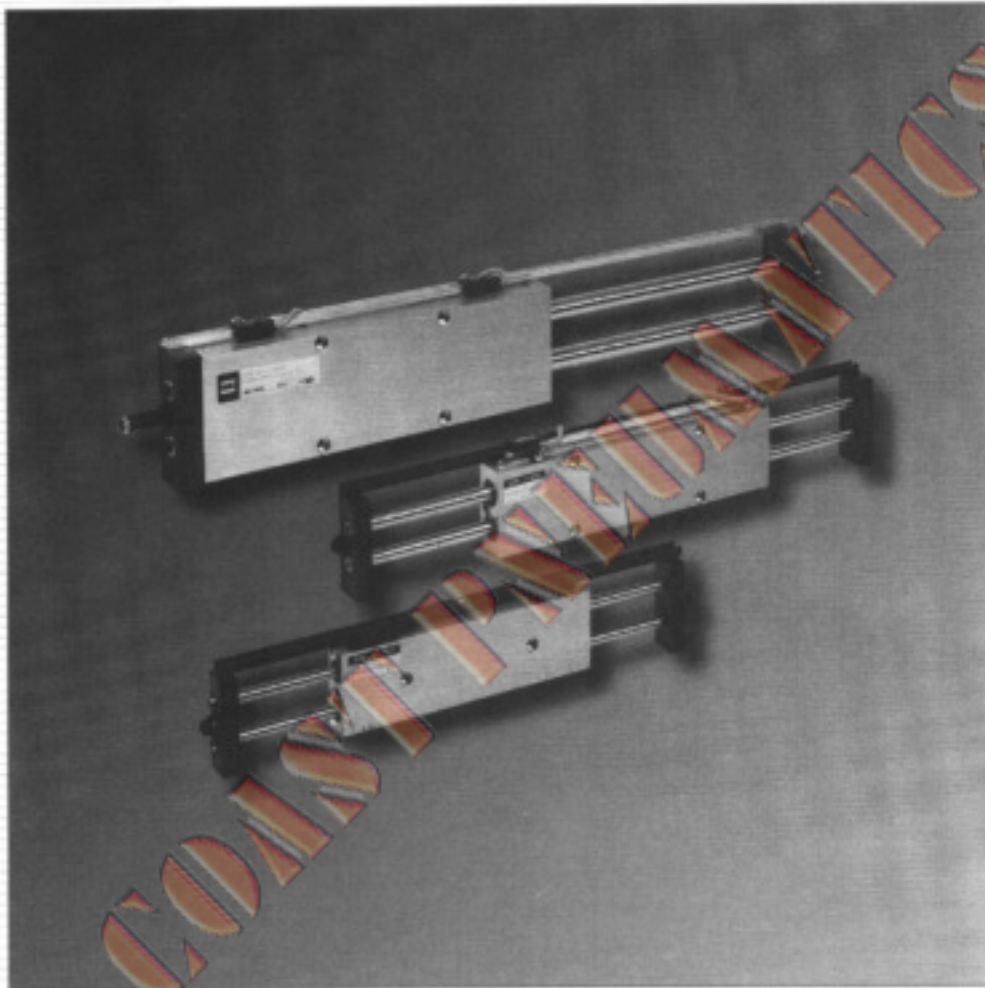


Air Cylinder

NCX2 Series

Slide Unit



Highly Accurate Positioning
Dual Mounting Options
Wide Stroke Range (1" ~ 8")
Auto Switch Mounts on Housing or End Plate
Stroke Adjustment is Standard

Highly accurate positioning. Ideal for robotic applications.

● Can use shock absorber to absorb impulse and noise
adjustment bolt standard

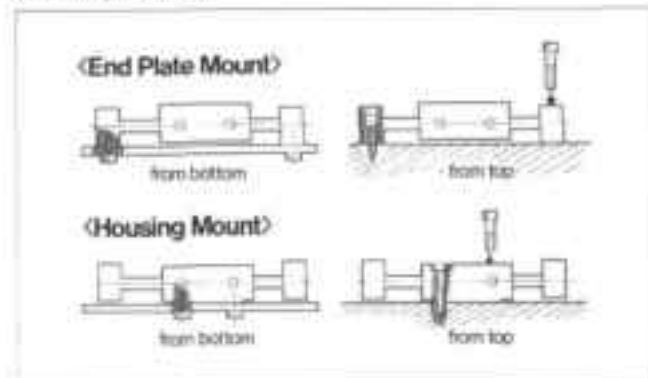
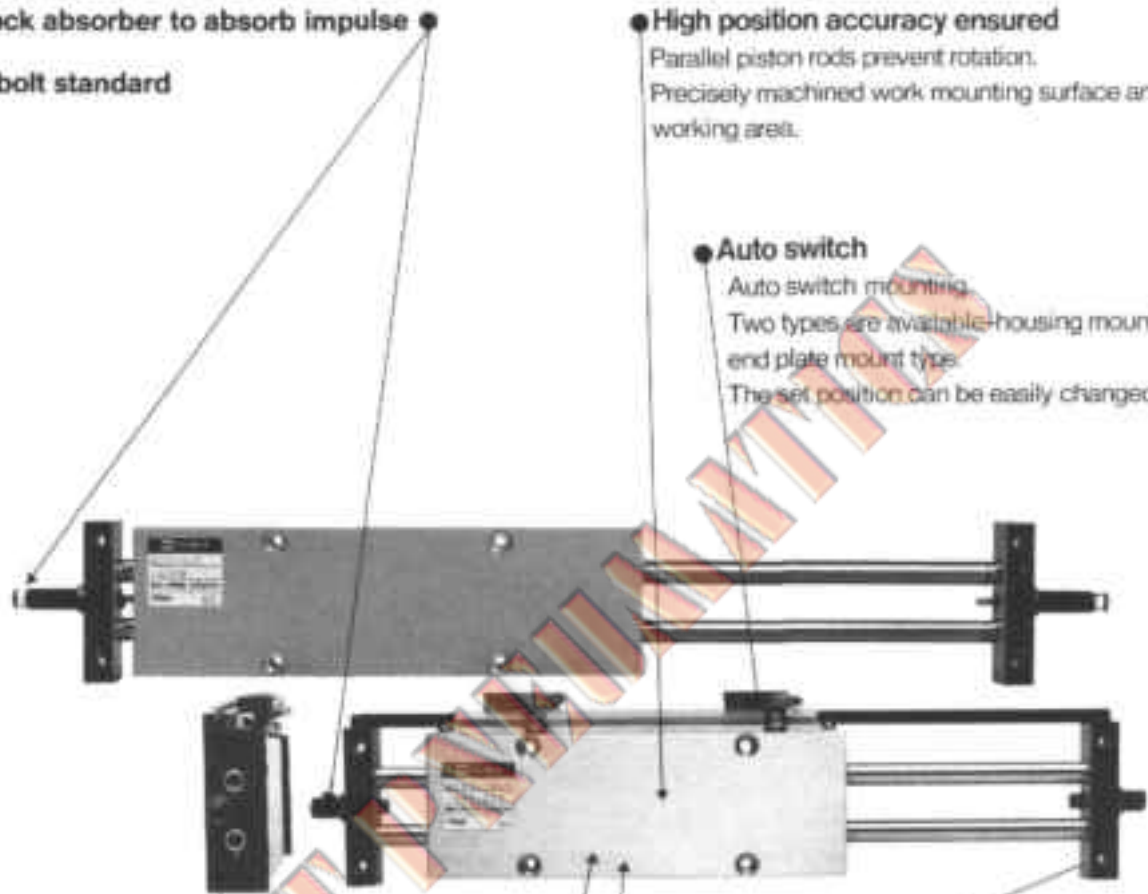
● High position accuracy ensured
Parallel piston rods prevent rotation.
Precisely machined work mounting surface and cylinder working area.

