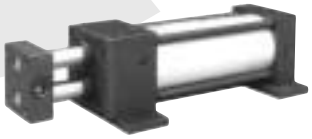
Series N
Non-Rotating Cylinders

ACT-3-4 –
01 (MX0) Basic Cylinder



ACT-3-6 –
Cylinder with
20 (Not NFPA) Base Bar

ACT-3-8 –
Cylinder with
02 (MS4) Bottom Tap

ACT-3-10 –
Cylinder with
04 (MF1) Front Flange

ACT-3-12 –
Cylinder with
05 (MF2) Rear Flange

ACT-3-14 –
Cylinder with
07 (MP2) Detachable Clevis

ACT-3-16 –
Cylinder with
18 (MP4) Detachable Eye

ACT-3-18 –
Double Rod End Cylinder

ACT-3-20 –
Double Rod End Cylinder
with 20 (Not NFPA) Base Bar

ACT-3-22 –
Double Rod End Cylinder
with 02 (MS4) Bottom Tap

ACT-3-24 –
Double Rod End Cylinder
with 04 (MF1) Front Flange

ACT-3-24 –
Double Rod End Cylinder
with 05 (MF2) Rear Flange

The finest materials for each component!

1 Piston Seals: Lip-type carboxylated nitrile incorporating Teflon® and other non-lube additives as integral parts of the compound. Extremely smooth stroke performance and "no lube added" operation results from reduced friction.

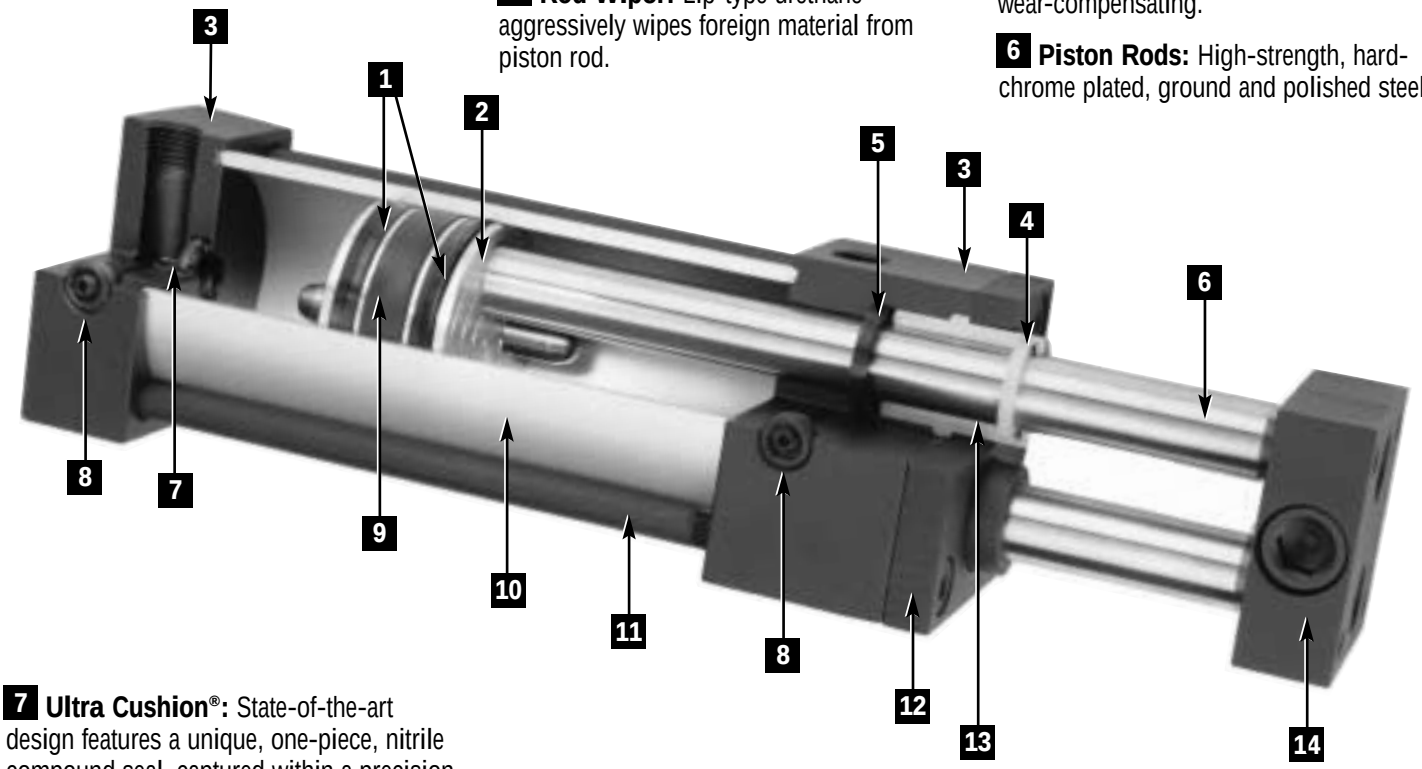
2 Piston: Solid aluminum alloy, light-weight for low inertia, yet strong.

3 Head/Cap: Precision machined from (6061-T6) solid aluminum bar, anodized for corrosion resistance.

4 Rod Wiper: Lip-type urethane aggressively wipes foreign material from piston rod.

5 Rod Seals: Rounded lip-type carboxylated nitrile incorporating Teflon® and other non-lube additives as integral parts of the compound. Extremely smooth stroke performance and "no lube added" operation results from reduced friction. Rod Seal is pressure-energized and wear-compensating.

6 Piston Rods: High-strength, hard-chrome plated, ground and polished steel.



7 Ultra Cushion®: State-of-the-art design features a unique, one-piece, nitrile compound seal, captured within a precision machined groove. Linear and radial "float" of cushion seal eliminates misalignment. Ultra Cushions provide exceptionally fast "out of cushion" stroke reversal. (Head and Cap Cushions are optional.)

8 Adjustable Captive Cushion Needle

9 Wear Strip: Teflon® and graphite composition for minimum friction, maximum wear and side load resistance. (Magnetic band under wear strip optional.)

10 Tube: 6063-T832 aluminum alloy ideally suited for air service. Tube is clear anodized on the O.D. and "hard anodic coated" on the I.D. resulting in a smooth, file-hard (60RC), corrosion-resistant and score-resistant surface finish.

11 Tie Rods: High-strength steel maintains compression on tube end seals.

12 Retainer: High-strength steel is used to retain rod bearings.

13 Rod Bearings: Machined from durable, close-grained cast iron, then completely coated with Teflon® to insure permanent lubrication and corrosion resistance.

14 Tooling Plate: Machined from solid steel and notched for secure attachment. Modular and pilot adaptor plates are available to add to the tooling plate mounting. (Use of modular and pilot adapter plates adds to overall length.)

Series Q

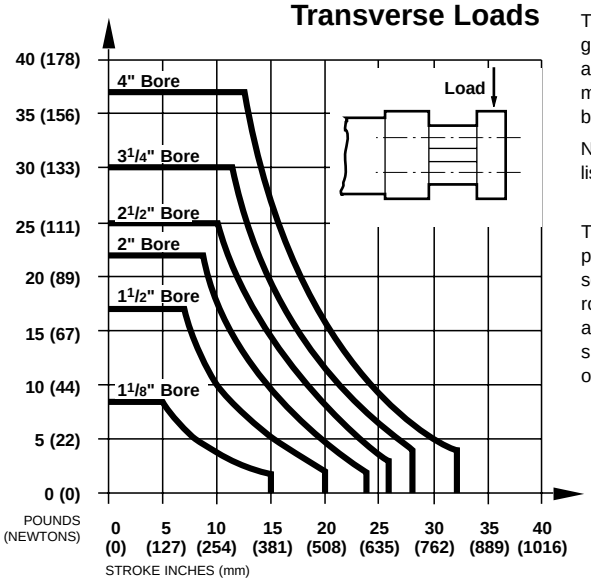
Series Q cylinders are designed for corrosive environments. They are identical to the Series N in design, function, and dimensions, but have electroless nickel plating and stainless steel components to create significant resistance to corrosion.

Features:

Head, cap, tube , bushings, front plate, mounts, tooling plate, tie rod nuts, and screws are plated with electroless nickel to a minimum thickness of .0005".

Piston rod, tie rods, and cushion needles are made from 300 series stainless steel.

Transverse Loads

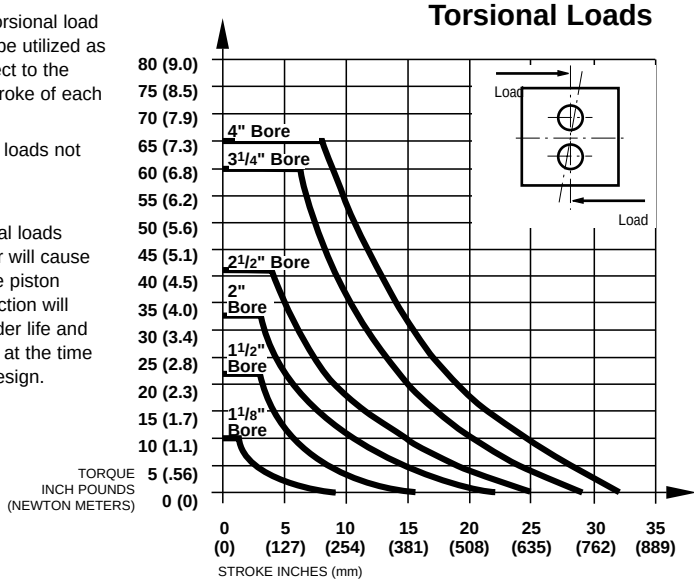


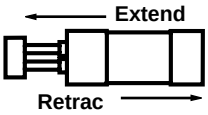
The transverse and torsional load graphs shown are to be utilized as a guideline with respect to the maximum load and stroke of each bore size.

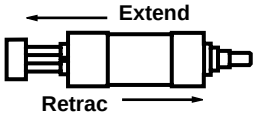
NOTE: For strokes or loads not listed consult factory.

Transverse or torsional loads placed on the cylinder will cause some deflection of the piston rods. Excessive deflection will adversely affect cylinder life and should be considered at the time of initial application design.

Torsional Loads







Theoretical Extend and Retract Forces in pounds (newtons)

Bore	Movement	Effective Piston Area In² (cm²)	PSI (bar) 20 (1)	40 (3)	50 (3)	60 (4)	80 (6)	100 (7)	125 (9)	150 (10)	Cu Ft (cm³) Displacement Per In of Stroke
1-1/8"	Extend	.99 (6.41)	20 (88)	40 (177)	50 (221)	60 (265)	80 (354)	99 (442)	124 (553)	149 (664)	.00058 (16)
	Retract	.84 (5.43)	17 (75)	34 (150)	42 (187)	50 (225)	67 (299)	84 (374)	105 (468)	126 (561)	.00049 (14)
1-1/2"	Extend	1.77 (11.40)	35 (157)	71 (315)	88 (393)	106 (472)	141 (629)	177 (786)	221 (983)	265 (1179)	.00102 (29)
	Retract	1.55 (9.97)	31 (138)	62 (275)	77 (344)	93 (413)	124 (550)	155 (688)	193 (860)	232 (1032)	.00089 (25)
2"	Extend	3.14 (20.27)	63 (280)	126 (559)	157 (699)	189 (839)	251 (1119)	314 (1398)	393 (1748)	471 (2097)	.00182 (52)
	Retract	2.53 (16.31)	51 (225)	101 (450)	126 (562)	152 (675)	202 (900)	253 (1125)	316 (1406)	379 (1687)	.00146 (41)
2-1/2"	Extend	4.91 (31.67)	98 (437)	196 (874)	245 (1092)	295 (1311)	393 (1748)	491 (2185)	614 (2731)	736 (3277)	.00284 (80)
	Retract	4.30 (27.71)	86 (382)	172 (765)	215 (956)	258 (1147)	344 (1529)	430 (1911)	537 (2389)	644 (2867)	.00249 (71)
3-1/4"	Extend	8.30 (53.32)	166 (738)	332 (1477)	415 (1846)	498 (2215)	664 (2953)	830 (3692)	1037 (4615)	1244 (5538)	.00480 (136)
	Retract	7.51 (48.45)	150 (668)	300 (1337)	376 (1671)	451 (2005)	601 (2674)	751 (3342)	939 (4177)	1127 (5013)	.00435 (123)
4"	Extend	12.57 (81.07)	251 (1118)	503 (2237)	628 (2796)	754 (3355)	1005 (4473)	1257 (5592)	1571 (6990)	1885 (8388)	.00727 (206)
	Retract	11.78 (76.01)	236 (1049)	471 (2097)	589 (2621)	707 (3146)	943 (4194)	1178 (5243)	1473 (6553)	1767 (7864)	.00682 (193)
Extend Double Rod Forces											
1-1/8"	Standard	.88 (5.69)	18 (79)	35 (157)	44 (196)	53 (235)	71 (314)	88 (392)	110 (491)	132 (589)	.00051 (14)
	Oversize	.80 (5.15)	16 (71)	32 (142)	40 (178)	48 (213)	64 (284)	80 (355)	100 (444)	120 (533)	.00047 (13)
1-1/2"	Standard	1.46 (9.42)	29 (130)	58 (260)	73 (325)	88 (390)	117 (520)	146 (650)	183 (812)	219 (975)	.00084 (24)
	Oversize	.98 (6.34)	20 (87)	39 (175)	49 (218)	59 (262)	79 (350)	98 (437)	123 (546)	147 (655)	.00057 (16)
2"	Standard	2.84 (18.29)	57 (252)	113 (505)	142 (631)	170 (757)	227 (1009)	284 (1262)	354 (1577)	425 (1892)	.00164 (46)
	Oversize	2.36 (15.21)	47 (210)	94 (420)	118 (524)	141 (629)	189 (839)	236 (1049)	295 (1311)	354 (1573)	.00137 (39)
2-1/2"	Standard	4.60 (29.69)	92 (410)	184 (819)	230 (1024)	276 (1229)	368 (1638)	460 (2048)	575 (2560)	690 (3072)	.00266 (75)
	Oversize	4.12 (26.61)	82 (367)	165 (734)	206 (918)	247 (1101)	330 (1468)	412 (1835)	516 (2294)	619 (2753)	.00239 (68)
3-1/4"	Standard	7.51 (48.46)	150 (668)	300 (1337)	376 (1671)	451 (2005)	601 (2674)	751 (3342)	939 (4178)	1127 (5014)	.00435 (123)
	Oversize	6.81 (43.94)	136 (606)	272 (1212)	341 (1515)	409 (1819)	545 (2425)	681 (3031)	851 (3789)	1022 (4546)	.00394 (112)
4"	Standard	11.78 (76.01)	236 (1049)	471 (2097)	589 (2621)	707 (3146)	942 (4194)	1178 (5243)	1473 (6553)	1767 (7864)	.00682 (193)
	Oversize	11.08 (71.49)	222 (986)	443 (1972)	554 (2466)	665 (2959)	886 (3945)	1108 (4931)	1385 (6164)	1662 (7397)	.00641 (181)

Operating Temperatures:
-20°F to 200°F
(-29°C to 93°C)
Operating Pressure:
250 psig (17.2 bar)
1-1/8" Bore pressure rating
150 psi
Bore Sizes: 1-1/8", 1-1/2", 2", 2-1/2", 3-1/4", 4"

Supply:
Filtered compressed air to 250 psi
(for hydraulic service consult factory.)
Materials:
Head and end caps - anodized 6061-T6 aluminum
Tube: 6063-T832 aluminum, clear anodized O.D., hard coat anodized I.D.
Piston Rod: C1141 hard chrome plated steel
Piston: 2011-T451aluminum
Rod Bearings: G2 Durabar cast iron, teflon coated
Seals: carboxylated nitrile
Tie Rods: 12L14 steel

- **Basic Cylinders available in 1-1/8" thru 4" bore sizes.**
- **Cylinders rated to 250 PSI air.**
  (For hydraulic service consult factory)
- **Designed for non-lube service.**
- **Low breakaway seal design.**
- **Position sensing switches available on all bore sizes.**
  (See ACT-3-28/29 for ordering information.)

Cylinder Order Information

■ ■ ■ ■ ■ – ■ **0 1** – ■ ■ **B** ■ ■

1 2 3 4 5 6 7 8 9 10 11 12 13

N	Series N
Q	Series Q Electroless Nickel

Single Rod End	Bore	Double Rod End*
B	1 1/8"	P
C	1 1/2"	Q
D	2"	R
E	2 1/2"	S
F	3 1/4"	T
G	4"	U

*Double Rod End has two Piston Rods on one end and one Piston Rod on opposite end.

Full Inches in Strokes	
00	0" Stroke
01	1" Stroke
02	2" Stroke
03	3" Stroke
04	4" Stroke
05	5" Stroke
06	6" Stroke
. . .	. . .
30	30" Stroke
xx	Special

Fractional Increments of Stroke			
A	0"	J	1/2"
B	1/16"	K	9/16"
C	1/8"	M	5/8"
D	3/16"	N	11/16"
E	1/4"	P	3/4"
F	5/16"	R	13/16"
G	3/8"	S	7/8"
H	7/16"	T	15/16"
X	Special		

Rod Axis	
E	Horizontal Rod Axis
N	Vertical Rod Axis
A	No Tooling Plate - Horizontal Rod
B	No Tooling Plate - Vertical Rod
C	Blank Rod End - Horizontal Rod*
D	Blank Rod End - Vertical Rod*
X	Special

* Does not include tooling plate

	Options
O	No Options
M	Metal Rod Scraper
P	Air/Oil Piston
R	Double Rod W/OS Cap Rod
S	Stainless Piston Rods
V	Viton Seals
X	Special

Magnetic Option	
O	No Magnet
M	Magnetic Piston

B	Design Level

Cushions†				
Needle Position	1	2**	3	4
No Cushions	A			
Head Only	B	C	D	E
Cap Only	G	H	J	K
Head and Cap	N	M	P	R
Special	X			

†Cushions not available on 1 1/8" Bore.
**Standard position

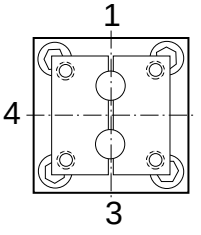
Ports				
Position	1**	2	3	4
Standard	A	B	C	D
Special	X			

**Standard position

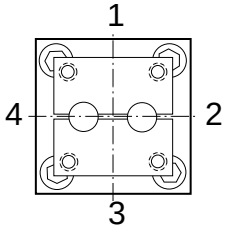
Mounting Options			
01	**No Mounts (MX0)**	07	Det. Clevis (MP2)
02	Bottom Tap (MS4)	18	Det. Eye (MP4)
04	Front Flange (MF1)	20	Base Bar
05	Rear Flange (MF2)	XX	Special

Switch, Port, and Cushion Needle Positions
(As viewed from twin rod end)

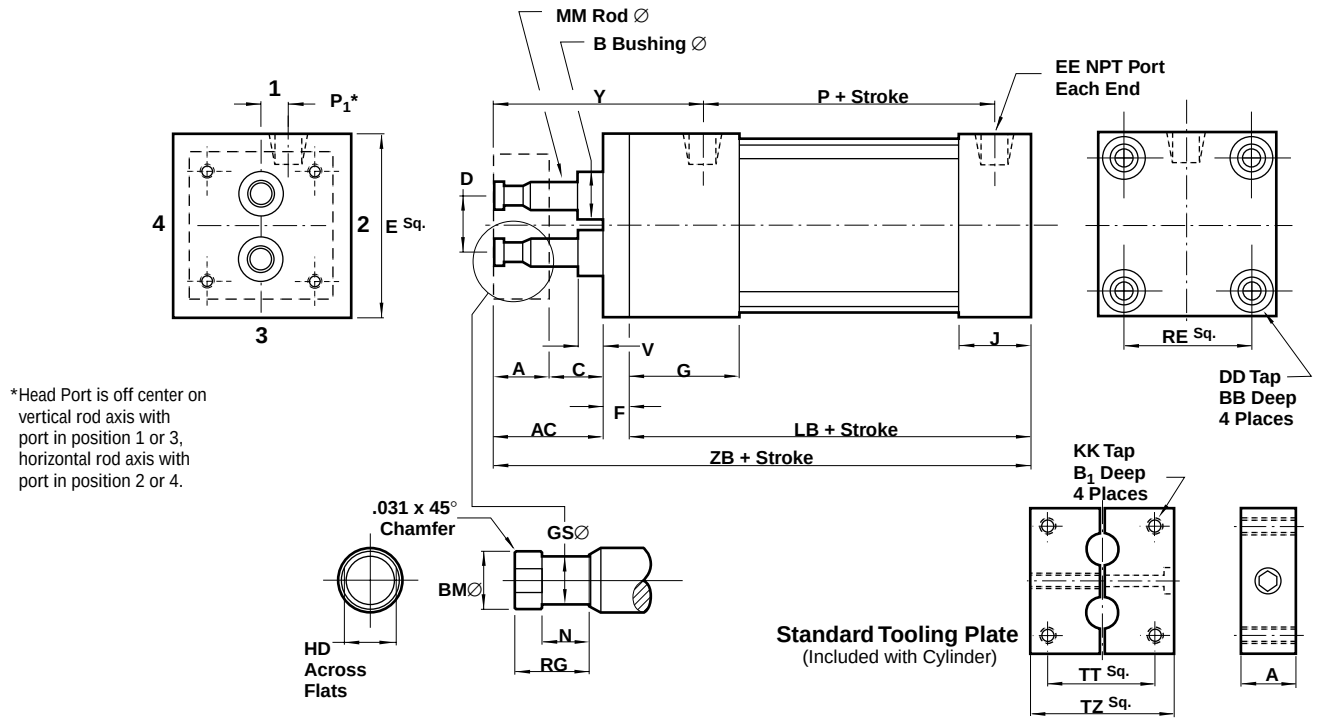
Vertical Rod Axis



Horizontal Rod Axis



See ACT-3-30 for complete instructions on how to order cylinders.



