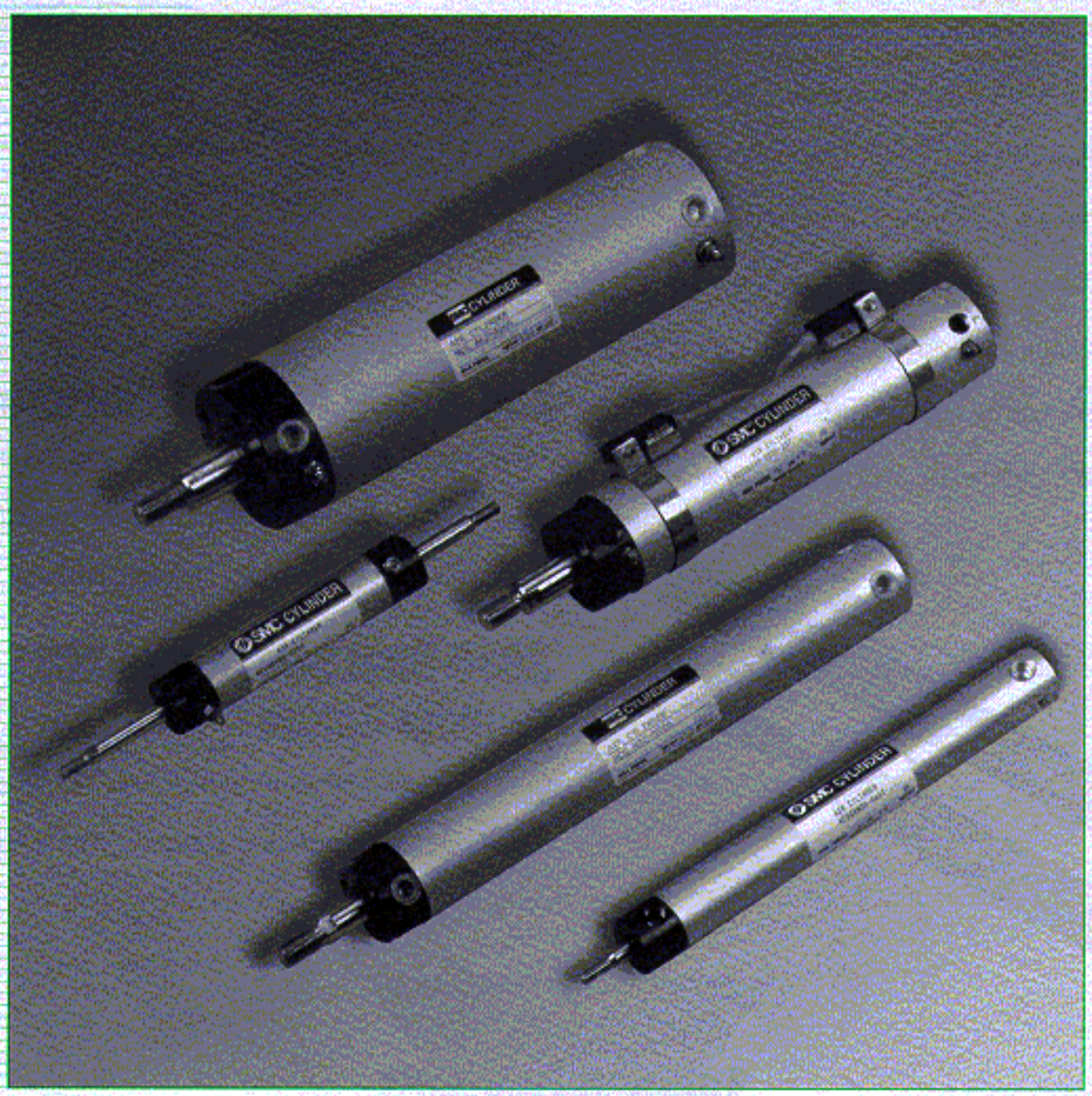
N303

SMC®

Air Cylinder

NCG Series

High Speed/Precision



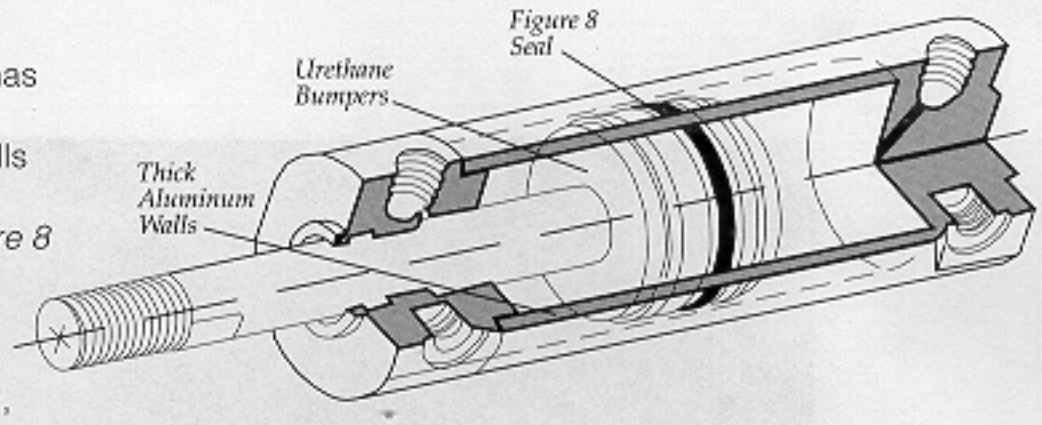
Repairable
Short Overall Length for Stroke
High Speed - Maximum 40 inch/sec.
6 Bores Sizes/9 Mounting Options
Auto Switch Capable

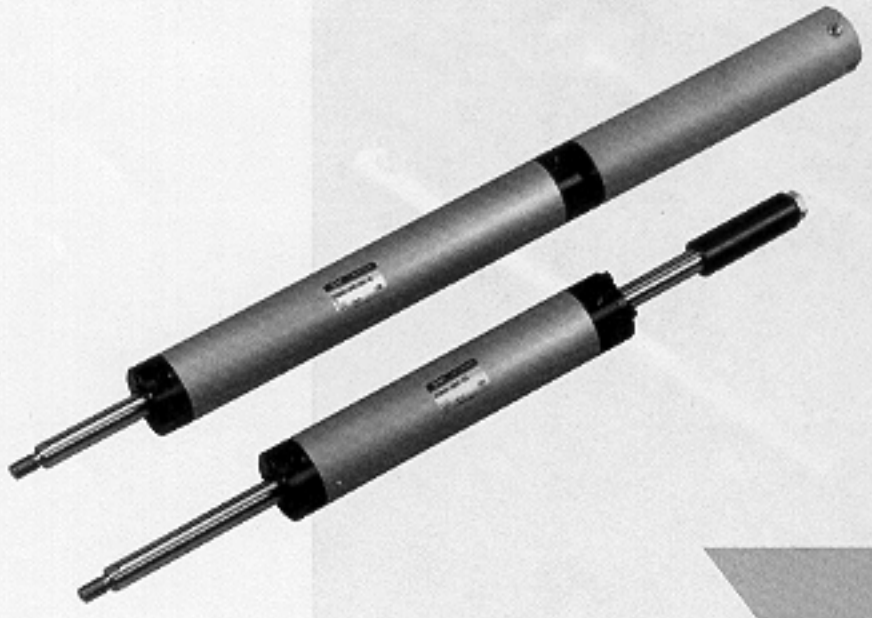
High Speed, Precision Air Cylinder: Series NCG

Bore Sizes 3/4, 1, 1 1/4, 1 1/2, 2, 2 1/2

Quality, performance, and more standard options make the NCG even better!

The NCG cylinder is a repairable round line cylinder that's competitively priced with the crimp-types and now, SMC has added even ***more standard options***. Thick aluminum walls make it less susceptible to damage and misuse. Our *figure 8 seal* provides low friction with consistency throughout the pressure range. Our seal is designed to resist rolling, and, compression is taken up in the center of the seal instead of the O.D. so you have less seal wear. In fact, ***the NCG lasts up to twice as long as a throwaway type cylinder***. The NCG is capable of high speed performance of up to 40"/second.





XC8 & XC9 Stroke Adjustment Option

The ability to ***adjust and fine tune the cylinder stroke*** allows changes to be made during initial machine setup. Adjustable strokes also create flexibility in manufacturing.

XC10 Dual Stroke and XC11 Tandem Option

Dual stroke and tandem cylinders are ideal for obtaining ***3 or 4 positions with one actuator***. These designs are compact, streamline, and easy to mount.

Table of Contents

How To Order

NCG ( ) **L** **N** **25** – **04** **00** – **XC37**

Style
– - Std. Cylinder
*K - Non Rotating Rod
*W- Double Rod

Mounting
B - Basic
C - Single Clevis
L - Foot
F - Front flange
G - Rear flange
U - Front trunnion
T - Rear trunnion
D - Double clevis
N - Front Nose mount

Cushion
N - Urethane bumper (std.)
**A - Adjustable air cushion

Bore

Bore size	Nominal size
20mm	3/4 inch
25mm	1inch
32mm	1 1/4 inch
40mm	1 1/2 inch
50mm	2 inch
63mm	2 1/2 inch

Stroke/Inch*

Stroke/Hundredths of an inch*

*Note) Stroke Length must be indicated as 4 digits
First and second digit: Stroke/Inch
Third and fourth digit: Stroke/ Hundredths of an inch
Example) 0525 = 5.25 (5 1/4) inch stroke

Options
XC6 - Stainless Steel Rod
XB6 - High Temperature
XB7 - Low Temperature
XB9 - Low Speed
XC8 - Stroke adjustment (extend)
XC9 - Stroke adjustment (retract)
XC10 - Dual Stroke
XC11 - 3 Position Tandem
XC37 - Enlarged Orifice

Auto Switch Capable

NC **D** **G** ( ) **L** **N** **25** – **04** **00** – **B73** **S**

Auto Switch
D -with auto switch capability (built in magnet)

Style
– - Std. Cylinder
*K - Non Rotating Rod
*W- Dbl. Rod

Mounting

Cushion
N - Urethane bumper (std)
A - Adjustable air cushion

Bore

Stroke/ Hundredths of an inch*

Applicable auto switch
– - Without auto switch

No. of Switches
– - 2 pcs.
S - 1 pc.
- state number of switches

Note: See Options Compatibility chart on page 21.
* Not available with nose mount as standard.
** Nose mount not available with air cushion (ø20 & ø25 bore).

Reed Switch

B53	D-B53	ø20~ø63
B54	D-B54	
B64	D-B64	
B73	D-B73	
B76	D-B76	
B80	D-B80	
C73	D-C73	
C76	D-C76	
C80	D-C80	
C73C	D-C73C	
C80C	D-C80C	
2 color		
B592	D-B59W	ø20~ø63

*Standard lead wire length is 18". "L" is added for 10' lead wires. Example: B53L D-B53L.
Min. strokes for cylinders w/switches: pg. 8

Solid State

G59	D-G59	ø20~ø63
G5P	D-G5P	
K59	D-K59	
G4NTL	D-G5NTL	
H7A1	D-H7A1	
H7A2	D-H7A2	
H7B	D-H7B	
H7C	D-H7C	
2 color		
G59W	D-G59W	ø20~ø63
G5PW	D-G5PW	
K59W	D-K59W	
G59F	D-G59F	
G5BAL	D-G5BAL	
G79	D-G79	
H7NW	D-H7NW	
H7PW	D-H7PW	
H7BW	D-H7BW	
H7BAL	D-H7BAL	
H7LF	D-H7LF	
H7NF	D-H7NF	

Mounting Bracket/Part No.

Mounting Bracket	Cylinder nominal size inch (Bore size mm)					
	3/4(20)	1(25)	1 1/4(32)	1 1/2(40)	2(50)	2 1/2(63)
Foot	NCG-L020	NCG-L025	NCG-L032	NCG-L040	NCG-L050	NCG-L063
Flange	NCG-F020	NCG-F025	NCG-F032	NCG-F040	NCG-F050	NCG-F063
Trunnion	NCG-T020	NCG-T025	NCG-P032	NCG-T040	NCG-T050	NCG-T063
Trunion bracket	NCG-P020	NCG-P025	NCG-P032	NCG-P040	NCG-P050	NCG-P063
Double clevis	NCG-D020	NCG-D025	NCG-D032	NCG-D040	NCG-D050	NCG-D063
Single clevis	NCG-C020	NCG-C025	NCG-C032	NCG-C040	NCG-C050	NCG-C063

Auto Switch Mounting Band/Part No.

Mounting Band Model No.	Bore size inch (mm)					
	3/4 (20)	1(25)	1 1/4 (32)	1 1/2 (40)	2 (50)	2 1/2 (63)
D-B5 D-B6 D-G5 D-K5	BA-01	BA-02	BA-32	BA-04	BA-05	BA-06
D-B7 D-B8 D-G7	BM1-01	BM1-02	BM1-32	BM1-04	BM1-05	BM1-06
D-C7 D-C8 D-H7	BMA2-020	BMA2-025	BMA2-032	BMA2-040	BMA2-050	BMA2-063

Specifications

Bore size (mm)	20	25	32	40	50	63
Nominal size (inch)	3/4	1	1 1/4	1 1/2	2	2 1/2
Media	air					
Max. Operating pressure	140 PSI (9.9 kgf/cm)					
Min. Operating pressure	7 PSI (0.5 kgf/cm)					
Max. Inlet pressure	215 PSI (15 kgf/cm)					
Ambient and fluid temperature	40 ~ 140°F (5~60°C)					
Piston speed	2 ~ 40 inch/sec (50~1000 mm/s)					
Cushion	Urethane bumper or adjustable air cushion					
Lubrication	Not required (prelubricated at factory)					
Type of Mounting	Basic, Foot, Front flange, Rear flange, Front trunion, Rear trunion, Dbl/Sgl clevis, Front Nose					
Stroke tolerance	~40" $^{+0.055"}_{-0}$ ~48" $^{+0.071"}_{-0}$					

Accessories *(see page 27)*

Options	Rod end nut
	Rod clevis, Trunnion, Pivot bracket, Double clevis pin

Stock Stroke List For All Styles

Bore Size	Standard Stocked Stroke	Max. Std. Stroke
20	1, 2, 3, 4, 5, 6, 8	20
25	1, 2, 3, 4, 5, 6, 8, 10, 12	25
32	1, 2, 3, 4, 5, 6, 8, 10, 12	40
40	1, 2, 3, 4, 5, 6, 8, 10, 12	45
50	1, 2, 3, 4, 5, 6, 8, 10, 12	55
63	1, 2, 3, 4, 5, 6, 8, 10, 12	55

Weight Chart

(lbs.)

Bore Size		20	25	32	40	50	63
Basic Weight	Basic type	0.22	0.35	0.55	0.86	1.63	2.29
	Foot type	0.46	0.64	0.90	1.34	2.92	4.34
	Flange type	0.40	0.57	0.86	1.30	2.38	3.39
	Trunnion type	0.24	0.40	0.62	0.97	1.94	2.60
	Single Clevis	0.25	0.40	0.67	0.98	1.90	2.62
	Double Clevis type	0.33	0.53	0.88	1.36	2.51	3.78
Additional weight for trunnion bracket		0.18	0.20	0.37	0.50	0.97	1.76
Additional weight for single clevis bracket		0.12	0.12	0.12	0.32	0.45	0.51
Additional weight per 1" of stroke		0.05	0.08	0.10	0.16	0.24	0.29
Additional weight for air cushion		0.02	0.02	0.04	0.04	0.07	0.07
Additional weight for long stroke (see p. 9)		0.02	0.02	0.04	0.07	0.13	0.22

Calculation Example: NCGLA20-0400
Foot type, Bore 20 (3/4"), 4 inch stroke with air cushion
Basic weight (Foot type) . . . 0.46
Additional weight . . . 0.05 / 1" of stroke
Cylinder stroke . . . 4 inch
Air cushion . . . 0.02

Calculation = 0.46 + 0.05 x 4 + 0.02 = 0.68 lbs.

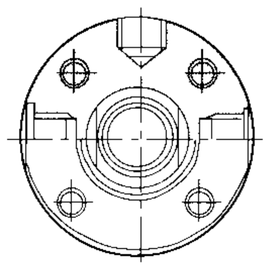
Theoretical Cylinder Forces

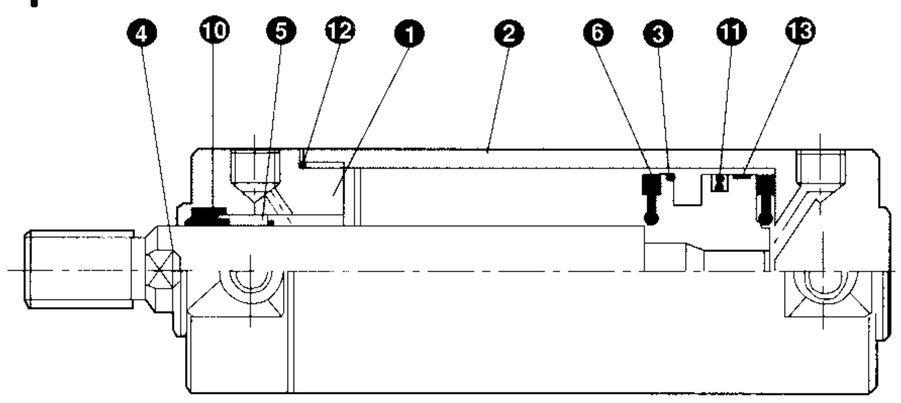
(lbs.)