● Auto switch
Auto switch mounting.
Two types are available—housing mount type and end plate mount type.
The set position can be easily changed.

● Space saving compact design
Thin design.
Low profile.
Designed to minimize space requirements.

● Either the housing or the plate can be fixed, depending upon your application.
Mount by fastening with bolts either at top or bottom.
Three piping ports are available, depending upon the mounting method.

● Wide stroke range



How To Order



NCX2 N Bore Stroke

Series • Slide Unit

Type •

- N — Non-lube type
- H — Air-hydro type (except $\varnothing 10$) Special order only

• Bore mm(inch) — Stroke(inch)

Bore mm(inch)			Stroke	
10 (3/8)	15 (5/8)	25 (1)	Code	inch
●	●	●	100	1
●	●	●	200	2
●	●	●	300	3
●	●	●	400	4
●	●	●	500	5
●	●	●	600	6
●	●	●	700	7
●	●	●	800	8

- Stroke adjustment
 - With adjustment bolts (std.)
- B — With shock absorbers
- BC — With Cap type shock absorbers
- BS — With one shock absorber
- BCS — With one Cap type shock absorber

With Auto Switch Capability



NC DB X2 N Bore Stroke A73

Version •

Type •

Auto Switch Capable Cylinder •

- DB — Auto Switch/Housing mount
- DP — Auto Switch/End plate mount

• Bore - Stroke (mm)-(inch)

Stroke adjustment •

- With adjustment bolts (std.)

- B — With shock absorbers
- BC — With Cap type shock absorbers
- BS — With one shock absorber
- BCS — With one Cap type shock absorber

• Auto Switch Suffix
<Number of Auto Switch>
— 2 pcs.
S — 1 pc.

• Auto Switch Type
— Without auto switch

Reed Switch

A72	D-A72	Housing mount End plate mount
A73	D-A73	
A80	D-A80	
A73C	D-A73C	
A80C	D-A80H	
A72H	D-A72H	
A73H	D-A73H	
A78H	D-A78H	
A80H	D-A80H	
E73A	D-E73A	
E76A	D-E76A	
E80A	D-E80A	

Solid State

F79	D-F79	3 Wire NPN	Housing Mount $\varnothing 15, \varnothing 25$
F79V	D-F79V		
F79TL	D-F79TL		
F7P	D-F7P	3 Wire PNP	
F7PV	D-F7PV		
F7PW	D-F7PW		
F79V	D-F79V	2 Wire	End Plate Mount $\varnothing 10, \varnothing 15, \varnothing 25$
J79W	D-J79W		
F7BAL	D-F7BAL		
J79C	D-J79C	Connector	
F79F	D-F79F	4 Wire NPN	
F7LF	D-F7LF		

* Suffix L for lead wire exceeding 10 ft. (3m) length.
(Ex.) 73L-D-73L
Note: 3m lead standard on D-F7BAL & D-F7NTL.

Applicable Shock Absorbers

Slide Unit	Shock Absorber/Cap Type
NCX2N10	NRB031-025/NRBCO31-025
NCDBX2N10	
NCDPX2N10	
NCX2N15	NRB031-025/NRBCO31-025
NCDBX2N15	
NCDPX2N15	
NCX2N25	NRB050-030/NRBC050-030
NCDBX2N25	
NCDPX2N25	

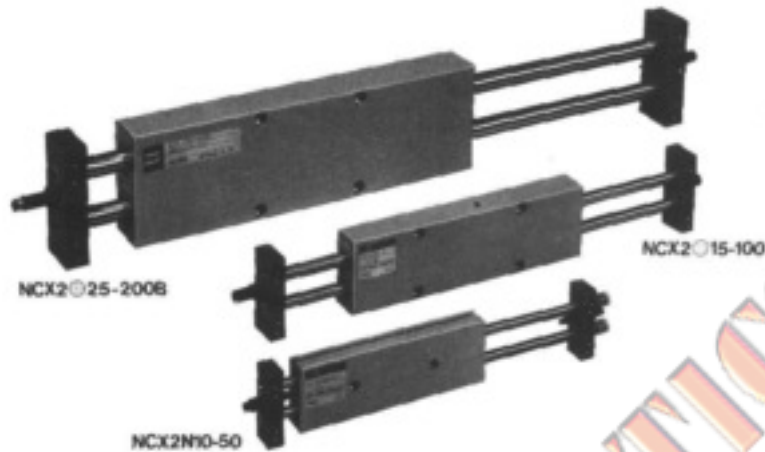
To Order Switch Rail Separately

Model	Bore	Part No.	Switch Mounting Kit A7*, A8*, F7*, J7*
NCDBX2	10	RCBX10-○	NCD-M3
NCDBX2	15	RCBX15-○	
NCDBX2	25	RCBX25-○	
NCDPX2	10	RCPX10-○	
NCDPX2	15	RCPX15-○	
NCDPX2	25	RCPX25-○	