Dimension	1-1/8" Bore (28.58)	1-1/2" Bore (38.10)	2" Bore (50.80)	2-1/2" Bore (63.50)	3-1/4" Bore (82.55)	4" Bore (101.60)
A	.625 (15.88)	.625 (15.88)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
AC	1.250 (31.75)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)	1.750 (44.45)
B	N/A	.590 (14.99)	.900 (22.86)	.900 (22.86)	1.498 (38.05)	1.498 (38.05)
B_1	.500 (12.70)	Thru	Thru	Thru	Thru	Thru
BB	.188 (4.78)	.312 (7.92)	.312 (7.92)	.312 (7.92)	.437 (11.10)	.437 (11.10)
BM	.270 (6.86)	.330 (8.38)	.550 (13.97)	.550 (13.97)	.900 (22.86)	.900 (22.86)
C	.625 (15.88)	.875 (22.23)	.750 (19.05)	1.000 (25.40)	.500 (12.70)	.500 (12.70)
D	.627 (15.93)	.750 (19.05)	1.052 (26.72)	1.398 (35.51)	2.000 (50.80)	2.360 (59.94)
DD	10 – 32	1/4 – 28	5/16 – 24	5/16 – 24	3/8 – 24	3/8 – 24
E	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.000 (76.20)	3.750 (95.25)	4.500 (114.30)
EE	1/8	1/4	1/4	1/4	3/8	3/8
F	.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
G	1.000 (25.4)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)
GS	.190 (4.83)	.250 (6.35)	.500 (12.70)	.500 (12.70)	.750 (19.05)	.750 (19.05)
HD	.250 (6.35)	.312 (7.92)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
J	.625 (15.88)	1.000 (25.40)	1.000 (25.40)	1.000 (25.40)	1.250 (31.75)	1.250 (31.75)
KK	6 – 32	10 – 32	1/4 – 28	5/16 – 24	3/8 – 24	3/8 – 24
LB	2.250 (57.15)	3.625 (92.08)	3.625 (92.08)	3.750 (95.25)	4.250 (107.95)	4.250 (107.95)
MM	.312 (7.92)	.375 (9.53)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
N	.400 (10.16)	.400 (10.16)	.526 (13.36)	.526 (13.36)	.784 (19.81)	.784 (19.81)
P	1.469 (37.31)	2.125 (53.98)	2.125 (53.98)	2.250 (57.15)	2.625 (66.68)	2.625 (66.68)
P_1	.241 (6.12)	.303 (7.70)	.480 (12.19)	.635 (16.13)	.845 (21.46)	.875 (22.23)
RE	1.125 (28.58)	1.428 (36.27)	1.840 (46.74)	2.192 (55.68)	2.758 (70.05)	3.323 (84.40)
RG	.580 (14.73)	.580 (14.73)	.705 (17.91)	.705 (17.91)	1.205 (30.61)	1.205 (30.61)
TT	.750 (19.05)	1.125 (28.58)	1.430 (36.32)	1.840 (46.74)	1.790 (45.47)	3.440 (87.38)
TZ	1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.250 (82.55)	4.000 (101.60)
V	N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
Y	2.031 (51.59)	2.875 (73.03)	2.875 (73.03)	3.125 (79.38)	3.437 (87.30)	3.437 (87.30)
ZB	3.750 (95.25)	5.500 (139.70)	5.500 (139.70)	5.875 (149.23)	6.625 (168.28)	6.625 (168.28)

- **(Not NFPA) 20 Base Bar Mounts available in 1-1/8" thru 4" bore sizes.**
- **Cylinders rated to 250 PSI air. (For hydraulic service consult factory)**
- **Designed for non-lube service.**
- **New low breakaway design.**
- **Switches available on all bore sizes. (See ACT-3-28/29 for ordering information.)**

Cylinder Order Information

■ ■ ■ ■ ■ – ■ **2** **0** – ■ ■ **B** ■ ■

1 2 3 4 5 6 7 8 9 10 11 12 13

N	Series N
Q	Series Q Electroless Nickel

Single Rod End	Bore	Double Rod End*
B	1 1/8"	P
C	1 1/2"	Q
D	2"	R
E	2 1/2"	S
F	3 1/4"	T
G	4"	U

*Double Rod End has two Piston Rods on one end and one Piston Rod on opposite end.

Full Inches in Strokes	
00	0" Stroke
01	1" Stroke
02	2" Stroke
03	3" Stroke
04	4" Stroke
05	5" Stroke
06	6" Stroke
. . .	. . .
30	30" Stroke
xx	Special

Fractional Increments of Stroke			
A	0"	J	1/2"
B	1/16"	K	9/16"
C	1/8"	M	5/8"
D	3/16"	N	11/16"
E	1/4"	P	3/4"
F	5/16"	R	13/16"
G	3/8"	S	7/8"
H	7/16"	T	15/16"
X	Special		

Rod Axis	
E	Horizontal Rod Axis
N	Vertical Rod Axis
A	No Tooling Plate - Horizontal Rod
B	No Tooling Plate - Vertical Rod
C	Blank Rod End - Horizontal Rod*
D	Blank Rod End - Vertical Rod*
X	Special

* Does not include tooling plate

	Options
O	No Options
M	Metal Rod Scraper
P	Air/Oil Piston
R	Double Rod W/OS Cap Rod
S	Stainless Piston Rods
V	Viton Seals
X	Special

Magnetic Option	
O	No Magnet
M	Magnetic Piston

B	Design Level

Cushions†				
Needle Position	1	2**	3	4
No Cushions	A			
Head Only	B	C	D	E
Cap Only	G	H	J	K
Head and Cap	N	M	P	R
Special	X			

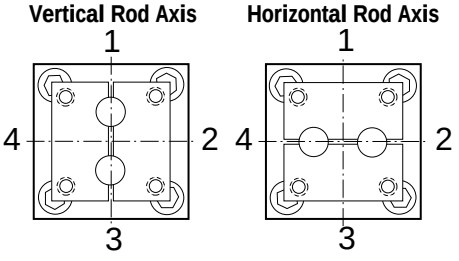
†Cushions not available on 1 1/8" Bore.
**Standard position

Ports				
Position	1**	2	3	4
Standard	A	B	C	D
Special	X			

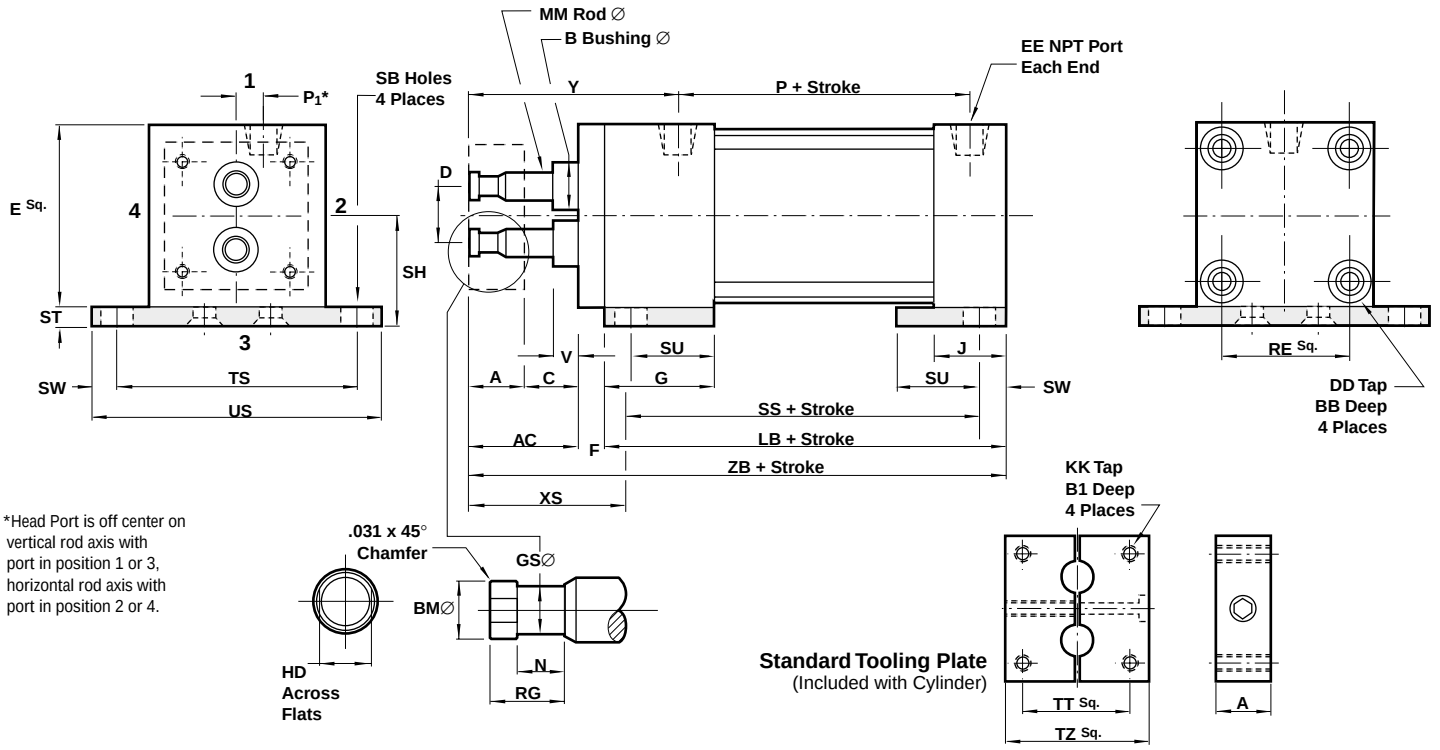
**Standard position

Mounting Options			
01	No Mounts (MX0)	07	Det. Clevis (MP2)
02	Bottom Tap (MS4)	18	Det. Eye (MP4)
04	Front Flange (MF1)	**20**	**Base Bar**
05	Rear Flange (MF2)	XX	Special

Switch, Port, and Cushion Needle Positions
(As viewed from twin rod end)



See ACT-3-30 for complete instructions on how to order cylinders.



*Head Port is off center on vertical rod axis with port in position 1 or 3, horizontal rod axis with port in position 2 or 4.

Standard Tooling Plate
(Included with Cylinder)

Dimension	1-1/8" Bore (28.58)	1-1/2" Bore (38.10)	2" Bore (50.80)	2-1/2" Bore(63.50)	3-1/4" Bore (82.55)	4" Bore (101.60)
A	.625 (15.88)	.625 (15.88)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
AC	1.250 (31.75)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)	1.750 (44.45)
B	N/A	.590 (14.99)	.900 (22.86)	.900 (22.86)	1.498 (38.05)	1.498 (38.05)
B_1	.500 (12.70)	Thru	Thru	Thru	Thru	Thru
BB	.188 (4.78)	.312 (7.92)	.312 (7.92)	.312 (7.92)	.437 (11.10)	.437 (11.10)
BM	.270 (6.86)	.330 (8.38)	.550 (13.97)	.550 (13.97)	.900 (22.86)	.900 (22.86)
C	.625 (15.88)	.875 (22.23)	.750 (19.05)	1.000 (25.40)	.500 (12.70)	.500 (12.70)
D	.627 (15.93)	.750 (19.05)	1.052 (26.72)	1.398 (35.51)	2.000 (50.80)	2.360 (59.94)
DD	10 – 32	1/4 – 28	5/16 – 24	5/16 – 24	3/8 – 24	3/8 – 24
E	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.000 (76.20)	3.750 (95.25)	4.500 (114.30)
EE	1/8	1/4	1/4	1/4	3/8	3/8
F	.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
G	1.000 (25.40)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)
GS	.190 (4.83)	.250 (6.35)	.500 (12.70)	.500 (12.70)	.750 (19.05)	.750 (19.05)
HD	.250 (6.35)	.312 (7.92)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
J	.625 (15.88)	1.000 (25.40)	1.000 (25.40)	1.000 (25.40)	1.250 (31.75)	1.250 (31.75)
KK	6 – 32	10 – 32	1/4 – 28	5/16 – 24	3/8 – 24	3/8 – 24
LB	2.250 (57.15)	3.625 (92.08)	3.625 (92.08)	3.750 (95.25)	4.250 (107.95)	4.250 (107.95)
MM	.312 (7.92)	.375 (9.53)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
N	.400 (10.16)	.400 (10.16)	.526 (13.36)	.526 (13.36)	.784 (19.81)	.784 (19.81)
P	1.469 (37.31)	2.125 (53.98)	2.125 (53.98)	2.250 (57.15)	2.625 (66.68)	2.625 (66.68)
P_1	.241 (6.12)	.303 (7.70)	.480 (12.19)	.635 (16.13)	.845 (21.46)	.875 (22.23)
RE	1.125 (28.58)	1.428 (36.27)	1.840 (46.74)	2.192 (55.68)	2.758 (70.05)	3.323 (84.40)
RG	.580 (14.73)	.580 (14.73)	.705 (17.91)	.705 (17.91)	1.205 (30.61)	1.205 (30.61)
SB	.203 (5.16)	.437 (11.10)	.437 (11.10)	.437 (11.10)	.563 (14.30)	.563 (14.30)
SH	1.000 (25.40)	1.250 (31.75)	1.500 (38.10)	1.875 (47.63)	2.375 (60.33)	2.750 (69.85)
SS	1.750 (44.45)	2.875 (73.03)	2.875 (73.03)	3.000 (76.20)	3.250 (82.55)	3.250 (82.55)
ST	.250 (6.35)	.250 (6.35)	.250 (6.35)	.375 (9.53)	.500 (12.70)	.500 (12.70)
SU	.750 (19.05)	1.125 (25.58)	1.125 (25.58)	1.125 (25.58)	1.250 (31.75)	1.250 (31.75)
SW	.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.500 (12.70)	.500 (12.70)
TS	1.875 (47.63)	2.750 (69.85)	3.250 (82.55)	3.750 (95.25)	4.750 (120.65)	5.500 (139.70)
TT	.750 (19.05)	1.125 (28.58)	1.430 (36.32)	1.840 (46.74)	1.790 (45.47)	3.440 (87.38)
TZ	1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.250 (82.55)	4.000 (101.60)
US	2.375 (60.33)	3.500 (88.90)	4.000 (101.60)	4.500 (114.30)	5.750 (146.05)	6.500 (165.10)
V	N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
XS	1.750 (44.45)	2.250 (57.15)	2.250 (57.15)	2.500 (63.50)	2.875 (73.03)	2.875 (73.03)
Y	2.031 (51.59)	2.875 (73.03)	2.875 (73.03)	3.125 (79.38)	3.437 (87.30)	3.437 (87.30)
ZB	3.750 (95.25)	5.500 (139.70)	5.500 (139.70)	5.875 (149.23)	6.625 (168.28)	6.625 (168.28)

- **NFPA (MS4) 02 Bottom Tap Mounts available in 1-1/8" thru 4" bore sizes.**
- **Cylinders rated to 250 PSI air. (For hydraulic service consult factory)**
- **Designed for non-lube service.**
- **New low breakaway design.**
- **Switches available on all bore sizes. (See ACT-3-28/29 for ordering information.)**

Cylinder Order Information

■ ■ ■ ■ ■ – ■ **0** **2** – ■ ■ **B** ■ ■

1 2 3 4 5 6 7 8 9 10 11 12 13

N	Series N
Q	Series Q Electroless Nickel

Single Rod End	Bore	Double Rod End*
B	1 1/8"	P
C	1 1/2"	Q
D	2"	R
E	2 1/2"	S
F	3 1/4"	T
G	4"	U

*Double Rod End has two Piston Rods on one end and one Piston Rod on opposite end.

Full Inches in Strokes	
00	0" Stroke
01	1" Stroke
02	2" Stroke
03	3" Stroke
04	4" Stroke
05	5" Stroke
06	6" Stroke
. . .	. . .
30	30" Stroke
xx	Special

Fractional Increments of Stroke			
A	0"	J	1/2"
B	1/16"	K	9/16"
C	1/8"	M	5/8"
D	3/16"	N	11/16"
E	1/4"	P	3/4"
F	5/16"	R	13/16"
G	3/8"	S	7/8"
H	7/16"	T	15/16"
X	Special		

Rod Axis	
E	Horizontal Rod Axis
N	Vertical Rod Axis
A	No Tooling Plate - Horizontal Rod
B	No Tooling Plate - Vertical Rod
C	Blank Rod End - Horizontal Rod*
D	Blank Rod End - Vertical Rod*
X	Special

* Does not include tooling plate

	Options
O	No Options
M	Metal Rod Scraper
P	Air/Oil Piston
R	Double Rod W/OS Cap Rod
S	Stainless Piston Rods
V	Viton Seals
X	Special

Magnetic Option	
O	No Magnet
M	Magnetic Piston

B	Design Level

Cushions†				
Needle Position	1	2**	3	4
No Cushions	A			
Head Only	B	C	D	E
Cap Only	G	H	J	K
Head and Cap	N	M	P	R
Special	X			

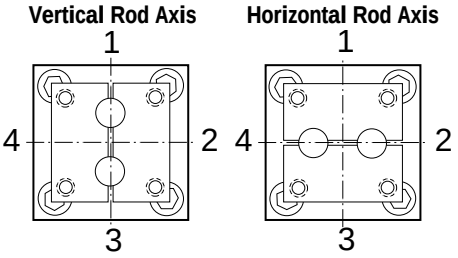
†Cushions not available on 1 1/8" Bore.
**Standard position

Ports				
Position	1**	2	3	4
Standard	A	B	C	D
Special	X			

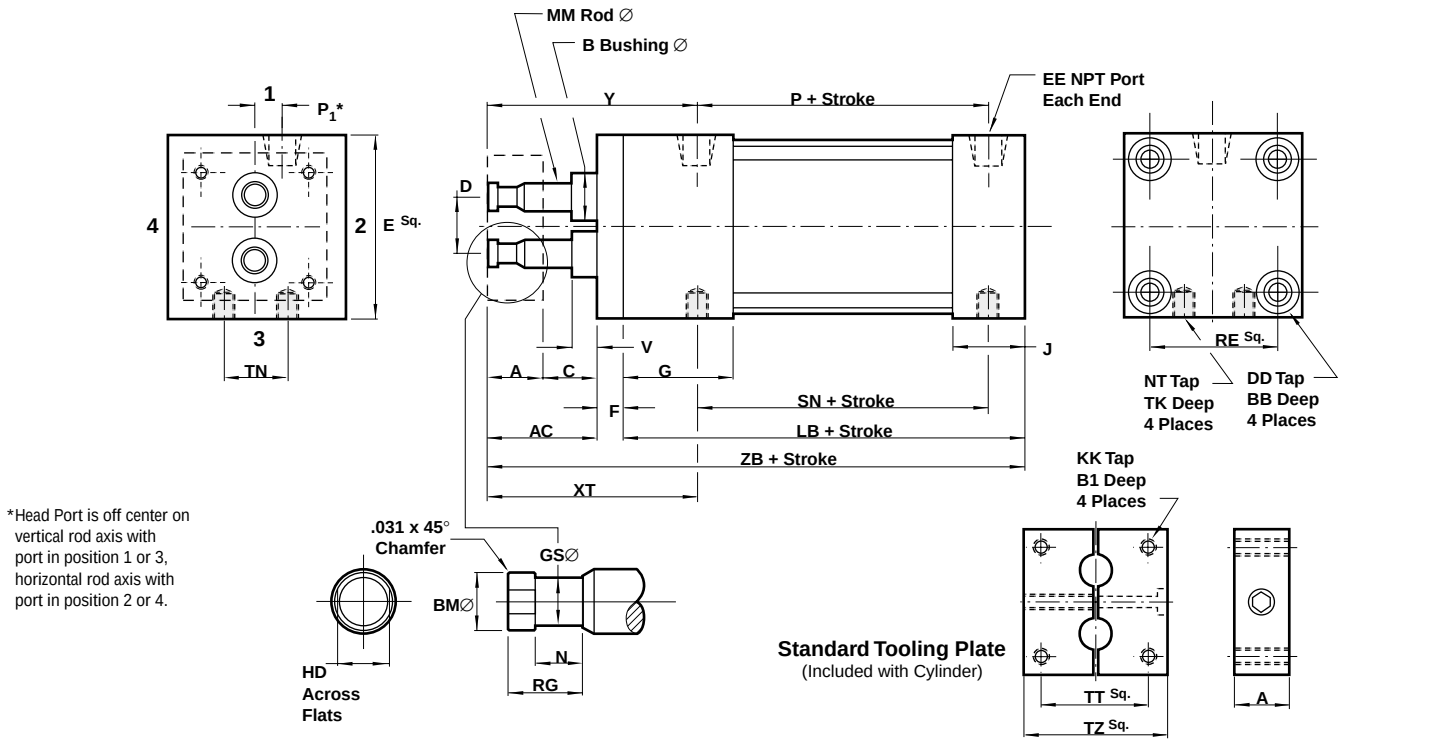
**Standard position

Mounting Options			
01	No Mounts (MX0)	07	Det. Clevis (MP2)
02	**Bottom Tap (MS4)**	18	Det. Eye (MP4)
04	Front Flange (MF1)	20	Base Bar
05	Rear Flange (MF2)	XX	Special

Switch, Port, and Cushion Needle Positions
(As viewed from twin rod end)



See ACT-3-30 for complete instructions on how to order cylinders.