Bore	Rod Diameter Inches	Action	Effective Area IN²	Operating Pressures (PSI)					
				25	50	75	100	125	150
20 (3/4)	0.315	OUT	0.487	12.1	24.3	36.5	48.7	60.8	73.0
		IN	0.410	10.2	20.5	30.7	41.0	51.2	61.5
25 (1)	0.39	OUT	0.760	19.0	38.0	57.0	76.0	95.0	114
		IN	0.638	15.9	31.9	47.8	63.8	79.8	95.7
32 (1 1/4)	0.47	OUT	1.25	31.2	62.5	93.7	125	156	187
		IN	1.07	26.7	53.5	80.2	107	133	160
40 (1 1/2)	0.63	OUT	1.95	48.7	97.5	146	195	243	292
		IN	1.64	41.0	82.0	123	164	205	246
50 (2)	0.79	OUT	3.04	76.0	152	228	304	380	456
		IN	2.55	63.7	127	191	255	318	382
63 (2 1/2)	0.79	OUT	4.83	120	241	362	483	603	724
		IN	4.34	108	217	325	434	542	651

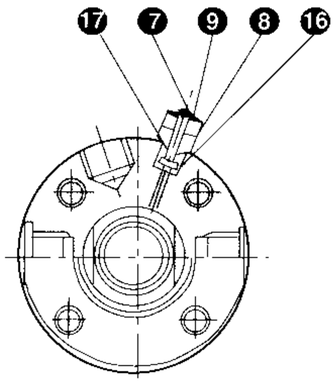
Construction & Parts List

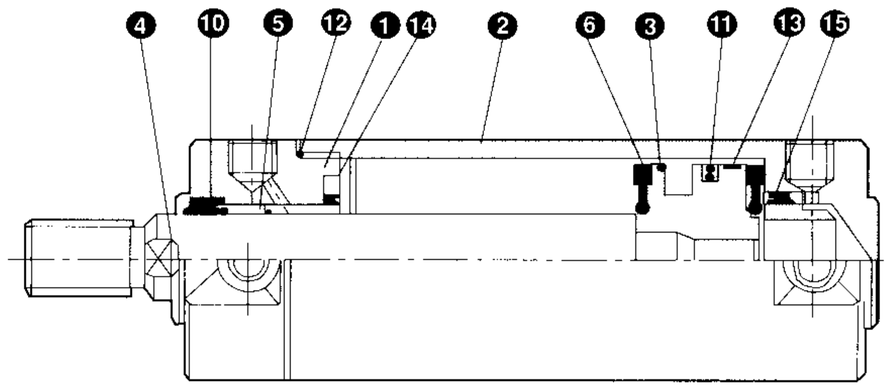
Standard Model with Urethane Bumper





With Adjustable Air Cushion





Parts List

No.	Description	Material	Surface Treatment
❶	**Rod Cover**	Aluminum alloy	Black anodizing
❷	**Tube Cover**	Aluminum alloy	Black anodizing
❸	**Piston**	Aluminum alloy	Chromate; Black anodizing w/air cushion
❹	**Piston Rod**	Carbon steel*	Hard chrome plated
❺	**Bushing**	Sintered metal	
❻	**Bumper**	Urethane	
❼	**Cushion valve**	Rolled steel	Nickel plated
❽	**Valve retainer**	Rolled steel	Nickel plated
❾	**Lock nut**	Carbon steel	Nickel plated
❿	**Rod seal**	NBR	
⓫	**Piston seal**	NBR	
⓬	**Tube gasket**	NBR	
⓭	**Wear ring**	Phenolic	
⓮	**Cushion seal A**	NBR	
⓯	**Cushion seal B**	NBR	
⓰	**Valve seal**	NBR	
⓱	**Valve retainer gasket**	NBR	

*Piston Rod is stainless steel for ø20 ø25 switch capable models.

Note) Rod Jam Nut must be ordered separately on all mounting variations.

Wear Ring

Bore Size	Part Number
20 (3/4")	CM-020-07-301A
25 (1")	CM-025-07-302A
32 (1 1/4")	CM-032-07-304A
40 (1 1/2")	C1A040-07-305A
50 (2")	C1A050-07-306A
63 (2 1/2")	C1A063-07-307A

Repair Kit

Bore Size	Bumper Design	Air Cushion Design
20 (3/4")	CG1N20-PS	CG1A20-PS
25 (1")	CG1N25-PS	CG1A25-PS
32 (1 1/4")	CG1N32-PS	CG1A32-PS
40 (1 1/2")	CG1N40-PS	CG1A40-PS
50 (2")	CG1N50-PS	CG1A50-PS
63 (2 1/2")	CG1N63-PS	CG1A63-PS

Kit contains: 1 rod seal; 1 piston seal; 2 cylinder tube seals;
*2 cushion valve seals (Air cushion design only)

Care & Maintenance

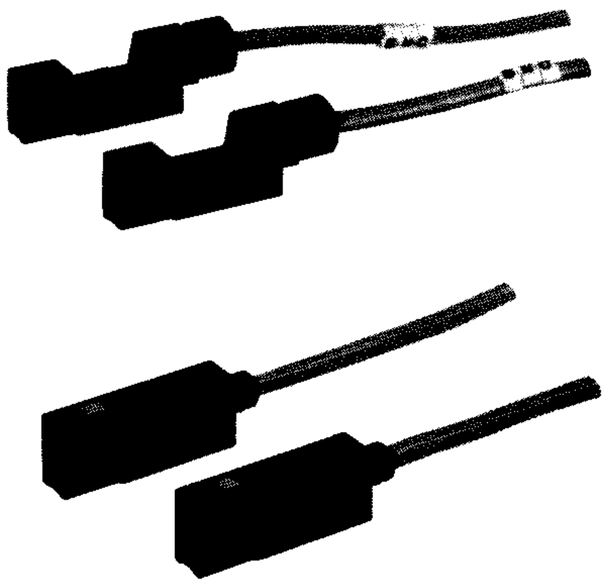
❶ Before mounting, completely flush the piping to avoid dust or other particles from entering the cylinder.

❷ The load of the piston rod should always be aligned parallel with the cylinder axis.

❸ Avoid damaging the piston rod. Scratches and nicks can lead to rod seal damage that may result in air leakage.

❹ When disassembling the cylinder, hold the flats on the tube cover in a vise and unscrew the rod cover with a wrench.

When reassembling; tighten an additional 2 degrees beyond the original position. (Bore sizes of ø50 and over may be difficult to disassemble due to the large tightening torque. Please consult SMC when disassembly is required.



Reed Switches/Band Mount Auto Switches

Auto Switch Model		Operating Voltage	Max. Current or Operating current range (mA)	Indicator Light/Wire	Application
D-B5, B6 Grommet Type Built-in contact protection Circuit (B53, B64)	**D-B54**	24VDC	10 ~50MA	• 2 wire	Relay Sequencer
		110VAC	5 ~22mA		
		220VAC	5 ~11mA		
	D-B53	24VDC	5 ~ 50mA	• 2 wire	Sequencer
	D-B64	24VDC	50mA	X 2 wire	Relay Sequencer
		110VAC	22mA		
		220VAC	11mA		
D-B7, B8 D-C7, C8 Grommet	D-B73 D-C73	24VDC	5 ~ 40mA	• 2 wire	Relay Sequencer
	D-C73C	110VAC	5 ~ 20mA		
	D-B76 D-C76	4 ~ 8 VDC	20mA	• 2 wire	IC Circuit
	D-B80	24V	50mA	X 2 wire	Relay Sequencer
	D-C80	48V	40mA		
	D-C80C	110V	18mA		

*Lead length . . . 1.5ft. standard (10 ft. optional)
*A contact protection box is necessary if the current load is inductive, 110VAC, and the lead wire length is greater than 16 ft.

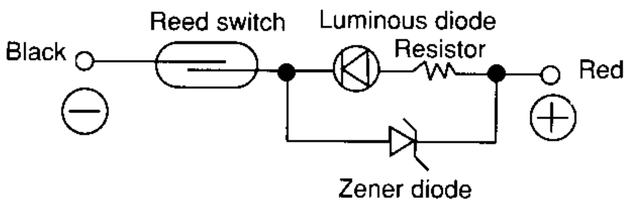
• – Available
x – Not Available

Solid State Switches & Band Mount Auto Switches

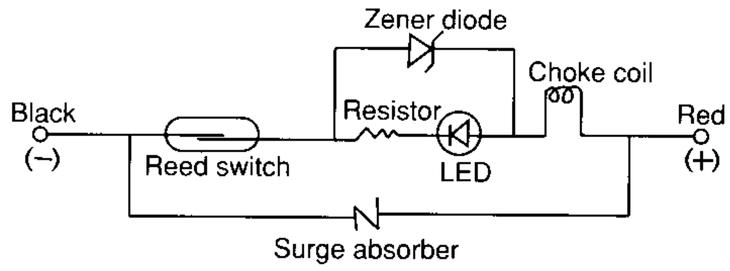
Model Number	Power Source	Current Consumption	Operating Voltage	Max. Current or Range	Indicator lamp/wire (output)	Application
D-G59	4.5 ~ 28 VDC	On: 12mA or less Off: 1mA or less	24 VDC(10~28VDC)	1250mA	• 3 wire (NPN)	IC Circuit Relay Sequencer
D-G5P	4.5 ~ 28 VDC	On: 15mA or less Off: 1mA or less	–	100mA or less	• 3 wire (PNP)	IC Circuit Relay Sequencer
D-K59	–	–	24 VDC(10~28VDC)	5~15mA	• 2 wire	Relay, Sequencer
D-G5NTL	4.5 ~ 28 VDC	10mA or less	24 VDC(10~28VDC)	80mA or less	• 3 wire (NPN)	IC Circuit Relay Sequencer
D-H7A1	4.5 ~ 28 VDC	On: 12mA or less Off: 1mA or less	24 VDC(10~28VDC)	150mA	• 3 wire (NPN)	IC Circuit Relay Sequencer
D-H7A2	4.5 ~ 28 VDC	On: 15mA or less Off: 1mA or less	–	100mA or less	• 3 wire (PNP)	IC Circuit Relay Sequencer
D-H7B	–	–	24 VDC(10~28VDC)	5~150mA	• 2 wire	Relay, Sequencer
D-H7C	24VDC	–	24 VDC(10~28VDC)	5~150mA	• 2 wire	Relay, Sequencer
D-G59W	–	–	24 VDC(10~28VDC)	5~40mA	• 3 wire (NPN)	Relay, Sequencer
D-G5PW	2.5 ~ 28 VDC	On: 12mA or less Off: 1mA or less	–	80mA or less	• 3 wire (PNP)	IC Circuit Relay Sequencer
D-K59W	–	–	24 VDC(10~28VDC)	5~40mA	• 2 wire	Relay, Sequencer
D-G59F	4.5 ~ 28 VDC	On: 10mA or less Off: 1mA or less	–	40mA or less	• 4 wire (NPN)	IC Circuit Relay, Sequencer
D-G5BAL	–	–	24 VDC(10~28VDC)	Off: 1mA or less	X 2 wire	Relay, Sequencer
D-G79	24VDC	16mA or less	24 VDC(10~28VDC)	150mA or less	• 3 wire (NPN)	Relay, Sequencer
D-H7NW	4.5 ~ 28 VDC	On: 12mA or less Off: 1mA or less	–	80mA or less	• 3 wire (NPN)	Relay, Sequencer
D-H7PW	20~28VDC	12MA or less	–	80mA or less	X 3 wire (NPN)	Relay, Sequencer
D-H7BW	–	–	24 VDC(10~28VDC)	5~40mA	X 2 wire	Relay, Sequencer
D-H7BAL	–	–	24 VDC (10~28VDC)	Off: 1mA or less	• 2 wire	Relay, Sequencer
D-H7LF	24VDC(20~26VDC)	20mA or less	26 VDC or less	40mA or less	• 4 wire (NPN)	Relay, Sequencer
D-H7NF	4.5 ~ 28 VDC	On: 10mA or less Off:1mA or less	28 VDC or less	40mA or less	• 4 wire (NPN)	IC Circuit Relay Sequencer