○ = specify stroke (ex: 100=1", 200=2", etc.)
includes two mounting screws

Slide Unit Series NCX2

ORDER
ONLINE



Specifications

Type		Non-lube type	Air-hydro type**
Fluid		Air	LP Oil
Proof pressure		220PSI(15kgf/cm ²)	
Max. operating pressure		140PSI(9.9kgf/cm ²)	
Min. operating pressure	NCX2N10	22PSI(1.5kgf/cm ²)	—
	NCX2-15	22PSI(1.5kgf/cm ²)	
	NCX2-25	15PSI(1kgf/cm ²)	
Ambient and operating fluid temperature		40~140°F(5~60°C)	
Piston speed		1.2 8.0inch/sec	See list below
Cushion		Optional shock absorber available	
Stroke adjustment range		+0.08 ~ -1.00inch of standard stroke	
(*) Max. load	NCX2N10	2.2lb(1kgf)	
	NCX2-15	6.6lb(3kgf)	
	NCX2-25	13.2lb(6kgf)	
Non-rotating accuracy at zero extension	NCX2N10	±0.1°	
	NCX2-15	±0.04°	
	NCX2-25	±0.02°	

* Please position the center of gravity of the load and the slide unit as close as possible. If this is not possible, contact SMC Representative.

**Special order only.

Standard Stroke List

Model	Standard stroke (inch)							
	1	2	3	4	5	6	7	8
NCX2N10	●	●	●	●	—	—	—	—
NCX2-15	●	●	●	●	●	●	●	●
NCX2-25	●	●	●	●	●	●	●	●

Theoretical Cylinder Force

Model	Rod dia inch(mm)	Pressure area inch ² (cm ²)	Operating pressure							
			30	50	80	100	120	140	150	
NCX2N10	0.24(6)	0.16(1.01)	4.8	8.0	12.8	16.0	19.2	22.4	24.0	
NCX2-15	0.31(8)	0.40(2.07)	12.0	20.0	32.0	40.0	48.0	56.0	60.0	
NCX2-25	0.55(14)	0.91(5.97)	27.3	45.5	72.8	91.0	109	127	136	

Piston Speed/Air-Hydro Type

Model	End plate mounted	Housing mounted
NCX2H15	*	0.2~2 inch/sec
NCX2H25	0.2~1.6 inch/sec	0.2~4 inch/sec

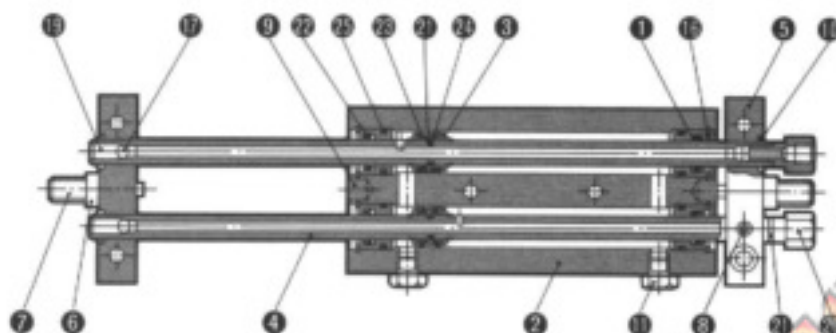
* Plate type in low pressure hydraulic operation allows low speed piston speed only due to internal flow restriction.

Weight Chart

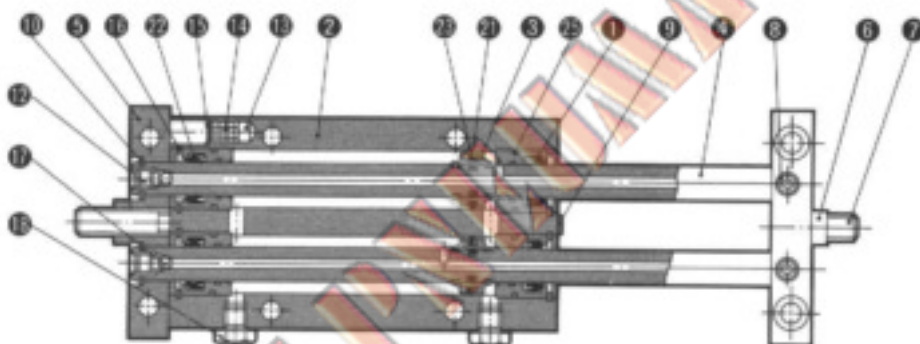
Model	Standard stroke (inch)								lbs
	1	2	3	4	5	6	7	8	
NCX2N10	0.44	0.56	0.67	0.78	—	—	—	—	
NCX2-15	0.53	0.76	1.02	1.27	1.51	1.76	2.00	2.24	
NCX2-25	2.05	2.53	3.00	3.49	3.98	4.44	5.07	5.42	

Construction

NCX2N10



NCX2O15
NCX2O25



Parts List

No.	Description	Material	Note
1	Rod cover	Aluminum bearing alloy	
2	Housing	Aluminum alloy	Hard alumite
3	Piston	Aluminum alloy	Chromate
4	Piston rod	Carbon steel	Hard chromium plating
5	Plate	Aluminum alloy	Black hard alumite
6	Lock nut	Carbon steel	Black zinc chromate
7	Adjusting bolt	Chromium steel	Black zinc chromate
8	Set screw (for fixing rod)	Chromium steel	Black zinc chromate
9	Pin	Hi-carbon chromium bearing steel	Hardened
10	Retaining ring	Carbon tool steel	Black zinc chromate
11	Plug	Brass	
12	Blank plug	Chromium steel	Black zinc chromate
13	Magnet	Rare-earth magnet	
14	Spring	Stainless steel	
15	Retaining ring	Carbon tool steel	
16	Retaining ring	Carbon tool steel	Nickel plate

Parts List

No.	Description	Material	Note
1	Steel ball	Hi-carbon chromium bearing steel	
2	Socket	Carbon steel	Electroless plating
3	Gasket	NBR	

Seals List

No.	Description	Material	Kit Qty.	Seal Kit
1	Rod Seal	NBR	4	NCX2N10-PS
2	Piston Seal		4	
3	Piston Gasket		0	NCX2N25-PS
4	Cylinder tube gasket		4	

Note: 2 Piston Seals on 15 & 25 Bores

Applicable Cylinder & Switch Type

Mounting	Bore inch (mm)	Switch	Indicator light	Electrical entry	
Housing	0.4 (ø10)	D-E70A	○	Grommet (length of lead wire: 1.5 ft (0.5m) standard, 10 ft (3m) option)	
		D-E80A	—		
		D-A7	○		
	0.6 (ø15)	D-A8	—		
		1.0 (ø25)	D-F7		○
			D-J7		○
End plate	0.4 (ø10)	D-A7	○		
	0.6 (ø15)	D-A8	—		
	1.0 (ø25)	D-F7	○		
		D-J7	○		

