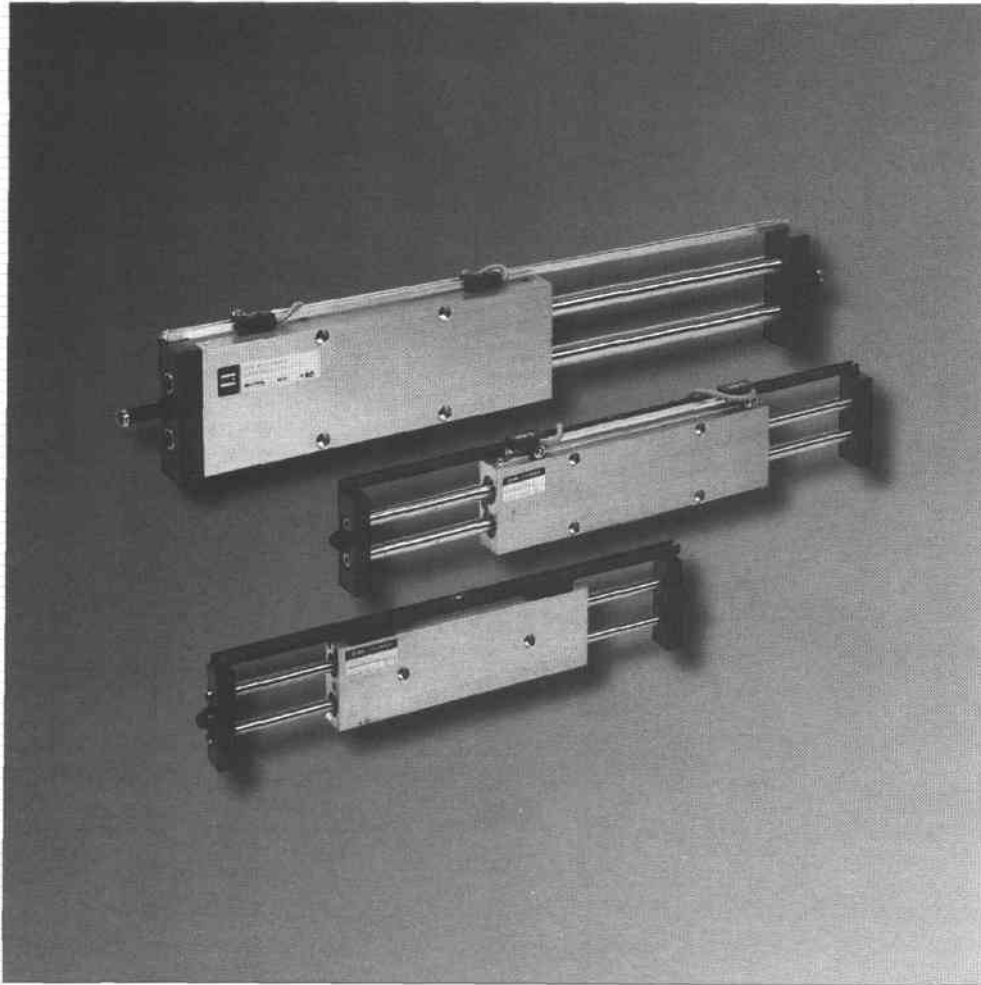




Air Cylinder

# *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

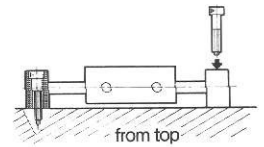
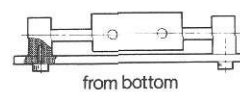
Thin design.  
Low profile.  
Designed to minimize space requirements.

Wide stroke range

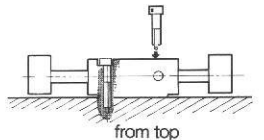
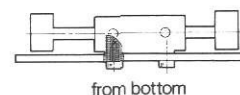
Either the housing or the plate can be fixed, depending upon your application.

Mount by fastening with bolts either at top or bottom.  
Three piping ports are available, depending upon the mounting method.

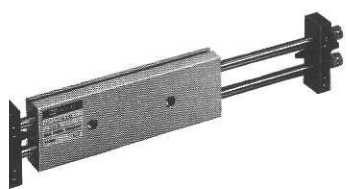
<End Plate Mount>



<Housing Mount>



## How To Order



**NCX2** **N** **Bore** **Stroke**

• **Series**  
Slide Unit

• **Type**  
N — Non-lube type  
H — Air-hydro type (except Ø10)  
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.)

