

ARO

Pneumatic Cylinders

*Composite, round line repairable and disposable,
and NFPA square interchangeable*



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Pneumatic Cylinders

Descriptions

Series 01 Micro-Air™ Cylinders (1/2" thru 1-1/8" bore)

Micro-Air Cylinders, small bore, repairable, double-acting cylinders, are designed for light duty applications. Available in 1/2, 3/4, and 1-1/8 inch bore sizes. Operate on air pressure to 200 PSI, generating thrusts from 4.9 to 199 pounds. They are available in stroke lengths up to 6 inches and in several mounting styles. For more information, see pages 9 through 11.



Series S Silverair™ Cylinders (1/2" thru 2-1/2" bore)

Silverair Cylinders, small and medium bore, disposable, single- and double-acting cylinders are designed for light duty applications. Available in bore sizes from 1/2 inch to 2-1/2 inches. Operate on air pressures to 200 PSI, generating thrusts up to 982 pounds. For more information, see pages 12 through 24.



Premair™ Composite Cylinders (7/16" thru 2" bore)

Featuring a patented composite body construction, the new Premair cylinder is ideal in assembly environments where corrosive (including wet or wash down) conditions exist. Premair's composite construction is also dent-resistant, lighter weight, quieter and provides superior service life when compared to metal cylinders. Available in 7 bore sizes and 3 types (double-acting, spring extend, spring retract); Premair offers a broad spectrum of trouble-free linear motion. For more information, see pages 25 through 33.



Series 23, 24 & 28 Economair® Cylinders (1-1/8" thru 4" bore)

Economair Cylinders, round line repairable cylinders, are designed for medium to heavy-duty use in a wide range of applications. Available in 1-1/8 to 4-inch bore sizes. Operate on air pressure to 200 PSI, generating thrusts from 25 to 2,513 pounds. Available as double-acting, with optional cushions, magnetic pistons or double rod ends. O-ring seals are standard. U-cup or low friction seals are optional. A variety of mounts are available to meet a wide range of application requirements.

For more information, see pages 34 through 39.

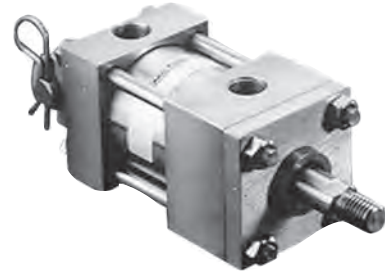


Pneumatic Cylinders

Descriptions

Series AN & SN Provenair® Cylinders (1-1/2" thru 10" bore)

Provenair Cylinders are NFPA interchangeable square head cylinders designed for rugged use. Available in 1-1/2 to 10-inch bore sizes. They operate on air pressure up to 250 PSI, generating thrusts up to 3,141 pounds. They are available as double-acting, with optional cushions, magnetic pistons and/or with double rod ends. A broad selection of NFPA standard mounts makes them dimensionally interchangeable with other NFPA cylinders. For more information, see pages 41 through 55.



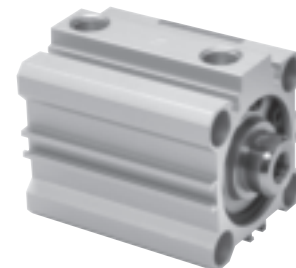
Premair™ Series Round Compact Cylinders (1/2" thru 4" bore)

Premair Round Compact Cylinders are available in 8 bore sizes, from 1/2" thru 4". They are designed for light to medium duty applications and are interchangeable with the leading manufacturer of round compact cylinders. These cylinders are available in single or double acting, and with a variety of mounting, seal and magnetic options. For more information, see pages 59 through 67.



Premair™ Series Square Metric Compact Cylinders (12mm thru 160mm bore)

Premair Square Metric Compact Cylinders are available in 13 bore sizes, from 12mm thru 160mm. All cylinders come with NPT Ports and inch threads on rod end, and magnetic piston as standard. Mounting through holes are tapped and accept a variety of mounting kits. These cylinders interchange with the leading manufacturers of Square Compact Cylinders. For more information, see pages 68 through 74.