Auto Switch Specifications

Model Number	Load Voltage	Load Current	Normally Open	Protection Circuit	Application
D-A72-A72H	200VAC	5 - 10mA	○	No	Relay, PLC
D-A73 D-A73H D-E73A	24VDC	5 - 40mA	○	No	
	100VAC	5 - 25mA	○	No	
D-A80 D-A80H D-E80A	24VAC/VDC or less	Max. 50mA	○	No	IC Circuit, Relay, PLC
	48VAC/VDC	Max. 40mA			
	100VAC/VDC	Max. 20mA			
D-A76H D-E76A	4-8VDC	Max. 20mA	○	No	IC Circuit
D-A73C	24VDC	5 - 40mA	○	No	Relay, PLC
D-A80C	24VAC/VDC or less	Max. 50mA	○	No	IC Circuit, Relay, PLC
Response time	1.2 ms				
Shock rating	30G				
Temperature range	40 - 140° F (5 - 60°C)				

Always use the correct protection box for induction load, or 110VAC, or length of lead wire exceeding 10ft (3m).

Solid State Type

Model Number	Type	Power Source	Load Voltage	Load Current	Application
D-F7S	3 Wire NPN	5, 12, 24VDC (4.5-28VDC)	28VDC or less	Max. 40mA	IC Circuit, Relay, PLC
D-F7P	3 Wire PNP		—	Max. 80mA	
D-J7S	2 Wire	—	24VDC (10-28VDC)	5 - 40mA	24VDC Relay, PLC
D-F7W	3 Wire NPN	5, 12, 24VDC (4.5-28VDC)	28VDC or less	Max. 40mA	IC Circuit, Relay, PLC
D-F7PV	3 Wire PNP				
D-F7BV	2 Wire	—	24VDC (10-28VDC)	5 - 150mA	24VDC Relay, PLC
D-F7PW	3 Wire PNP	5, 12, 24VDC (4.5-28VDC)	—	Max. 80mA	IC Circuit, Relay, PLC
D-J7W	2 Wire	—	24VDC (10-28VDC)	5 - 40mA	24VDC Relay, PLC
D-F7BAL	2 Wire	—	24VDC (10-28VDC)	5 - 40mA	24VDC Relay, PLC
D-J7C	2 Wire	—	24VDC (10-28VDC)	5 - 40mA	
D-F7LF	4 Wire NPN	24VDC (20-28VDC)	28VDC or less	Max. 40mA	
D-F7NF		5, 12, 24VDC (4.5-28VDC)	28VDC or less	Max. 40mA	IC Circuit, Relay, PLC
D-F7NTL	3 Wire NPN	5, 12, 24VDC (4.5-28VDC)	28VDC or less	Max. 80mA	IC Circuit, Relay, PLC
Response time	1 ms or less				
Shock Rating	50G				
Insulation	50MΩ or more at 500VDC (between case and cable)				
Temperature range	14 - 140° F (-10 - 60°C)				

Contact Protection Box

D-A7, D-A8, D-E7, & D-E8 type switches have no built-in contact protection circuit. Use this box for induction load; 16ft (5m) or more lead wire length, or 110VAC.

Part No.	Operating voltage	Length of lead wire
CD-P11	110VAC 220VAC	Switch connection side 1.5ft (0.5m)
CD-P12	24VDC	Switch connection side 1.5ft (0.5m)

D-A8 and D-E8 type switches are used for 110VAC or less, since there is no voltage limitation, you can select a suitable model for your needs.

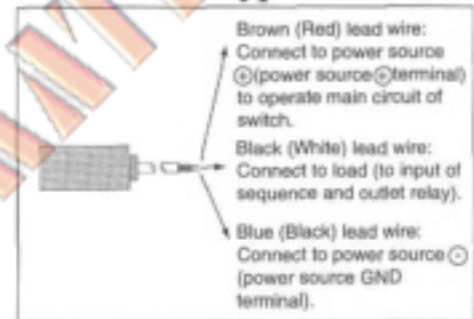
Operating Instructions

- Reed switches which have indicator lights are polarized (light emitting diodes). Brown (red) lead wire is (+), and Blue (black) lead wire is (-). When connection is reversed, switch will operate, but indicator light will not go on.
- Electrical current should be kept within the operating current range. When used at current levels less than the operating current range, the indicator light will not turn on, and if operated in excess of the operating current range, the indicator light will be damaged.
- Switch types 72 and 73 can be connected in parallel, but series connections cause large voltage drops due to the internal resistance in the LED. (Approx. 2V/switch).

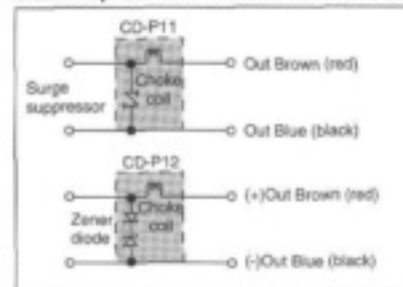
Mounting

- Always connect switch to load before turning on power.
- When shipping, please avoid dropping, nicks, and excessive shock.
- Avoid use in magnetically contaminated areas.
- Prevent repeated bending of wires.

Switch Connection/ Solid State Type

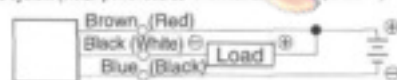


Contact protection box/Internal circuit



Solid State Wiring Method

3 wire system (When power source for switch and load is common)



3 wire system (When power source for switch and load is not common)



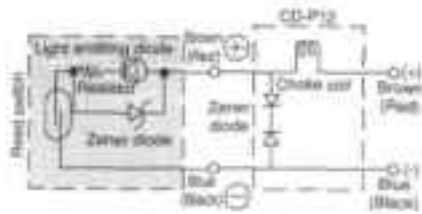
2 wire system



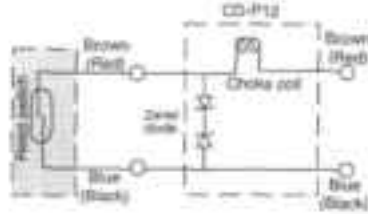
- Brown (Red) lead wire: Connect to the power source ⊕ (power source terminal) to operate main circuit of switch. In case of 2 wire systems connect with ⊖ side of load.
- Black (White) lead wire: Connect to load (to the input of sequence controller and outlet relay)
- Blue (Black) lead wire: Connect to the power source ⊖.