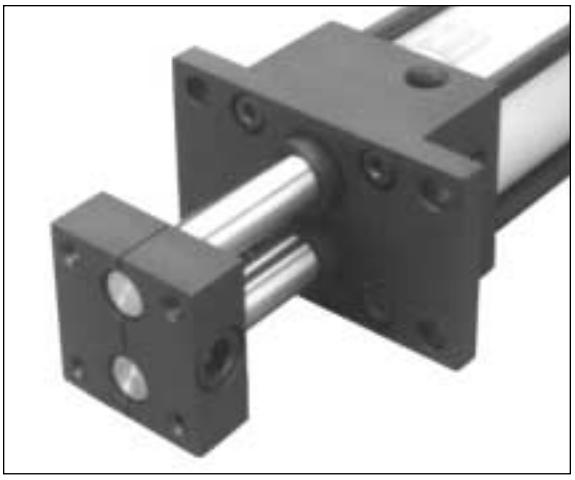


*Head Port is off center on vertical rod axis with port in position 1 or 3, horizontal rod axis with port in position 2 or 4.

Standard Tooling Plate
(Included with Cylinder)

Dimension	1-1/8" Bore (28.58)	1-1/2" Bore (38.10)	2" Bore (50.80)	2-1/2" Bore (63.50)	3-1/4" Bore (82.55)	4" Bore (101.60)
A	.625 (15.88)	.625 (15.88)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
AC	1.250 (31.75)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)	1.750 (44.45)
B	N/A	.590 (14.99)	.900 (22.86)	.900 (22.86)	1.498 (38.05)	1.498 (38.05)
B_1	.500 (12.70)	Thru	Thru	Thru	Thru	Thru
BB	.188 (4.78)	.312 (7.92)	.312 (7.92)	.312 (7.92)	.437 (11.10)	.437 (11.10)
BM	.270 (6.86)	.330 (8.38)	.550 (13.97)	.550 (13.97)	.900 (22.86)	.900 (22.86)
C	.625 (15.88)	.875 (22.23)	.750 (19.05)	1.000 (25.40)	.500 (12.70)	.500 (12.70)
D	.627 (15.93)	.750 (19.05)	1.052 (26.72)	1.398 (35.51)	2.000 (50.80)	2.360 (59.94)
DD	10 – 32	1/4 – 28	5/16 – 24	5/16 – 24	3/8 – 24	3/8 – 24
E	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.000 (76.20)	3.750 (95.25)	4.500 (114.30)
EE	1/8	1/4	1/4	1/4	3/8	3/8
F	.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
G	1.000 (25.4)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)
GS	.190 (4.83)	.250 (6.35)	.500 (12.70)	.500 (12.70)	.750 (19.05)	.750 (19.05)
HD	.250 (6.35)	.312 (7.92)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
J	.625 (15.88)	1.000 (25.40)	1.000 (25.40)	1.000 (25.40)	1.250 (31.75)	1.250 (31.75)
KK	6 – 32	10 – 32	1/4 – 28	5/16 – 24	3/8 – 24	3/8 – 24
LB	2.250 (57.15)	3.625 (92.08)	3.625 (92.08)	3.750 (95.25)	4.250 (107.95)	4.250 (107.95)
MM	.312 (7.92)	.375 (9.53)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
N	.400 (10.16)	.400 (10.16)	.526 (13.36)	.526 (13.36)	.784 (19.81)	.784 (19.81)
NT	10 – 32	1/4 – 20	5/16 – 18	3/8 – 16	1/2 – 13	1/2 – 13
P	1.469 (37.31)	2.125 (53.98)	2.125 (53.98)	2.250 (57.15)	2.625 (66.68)	2.625 (66.68)
P_1	.241 (6.12)	.303 (7.70)	.480 (12.19)	.635 (16.13)	.845 (21.46)	.875 (22.23)
RE	1.125 (28.58)	1.428 (36.27)	1.840 (46.74)	2.192 (55.68)	2.758 (70.05)	3.323 (84.40)
RG	.580 (14.73)	.580 (14.73)	.705 (17.91)	.705 (17.91)	1.205 (30.61)	1.205 (30.61)
SN	1.500 (38.10)	2.250 (57.15)	2.250 (57.15)	2.375 (60.33)	2.625 (66.68)	2.625 (66.68)
TK	.250 (6.35)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)	.750 (19.05)
TN	.500 (12.70)	.625 (15.88)	.875 (22.23)	1.250 (31.75)	1.500 (38.10)	2.063 (52.40)
TT	.750 (19.05)	1.125 (28.58)	1.430 (36.32)	1.840 (46.74)	1.790 (45.47)	3.440 (87.38)
TZ	1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.250 (82.55)	4.000 (101.60)
V	N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
XT	2.000 (50.80)	2.812 (71.42)	2.812 (71.42)	3.063 (77.80)	3.437 (87.30)	3.437 (87.30)
Y	2.031 (51.59)	2.875 (73.03)	2.875 (73.03)	3.125 (79.38)	3.437 (87.30)	3.437 (87.30)
ZB	3.750 (95.25)	5.500 (139.70)	5.500 (139.70)	5.875 (149.23)	6.625 (168.28)	6.625 (168.28)

- **NFPA (MF1) 04 Front Flange Mounts available in 1-1/8" thru 4" bore sizes.**
- **Cylinders rated to 250 PSI air. (For hydraulic service consult factory)**
- **Designed for non-lube service.**
- **New low breakaway design.**
- **Switches available on all bore sizes. (See ACT-3-28/29 for ordering information.)**



Cylinder Order Information

■ ■ ■ ■ ■ – ■ **0** **4** – ■ ■ **B** ■ ■

1 2 3 4 5 6 7 8 9 10 11 12 13

N	Series N
Q	Series Q Electroless Nickel

Single Rod End	Bore	Double Rod End*
B	1 1/8"	P
C	1 1/2"	Q
D	2"	R
E	2 1/2"	S
F	3 1/4"	T
G	4"	U

*Double Rod End has two Piston Rods on one end and one Piston Rod on opposite end.

Full Inches in Strokes	
00	0" Stroke
01	1" Stroke
02	2" Stroke
03	3" Stroke
04	4" Stroke
05	5" Stroke
06	6" Stroke
. . .	. . .
30	30" Stroke
xx	Special

Fractional Increments of Stroke			
A	0"	J	1/2"
B	1/16"	K	9/16"
C	1/8"	M	5/8"
D	3/16"	N	11/16"
E	1/4"	P	3/4"
F	5/16"	R	13/16"
G	3/8"	S	7/8"
H	7/16"	T	15/16"
X	Special		

Rod Axis	
E	Horizontal Rod Axis
N	Vertical Rod Axis
A	No Tooling Plate - Horizontal Rod
B	No Tooling Plate - Vertical Rod
C	Blank Rod End - Horizontal Rod*
D	Blank Rod End - Vertical Rod*
X	Special

* Does not include tooling plate

	Options
O	No Options
M	Metal Rod Scraper
P	Air/Oil Piston
R	Double Rod W/OS Cap Rod
S	Stainless Piston Rods
V	Viton Seals
X	Special

Magnetic Option	
O	No Magnet
M	Magnetic Piston

B	Design Level

Cushions†				
Needle Position	1	2**	3	4
No Cushions	A			
Head Only	B	C	D	E
Cap Only	G	H	J	K
Head and Cap	N	M	P	R
Special	X			

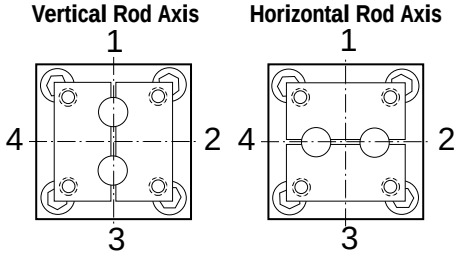
†Cushions not available on 1 1/8" Bore.
**Standard position

Ports				
Position	1**	2	3	4
Standard	A	B	C	D
Special	X			

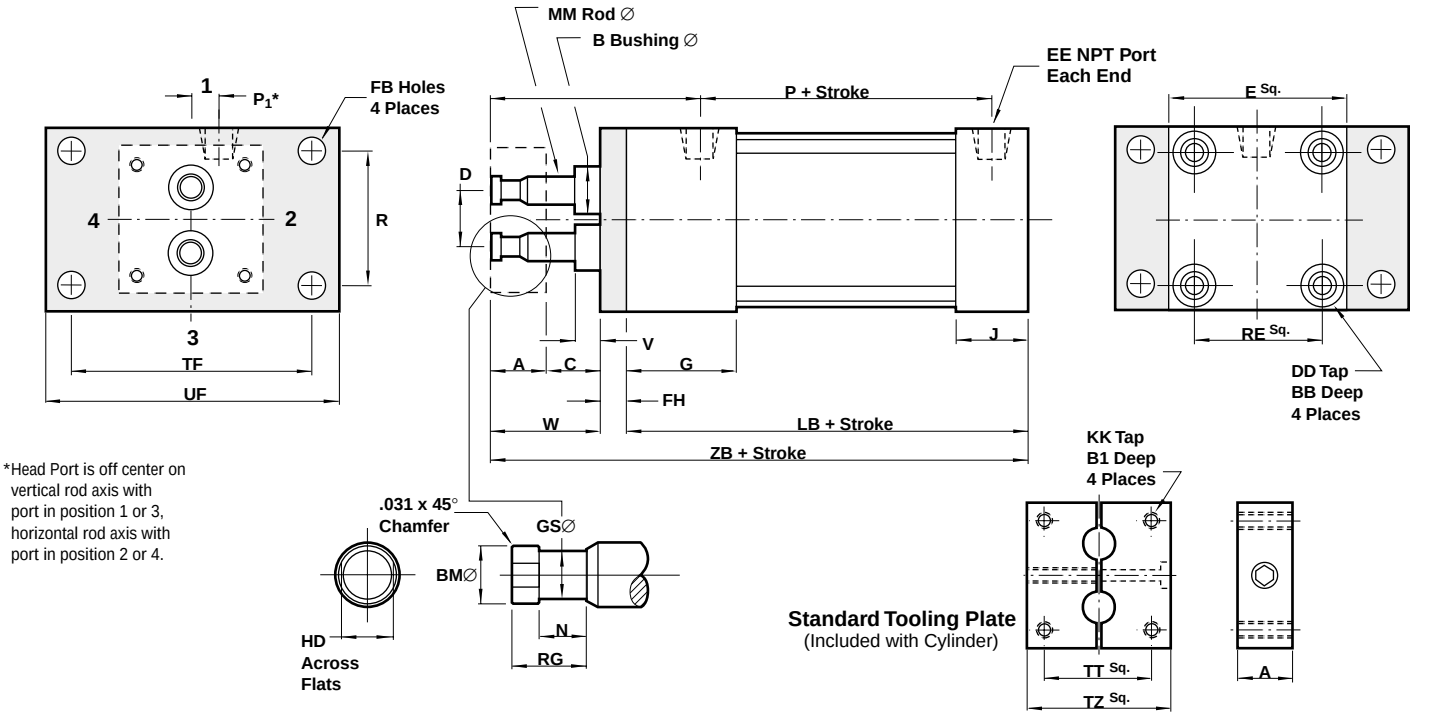
**Standard position

Mounting Options			
01	No Mounts (MX0)	07	Det. Clevis (MP2)
02	Bottom Tap (MS4)	18	Det. Eye (MP4)
04	**Front Flange (MF1)**	20	Base Bar
05	Rear Flange (MF2)	XX	Special

Switch, Port, and Cushion Needle Positions
(As viewed from twin rod end)



See ACT-3-30 for complete instructions on how to order cylinders.



*Head Port is off center on vertical rod axis with port in position 1 or 3, horizontal rod axis with port in position 2 or 4.

Standard Tooling Plate
(Included with Cylinder)

Dimension	1-1/8" Bore (28.58)	1-1/2" Bore (38.10)	2" Bore (50.80)	2-1/2" Bore (63.50)	3-1/4" Bore (82.55)	4" Bore (101.60)
A	.625 (15.88)	.625 (15.88)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
B	N/A	.590 (14.99)	.900 (22.86)	.900 (22.86)	1.498 (38.05)	1.498 (38.05)
B_1	.500 (12.70)	Thru	Thru	Thru	Thru	Thru
BB	.188 (4.78)	.312 (7.92)	.312 (7.92)	.312 (7.92)	.437 (11.10)	.437 (11.10)
BM	.270 (6.86)	.330 (8.38)	.550 (13.97)	.550 (13.97)	.900 (22.86)	.900 (22.86)
C	.625 (15.88)	.875 (22.23)	.750 (19.05)	1.000 (25.40)	.500 (12.70)	.500 (12.70)
D	.627 (15.93)	.750 (19.05)	1.052 (26.72)	1.398 (35.51)	2.000 (50.80)	2.360 (59.94)
DD	10 – 32	1/4 – 28	5/16 – 24	5/16 – 24	3/8 – 24	3/8 – 24
E	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.000 (76.20)	3.750 (95.25)	4.500 (114.30)
EE	1/8	1/4	1/4	1/4	3/8	3/8
FB	.219 (5.56)	.312 (7.92)	.375 (9.53)	.375 (9.53)	.437 (11.10)	.437 (11.10)
FH	.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
G	1.000 (25.4)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)
GS	.190 (4.83)	.250 (6.35)	.500 (12.70)	.500 (12.70)	.750 (19.05)	.750 (19.05)
HD	.250 (6.35)	.312 (7.92)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
J	.625 (15.88)	1.000 (25.40)	1.000 (25.40)	1.000 (25.40)	1.250 (31.75)	1.250 (31.75)
KK	6 – 32	10 – 32	1/4 – 28	5/16 – 24	3/8 – 24	3/8 – 24
LB	2.250 (57.15)	3.625 (92.08)	3.625 (92.08)	3.750 (95.25)	4.250 (107.95)	4.250 (107.95)
MM	.312 (7.92)	.375 (9.53)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
N	.400 (10.16)	.400 (10.16)	.526 (13.36)	.526 (13.36)	.784 (19.81)	.784 (19.81)
P	1.469 (37.31)	2.125 (53.98)	2.125 (53.98)	2.250 (57.15)	2.625 (66.68)	2.625 (66.68)
P_1	.241 (6.12)	.303 (7.70)	.480 (12.19)	.635 (16.13)	.845 (21.46)	.875 (22.23)
R	1.000 (25.40)	1.430 (36.32)	1.840 (46.74)	2.190 (55.63)	2.760 (70.10)	3.320 (84.33)
RE	1.125 (28.58)	1.428 (36.27)	1.840 (46.74)	2.192 (55.68)	2.758 (70.05)	3.323 (84.40)
RG	.580 (14.73)	.580 (14.73)	.705 (17.91)	.705 (17.91)	1.205 (30.61)	1.205 (30.61)
TF	2.000 (50.80)	2.750 (69.85)	3.375 (85.73)	3.875 (98.43)	4.688 (119.08)	5.437 (138.10)
TT	.750 (19.05)	1.125 (28.58)	1.430 (36.32)	1.840 (46.74)	1.790 (45.47)	3.440 (87.38)
TZ	1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.250 (82.55)	4.000 (101.60)
UF	2.500 (63.50)	3.750 (95.25)	4.125 (104.78)	4.625 (117.48)	5.500 (139.70)	6.250 (158.75)
V	N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
W	1.250 (31.75)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)	1.750 (44.45)
Y	2.031 (51.59)	2.875 (73.03)	2.875 (73.03)	3.125 (79.38)	3.437 (87.30)	3.437 (87.30)
ZB	3.750 (95.25)	5.500 (139.70)	5.500 (139.70)	5.875 (149.23)	6.625 (168.28)	6.625 (168.28)

- **NFPA (MF2) 05 Rear Flange Mounts available in 1-1/8" thru 4" bore sizes.**
- **Cylinders rated to 250 PSI air. (For hydraulic service consult factory)**
- **Designed for non-lube service.**
- **New low breakaway design.**
- **Switches available on all bore sizes. (See ACT-3-28/29 for ordering information.)**

Cylinder Order Information

■	■	■	■	■	–	■	0	5	–	■	■	B	■	■
1	2	3	4	5		6	7	8		9	10	11	12	13

N	Series N
Q	Series Q Electroless Nickel

Single Rod End	Bore	Double Rod End*
B	1 1/8"	P
C	1 1/2"	Q
D	2"	R
E	2 1/2"	S
F	3 1/4"	T
G	4"	U

*Double Rod End has two Piston Rods on one end and one Piston Rod on opposite end.

Full Inches in Strokes	
00	0" Stroke
01	1" Stroke
02	2" Stroke
03	3" Stroke
04	4" Stroke
05	5" Stroke
06	6" Stroke
. . .	. . .
30	30" Stroke
xx	Special

Fractional Increments of Stroke			
A	0"	J	1/2"
B	1/16"	K	9/16"
C	1/8"	M	5/8"
D	3/16"	N	11/16"
E	1/4"	P	3/4"
F	5/16"	R	13/16"
G	3/8"	S	7/8"
H	7/16"	T	15/16"
X	Special		

Rod Axis	
E	Horizontal Rod Axis
N	Vertical Rod Axis
A	No Tooling Plate - Horizontal Rod
B	No Tooling Plate - Vertical Rod
C	Blank Rod End - Horizontal Rod*
D	Blank Rod End - Vertical Rod*
X	Special

* Does not include tooling plate

	Options
O	No Options
M	Metal Rod Scraper
P	Air/Oil Piston
R	Double Rod W/OS Cap Rod
S	Stainless Piston Rods
V	Viton Seals
X	Special

Magnetic Option	
O	No Magnet
M	Magnetic Piston

B	Design Level

Cushions†				
Needle Position	1	2**	3	4
No Cushions	A			
Head Only	B	C	D	E
Cap Only	G	H	J	K
Head and Cap	N	M	P	R
Special	X			

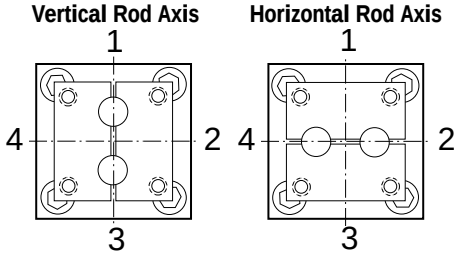
†Cushions not available on 1 1/8" Bore.
**Standard position

Ports				
Position	1**	2	3	4
Standard	A	B	C	D
Special	X			

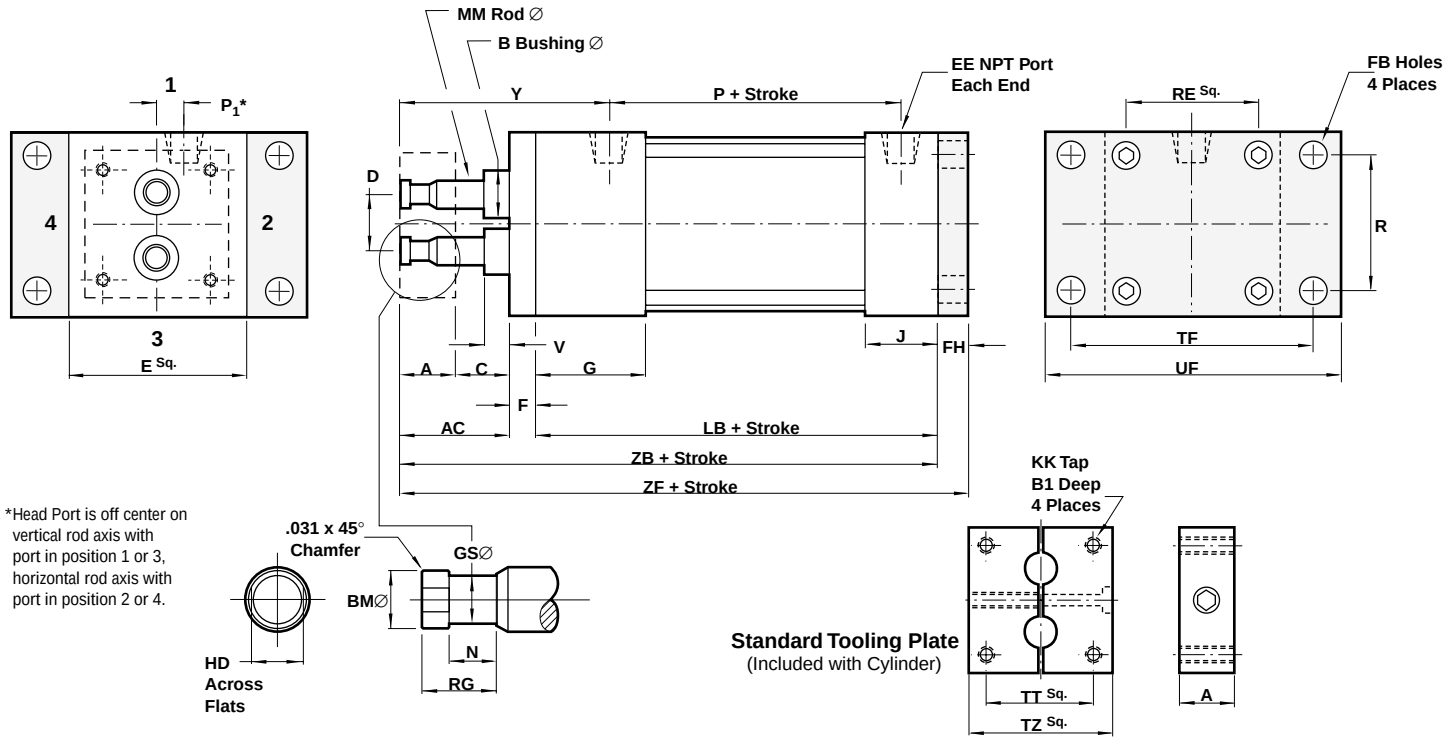
**Standard position

Mounting Options			
01	No Mounts (MX0)	07	Det. Clevis (MP2)
02	Bottom Tap (MS4)	18	Det. Eye (MP4)
04	Front Flange (MF1)	20	Base Bar
05	**Rear Flange (MF2)**	XX	Special

Switch, Port, and Cushion Needle Positions
(As viewed from twin rod end)



See ACT-3-30 for complete instructions on how to order cylinders.