Auto Switch Circuit Diagrams

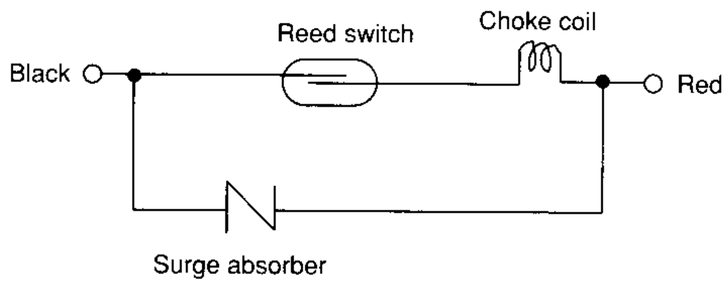
D-B53



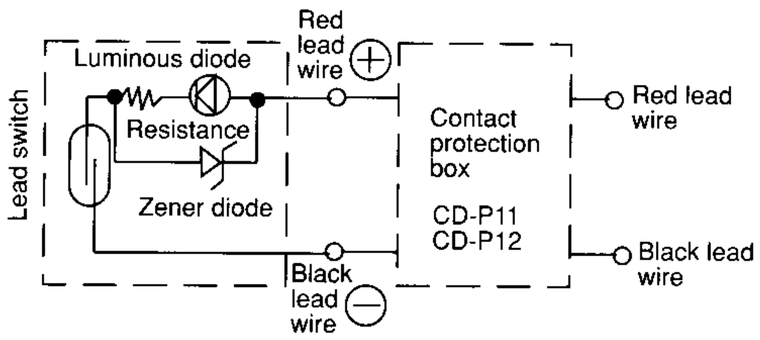
D-B54



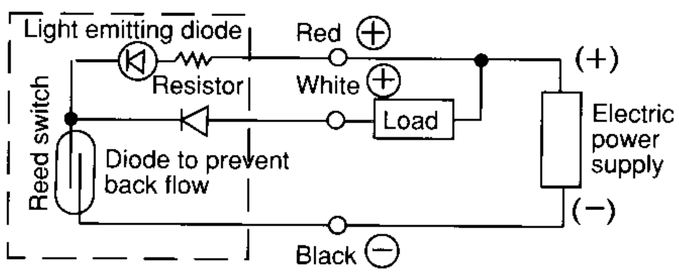
D-B64



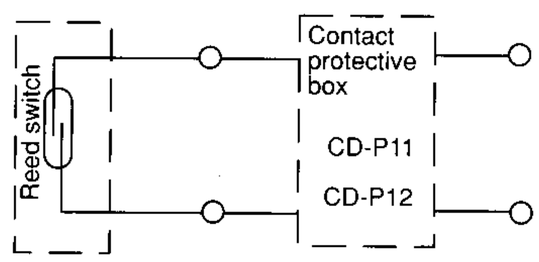
D-B73, D-C73, D-C73C



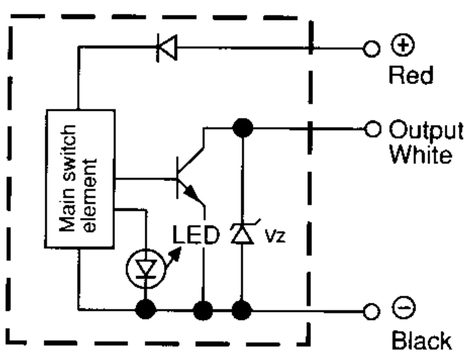
D-B76, D-C76



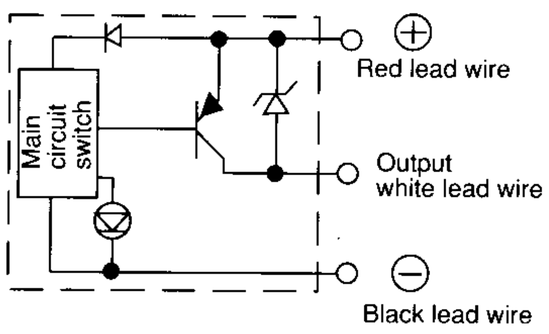
D-B80, D-C80, D-C80C



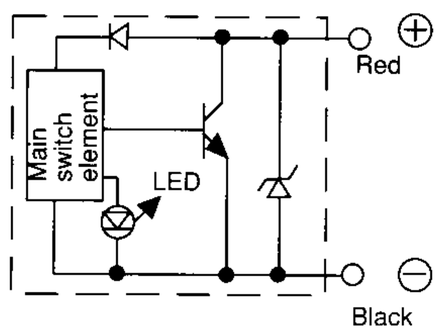
D-G59, D-G79, D-H7A1



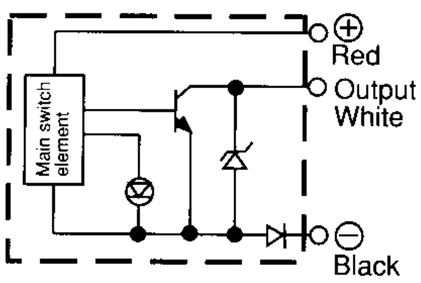
D-G5P, D-H7A2



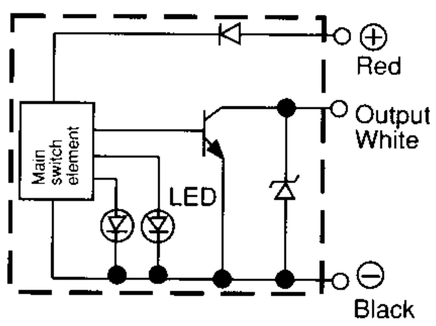
D-K59, D-H7B, D-H7C



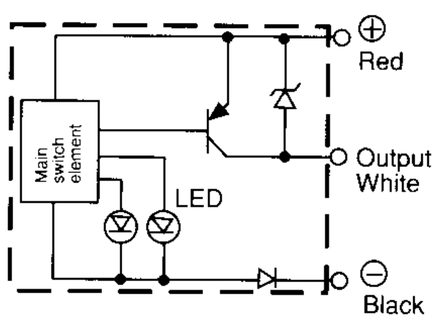
D-G5NTL



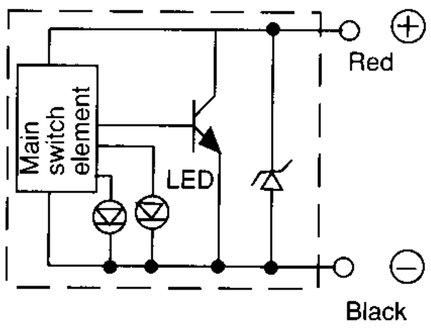
D-G59W, D-H7NW



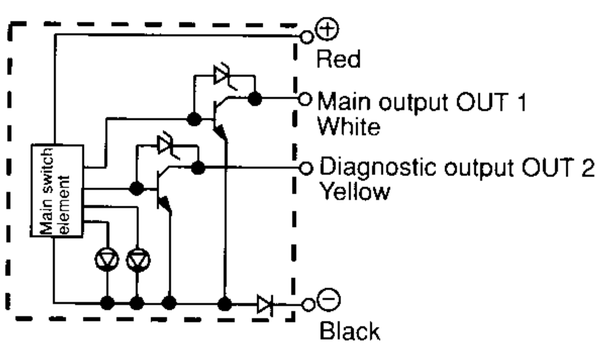
D-G5PW, D-H7PW



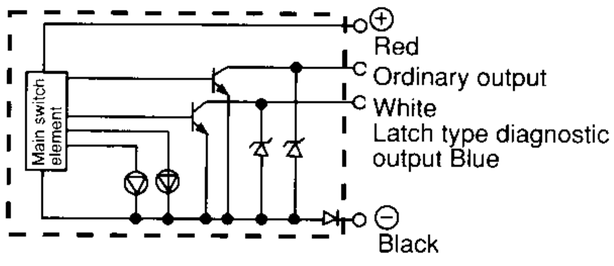
D-G5BAL, D-H7BAL, D-K59W, D-H7BW,



D-G59F, D-H7NF

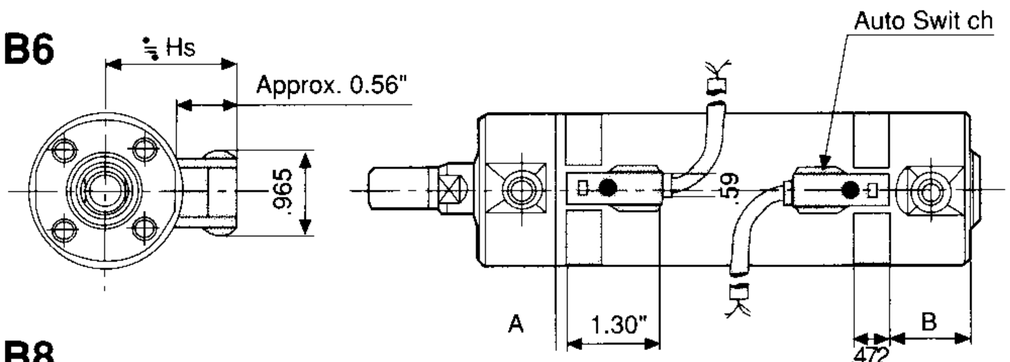


D-H7LF

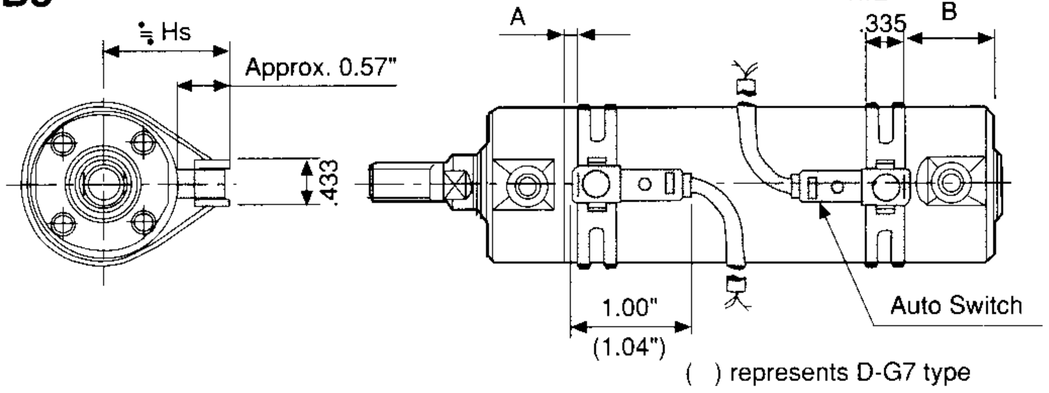


Auto Switch Mounting Data

D-B5 • B6



D-B7 • B8
D-G7



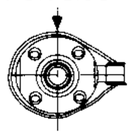
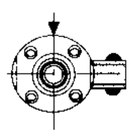
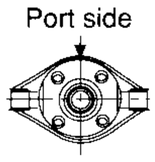
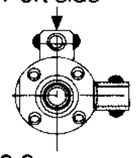
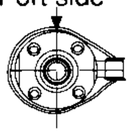
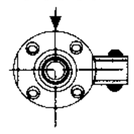
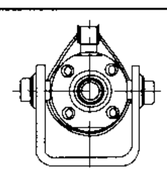
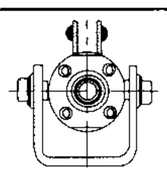
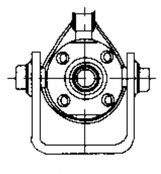
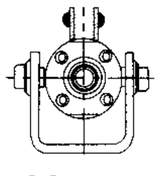
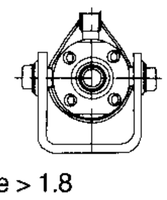
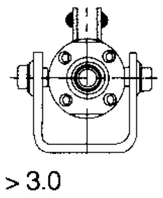
( ) represents D-G7 type

Proper Auto Switch Placement Dimensions

(Inch)

Auto Switch	D-B5, B6			D-B7, B8 and D-G7		
Bore Size	A	B	Approx. ≒ Hs	A	B	Approx. ≒ Hs
3/4 (20)	0.04	0.70	1.07	0.31	0.96	1.08
1 (25)	0.04	0.70	1.17	0.31	0.96	1.18
1 1/4 (32)	0.04	0.81	1.31	0.31	1.08	1.32
1 1/2 (40)	0.18	0.83	1.49	0.45	1.10	1.50
2 (50)	0.20	1.06	1.70	0.47	1.34	1.71
2 1/2 (63)	0.24	1.06	1.98	0.51	1.34	1.99

Auto Switch Mounting Position

Mounting	Number of Auto Switches	D-B7, D-B8, D-G7	D-B5, D-B6
Basic Mount • Foot Mount • Front Flange Mount • Rear Flange Mount • Double Clevis Mount	One switch (Rod cover side)	Port side  Stroke > 0.4	Port side  Stroke > 0.4
	Two switches (Different orientation)	Port side  Stroke > 0.6	Port side  Stroke > 0.6
	Two switches (Same orientation)	Port side  Stroke > 1.8	Port side  Stroke > 3.0
Front Trunnion Mount • Rear Trunnion Mount	One switch	 Stroke > 0.4	 Stroke > 0.4
	Two switches (Different orientation)	 Stroke > 0.6	 Stroke > 0.6
	Two switches (Same orientation)	 Stroke > 1.8	 Stroke > 3.0

Minimum Stroke Required For Auto Switches

Switch Model	with 2 switches	with 1 switch
D-B7 D-B8 D-G7 D-B5 D-B6	0.60"	0.40"

Operational Instructions

❶ **D-B53, B54, B75** have indicator lights equipped with light emitting diode. The red lead wire is (+), and the black lead wire is (-). If connection is reversed, switch will operate but indicator light will not work.

❷ Electrical current should be kept within the specified operating current range. If used at less than the operating current, the indicator light with not turn on, and if operated in excess of the operating current range, the indicator light will be damaged.

❸ **D-B53, B54, B73** can be connected in parallel, connection in series causes large voltage drops due to the internal resistance in the LED. (Approx. 2V/switch. Approx. 2.7V for D-B53).

Mounting

❶ Always connect switch to load before turning on the power.
❷ Avoid using in a magnetically contaminated area.
❸ Prevent repeated bending of the lead wire.
❹ If auto switch cylinders are used in parallel, keep the distance between cylinders greater than 1.5 inches.

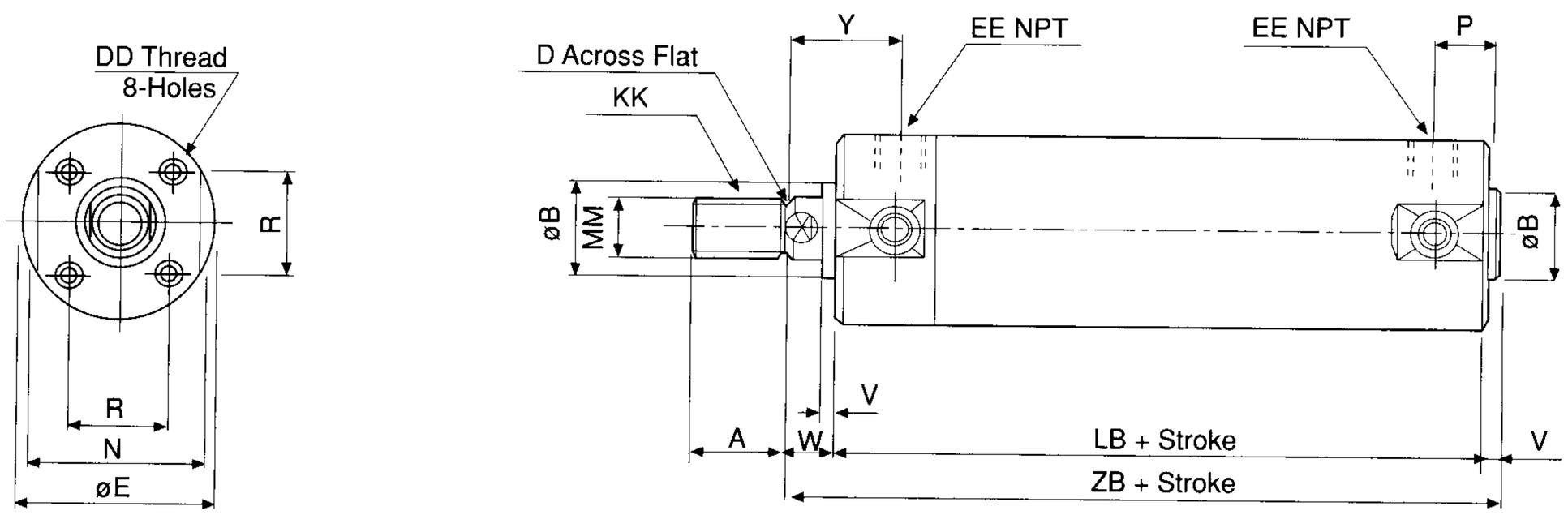
Contact Protection Box

D-B7, D-B8 switches have no internal protection circuit. If the current load is inductive and the lead wire length is greater than 16 feet, or the operating voltage is 110V, the contact protection box is necessary.

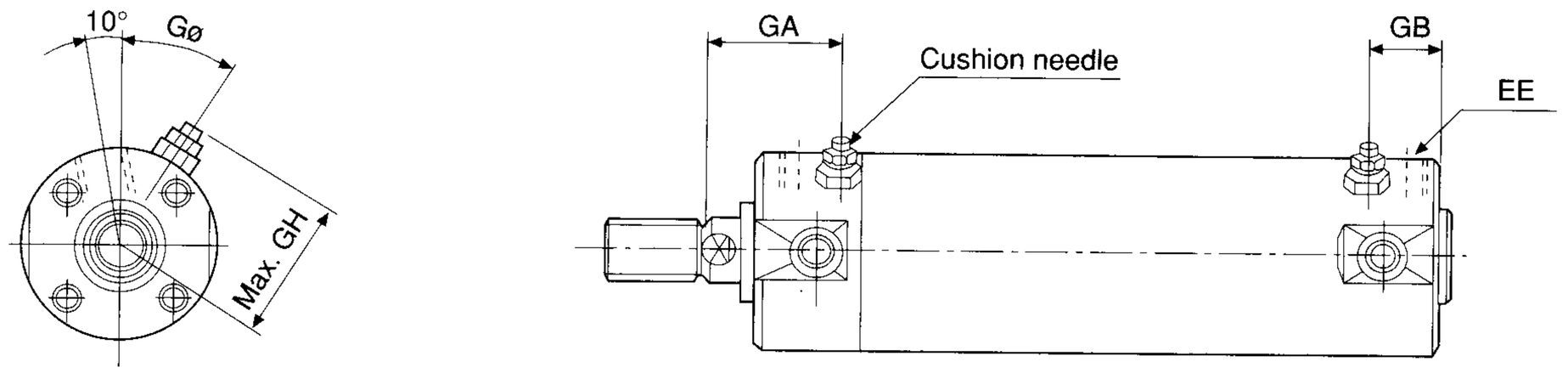
Part No.	Operating Voltage	Length of Lead wire
CD-P11	110VAC	Switch connection side 1.5ft. (0.5m) Load connection side 1.5ft. (0.5m)
CD-P12	24VDC	

Basic Model Dimensions

NC○GBN



With adjustable air cushion
NC○GBA



(Inch)

Bore	Max. Std. Stroke	A	B	D	DD	E	EE	KK	LB	MM	N	P	R	V	W	Y	ZB
20	8	0.50	0.472 $^{0}_{-0.0011}$	0.24	8-32 x 0.28	1.02	1/8	1/4-28UNF	2.70	0.315	0.94	0.47	0.55	0.08	0.50	0.97	3.28
25	12	0.50	0.551 $^{0}_{-0.0011}$	0.31	10-32 x 0.30	1.22	1/8	5/16-24UNF	2.70	0.394	1.14	0.47	0.65	0.08	0.62	1.09	3.40
32	12	0.75	0.709 $^{0}_{-0.0011}$	0.39	10-32 x 0.30	1.50	1/8	7/16-20UNF	2.78	0.472	1.42	0.43	0.79	0.08	0.88	1.35	3.74
40	12	0.75	0.984 $^{0}_{-0.0013}$	0.55	1/4-28 x 0.47	1.85	1/8	7/16-20UNF	3.06	0.630	1.73	0.47	1.02	0.08	0.88	1.39	4.02
50	12	0.88	1.181 $^{0}_{-0.0013}$	0.71	5/16-24 x 0.63	2.28	1/4	1/2-20UNF	3.53	0.787	2.17	0.51	1.26	0.08	1.19	1.74	4.80
63	12	0.88	1.260 $^{0}_{-0.0015}$	0.71	3/8-24 x 0.63	2.83	1/4	1/2-20UNF	3.53	0.787	2.72	0.51	1.50	0.08	1.19	1.74	4.80

Adjustable Air Cushion Model

(Inch)

Bore	GA	GB	GH	Gø	EE
20	1.05	0.55	0.90	30°	10-32UNF
25	1.17	0.55	0.98	30°	10-32UNF
32	1.43	0.51	1.12	25°	1/8 NPT
40	1.47	0.55	1.30	20°	1/8 NPT
50	1.82	0.59	1.60	20°	1/4 NPT
63	1.82	0.59	1.87	20°	1/4 NPT

Long Stroke

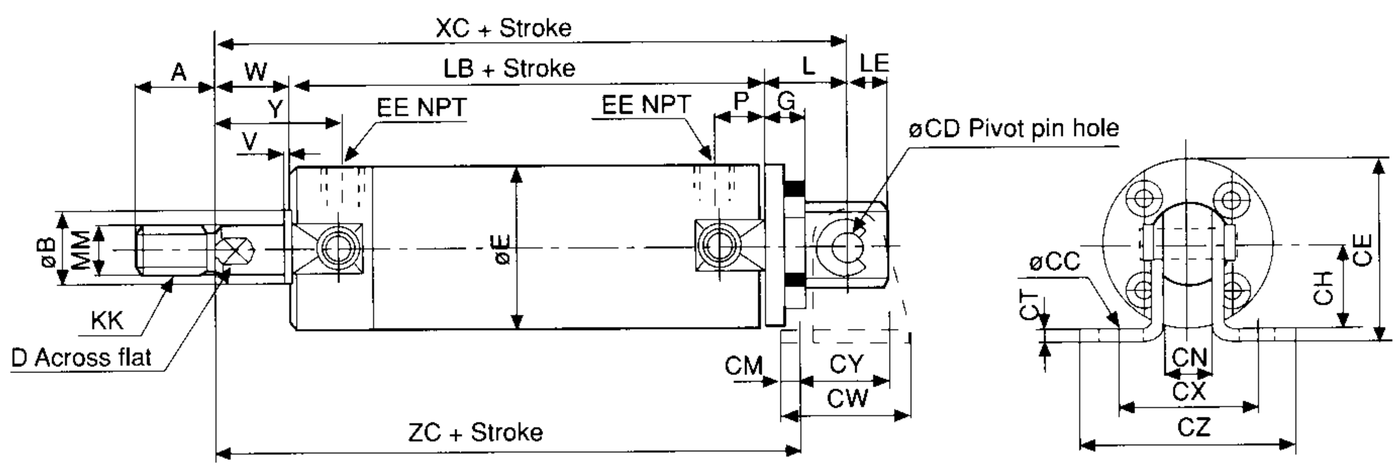
(Inch)

Bore	Stroke Range	LB	ZB
20	8.01 to 20	3.02	3.60
25	12.01 to 25	3.02	3.72
32	12.01 to 40	3.09	4.05
40	12.01 to 45	3.41	4.37
50	12.01 to 55	4.00	5.27
63	12.01 to 55	4.00	5.27

Note: Long stroke design is a three piece construction: rod cover, head cover, and tube body.

Single Clevis Model Dimensions

NC○GCN○ - ○
NC○GCA○ - ○



(Inch)

Bore	Max.Std. Stroke	A	øB	øCD	CN	D	øE	EE	G	KK	L	LB	LE	MM	P	Y	W	Y	XC	ZC
20	8	0.50	0.472 $^{0}_{-0.0011}$	0.25	0.38	0.24	1.02	1/8	0.31	1/4-28UNF	0.70	2.70	0.28	0.315	0.47	0.08	0.50	0.97	3.91	3.63
25	12	0.50	0.551 $^{0}_{-0.0011}$	0.25	0.38	0.31	1.22	1/8	0.33	5/16-24UNF	0.68	2.70	0.28	0.394	0.47	0.08	0.62	1.09	4.00	3.72
32	12	0.75	0.709 $^{0}_{-0.0011}$	0.25	0.50	0.39	1.50	1/8	0.61	7/16-20UNF	1.07	2.78	0.39	0.472	0.43	0.08	0.88	1.35	4.72	4.59
40	12	0.75	0.984 $^{0}_{-0.0013}$	0.375	0.62	0.55	1.85	1/8	0.39	7/16-20UNF	0.88	3.06	0.38	0.630	0.47	0.08	0.88	1.39	4.81	4.25
50	12	0.88	1.181 $^{0}_{-0.0013}$	0.375	0.75	0.71	2.28	1/4	0.47	1/2-20UNF	0.91	3.53	0.44	0.787	0.51	0.08	1.19	1.74	5.63	5.50
63	12	0.88	1.260 $^{0}_{-0.0015}$	0.375	0.75	0.71	2.83	1/4	0.47	1/2-20UNF	0.91	3.53	0.44	0.787	0.51	0.08	1.19	1.74	5.63	5.50

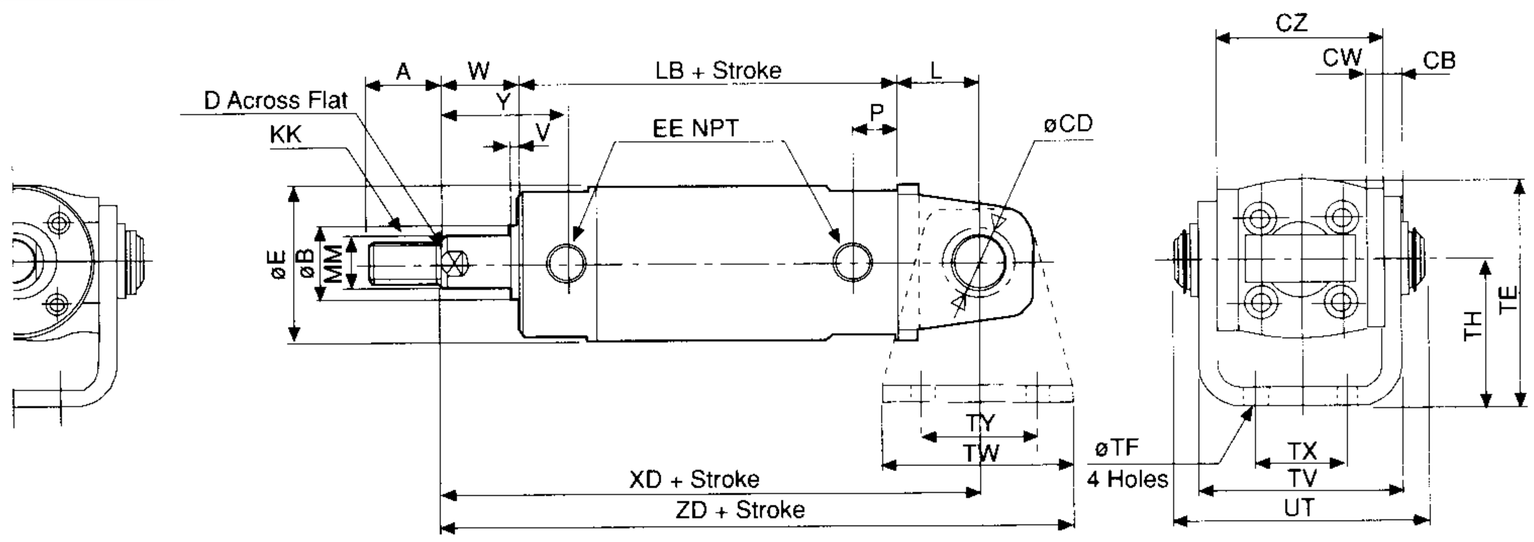
(Inch)

Bore	CC	Single Clevis								
		CE	CH	CM	CN	CT	CW	CX	CY	CZ
20	0.27	1.39	0.87	0.18	0.38	0.12	1.10	1.25	0.75	1.95
25	0.27	1.49	0.87	0.18	0.38	0.12	1.10	1.25	0.75	1.95
32	0.27	1.63	0.87	0.10	0.50	0.12	1.10	1.38	0.75	2.07
40	0.27	2.31	1.38	0.25	0.62	0.18	1.50	1.86	1.00	2.60
50	0.26	2.52	1.38	0.25	0.75	0.25	1.50	2.12	1.00	3.00
63	0.26	3.17	1.75	0.25	0.75	0.25	1.50	2.12	1.00	3.00

Note) Single clevis bracket must be order separately.