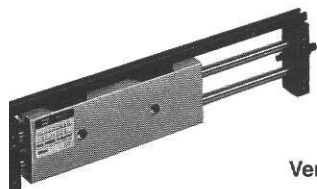
**B** — With shock absorbers

**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**  
Auto Switch Capable Cylinder

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

• **Type**  
N — Non-lube type  
H — Air-hydro type (except Ø10)  
Special order only

• **Bore - Stroke**  
(ømm)-(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	
A76H	D-A76H	
A80H	D-A80H	
E73A	D-E73A	
E76A	D-E76A	
E80A	D-E80A	

## 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-○	

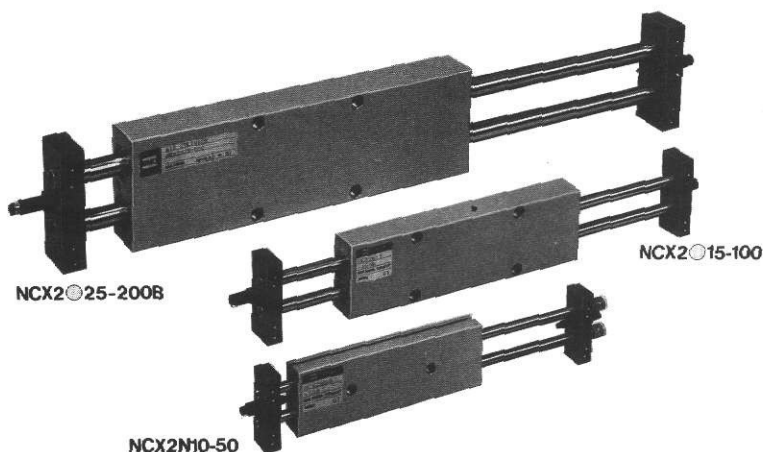
○ = specify stroke (ex: 100=1", 200=2", etc.)  
includes two mounting screws

## Solid State

F79	D-F79	3 Wire NPN	Housing Mount Ø15,Ø25
F7NV	D-F7NV		
F7NTL	D-F7NTL		
F7P	D-F7P	3 Wire PNP	
F7PV	D-F7PV		
F7PW	D-F7PW		
F7BV	D-F7BV	2 Wire	End Plate Mount Ø10,Ø15,Ø25
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.

# Slide Unit Series NCX2



## Specifications

Type		Non-lube type	Air-hydro type**
Fluid		Air	L.P. Oil
Proof pressure		220PSI(15kgf/cm <sup>2</sup> )	
Max. operating pressure		140PSI(9.9kgf/cm <sup>2</sup> )	
Min. operating pressure	NCX2N10	22PSI(1.5kgf/cm <sup>2</sup> )	—
	NCX2-15	22PSI(1.5kgf/cm <sup>2</sup> )	
	NCX2-25	15PSI(1kgf/cm <sup>2</sup> )	
Ambient and operating fluid temperature		40~140°F(5~60°C)	
Piston speed		1.2 ~ 8.0 inch/sec	See list below
Cushion		Optional shock absorber available	
Stroke adjustment range		+0.08 ~ -1.00 inch 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	●	●	●	●	●	●	●	●

## 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.

## Theoretical Cylinder Force

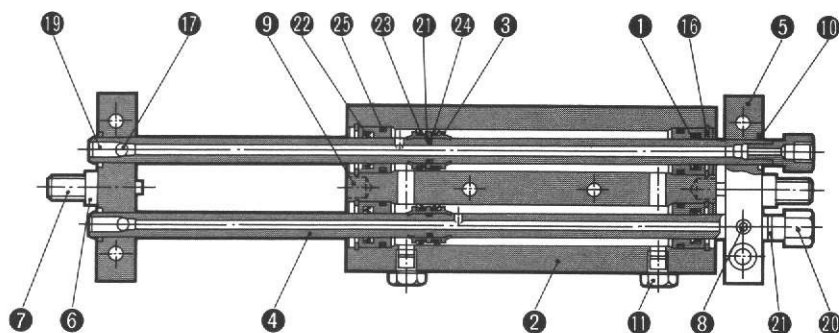
Model	Rod dia inch(mm)	Pressure area inch <sup>2</sup> (cm <sup>2</sup> )	Operating pressure PSI							
			30	50	80	100	120	140	150	
NCX2N10	0.24(6)	0.16(1.01)	4.8	8.0	12.8	16.0	19.2	22.4	24.0	
NCX2-15	0.31(8)	0.40(2.07)	12.0	20.0	32.0	40.0	48.0	56.0	60.0	
NCX2-25	0.55(14)	0.91(5.97)	27.3	45.5	72.8	91.0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