Dimension	1-1/8" Bore (28.58)	1-1/2" Bore (38.10)	2" Bore (50.80)	2-1/2" Bore (63.50)	3-1/4" Bore (82.55)	4" Bore (101.60)
A	.625 (15.88)	.625 (15.88)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
AC	1.250 (31.75)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)	1.750 (44.45)
B	N/A	.590 (14.99)	.900 (22.86)	.900 (22.86)	1.498 (38.05)	1.498 (38.05)
B_1	.500 (12.70)	Thru	Thru	Thru	Thru	Thru
BM	.270 (6.86)	.330 (8.38)	.550 (13.97)	.550 (13.97)	.900 (22.86)	.900 (22.86)
C	.625 (15.88)	.875 (22.23)	.750 (19.05)	1.000 (25.40)	.500 (12.70)	.500 (12.70)
D	.627 (15.93)	.750 (19.05)	1.052 (26.72)	1.398 (35.51)	2.000 (50.80)	2.360 (59.94)
E	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.000 (76.20)	3.750 (95.25)	4.500 (114.30)
EE	1/8	1/4	1/4	1/4	3/8	3/8
F	.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
FB	.219 (5.56)	.312 (7.92)	.375 (9.53)	.375 (9.53)	.437 (11.10)	.437 (11.10)
FH	.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
G	1.000 (25.4)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)
GS	.190 (4.83)	.250 (6.35)	.500 (12.70)	.500 (12.70)	.750 (19.05)	.750 (19.05)
HD	.250 (6.35)	.312 (7.92)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
J	.625 (15.88)	1.000 (25.40)	1.000 (25.40)	1.000 (25.40)	1.250 (31.75)	1.250 (31.75)
KK	6 – 32	10 – 32	1/4 – 28	5/16 – 24	3/8 – 24	3/8 – 24
LB	2.250 (57.15)	3.625 (92.08)	3.625 (92.08)	3.750 (95.25)	4.250 (107.95)	4.250 (107.95)
MM	.312 (7.92)	.375 (9.53)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
N	.400 (10.16)	.400 (10.16)	.526 (13.36)	.526 (13.36)	.784 (19.81)	.784 (19.81)
P	1.469 (37.31)	2.125 (53.98)	2.125 (53.98)	2.250 (57.15)	2.625 (66.68)	2.625 (66.68)
P_1	.241 (6.12)	.303 (7.70)	.480 (12.19)	.635 (16.13)	.845 (21.46)	.875 (22.23)
R	1.000 (25.40)	1.430 (36.32)	1.840 (46.74)	2.190 (55.63)	2.760 (70.10)	3.320 (84.33)
RE	1.125 (28.58)	1.428 (36.27)	1.840 (46.74)	2.192 (55.68)	2.758 (70.05)	3.323 (84.40)
RG	.580 (14.73)	.580 (14.73)	.705 (17.91)	.705 (17.91)	1.205 (30.61)	1.205 (30.61)
TF	2.000 (50.80)	2.750 (69.85)	3.375 (85.73)	3.875 (98.43)	4.688 (119.08)	5.437 (138.10)
TT	.750 (19.05)	1.125 (28.58)	1.430 (36.32)	1.840 (46.74)	1.790 (45.47)	3.440 (87.38)
TZ	1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.250 (82.55)	4.000 (101.60)
UF	2.500 (63.50)	3.750 (95.25)	4.125 (104.78)	4.625 (117.48)	5.500 (139.70)	6.250 (158.75)
V	N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
Y	2.031 (51.59)	2.875 (73.03)	2.875 (73.03)	3.125 (79.38)	3.437 (87.30)	3.437 (87.30)
ZB	3.750 (95.25)	5.500 (139.70)	5.500 (139.70)	5.875 (149.23)	6.625 (168.28)	6.625 (168.28)
ZF	4.000 (101.60)	5.875 (149.23)	5.875 (149.23)	6.250 (158.75)	7.250 (184.15)	7.250 (184.15)

Series N Actuators

Cylinder with 07 (MP2) Detachable Clevis

- **NFPA (MP2) 07 Detachable Clevis Mounts available in 1-1/8" thru 4" bore sizes.**
- **Cylinders rated to 250 PSI air. (For hydraulic service consult factory)**
- **Designed for non-lube service.**
- **New low breakaway design.**
- **Switches available on all bore sizes. (See ACT-3-28/29 for ordering information.)**

Cylinder Order Information

■ ■ ■ ■ ■ – ■ **0 7** – ■ ■ **B** ■ ■

1 2 3 4 5 6 7 8 9 10 11 12 13

N	Series N
Q	Series Q Electroless Nickel

Single Rod End	Bore	Double Rod End*
B	1 1/8"	P
C	1 1/2"	Q
D	2"	R
E	2 1/2"	S
F	3 1/4"	T
G	4"	U

*Double Rod End has two Piston Rods on one end and one Piston Rod on opposite end.

Full Inches in Strokes	
00	0" Stroke
01	1" Stroke
02	2" Stroke
03	3" Stroke
04	4" Stroke
05	5" Stroke
06	6" Stroke
. . .	. . .
30	30" Stroke
xx	Special

Fractional Increments of Stroke			
A	0"	J	1/2"
B	1/16"	K	9/16"
C	1/8"	M	5/8"
D	3/16"	N	11/16"
E	1/4"	P	3/4"
F	5/16"	R	13/16"
G	3/8"	S	7/8"
H	7/16"	T	15/16"
X	Special		

Rod Axis	
E	Horizontal Rod Axis
N	Vertical Rod Axis
A	No Tooling Plate - Horizontal Rod
B	No Tooling Plate - Vertical Rod
C	Blank Rod End - Horizontal Rod*
D	Blank Rod End - Vertical Rod*
X	Special

* Does not include tooling plate

	Options
O	No Options
M	Metal Rod Scraper
P	Air/Oil Piston
R	Double Rod W/OS Cap Rod
S	Stainless Piston Rods
V	Viton Seals
X	Special

Magnetic Option	
O	No Magnet
M	Magnetic Piston

B	Design Level

Cushions†				
Needle Position	1	2**	3	4
No Cushions	A			
Head Only	B	C	D	E
Cap Only	G	H	J	K
Head and Cap	N	M	P	R
Special	X			

†Cushions not available on 1 1/8" Bore.
**Standard position

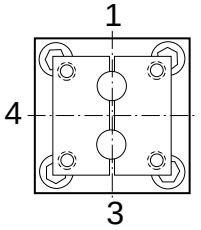
Ports				
Position	1**	2	3	4
Standard	A	B	C	D
Special	X			

**Standard position

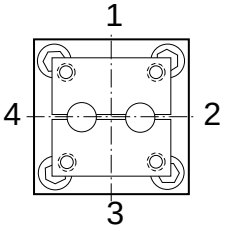
Mounting Options			
01	No Mounts (MX0)	**07**	**Det. Clevis (MP2)**
02	Bottom Tap (MS4)	18	Det. Eye (MP4)
04	Front Flange (MF1)	20	Base Bar
05	Rear Flange (MF2)	XX	Special

Switch, Port, and Cushion Needle Positions
(As viewed from twin rod end)

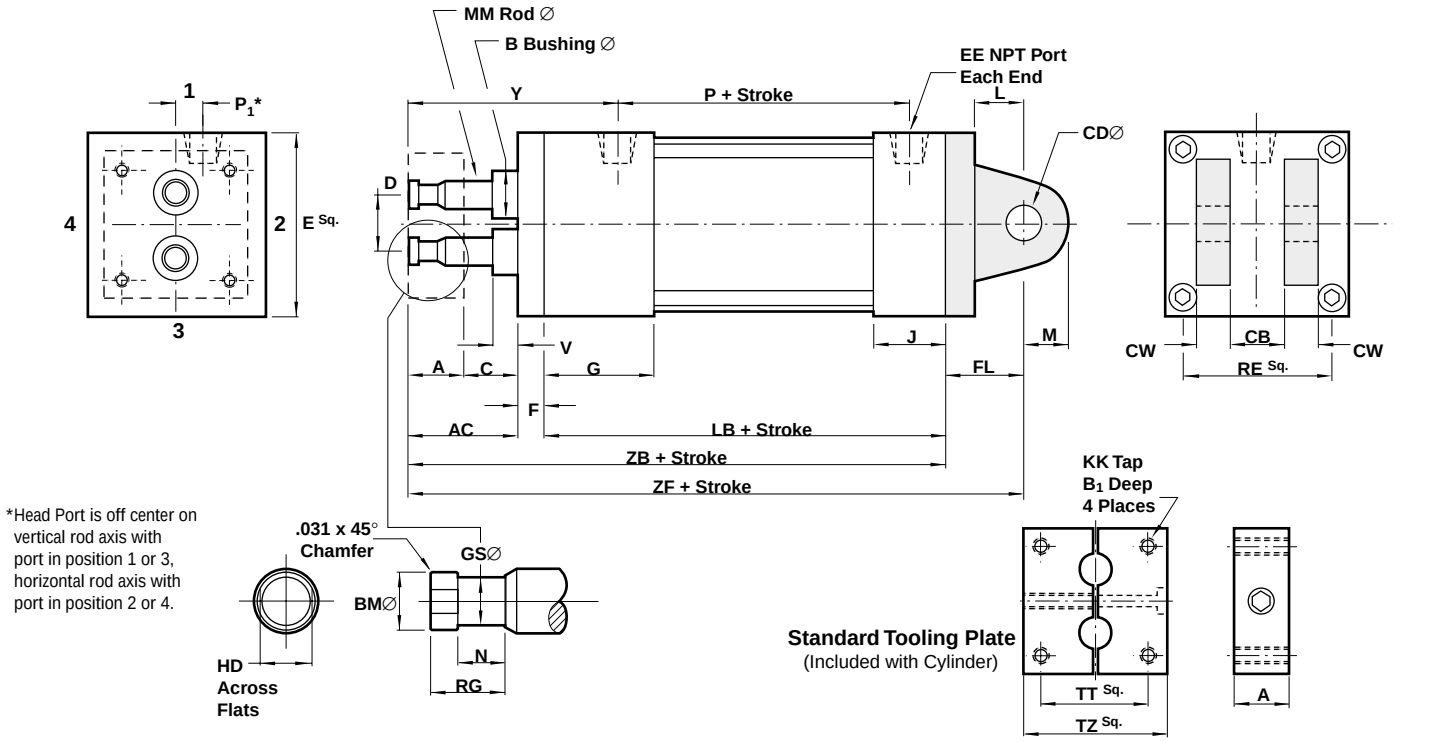
Vertical Rod Axis



Horizontal Rod Axis



See ACT-3-30 for complete instructions on how to order cylinders.



Dimension	1-1/8" Bore (28.58)	1-1/2" Bore (38.10)	2" Bore (50.80)	2-1/2" Bore (63.50)	3-1/4" Bore (82.55)	4" Bore (101.60)
A	.625 (15.88)	.625 (15.88)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
AC	1.250 (31.75)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)	1.750 (44.45)
B	N/A	.590 (14.99)	.900 (22.86)	.900 (22.86)	1.498 (38.05)	1.498 (38.05)
B_1	.500 (12.70)	Thru	Thru	Thru	Thru	Thru
BM	.270 (6.86)	.330 (8.38)	.550 (13.97)	.550 (13.97)	.900 (22.86)	.900 (22.86)
C	.625 (15.88)	.875 (22.23)	.750 (19.05)	1.000 (25.40)	.500 (12.70)	.500 (12.70)
CB	.375 (9.53)	.750 (19.05)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
CD	.375 (9.53)	.500 (12.70)	.500 (12.70)	.500 (12.70)	.750 (19.05)	.750 (19.05)
CW	.250 (6.35)	.500 (12.70)	.500 (12.70)	.500 (12.70)	.625 (15.88)	.625 (15.88)
D	.627 (15.93)	.750 (19.05)	1.052 (26.72)	1.398 (35.51)	2.000 (50.80)	2.360 (59.94)
E	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.000 (76.20)	3.750 (95.25)	4.500 (114.30)
EE	1/8	1/4	1/4	1/4	3/8	3/8
F	.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
FL	1.125 (28.58)	1.125 (28.58)	1.125 (28.58)	1.125 (28.58)	1.875 (47.63)	1.875 (47.63)
G	1.000 (25.4)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)
GS	.190 (4.83)	.250 (6.35)	.500 (12.70)	.500 (12.70)	.750 (19.05)	.750 (19.05)
HD	.250 (6.35)	.312 (7.92)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
J	.625 (15.88)	1.000 (25.40)	1.000 (25.40)	1.000 (25.40)	1.250 (31.75)	1.250 (31.75)
KK	6 – 32	10 – 32	1/4 – 28	5/16 – 24	3/8 – 24	3/8 – 24
L	.625 (15.88)	.750 (19.05)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
LB	2.250 (57.15)	3.625 (92.08)	3.625 (92.08)	3.750 (95.25)	4.250 (107.95)	4.250 (107.95)
M	.375 (9.53)	.625 (15.88)	.625 (15.88)	.625 (15.88)	.875 (22.23)	.875 (22.23)
MM	.312 (7.92)	.375 (9.53)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
N	.400 (10.16)	.400 (10.16)	.526 (13.36)	.526 (13.36)	.784 (19.81)	.784 (19.81)
P	1.469 (37.31)	2.125 (53.98)	2.125 (53.98)	2.250 (57.15)	2.625 (66.68)	2.625 (66.68)
P_1	.241 (6.12)	.303 (7.70)	.480 (12.19)	.635 (16.13)	.845 (21.46)	.875 (22.23)
RE	1.125 (28.58)	1.428 (36.27)	1.840 (46.74)	2.192 (55.68)	2.758 (70.05)	3.323 (84.40)
RG	.580 (14.73)	.580 (14.73)	.705 (17.91)	.705 (17.91)	1.205 (30.61)	1.205 (30.61)
TT	.750 (19.05)	1.125 (28.58)	1.430 (36.32)	1.840 (46.74)	1.790 (45.47)	3.440 (87.38)
TZ	1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.250 (82.55)	4.000 (101.60)
V	N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
XD	4.875 (123.83)	6.625 (168.28)	6.625 (168.28)	7.000 (177.80)	8.375 (212.73)	8.375 (212.73)
Y	2.031 (51.59)	2.875 (73.03)	2.875 (73.03)	3.125 (79.38)	3.437 (87.30)	3.437 (87.30)
ZB	3.750 (95.25)	5.500 (139.70)	5.500 (139.70)	5.875 (149.23)	6.625 (168.28)	6.625 (168.28)

- **NFPA (MP4) 18 Detachable Eye Mounts available in 1-1/8" thru 4" bore sizes.**
- **Cylinders rated to 250 PSI air. (For hydraulic service consult factory)**
- **Designed for non-lube service.**
- **New low breakaway design.**
- **Switches available on all bore sizes. (See ACT-3-28/29 for ordering information.)**

Cylinder Order Information

■ ■ ■ ■ ■ – ■ **1** **8** – ■ ■ **B** ■ ■

1 2 3 4 5 6 7 8 9 10 11 12 13

N	Series N
Q	Series Q Electroless Nickel

Single Rod End	Bore	Double Rod End*
B	1 1/8"	P
C	1 1/2"	Q
D	2"	R
E	2 1/2"	S
F	3 1/4"	T
G	4"	U

*Double Rod End has two Piston Rods on one end and one Piston Rod on opposite end.

Full Inches in Strokes	
00	0" Stroke
01	1" Stroke
02	2" Stroke
03	3" Stroke
04	4" Stroke
05	5" Stroke
06	6" Stroke
. . .	. . .
30	30" Stroke
xx	Special

Fractional Increments of Stroke			
A	0"	J	1/2"
B	1/16"	K	9/16"
C	1/8"	M	5/8"
D	3/16"	N	11/16"
E	1/4"	P	3/4"
F	5/16"	R	13/16"
G	3/8"	S	7/8"
H	7/16"	T	15/16"
X	Special		

Rod Axis	
E	Horizontal Rod Axis
N	Vertical Rod Axis
A	No Tooling Plate - Horizontal Rod
B	No Tooling Plate - Vertical Rod
C	Blank Rod End - Horizontal Rod*
D	Blank Rod End - Vertical Rod*
X	Special

* Does not include tooling plate

	Options
O	No Options
M	Metal Rod Scraper
P	Air/Oil Piston
R	Double Rod W/OS Cap Rod
S	Stainless Piston Rods
V	Viton Seals
X	Special

Magnetic Option	
O	No Magnet
M	Magnetic Piston

B	Design Level

Cushions†				
Needle Position	1	2**	3	4
No Cushions	A			
Head Only	B	C	D	E
Cap Only	G	H	J	K
Head and Cap	N	M	P	R
Special	X			

†Cushions not available on 1 1/8" Bore.
**Standard position

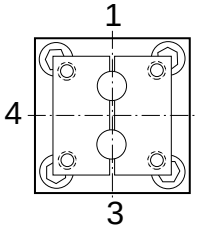
Ports				
Position	1**	2	3	4
Standard	A	B	C	D
Special	X			

**Standard position

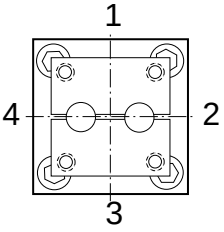
Mounting Options			
01	No Mounts (MX0)	07	Det. Clevis (MP2)
02	Bottom Tap (MS4)	**18**	**Det. Eye (MP4)**
04	Front Flange (MF1)	20	Base Bar
05	Rear Flange (MF2)	XX	Special

Switch, Port, and Cushion Needle Positions
(As viewed from twin rod end)