Pneumatic Cylinders

Accessories

Mounts

- Micro-Air™
- Silverair™
- Premair™
- Economair®
- Provenair® (1-1/2 thru 10-inch bore)
- Provenair® Stainless Steel (1-1/2 thru 8-inch bore)



Mounts

Rod End Accessories

- Micro-Air™
- Silverair™
- Premair™
- Economair®
- Provenair® (1-1/2 thru 10-inch bore)



Rod End Accessories

Alignment Couplers



Alignment Couplers

Switches, Cylinder Mounted

Flow Control Valves

Volume Chambers

Repair Kits



Electrical Switches



Right Angle Flow Controls

Pneumatic Cylinders

Developing Specifications

Calculating the Proper Bore Size

A cylinder's bore size determines the force it will produce at a given supply pressure. The weight of the load or the clamping force required will largely determine the force requirements of the cylinder, and hence, the bore size required. But before determining the appropriate bore size you must compensate for air pressure drop, packing friction and load variations using the following computation:

A) Compensating for Pressure Drop – Decrease the line pressure value by 15 p.s.i. This compensates for pressure drop in the system.

Operating pressure (psig) = Line pressure (psig) less 15 (psig pressure drop)

Example: If the line pressure is 95 (psig), subtract 15 (psig) to obtain 80 (psig) operating pressure (for sizing purposes).

B) Compensating for Packing Friction – Before you begin selecting a cylinder you already know the weight of the load you must move or the clamping force you must apply. **Multiply this force or load value by 1.25.** This compensates for packing friction and load variations. (If speed is of concern for your application, multiply the force value by 2.0.)

Force required (in pounds) = 1.25 x load (or required clamping force)

Example: If cylinder must move 100 pound load, multiplying 100 pounds by 1.25 = 125 pounds force required.

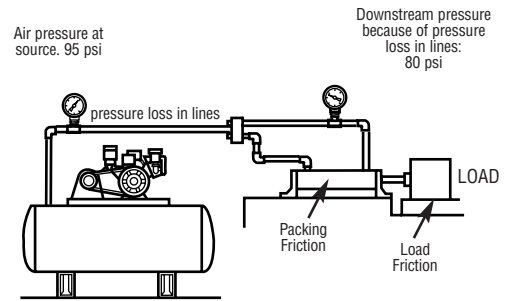
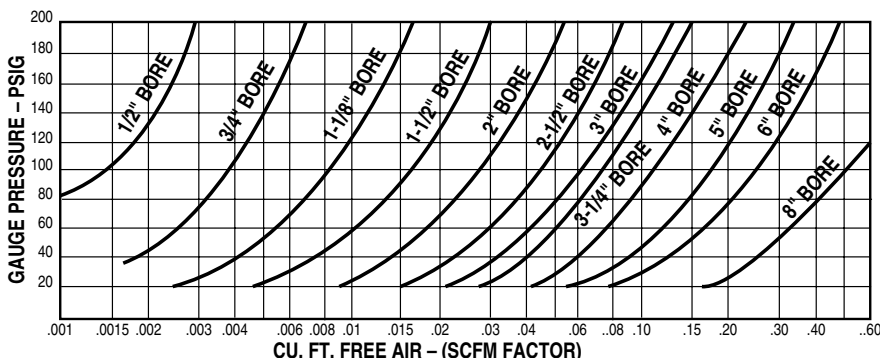
Now, at the top of the chart on the next page, find the column with the operating pressure calculated in "A" above (in this example, 80 psig). Go down that column until you find the force requirement calculated in "B", above (or the next higher value). Note that the force values in bold type represent the extend force while those in standard type represent retract force (retract force is lower because the rod reduces the effective piston area). Choose the appropriate value, then go to the Cylinder Bore column to find the bore requirements for your application.

Now that you know the cylinder bore size that will produce the force required for your application, go to page 7 to determine rod size requirements.

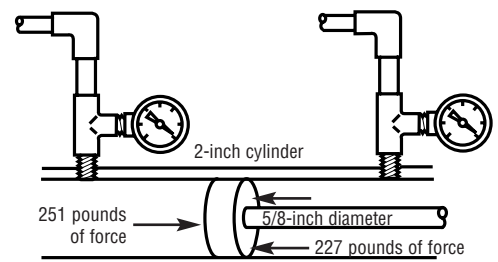
Air consumption for each cylinder bore size can be found in the chart below.