Double Clevis Model Dimensions

NC○GDN○ - ○
NC○GDA○ - ○



(Inch)

Bore	Max Std. Stroke	A	øB	CB	øCD	CW	CZ	D	øE	EE	KK	L	LB	MM	P	V	W	XD	Y	ZD
20	8	0.50	0.472 $^{0}_{-0.0011}$	0.12	0.31	0.12	1.14	0.24	1.02	1/8	1/4-28UNF	0.55	2.70	0.315	0.47	0.08	0.50	3.75	0.97	4.58
25	12	0.50	0.551 $^{0}_{-0.0011}$	0.12	0.39	0.12	1.30	0.31	1.22	1/8	5/16-24UNF	0.63	2.70	0.394	0.47	0.08	0.62	3.95	1.09	4.78
32	12	0.75	0.709 $^{0}_{-0.0011}$	0.18	0.47	0.18	1.57	0.39	1.50	1/8	7/16-20UNF	0.79	2.78	0.472	0.43	0.08	0.88	4.45	1.35	5.39
40	12	0.75	0.984 $^{0}_{-0.0013}$	0.18	0.55	0.18	1.93	0.55	1.85	1/8	7/16-20UNF	0.87	3.06	0.630	0.47	0.08	0.88	4.81	1.39	5.91
50	12	0.88	1.181 $^{0}_{-0.0013}$	0.24	0.63	0.24	2.36	0.71	2.28	1/4	1/2-20UNF	0.98	3.53	0.787	0.51	0.08	1.19	5.70	1.74	6.96
63	12	0.88	1.260 $^{0}_{-0.0015}$	0.31	0.71	0.31	2.91	0.71	2.83	1/4	1/2-20UNF	1.18	3.53	0.787	0.51	0.08	1.19	5.90	1.74	7.38

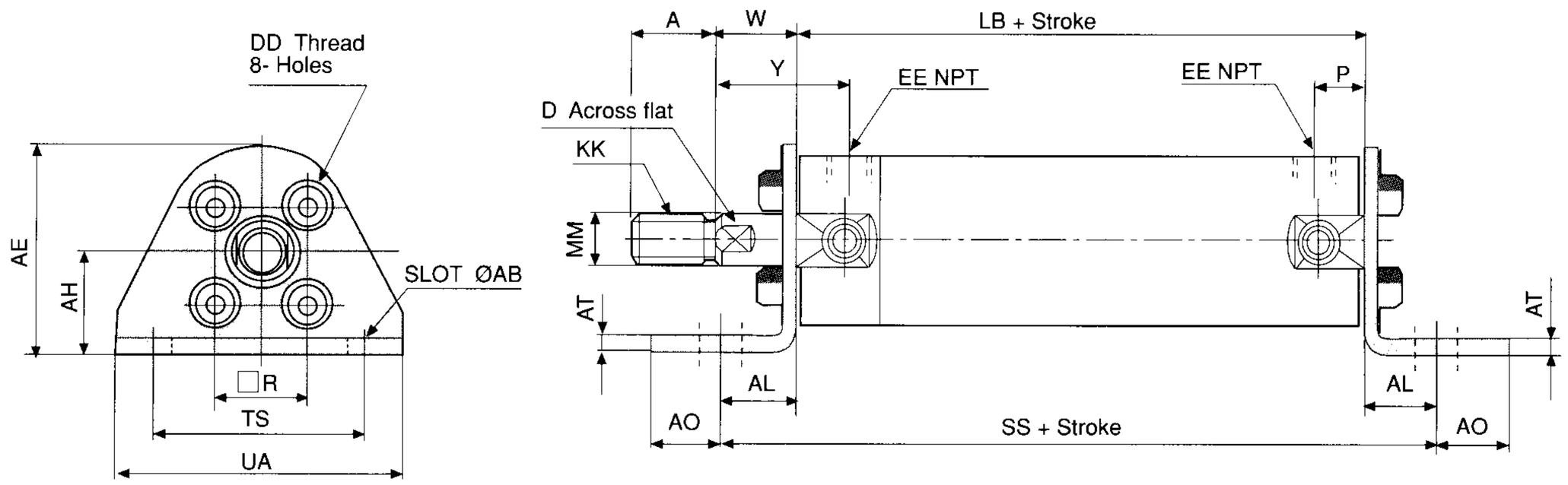
(Inch)

Bore	Double Clevis							
	TY	TF	TV	TE	TH	TX	TW	UT
20	1.10	0.22	1.39	1.50	0.98	0.63	1.66	1.71
25	1.10	0.22	1.55	1.79	1.18	0.79	1.66	1.89
32	1.10	0.28	1.93	2.13	1.38	0.87	1.88	2.34
40	1.18	0.28	2.28	2.50	1.57	1.18	2.20	2.81
50	1.42	0.35	2.83	3.11	1.97	1.42	2.52	3.39
63	1.81	0.43	3.54	3.78	2.36	1.81	2.92	4.15

Note) For Long Stroke dimensions refer to page 9.
Note) Double clevis bracket and double clevis pin must be ordered separately.

Foot Model Dimensions

NC○GLN○-○
NC○GLA○-○



(Inch)

Bore	Max. Std. Stroke	A	AB	AE	AH	AL	AO	AT	D	DD	EE	KK	LB	MM
20	8	0.50	0.27	1.44	0.81	0.56	0.44	0.12	0.24	8-32 x 0.28	1/8	1/4-28UNF	2.70	0.315
25	12	0.50	0.27	1.52	0.81	0.56	0.44	0.12	0.31	10-32 X 0.30	1/8	5/16-24UNF	2.70	0.394
32	12	0.75	0.28	1.83	1.00	0.75	0.75	0.12	0.39	10-32 x 0.30	1/8	7/16-20UNF	2.78	0.472
40	12	0.75	0.28	2.02	1.00	0.72	0.78	0.12	0.55	1/4-28 x 0.47	1/8	7/16-20UNF	3.06	0.630
50	12	0.88	0.34	2.84	1.50	1.00	0.62	0.25	0.71	5/16-24 x 0.63	1/4	1/2-20UNF	3.53	0.787
63	12	0.88	0.34	3.29	1.75	1.00	0.62	0.25	0.71	3/8-24 x 0.63	1/4	1/2-20UNF	3.53	0.787

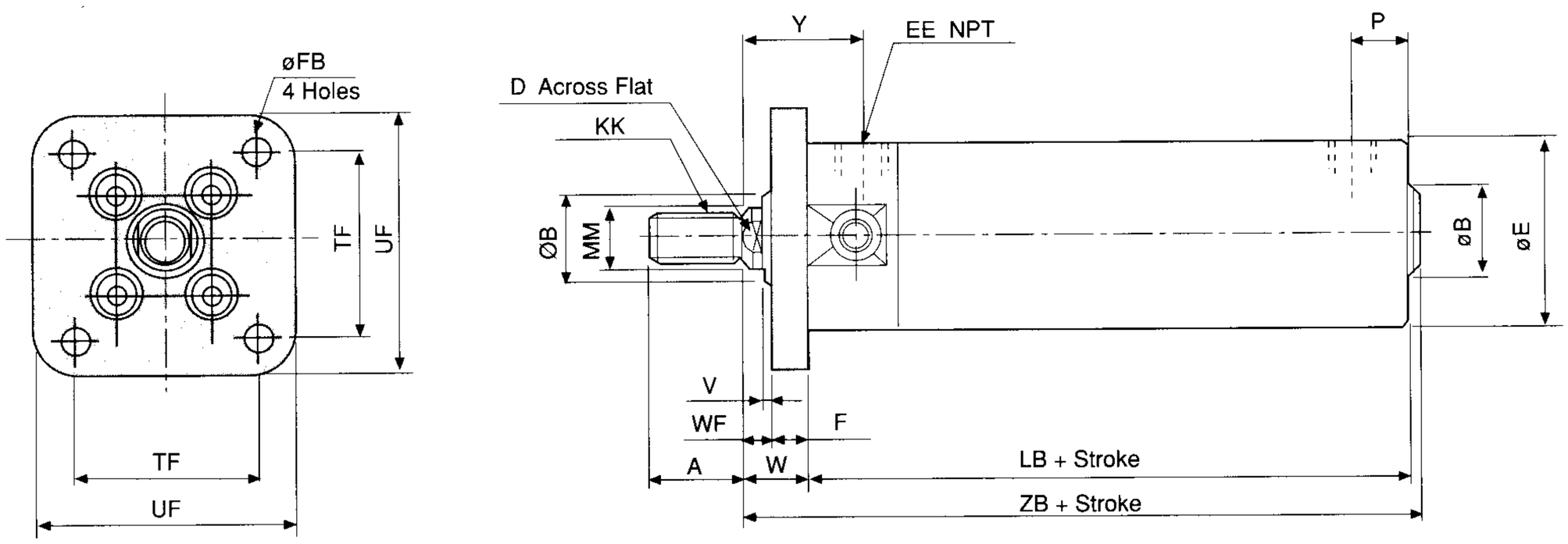
(Inch)

Bore	Max. Std. Stroke	P	R	SS	TS	UA	W	Y
20	8	0.47	0.55	3.82	1.50	1.88	0.50	0.97
25	12	0.47	0.65	3.82	1.50	1.88	0.62	1.09
32	12	0.43	0.79	4.28	1.88	2.50	0.88	1.35
40	12	0.47	1.02	4.50	1.88	2.50	0.88	1.39
50	12	0.51	1.26	5.53	2.24	3.12	1.19	1.74
63	12	0.51	1.50	5.53	2.88	3.75	1.19	1.74

Note) For Long Stroke dimensions refer to page 9.

Front Flange Model Dimensions

NC○GFN○-○
NC○GFA○-○



(Inch)

Bore	Max Std. Stroke	A	B	D	E	EE	F	FB	KK	LB	MM
20	8	0.50	0.472 $^{0}_{-0.0011}$	0.24	1.02	1/8	0.24	0.22	1/4-28UNF	2.70	0.315
25	12	0.50	0.551 $^{0}_{-0.0011}$	0.31	1.22	1/8	0.28	0.22	5/16-24UNF	2.70	0.394
32	12	0.75	0.709 $^{0}_{-0.0011}$	0.39	1.50	1/8	0.28	0.28	7/16-20UNF	2.78	0.472
40	12	0.75	0.984 $^{0}_{-0.0013}$	0.55	1.85	1/8	0.31	0.28	7/16-20UNF	3.06	0.630
50	12	0.88	1.181 $^{0}_{-0.0013}$	0.71	2.28	1/4	0.35	0.35	1/2-20UNF	3.53	0.787
63	12	0.88	1.260 $^{0}_{-0.0015}$	0.71	2.83	1/4	0.35	0.43	1/2-20UNF	3.53	0.787

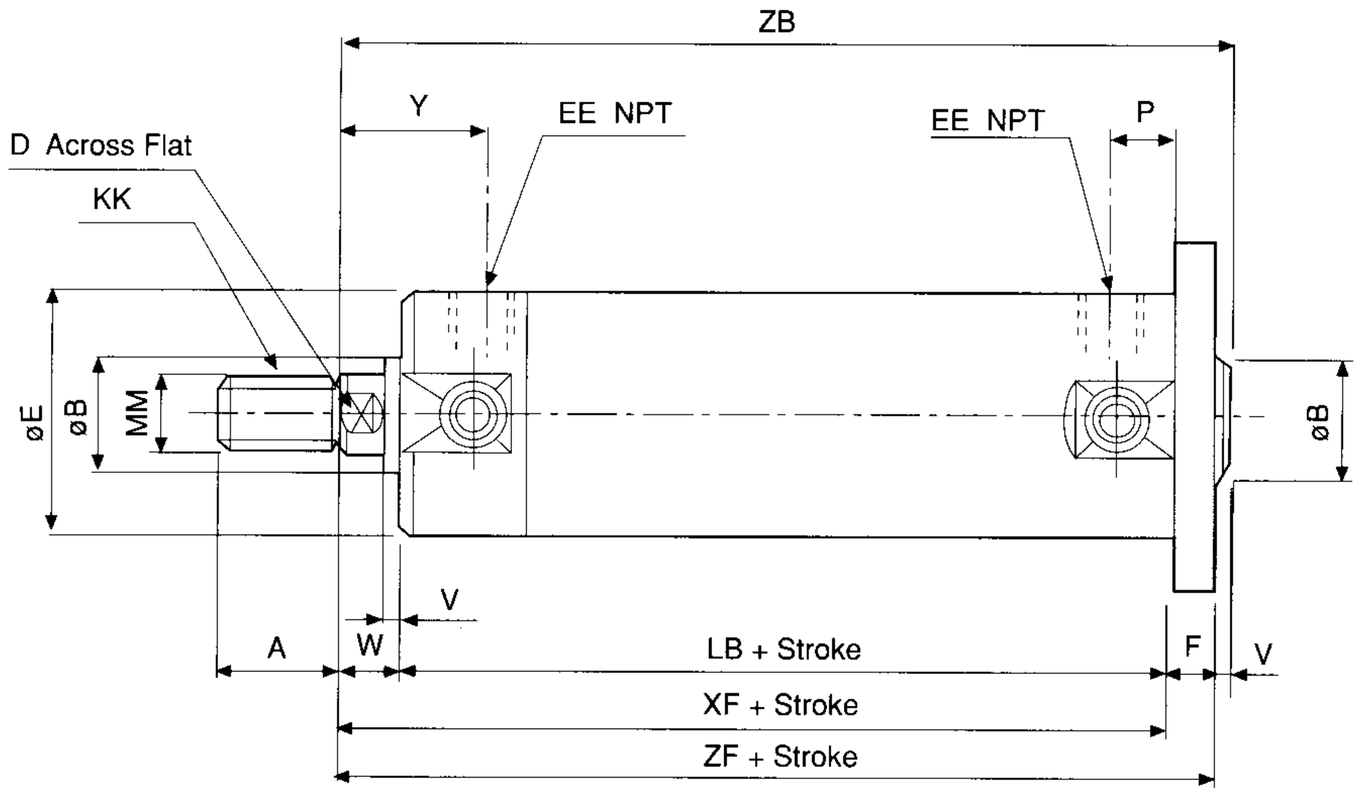
(Inch)

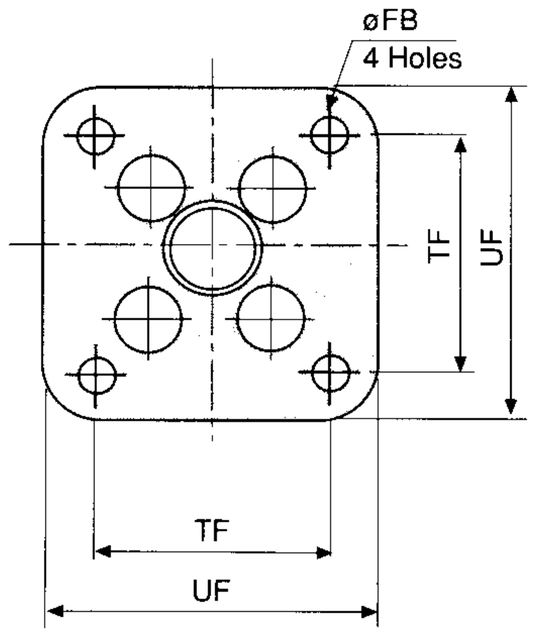
Bore	P	TF	UF	V	WF	W	Y	ZB
20	0.47	1.10	1.57	0.08	0.26	0.50	0.97	3.28
25	0.47	1.26	1.73	0.08	0.34	0.62	1.09	3.40
32	0.43	1.50	2.09	0.08	0.60	0.88	1.35	3.74
40	0.47	1.81	2.40	0.08	0.57	0.88	1.39	4.02
50	0.51	2.28	3.00	0.08	0.84	1.19	1.74	4.80
63	0.51	2.76	3.62	0.08	0.84	1.19	1.74	4.80

Note) For Long Stroke dimensions refer to page 9.