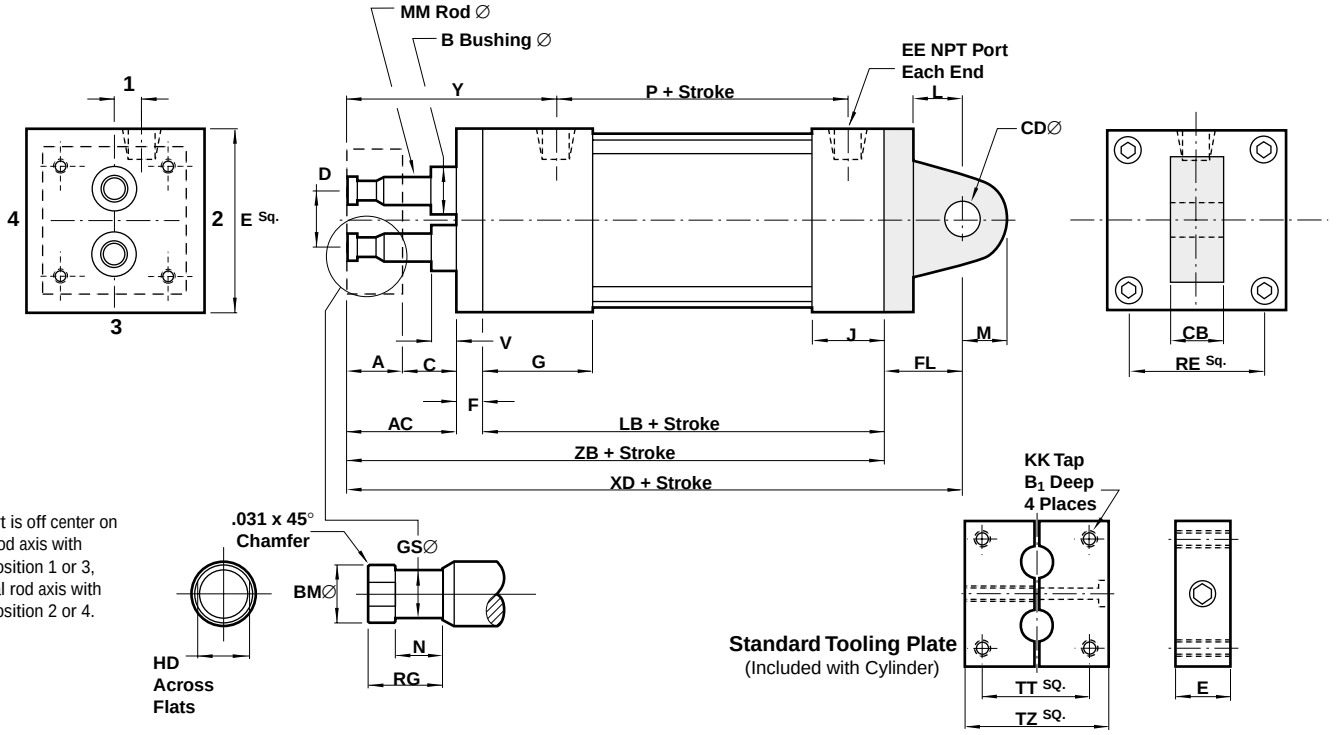
Vertical Rod Axis



Horizontal Rod Axis

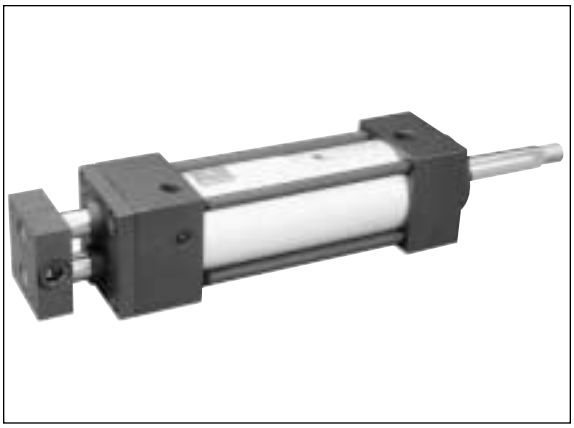


See ACT-3-30 for complete instructions on how to order cylinders.



Dimension	1-1/8" Bore (28.58)	1-1/2" Bore (38.10)	2" Bore (50.80)	2-1/2" Bore (63.50)	3-1/4" Bore (82.55)	4" Bore (101.60)
A	.625 (15.88)	.625 (15.88)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
AC	1.250 (31.75)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)	1.750 (44.45)
B	N/A	.590 (14.99)	.900 (22.86)	.900 (22.86)	1.498 (38.05)	1.498 (38.05)
B_1	.500 (12.70)	Thru	Thru	Thru	Thru	Thru
BM	.270 (6.86)	.330 (8.38)	.550 (13.97)	.550 (13.97)	.900 (22.86)	.900 (22.86)
C	.625 (15.88)	.875 (22.23)	.750 (19.05)	1.000 (25.40)	.500 (12.70)	.500 (12.70)
CB	.375 (9.53)	.750 (19.05)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
CD	.375 (9.53)	.500 (12.70)	.500 (12.70)	.500 (12.70)	.750 (19.05)	.750 (19.05)
D	.627 (15.93)	.750 (19.05)	1.052 (26.72)	1.398 (35.51)	2.000 (50.80)	2.360 (59.94)
E	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.000 (76.20)	3.750 (95.25)	4.500 (114.30)
EE	1/8	1/4	1/4	1/4	3/8	3/8
F	.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
FL	1.125 (28.58)	1.125 (28.58)	1.125 (28.58)	1.125 (28.58)	1.875 (47.63)	1.875 (47.63)
G	1.000 (25.4)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)
GS	.190 (4.83)	.250 (6.35)	.500 (12.70)	.500 (12.70)	.750 (19.05)	.750 (19.05)
HD	.250 (6.35)	.312 (7.92)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
J	.625 (15.88)	1.000 (25.40)	1.000 (25.40)	1.000 (25.40)	1.250 (31.75)	1.250 (31.75)
KK	6 – 32	10 – 32	1/4 – 28	5/16 – 24	3/8 – 24	3/8 – 24
L	.625 (15.88)	.750 (19.05)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
LB	2.250 (57.15)	3.625 (92.08)	3.625 (92.08)	3.750 (95.25)	4.250 (107.95)	4.250 (107.95)
M	.375 (9.53)	.625 (15.88)	.625 (15.88)	.625 (15.88)	.875 (22.23)	.875 (22.23)
MM	.312 (7.92)	.375 (9.53)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
N	.400 (10.16)	.400 (10.16)	.526 (13.36)	.526 (13.36)	.784 (19.81)	.784 (19.81)
P	1.469 (37.31)	2.125 (53.98)	2.125 (53.98)	2.250 (57.15)	2.625 (66.68)	2.625 (66.68)
P_1	.241 (6.12)	.303 (7.70)	.480 (12.19)	.635 (16.13)	.845 (21.46)	.875 (22.23)
RE	1.125 (28.58)	1.428 (36.27)	1.840 (46.74)	2.192 (55.68)	2.758 (70.05)	3.323 (84.40)
RG	.580 (14.73)	.580 (14.73)	.705 (17.91)	.705 (17.91)	1.205 (30.61)	1.205 (30.61)
TT	.750 (19.05)	1.125 (28.58)	1.430 (36.32)	1.840 (46.74)	1.790 (45.47)	3.440 (87.38)
TZ	1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.250 (82.55)	4.000 (101.60)
V	N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
XD	4.875 (123.83)	6.625 (168.28)	6.625 (168.28)	7.000 (177.80)	8.375 (212.73)	8.375 (212.73)
Y	2.031 (51.59)	2.875 (73.03)	2.875 (73.03)	3.125 (79.38)	3.437 (87.30)	3.437 (87.30)
ZB	3.750 (95.25)	5.500 (139.70)	5.500 (139.70)	5.875 (149.23)	6.625 (168.28)	6.625 (168.28)

- **Double Rod End Cylinders available in 1-1/8" thru 4" bore sizes.**
- **Cylinders rated to 250 PSI air. (For hydraulic service consult factory)**
- **Designed for non-lube service.**
- **New low breakaway design.**
- **Switches available on all bore sizes. (See ACT-3-28/29 for ordering information.)**



Cylinder Order Information

■ ■ ■ ■ ■ – ■ **0** **1** – ■ ■ **B** ■ ■

1 2 3 4 5 6 7 8 9 10 11 12 13

N	Series N
Q	Series Q Electroless Nickel

Single Rod End	Bore	Double Rod End*
B	1 1/8"	P
C	1 1/2"	Q
D	2"	R
E	2 1/2"	S
F	3 1/4"	T
G	4"	U

*Double Rod End has two Piston Rods on one end and one Piston Rod on opposite end.

Full Inches in Strokes	
00	0" Stroke
01	1" Stroke
02	2" Stroke
03	3" Stroke
04	4" Stroke
05	5" Stroke
06	6" Stroke
. . .	. . .
30	30" Stroke
xx	Special

Fractional Increments of Stroke			
A	0"	J	1/2"
B	1/16"	K	9/16"
C	1/8"	M	5/8"
D	3/16"	N	11/16"
E	1/4"	P	3/4"
F	5/16"	R	13/16"
G	3/8"	S	7/8"
H	7/16"	T	15/16"
X	Special		

Rod Axis	
E	Horizontal Rod Axis
N	Vertical Rod Axis
A	No Tooling Plate - Horizontal Rod
B	No Tooling Plate - Vertical Rod
C	Blank Rod End - Horizontal Rod*
D	Blank Rod End - Vertical Rod*
X	Special

* Does not include tooling plate

Note: 1 1/8" diameter not NFPA

	Options
O	No Options
M	Metal Rod Scraper
P	Air/Oil Piston
R	Double Rod W/OS Cap Rod
S	Stainless Piston Rods
V	Viton Seals
X	Special

Magnetic Option	
O	No Magnet
M	Magnetic Piston

B	Design Level

Cushions†				
Needle Position	1	2**	3	4
No Cushions	A			
Head Only	B	C	D	E
Cap Only	G	H	J	K
Head and Cap	N	M	P	R
Special	X			

†Cushions not available on 1 1/8" Bore.
**Standard position

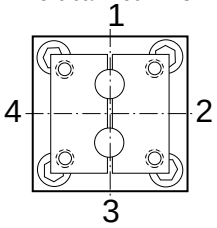
Ports				
Position	1**	2	3	4
Standard	A	B	C	D
Special	X			

**Standard position

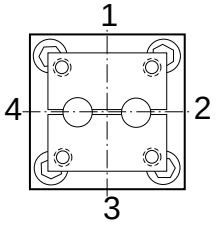
Mounting Options			
01	**No Mounts (MX0)**	20	Base Bar
02	Bottom Tap (MS4)	XX	Special
04	Front Flange (MF1)		
05	Rear Flange (MF2)		

Switch, Port, and Cushion Needle Positions
(As viewed from twin rod end)

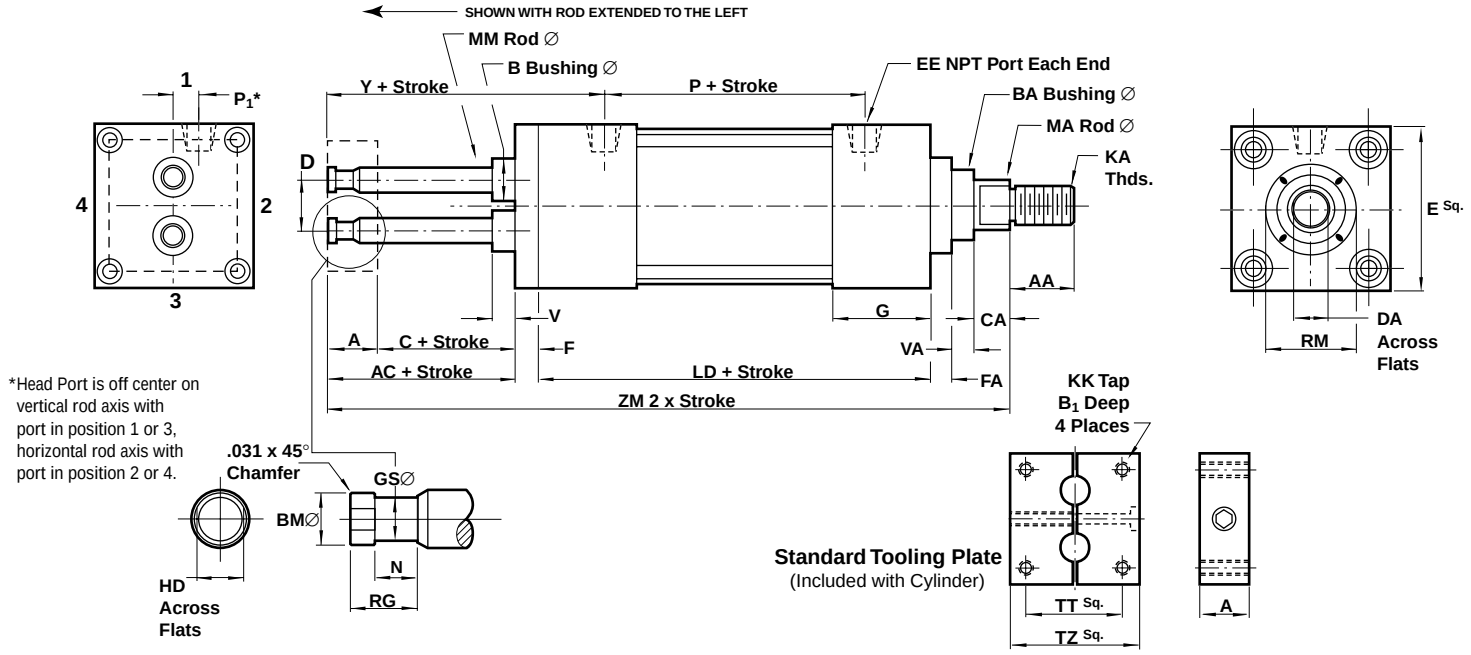
Vertical Rod Axis



Horizontal Rod Axis



See ACT-3-30 for complete instructions on how to order cylinders.



Dimension		1-1/8" Bore (28.58)	1-1/2" Bore (38.10)	2" Bore (50.80)	2-1/2" Bore (63.50)	3-1/4" Bore (82.55)	4" Bore (101.60)
A		.625 (15.88)	.625 (15.88)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
AA	Standard	.625 (15.88)	.750 (19.05)	.750 (19.05)	.750 (19.05)	1.125 (28.58)	1.125 (28.58)
	Oversize	.750 (19.05)	1.125 (28.58)	1.125 (28.58)	1.125 (28.58)	1.625 (41.28)	1.625 (41.28)
AC		1.250 (31.75)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)	1.750 (44.45)
B		N/A	.590 (14.99)	.900 (22.86)	.900 (22.86)	1.498 (38.05)	1.498 (38.05)
B_1		.500 (12.70)	Thru	Thru	Thru	Thru	Thru
BA	Standard	N/A	1.125 (28.58)	1.125 (28.58)	1.125 (28.58)	1.500 (38.10)	1.500 (38.10)
	Oversize	N/A	1.400 (35.56)	1.500 (38.10)	1.500 (38.10)	2.000 (50.80)	2.000 (50.80)
BM		.270 (6.86)	.330 (8.38)	.550 (13.97)	.550 (13.97)	.900 (22.86)	.900 (22.86)
C		.625 (15.88)	.875 (22.23)	.750 (19.05)	1.000 (25.40)	.500 (12.70)	.500 (12.70)
CA	Standard	.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.500 (12.70)	.500 (12.70)
	Oversize	.250 (6.35)	.500 (12.70)	.500 (12.70)	.500 (12.70)	.625 (15.88)	.625 (15.88)
D		.627 (15.93)	.750 (19.05)	1.052 (26.72)	1.398 (35.51)	2.000 (50.80)	2.360 (59.94)
DA	Standard	.312 (7.92)	.500 (12.70)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
	Oversize	.437 (11.10)	.812 (20.62)	.812 (20.62)	.812 (20.62)	1.125 (28.58)	1.125 (28.58)
E		1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.000 (76.20)	3.750 (95.25)	4.500 (114.30)
EE		1/8	1/4	1/4	1/4	3/8	3/8
F		.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
FA		.125 (3.18)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
G		1.00 (25.40)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)
GS		.190 (4.83)	.250 (6.35)	.500 (12.70)	.500 (12.70)	.750 (19.05)	.750 (19.05)
HD		.250 (6.35)	.312 (7.92)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
KA	Standard	3/8 – 24	1/2 – 20	1/2 – 20	1/2 – 20	3/4 – 16	3/4 – 16
	Oversize	1/2 – 20	3/4 – 16	3/4 – 16	3/4 – 16	1 – 14	1 – 14
KK		6 – 32	10 – 32	1/4 – 28	5/16 – 24	3/8 – 24	3/8 – 24
LD		†2.875 †(73.03)	4.125 (104.78)	4.125 (104.78)	4.250 (107.95)	4.750 (120.65)	4.750 (120.65)
MA	Standard	.375 (9.53)	.625 (15.88)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
	Oversize	.500 (12.70)	1.000 (25.40)	1.000 (25.40)	1.000 (25.40)	1.375 (34.93)	1.375 (34.93)
MM		.312 (7.92)	.375 (9.53)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
N		.400 (10.16)	.400 (10.16)	.526 (13.36)	.526 (13.36)	.784 (19.81)	.784 (19.81)
P		†1.844 †(46.84)	2.125 (53.98)	2.125 (53.98)	2.250 (57.15)	2.625 (66.68)	2.625 (66.68)
P_1		.241 (6.12)	.303 (7.70)	.480 (12.19)	.635 (16.13)	.845 (21.46)	.875 (22.23)
RG		.580 (14.73)	.580 (14.73)	.705 (17.91)	.705 (17.91)	1.205 (30.61)	1.205 (30.61)
RM	Standard	.750 (19.05)	2.000sq (50.80)	2.000 (50.80)	2.000 (50.80)	2.625 (66.68)	2.625 (66.68)
	Oversize	1.000 (25.40)	2.000sq (50.80)	2.500sq (63.50)	3.000sq (76.20)	3.375 (85.73)	3.375 (85.73)
TT		.750 (19.05)	1.125 (28.58)	1.430 (36.32)	1.840 (46.74)	1.790 (45.47)	3.440 (87.38)
TZ		1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.250 (82.55)	4.000 (101.60)
V		N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
VA	Standard	N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
	Oversize	N/A	.500 (12.70)	.500 (12.70)	.500 (12.70)	.375 (9.53)	.375 (9.53)
Y		2.031 (51.59)	2.875 (73.03)	2.875 (73.03)	3.125 (81.66)	3.437 (87.30)	3.437 (87.30)
ZM		†4.625 †(117.48)	7.000 (177.80)	7.000 (177.80)	7.375 (187.33)	8.500 (215.90)	8.500 (215.90)

†Note: $1\frac{1}{8}$" bore overall body is $\frac{3}{8}$" longer than our standard Series "C" Double Rod End Cylinder.

Series N Actuators

Double Rod End Cylinder with 20 (Not NFPA) Base Bar

- **(Not NFPA) 20 Base Bar Mounts available in 1-1/8" thru 4" bore sizes.**
- **Cylinders rated to 250 PSI air. (For hydraulic service consult factory)**
- **Designed for non-lube service.**
- **New low breakaway design.**
- **Switches available on all bore sizes (See ACT-3-28/29 for ordering information.)**

Cylinder Order Information

■ ■ ■ ■ ■ – ■ **2** **0** – ■ ■ **B** ■ ■

1 2 3 4 5 6 7 8 9 10 11 12 13

N	Series N
Q	Series Q Electroless Nickel

Single Rod End	Bore	Double Rod End*
B	$1^1/_8$"	P
C	$1^1/_2$"	Q
D	2"	R
E	$2^1/_2$"	S
F	$3^1/_4$"	T
G	4"	U

*Double Rod End has two Piston Rods on one end and one Piston Rod on opposite end.