Cylinder Air Consumption

To calculate the air consumption of a cylinder, multiply the total inches of stroke (extend plus retract) by the cycles per minute times the SCFM factor from the chart below. To find the SCFM factor, find your gauge pressure in the left hand column. Next, find your cylinder bore size in the chart. Where the two intersect, read down to the SCFM factor at the bottom of the chart.



This illustration shows a pressure loss of 15 PSI through the airlines and points out friction factors, both of which must be compensated for.



Given equal pressure on both sides of a piston, the surface area on the extend side will provide greater force.

Pneumatic Cylinders

Bore Selection Sizes

$$\text{EFFECTIVE PISTON AREA} \times \text{OPERATING PRESSURE} = \text{FORCE}$$

CYLINDER BORE (INCHES)	ROD DIAMETER (INCHES)	EFFECTIVE PISTON AREA (SQ. IN.)	OPERATING PRESSURE (PSI)										
			20	40	60	70	80	90	100	110	125	150	200
SELECTING BORE SIZE			FORCE OR LOAD VALUE										
7/16		.15	3	6	9	10	12	13	15	16	18	22	30
	3/16	.123	2.5	4.9	7.4	8.6	9.8	11	12.3	13.5	15.4	18.5	24.6
1/2		.196	4	8	12	14	16	18	20	22	25	29	39
	3/16	.169	3	7	10	12	14	15	17	19	21	25	34
	1/4	.147	3	6	9	10	12	13	15	16	18	22	29
9/16		.25	5	10	15	17	20	22	25	27	31	37	50
	3/16	.23	4.5	8.9	13.4	15.6	17.8	20	22	29.5	27.9	33.5	44.6
3/4		.442	9	18	27	31	35	40	44	49	55	66	88
	1/4	.393	8	16	24	28	31	35	39	43	49	59	79
7/8		.604	12	24	36	42	48	54	60	66	75	90	120
	1/4	.553	11	22	33	38	44	49	55	60	69	82	110
1-1/16		.890	18	36	53	62	71	80	89	98	111	134	178
	5/16	.810	16	32	49	57	65	73	81	89	101	122	162
1-1/8		.994	20	40	60	70	80	89	99	109	124	149	199
	5/16	.917	18	37	55	64	73	83	92	101	115	138	183
	3/8	.884	18	35	53	62	71	80	88	97	110	133	177
1-1/4		1.227	25	49	74	88	98	110	123	135	153	184	245
	7/16	1.077	22	43	65	75	86	97	108	118	135	162	215
1-1/2		1.767	35	71	106	124	141	159	177	194	221	265	353
	7/16	1.617	32	65	97	113	129	146	162	178	202	243	323
	1/2	1.571	31	63	94	110	126	141	157	173	196	236	314
	5/8	1.460	29	58	88	102	117	131	146	161	183	219	292
	1	1.325	27	53	80	93	106	119	133	146	166	199	265
1-3/4		2.405	48	96	144	168	192	216	240	265	301	361	481
	1/2	2.209	44	88	133	155	177	199	221	243	276	331	442
2		3.142	63	126	189	220	251	283	314	346	393	471	628
	5/8	2.835	57	113	170	198	227	255	284	312	354	425	567
	1	2.700	54	108	162	189	216	243	270	297	338	405	540
2-1/2		4.910	98	196	295	344	393	442	491	540	614	737	982
	5/8	4.602	92	184	276	322	368	414	460	506	575	690	920
	3/4	4.470	89	179	268	313	358	402	447	492	559	671	894
	1	4.123	82	165	247	289	330	371	412	454	515	618	825
3		7.069	141	283	424	495	566	636	707	778	884	1060	1414
	3/4	6.6268	133	265	398	464	530	596	663	729	828	994	1325
3-1/4		8.296	166	332	498	581	664	747	830	913	1037	1244	1659
	1	7.510	150	300	451	526	601	676	751	826	939	1127	1502
	1-3/8	6.810	136	272	409	477	545	613	681	749	851	1021	1362
4		12.566	251	503	754	880	1005	1131	1257	1382	1571	1885	2513
	1	11.781	236	471	707	825	942	1060	1178	1296	1473	1767	2356
	1-3/8	11.081	222	443	665	776	886	997	1108	1219	1385	1662	2216
5		19.635	393	785	1178	1374	1571	1767	1964	2160	2454	2945	3927
	1	18.850	377	754	1131	1320	1508	1697	1885	2074	2356	2828	3770
	1-3/8	18.150	363	726	1089	1271	1452	1634	1815	1996	2269	2723	3630
6		28.274	565	1131	1696	1979	2262	2545	2827	3110	3534	4241	5655
	1-3/8	16.789	536	1072	1607	1875	2143	2411	2679	2947	3349	4018	5358
	1-3/4	25.870	517	1035	1552	1811	2070	2328	2587	2846	3234	3881	5174
8		50.260	1005	2010	3016	3518	4021	4523	5026	5529	6283	7539	10052
	1-3/8	48.770	975	1951	2926	3414	3902	4489	4877	5365	6096	7316	9754
	1-3/4	47.820	956	1913	2869	3347	3826	4304	4782	5260	5978	7173	9564
10		78.54	1571	3142	4712	5497	6283	7068	7854	8639	9818	11781	15708
	1-3/4	76.14	1523	3046	4568	5330	6091	6853	7614	8375	9518	11421	15228

