT	—	●	○	—		IC circuit		
				3 wire (NPN)			H7NF	●	●	○	—				
				4 wire (NPN)			5V, 12V	H7LF	●	●	○			—	
				—		—		—	—	—					

* Lead wire length symbols 0.5m Nil (Example) C73C 5m Z (Example) C73CZ
3m L C73CL None N C73CN

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

Internal magnet cylinder part numbers

In the case of internal magnets with no auto switches, the auto switch type symbol is "Nil".
(Example) CDNGLN40-100-D

Mounting brackets part numbers

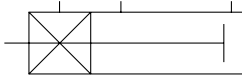
Refer to page 3.4-6 for the part numbers of mounting brackets for other than the basic air cylinder.

Cylinder with Lock *Series CNG*

Double Acting: *Single Rod*



Symbol



Models

Series	Type	Action	Bore size (mm)	Locking action
CNG	Non-lube type	Double acting	20, 25, 32, 40	Spring locking

Cylinder Specifications

Type	Non-lube type
Fluid	Air
Proof pressure	1.5MPa
Maximum operating pressure	1.0MPa
Minimum operating pressure	0.08MPa
Piston speed	50 to 1000mm/s*
Ambient and fluid temperature	Without auto switch: -10°C to 70°C With auto switch: -10°C to 60°C (with no freezing)
Cushion	Rubber bumper, Air cushion
Stroke length tolerance (mm)	to 800st: $^{+1.4}_0$
Thread tolerance	JIS class 2
Mounting brackets	Basic type, Axial foot type, Front flange type, Rear flange type, Front trunnion type, Rear trunnion type, Clevis type (used for 90° change of port position)

* There is a limit to the load weight depending on the piston speed when locked, mounting position and operating pressure.

Lock Specifications

Bore size (mm)	20	25	32	40
Locking action	Spring locking (exhaust locking)			
Unlocking pressure	0.20MPa or more	0.25MPa or more		
Locking pressure	0.15MPa or less	0.20MPa or less		
Operating pressure range	0.2 to 1.0MPa	0.25 to 1.0MPa		
Locking direction	Both directions			

Standard Strokes

Bore size (mm)	Standard stroke (mm) <small>Note 1)</small>	Long stroke (mm) <small>Note 2)</small>	Maximum available stroke (mm)
20	25, 50, 75, 100, 125, 150, 200	201 to 350	1500
25	25, 50, 75, 100, 125, 150, 200, 250, 300	301 to 400	
32		301 to 450	
40		301 to 800	

Note 1) Intermediate strokes other than the above are produced upon receipt of order. Spacers are not used for intermediate strokes.

Note 2) Long strokes are applicable to the axial foot type and front flange type.
In case of other mounting brackets or when long stroke limits are exceeded, the maximum useable stroke is determined by the stroke selection table (information edition).

Minimum Stroke for Auto Switch Mounting

Model	Number of auto switches mounted	
	2 pcs.	1 pc.
D-C7, C8 D-B5, B6 D-H7 D-G5N	15mm	10mm
D-B59W	20mm	15mm
D-H7LF	20mm	10mm

Rod Boot Material

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

* The maximum ambient temperature for the rod boot itself.

Stopping Accuracy

Locking action	Piston speed (mm/s)			
	100	300	500	1000
Spring locking	±0.3	±0.6	±1.0	±2.0

Conditions/Horizontal, supply pressures P = 0.5MPa

Load weight Upper limit of allowed values

Solenoid valve for locking Mounted directly to unlocking port

Maximum value taken from the range of 100 measured stopping positions

Holding Force for Spring Locking (Maximum Static Load)

Bore size(mm)	20	25	32	40
Holding force N	215	335	550	860

CL
MLG
CNA
CNG
MNB
CNS
CLS
CB
CV/MVG
CXW
CXS
CXT
MX
MXU
MXH
MXS
MXQ
MXF
MXW
MXP
MG
MGP
MGQ
MGG
MGC
MGF
MGZ
CY
MY

Series CNG

Mounting Bracket Part Numbers

Mounting bracket	Bore size (mm)			
	20	25	32	40
Axial foot *	CNG-L020	CNG-L025	CNG-L032	CNG-L040
Flange	CNG-F020	CNG-F025	CNG-F032	CNG-F040
Trunnion pin	CG-T020	CG-T025	CG-T032	CG-T040
Clevis **	CG-D020	CG-D025	CG-D032	CG-D040
Front trunnion bracket	CNG-020-24	CNG-025-24	CNG-032-24	CNG-040-24
Rear trunnion bracket	CG-020-24A	CG-025-24A	CG-032-24A	CG-040-24A

* Order 2 pcs. of foot brackets for each cylinder.

** The clevis type is packaged with clevis pin, snap ring and mounting bolts.

*** Mounting bolts are included with the foot and flange types.

Auto Switch Mounting Bracket Part Nos.

Auto switch model	Bore size (mm)			
	20	25	32	40
D-C7, C8	BMA2-020	BMA2-025	BMA2-032	BMA2-040
D-H7				
D-B5, B6	BA-01	BA-02	BA-32	BA-04
D-G5NT				

Stainless Steel Mounting Screw Kits

The following stainless steel mounting screw kits are available for use depending on the operating environment. (Switch mounting bands are not included and should be ordered separately.)

BBA3: for D-B5/B6/G5

BBA4: for D-C7/C8/H7

When type D-H7BAL switches are shipped mounted on a cylinder, the above stainless steel screws are used. Also, when switches are shipped separately BBA4 is included.

Accessories

Mounting bracket		Basic type	Axial foot type	Front flange type	Rear flange type	Front trunnion type	Rear trunnion type	Clevis type
Standard equipment	Rod end nut	●	●	●	●	●	●	●
	Clevis pin	—	—	—	—	—	—	●
Options	Single knuckle joint	●	●	●	●	●	●	●
	Double knuckle joint (with pin) *	●	●	●	●	●	●	●
	Trunnion bracket	—	—	—	—	●	●	●
	Rod boot	●	●	●	●	●	●	●

* The pin and snap ring are packaged together with the double knuckle joint when shipped.

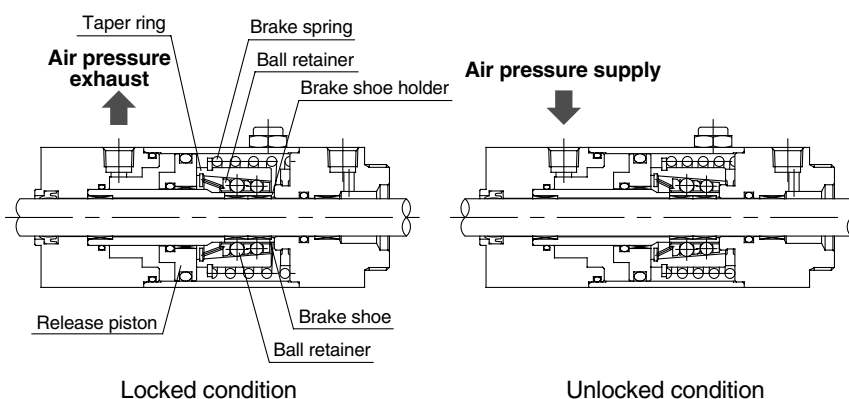
Weight Table

Bore size (mm)		20	25	32	40
Basic weight	Basic type	0.52	0.83	0.91	1.24
	Axial foot type	0.63	0.96	1.07	1.46
	Flange type	0.64	1.01	1.08	1.47
	Trunnion type	0.53	0.85	0.94	1.29
	Clevis type	0.57	0.91	1.06	1.47
Front trunnion bracket		0.11	0.13	0.20	0.27
Rear trunnion bracket		0.08	0.09	0.17	0.25
Single knuckle joint		0.05	0.09	0.09	0.10
Double knuckle joint (with pin)		0.05	0.09	0.09	0.13
Additional weight per 50mm of stroke		0.05	0.07	0.09	0.15
Additional weight for air cushion		0.01	0.01	0.02	0.02
Additional weight for long stroke		0.01	0.01	0.02	0.03

Calculation method (Example) CNGLA20-100-D (foot type, ø20, 100st)

Basic weight 0.63kg (foot type, ø20)
 Additional weight 0.05kg/50st
 Air cylinder stroke 100st
 Air cushion additional weight 0.01kg
 $0.63 + 0.05 \times 100/50 + 0.01 = 0.74\text{kg}$

Construction Principle



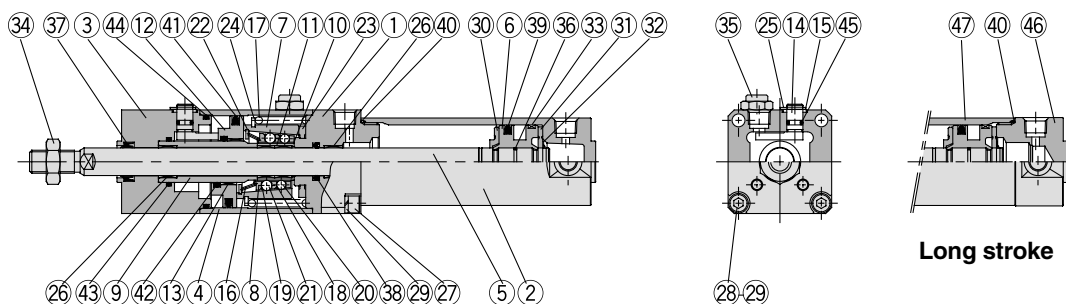
Spring Locking (Exhaust Locking)

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. The braking force is released as the steel balls are removed from the taper ring by the ball retainer.

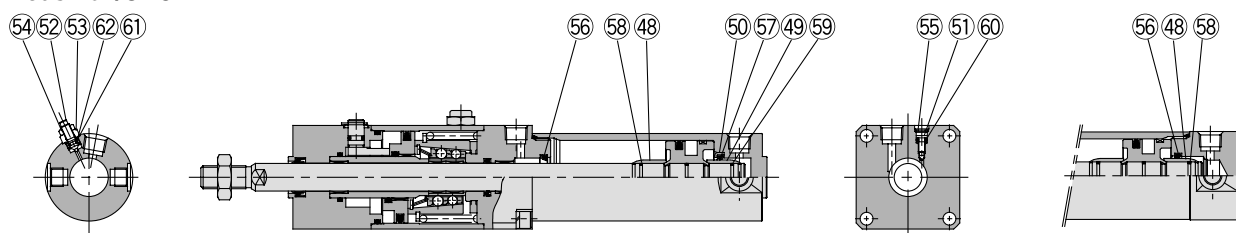
Construction

With rubber bumper/CNGBN



Long stroke

With air cushion/CNGBA



Long stroke

Parts list

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	White hard anodized
2	Tube cover	Aluminum alloy	White hard anodized
3	Cover	Aluminum alloy	White hard anodized
4	Intermediate cover	Aluminum alloy	White hard anodized
5	Piston rod	Carbon steel *	Hard chrome plated
6	Piston	Aluminum alloy	Chromated
7	Taper ring	Carbon steel	Heat treated
8	Ball retainer	Special resin	
9	Piston guide	Carbon steel	Zinc chromated
10	Brake shoe holder	Special steel	Heat treated
11	Brake shoe	Special friction material	
12	Release piston	Carbon steel	Zinc chromated
13	Release piston bushing	ø20 Sintered oil containing alloy	
		ø25, ø32, ø40 Steel + Special resin	
14	Unlocking cam	Chromium molybdenum steel	Electroless nickel plated
15	Washer	Rolled steel	Electroless nickel plated
16	Retainer pre-load spring	Steel wire	Zinc chromated
17	Brake spring	Steel wire	Zinc chromated
18	Clip A	Stainless steel	ø25, ø32 only
19	Clip B	Stainless steel	ø25, ø32 only
20	Steel ball A	Carbon steel	
21	Steel ball B	Carbon steel	
22	Tooth ring	Stainless steel	
23	Damper	Urethane	
24	C type snap ring for taper ring	Carbon steel	
25	C type snap ring for unlocking cam shaft	Carbon steel	
26	Bushing	Sintered oil containing alloy	ø40 is lead bronze casting
27	Hexagon socket head screw	Chromium molybdenum steel	Nickel plated
28	Hexagon socket head screw	Chromium molybdenum steel	Nickel plated
29	Spring washer for hexagon socket head screw	Steel wire	Nickel plated
30	Damper A	Urethane	
31	Damper B	Urethane	ø40 is the same as damper A
32	Snap ring	Stainless steel	
33	Wear ring	Resin	
34	Rod end nut	Rolled steel	Nickel plated
35	BC element	Bronze	
36	Piston gasket	NBR	

Note) In the case of cylinders equipped with auto switches, magnets are installed in the piston.
 * The material for ø20 and ø25 cylinders equipped with auto switches is stainless steel.