Switch Circuit

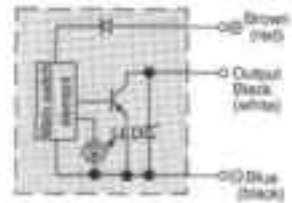
D-A73, D-A73H, D-A73C



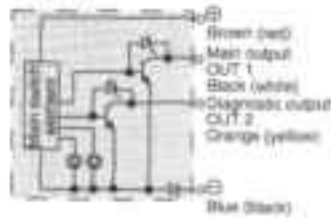
D-A80, D-A80H, D-A80C



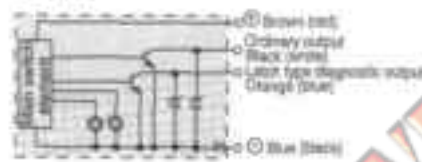
D-F7NTL, D-F7NV,
D-F79 (Solid state type)



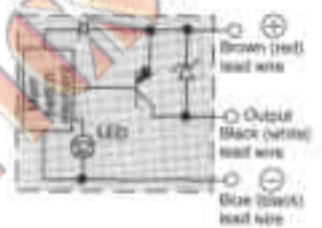
D-F79F



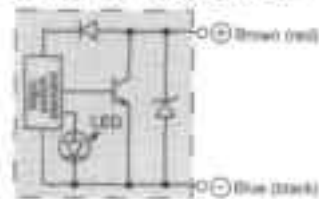
D-F7LF



D-F7P, D-F7PV



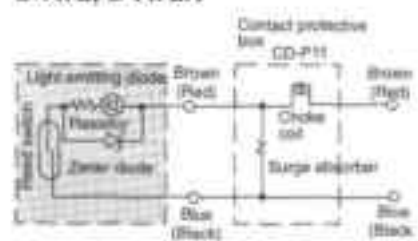
D-J79, D-J79C, D-F7BV



D-F7BAL, D-J79W



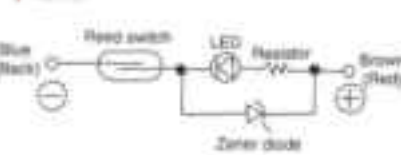
D-A72, D-A72H



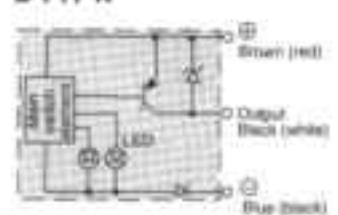
D-E80A



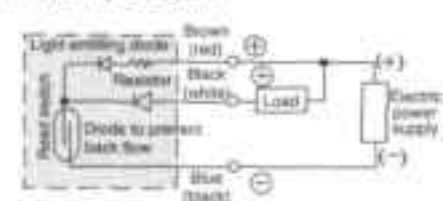
D-E73A



D-F7PW

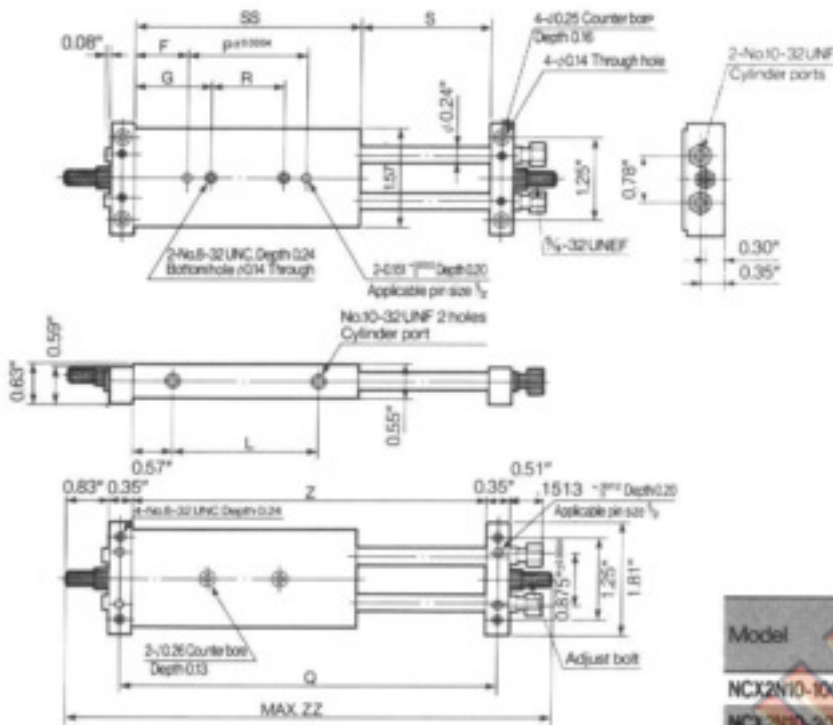


D-A76H, D-E76A



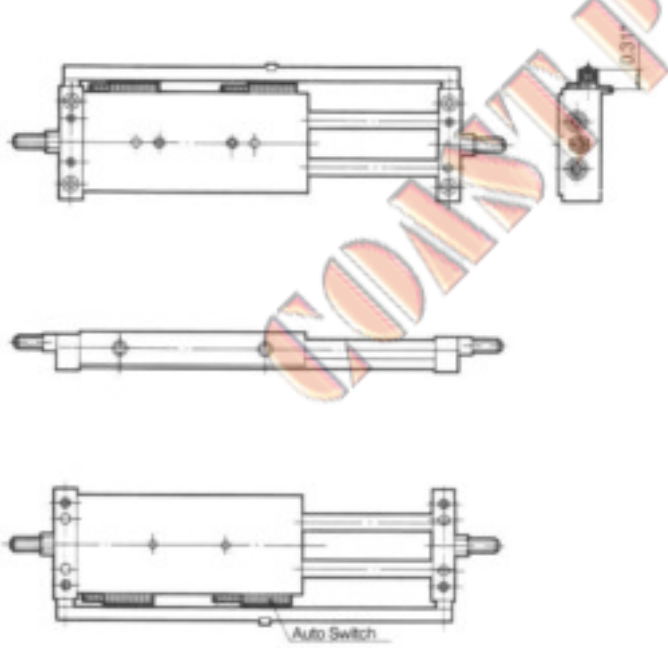
NCX2N10-Stroke/Dimensions

asic type