Rear Flange Model Dimensions

NC○GGN○ - ○
NC○GGA○ - ○





(Inch)

Bore	Max. Std. Stroke	A	B	D	E	EE	F	FB	KK	LB	MM
20	8	0.50	$0.472^{0}_{-0.0011}$	0.24	1.02	1/8	0.24	0.22	1/4-28UNF	2.70	0.315
25	12	0.50	$0.551^{0}_{-0.0011}$	0.31	1.22	1/8	0.28	0.28	7/16-20UNF	2.70	0.394
32	12	0.75	$0.709^{0}_{-0.0011}$	0.39	1.50	1/8	0.28	0.28	7/16-20UNF	2.78	0.472
40	12	0.75	$0.984^{0}_{-0.0013}$	0.55	1.85	1/8	0.31	0.28	7/16-20UNF	3.06	0.630
50	12	0.88	$1.181^{0}_{-0.0013}$	0.71	2.28	1/4	0.35	0.35	1/2-20UNF	3.53	0.787
63	12	0.88	$1.260^{0}_{-0.0015}$	0.71	2.83	1/4	0.35	0.43	1/2-20UNF	3.53	0.787

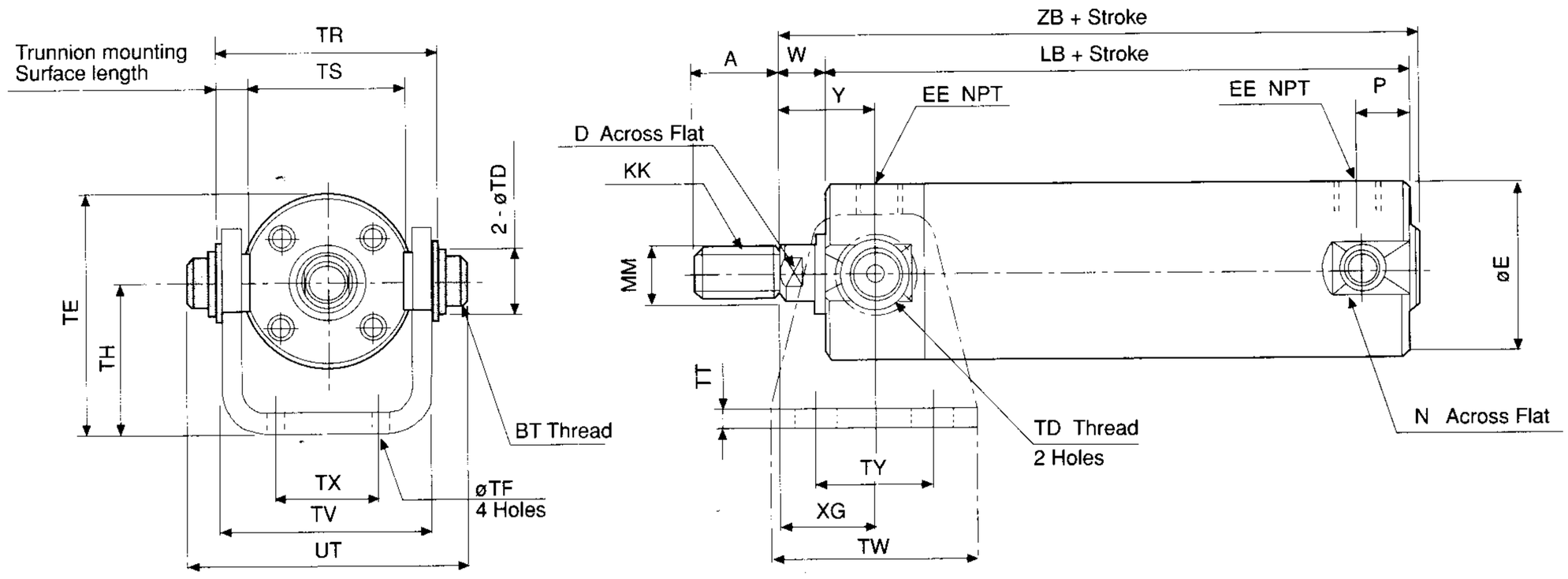
(Inch)

Bore	P	TF	UF	V	W	XF	Y	ZF	ZB
20	0.47	1.10	1.57	0.08	0.50	3.20	0.97	3.44	3.52
25	0.47	1.26	1.73	0.08	0.62	3.32	1.09	3.60	3.68
32	0.43	1.50	2.09	0.08	0.88	3.66	1.35	3.94	4.02
40	0.47	1.81	2.40	0.08	0.88	3.94	1.39	4.25	4.33
50	0.51	2.28	3.00	0.08	1.19	4.72	1.74	5.07	5.15
63	0.51	2.76	3.62	0.08	1.19	4.72	1.74	5.07	5.15

Note) For Long Stroke dimensions refer to page 9.

Front Trunnion Model Dimensions

NC○GUN○ - ○
NC○GUA○ - ○



(Inch)

Bore	Max. Std. Stroke	A	D	øE	EE	KK	LB	MM	N	P	W	XG	Y	ZB
20	8	0.50	0.24	1.02	1/8	1/4-28UNF	2.70	0.315	0.94	0.47	0.50	0.93	0.97	3.28
25	12	0.50	0.31	1.22	1/8	5/16-24UNF	2.70	0.394	1.14	0.47	0.62	1.05	1.09	3.40
32	12	0.75	0.39	1.50	1/8	7/16-20UNF	2.78	0.472	1.42	0.43	0.88	1.31	1.35	3.74
40	12	0.75	0.55	1.85	1/8	7/16-20UNF	3.06	0.630	1.73	0.47	0.88	1.35	1.39	4.02
50	12	0.88	0.71	2.28	1/4	1/2-20UNF	3.53	0.787	2.17	0.51	1.19	1.70	1.74	4.80
63	12	0.88	0.71	2.83	1/4	1/2-20UNF	3.53	0.787	2.72	0.51	1.19	1.70	1.74	4.80

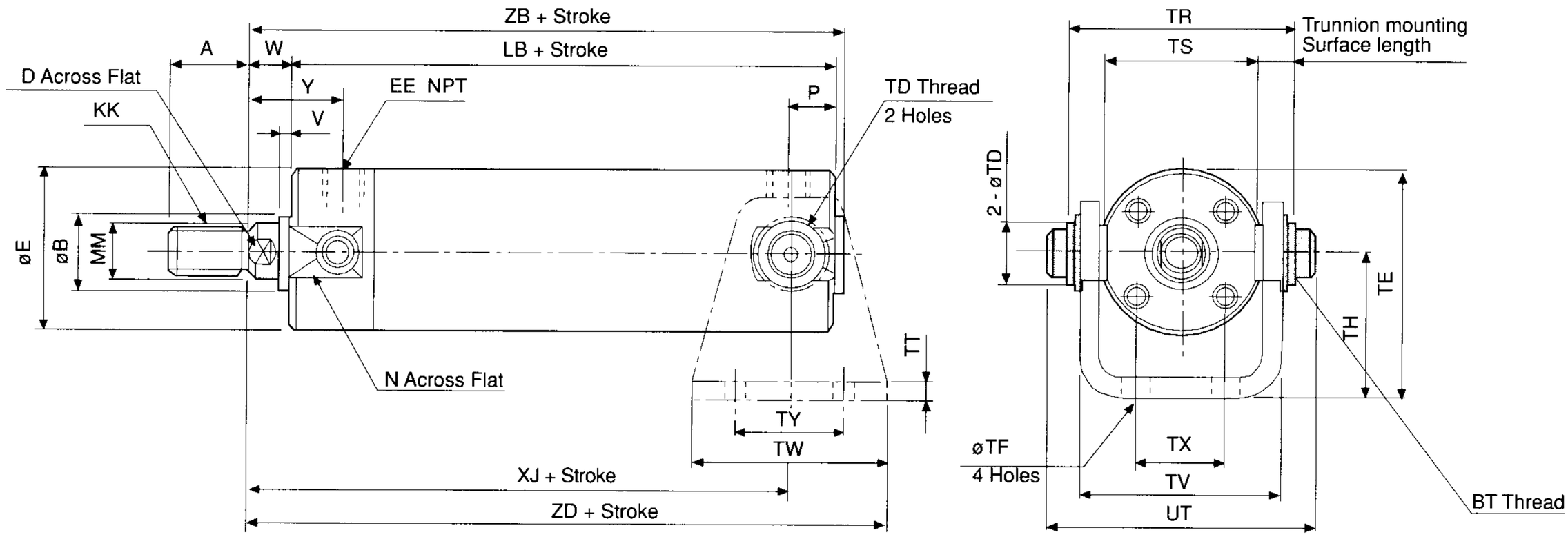
(Inch)

Bore	TE	TH	TR	TS	TT	TX	TW	TY	TF	TV	TD	UT	BT
20	1.50	0.98	1.54	1.10	0.12	0.63	1.66	1.10	0.22	1.39	0.315	1.87	M5 x .8
25	1.79	1.18	1.69	1.30	0.12	0.79	1.66	1.10	0.22	1.55	0.394	2.09	M6 x .75
32	2.13	1.38	2.15	1.58	0.18	0.87	1.88	1.10	0.28	1.93	0.472	2.67	M8 x 1.8
40	2.50	1.57	2.58	1.93	0.18	1.18	2.20	1.42	0.35	2.28	0.551	3.10	M10 x 1.25
50	3.11	1.97	3.15	2.36	0.24	1.42	2.52	1.42	0.35	2.83	0.630	3.88	M12 x 1.25
63	3.78	2.36	3.86	2.91	0.31	1.81	2.91	1.81	0.43	3.54	0.709	4.69	M14 x 1.5

Note) For Long Stroke dimensions refer to page 9.

Rear Trunnion Model Dimensions

NC○GTN○-○
NC○GTA○-○



(Inch)

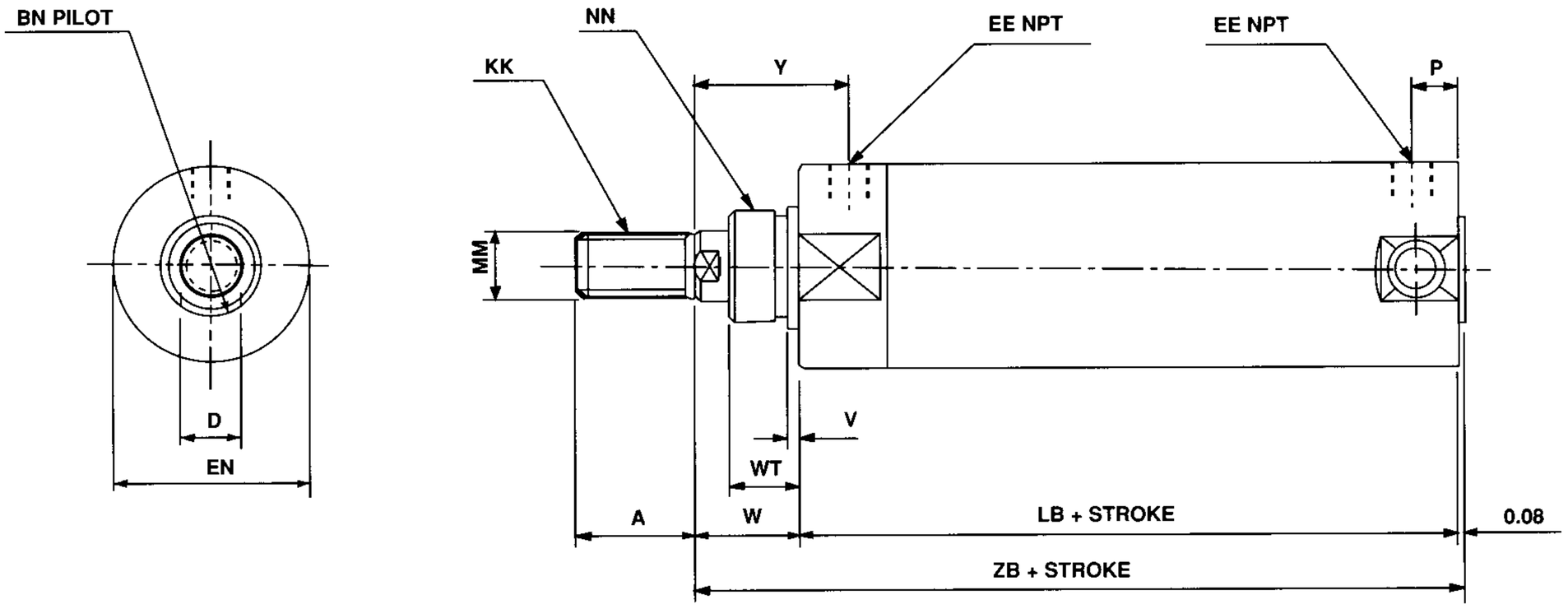
Bore	Max. Std. Stroke	A	B	D	E	EE	KK	LB	MM	N	P	V	W	XJ	Y	ZB	ZD
20	8	0.50	$0.472^{0}_{-0.0011}$	0.24	1.02	1/8	1/4-28UNF	2.70	0.315	0.94	0.47	0.08	0.50	2.77	0.97	3.28	3.60
25	12	0.50	$0.551^{0}_{-0.0011}$	0.31	1.22	1/8	5/16-24UNF	2.70	0.394	1.14	0.47	0.08	0.62	2.89	1.09	3.40	3.72
32	12	0.75	$0.709^{0}_{-0.0011}$	0.39	1.50	1/8	7/16-20UNF	2.78	0.472	1.42	0.43	0.08	0.88	3.27	1.35	3.74	4.21
40	12	0.75	$0.984^{0}_{-0.0013}$	0.55	1.85	1/8	7/16-20UNF	3.06	0.630	1.73	0.47	0.08	0.88	3.54	1.39	4.02	4.64
50	12	0.88	$1.181^{0}_{-0.0013}$	0.71	2.28	1/4	1/2-20UNF	3.53	0.787	2.17	0.51	0.08	1.19	4.25	1.74	4.80	5.51
63	12	0.88	$1.260^{0}_{-0.0015}$	0.71	2.83	1/4	1/2-20UNF	3.53	0.787	2.72	0.51	0.08	1.19	4.25	1.74	4.80	5.71

(Inch)

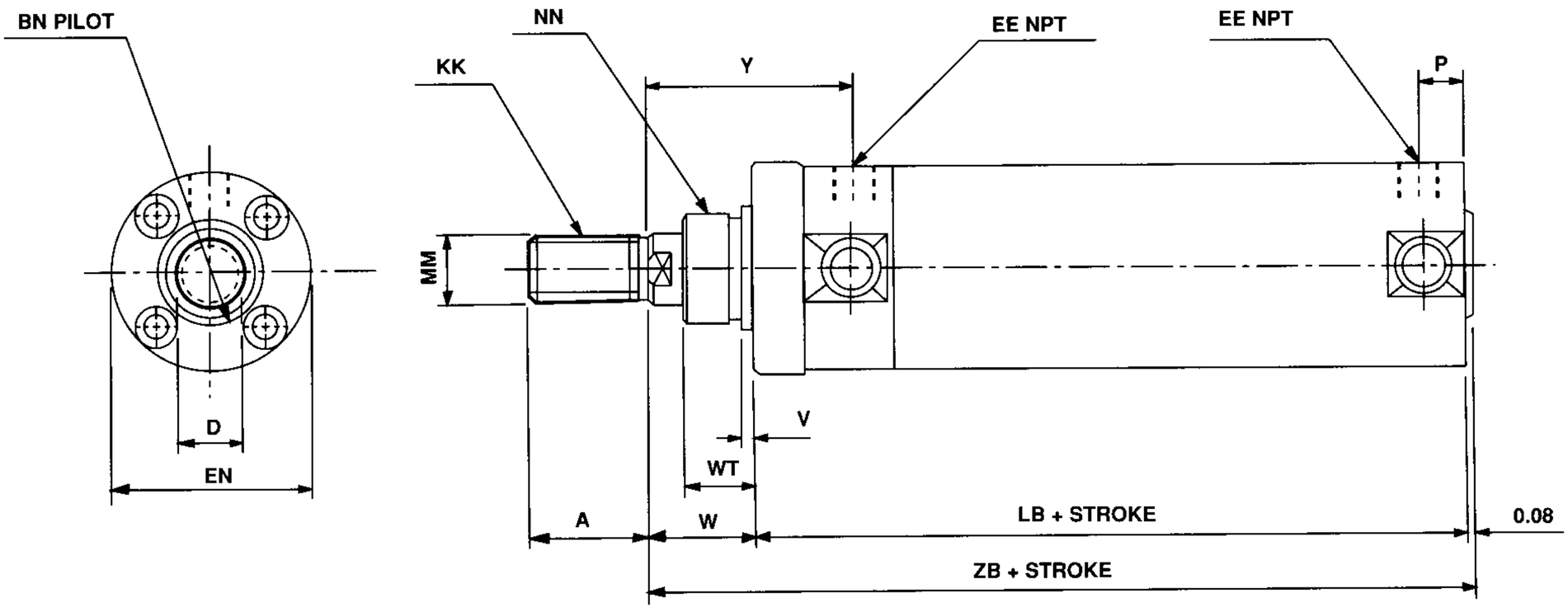
Bore	TE	TH	TR	TS	TT	TX	TW	TY	øTF	TV	øTD	UT	BT
20	1.50	0.98	1.54	1.10	0.12	0.63	1.66	1.10	0.22	1.39	0.315	1.87	M5 x .8
25	1.79	1.18	1.69	1.30	0.12	0.79	1.66	1.10	0.22	1.55	0.394	2.09	M6 x .75
32	2.13	1.38	2.15	1.58	0.18	0.87	1.88	1.10	0.28	1.93	0.472	2.67	M8 x 1.8
40	2.50	1.57	2.58	1.93	0.18	1.18	2.20	1.18	0.28	2.28	0.551	3.10	M10 x 1.25
50	3.11	1.97	3.15	2.36	0.24	1.42	2.52	1.42	0.35	2.83	0.630	3.88	M12 x 1.25
63	3.78	2.36	3.86	2.91	0.31	1.81	2.92	1.81	0.43	3.54	0.709	4.69	M14 x 1.5

Note) For Long Stroke dimensions refer to page 9.