Parts list

No.	Description	Material	Note
37	Rod seal A	NBR	
38	Rod seal B	NBR	
39	Piston seal	NBR	
40	Cylinder tube gasket	NBR	
41	Release piston seal	NBR	
42	Rod seal C	NBR	
43	Piston guide gasket	NBR	
44	Intermediate cover gasket	NBR	
45	Unlocking cam gasket	NBR	
46	Head cover	Aluminum alloy	White hard anodized
47	Cylinder tube	Aluminum alloy	Hard anodized
48	Cushion ring A	Brass	
49	Cushion ring B	Brass	Same as cushion ring A except for ø20, 25 standard strokes
50	Seal retainer	Rolled steel	Zinc chromated long strokes not available
51	Cushion valve A	Chromium molybdenum steel	Electroless nickel plated
52	Cushion valve B	Rolled steel	Electroless nickel plated
53	Valve retainer	Rolled steel	Electroless nickel plated
54	Lock nut	Rolled steel	Nickel plated
55	Snap ring	Stainless steel	
56	Cushion seal A	Urethane	
57	Cushion seal B	Urethane	Same as cushion seal A except for ø20, 25 standard strokes
58	Cushion ring gasket A	NBR	
59	Cushion ring gasket B	NBR	Same as cushion ring gasket A except for ø20, 25 standard strokes
60	Valve seal A	NBR	
61	Valve seal B	NBR	
62	Valve retainer gasket	NBR	

Replacement parts: Seal kits

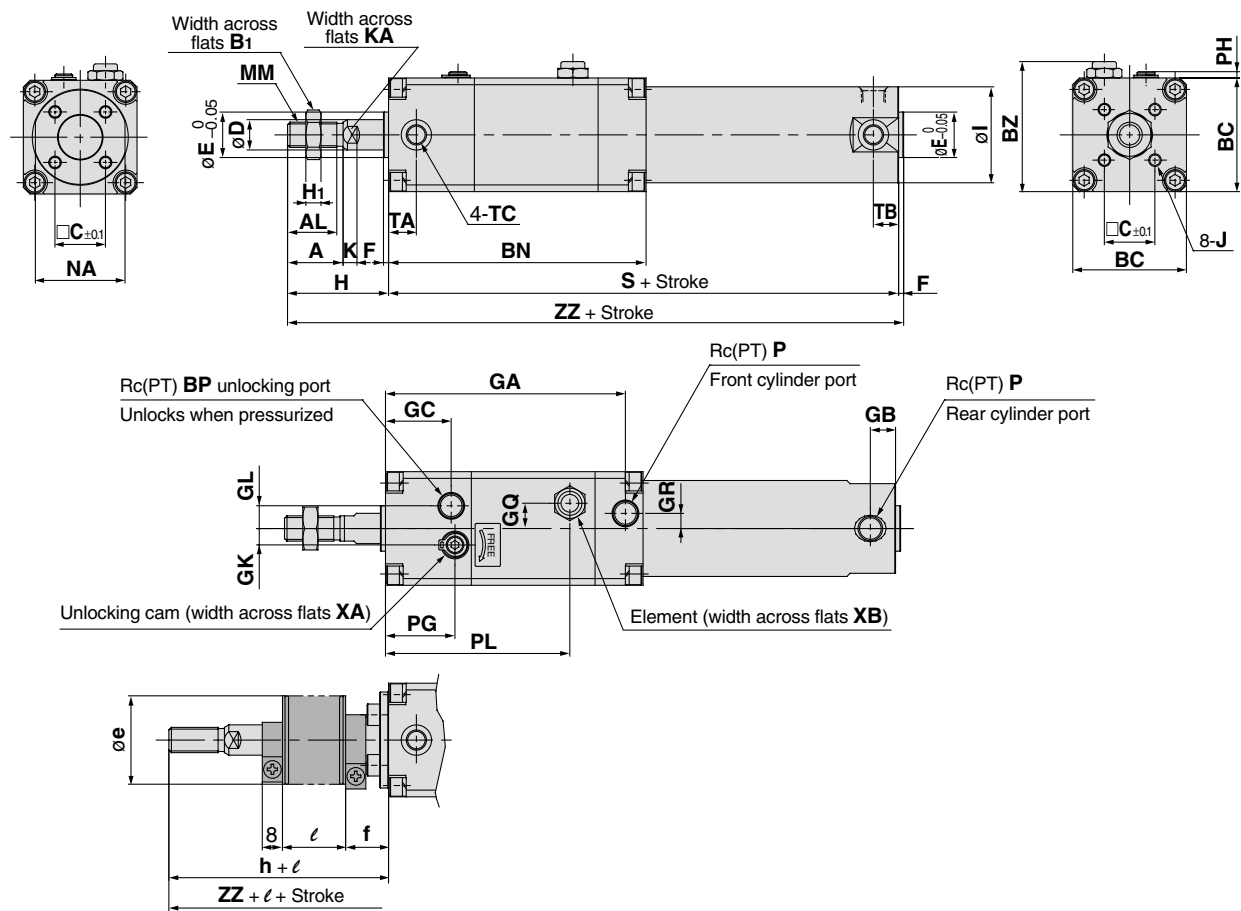
Bore size (mm)	Seal kit No.	Contents
20	CG1N20-PS	A set of above Nos. 37, 39, 40
25	CG1N25-PS	
32	CG1N32-PS	
40	CG1N40-PS	

* Since the lock section for Series CNG is normally replaced as a unit, replacement seal kits are for the cylinder section only. Order using the seal kit number for each bore size.

Series CNG

Dimensions

Basic type (B): With rubber bumper/CNGBN



With rod boot

(mm)																								
Bore size (mm)	Stroke range without rod boot		Stroke range with rod boot		A	AL	B1	BC	BN	BP	BZ	□C	D	E	F	GA	GB	GC	GK	GL	GR	GQ	H1	I
	Standard	Long stroke	Standard	Long stroke																				
20	to 200	201 to 350	20 to 200	201 to 350	18	15.5	13	38	93	1/8	44.5	14	8	12	2	85	10 (12)	18	5.5	6	4	8	5	26
25	to 300	301 to 400	20 to 300	301 to 400	22	19.5	17	45	103	1/8	51.5	16.5	10	14	2	96	10 (12)	25	6.5	9	7	10	6	31
32	to 300	301 to 450	20 to 300	301 to 450	22	19.5	17	45	104	1/8	51.5	20	12	18	2	97	10 (12)	25	6.5	9	7	10	6	38
40	to 300	301 to 800	20 to 300	301 to 800	30	27	19	52	112	1/8	58.5	26	16	25	2	104	10 (13)	26	7	11	7	12	8	47

																						(mm)	
Bore size (mm)	J	K	KA	MM	NA	P	PG	PH	PL	S	TA	TB	TC	XA	XB	Without rod boot		With rod boot					
																H	ZZ	e	f	h	ℓ	ZZ	
20	M4 depth 7	5	6	M8	24	1/8	21.5	2	65	141 (149)	11	11	M5	3	12	35	178 (186)	30	16	55	Stroke x	198 (206)	
25	M5 depth 7.5	5.5	8	M10 x 1.25	29	1/8	26.5	2.5	73	151 (159)	11	11	M6 x 0.75	3	12	40	193 (201)	30	17	62		215 (223)	
32	M5 depth 8	5.5	10	M10 x 1.25	35.5	1/8	26.5	2.5	73	154 (162)	11	10 (11)	M8 x 1.0	3	12	40	196 (204)	35	17	62		218 (226)	
40	M6 depth 12	6	14	M14 x 1.5	44	1/8	28	2.5	81	169 (178)	12	10 (12)	M10 x 1.25	4	12	50	221 (230)	35	17	70		241 (250)	

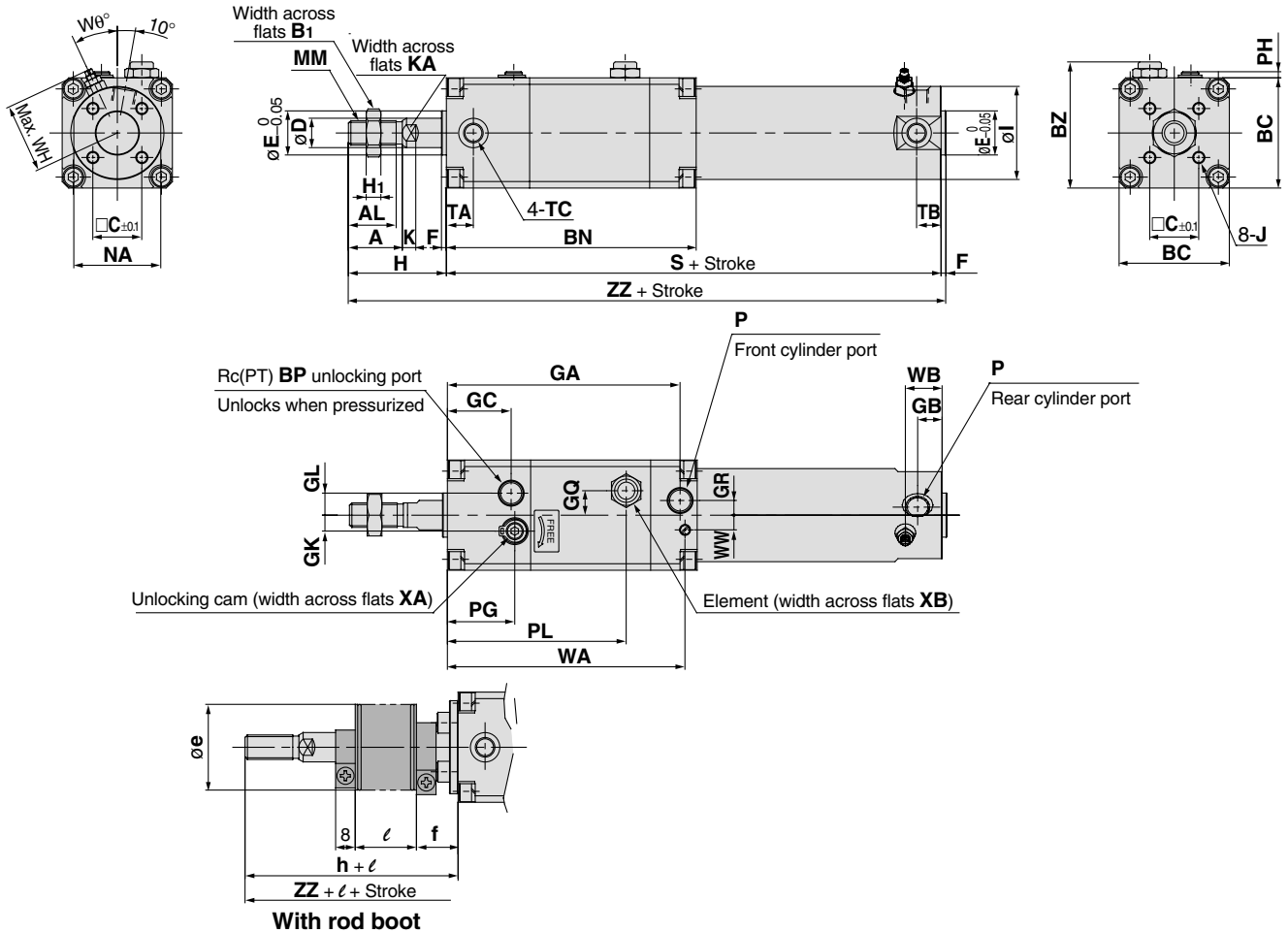
Note) Dimensions inside () are for long strokes.