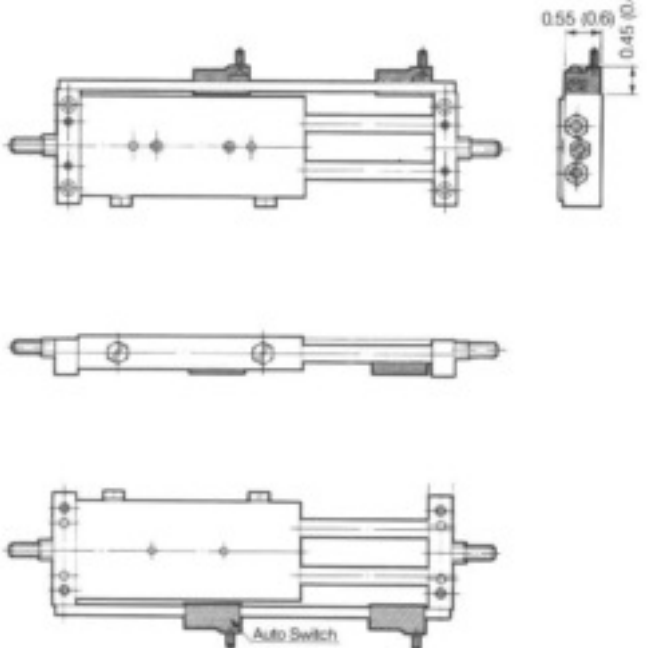


Model	F	G	L	P	Q	R	S	SS	Z	Adjust bolt ZZ
NCX2N10-100	0.73	0.98	1.55	1.25	4.13	0.75	1.08	2.70	3.78	6.14
NCX2N10-200	1.23	1.48	2.55	1.25	6.13	0.75	2.08	3.70	5.78	8.14
NCX2N10-300	1.10	1.35	3.55	2.50	8.13	2.00	3.08	4.70	7.78	10.14
NCX2N10-400	1.60	1.85	4.55	2.50	10.13	2.00	4.08	5.70	9.78	12.14

With Auto switch, Housing mount type: NCDBX2N10-Stroke



With Auto switch, End plate mount type: NCDPX2N10-Stroke



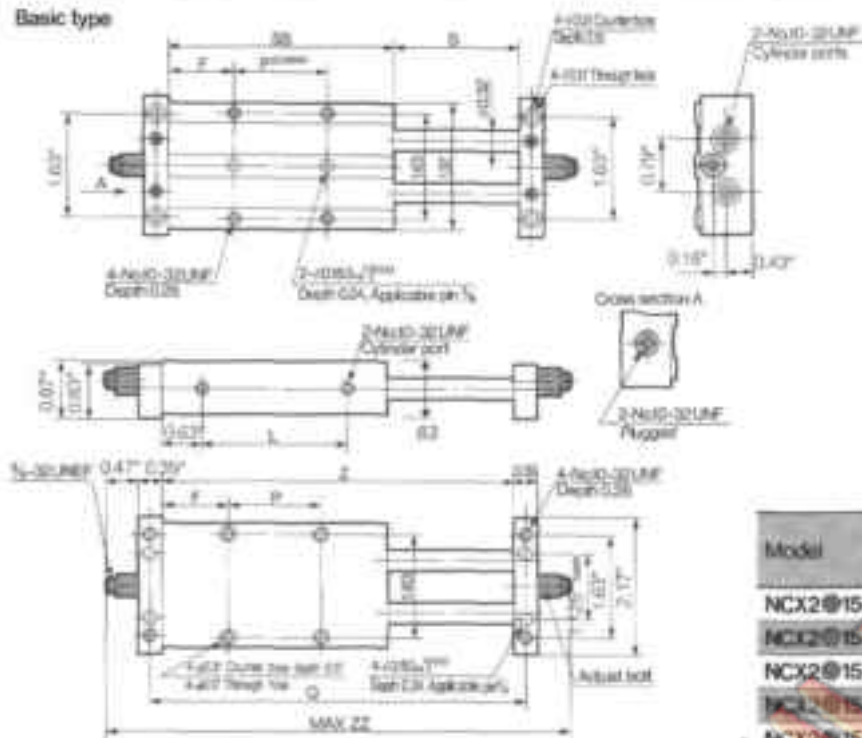
Note: This diagram is for D-E7 or D-E8 type.

Note: This diagram is for D-A7 or D-A8 type.
() : Dimension with D-F7 or D-J7 type.

NCX2 15 Stroke Dimensions

inch

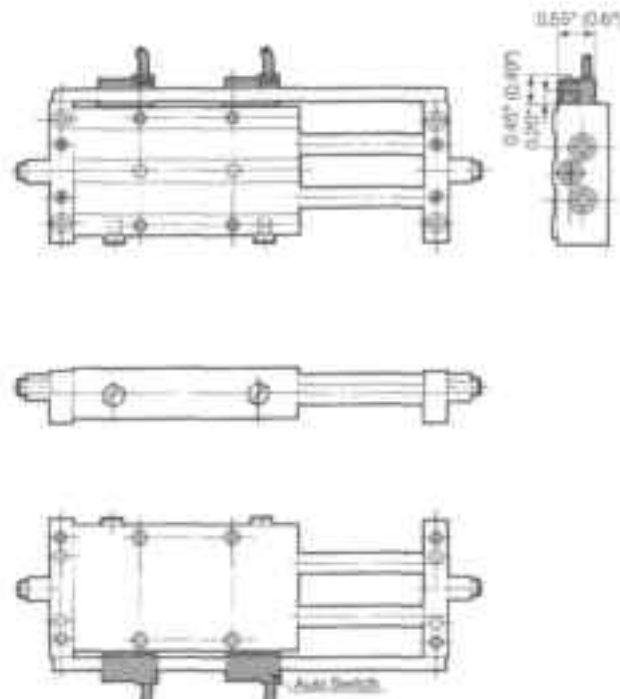
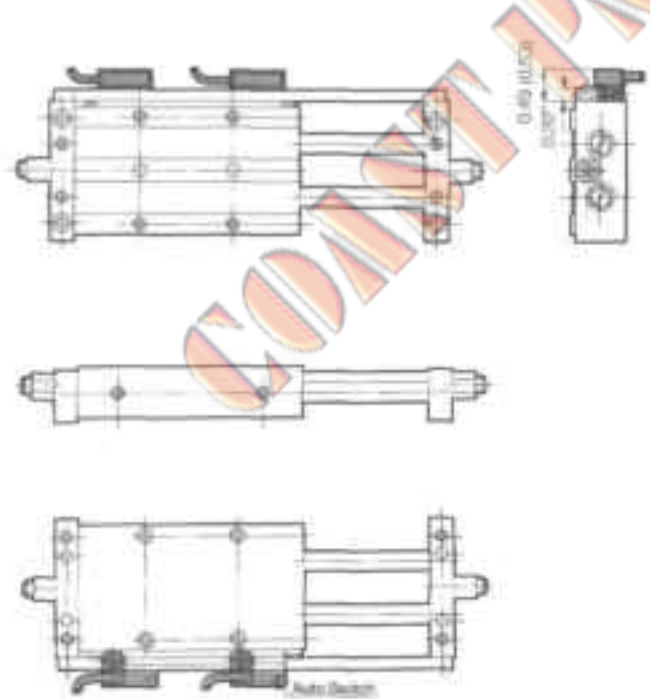
Basic type