## 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	

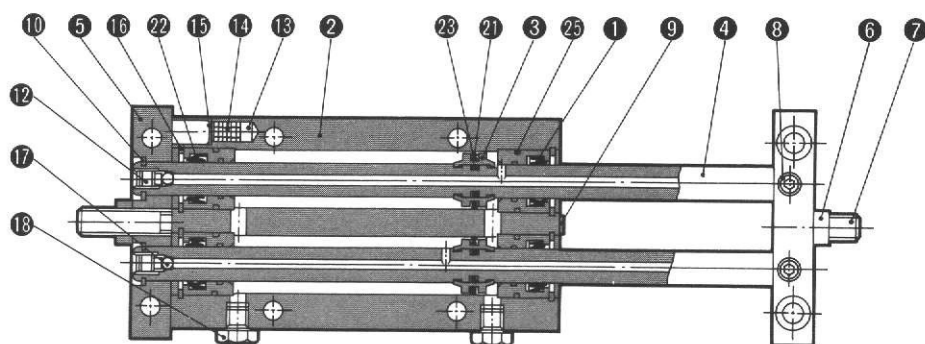
## Construction

NCX2N10



NCX2 15

NCX2 25



### 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

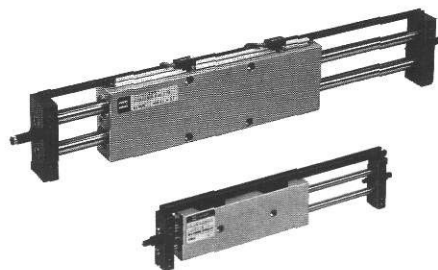
### Parts List

No.	Description	Material	Note
17	Steel ball	Hi-carbon chromium bearing steel	
20	Socket	Carbon steel	Electroless plating
21	Gasket	NBR	

### Seals List

No.	Description	Material	Kit Qty.	Seal Kit
22	Rod Seal	NBR	4	NCX2N10-PS NCX2N15-PS NCX2N25-PS
23	Piston Seal		4	
24	Piston Gasket		0	
25	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-E7○A	○	Grommet [ length of lead wire: 1.5 ft (0.5m) standard, 10 ft (3m) option ]
		D-E8○A	—	
	0.6(ø15)	D-A7 ○	○	
		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 ~ 20mA			
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)			

Please use the contact protection box for induction load, or 110VAC, or length of lead wire exceeding 16ft (5m).

## Solid State Type

Model Number	Type	Power Source	Load Voltage	Load Current	Application
D-F79	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-J79	2 Wire	—————	24VDC (10~28VDC)	5 ~ 40mA	24VDC Relay, PLC
D-F7NV	3 Wire NPN	5, 12, 24VDC (4.5~28VDC)	28VDC or less	Max. 40mA	IC Circuit, Relay, PLC
D-F7PV	3 Wire PNP		—————	Max. 80mA	
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-J79W	2 Wire	—————	24VDC (10~28VDC)	5 ~ 40mA	24VDC Relay, PLC
D-F7BAL	2 Wire	—————	24VDC (10~28VDC)	5 ~ 40mA	24VDC Relay, PLC
D-J79C	2 Wire	—————	24VDC (10~28VDC)	5 ~ 40mA	
D-F7LF	4 Wire NPN	24VDC (20~26VDC)	26VDC 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	
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)			



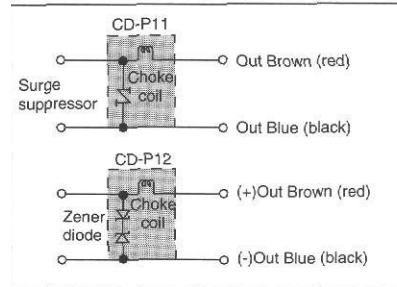
## Contact Protection Box

**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
<b>CD-P11</b>	110VAC 220VAC	Switch connection side 1.5ft (0.5m)
<b>CD-P12</b>	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.

### Contact protection box/Internal circuit



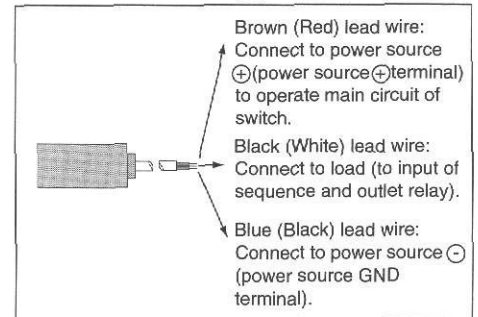
## Operating Instructions

- 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

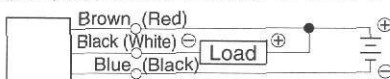
- Always connect switch to load before turning on power.
- When shipping, please avoid dropping, nicks, and excessive shock.
- Avoid use in magnetically contaminated areas.
- Prevent repeated bending of wires.