Cylinder with Lock

Double Acting: Single Rod

Series CNG

Basic type (B): With air cushion/CNGBA



Bore size (mm)	Stroke range without rod boot		Stroke range with rod boot		A	AL	B1	BC	BN	BP	BZ	C	D	E	F	GA	GB	GC	GK	GL	GR	GQ	H1	I
	Standard	Long stroke	Standard	Long stroke																				
20	to 200	201 to 350	20 to 200	201 to 350	18	15.5	13	38	93	1/8	44.5	14	8	12	2	87	10 (12)	18	5.5	6	4	8	5	26
25	to 300	301 to 400	20 to 300	301 to 400	22	19.5	17	45	103	1/8	51.5	16.5	10	14	2	97	10 (12)	25	6.5	9	7	10	6	31
32	to 300	301 to 450	20 to 300	301 to 450	22	19.5	17	45	104	1/8	51.5	20	12	18	2	97	10 (12)	25	6.5	9	7	10	6	38
40	to 300	301 to 800	20 to 300	301 to 800	30	27	19	52	112	1/8	58.5	26	16	25	2	104	10 (13)	26	7	11	7	12	8	47

Bore size (mm)	J	K	KA	MM	NA	P	PG	PH	PL	S	TA	TB	TC	WA	WB	WH	WW	Wθ	XA	XB
20	M4 depth 7	5	6	M8	24	M5	21.5	2	65	141 (149)	11	11	M5	88	15 (16)	23	5.5	30°	3	12
25	M5 depth 7.5	5.5	8	M10 x 1.25	29	M5	26.5	2.5	73	151 (159)	11	11	M6 x 0.75	98	15 (16)	25	6	30°	3	12
32	M5 depth 8	5.5	10	M10 x 1.25	35.5	Rc(PT) 1/8	26.5	2.5	73	154 (162)	11	10 (11)	M8 x 1.0	99	15 (16)	28.5	6	25°	3	12
40	M6 depth 12	6	14	M14 x 1.5	44	Rc(PT) 1/8	28	2.5	81	169 (178)	12	10 (12)	M10 x 1.25	107	15 (16)	33	8	20°	4	12

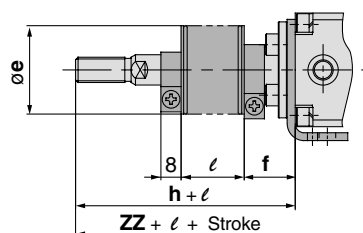
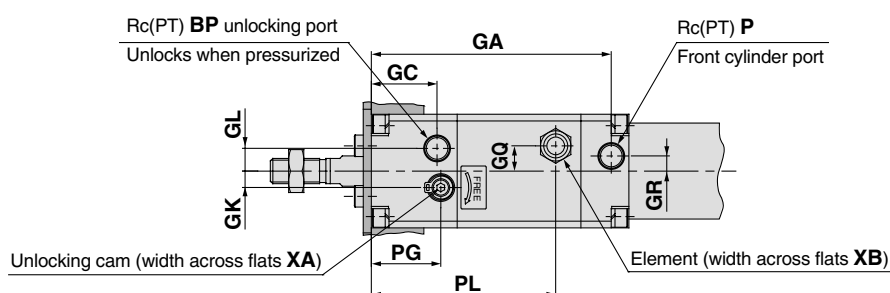
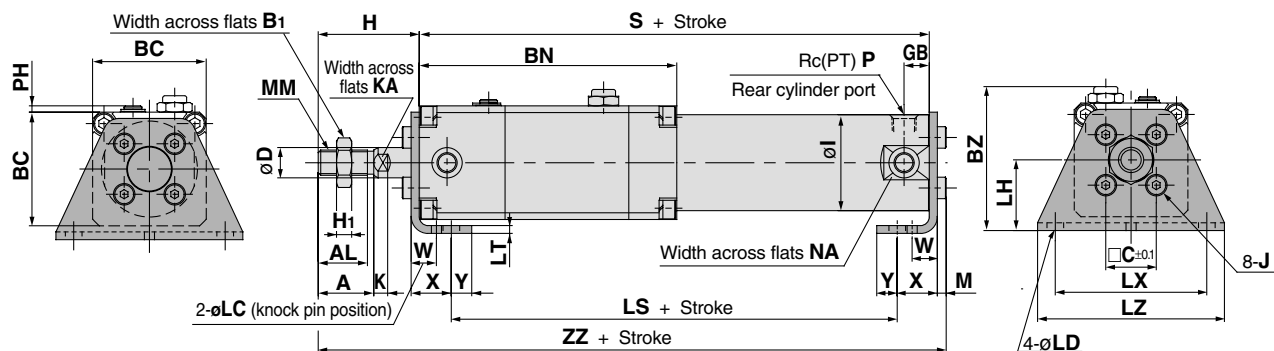
Bore size (mm)	Without rod boot		With rod boot		Stroke x	ZZ
	H	ZZ	e	f		
20	35	178 (186)	30	16	0.25	198 (206)
25	40	193 (201)	30	17	0.25	215 (223)
32	40	196 (204)	35	17	0.25	218 (226)
40	50	221 (230)	35	17	0.25	241 (250)

Note) Dimensions inside () are for long strokes.
Dimensions with mounting bracket are the same as dimensions with rubber bumper.

Series CNG

Dimensions

Axial foot type (L): With rubber bumper/CNGLN



With rod boot

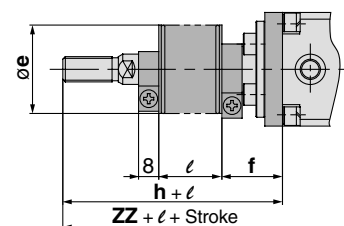
Bore size (mm)	Stroke range without rod boot		Stroke range with rod boot		A	AL	B1	BC	BN	BP	BZ	□C	D	GA	GB	GC	GK	GL	GR	GQ	H1	I	J
	Standard	Long stroke	Standard	Long stroke																			
20	to 200	201 to 350	20 to 200	201 to 350	18	15.5	13	38	93	1/8	50.5	14	8	85	10 (12)	18	5.5	6	4	8	5	26	M4
25	to 300	301 to 400	20 to 300	301 to 400	22	19.5	17	45	103	1/8	57	16.5	10	96	10 (12)	25	6.5	9	7	10	6	31	M5
32	to 300	301 to 450	20 to 300	301 to 450	22	19.5	17	45	104	1/8	57	20	12	97	10 (12)	25	6.5	9	7	10	6	38	M5
40	to 300	301 to 800	20 to 300	301 to 800	30	27	19	52	112	1/8	65.5	26	16	104	10 (13)	26	7	11	7	12	8	47	M6

Bore size (mm)	K	KA	M	MM	NA	P	PG	PH	PL	S	LC	LD	LH	LS	LT	LX	LZ	X	Y	W	XA	XB
20	5	6	3	M8	24	1/8	21.5	2	65	141 (149)	4	6	25	117 (125)	3	50	62	15	7	10	3	12
25	5.5	8	3.5	M10 x 1.25	29	1/8	26.5	2.5	73	151 (159)	4	6	28	127 (135)	3	57	70	15	7	10	3	12
32	5.5	10	3.5	M10 x 1.25	35.5	1/8	26.5	2.5	73	154 (162)	4	6.6	28	128 (136)	3	60	74	16	8	10	3	12
40	6	14	4	M14 x 1.5	44	1/8	28	2.5	81	169 (178)	4	6.6	33	142 (151)	3	68	84	16.5	8.5	10	4	12

(mm)							
Bore size (mm)	Without rod boot		With rod boot				
	H	ZZ	e	f	h	ℓ	ZZ
20	35	182 (190)	30	19	55	Stroke x 0.25	202 (210)
25	40	197.5 (205.5)	30	20	62		219.5 (227.5)
32	40	200.5 (208.5)	35	20	62		222.5 (230.5)
40	50	226 (235)	35	20	70		246 (255)

Note) Dimensions inside () are for long strokes.

Front flange type (F): With rubber bumper/CNGFN



With rod boot

(mm)																								
Bore size (mm)	Stroke range without rod boot		Stroke range with rod boot		A	AL	B1	BC	BF	BN	BP	BZ	□C	D	E	F	GA	GB	GC	GK	GL	GR	GQ	H1
	Standard	Long stroke	Standard	Long stroke																				
20	to 200	201 to 350	20 to 200	201 to 350	18	15.5	13	38	38	93	1/8	44.5	14	8	12	2	85	10 (12)	18	5.5	6	4	8	5
25	to 300	301 to 400	20 to 300	301 to 400	22	19.5	17	45	45	103	1/8	51.5	16.5	10	14	2	96	10 (12)	25	6.5	9	7	10	6
32	to 300	301 to 450	20 to 300	301 to 450	22	19.5	17	45	45	104	1/8	51.5	20	12	18	2	97	10 (12)	25	6.5	9	7	10	6
40	to 300	301 to 800	20 to 300	301 to 800	30	27	19	52	52	112	1/8	58.5	26	16	25	2	104	10 (13)	26	7	11	7	12	8

(mm)																									
Bore size (mm)	I	J	K	KA	MM	NA	P	PG	PH	PL	S	FD	FT	FX	FY	FZ	XA	XB	Without rod boot		With rod boot				
																			H	ZZ	e	f	h	ℓ	ZZ
20	26	M4	5	6	M8	24	1/8	21.5	2	65	141 (149)	5.5	6	52	25	65	3	12	35	178 (186)	30	22	55	Stroke x	198 (206)
25	31	M5	5.5	8	M10 x 1.25	29	1/8	26.5	2.5	73	151 (159)	5.5	7	60	30	75	3	12	40	193 (201)	30	24	62		215 (223)
32	38	M5	5.5	10	M10 x 1.25	35.5	1/8	26.5	2.5	73	154 (162)	6.6	7	60	30	75	3	12	40	196 (204)	35	24	62		218 (226)
40	47	M6	6	14	M14 x 1.5	44	1/8	28	2.5	81	169 (178)	6.6	8	66	36	82	4	12	50	221 (230)	35	25	70		241 (250)

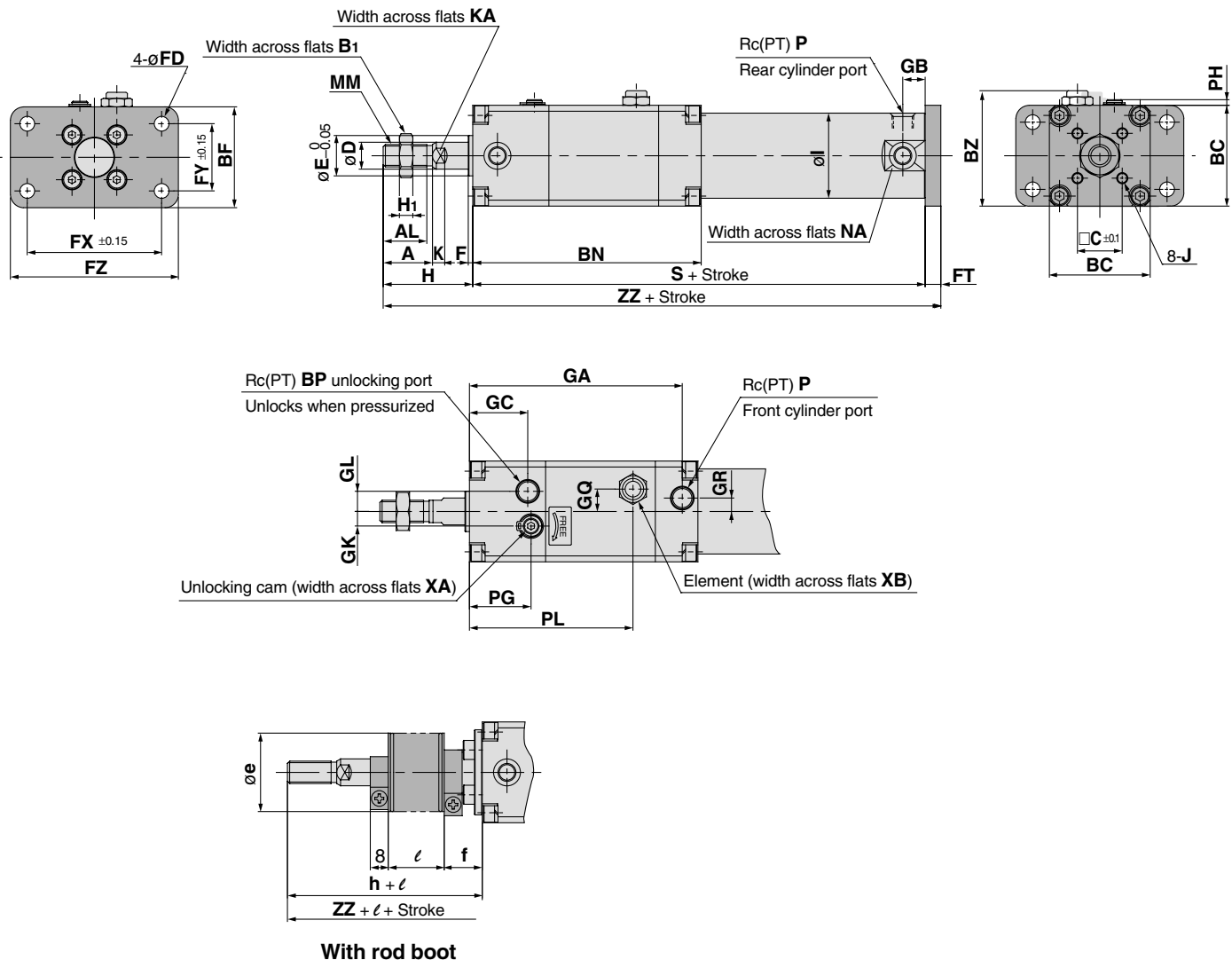
Note) Dimensions inside () are for long strokes.