Model	P	L	P	O	S	SS	Z	Actual bot ZZ
NCX2@15-300	1.02	1.52	0.75	4.25	1.08	2.78	3.88	5.98
NCX2@15-300	1.14	2.32	1.50	6.25	2.08	3.76	5.80	7.88
NCX2@15-300	1.63	3.52	1.50	8.25	3.08	4.78	7.86	9.98
NCX2@15-400	1.30	4.52	3.00	10.25	4.08	5.78	9.86	11.98
NCX2@15-500	1.89	5.52	3.00	12.25	5.08	6.78	11.88	13.98
NCX2@15-600	2.39	6.52	3.00	14.25	6.08	7.78	13.88	15.98
NCX2@15-700	2.89	7.52	3.00	16.25	7.08	8.78	15.86	17.98
NCX2@15-800	3.39	8.52	3.00	18.25	8.08	9.78	17.88	19.98

With Auto switch, Housing mount type: NCDBX2 15 Stroke

With Auto switch, End plate mount type: NCDPX2 15 Stroke



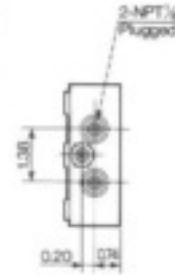
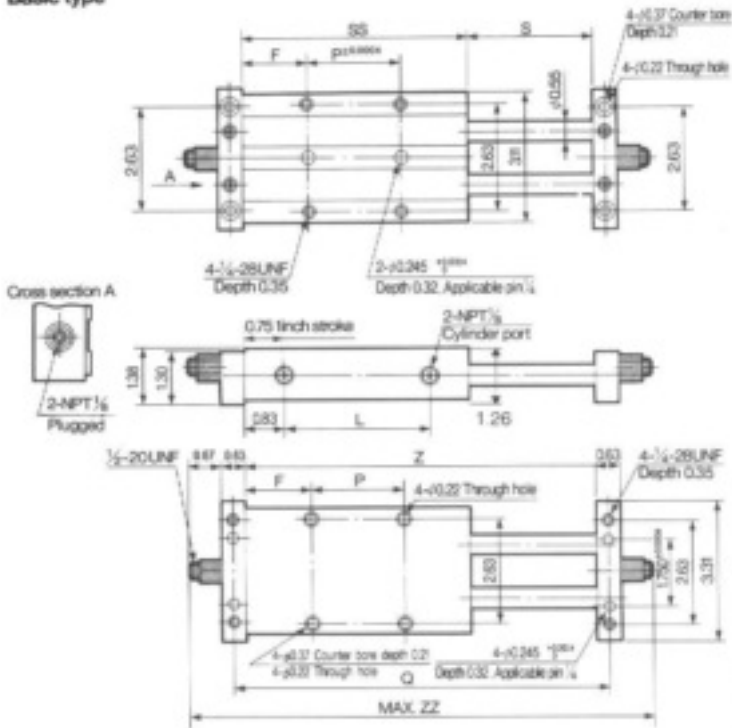
Note: This diagram is for D-A7 or D-A8 type () with D-F7 or D-J7 type.

Note: This diagram is for D-A7 or D-A8 type () with D-F7 or D-J7 type.

NCX2 25—Stroke/Dimensions

inch

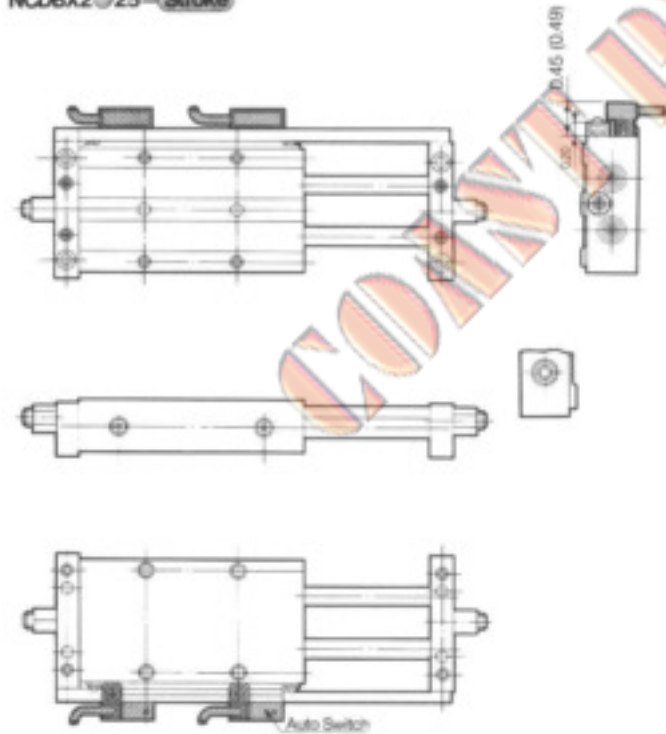
Basic type



Model	F	L	P	Q	S	SS	Z	Adjust bolt ZZ
NCX2 25-100	1.15	1.80	1.00	5.00	1.08	3.29	4.37	6.97
NCX2 25-200	1.15	2.64	2.00	7.00	2.08	4.29	6.37	8.97
NCX2 25-300	1.65	3.64	2.00	9.00	3.08	5.29	8.37	10.97
NCX2 25-400	1.65	4.94	3.00	11.00	4.08	6.29	10.37	12.97
NCX2 25-500	2.15	5.64	3.00	13.00	5.08	7.29	12.37	14.97
NCX2 25-600	2.65	6.64	3.00	15.00	6.08	8.29	14.37	16.97
NCX2 25-700	3.15	7.64	3.00	17.00	7.08	9.29	16.37	18.97
NCX2 25-800	3.65	8.64	3.00	19.00	8.08	10.29	18.37	20.97