## Switch Connection/ Solid State Type

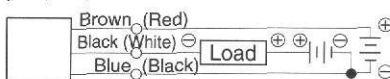


## Solid State Wiring Method

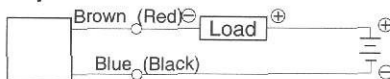
3 wire system (When power source for switch and load is common)



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



2 wire system

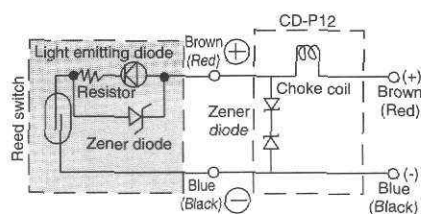


- Brown (Red) lead wire: Connect to the power source + (power source terminal) to operate main circuit of switch. In case of 2 wire systems connect with — side of load.
- Black (White) lead wire: Connect to load (to the input of sequence controller and outlet relay)
- Blue (Black) lead wire: Connect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

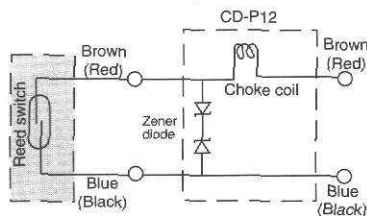
# Series NCDX2

## Switch Circuit

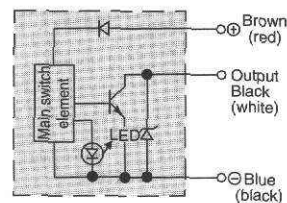
**D-A73, D-A73H, D-A73C**



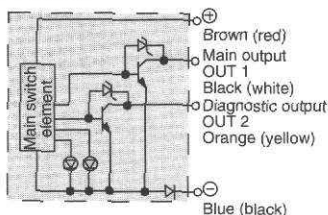
**D-A80, D-A80H, D-A80C**



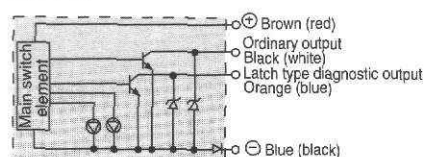
**D-F7NTL, D-F7NV, D-F79 (Solid state type)**