Full Inches in Strokes	
00	0" Stroke
01	1" Stroke
02	2" Stroke
03	3" Stroke
04	4" Stroke
05	5" Stroke
06	6" Stroke
. . .	. . .
30	30" Stroke
xx	Special

Fractional Increments of Stroke			
A	0"	J	1/2"
B	1/16"	K	9/16"
C	1/8"	M	5/8"
D	3/16"	N	11/16"
E	1/4"	P	3/4"
F	5/16"	R	13/16"
G	3/8"	S	7/8"
H	7/16"	T	15/16"
X	Special		

Rod Axis	
E	Horizontal Rod Axis
N	Vertical Rod Axis
A	No Tooling Plate - Horizontal Rod
B	No Tooling Plate - Vertical Rod
C	Blank Rod End - Horizontal Rod*
D	Blank Rod End - Vertical Rod*
X	Special

* Does not include tooling plate

	Options
O	No Options
M	Metal Rod Scraper
P	Air/Oil Piston
R	Double Rod W/OS Cap Rod
S	Stainless Piston Rods
V	Viton Seals
X	Special

Magnetic Option	
O	No Magnet
M	Magnetic Piston

B	Design Level

Cushions†				
Needle Position	1	2**	3	4
No Cushions	A			
Head Only	B	C	D	E
Cap Only	G	H	J	K
Head and Cap	N	M	P	R
Special	X			

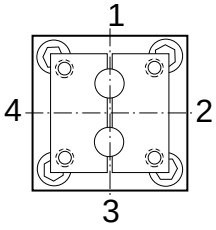
†Cushions not available on $1^1/_8$" Bore.
**Standard position

Ports				
Position	1**	2	3	4
Standard	A	B	C	D
Special	X			

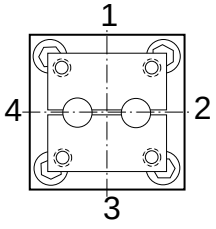
**Standard position

Mounting Options			
01	No Mounts (MX0)	**20**	**Base Bar**
02	Bottom Tap (MS4)	XX	Special
04	Front Flange (MF1)		
05	Rear Flange (MF2)		

Vertical Rod Axis



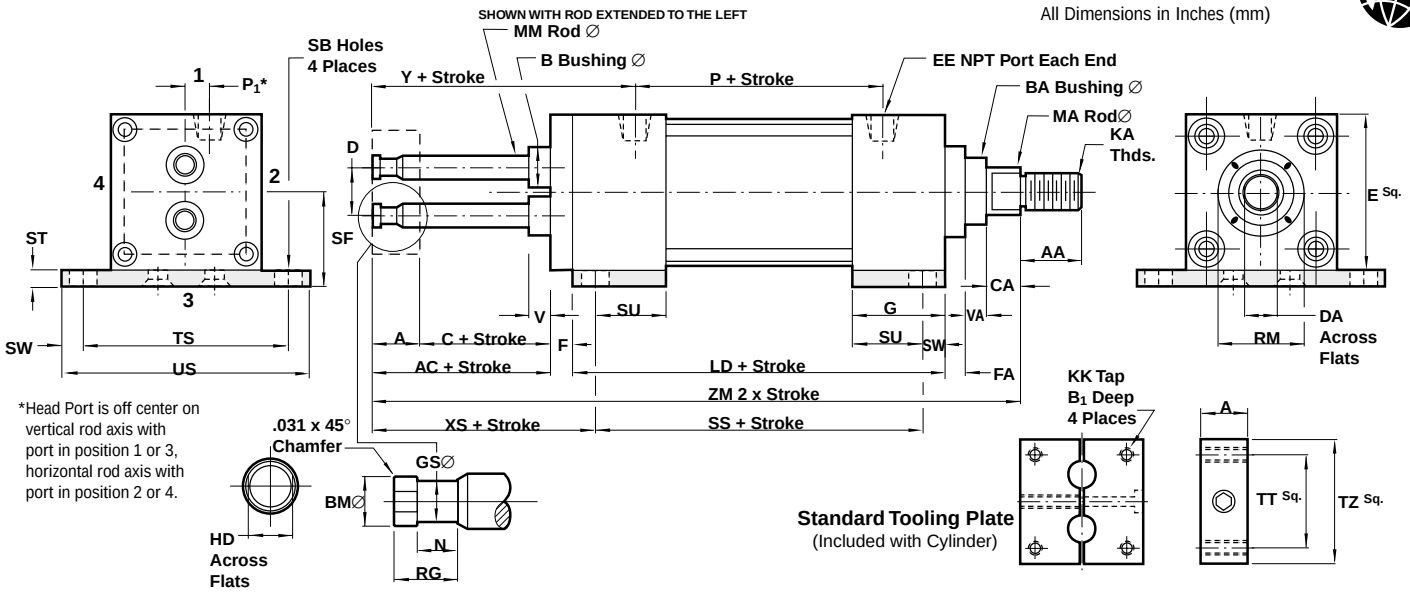
Horizontal Rod Axis



Note: $1^1/_8$" diameter not NFPA

ACT-3-30 for complete instructions on how to order cylinders.

All Dimensions in Inches (mm)



Dimension		1-1/8" Bore (28.58)	1-1/2" Bore (38.10)	2" Bore (50.80)	2-1/2" Bore (63.50)	3-1/4" Bore (82.55)	4" Bore (101.60)
A		.625 (15.88)	.625 (15.88)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
AA	Standard	.625 (15.88)	.750 (19.05)	.750 (19.05)	.750 (19.05)	1.125 (28.58)	1.125 (28.58)
	Oversize	.750 (19.05)	1.125 (28.58)	1.125 (28.58)	1.125 (28.58)	1.625 (41.28)	1.625 (41.28)
AC		1.250 (31.75)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)	1.750 (44.45)
B		N/A	.590 (14.99)	.900 (22.86)	.900 (22.86)	1.498 (38.05)	1.498 (38.05)
B_1		.500 (12.70)	Thru	Thru	Thru	Thru	Thru
BA	Standard	N/A	1.125 (28.58)	1.125 (28.58)	1.125 (28.58)	1.500 (38.10)	1.500 (38.10)
	Oversize	N/A	1.400 (35.56)	1.500 (38.10)	1.500 (38.10)	2.000 (50.80)	2.000 (50.80)
BM		.270 (6.86)	.330 (8.38)	.550 (13.97)	.550 (13.97)	.900 (22.86)	.900 (22.86)
C		.625 (15.88)	.875 (22.23)	.750 (19.05)	1.000 (25.40)	.500 (12.70)	.500 (12.70)
CA	Standard	.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.500 (12.70)	.500 (12.70)
	Oversize	.250 (6.35)	.500 (12.70)	.500 (12.70)	.500 (12.70)	.625 (15.88)	.625 (15.88)
D		.627 (15.93)	.750 (19.05)	1.052 (26.72)	1.398 (35.51)	2.000 (50.80)	2.360 (59.94)
DA	Standard	.312 (7.92)	.500 (12.70)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
	Oversize	.437 (11.10)	.812 (20.62)	.812 (20.62)	.812 (20.62)	1.125 (28.58)	1.125 (28.58)
E		1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.000 (76.20)	3.750 (95.25)	4.500 (114.30)
EE		1/8	1/4	1/4	1/4	3/8	3/8
F		.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
FA		.125 (3.18)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
G		1.000 (25.4)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)
GS		.190 (4.83)	.250 (6.35)	.500 (12.70)	.500 (12.70)	.750 (19.05)	.750 (19.05)
HD		.250 (6.35)	.312 (7.92)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
KA	Standard	3/8 – 24	1/2 – 20	1/2 – 20	1/2 – 20	3/4 – 16	3/4 – 16
	Oversize	1/2 – 20	3/4 – 16	3/4 – 16	3/4 – 16	1 – 14	1 – 14
KK		6 – 32	10 – 32	1/4 – 28	5/16 – 24	3/8 – 24	3/8 – 24
LD		†2.875 †(73.03)	4.125 (104.78)	4.125 (104.78)	4.250 (107.95)	4.750 (120.65)	4.750 (120.65)
MA	Standard	.375 (9.53)	.625 (15.88)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
	Oversize	.500 (12.70)	1.000 (25.40)	1.000 (25.40)	1.000 (25.40)	1.375 (34.93)	1.375 (34.93)
MM		.312 (7.92)	.375 (9.53)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
N		.400 (10.16)	.400 (10.16)	.526 (13.36)	.526 (13.36)	.784 (19.81)	.784 (19.81)
P		†1.844 †(46.84)	2.125 (53.98)	2.125 (53.98)	2.250 (57.15)	2.625 (66.68)	2.625 (66.68)
P_1		.241 (6.12)	.303 (7.70)	.480 (12.19)	.635 (16.13)	.845 (21.46)	.875 (22.23)
RG		.580 (14.73)	.580 (14.73)	.705 (17.91)	.705 (17.91)	1.205 (30.61)	1.205 (30.61)
RM	Standard	.750 (19.05)	2.000sq (50.80)	2.000 (50.80)	2.000 (50.80)	2.625 (66.68)	2.625 (66.68)
	Oversize	1.000 (25.40)	2.000sq (50.80)	2.500sq (63.50)	3.000sq (76.20)	3.375 (85.73)	3.375 (85.73)
SB		.203 (5.16)	.437 (11.10)	.437 (11.10)	.437 (11.10)	.563 (14.30)	.563 (14.30)
SH		1.000 (25.40)	1.250 (31.75)	1.500 (38.10)	1.875 (47.63)	2.375 (60.33)	2.750 (69.85)
SS		2.250 (57.15)	3.375 (85.73)	3.375 (85.73)	3.500 (88.90)	3.750 (95.25)	3.750 (95.25)
ST		.250 (6.35)	.250 (6.35)	.250 (6.35)	.375 (9.53)	.500 (12.70)	.500 (12.70)
SU		.750 (19.05)	1.125 (28.58)	1.125 (28.58)	1.125 (28.58)	1.250 (31.75)	1.250 (31.75)
SW		.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.500 (12.70)	.500 (12.70)
TS		1.875 (47.63)	2.750 (69.85)	3.250 (82.55)	3.750 (95.25)	4.750 (120.65)	5.500 (139.70)
TT		.750 (19.05)	1.125 (28.58)	1.430 (36.32)	1.840 (46.74)	1.790 (45.47)	3.440 (87.38)
TZ		1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.250 (82.55)	4.000 (101.60)
US		2.375 (60.33)	3.500 (88.90)	4.000 (101.60)	4.500 (114.30)	5.750 (146.05)	6.500 (165.10)
V		N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
VA	Standard	N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
	Oversize	N/A	.500 (12.70)	.500 (12.70)	.500 (12.70)	.375 (9.53)	.375 (9.53)
XS		1.750 (44.50)	2.250 (57.15)	2.250 (57.15)	2.250 (57.15)	2.875 (73.03)	2.875 (73.03)
Y		2.031 (51.59)	2.875 (73.03)	2.875 (73.03)	3.125 (81.66)	3.437 (87.30)	3.437 (87.30)
ZM		†4.625 †(117.48)	7.000 (177.80)	7.000 (177.80)	7.375 (187.33)	8.500 (215.90)	8.500 (215.90)

†Note: $1\frac{1}{8}$" bore overall body is $\frac{3}{8}$" longer than our standard Series "C" Double Rod End Cylinder.

Series N Actuators

Double Rod End Cylinder with 02 (MS4) Bottom Tap

- **NFPA (MF1) 02 Bottom Tap Mounts available in 1-1/8" thru 4" bore sizes.**
- **Cylinders rated to 250 PSI air. (For hydraulic service consult factory)**
- **Designed for non-lube service.**
- **New low breakaway design.**
- **Switches available on all bore sizes. (See ACT-3-28/29 for ordering information.)**

Cylinder Order Information

■ ■ ■ ■ ■ – ■ **0 2** – ■ ■ **B** ■ ■

1 2 3 4 5 6 7 8 9 10 11 12 13

N	Series N
Q	Series Q Electroless Nickel

Single Rod End	Bore	Double Rod End*
B	1 1/8"	P
C	1 1/2"	Q
D	2"	R
E	2 1/2"	S
F	3 1/4"	T
G	4"	U

*Double Rod End has two Piston Rods on one end and one Piston Rod on opposite end.

Full Inches in Strokes	
00	0" Stroke
01	1" Stroke
02	2" Stroke
03	3" Stroke
04	4" Stroke
05	5" Stroke
06	6" Stroke
. . .	. . .
30	30" Stroke
xx	Special

Fractional Increments of Stroke			
A	0"	J	1/2"
B	1/16"	K	9/16"
C	1/8"	M	5/8"
D	3/16"	N	11/16"
E	1/4"	P	3/4"
F	5/16"	R	13/16"
G	3/8"	S	7/8"
H	7/16"	T	15/16"
X	Special		

Rod Axis	
E	Horizontal Rod Axis
N	Vertical Rod Axis
A	No Tooling Plate - Horizontal Rod
B	No Tooling Plate - Vertical Rod
C	Blank Rod End - Horizontal Rod*
D	Blank Rod End - Vertical Rod*
X	Special

* Does not include tooling plate

Note: 1 1/8" diameter not NFPA

	Options
O	No Options
M	Metal Rod Scraper
P	Air/Oil Piston
R	Double Rod W/OS Cap Rod
S	Stainless Piston Rods
V	Viton Seals
X	Special

Magnetic Option	
O	No Magnet
M	Magnetic Piston

B	Design Level

Cushions†				
Needle Position	1	2**	3	4
No Cushions	A			
Head Only	B	C	D	E
Cap Only	G	H	J	K
Head and Cap	N	M	P	R
Special	X			

†Cushions not available on 1 1/8" Bore.
**Standard position

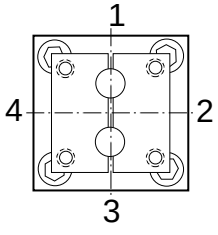
Ports				
Position	1**	2	3	4
Standard	A	B	C	D
Special	X			

**Standard position

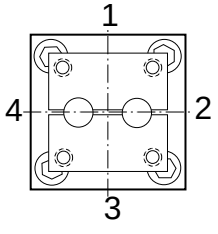
Mounting Options			
01	No Mounts (MX0)	07	Det. Clevis (MP2)
02	**Bottom Tap (MS4)**	18	Det. Eye (MP4)
04	Front Flange (MF1)	20	Base Bar
05	Rear Flange (MF2)	XX	Special

Switch, Port, and Cushion Needle Positions
(As viewed from twin rod end)

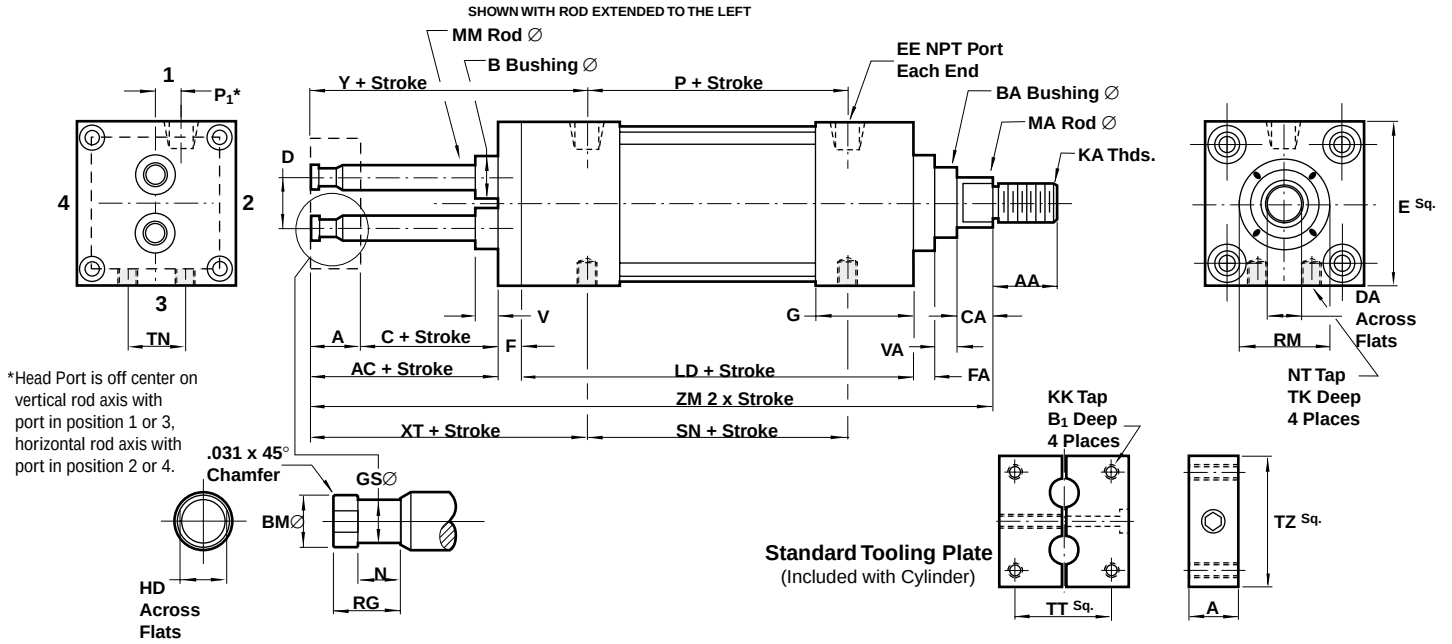
Vertical Rod Axis



Horizontal Rod Axis



See ACT-3-30 for complete instructions on how to order cylinders.



Dimension		1-1/8" Bore (28.58)	1-1/2" Bore (38.10)	2" Bore (50.80)	2-1/2" Bore (63.50)	3-1/4" Bore (82.55)	4" Bore (101.60)
A		.625 (15.88)	.625 (15.88)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
AA	Standard	.625 (15.88)	.750 (19.05)	.750 (19.05)	.750 (19.05)	1.125 (28.58)	1.125 (28.58)
	Oversize	.750 (19.05)	1.125 (28.58)	1.125 (28.58)	1.125 (28.58)	1.625 (41.28)	1.625 (41.28)
AC		1.250 (31.75)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)	1.750 (44.45)
B		N/A	.590 (14.99)	.900 (22.86)	.900 (22.86)	1.498 (38.05)	1.498 (38.05)
B_1		.500 (12.70)	Thru	Thru	Thru	Thru	Thru
BA	Standard	N/A	1.125 (28.58)	1.125 (28.58)	1.125 (28.58)	1.500 (38.10)	1.500 (38.10)
	Oversize	N/A	1.400 (35.56)	1.500 (38.10)	1.500 (38.10)	2.000 (50.80)	2.000 (50.80)
BM		.270 (6.86)	.330 (8.38)	.550 (13.97)	.550 (13.97)	.900 (22.86)	.900 (22.86)
C		.625 (15.88)	.875 (22.23)	.750 (19.05)	1.000 (25.40)	.500 (12.70)	.500 (12.70)
CA	Standard	.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.500 (12.70)	.500 (12.70)
	Oversize	.250 (6.35)	.500 (12.70)	.500 (12.70)	.500 (12.70)	.625 (15.88)	.625 (15.88)
D		.627 (15.93)	.750 (19.05)	1.052 (26.72)	1.398 (35.51)	2.000 (50.80)	2.360 (59.94)
DA	Standard	.312 (7.92)	.500 (12.70)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
	Oversize	.437 (11.10)	.812 (20.62)	.812 (20.62)	.812 (20.62)	1.125 (28.58)	1.125 (28.58)
E		1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.000 (76.20)	3.750 (95.25)	4.500 (114.30)
EE		1/8	1/4	1/4	1/4	3/8	3/8
F		.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
FA		.125 (3.18)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
G		1.000 (25.4)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)
GS		.190 (4.83)	.250 (6.35)	.500 (12.70)	.500 (12.70)	.750 (19.05)	.750 (19.05)
HD		.250 (6.35)	.312 (7.92)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
KA	Standard	3/8 – 24	1/2 – 20	1/2 – 20	1/2 – 20	3/4 – 16	3/4 – 16
	Oversize	1/2 – 20	3/4 – 16	3/4 – 16	3/4 – 16	1 – 14	1 – 14
KK		6 – 32	10 – 32	1/4 – 28	5/16 – 24	3/8 – 24	3/8 – 24
LD		†2.875 †(73.03)	4.125 (104.78)	4.125 (104.78)	4.250 (107.95)	4.750 (120.65)	4.750 (120.65)
MA	Standard	.375 (9.53)	.625 (15.88)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
	Oversize	.500 (12.70)	1.000 (25.40)	1.000 (25.40)	1.000 (25.40)	1.375 (34.93)	1.375 (34.93)
MM		.312 (7.92)	.375 (9.53)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
N		.400 (10.16)	.400 (10.16)	.526 (13.36)	.526 (13.36)	.784 (19.81)	.784 (19.81)
NT		10 – 32	1/4 – 20	5/16 – 18	3/8 – 16	1/2 – 13	1/2 – 13
P		†1.844 †(46.84)	2.125 (53.98)	2.125 (53.98)	2.250 (57.15)	2.625 (66.68)	2.625 (66.68)
P_1		.241 (6.12)	.303 (7.70)	.480 (12.19)	.635 (16.13)	.845 (21.46)	.875 (22.23)
RG		.580 (14.73)	.580 (14.73)	.705 (17.91)	.705 (17.91)	1.205 (30.61)	1.205 (30.61)
RM	Standard	.750 (19.05)	2.000sq (50.80)	2.000 (50.80)	2.000 (50.80)	2.625 (66.68)	2.625 (66.68)
	Oversize	1.000 (25.40)	2.000sq (50.80)	2.500sq (63.50)	3.000sq (76.20)	3.375 (85.73)	3.375 (85.73)
SN		1.875 (47.63)	2.250 (57.15)	2.250 (57.15)	2.375 (60.33)	2.625 (66.68)	2.625 (66.68)
TK		.250 (6.35)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)	.750 (19.05)
TN		.500 (12.70)	.625 (15.88)	.875 22.23	1.250 (31.75)	1.500 (38.10)	2.063 (52.40)
TT		.750 (19.05)	1.125 (28.58)	1.430 (36.32)	1.840 (46.74)	1.790 (45.47)	3.440 (87.38)
TZ		1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.250 (82.55)	4.000 (101.60)
V		N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
VA	Standard	N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
	Oversize	N/A	.500 (12.70)	.500 (12.70)	.500 (12.70)	.375 (9.53)	.375 (9.53)
XT		2.000 (50.80)	2.812 (71.42)	2.812 (71.42)	3.063 (77.80)	3.437 (87.30)	3.437 (87.30)
Y		2.031 (51.59)	2.875 (73.03)	2.875 (73.03)	3.125 (81.66)	3.437 (87.30)	3.437 (87.30)
ZM		†4.625 †(117.48)	7.000 (177.80)	7.000 (177.80)	7.375 (187.33)	8.500 (215.90)	8.500 (215.90)

†Note: $1\frac{1}{8}$" bore overall body is $\frac{3}{8}$" longer than our standard Series "C" Double Rod End Cylinder.