Front Nose Mount Dimensions



Bore	Max. Std. Stroke	A	BN	D	EE	EN	KK	LB	MM	NN	P	V	W	WT	Y	ZB
20	8	0.55	0.749 $^{+0.0002}_{-0.0030}$	0.24	1/8	1.12	1/4-28	2.60	0.315	3/4-16	0.47	0.12	0.88	0.63	1.25	3.56
25	12	0.55	0.749 $^{+0.0002}_{-0.0030}$	0.31	1/8	1.24	5/16-24	2.60	.394	3/4-16	0.47	0.12	0.88	0.63	1.25	3.56



(Inch)

Max Bore	Std. Stroke	A	BN	D	EE	EN	KK	LB	MM	NN	P	V	W	WT	Y	ZB
32	12	0.83	0.749 $^{+0.0002}_{-0.0030}$	0.39	1/8	1.63	7/16-20	3.15	0.472	3/4-16	0.43	0.12	0.88	0.63	1.75	4.11
40	12	0.75	1.058 $^{+0.0002}_{-0.0030}$	0.55	1/8	2.00	7/16-20	3.62	0.630	1-14	0.47	0.19	1.25	0.88	2.32	4.95
50	12	0.88	1.374 $^{0}_{-0.0040}$	0.71	1/4	2.38	1/2-20	4.12	0.787	1 1/4-12	0.51	0.12	1.19	0.81	2.33	5.39
63	12	0.88	1.500 $^{0}_{-0.0039}$	0.71	1/4	2.87	1/2-20	4.19	0.787	1 3/8-12	0.51	0.12	1.19	0.81	2.40	5.46

Double Acting/Non-rotating Rod: Series NCGK

High Non-Rotating Accuracy
ø20, ø25 – ±1°
ø32 – ±0.8°
ø40~ø63 – ±0.5°

Long Life, High Speed Operation

Non-lube Operation

Auto Switch Capable

Model

Series	Type	Action	Cushion	Piston Packing
NCGK	Non-lube	Dbl. Acting	Rubber cushion	Special packing

Specifications

Fluid		Air
Max. operating pressure		150 PSI (9.9kgf/cm²)
Min. operating pressure		8 PSI (0.5kgf/cm²)
Ambient and fluid temperature		40 ~ 140°F (5 ~ 60°C)
Piston Velocity		2 ~ 20 in/sec. (50 ~ 500 mm/sec)
Non-rotating accuracy	ø20, ø25	±1°
	ø32	±.8°
	ø40 ~ ø63	±0.5°
Mounting style		Basic, Axial foot, Rod side flange, Head side flange, Rod side trunnion, Head side trunnion, Clevis, Front nose* (not available on ø20 and ø25); (32 ~ 63 as Special)

Weight Table

lbs

Bore	ø20	ø25	ø32	ø40	ø50	ø63
Basic	0.22	0.37	0.57	0.90	1.70	2.63
Foot	0.46	0.66	0.93	1.39	2.76	3.95
Flange	0.40	0.60	0.88	1.35	2.45	3.46
Trunnion	0.24	0.42	0.64	1.01	2.01	2.67
Clevis	0.33	0.55	.090	1.41	2.58	3.86
Add'l Weight for Trunnion Brkt	0.18	0.20	0.38	0.50	0.97	1.76
Add'l Weight for Sgl. Clevis Brkt	0.12	0.12	0.12	0.32	0.45	0.51
Add'l Weight Per 1" of Stroke	0.05	0.08	0.40	0.16	0.24	0.29

Calculation method
(Example) NCG1KLN20-0100
(Foot • ø20, 100st)

- Basic weight..... 0.46 (foot • ø20)
- Additional weight.... .05/1" stroke
- Cylinder stroke..... 0100st

0.46 + (.05*1) = .51 lbs.

Precautions

Installation

- Avoid applying rotational torque to the piston rod.

Allowable rotating	ø20	ø25	ø32	ø40	ø50	ø63
torque (kgf•cm) or less	2.0	2.5	2.5	4.5	4.5	4.5

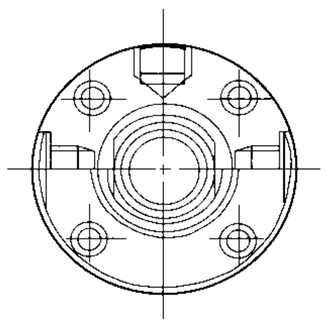
- The load of the piston rod should always be aligned parallel, with the cylinder axis.
- Completely retract the rod before applying any kind of torque on the rod end nut. Prevent torque on the guide bushing by holding the rod stationary with a wrench on the rod flats.
- To disassemble, hold the wrench flats on the tube cover in a vice. Holding the rod cover wrench flats with a wrench, unscrew counter-clockwise to remove cover. To reassemble, tighten the cover an extra 2" from the original assembled position. (Bore sizes of ø50 and over may be difficult to disassemble due to the large tightening torque. Consult factory when disassembly is required.

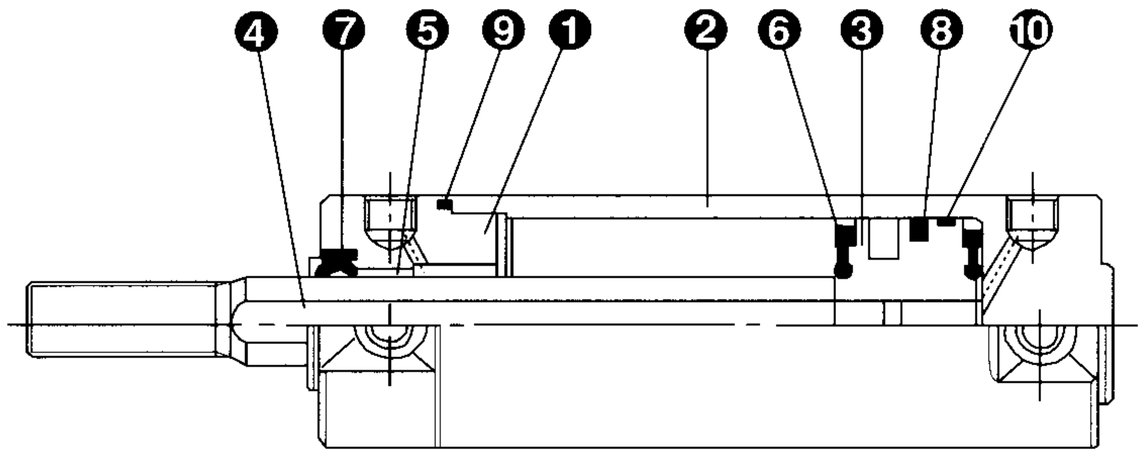
Piping Installation

- Flush piping thoroughly before connection in order to prevent dust or chips from entering the cylinder.

Construction/Parts List

Rubber Cushion Type





Parts List

No.	Description	Material	Remarks
❶	Rod Cover	Aluminum alloy	Black anodized
❷	Tube Cover	Aluminum alloy	Hard anodized
❸	Piston	Aluminum alloy	Chromate
❹	*Piston Rod	Carbon steel	Hard Chrome Plating
❺	Non-rotating guide	Oil impregnated sintered metal	–
❻	Bumper	Urethane	–
❼	Rod Seal	NBR	–
❽	Piston Seal	NBR	–
❾	Tube Seal	NBR	–
❿	Wear Ring	Resin	–

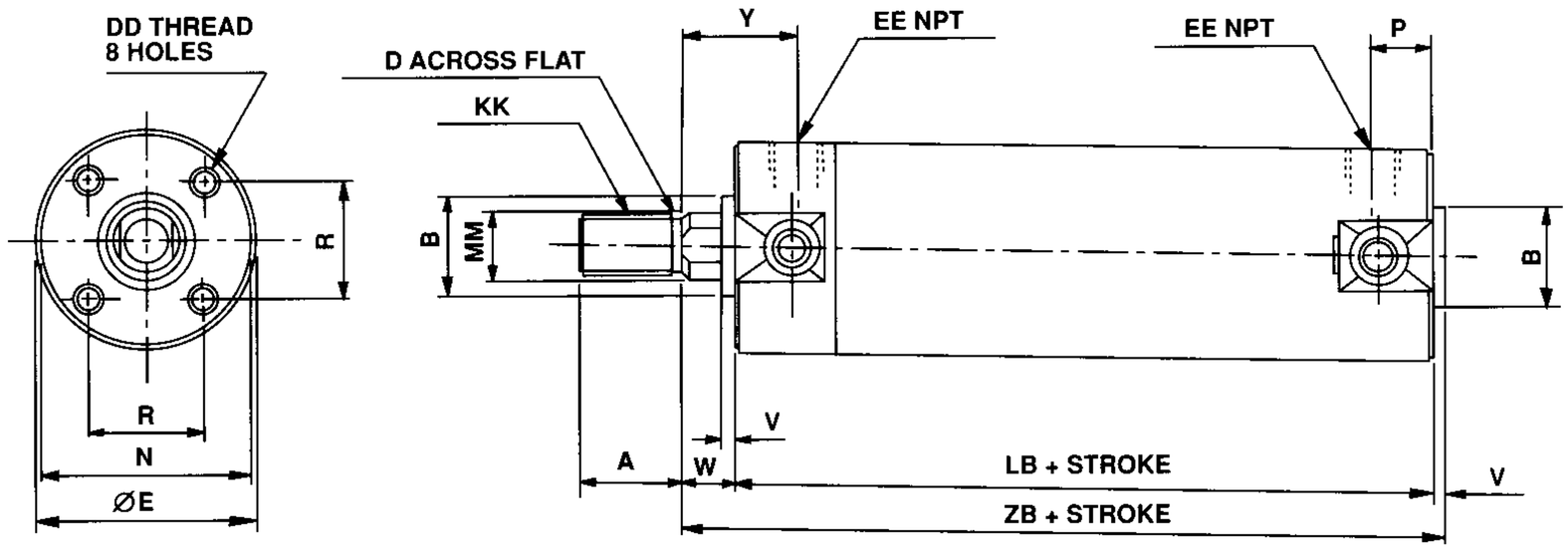
* The material for ø20 and ø25 cylinders is stainless steel

Repair Kits

Bore Size	Bumper Design
20 (3/4")	CG1KN20-PS
25 (1")	CG1KN25-PS
32 (1 1/4")	NCGK033-PS
40 (1 1/2")	CG1KN40-PS
50 (2")	CG1KN50-PS
63 (2 1/2")	CG1KN63-PS

Kit contains: 1 rod seal; 1 piston seal, 2 cylinder tube seals

Double Acting/Non-rotating Dimensions



(Inch)

Bore	Max Std. Stroke	MM	KK	A	B h8	D	DD	E	EE	LB	N	P	R	V	W	Y	ZB
20	8	0.362	1/4-28	0.50	0.472 $^{0}_{-0.0011}$	0.31	8-32 x 0.28	1.02	1/8	2.70	0.94	0.47	0.55	0.08	0.50	0.97	3.28
25	12	0.433	5/16-24	0.50	0.551 $^{0}_{-0.0011}$	0.39	10-32 x 0.30	1.22	1/8	2.70	1.14	0.47	0.65	0.08	0.62	1.09	3.40
32	12	0.551	7/16-20	0.75	0.709 $^{0}_{-0.0011}$	0.47	10-32 x 0.30	1.50	1/8	2.78	1.42	0.43	0.79	0.08	0.88	1.35	3.74
40	12	0.630	7/16-20	0.75	0.984 $^{0}_{-0.0013}$	0.55	1/4-28 x 0.47	1.85	1/8	3.06	1.73	0.47	1.02	0.08	0.88	1.39	4.02
50	12	0.787	1/2-20	0.88	1.181 $^{0}_{-0.0013}$	0.71	5/16-24 x 0.63	2.28	1/4	3.53	2.17	0.51	1.26	0.08	1.19	1.74	4.80
63	12	0.787	1/2-20	0.88	1.260 $^{0}_{-0.0015}$	0.71	3/8-24 x 0.63	2.83	1/4	3.53	2.72	0.51	1.50	0.08	1.19	1.74	4.80

Note) For Long Stroke dimensions refer to page 7.

Double Acting/Double Rod: Series NCGW

Model

Series	Type	Action	Cushion	Piston Packing
NCGW	Non-lube	Dbl. Acting	Rubber cushion	Special packing

Specifications

Fluid	Air
Max. operating pressure	150 PSI (9.9kgf/cm²)
Min. operating pressure	12 PSI (0.8kgf/cm²)
Ambient and fluid temperature	40 ~ 140°F (5 ~ 60°C)
Piston velocity	2~40 in/sec. (50~1000 mm/sec (ø20~ø63) 2~28 in/sec. (50~700mm/sec (ø80, ø100)
*Mounting style	Basic, Axial foot, Rod side, Flange, Rod side trunion

Weight Table

Bore	ø20	ø25	ø32	ø40	ø50	ø63
Basic	0.29	.049	0.73	1.21	2.25	3.02
Foot	0.53	0.77	1.08	1.70	3.31	4.61
Flange	0.46	0.71	1.04	1.65	3.00	4.12
Trunnion	0.31	0.53	0.79	1.32	2.56	3.33
Add'l Weight for Trunnion Brkt.	0.18	0.20	0.37	0.55	0.97	1.76
Add'l Weight Per 1" of Stroke	0.15	0.22	0.29	0.51	0.75	0.84
Add'l Weight with Air Cushion	0.02	0.02	0.04	0.04	0.07	0.07

Calculation method
(Example) NCG1WLN32-0100

- Basic weight..... 1.08 (foot • ø32)
- Additional weight.... .29/1" stroke
- Cylinder stroke..... 0100st

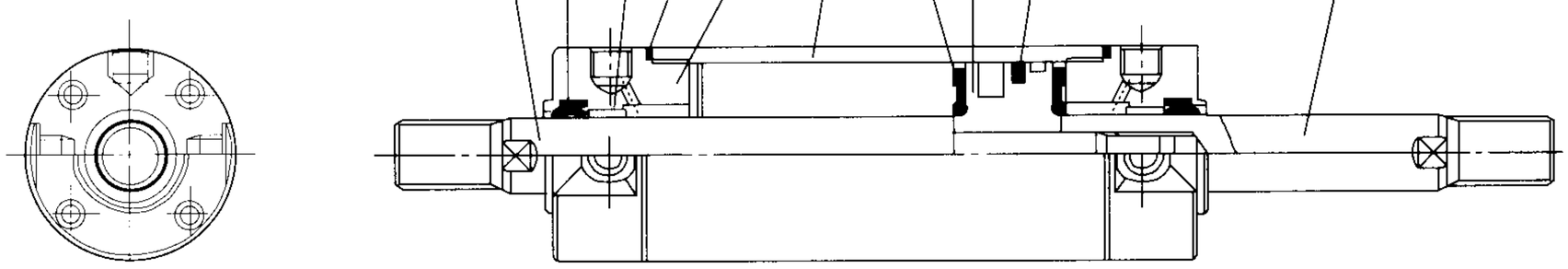
1.08 + .(29 x 1) = 1.37 lbs.

Precautions

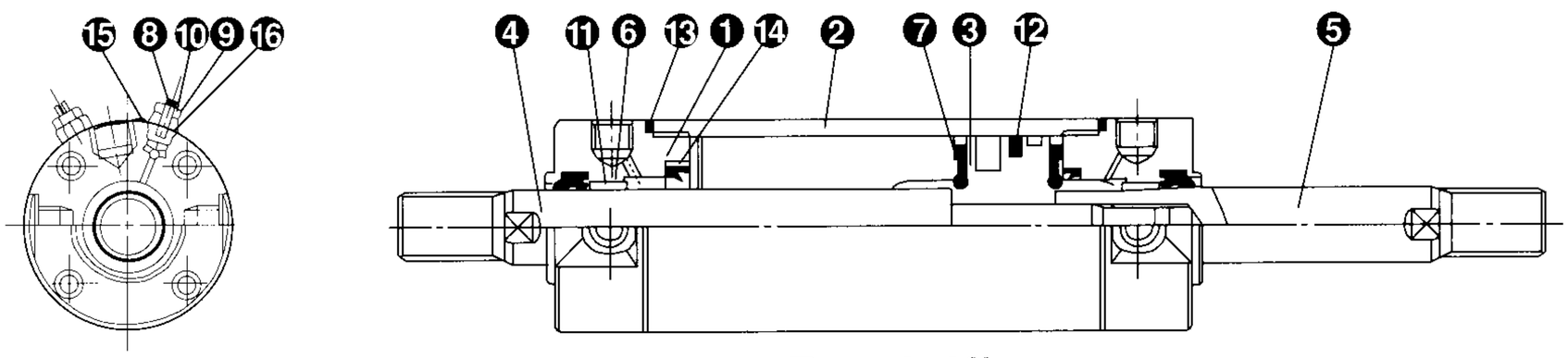
- Flush piping thoroughly before connection in order to prevent dust or chips from entering the cylinder.
- Loads on the piston rod must only be in an axial direction.
- Bending or damaging the piston rod may cause damage to packings and/or leakage.
- To disassemble, hold the wrench flats of the tube cover in a vice. By holding the rod cover wrench flats with a wrench, unscrew counter-clockwise to remove the cover. When re-assembling, tighten the cover an extra 2 inches from the original assembled position. (Bore sizes of ø50 and over may be difficult to disassemble due to the large tightening torque. Please consult SMC when disassembly is required.

Construction/Parts List

Rubber Cushion



Air Cushion



Parts List

No.	Description	Material	Remarks
❶	Rod Cover	Aluminum alloy	Black anodized
❷	Tube Cover	Aluminum alloy	Hard anodized
❸	Piston	Aluminum alloy	Chromate
❹	*Piston Rod A	Carbon steel	Hard Chrome Plating
❺	*Piston Rod B	Carbon steel	Hard Chrome Plating
❻	Bushing	Oil impregnated sintered metal	–
❼	Bumper	Urethane	–
❽	Cushion valve	Rolled steel	Electroless Nickel plating
❾	Valve retainer	Rolled steel	Electroless Nickel plating
❿	Lock nut	Carbon Steel	Nickel plating
⓫	Rod seal	NBR	–
⓬	Pistion seal		–
⓭	Tube seal		–
⓮	Cushion		–
⓯	Valve packing		–
⓰	Gasket for valve retainer		–

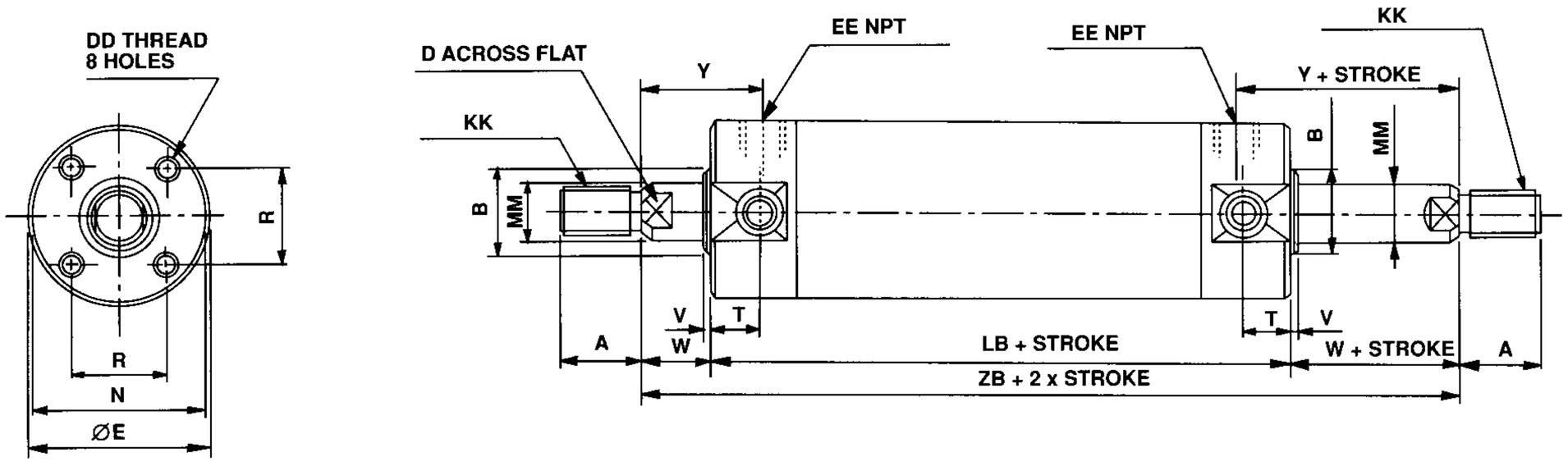
The material of ø20 and ø25 cylinders with auto switch is stainless steel.