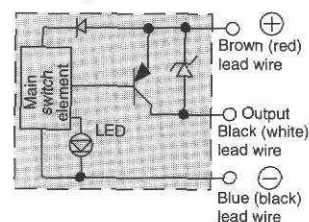
**D-F79F**



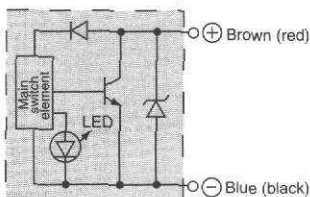
**D-F7LF**



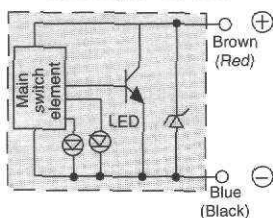
**D-F7P, D-F7PV**



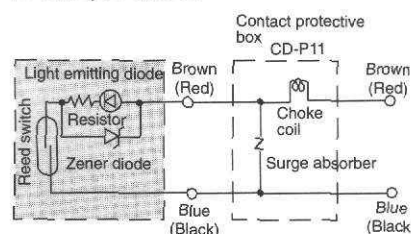
**D-J79, D-J79C, D-F7BV**



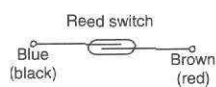
**D-F7BAL, D-J79W**



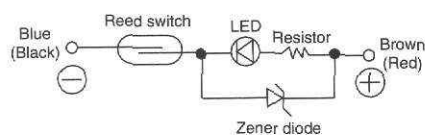
**D-A72, D-A72H**



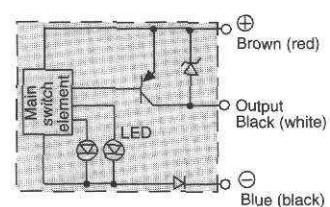
**D-E80A**



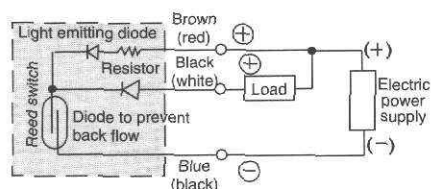
**D-E73A**



**D-F7PW**



**D-A76H, D-E76A**

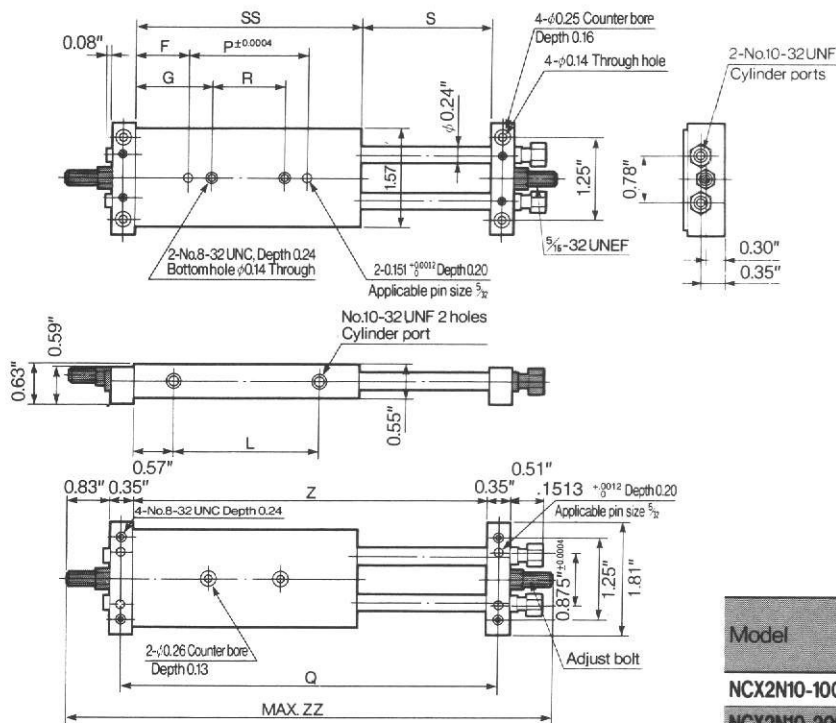




## NCX2N10-Stroke/Dimensions

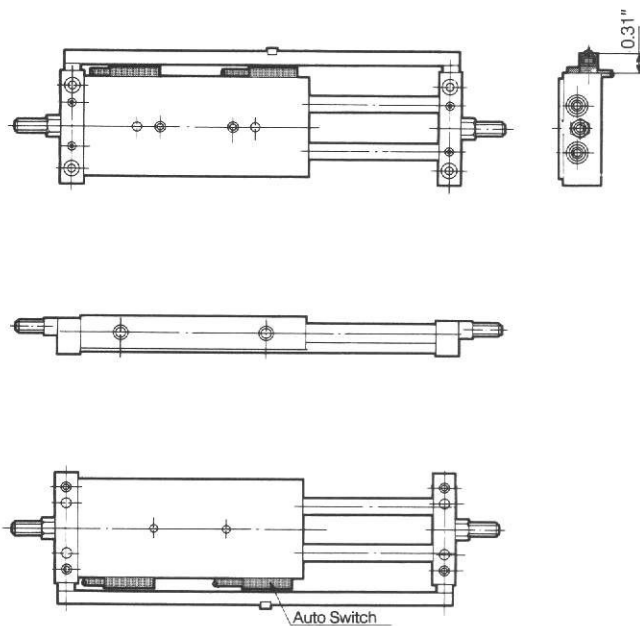
inch

isic type

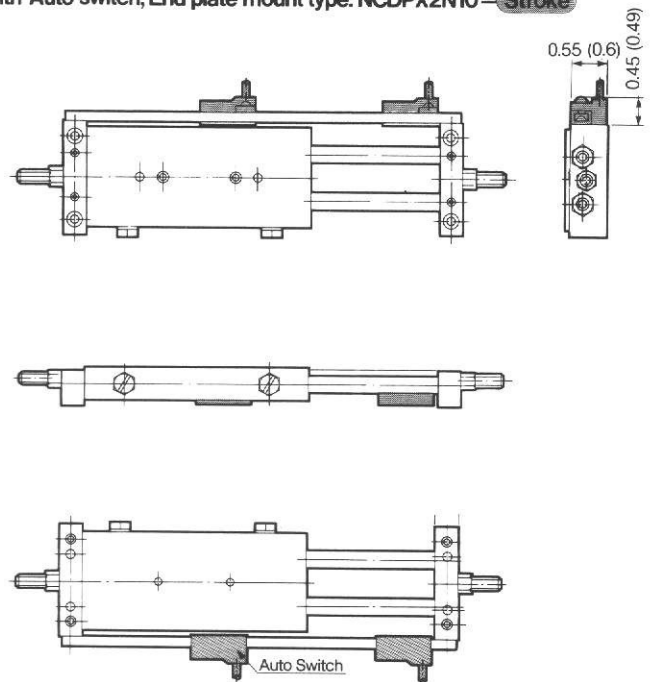


Model	F	G	L	P	Q	R	S	SS	Z	Adjust bolt ZZ
NCX2N10-100	0.73	0.98	1.55	1.25	4.13	0.75	1.08	2.70	3.78	6.14
NCX2N10-200	1.23	1.48	2.55	1.25	6.13	0.75	2.08	3.70	5.78	8.14
NCX2N10-300	1.10	1.35	3.55	2.50	8.13	2.00	3.08	4.70	7.78	10.14
NCX2N10-400	1.60	1.85	4.55	2.50	10.13	2.00	4.08	5.70	9.78	12.14

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.