- **NFPA (MF1) 04 Front Flange Mounts available in 1-1/8" thru 4" bore sizes.**
- **Cylinders rated to 250 PSI air. (For hydraulic service consult factory)**
- **Designed for non-lube service.**
- **New low breakaway design.**
- **Switches available on all bore sizes. (See ACT-3-28/29 for ordering information.)**

Cylinder Order Information

■	■	■	■	■	–	■	0	4	–	■	■	B	■	■
1	2	3	4	5		6	7	8		9	10	11	12	13

N	Series N
Q	Series Q Electroless Nickel

Single Rod End	Bore	Double Rod End*
B	1 1/8"	P
C	1 1/2"	Q
D	2"	R
E	2 1/2"	S
F	3 1/4"	T
G	4"	U

*Double Rod End has two Piston Rods on one end and one Piston Rod on opposite end.

Full Inches in Strokes	
00	0" Stroke
01	1" Stroke
02	2" Stroke
03	3" Stroke
04	4" Stroke
05	5" Stroke
06	6" Stroke
. . .	. . .
30	30" Stroke
xx	Special

Fractional Increments of Stroke			
A	0"	J	1/2"
B	1/16"	K	9/16"
C	1/8"	M	5/8"
D	3/16"	N	11/16"
E	1/4"	P	3/4"
F	5/16"	R	13/16"
G	3/8"	S	7/8"
H	7/16"	T	15/16"
X	Special		

Rod Axis	
E	Horizontal Rod Axis
N	Vertical Rod Axis
A	No Tooling Plate - Horizontal Rod
B	No Tooling Plate - Vertical Rod
C	Blank Rod End - Horizontal Rod*
D	Blank Rod End - Vertical Rod*
X	Special

* Does not include tooling plate

Note: 1 1/8" diameter not NFPA

	Options
O	No Options
M	Metal Rod Scraper
P	Air/Oil Piston
R	Double Rod W/OS Cap Rod
S	Stainless Piston Rods
V	Viton Seals
X	Special

Magnetic Option	
O	No Magnet
M	Magnetic Piston

B	Design Level

Cushions†				
Needle Position	1	2**	3	4
No Cushions	A			
Head Only	B	C	D	E
Cap Only	G	H	J	K
Head and Cap	N	M	P	R
Special	X			

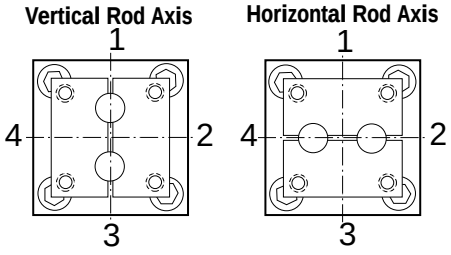
†Cushions not available on 1 1/8" Bore.
**Standard position

Ports				
Position	1**	2	3	4
Standard	A	B	C	D
Special	X			

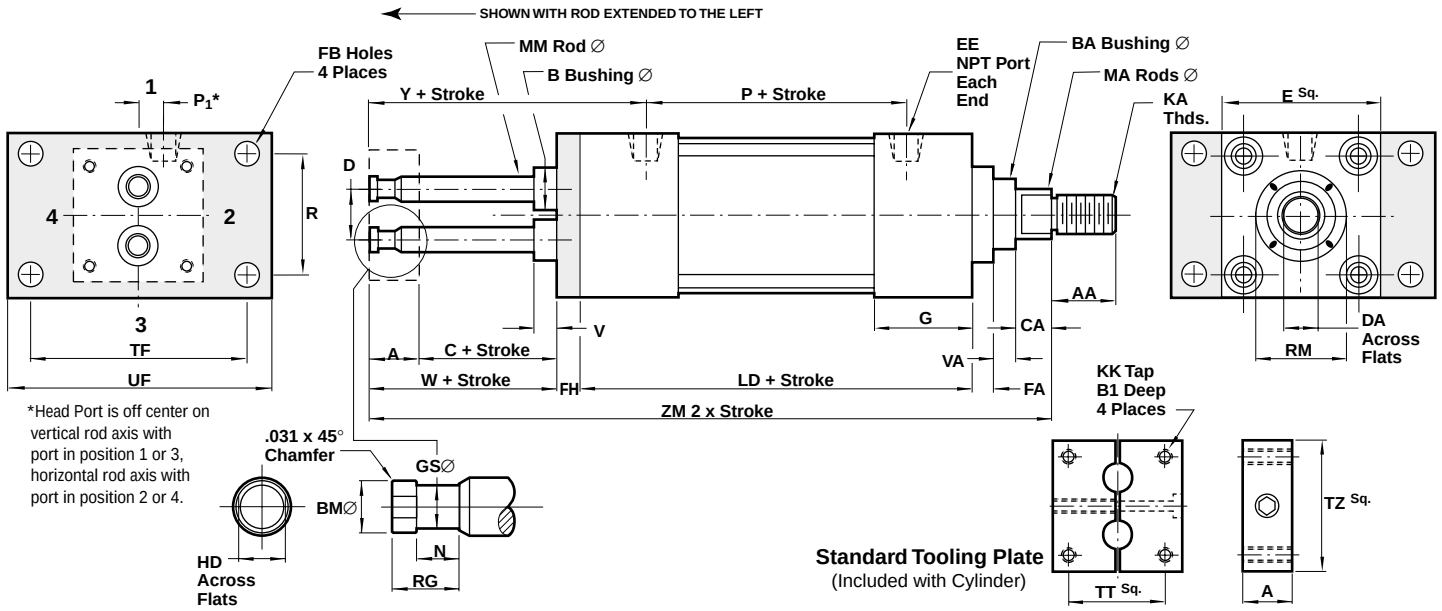
**Standard position

Mounting Options			
01	No Mounts (MX0)	07	Det. Clevis (MP2)
02	Bottom Tap (MS4)	18	Det. Eye (MP4)
04	**Front Flange (MF1)**	20	Base Bar
05	Rear Flange (MF2)	XX	Special

Switch, Port, and Cushion Needle Positions
(As viewed from twin rod end)



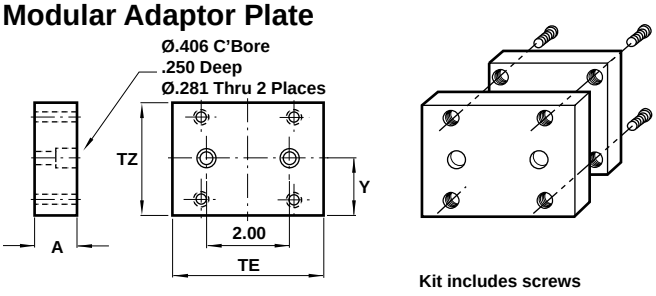
See ACT-3-30 for complete instructions on how to order cylinders.



Dimension		1-1/8" Bore (28.58)	1-1/2" Bore (38.10)	2" Bore (50.80)	2-1/2" Bore (63.50)	31/4" Bore (82.55)	4" Bore (101.60)
A		.625 (15.88)	.625 (15.88)	.750 (19.05)	.750 (19.05)	1.250 (31.75)	1.250 (31.75)
AA	Standard	.625 (15.88)	.750 (19.05)	.750 (19.05)	.750 (19.05)	1.125 (28.58)	1.125 (28.58)
	Oversize	.750 (19.05)	1.125 (28.58)	1.125 (28.58)	1.125 (28.58)	1.625 (41.28)	1.625 (41.28)
B		N/A	.590 (14.99)	.900 (22.86)	.900 (22.86)	1.498 (38.05)	1.498 (38.05)
B_1		.500 (12.70)	Thru	Thru	Thru	Thru	Thru
BA	Standard	N/A	1.125 (28.58)	1.125 (28.58)	1.125 (28.58)	1.500 (38.10)	1.500 (38.10)
	Oversize	N/A	1.400 (35.56)	1.500 (38.10)	1.500 (38.10)	2.000 (50.80)	2.000 (50.80)
BM		.270 (6.86)	.330 (8.38)	.550 (13.97)	.550 (13.97)	.900 (22.86)	.900 (22.86)
C		.625 (15.88)	.875 (22.23)	.750 (19.05)	1.000 (25.40)	.500 (12.70)	.500 (12.70)
CA	Standard	.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.500 (12.70)	.500 (12.70)
	Oversize	.250 (6.35)	.500 (12.70)	.500 (12.70)	.500 (12.70)	.625 (15.88)	.625 (15.88)
D		.627 (15.93)	.750 (19.05)	1.052 (26.72)	1.398 (35.51)	2.000 (50.80)	2.360 (59.94)
DA	Standard	.312 (7.92)	.500 (12.70)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
	Oversize	.437 (11.10)	.812 (20.62)	.812 (20.62)	.812 (20.62)	1.125 (28.58)	1.125 (28.58)
E		1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.000 (76.20)	3.750 (95.25)	4.500 (114.30)
EE		1/8	1/4	1/4	1/4	3/8	3/8
FA		.125 (3.18)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
FB		.219 (5.56)	.312 (7.92)	.375 (9.53)	.375 (9.53)	.437 (11.10)	.437 (11.10)
FH		.250 (6.35)	.375 (9.53)	.375 (9.53)	.375 (9.53)	.625 (15.88)	.625 (15.88)
G		1.000 (25.4)	1.500 (38.10)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)
GS		.190 (4.83)	.250 (6.35)	.500 (12.70)	.500 (12.70)	.750 (19.05)	.750 (19.05)
HD		.250 (6.35)	.312 (7.92)	.500 (12.70)	.500 (12.70)	.812 (20.62)	.812 (20.62)
KA	Standard	3/8 – 24	1/2 – 20	1/2 – 20	1/2 – 20	3/4 – 16	3/4 – 16
	Oversize	1/2 – 20	3/4 – 16	3/4 – 16	3/4 – 16	1 – 14	1 – 14
KK		6 – 32	10 – 32	1/4 – 28	5/16 – 24	3/8 – 24	3/8 – 24
LD		†2.875 †(73.03)	4.125 (104.78)	4.125 (104.78)	4.250 (107.95)	4.750 (120.65)	4.750 (120.65)
MA	Standard	.375 (9.53)	.625 (15.88)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
	Oversize	.500 (12.70)	1.000 (25.40)	1.000 (25.40)	1.000 (25.40)	1.375 (34.93)	1.375 (34.93)
MM		.312 (7.92)	.375 (9.53)	.625 (15.88)	.625 (15.88)	1.000 (25.40)	1.000 (25.40)
N		.400 (10.16)	.400 (10.16)	.526 (13.36)	.526 (13.36)	.784 (19.81)	.784 (19.81)
P		†1.844 †(46.84)	2.125 (53.98)	2.125 (53.98)	2.250 (57.15)	2.625 (66.68)	2.625 (66.68)
P_1		.241 (6.12)	.303 (7.70)	.480 (12.19)	.635 (16.13)	.845 (21.46)	.875 (22.23)
R		1.000 (25.40)	1.430 (36.32)	1.840 (46.74)	2.190 (55.63)	2.760 (70.10)	3.320 (84.33)
RG		.580 (14.73)	.580 (14.73)	.705 (17.91)	.705 (17.91)	1.205 (30.61)	1.205 (30.61)
RM	Standard	.750 (19.05)	2.000sq (50.80)	2.000 (50.80)	2.000 (50.80)	2.625 (66.68)	2.625 (66.68)
	Oversize	1.000 (25.40)	2.000sq (50.80)	2.500sq (63.50)	3.000sq (76.20)	3.375 (85.73)	3.375 (85.73)
TF		2.000 (50.80)	2.750 (69.85)	3.375 (85.73)	3.875 (98.43)	4.688 (119.08)	5.437 (138.10)
TT		.750 (19.05)	1.125 (28.58)	1.430 (36.32)	1.840 (46.74)	1.790 (45.47)	3.440 (87.38)
TZ		1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.250 (82.55)	4.000 (101.60)
UF		2.500 (63.50)	3.750 (95.25)	4.125 (104.78)	4.625 (117.48)	5.500 (139.70)	6.250 (158.75)
V		N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
VA	Standard	N/A	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)	.250 (6.35)
	Oversize	N/A	.500 (12.70)	.500 (12.70)	.500 (12.70)	.375 (9.53)	.375 (9.53)
W		1.250 (31.75)	1.500 (38.10)	1.500 (38.10)	1.750 (44.45)	1.750 (44.45)	1.750 (44.45)
Y		2.031 (51.59)	2.875 (73.03)	2.875 (73.03)	3.125 (81.66)	3.437 (87.30)	3.437 (87.30)
ZM		†4.625 †(117.48)	7.000 (177.80)	7.000 (177.80)	7.375 (187.33)	8.500 (215.90)	8.500 (215.90)

†Note: $1\frac{1}{8}$" bore overall body is $\frac{3}{8}$" longer than our standard Series "C" Double Rod End Cylinder.

Modular Adaptor Plate

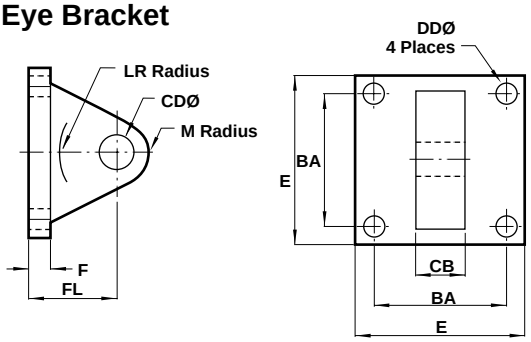


Kit includes screws

Modular Adaptor Plate Dimensions

Bore	1-1/8"	1-1/2"	2"	2-1/2"
	NB-172-225K	NB-172-03K	NB-172-04K	NB-172-05K
A	.625 (15.88)	.625 (15.88)	.625 (15.88)	.625 (15.88)
TE	3.000 (76.20)	3.000 (76.20)	3.000 (76.20)	3.000 (76.20)
TZ	1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)
Y	.625 (15.88)	.750 (19.05)	1.000 (25.40)	1.250 (31.75)

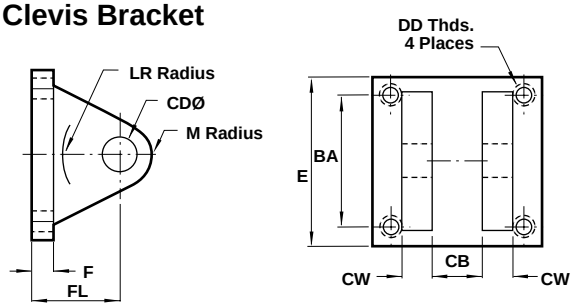
Eye Bracket



NFPA Eye Bracket Dimensions

	C-89-03A	C-89-065A	C-89-12A
BA	1.625 (41.28)	2.562 (65.07)	3.250 (82.55)
CB	.750 (19.05)	1.250 (31.75)	1.500 (38.10)
CD	.500 (12.70)	.750 (19.05)	1.000 (25.40)
DD	.406 (10.31)	.531 (13.49)	.656 (16.66)
E	2.500 (63.50)	3.500 (88.90)	4.500 (114.30)
F	.375 (9.53)	.625 (15.88)	.750 (19.05)
FL	1.125 (28.58)	1.875 (47.63)	2.250 (57.15)
LR	.750 (19.05)	1.250 (31.75)	1.500 (38.10)
M	.500 (12.70)	.750 (19.05)	1.000 (25.40)

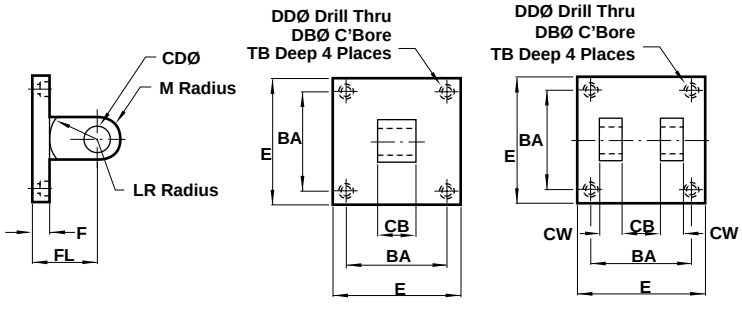
Clevis Bracket



NFPA Clevis Bracket Dimensions

	C-91-03A	C-91-065A	C-91-12A
BA	1.625 (41.28)	2.562 (65.07)	3.250 (82.55)
CB	.750 (19.05)	1.250 (31.75)	1.500 (38.10)
CD	.500 (12.70)	.750 (19.05)	1.000 (25.40)
CW	.500 (12.70)	.625 (15.88)	.750 (19.05)
DD	3/8-24	1/2-20	5/8-18
E	2.500 (63.50)	3.500 (88.90)	4.500 (114.30)
F	.375 (9.53)	.625 (15.88)	.750 (19.05)
FL	1.125 (28.58)	1.875 (47.63)	2.250 (57.15)
LR	.750 (19.05)	1.250 (31.75)	1.500 (38.10)
M	.500 (12.70)	.812 (20.62)	1.000 (25.40)

1-1/8" Bore Eye & Clevis Bracket

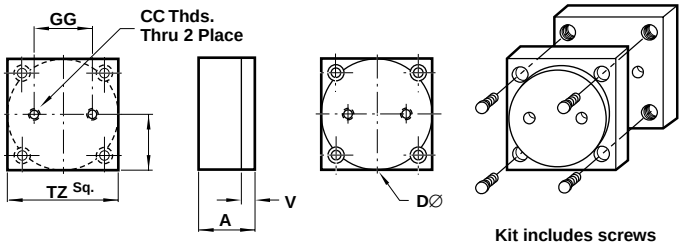


1-1/8" Bore Eye & Clevis Bracket Dimensions

	W-89-225K Eye	W-91-225K Clevis
BA	1.125 (28.58)	1.150 (29.21)
CB	.375 (9.53)	.375 (9.53)
CD	.375 (9.53)	.375 (9.53)
CW	–	.250 (6.35)
DB	.328 (8.33)	.328 (8.33)
DD	.203 (5.16)	.203 (5.16)
E	1.500 (38.10)	1.500 (38.10)
F	.500 (12.70)	.500 (12.70)
FL	1.125 (28.58)	1.125 (28.58)
LR	.625 (15.88)	.625 (15.88)
M	.375 (9.53)	.375 (9.53)
TB	.312 (7.92)	.312 (7.92)

Note: 1-1/8" bore eye and clevis brackets include standard pivot pin and mounting screws.