CL
MLG
CNA
CNG
MNB
CNS
CLS
CB
CV/MVG
CXW
CXS
CXT
MX
MXU
MXH
MXS
MXQ
MXF
MXW
MP
MG
MGP
MGQ
MGG
MGC
MGF
MGZ
CY
MY

Series CNG

Dimensions

Rear flange type (G): With rubber bumper/CNGGN



Bore size (mm)	Stroke range without rod boot		Stroke range with rod boot		A	AL	B1	BC	BF	BN	BP	BZ	C	D	E	F	GA	GB	GC	GK	GL	GR	GQ	H1	I
	Standard	Long stroke	Standard	Long stroke																					
20	to 200	—	20 to 200	—	18	15.5	13	38	38	93	1/8	44.5	14	8	12	2	85	10	18	5.5	6	4	8	5	26
25	to 300	—	20 to 300	—	22	19.5	17	45	45	103	1/8	51.5	16.5	10	14	2	96	10	25	6.5	9	7	10	6	31
32	to 300	—	20 to 300	—	22	19.5	17	45	45	104	1/8	51.5	20	12	18	2	97	10	25	6.5	9	7	10	6	38
40	to 300	301 to 500	20 to 300	301 to 500	30	27	19	52	52	112	1/8	58.5	26	16	25	2	104	10 (13)	26	7	11	7	12	8	47

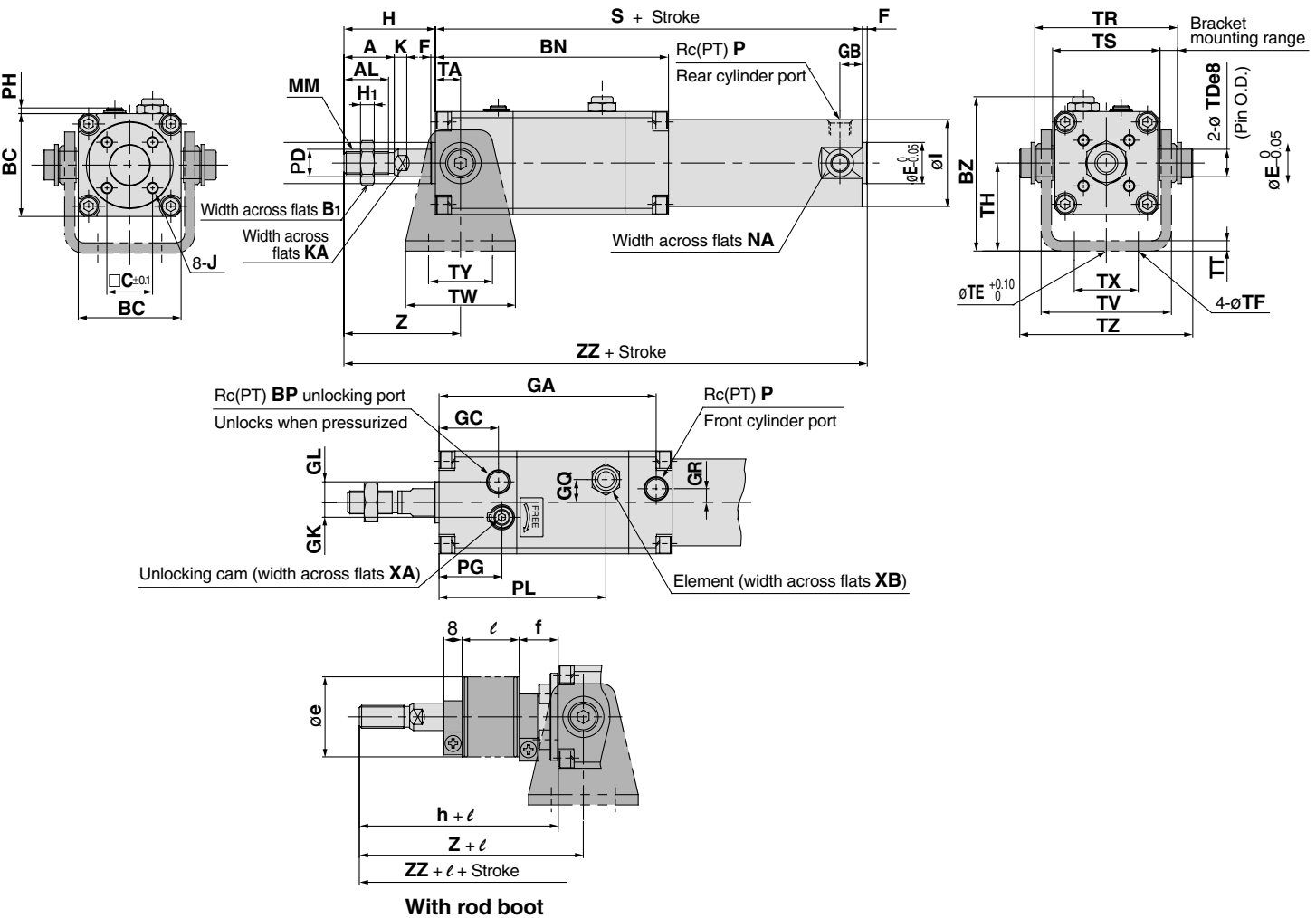
																					(mm)			
Bore size (mm)	J	K	KA	MM	NA	P	PG	PH	PL	S	FD	FT	FX	FY	FZ	XA	XB	Without rod boot		With rod boot				
																		H	ZZ	e	f	h	ℓ	ZZ
20	M4	5	6	M8	24	1/8	21.5	2	65	141	5.5	6	52	25	65	3	12	35	182	30	16	55	Stroke x	202
25	M5	5.5	8	M10 x 1.25	29	1/8	26.5	2.5	73	151	5.5	7	60	30	75	3	12	40	198	30	17	62		220
32	M5	5.5	10	M10 x 1.25	35.5	1/8	26.5	2.5	73	154	6.6	7	60	30	75	3	12	40	201	35	17	62		223
40	M6	6	14	M14 x 1.5	44	1/8	28	2.5	81	169 (178)	6.6	8	66	36	82	4	12	50	227 (236)	35	17	70		247 (256)

Note) Dimensions inside () are for long strokes.

Cylinder with Lock

Double Acting: Single Rod **Series CNG**

Front trunnion type (U): With rubber bumper/CNGUN



(mm)																								
Bore size (mm)	Stroke range without rod boot		Stroke range with rod boot		A	AL	B ₁	BC	BN	BP	BZ	□C	D	E	F	GA	GB	GC	GK	GL	GR	GQ	H ₁	I
	Standard	Long stroke	Standard	Long stroke																				
20	to 200	—	20 to 200	—	18	15.5	13	38	93	1/8	56.5	14	8	12	2	85	10	18	5.5	6	4	8	5	26
25	to 300	—	20 to 300	—	22	19.5	17	45	103	1/8	66	16.5	10	14	2	96	10	25	6.5	9	7	10	6	31
32	to 300	—	20 to 300	—	22	19.5	17	45	104	1/8	67.5	20	12	18	2	97	10	25	6.5	9	7	10	6	38
40	to 300	301 to 500	20 to 300	301 to 500	30	27	19	52	112	1/8	75	26	16	25	2	104	10 (13)	26	7	11	7	12	8	47

(mm)																									
Bore size (mm)	J	K	KA	MM	NA	P	PG	PH	PL	S	TA	TDe8	TE	TF	TH	TR	TS	TT	TV	TW	TX	TY	TZ	XA	XB
20	M4	5	6	M8	24	1/8	21.5	2	65	141	11	8 ^{-0.025 -0.047}	10	5.5	31	51	40	3.2	47.8	42	26	28	59.6	3	12
25	M5	5.5	8	M10 x 1.25	29	1/8	26.5	2.5	73	151	11	10 ^{-0.025 -0.047}	10	5.5	37	58	47	3.2	54.8	42	28	28	68	3	12
32	M5	5.5	10	M10 x 1.25	35.5	1/8	26.5	2.5	73	154	11	12 ^{-0.032 -0.059}	10	6.6	38.5	62.5	47	4.5	57.4	48	28	28	75.7	3	12
40	M6	6	14	M14 x 1.5	44	1/8	28	2.5	81	169 (178)	12	14 ^{-0.032 -0.059}	10	6.6	42.5	72.5	54	4.5	65.4	56	36	30	85.7	4	12

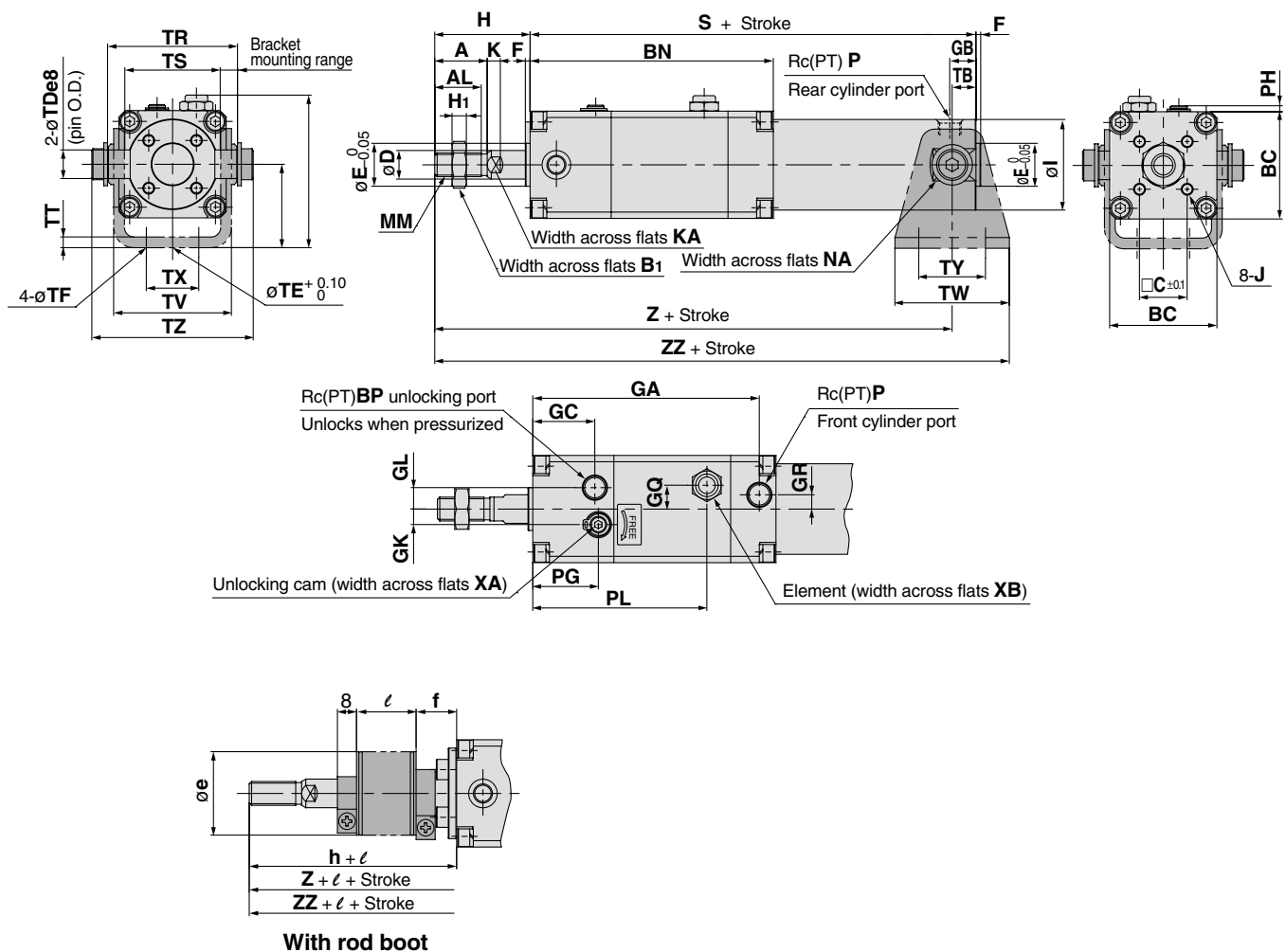
Bore size (mm)	Without rod boot			With rod boot							
	H	Z	ZZ	e	f	h	l	Z	ZZ	Stroke x	
20	35	46	178	30	16	55	0.25	66	198		
25	40	51	193	30	17	62		73	215		
32	40	51	196	35	17	62		73	218		
40	50	62	221 (230)	35	17	70		82	241 (250)		

Note) Dimensions inside () are for long strokes.
Refer to page 3.4-16 regarding the trunnion bracket.