VALUES IN BOLD TYPE REPRESENT EXTEND FORCE. Other values represent retract force (piston area, less area of piston rod).
Check series order information for available rod diameters in each series.


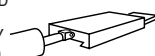
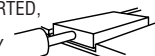
Pneumatic Cylinders

Rod Diameter

- A) use the stroke factor table to find the proper multiplier based on the mounting configuration and rod end connection used.
- B) Multiply your required working stroke length by the factor you found from the stroke factor table in Step A. Note: if you require a rod or thread extension in your application (Longer than standard) add the extra length(s) to your required working stroke length and then multiply by the stroke factor found in Step A, the result of this arithmetic is the "L" Value.

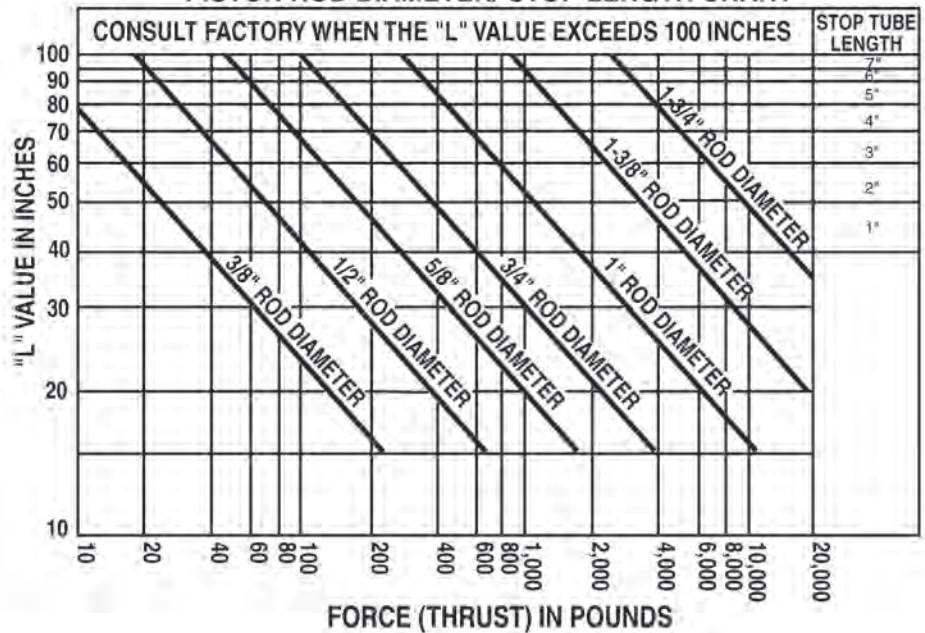
- C) Use the piston rod diameter/ stop length chart to complete your cylinder specification. Find the approximate "L" value (determined in Steps A & B) on the left side of the chart. At the bottom of the chart, find the force (thrust) required for your cylinder. Reference the bore selection sizes table on the previous page to determine bore size, rod diameter or force at various PSI. Find the intersection of the "L" value (Horizontal) line with the force in pounds (Vertical) line. The intersection should be on, or to-the-left of the diagonal (rod diameter) line. The diagonal (rod diameter) line indicates the correct piston rod diameter for your application. Note: If your "L" value-force lines intersect above, or to-the-right of a diagonal line, find a cylinder with the next larger piston rod diameter to avoid premature cylinder wear or failure.