Repair Kits

Bore Size	Bumper Design	Air Cushion Design
20 (3/4")	CG1WN20-PS	CG1WA20-PS
25 (1")	CG1WN25-PS	CG1WA25-PS
32 (1 1/4")	CG1WN32-PS	CG1WA32-PS
40 (1 1/2")	CG1WN40-PS	CG1WA40-PS
50 (2")	CG1WN50-PS	CG1WA50-PS
63 (2 1/2")	CG1WN63-PS	CG1WA63-PS

Kit contains: 2 rod seals; 1 piston seal; 2 cylinder tube seals; *2 cushion valve seals (Air cushion design only)

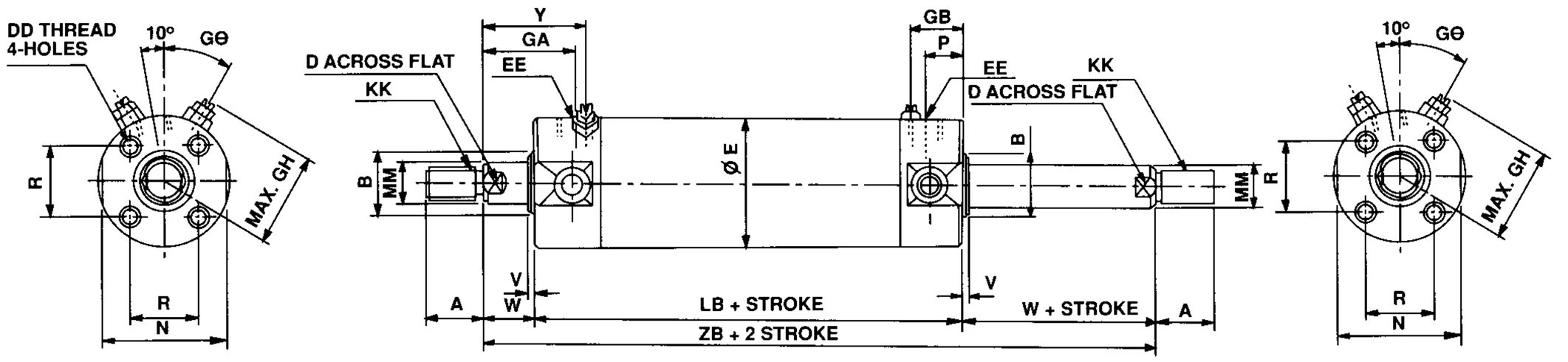
Double Acting/Double Rod Dimensions



Inch

Bore	Max Std. Stroke	MM	KK	A	B	D	DD	E	EE	LB	N	R	T	V	W	Y	ZB
20	14	0.315	1/4-28	0.50	0.472 $^{0}_{-0.0011}$	0.24	8-32 x 0.28	1.02	1/8	3.02	0.94	0.55	0.43	0.08	0.50	0.97	4.02
25	16	0.394	5/16-24	0.50	0.551 $^{0}_{-0.0011}$	0.31	10-32 x 0.30	1.22	1/8	3.02	1.14	0.65	0.43	0.08	0.62	1.09	4.26
32	18	0.472	7/16-20	0.75	0.709 $^{0}_{-0.0011}$	0.39	10-32 x 0.30	1.50	1/8	3.09	1.42	0.79	0.43	0.08	0.88	1.35	4.85
40	31	0.630	7/16-20	0.75	0.984 $^{0}_{-0.0013}$	0.55	1/4-28 x 0.47	1.85	1/8	3.41	1.73	1.02	0.47	0.08	0.88	1.39	5.17
50	47	0.787	1/2-20	0.88	1.181 $^{0}_{-0.0013}$	0.71	5/16-24 x 0.63	2.28	1/4	4.00	2.17	1.26	0.51	0.08	1.19	1.74	6.38
63	47	0.787	1/2-20	0.88	1.260 $^{0}_{-0.0015}$	0.71	3/8-24 x 0.63	2.83	1/4	4.00	2.72	1.50	0.51	0.08	1.19	1.74	6.38

With air cushion



Inch

Bore	Max. Std Stroke	MM	KK	A	B	D	DD	E	EE	GA	GB	GH	GO	LB	N	P	R	V	W	Y	ZB
20	14	0.315	1/4-28	0.50	0.472 $^{0}_{-0.0011}$	0.24	8-32 x 0.28	1.02	10-32UNF	1.05	0.55	0.90	30°	3.02	0.94	0.47	0.55	0.08	0.50	0.97	4.02
25	16	0.394	5/16-24	0.50	0.551 $^{0}_{-0.0011}$	0.31	10-32 x 0.30	1.22	10.32UNF	1.17	0.55	0.98	30°	3.02	1.14	0.47	0.65	0.08	0.62	1.09	4.26
32	18	0.472	7/16-20	0.75	0.709 $^{0}_{-0.0011}$	0.39	10-32 x 0.30	1.50	1/8	1.43	0.51	1.12	25°	3.09	1.42	0.43	0.79	0.08	0.88	1.35	4.85
40	31	0.630	7/16-20	0.75	0.984 $^{0}_{-0.0013}$	0.55	1/4-28 x 0.47	1.85	1/8	1.47	0.55	1.30	20°	3.41	1.73	0.47	1.02	0.08	0.88	1.39	5.17
50	47	0.787	1/2-20	0.88	1.181 $^{0}_{-0.0013}$	0.71	5/16-24 x 0.63	2.28	1/4	1.82	0.59	1.60	20°	4.00	2.17	0.51	1.26	0.08	1.19	1.74	6.38
63	47	0.787	1/2-20	0.88	1.260 $^{0}_{-0.0015}$	0.71	3/8-24 x 0.63	2.83	1/4	1.82	0.59	1.87	20°	4.00	2.72	0.51	1.50	0.08	1.19	1.74	6.38

NCG Options Compatibility Chart

	D	K	W	A	XC6	XB6	XB7	XB9	XC37
Standard	Y	Y	Y	Y	Y	Y	Y	Y	Y
Auto-Switch Capable (D)	\\	Y	Y	Y	Y*	NA	NA	Y	Y
Non-Rotating (K)		\\	N.STD	NA	***	NA	NA	NA	NA
Double Rod (W)			\\	Y	Y	Y	Y	NA	Y
Air Cushion (A)				\\	Y	**	NA	NA	Y
Stainless Steel Rod (XC6)					\\	Y	Y	Y	Y
High Temperature (XB6)						\\	NA	NA	Y
Low Temperature (XB7)							\\	NA	Y
Low Speed (XB9)								\\	NA
High Speed (XC37)									\\

* Stainless steel rod is standard on ø20 and ø25 bores autoswitch capable cylinders. Available on all bore sizes.

** Air cushion and high temperature available on ø40, ø50, and ø63 bores only, not available on ø20, ø25, and ø32.

*** Stainless steel rod is standard on ø20 and ø25 bore, and not available on ø32, ø40, ø50 and ø63.

LEGEND	
Y	Yes, available
NA	Not available
N.STD	Not Standard

Port Orifice Size (mm)

		XC37 Std.		XC37 Long Stroke	
Bore	**Standard**	**Rod End**	**Cap End**	**Rod End**	**Cap End**
20	2.1	5	4	5	5
25	2.5	5	4.5	5	5
32	3.3	6	5	6	6
40	3.9	7	5	7	7
50	4.5	9	7	9	9
63	5.7	9	7	9	9

Made To Order NCG Options

High Temperature Resisting Cylinder

NCG (Mounting style) (Type) (Bore) – (Stroke) –XB6

The cylinder seals have been changed to heat-resistant material for use under high-temperature conditions of up to 300°F.

Specifications

Bore(mm)	ø20, ø25, ø32, ø40, ø50, ø63	
Action	Double acting	
Fluid	Air	
Ambient temperature range	~4~+300°F (-20~+150°C)	
Pistion velocity	2~20in/sec (50~500mm/sec)	
Cushion	ø20, ø25, ø32	Type:N=w/out cushion
	ø40, ø50, ø63	Type:A=Air cushion
Material	Seals - fluorocarbon rubber Wear ring- Resin	
Lubrication	Fluoroplastics grease	
Mounting styles	Basic, Axial foot, Rod side flange, Head side flange, Rode side trunnion head side trunnion, Single Clevis, Dbl. Clevis, Nose	

Major dimensions are the same as that of the double acting single rod, and no auto switch can be attached. Air cushions available on ø40, ø50, & ø63 bores only.

Low Temperature Resisting Cylinder

NCG (Mounting style) N (Bore) – (Stroke) –XB7

The cylinder seals have been changed to cold-resistant material for use under low-temperature conditions of down to -22°F.

Specifications

Bore (mm)	ø20,ø25, ø32, ø40
Action	Double acting
Fluid	Air
Ambient temperature range	-22 ~ 158°F (-30 ~ +70°C)
Pistion Velocity	2 ~ 20in/sec (50 ~ 500mm/sec)
Cushion	No
Material	Seals: Low nitrile rubber Wear ring: Resin
Lubrication	Fluoroplastics grease
Mounting style	Basic, Axial foot, Rod side flange, head side flange, Rod side trunnion, Head side trunnion, Clevis

Major dimensions are the same as that of the double acting single rod, and no auto switch can be attached.

Low Speed Cylinder

NCG (Mounting style) N (Bore) – (Stroke) –XB9

There is no stick-slip phenomenon at a low-speed drive of 10 ~ 50mm/sec, and all strokes drive at a constant speed smoothly.

Specifications

Bore (mm)	ø20, ø25, ø32, ø40, ø50, ø63
Action	Double acting
Fluid	Air
Max. operating pressure	140PSI (9.9 kgf/cm²)
Min. operating pressure	8 PSI (0.5 kgf/cm²)
Pistion velocity	.4 ~ 2in/sec (10 ~ 50mm/sec)
Mounting style	Basic, Axial foot, Rod side flange, Head side flange, Rod side trunnion, Head side trunnion, Clevis

Major dimensions are the same as that of the double acting single rod, and auto switches can be attached.

Stainless Piston Rod

NCG (Mounting style) (Type) (Bore) – (Stroke) –XC6

NCGW (Mounting style) (Type) (Bore) – (Stroke) –XC6

This is used for enhanced corrosion resistance in wet environments.

Specifications

Bore (mm)		ø20, ø25, ø32, ø40, ø50, ø63
Action		Double acting
Piston Rod & Rod end nut material		Stainless steel
Max. operating pressure		140 PSI (9.9 kgf/cm²)
Min. operating pressure	Single rod	8 PSI (0.5 kgf/cm²)
	Dbl. rod	11 PSI (0.8 kgf/cm)
Piston velocity		2~40in/sec (50~1000mm/sec)
Mounting style		Basic, Axial foot, flange, trunnion

Major dimensions are the same as that of the double acting single rod or double rod, and auto switches can be attached.

Stroke Adjustment (Extend) Series: NCG-XC8

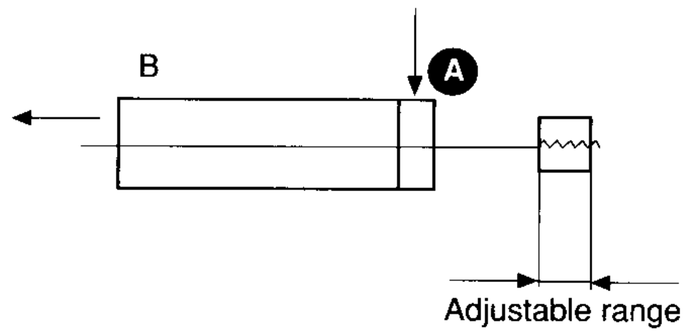
NCG [Mounting Style] **N** [Bore]—[Stroke] [Adjustment range (A or B)] **—XC8**

The extend stroke of the cylinder can be adjusted by the stop collar at the head side from full stroke 0~1inch or 0~2 inch.

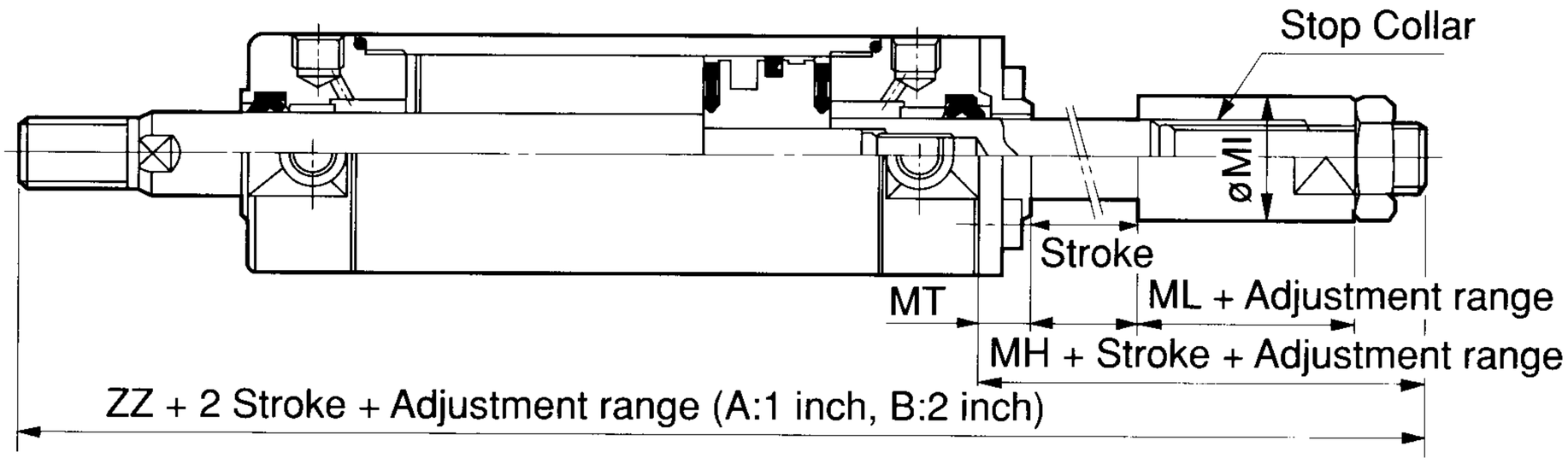
Specifications

Bore (mm)	ø20, ø25, ø32, ø40, ø50, ø63
Action	Double Acting
Fluid	Air
Max. operating pressure	140 PSI (9.9kgf/cm²)
Min. operating pressure	11 PSI (0.8kgf/cm²)
Piston velocity	Out stroke:2~20 in/sec Return stroke:2~40 in/sec
Cushion	Rubber cushion
Ambient and fluid temperature	40 ~ 140°F (5~60°C)
Stroke adjustment system	Stopper adjustment
Stroke adjustment range (Adjustment symbol)	A: 0~1 inch B: 0~2 inches
Mounting Style	Basic type, Axial foot type, Rod side flange, Rod side trunnion Head side trunnion, Nose mount

Note) Seal Kit is the same as that of the Double rod (W) option on page 19.



Construction · Major Dimensions



(inch)

Bore (mm)	MH	øMI	ML	MT	ZZ
20	1.50	0.59	0.73	0.35	5.52
25	1.65	0.79	0.77	0.43	5.79
32	1.73	0.79	0.77	0.43	6.45
40	1.85	0.98	0.89	0.43	6.89
50	2.40	1.38	1.20	0.43	8.47
63	2.40	1.38	1.20	0.51	8.47

Other dimensions are the same as for the NCG cylinder. (See page 9)

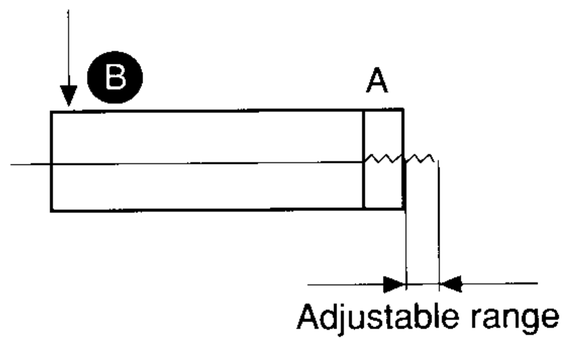
Stroke Adjustment (Retract) Series: NCG-XC9

NCG [Mounting Style] **N** [Bore]—[Stroke] [Adjustment range (A or B)] — **XC9**

The retract stroke of the cylinder can be adjusted from 0~1 inch or 0~2 inches with the adjusting bolt.

Specifications

Bore (mm)	ø20, ø25, ø32, ø40, ø50, ø63
Action	Double Acting
Fluid	Air
Max. operating pressure	140 PSI (9.9kgf/cm²)
Min. operating pressure	7 PSI (0.5kgf/cm²)
Piston velocity	Return stroke:2~20 in/sec Out stroke:2~40 in/sec
Cushion	Rubber cushion
Ambient and fluid temperature	40 ~ 140°F (5~60°C)
Stroke adjustment system	Adjusting bolt
Stroke adjustment range	A: ~ 1 inches B: ~ 2 inches
Mounting Style	Basic type, Axial foot type, Rod side flange, Head side flange, Rod side trunnion, Head side trunnion, Nose Mount

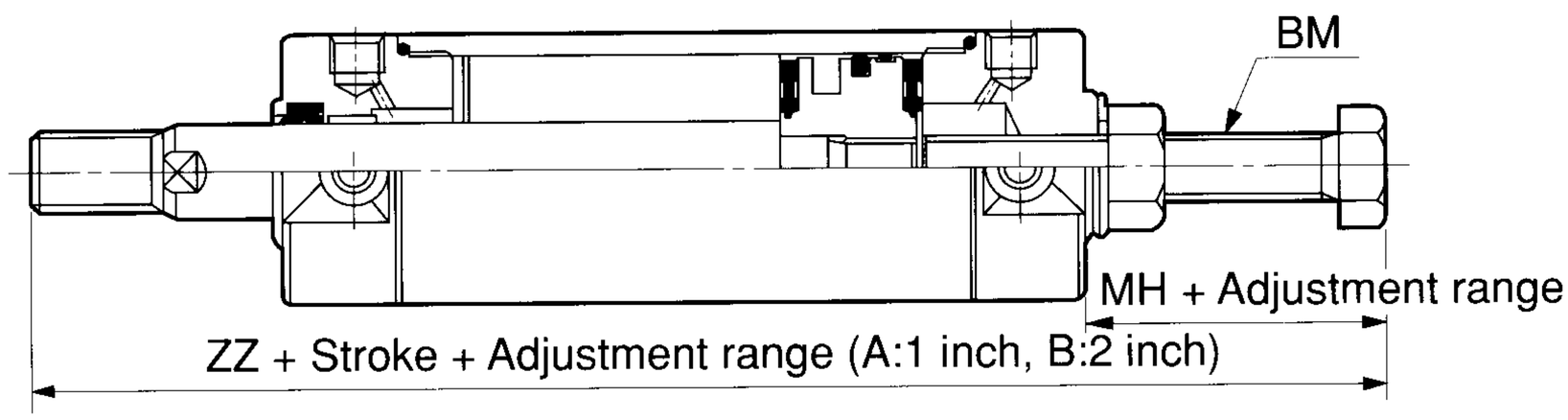


Note) Seal kit is the same as that of the Single rod kit on page 17. Adjustment thread seal sold separately.