Series CNG

Dimensions

Rear trunnion type (T): With rubber bumper/CNGTN



(mm)																										
Bore size (mm)	Stroke range without rod boot		Stroke range with rod boot		A	AL	B1	BC	BN	BP	BZ	□C	D	E	F	GA	GB	GC	GK	GL	GR	GQ	H1	I		
	Standard	Long stroke	Standard	Long stroke																						
20	to 200	—	20 to 200	—	18	15.5	13	38	93	1/8	50.5	14	8	12	2	85	10	18	5.5	6	4	8	5	26		
25	to 300	—	20 to 300	—	22	19.5	17	45	103	1/8	59	16.5	10	14	2	96	10	25	6.5	9	7	10	6	31		
32	to 300	—	20 to 300	—	22	19.5	17	45	104	1/8	64	20	12	18	2	97	10	25	6.5	9	7	10	6	38		
40	to 300	301 to 500	20 to 300	301 to 500	30	27	19	52	112	1/8	72.5	26	16	25	2	104	10 (13)	26	7	11	7	12	8	47		

Bore size (mm)	J	K	KA	MM	NA	P	PG	PH	PL	S	TB	TDe8	TE	TF	TH	TR	TS	TT	TV	TW	TX	TY	TZ	XA	XB	(mm)	
20	M4	5	6	M8	24	1/8	21.5	2	65	141	11	8 ^{-0.025} _{-0.047}	10	5.5	25	39	28	3.2	35.8	42	16	28	47.6	3	12		
25	M5	5.5	8	M10 x 1.25	29	1/8	26.5	2.5	73	151	11	10 ^{-0.025} _{-0.047}	10	5.5	30	43	33	3.2	39.8	42	20	28	53	3	12		
32	M5	5.5	10	M10 x 1.25	35.5	1/8	26.5	2.5	73	154	10	12 ^{-0.032} _{-0.059}	10	6.6	35	54.5	40	4.5	49.4	48	22	28	67.7	3	12		
40	M6	6	14	M14 x 1.5	44	1/8	28	2.5	81	169 (178)	10 (12)	14 ^{-0.032} _{-0.059}	10	6.6	40	65.5	49	4.5	58.4	56	30	30	78.7	4	12		

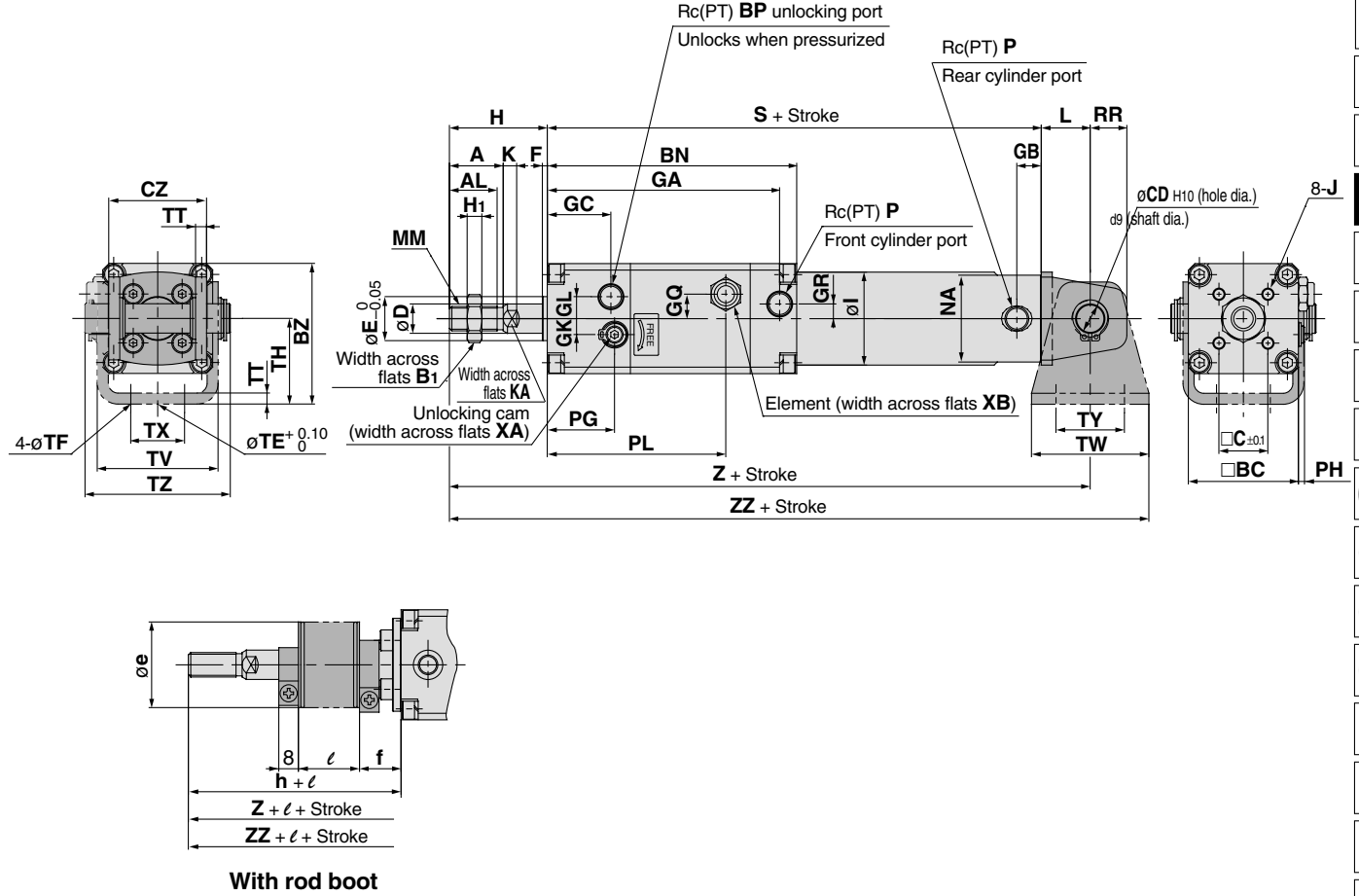
Bore size (mm)	Without rod boot			With rod boot									(mm)	
	H	Z	ZZ	e	f	h	l	Z	ZZ					
20	35	165	186	30	16	55	0.25	185	206					
25	40	180	201	30	17	62	Stroke x	202	223					
32	40	184	208	35	17	62		206	230					
40	50	209 (216)	237 (244)	35	17	70		229 (236)	257 (264)					

Note) Dimensions inside () are for long strokes.
Refer to page 3.4-16 regarding the trunnion bracket.

Cylinder with Lock

Double Acting: Single Rod **Series CNG**

Clevis type (D): With rubber bumper/CNGDN



With rod boot

(mm)																								
Bore size (mm)	Stroke range without rod boot		Stroke range with rod boot		A	AL	B ₁	BC	BN	BP	BZ	□C	D	E	F	GA	GB	GC	GK	GL	GR	GQ	H ₁	I
	Standard	Long stroke	Standard	Long stroke																				
20	to 200	—	20 to 200	—	18	15.5	13	38	93	1/8	44	14	8	12	2	85	10	18	5.5	6	4	8	5	26
25	to 300	—	20 to 300	—	22	19.5	17	45	103	1/8	52.5	16.5	10	14	2	96	10	25	6.5	9	7	10	6	31
32	to 300	—	20 to 300	—	22	19.5	17	45	104	1/8	57.5	20	12	18	2	97	10	25	6.5	9	7	10	6	38
40	to 300	301 to 500	20 to 300	301 to 500	30	27	19	52	112	1/8	66	26	16	25	2	104	10 (13)	26	7	11	7	12	8	47

Bore size (mm)	J	K	KA	MM	NA	P	PG	PH	PL	S	CD	CZ	L	RR	TE	TF	TH	TT	TV	TW	TX	TY	TZ	XA	XB
20	M4	5	6	M8	24	1/8	21.5	2	65	141	8	29	14	11	10	5.5	25	3.2	35.8	42	16	28	43.4	3	12
25	M5	5.5	8	M10 x 1.25	29	1/8	26.5	2.5	73	151	10	33	16	13	10	5.5	30	3.2	39.8	42	20	28	48	3	12
32	M5	5.5	10	M10 x 1.25	35.5	1/8	26.5	2.5	73	154	12	40	20	15	10	6.6	35	4.5	49.4	48	22	28	59.4	3	12
40	M6	6	14	M14 x 1.5	44	1/8	28	2.5	81	169 (178)	14	49	22	18	10	6.6	40	4.5	58.4	56	30	30	71.4	4	12

Bore size (mm)	Without rod boot			With rod boot						
	H	Z	ZZ	e	f	h	l	Z	ZZ	
20	35	190	211	30	16	55	Stroke x 0.25	210	231	
25	40	207	228	30	17	62		229	250	
32	40	214	238	35	17	62		236	260	
40	50	241 (250)	269 (278)	35	17	70		261 (270)	289 (298)	

Note) Dimensions inside () are for long strokes.
The clevis pin and snap ring are included.
Refer to page 3.4-16 regarding the trunnion bracket.

CL
MLG
CNA
CNG
MNB
CNS
CLS
CB
CV/MVG
CXW
CXS
CXT
MX
MXU
MXH
MXS
MXQ
MXF
MXW
MXP
MG
MGP
MGQ
MGG
MGC
MGF
MGZ
CY
MY

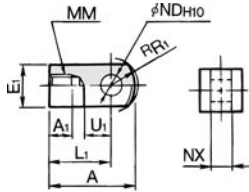
Series CNG

Accessory Dimensions

Single Knuckle Joint

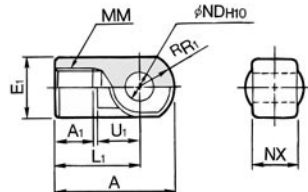
I-G02, G03

Material: Rolled steel



I-G04

Material: Cast iron

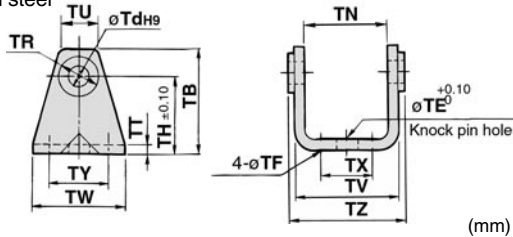


Part No.	Applicable bore size (mm)	A	A ₁	E ₁	L ₁	MM	R ₁	U ₁	NDH ₁₀	NX
I-G02	20	34	8.5	16	25	M8	10.3	11.5	8 ^{+0.058} ₀	8 ^{-0.2} _{-0.4}
I-G03	25, 32	41	10.5	20	30	M10 x 1.25	12.8	14	10 ^{+0.058} ₀	10 ^{-0.2} _{-0.4}
I-G04	40	42	14	22	30	M14 x 1.5	12	14	10 ^{+0.058} ₀	18 ^{-0.3} _{-0.5}

Front Trunnion Bracket

ø20 to ø40

Material: Rolled steel

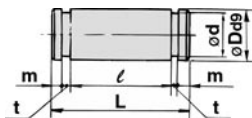


Part No.	Applicable bore size (mm)	TB	TdH ₉	TE	TF	TH	TN
CNG-020-24	20	42	8 ^{+0.036} ₀	10	5.5	31	41 ^{+0.4} _{+0.1}
CNG-025-24	25	48	10 ^{+0.036} ₀	10	5.5	37	48 ^{+0.4} _{+0.1}
CNG-032-24	32	53	12 ^{+0.043} ₀	10	6.6	38.5	48 ^{+0.5} _{+0.1}
CNG-040-24	40	60	14 ^{+0.043} ₀	10	6.6	42.5	56 ^{+0.5} _{+0.1}