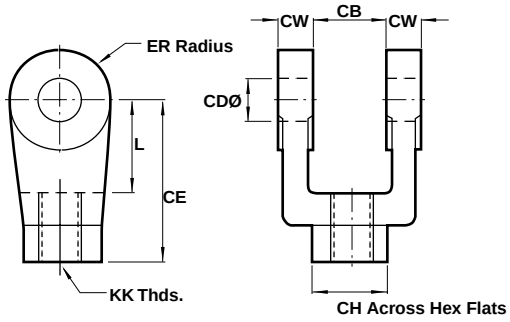
Pilot Adaptor Plate



Pilot Adaptor Plate Dimensions

Bore	1-1/8"	1-1/2"	2"	2-1/2"	3/4"	4"
	NB-171-225K	NB-171-03K	NB-171-04K	NB-171-05K	NB-171-065K	NB-171-08K
A	.625 (15.88)	.625 (15.88)	.625 (15.88)	.625 (15.88)	.875 (22.23)	.875 (22.23)
CC	1/4-20	5/16-18	5/16-18	3/8-16	1/2-13	1/2-13
D	1.260 (32.00)	1.575 (40.01)	1.969 (50.01)	2.480 (62.99)	3.150 (80.01)	3.937 (99.99)
GG	.750 (19.05)	.860 (21.84)	1.180 (29.97)	1.500 (38.10)	1.970 (50.04)	2.760 (70.10)
TZ	1.250 (31.75)	1.500 (38.10)	2.000 (50.80)	2.500 (63.50)	3.250 (82.55)	4.000(101.60)
V	.160 (4.06)	.160 (4.06)	.200 (5.08)	.200 (5.08)	.200 (5.08)	.200 (5.08)
Y	.625 (15.88)	.750 (19.05)	1.000 (25.40)	1.250 (31.75)	1.625 (41.28)	2.000 (50.80)

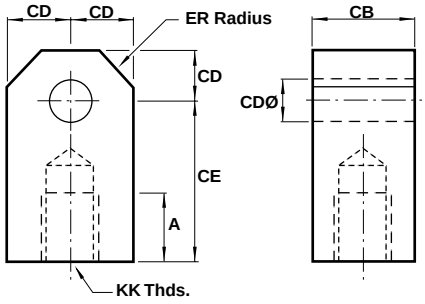
Rod Clevis



Rod Clevis Dimensions

	C-92-03	C-92-065	C-92-12
CB	.750 (19.05)	1.250 (31.75)	1.500 (38.10)
CD	.500 (12.70)	.750 (19.05)	1.000 (25.40)
CE	1.500 (38.10)	2.375 (60.33)	3.125 (79.38)
CH	1.000 (25.40)	1.250 (31.75)	1.500 (38.10)
CW	.500 (12.70)	.625 (15.88)	.750 (19.05)
ER	.500 (12.70)	.750 (19.05)	1.000 (25.40)
KK	1/2-20	3/4-16	1-14
L	.750 (19.05)	1.250 (31.75)	1.500 (38.10)

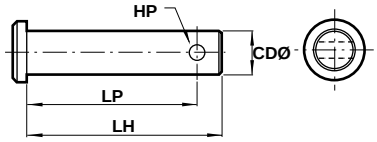
Rod Eye



Rod Eye Dimensions

	C-97-03	C-97-065	C-97-12
CB	.750 (19.05)	1.250 (31.75)	1.500 (38.10)
CD	.500 (12.70)	.750 (19.05)	1.000 (25.40)
CE	1.500 (38.10)	2.062 (52.37)	2.812 (71.42)
ER	.562 (14.27)	.937 (23.80)	1.125 (28.58)
KK	1/2-20	3/4-16	1-14

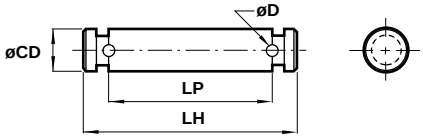
Standard Pin



Standard Pin Dimensions

	C-96-225	C-96-03	C-96-065	C-96-12
CD	.375 (9.53)	.500 (12.70)	.750 (19.05)	1.000 (25.40)
HP	.156 (3.96)	.156 (3.96)	.156 (3.96)	.203 (5.18)
LH	1.250 (31.75)	2.250 (57.15)	3.000 (76.20)	3.500 (88.90)
LP	1.032 (26.21)	2.093 (53.16)	2.843 (72.21)	3.297 (83.74)

NFPA Pin



NFPA Pin Dimensions

	C-96-03A	C-96-065A	C-96-12A
CD	.500 (12.70)	.750 (19.05)	1.000 (25.40)
LH	2.219 (56.36)	3.125 (79.38)	3.750 (95.25)
LP	1.875 (47.63)	2.750 (69.85)	3.250 (82.55)

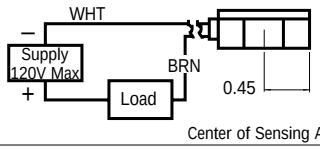
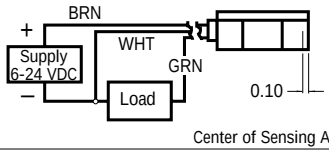
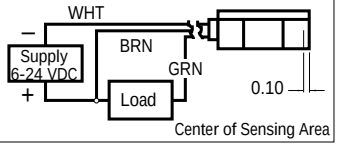
Series N Actuators

Switches for 1-1/8" to 2-1/2" Cylinders

- **Magnetically operated, non-contact sensing system.**
- **Consists of a magnet in the piston, and a sensing switch clamped to the tie rod holding it against the cylinder tube.**
- **One or more switches may be mounted to provide an indication of piston position.**
- **Switches are provided with vinyl molded cable.**
- **Adjustable mounting brackets allow for switches to be securely positioned anywhere along the range of piston travel.**
- **Indicator light facilitates installation and troubleshooting.**
- **Several switches may be mounted to control or initiate any sequence function.**
- **Mounting brackets standard with switches.**

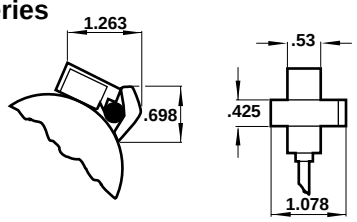
Specifications

*Metal Oxide Varistor Surge Suppression. **NOTE:** All CS7 and CS8 Series Switches are supplied with 9 foot leads.

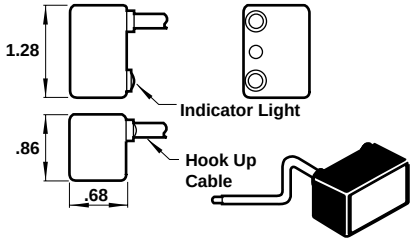
Switch Model	CS8-2-04 Reed	CS8-2-31 Hall	CS8-2-32 Hall
Bore Sizes	$1^1/_8$" thru $2^1/_2$"	$1^1/_8$" thru $2^1/_2$"	$1^1/_8$" thru $2^1/_2$"
Switch Type	Reed Switch *MOV & Light	Hall Effect & Light, Sourcing PNP	Hall Effect & Light, Sinking NPN
Function	SPST Normally Open	Normally Open	Normally Open
Switching Voltage	5-120 VDC/VAC 50/60 Hz	6-24 VDC	6-24 VDC
Switching Current	.5 Amp Max .005 Amp Min	.5 Amp Max	.5 Amp Max
Switching Power	10 VA	12 Watts Max	12 Watts Max
Max Voltage Drop	3.5 Volts	.5 Volts	.5 Volts
Magnetic Sensitivity	85 Gauss	85 Gauss	85 Gauss
Enclosure Classification	NEMA 6 & CSA Approved	NEMA 6 & CSA Approved	NEMA 6 & CSA Approved
Temperature Range	-22°F to +176°F	-22°F to +176°F	-22°F to +176°F
Wiring Diagrams			

Switch & Mounting Bracket Dimensions

CS8-2 Series

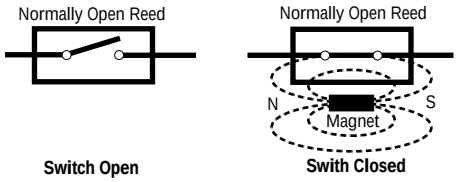


CS7 Series



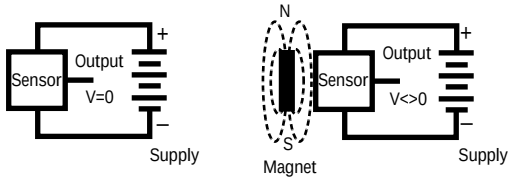
Reed Switch Working Principle

Reed switch sensors contain hermetically sealed reed elements (mechanical contacts) which are open in their normal state. When a magnetic field moves within proximity of the switch, magnetism is induced into the leads and forces the contacts to close.



Hall Effect/Magnetoresistive Working Principle

The solid state (no moving parts) magnetoresitive sensor responds to a north or south magnetic pole by providing a digital signal to the output control circuit. This technique enables the sensing of weak magnetic fields, with no limit to the maximum strength of the magnetic field.



Application Recommendations and Precautions

To provide maximum reliability.

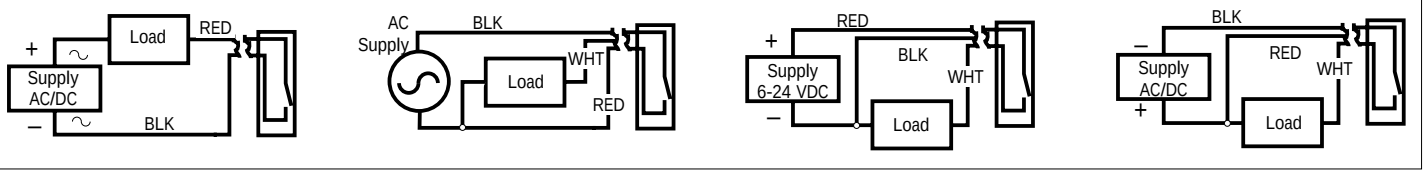
1. Always stay within the specifications and power rating limitations of the unit installed.
2. Primary and control circuit wiring should not be mixed in the same conduit. Motors will produce high pulses that will be introduced into the control wiring if the wiring is carried in the same conduit.
3. Never connect the switch without a load present. The switch will be destroyed.
4. Some electrical loads may be capacitive. Capacitive loading may occur due to distributed capacity in cable runs over 25 feet. Use switch Model CS7-24 whenever capacitive loading may occur.

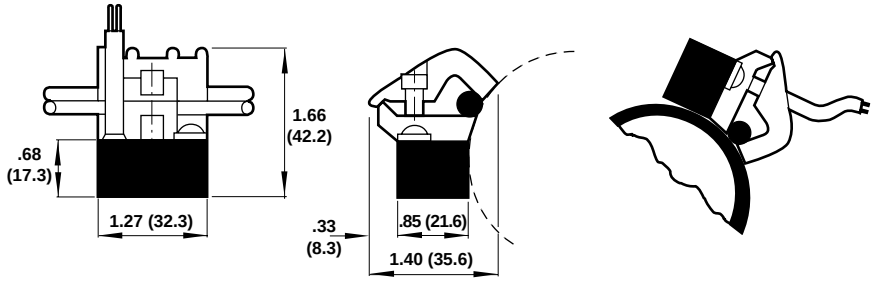
In order to obtain optimum performance and long life, magnetically operated limit switches should not be subjected to: (1) strong magnetic fields, (2) extreme temperature, and (3) excessive ferrous filing or chip buildup.

Improper wiring may damage or destroy the switch. The wiring diagram, along with the listed power ratings, must be carefully observed before connecting power to the switch.

Lower power switches are designed for signaling electronic circuits. Do not use on relay loads or with incandescent bulbs. Resistive loads only.

CS7-04 Reed	CS7-24 Reed	CS7-31 Hall	CS7-32 Hall
2" thru 4"	2" thru 4"	2" thru 4"	2" thru 4"
Reed Switch *MOV & Light	Reed Switch *MOV & Light, 3 Wire	Hall Effect & Light, Sourcing PNP	Hall Effect & Light, Sinking NPN
Normally Open	Normally Open	Normally Open	Normally Open
5-240 VDC/VAC 50/60 Hz	24-240 VAC 50/60 Hz	6-24 VDC	6-24 VDC
1 Amp Max	4 Amp Max 50 Amp Inrush	1 Amp Max	1 Amp Max
30 Watts Max	100 Watts Max	24 Watts Max	24 Watts Max
3 Volts	N/A	.5 Volts	.5 Volts
85 Gauss Parallel	85 Gauss Parallel	85 Gauss Parallel	85 Gauss Parallel
NEMA 6 & CSA Approved	NEMA 6 & CSA Approved	NEMA 6 & CSA Approved	NEMA 6 & CSA Approved
-22°F to +176°F	-22°F to +176°F	-22°F to +176°F	-22°F to +176°F





All Dimensions in Inches (mm)

Cylinder Order Information

N	C	0	4	J	–	E	0	2	–	A	M	B	O	O
1	2	3	4	5		6	7	8		9	10	11	12	13

N	Series N
Q	Series Q Electroless Nickel

Single Rod End	Bore	Double Rod End*
B	1 1/8"	P
C	1 1/2"	Q
D	2"	R
E	2 1/2"	S
F	3 1/4"	T
G	4"	U

*Double Rod End has two Piston Rods on one end and one Piston Rod on opposite end.

Full Inches in Strokes	
00	0" Stroke
01	1" Stroke
02	2" Stroke
03	3" Stroke
04	4" Stroke
05	5" Stroke
06	6" Stroke
. . .	. . .
30	30" Stroke
xx	Special

Fractional Increments of Stroke			
A	0"	J	1/2"
B	1/16"	K	9/16"
C	1/8"	M	5/8"
D	3/16"	N	11/16"
E	1/4"	P	3/4"
F	5/16"	R	13/16"
G	3/8"	S	7/8"
H	7/16"	T	15/16"
X	Special		

Rod Axis	
E	Horizontal Rod Axis
N	Vertical Rod Axis
A	No Tooling Plate - Horizontal Rod
B	No Tooling Plate - Vertical Rod
C	Blank Rod End - Horizontal Rod*
D	Blank Rod End - Vertical Rod*
X	Special

* Does not include tooling plate

Note: 1 1/8" diameter not NFPA

	Options
O	No Options
M	Metal Rod Scraper
P	Air/Oil Piston
R	Double Rod W/OS Cap Rod
S	Stainless Piston Rods
V	Viton Seals
X	Special

Magnetic Option	
O	No Magnet
M	Magnetic Piston

B	Design Level

Cushions†				
Needle Position	1	2**	3	4
No Cushions	A			
Head Only	B	C	D	E
Cap Only	G	H	J	K
Head and Cap	N	M	P	R
Special	X			

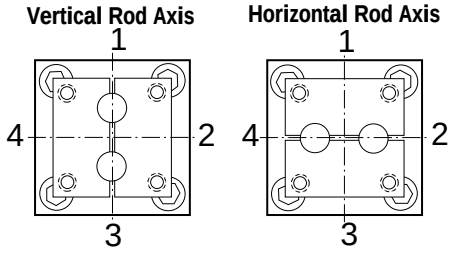
†Cushions not available on 1 1/8" Bore.
**Standard position

Ports				
Position	1**	2	3	4
Standard	A	B	C	D
Special	X			

**Standard position

Mounting Options			
01	**No Mounts (MX0)**	07	Det. Clevis (MP2)
02	Bottom Tap (MS4)	18	Det. Eye (MP4)
04	Front Flange (MF1)	20	Base Bar
05	Rear Flange (MF2)	XX	Special

Switch, Port, and Cushion Needle Positions
(As viewed from twin rod end)



EXAMPLE: Series "N" – 1 1/2" bore – 4 1/2" stroke – horizontal rod axis – standard tooling plate – MS4 Mount – standard ports at position #1 – standard cushion head and cap at position #2 – no options.

IMPORTANT: When using X, XX, or 98 in a model number, please be specific! X = (Description).

Reed & Hall Effect Switches
Available on all bore sizes – order separately. See pages 28 and 29 for specifications.

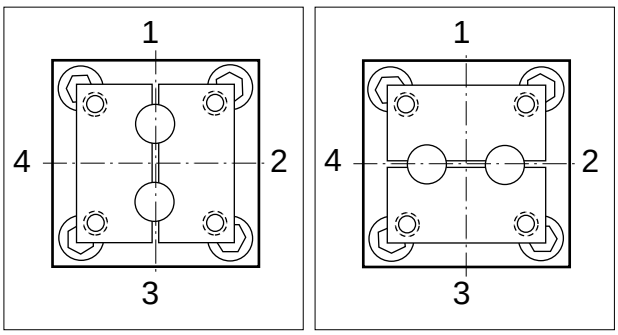
NOTE: Consult factory when using **competitive** position sensing devices.

Proximity Switches
Available on 1 1/2" thru 4" bores only. See page 30 for specifications.

To indicate switch mounting location, use "98" and specify end cap designations and the desired switch location.

NOTE: Proximity switch position must be 90° from rod axis.

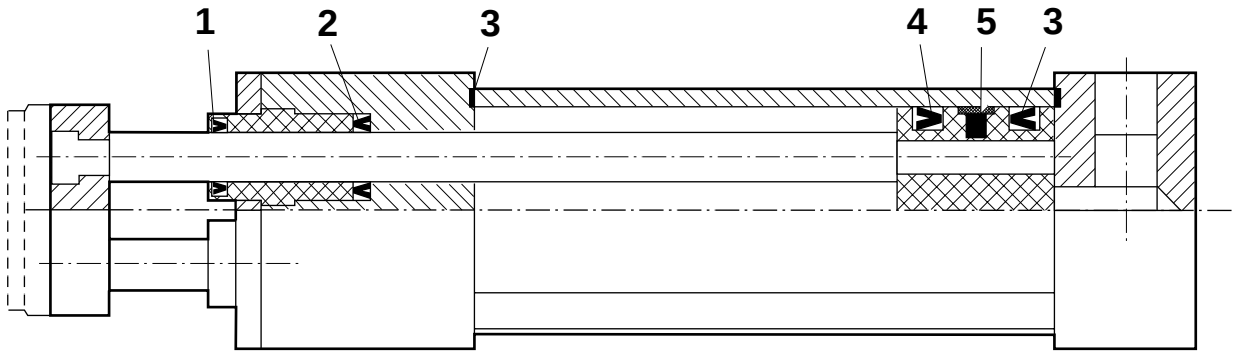
Switch, Port, and Cushion Needle Positions
(As viewed from twin rod end)



Cylinder Weights

Bore		Mounting Code 01–02	04	05	07–18	20	Add Per Inch of Stroke	Standard Tooling Plate	Pilot Adaptor Plate	Modular Adaptor Plate
1-1/8"	Single Rod End	1 lb	1 lb 2 ozs	1 lb 4 ozs	1 lb 6 ozs	1 lb 3 ozs	2 ozs	4 ozs	1.2 ozs	3.4 ozs
	Standard Double Rod End	1 lb 3 ozs	1 lb 5 ozs	1 lb 7 ozs	1 lb 9 ozs	1 lb 6 ozs	2.5 ozs			
	Oversize Double Rod End	1 lb 4 ozs	1 lb 6 ozs	1 lb 8 ozs	1 lb 10 ozs	1 lb 7 ozs	2.8 ozs			
1-1/2"	Single Rod End	2 lbs 4 ozs	2 lbs 10 ozs	2 lbs 15 ozs	2 lbs 14 ozs	2 lbs 8 ozs	4 ozs	6 ozs	1.8 ozs	4.1 ozs
	Standard Double Rod End	2 lbs 10 ozs	3 lbs	3 lbs 5 ozs	3 lbs 4 ozs	2 lbs 8 ozs	5.4 ozs			
	Oversize Double Rod End	3 lbs 4 ozs	3 lbs 10 ozs	3 lbs 15 ozs	3 lbs 14 ozs	3 lbs 14 ozs	7.6 ozs			
2"	Single Rod End	4 lbs 3 ozs	4 lbs 12 ozs	5 lbs 4 ozs	5 lbs 4 ozs	4 lbs 8 ozs	4 ozs	12 ozs	3.3 ozs	5.8 ozs
	Standard Double Rod End	4 lbs 9 ozs	5 lbs 2 ozs	5 lbs 10 ozs	5 lbs 10 ozs	4 lbs 14 ozs	5.4 ozs			
	Oversize Double Rod End	5 lbs 3 ozs	5 lbs 12 ozs	6 lbs 4 ozs	6 lbs 4 ozs	5 lbs 8 ozs	7.6 ozs			
2-1/2"	Single Rod End	4 lbs 4 ozs	4 lbs 15 ozs	5 lbs 12 ozs	5 lbs 7 ozs	4 lbs 13 ozs	6 ozs	1 lb 3 ozs	5.2 ozs	7.0 ozs
	Standard Double Rod End	4 lbs 10 ozs	5 lbs 5 ozs	6 lbs 2 ozs	5 lbs 13 ozs	5 lbs 3 ozs	7.4 ozs			
	Oversize Double Rod End	5 lbs 4 ozs	5 lbs 15 ozs	6 lbs 12 ozs	6 lbs 7 ozs	5 lbs 13 ozs	9.6 ozs			
3-1/4"	Single Rod End	12 lbs 5 ozs	13 lbs 10 ozs	15 lbs 12 ozs	15 lbs 3 ozs	13 lbs 5 ozs	11 ozs	3 lbs 6 ozs	11.4 ozs	N/A
	Standard Double Rod End	13 lbs 9 ozs	14 lbs 14 ozs	17 lbs	16 lbs 7 ozs	14 lbs 9 ozs	14.6 ozs			
	Oversize Double Rod End	14 lbs 10 ozs	15 lbs 15 ozs	18 lbs 1 oz	17 lbs 8 ozs	15 lbs 5 ozs	17.7 ozs			
4"	Single Rod End	16 lbs 10 ozs	17 lbs 13 ozs	21 lbs 1 oz	20 lbs 8 ozs	17 lbs 12 ozs	12 ozs	5 lbs 6 ozs	19.4 ozs	N/A
	Standard Double Rod End	17 lbs 14 ozs	19 lbs 1 oz	22 lbs 5 ozs	21 lbs 12 ozs	19 lbs	15.6 ozs			
	Oversize Double Rod End	18 lbs 15 ozs	20 lbs 2 ozs	23 lbs 6 ozs	22 lbs 13 ozs	20 lbs 1 oz	1 lb 2.7 ozs			

Single Rod End Cylinder



Single Rod End Seal Kits

Bore	Number
1 1/8"	NBSK-225
1 1/2"	NBSK-03
2"	NBSK-04
2 1/2"	NBSK-05
3 1/4"	NBSK-065
4"	NBSK-08

Seal Kit Consists of:		
Item	Description	Quantity
1	Rod wiper	2
2	Rod seal	2
3	Tube seal	2
4	Piston seal	2*
5	Wear band	1

*One bidirectional piston seal for the 1 1/8" bore

Double Rod End Seal Kits

Bore	Number
1 1/8"	NBSK-225D
1 1/2"	NBSK-03D
2"	NBSK-04D
2 1/2"	NBSK-05D
3 1/4"	NBSK-065D
4"	NBSK-08D

Seal Kit Consists of:		
Item	Description	Quantity
1	Rod wiper	2
2	Rod seal	2
3	Tube seal	2
4	Piston seal	2
5	Wear band	1
6	Bushing Seal	1
7	Rod seal	1
8	Rod wiper	1

Double Rod End Cylinder