Thread Seal Part #

ø20	7500 - 10	**ø40**	7500 - 3/8
ø25	7500 - 10	**ø50**	7500 - 1/2
ø32	7500 - 5/16	**ø63**	7500 - 5/8

Construction • Major Dimensions



(inch)

Bore (mm)	BM	MH	ZZ
20	No. 10-24 UNC	0.59	4.61
25	No. 10-24 UNC	0.59	4.73
32	5/16-18 UNC	0.92	5.64
40	3/8-16 UNC	1.09	6.13
50	1/2-13 UNC	1.44	7.51
63	5/8-11 UNC	1.52	7.59

Other dimensions are the same as for the NCG cylinder. (See page 9).

Dual Stroke Series: NCG-XC10

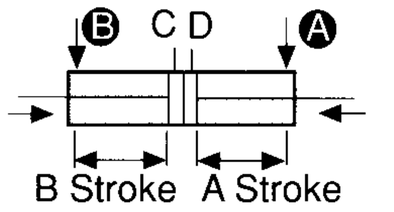
NCG [Mounting Style] **N** [Bore] — [Stroke A] + [Stroke B] — **XC10**

Two cylinders are constructed as one cylinder in a back-to-back configuration allowing the cylinder stroke to be controlled in three steps. Four positions are possible.

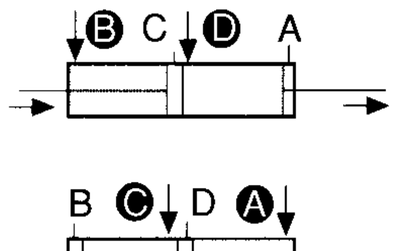
Specifications

Bore (mm)	ø20, ø25, ø32, ø40, ø50, ø63
Action	Double Acting
Fluid	Air
Max. operating pressure	140 PSI (9.9kgf/cm²)
Min. operating pressure	7 PSI (0.5kgf/cm²)
Piston velocity	2 inches ~ 40 inches/sec
Cushion	Rubber cushion
Ambient and fluid temperature	40 ~ 140°F (5~60°C)
Mounting Style	Basic type, Axial foot type, Flange type, Trunnion type

Note) Seal kit is the same as Qty. 2 single rod kits on page 17.

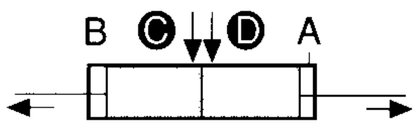


When air pressure is supplied to ports **A** and **B**, both **A** and **B** strokes retract.



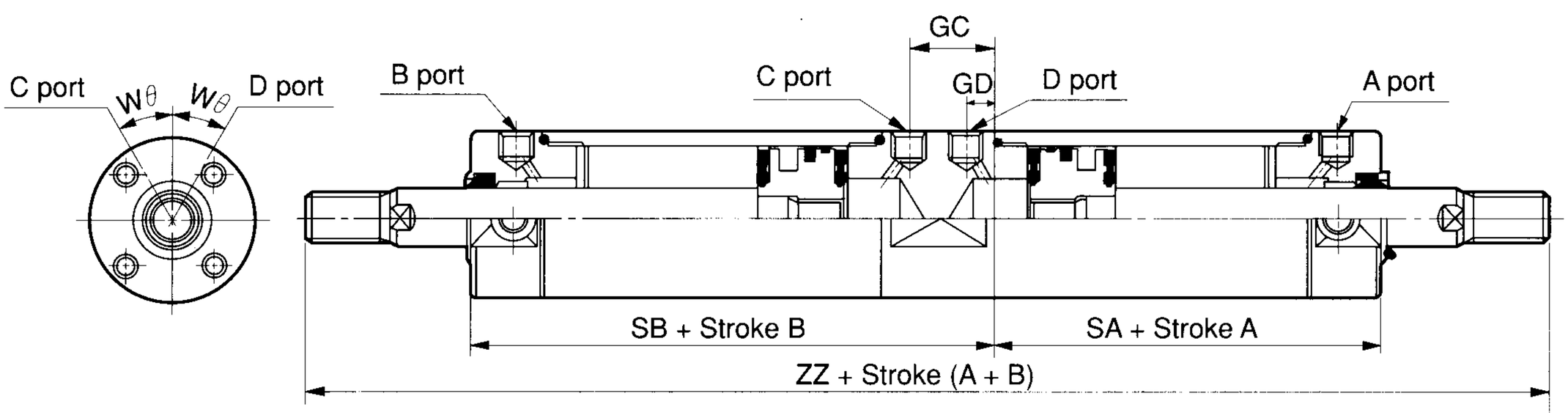
When air pressure is supplied to ports **B** and **D**, **A** stroke extends.

When air pressure is supplied to ports **A** and **C**, **B** stroke extends.



When air pressure is supplied to ports **C** and **D**, both strokes **A** and **B** extend.

Construction · Major Dimensions



(inch)

Bore (mm)	GC	GD	SA	SB	Wθ	ZZ
20	0.75	0.28	2.27	3.29	30°	7.56
25	0.75	0.28	2.27	3.29	30°	7.80
32	0.83	0.28	2.35	3.45	30°	9.06
40	0.91	0.28	2.62	3.80	20°	9.68
50	1.06	0.43	3.02	4.51	20°	11.67
63	1.06	0.43	3.02	4.51	20°	11.67

Other dimensions are the same as for the NCG cylinder. (See page 9)

3 Position Tandem Series: NCG-XC11

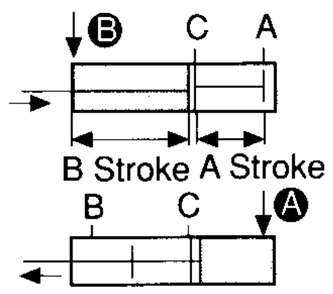
NCG [Mounting Style] **N** [Bore] — [Stroke A] + [Stroke B-A] **— XC11**

Two cylinders in tandem without connected piston rods allow 3 positions to be obtained when actuating in the proper sequence.

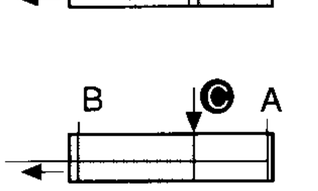
Part Number Example:
B Mount, 20 Bore
Stroke A = 3"
Stroke B = 5"
B-A = 2"
NCGBN 20 — 0300 + 0200 — XC11

Specifications

Bore (mm)	ø20, ø25, ø32, ø40, ø50, ø63
Action	Double Acting
Fluid	Air
Max. operating pressure	140 PSI (9.9kgf/cm²)
Min. operating pressure	7 PSI (0.5kgf/cm²)
Piston velocity	2 inches ~ 40 inches/sec
Cushion	Rubber cushion
Ambient and fluid temperature	40 ~ 140°F (5~60°C)
Stroke range	ø20: ~ 8 inches ø25 ~ ø63: ~ 12 inches
Mounting Style	Basic type, Axial foot type, Rod side flange, Head side flange, Rod side trunnion, Head side trunnion, Clevis

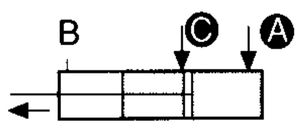


When air pressure is supplied to the **B** port, both **A** and **B** strokes retract.



When air pressure is supplied to the **A** port, the rod extends out equal to stroke **A**.

When air pressure is supplied to the **C** port, the rod extends an additional distance equal to the length of **B** - **A** stroke.

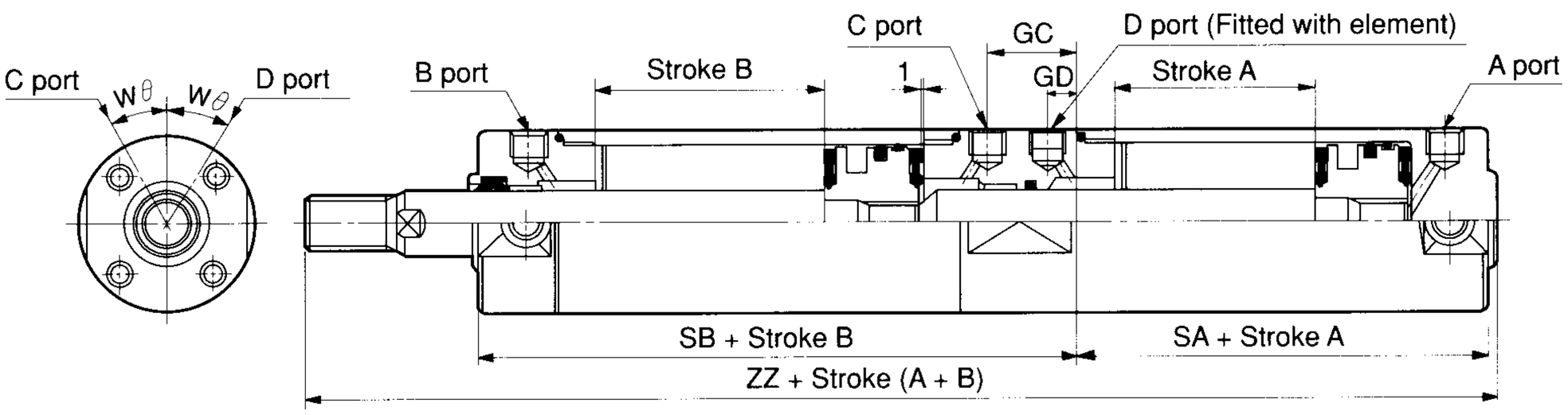


When air pressure is supplied to both ports **A** and **C**, double output force is obtainable in the range of the A stroke length.

Seal Kit Part Numbers

CG1N □ - PS - XC11
└ Bore Size

Construction · Major Dimensions



(inch)

Bore (mm)	GC	GD	SA	SB	Wθ	ZZ
20	0.75	0.28	1.95	3.33	30°	6.36
25	0.75	0.28	1.95	3.33	30°	6.48
32	0.83	0.28	2.03	3.49	30°	7.23
40	0.91	0.28	2.27	3.84	20°	7.82
50	1.06	0.43	2.54	4.55	20°	9.24
63	1.06	0.43	2.54	4.55	20°	9.24

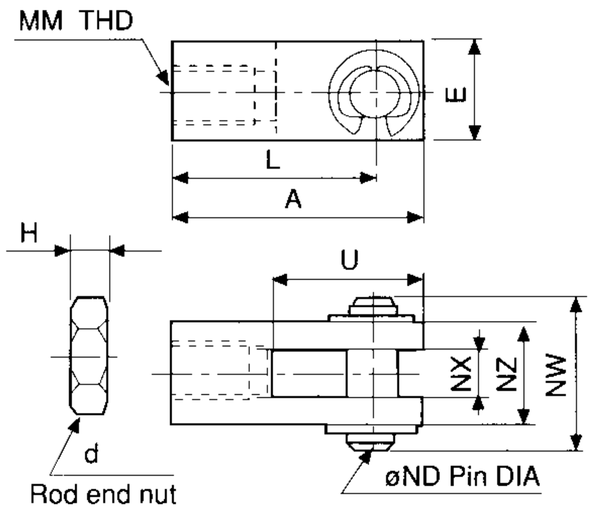
Other dimensions are the same as for the NCG cylinder.
(See page 9)

Accessories

Piston Rod Clevis

Inch

Part No.	Bore mm	A	d	E	H	L	MM	ND	NX	NW	NZ	U
NY-075	20	1.19	1/4-28UNF	0.51	0.16	0.94	1/4-28UNF	0.25	0.25	0.71	0.51	0.69
NY-106	25	1.19	5/16-24UNF	0.51	0.19	0.94	5/16-24UNF	0.25	0.25	0.71	0.51	0.69
NY-125	32 • 40	1.69	7/16-20UNF	0.75	0.25	1.32	7/16-20UNF	0.38	0.38	1.02	0.75	0.94
NY-G050	50 • 63	1.69	1/2-20UNF	0.75	0.31	1.32	1/2-20UNF	0.38	0.38	1.02	0.75	0.94

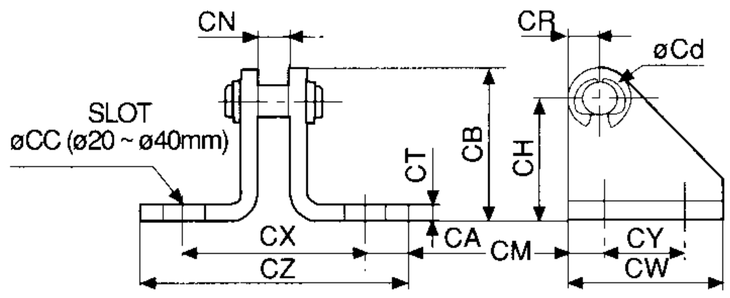


Single Clevis Bracket

Inch

Part No.	Bore mm	CA	CB	CC	Cd	CH	CM	CN	CR	CT	CX	CW	CY	CZ
NCG-PC020	20 & 25	0.35	1.18	0.27	0.25	0.87	0.18	0.38	0.31	0.12	1.25	1.10	0.75	1.95
NCG-PC032	32	0.35	1.18	0.27	0.25	0.87	0.18	0.50	0.31	0.12	1.37	1.10	0.75	2.07
NCG-PC040	40	0.36	1.75	0.27	0.38	1.38	0.25	0.63	0.37	0.18	1.87	1.50	1.00	2.60
NCG-PC050	50	0.44	1.75	0.76	0.38	1.38	0.25	0.75	0.37	0.24	2.12	1.50	1.00	3.00
NCG-PC063	63	0.44	2.12	0.26	0.38	1.75	0.25	0.75	0.37	0.24	2.12	1.50	1.00	3.00

Note) Includes clevis pin and two retaining rings.

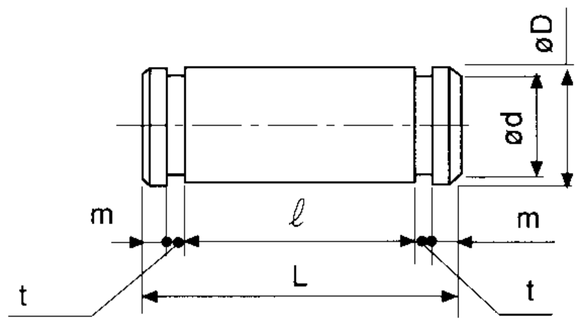


Single Clevis Pin

Inch

Part No.	Bore mm	øD	L	ød	ℓ	m	t
NCG-SP020	20	0.25	0.83	0.21	0.65	0.06	0.03
NCG-SP025	25	0.25	0.83	0.21	0.65	0.06	0.03
NCG-SP032	32	0.25	0.98	0.21	0.76	0.08	0.03
NCG-SP040	40	0.38	1.24	0.30	1.00	0.08	0.04
NCG-SP050	50	0.38	1.50	0.30	1.24	0.09	0.04
NCG-SP063	63	0.38	1.50	0.30	1.24	0.09	0.04

Note) Includes two retaining rings.

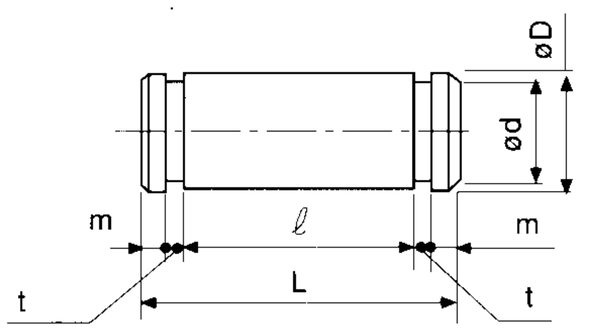


Double Clevis Pin

Inch

Part No.	Bore mm	øD	L	ød	ℓ	m	t
NCD-G02	20	0.315	1.71	0.30	1.52	0.06	0.04
NCD-G025	25	0.394	1.89	0.38	1.68	0.06	0.05
NCD-G03	32	0.472	2.34	0.45	2.12	0.06	0.05
NCD-G04	40	0.551	2.81	0.53	2.56	0.08	0.05
NCD-G05	50	0.630	3.38	0.60	3.13	0.08	0.05
NCD-G06	63	0.709	4.15	0.67	3.85	0.10	0.05

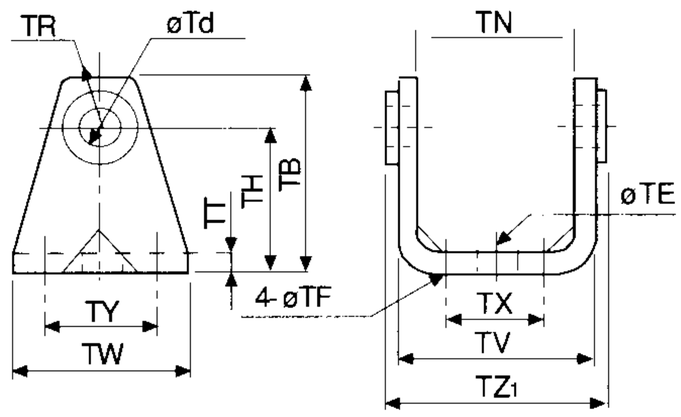
Note) Includes two retaining rings.



Trunnion Bracket and Double Clevis Bracket

Inch

Part No.	Bore mm	TB	øTd	øTE	øTF	TH	TN	TR	TT	TV	TW	TX	TY	TZ
NCG-P020	20	1.42	0.315	0.39	0.22	0.98	1.14	0.51	0.12	1.39	1.65	0.63	1.10	1.50
NCG-P025	25	1.69	0.394	0.39	0.22	1.18	1.30	0.59	0.12	1.55	1.65	0.79	1.10	1.65
NCG-P032	32	1.97	0.472	0.39	0.27	1.38	1.57	0.67	0.18	1.93	1.89	0.87	1.10	2.10
NCG-P040	40	2.28	0.551	0.39	0.27	1.57	1.93	0.83	0.18	2.28	2.20	1.18	1.18	2.53
NCG-P050	50	2.75	0.630	0.79	0.35	1.97	2.36	0.91	0.24	2.83	2.52	1.42	1.42	3.10
NCG-P063	63	3.23	0.709	0.79	0.43	2.36	2.91	0.98	0.31	3.54	2.91	1.81	1.81	3.80



Rod Jam Nut

Inch

Part No.	Bore mm	B	C	A	D
JM-025	20	0.50	0.16	0.44	1/4-28 UNF
JM-03	25	0.58	0.19	0.50	5/16-24 UNF
JM-045	32, 40	0.79	0.26	0.69	7/16-20 UNF
JM-05	50, 63	0.87	0.32	0.75	1/2-20 UNF