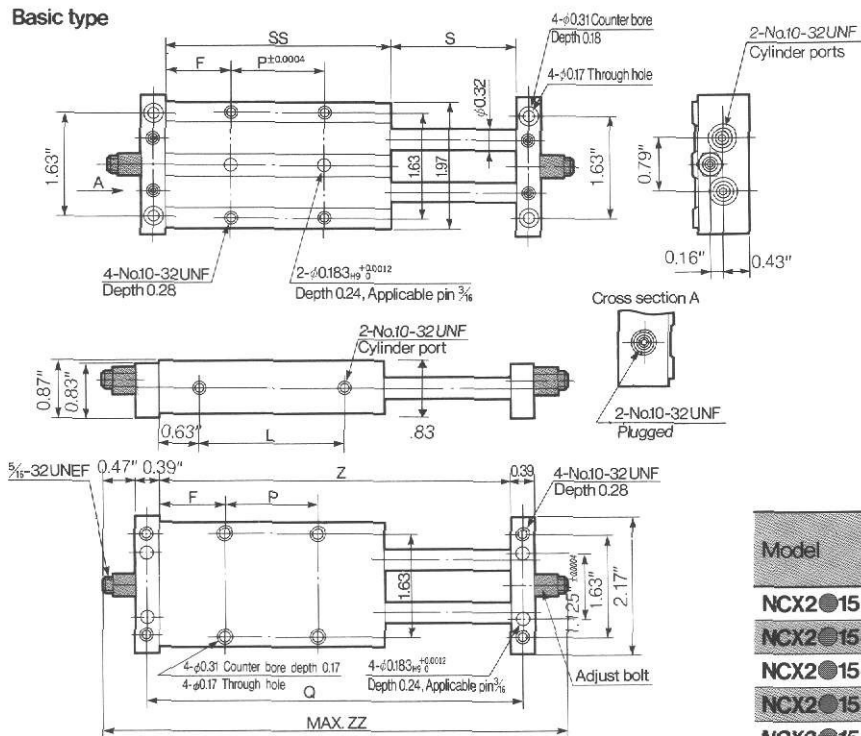
( ): Dimension with D-F7 or D-J7 type.