Part No.	Applicable bore size (mm)	TR	TT	TU	TV	TW	TX	TY	TZ
CNG-020-24	20	13	3.2	21.2	47.8	42	26	28	50
CNG-025-24	25	15	3.2	21.3	54.8	42	28	28	57
CNG-032-24	32	17	4.5	25.6	57.4	48	28	28	61.4
CNG-040-24	40	21	4.5	26.3	65.4	56	36	30	71.4

Knuckle Pin

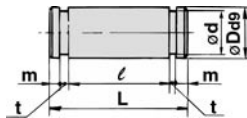
Material: Carbon steel



Part No.	Applicable bore size (mm)	Dd ₉	L	d	ℓ	m	t	Snap ring
IY-G02	20	8 ^{-0.040} _{-0.076}	21	7.6	16.2	1.5	0.9	C type 8 for shaft
IY-G03	25, 32	10 ^{-0.040} _{-0.076}	25.6	9.6	20.2	1.55	1.15	C type 10 for shaft
IY-G04	40	10 ^{-0.040} _{-0.076}	41.6	9.6	36.2	1.55	1.15	C type 10 for shaft

Clevis Pin

Material: Carbon steel



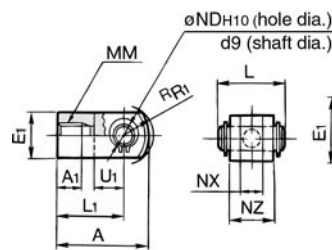
Part No.	Applicable bore size (mm)	Dd ₉	L	d	ℓ	m	t	Snap ring
CD-G02	20	8 ^{-0.040} _{-0.076}	43.4	7.6	38.6	1.5	0.9	C type 8 for shaft
CD-G25	25	10 ^{-0.040} _{-0.076}	48	9.6	42.6	1.55	1.15	C type 10 for shaft
CD-G03	32	12 ^{-0.050} _{-0.093}	59.4	11.5	54	1.55	1.15	C type 12 for shaft
CD-G04	40	14 ^{-0.050} _{-0.093}	71.4	13.4	65	2.05	1.15	C type 14 for shaft

Double Knuckle Joint

* The knuckle pin and snap ring are included.

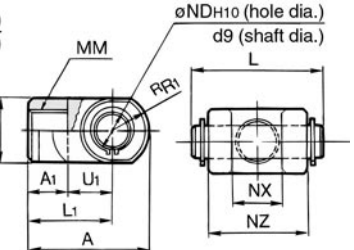
Y-G02, G03

Material: Rolled steel



Y-G04

Material: Cast iron

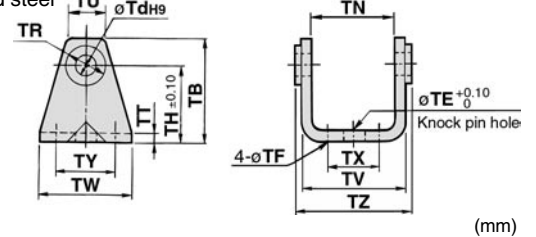


Part No.	Applicable bore size (mm)	A	A ₁	E ₁	L ₁	MM	R ₁	U ₁	ND	NX	NZ	L	Applicable pin part no.
Y-G02	20	34	8.5	16	25	M8	10.3	11.5	8	8 ^{+0.4} ₀	16	21	IY-G02
Y-G03	25, 32	41	10.5	20	30	M10 x 1.25	12.8	14	10	10 ^{+0.4} ₀	20	25.6	IY-G03
Y-G04	40	42	16	22	30	M14 x 1.5	12	14	10	18 ^{+0.5} ₀	36	41.6	IY-G04

Rear Trunnion Bracket

ø20 to ø40

Material: Rolled steel

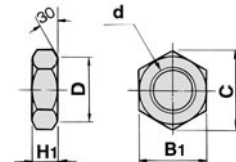


Part No.	Applicable bore size (mm)	TB	TdH ₉	TE	TF	TH	TN
CG-020-24A	20	36	8 ^{+0.036} ₀	10	5.5	25	(29.3)
CG-025-24A	25	43	10 ^{+0.036} ₀	10	5.5	30	(33.1)
CG-032-24A	32	50	12 ^{+0.043} ₀	10	6.6	35	(40.4)
CG-040-24A	40	58	14 ^{+0.043} ₀	10	6.6	40	(49.2)

Part No.	Applicable bore size (mm)	TR	TT	TU	TV	TW	TX	TY	TZ
CG-020-24A	20	13	3.2	18.1	35.8	42	16	28	38.3
CG-025-24A	25	15	3.2	20.7	39.8	42	20	28	42.1
CG-032-24A	32	17	4.5	23.6	49.4	48	22	28	53.8
CG-040-24A	40	21	4.5	27.3	58.4	56	30	30	64.6

Rod End Nut

Material: Rolled steel



Part No.	Applicable bore size (mm)	B ₁	C	D	d	H ₁
NT-02	20	13	(15)	12.5	M8	5
NT-03	25, 32	17	(19.6)	16.5	M10 x 1.25	6
NT-G04	40	19	(21.9)	18	M14 x 1.5	8

Series CNG

Auto Switch Specifications

Applicable Auto Switch Models

Auto switch model		Electrical entry
Reed switches	D-C7, C8	Grommet
	D-C73C, C80C	Connector
	D-B5, B6	Grommet
	D-B59W	Grommet (2 colour indication)
Solid state switches	D-H7□	Grommet
	D-H7□W	Grommet (2 colour indication)
	D-H7LF	Grommet (2 colour indication, latch type with diagnostic output)
	D-H7NF	Grommet (2 colour indication, with diagnostic output)
	D-H7BA	Grommet (2 colour indication, water resistant)
	D-H7C	Connector
	D-G5NT	Grommet (with timer)

Auto Switch Mounting Brackets by Stroke/Mounting Surfaces

st: Stroke (mm)						
Mounting bracket	Basic type, Foot type, Flange type, Clevis type			Trunnion type		
Number of auto switches	1 pc. (rod cover side)	2 pcs. (mounted on different sides)	2 pcs. (mounted on same side)	1 pc.	2 pcs. (mounted on different sides)	2 pcs. (mounted on same side)
Switch mounting surface						
Switch model						
D-C7, C8	10st or more	15 to 49st	50st or more	10st or more	15 to 49st	50st or more
D-H7□, H7□W D-H7BA, H7NF	10st or more	15 to 59st	60st or more	10st or more	15 to 59st	60st or more
D-C73C, C80C, H7C	10st or more	15 to 64st	65st or more	10st or more	15 to 64st	65st or more
D-H7LF	10st or more	20 to 64st	65st or more	10st or more	20 to 64st	65st or more
D-B5, B6, G5NT	10st or more	15 to 74st	75st or more	10st or more	15 to 74st	75st or more
D-B59W	15st or more	20 to 74st	75st or more	15st or more	20 to 74st	75st or more

Series CNG Model Selection

Precautions on Model Selection

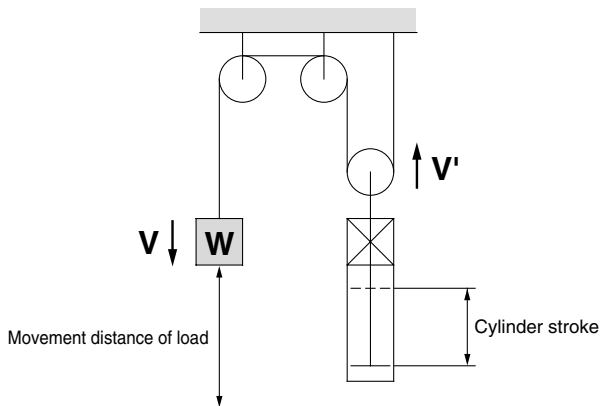
⚠ Caution

1. In order that the originally selected maximum speed is not exceeded, be certain to use a speed controller to adjust the total movement distance of the load so that movement takes place in no less than the applicable movement time.

The movement time is the time that is necessary for the load to travel the total movement distance from the start without any intermediate stops.

2. In cases where the cylinder stroke and the movement distance of the load are different (double speed mechanism, etc.), use the movement distance of the load for selection purposes.

Example)



Selection Example

- **Load weight:** $m = 12\text{kg}$
- **Movement distance:** $st = 200\text{mm}$
- **Movement time:** $t = 0.8\text{s}$
- **Load condition:** Vertical downward = Load in direction of rod extension
- **Operating pressure:** $P = 0.4\text{MPa}$

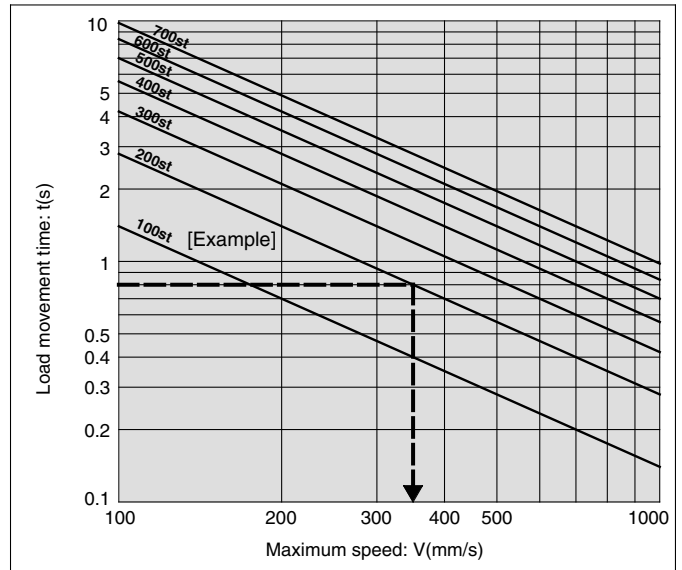
Step 1: From graph 1 find the maximum movement speed of the load
 \therefore Maximum speed V : approx. 350mm/s

Step 2: Select Graph 6 based upon the load condition and operating pressure, and then from the intersection of the maximum speed $V = 350\text{mm/s}$ found in Step 1, and the load weight $m = 12\text{kg}$
 $\therefore \phi 32 \rightarrow$ select a CNG32 or larger bore size.

Step 1 Find the maximum load speed: V .

Find the maximum load speed: $V(\text{mm/s})$ from the load movement time: $t(\text{s})$ and the movement distance: $st(\text{mm})$.

Graph 1



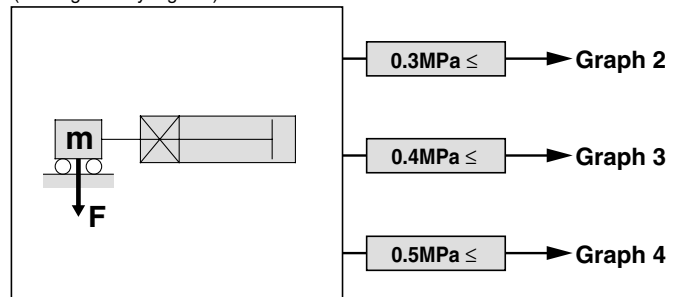
Step 2 Find the cylinder bore size.

Select a graph based upon the load condition and operating pressure, and then find the point of intersection for the maximum speed found in Step 1 and the load weight. Select the bore size on the line above the point of intersection.