With Auto switch, Housing mount type:

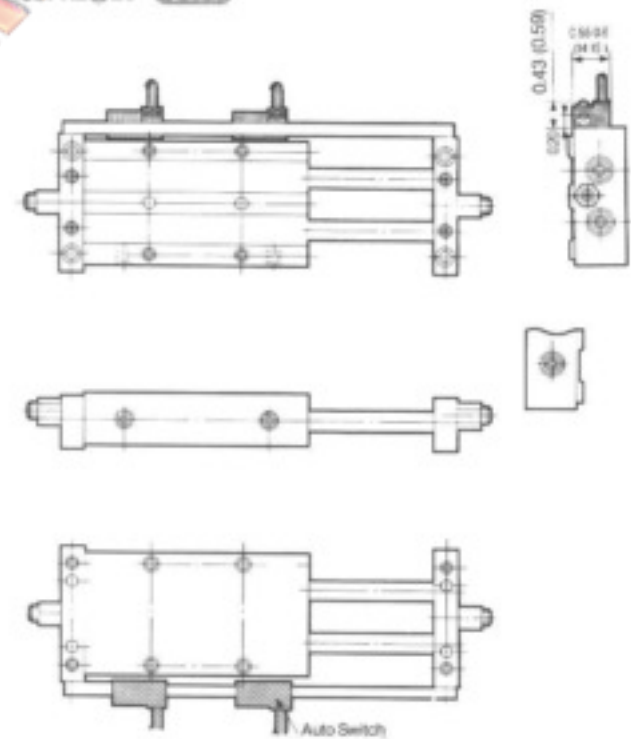
NCDBX2 25—Stroke



Note: This diagram is for D-A7 or D-A8 type.
() with D-F7 or D-J7 type.

With Auto switch, End plate mount type:

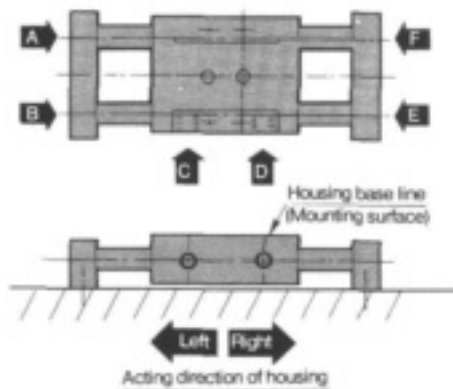
NCOPX2 25—Stroke



Note: This diagram is for D-A7 or D-A8 type.
() with D-F7 or D-J7 type.

Acting Direction For Each Pressure Port

Acting directions of housing when end plate area is fixed.



Pressure port	A	B	C	D	E	F
Acting direction of housing	Right	Left	Left	Right	Left	Right

* 9 piping patterns are available.

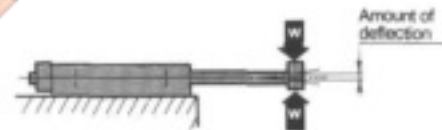
Piston Rod Deflection (Reference Factor)

For a concentrated load at the center of housing.



Model	Load (lb)	Stroke (inch)		Deflection $\times 10^{-3}$ inch	
		4	8	4	8
NCX2N10	2	2.8	5.6	2.8	5.6
NCX2@15	6	3.2	6.4	3.2	6.4
NCX2@25	13	3.2	6.4	3.2	6.4

For a concentrated load at the center of the end plate.



Model	Load (lb)	Stroke				Deflection $\times 10^{-3}$ inch			
		2	4	6	8	2	4	6	8
NCX2N10	0.5	2.4	11.8	—	—	2.4	11.8	—	—
NCX2@15	1.0	3.5	8.7	14.7	39.4	3.5	8.7	14.7	39.4
NCX2@25	2.0	1.2	3.5	6.3	9.8	1.2	3.5	6.3	9.8

Note: Values are the total amount of vertical deflection.

Operating Instructions

- When plumbing, pipe and fittings should be thoroughly flushed with clean air before connecting.
- Please use filtered compressed air.
- Please avoid scratches, nicks, etc. on the sliding surface area of the piston rod. These are liable to cause damage to seals, resulting in air leakage.
- Prevent nicks, scratches, etc. on housing mounting area and plate mounting area of both sides. Such damage will affect the flatness of the mounting area.
- When mounting housing, take care not to bend or distort the piston rod. This can cause high operating friction and promote wear of the bearing area, leading to inaccuracy and air leakage.
- Always tighten the lock-nut to prevent loosening after adjusting the stroke on either end.
- No lubrication is required, however, if required, use turbine oil #1 (ISO VG32). Machine oil or spindle oil is not recommended.

<Air-Hydro type>

- L.P. Oil: Use turbine oil #1 (ISO VG 32) or equivalent. Machine oil or spindle oil is not recommended.
- Prevent entrapment of air when supplying oil. The air-hydro type has no built-in air relief valve, therefore, port connection should be loosened before operation to bleed air.

Limited Cylinder Warranty—Terms and Conditions of Sale...

SMC Pneumatics, Incorporated (SMC) warrants that for 18 months or 1800 service miles*, whichever occurs first, from date of purchase it will replace, or make adjustment at SMC's option, of any defective cylinder product sold if the cylinder product is returned with SMC's prior written consent, transportation prepaid by the original buyer, and received by SMC at its place of business in Indianapolis, Indiana within the warranty period.

SMC shall have the right to inspect, prior to return, at the buyer's facility, any products claimed to be defective.

This warranty is limited exclusively to cylinder products which, in the opinion of SMC, have not been subjected to modification, misuse, negligence, misapplication, repairs or alterations. Damage caused by fire, theft, riot, explosion, or acts of God are excluded.

*Service Miles = (inches/stroke) x (2 strokes/cycle) x (no. of cycles) x $\frac{1 \text{ mile}}{63,360 \text{ inches}}$

from this warranty. The foregoing constitutes the sole exclusive remedy of the buyer and the only liability of SMC and is in lieu of any and all other warranties, expressed or implied, or statutory as to merchantability, fitness for purpose sold, description, quality, productiveness or any other matter. SMC shall not be liable for loss of use, or profit, or special or consequential damages.

SMC assumes no responsibility for engineering or technical advice pertaining to any manufactured item to which SMC's products or goods have been attached. No agent, employee, distributor, or representative of SMC has the authority to extend the scope of this warranty or to make any other promises, warranties or guarantees concerning the manufacture, sale or application of SMC's products.