# Series NCX2

## NCX2●15—Stroke/Dimensions

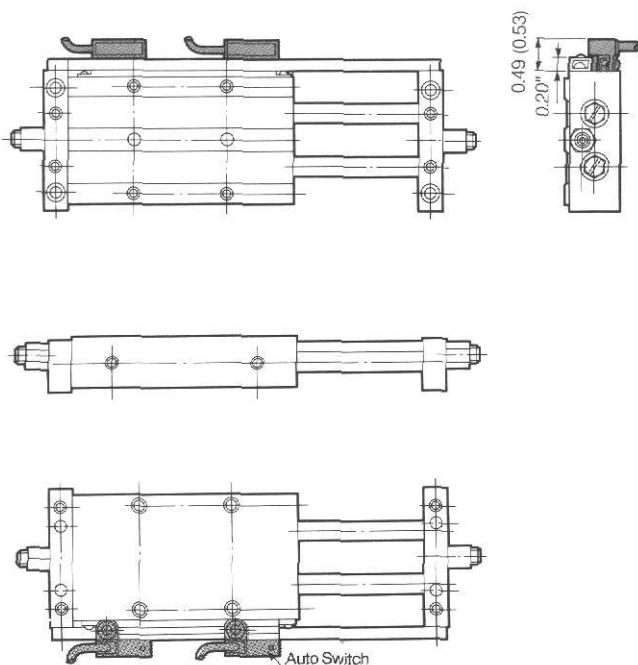
inch

### Basic type



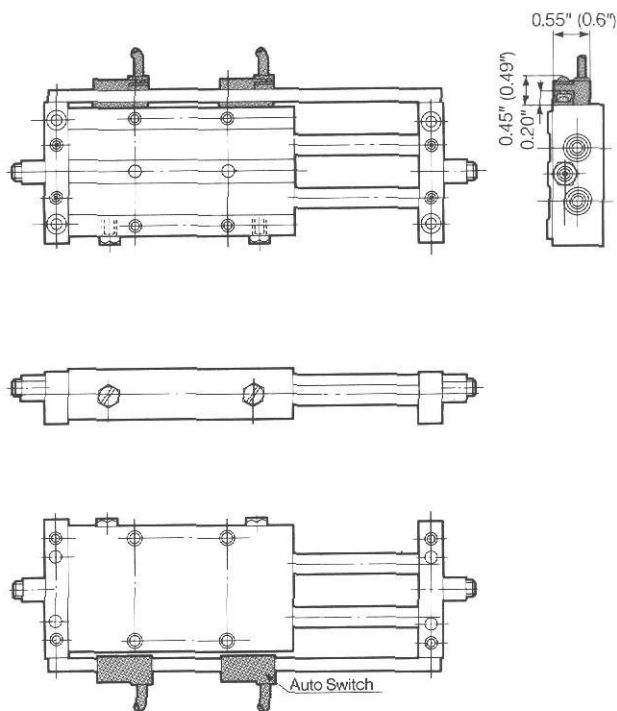
Model	F	L	P	Q	S	SS	Z	Adjust bolt ZZ
NCX2●15-100	1.02	1.52	0.75	4.25	1.08	2.78	3.86	5.98
NCX2●15-200	1.14	2.52	1.50	6.25	2.08	3.78	5.86	7.98
NCX2●15-300	1.64	3.52	1.50	8.25	3.08	4.78	7.86	9.98
NCX2●15-400	1.39	4.52	3.00	10.25	4.08	5.78	9.86	11.98
NCX2●15-500	1.89	5.52	3.00	12.25	5.08	6.78	11.86	13.98
NCX2●15-600	2.39	6.52	3.00	14.25	6.08	7.78	13.86	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	17.86	19.98

### With Auto switch, Housing mount type: NCDBX2●15—Stroke



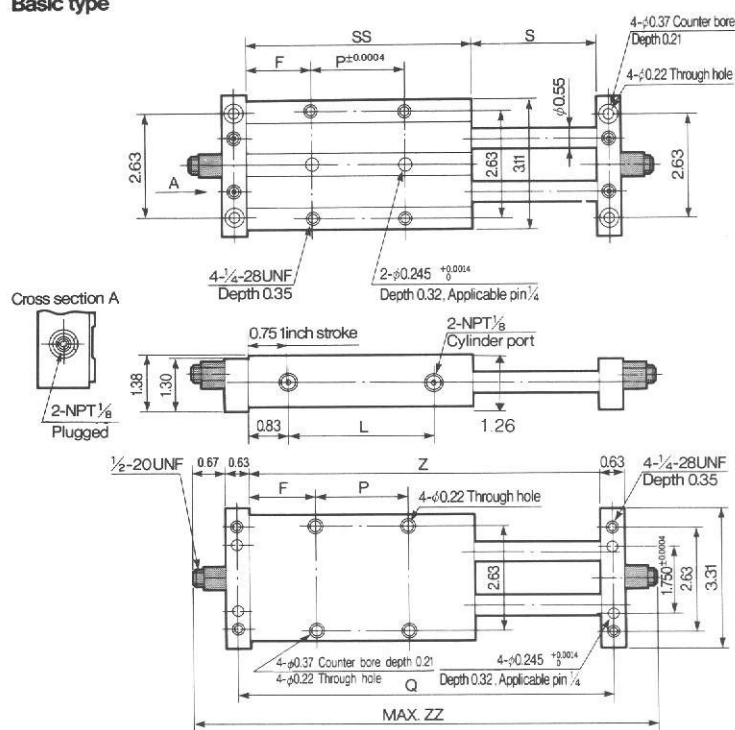
Note: This diagram is for D-A7 or D-A8 type.  
( ) : with D-F7 or D-J7 type.

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



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

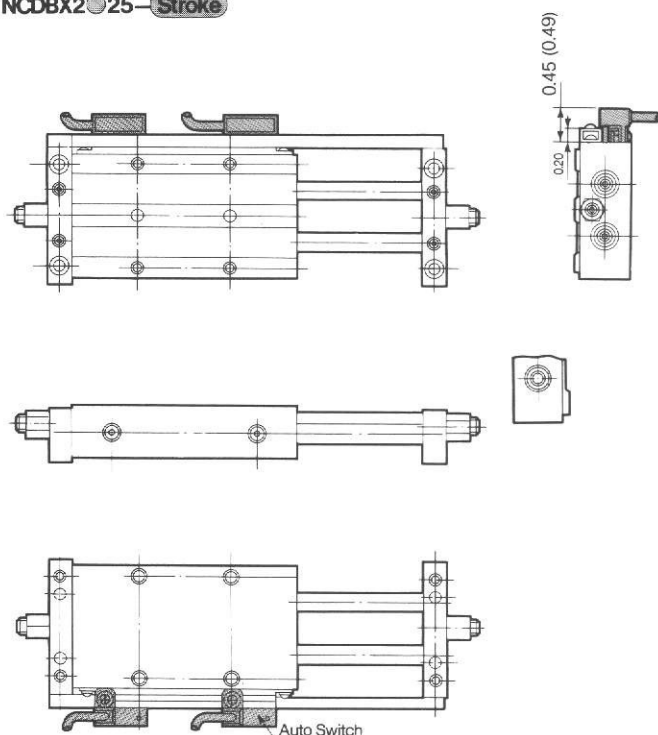
### Basic type



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	4.64	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:**