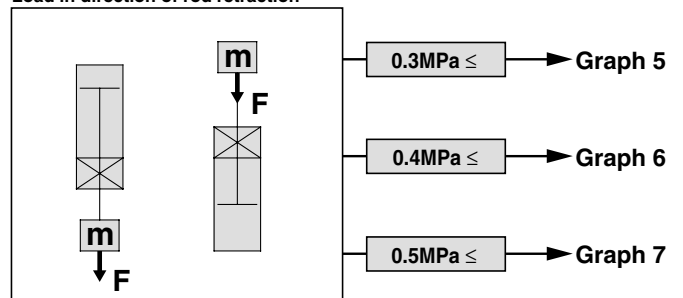
Load condition

Operating pressure

Direction of load at right angle to rod
 (* Being held by a guide)



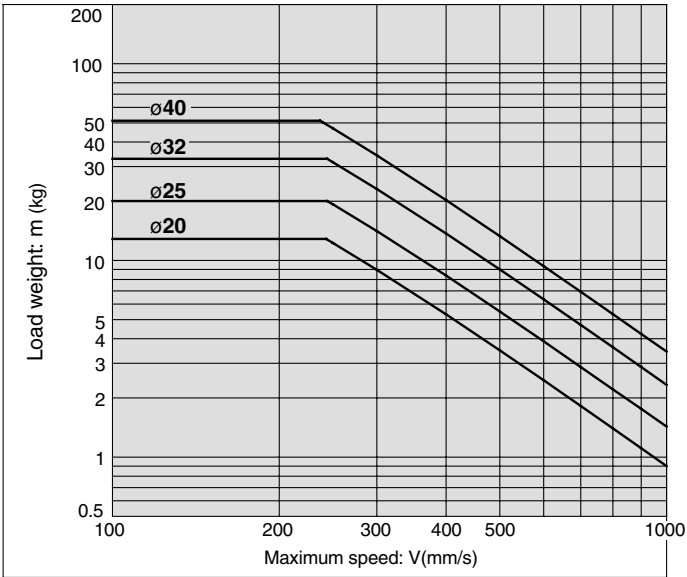
Load in direction of rod extension
 Load in direction of rod retraction



Selection Graphs

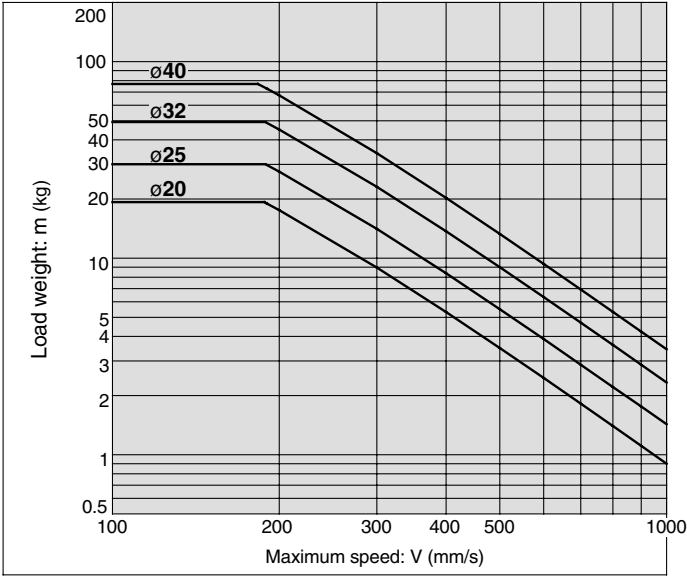
Graph 2

0.3MPa≤P<0.4MPa



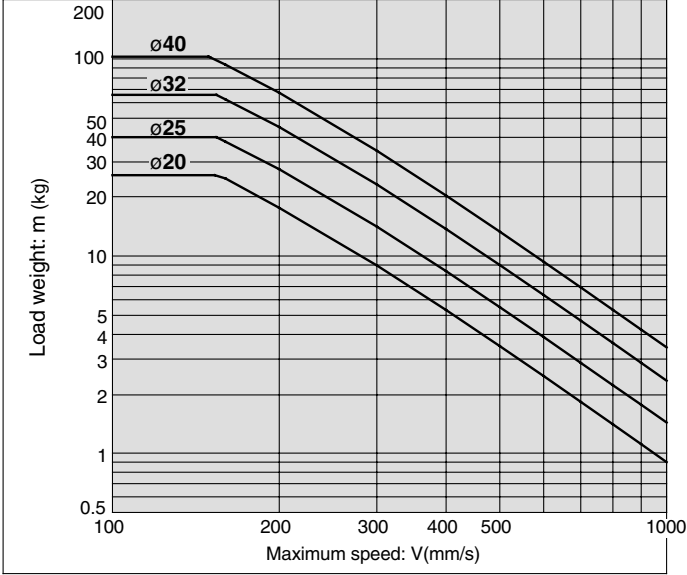
Graph 3

0.4MPa≤P<0.5MPa



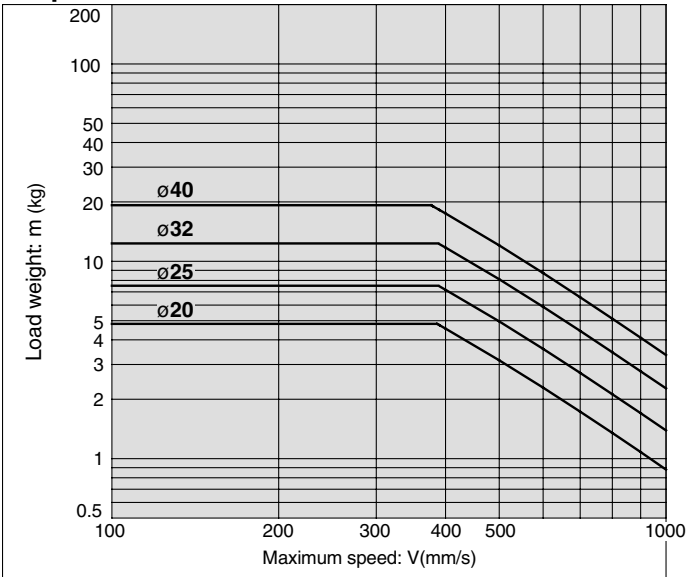
Graph 4

0.5MPa≤P



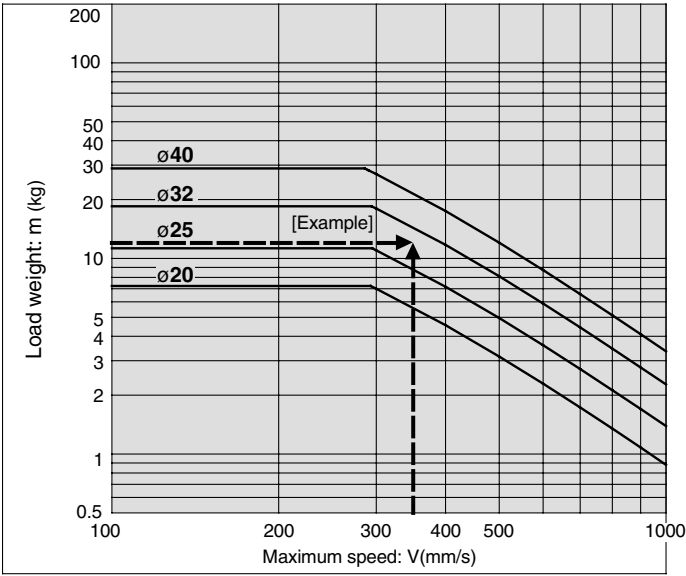
Graph 5

0.3MPa≤P<0.4MPa



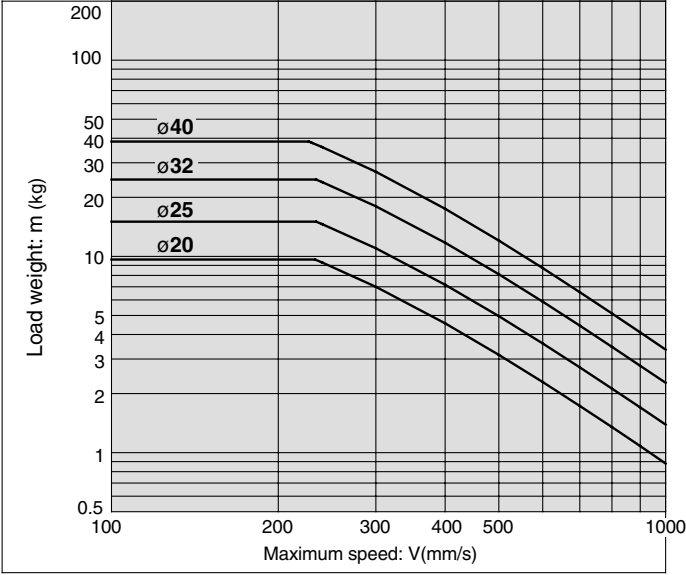
Graph 6

0.4MPa≤P<0.5MPa



Graph 7

0.5MPa≤P



- CL
- MLG
- CNA
- CNG**
- MNB
- CNS
- CLS
- CB
- CV/MVG
- CXW
- CXS
- CXT
- MX
- MXU
- MXH
- MXS
- MXQ
- MXF
- MXW
- MXP
- MG
- MGP
- MGQ
- MGG
- MGC
- MGF
- MGZ
- CY
- MY



Series CNG Specific Product Precautions 1

Be sure to read before handling.

Design of Equipment & Machinery

Warning

1. Construct so that the human body will not come into direct contact with driven objects or the moving parts of locking cylinders.

Devise a safe structure by attaching protective covers that prevent direct contact with the human body, or in cases where there is a danger of contact, provide sensors or other devices to perform an emergency stop, etc. before contact occurs.

2. Use a balance circuit, taking cylinder lurching into consideration.

In cases such as an intermediate stop, where a lock is operated at a desired position within the stroke and air pressure is applied from only one side of the cylinder, the piston will lurch at high speed when the lock is released. In such situations, there is a danger of causing human injury by having hands or feet, etc. caught, and also a danger of causing damage to the equipment. In order to prevent this lurching, use a balance circuit such as the recommended air pressure circuits (p. 3.4-21).

Selection

Warning

1. When in a locked condition, do not apply a load accompanied by an impact shock, strong vibration or turning force, etc.

Use caution, because an external action such as an impacting load, strong vibration or turning force, may damage the locking mechanism or reduce its life.

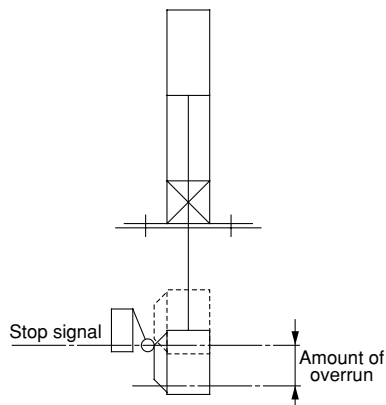
2. Consider stopping accuracy and the amount of overrun when an intermediate stop is performed.

Due to the nature of a mechanical lock, there is a momentary lag with respect to the stop signal, and a time delay occurs before stopping. The cylinder stroke resulting from this delay is the overrun amount. The difference between the maximum and minimum overrun amounts is the stopping accuracy.

- Place a limit switch before the desired stopping position, at a distance equal to the overrun amount.
- The limit switch must have a detection length (dog length) of the overrun amount + α .
- SMC's auto switches have operating ranges from 8 to 14mm (depending on the switch model).

When the overrun amount exceeds this range, self-holding of the contact should be performed at the switch load side.

* Refer to page 3.4-5 regarding stopping accuracy.



Selection

Warning

3. In order to further improve stopping accuracy, the time from the stop signal to the operation of the lock should be shortened as much as possible.

To accomplish this, use a device such as a highly responsive electric control circuit or solenoid valve driven by direct current, and place the solenoid valve as close as possible to the cylinder.

4. Note that stopping accuracy will be influenced by changes in piston speed.

When piston speed changes during the course of the cylinder stroke due to variations in the load or disturbances, etc., the dispersion of stopping positions will increase. Therefore, consideration should be given to establishing a standard speed for the piston just before it reaches the stopping position.

Moreover, the dispersion of stopping positions will increase during the cushioned portion of the stroke and during the accelerating portion of the stroke after the start of operation, due to the large changes in piston speed.

Mounting

Warning

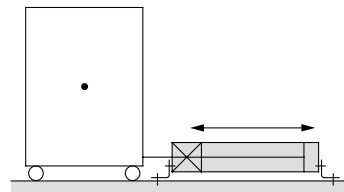
1. Be certain to connect the rod end to the load with the lock released.

- If connected when in the locked condition, a load greater than the turning force or holding force may operate on the piston rod and cause damage to the lock mechanism. The CNG series is equipped with an emergency unlocking mechanism, however, when connecting the rod end to the load this should be done with the lock released by simply connecting an air line to the unlocking port and supplying air pressure of 0.25MPa or more.

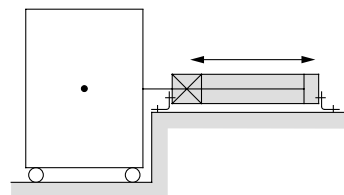
Caution

1. Do not apply an offset load to the piston rod.

Particular care should be taken to match the load's centre of gravity with the centre of the cylinder shaft. When there is a large discrepancy, the piston rod may be subjected to uneven wear or damage due to the inertial moment during locking stops.



X Load centre of gravity and cylinder shaft centre are not matched.



○ Load centre of gravity and cylinder shaft centre are matched.

Note) Can be used if all of the generated moment is absorbed by an effective guide.



Series CNG Specific Product Precautions 2

Be sure to read before handling.

Adjustment

⚠ Caution

1. Adjust the cylinder's air balance.

Balance the load by adjusting the air pressure in the front and rear sides of the cylinder with the load connected to the cylinder and the lock released. Lurching of the cylinder when unlocked can be prevented by carefully adjusting this air balance.