## NCDBX2025—Stroke

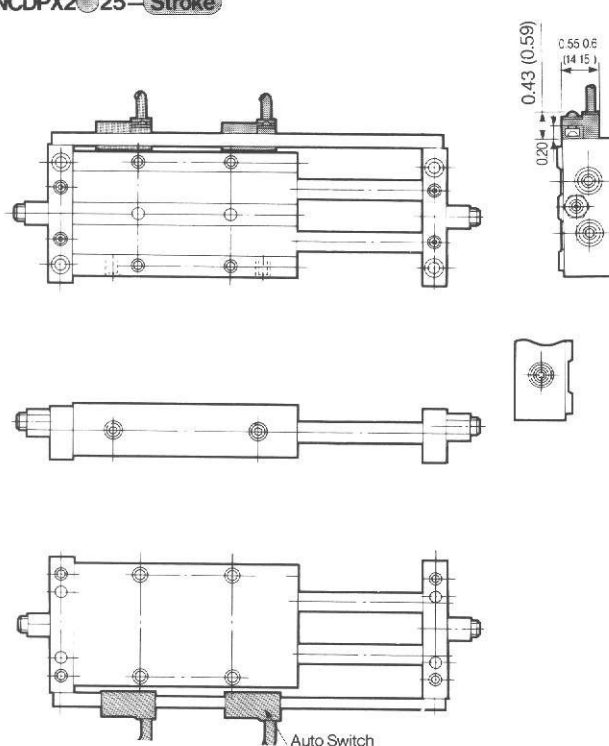


Note: This diagram is for D-A7 or D-A8 type.

( ): with D-F7 or D-J7 type.

**With Auto switch, End plate mount type:**

## NCDPX2025—Stroke



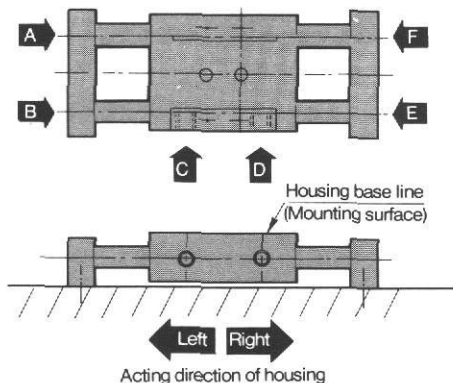
Note: This diagram is for D-A7 or D-A8 type.

( ) : with D-F7 or D-J7 type.

# Series NCX2

## Acting Direction For Each Pressure Port

Acting directions of housing when end plate area is fixed.

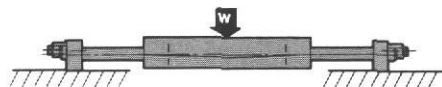


Pressure port	A	B	C	D	E	F
Acting direction of housing	Right	Left	Left	Right	Left	Right

\*9 piping patterns are available.

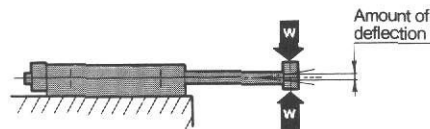
## Piston Rod Deflection (Reference Factor)

For a concentrated load at the center of housing.



Model	Load (lb)	Stroke (inch)		Deflection $\times 10^{-3}$ inch
		4	8	
NCX2N10	2	2.8		
NCX2 $\phi$ 15	6	3.2	11.0	
NCX2 $\phi$ 25	13	3.2	3.2	

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



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

Note: Values are the total amount of vertical deflection.

## Operating Instructions

- ① When plumbing, pipe and fittings should be thoroughly flushed with clean air before connecting.
- ② Please use filtered compressed air.
- ③ 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.
- ④ 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.
- ⑤ 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.
- ⑥ Always tighten the lock-nut to prevent loosening after adjusting the stroke on either end.
- ⑦ No lubrication is required, however, if required, use turbine oil #1 (ISO VG32). Machine oil or spindle oil is not recommended.

### <Air-Hydro type>

- ① L.P. Oil: Use turbine oil #1 (ISO VG 32) or equivalent. Machine oil or spindle oil is not recommended.
- ② 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.

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

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