2. Adjust the mounting positions of the detectors on auto switches, etc.

When intermediate stops are to be performed, adjust the mounting positions of detectors on auto switches, etc., taking into consideration the overrun amount with respect to the desired stopping positions.

Air Pressure Circuits

⚠ Warning

1. Be certain to use an air pressure circuit which will apply balancing pressure to both sides of the piston when in a locked stop.

In order to prevent cylinder lurching after a locked stop, when restarting or when manually unlocking, a circuit should be used which will apply balancing pressure to both sides of the piston, thereby canceling the force generated by the load in the direction of piston movement.

2. Use a solenoid valve for unlocking which has a large effective area, as a rule 50% or more of the effective area of the cylinder drive solenoid valve.

The larger the effective area is, the shorter the locking time will be (the overrun amount will be shorter), and stopping accuracy will be improved.

3. Place the solenoid valve for unlocking close to the cylinder, and no farther than the cylinder drive solenoid valve.

The less distance there is from the cylinder (the shorter the piping), the shorter the overrun amount will be, and stopping accuracy will be improved.

Air Pressure Circuits

⚠ Warning

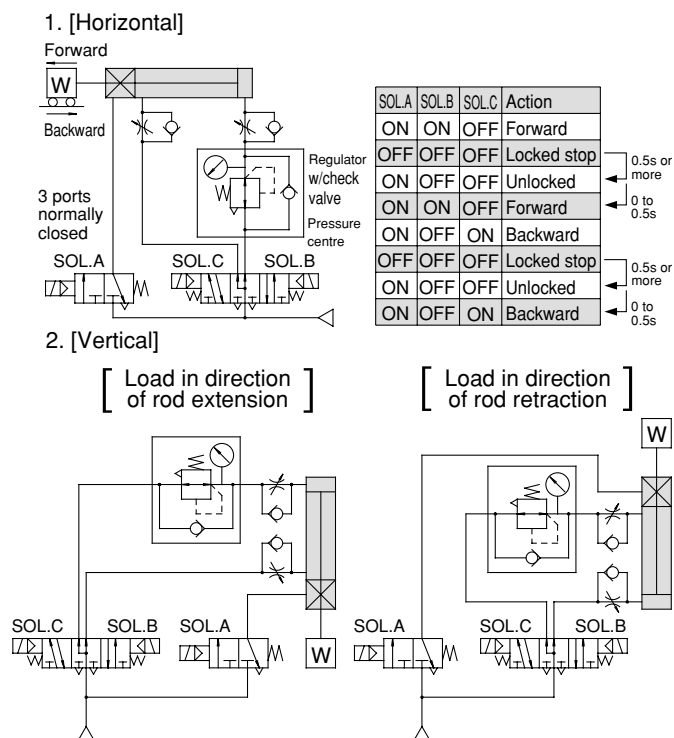
4. Allow at least 0.5 seconds from a locked stop (intermediate stop of the cylinder) until release of the lock.

When the locked stop time is too short, the piston rod (and load) may lurch at a speed greater than the control speed of the speed controller.

5. When restarting, control the switching signal for the unlocking solenoid valve so that it acts before or at the same time as the cylinder drive solenoid valve.

If the signal is delayed, the piston rod (and load) may lurch at a speed greater than the control speed of the speed controller.

6. Basic circuits.



CL
MLG
CNA
CNG
MNB
CNS
CLS
CB
CV/MVG
CXW
CXS
CXT
MX
MXU
MXH
MXS
MXQ
MXF
MXW
MXP
MG
MGP
MGQ
MGG
MGC
MGF
MGZ
CY
MY



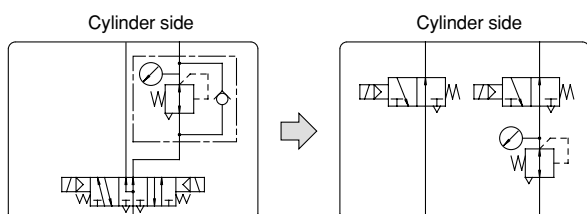
Series CNG Specific Product Precautions 3

Be sure to read before handling.

Air Pressure Circuits

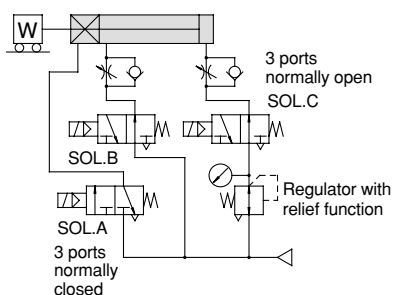
⚠ Caution

1. A 3 position pressure centre solenoid valve and regulator with check valve can be replaced with two 3 port normally open valves and a regulator with relief function.



[Example]

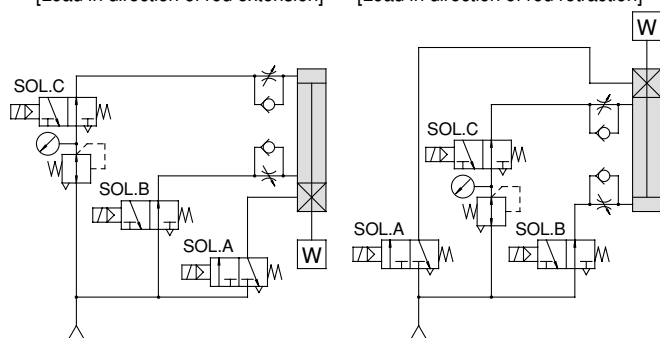
1. [Horizontal]



2. [Vertical]

[Load in direction of rod extension]

[Load in direction of rod retraction]



Manual Unlocking

⚠ Warning

1. **Never operate the unlocking cam until safety has been confirmed. (Do not turn to the FREE side.)**
 - a) When unlocking is performed with air pressure applied to only one side of the cylinder, the moving parts of the cylinder will lurch at high speed causing a serious hazard.
 - b) When unlocking is performed, be sure to confirm that personnel are not within the load movement range and that no other problems will occur if the load moves.
2. **Before operating the unlocking cam, exhaust any residual pressure which is in the system.**

Manual Unlocking

⚠ Warning

3. **Take measures to prevent the load from dropping when unlocking is performed.**

- a) Perform work with the load in its lowest position.
- b) Use supports, etc. to prevent the load from dropping.

⚠ Caution

1. **The unlocking cam is an emergency unlocking mechanism only.**

During an emergency when the air supply is stopped or cut off, this is used to alleviate a problem by forcibly pushing back the release piston and brake spring to release the lock.

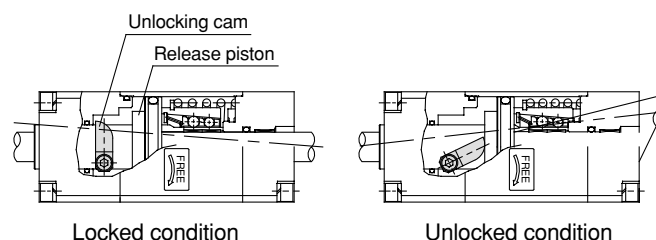
2. **When installing the cylinder into equipment or performing adjustments, etc., be sure to apply air pressure of 0.25MPa or more to the unlocking port, and do not perform work using the unlocking cam.**

3. **When releasing the lock with the unlocking cam, it must be noted that the internal resistance of the cylinder will be high, unlike normal unlocking with air pressure.**

Bore size (mm)	Cylinder internal resistance N	Cam operating torque (standard) N·m	Max. cam operating torque N·m	Applicable hex. wrench size
20	24.6	1.0	2.3	Size 3
25	38.2	2.5	4.7	Size 3
32	62.7	3.0	4.7	Size 3
40	98	4.0	8.2	Size 4

4. **Be sure to operate the unlocking cam on the FREE side (clockwise direction), and do not turn with a torque greater than the maximum cam operating torque. There is a danger of damaging the unlocking cam if it is turned excessively.**

5. **For safety reasons, the unlocking cam is constructed so that it cannot be fixed in the unlocked condition.**



[Principle]

If the unlocking cam is turned in a clockwise direction with a hexagon wrench, the release piston is pushed back and the lock is released. Further, if the unlocking cam is not held it will return to its original position and the unit will lock again. Therefore, the unlocking cam must be held in position for as long as unlocking is required.



Series CNG Specific Product Precautions 4

Be sure to read before handling.

Maintenance

Caution

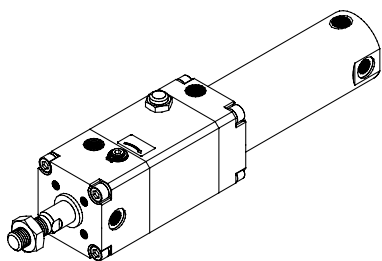
- Series CNG lock units are replaceable.
(However, please note that lock units cannot be replaced in the case of long stroke specifications.)
To order replacement lock units for the CNG series, use the order numbers given in the table below.

Bore size (mm)	Lock unit order number	
	Rubber bumper type	Air cushion type
20	CNGN20D-UA	CNGA20D-UA
25	CNGN25D-UA	CNGA25D-UA
32	CNGN32D-UA	CNGA32D-UA
40	CNGN40D-UA	CNGA40D-UA

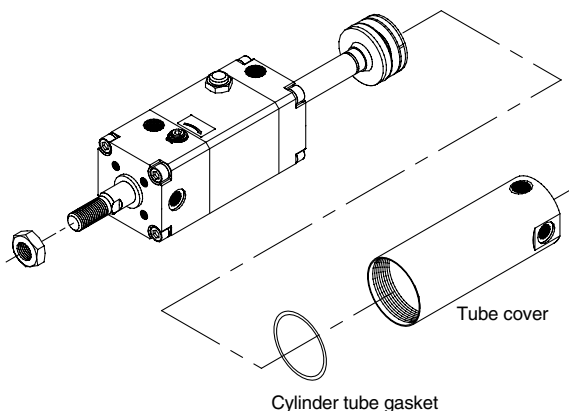
- Replacement of lock units.

- Remove the lock unit by securing the square section of the rod cover or the wrench flats of the tube cover in an apparatus such as a vice, and then loosening the other end with a spanner or adjustable angle wrench, etc.
See the table below for the dimensions of the square section and the wrench flats.

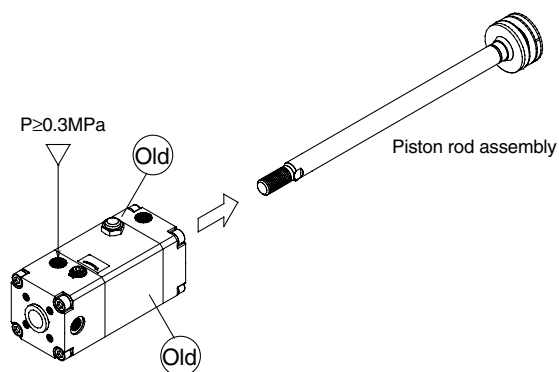
Bore size (mm)	Rod cover square section (mm)	Tube cover wrench flats (mm)
20	38	24
25	45	29
32	45	35.5
40	52	44



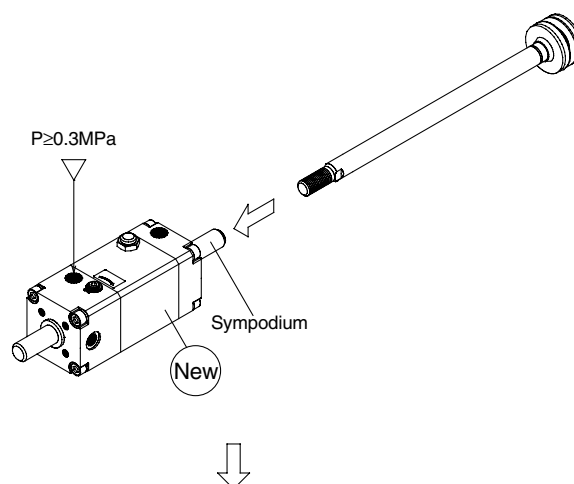
- Remove the tube cover.



- Apply compressed air of 0.3MPa or more to the unlocking port, and pull out the piston rod assembly.



- Similarly apply compressed air of 0.3MPa or more to the unlocking port of the new lock unit, and replace the symposium with the previous piston rod assembly.



- Reassemble by reversing the procedure in steps 1) and 2).
When retightening the sections, turn approximately 2° past their position prior to disassembly.

CL
MLG
CNA
CNG
MNB
CNS
CLS
CB
CV/MVG
CXW
CXS
CXT
MX
MXU
MXH
MXS
MXQ
MXF
MXW
MXP
MG
MGP
MGQ
MGG
MGC
MGF
MGZ
CY
MY