STROKE FACTOR

ROD END CONNECTION	CYLINDER RIGIDLY MOUNTED		CYLINDER PIVOT MOUNTED		
	L-MOUNTS, SIDE-TAPPED SIDE END LUGS	FRONT OR REAR FLANGE MOUNTING NUTS	FRONT-MOUNTED TRUNNION	CENTER-MOUNTED TRUNNION	CLEVIS EYE. OR REAR-MOUNTED TRUNNION
FIXED AND RIGIDLY GUIDED 	0.50	0.50	N/A	N/A	N/A
PIVOTED AND RIGIDLY GUIDED 	0.71	0.71	1.00	1.50	2.00
SUPPORTED, NOT RIGIDLY GUIDED 	1.00	1.00	N/A	N/A	N/A

Note: Remember, long, slim piston rods may buckle when subjected to a heavy push load.

PISTON ROD DIAMETER/ STOP LENGTH CHART



Note: When a stop tube is needed, a minimum 2" length is required on all Economair cylinders with Lip packings, and in 4", 5", 6" and 8" Provenair cylinders.

Stop Tube Requirements

Available in Economair & Provenair Only

Occasionally, an application will require a stop tube. Stop tube length is determined by "L" value. If your "L" value (from Step B) is 40 or greater, find the correct stop tube length for your cylinder on the right side of the piston rod diameter/stop length chart. The recommended stop-tube length is shown above the "L" value line.

Note: If "L" value is 39, no stop tube is required. If "L" value is 40-49, a 1" stop tube is recommended. If "L" value is 50-59, a 2" stop tube is recommended, etc.

Pneumatic Cylinders

Options

Additional options required will help determine which cylinder series will be selected:

Stainless steel piston rods are beneficial in corrosive environments. Stainless steel rods are standard on Micro-Air and Silverair Series. Stainless Steel rods are options on Economair and Provenair Series.

Cylinder cushions are designed to reduce the shock experienced at the end of the stroke by reducing piston speed the last fraction of an inch of stroke. Cylinder cushions are available in Economair and Provenair Series, only.

Packing shape and material affect cylinder performance:

- **O-Ring packings** are good, general purpose packings, but they require more breakaway force than other packing shapes.
- **O-Ring – Low Friction** packings provide the effective sealing characteristics of Buna N with the low friction characteristics of Teflon®. This design is effective where the cylinder must operate at low pressures.
- **U-Cup packings** offer low breakaway friction and better sealing characteristics at low pressure than O-Ring packings. U-cups are wear compensating seals; they offer longer wear life than O-rings.
- **U-Cup – Self Lube (“Slippery Seals”)** packings are ideal in applications where air line lubrication cannot be used. This packing design helps reduce cylinder “chatter” in low pressure applications and it offers the same sealing characteristics as Buna N.

Packing Characteristics

	Material	Sealing Characteristics	Friction Characteristics	Temperature Tolerance	Availability
O-RING	Teflon over Buna N O-Ring Seal	Good	Medium	0° to 180° F	Economair
O-RING	Buna N	Good	High	0° to 180° F	Micro-Air, Economair
O-RING	Viton®	Good	High	Up to 300° F	Micro-Air, Economair
U-CUP-SELF-LUBE (“Slippery Seals”)	Nitrile	Very Good	Low	0° to 180° F	Economair, Provenair
U-CUP	Buna N	Very Good	Medium	0° to 180° F	Economair, Provenair
U-CUP	Viton	Very Good	Medium	Up to 300° F	Economair, Provenair

Note: When applying rod cylinders, there must be no side load or bending stress at any point along the rod. Applications which induce side load and/or bending stress will damage packings, bushings, piston barrels, piston rods and cushion bosses. When metal parts are damaged, seal and packing replacement is an inadequate repair. The elastomers will quickly become damaged. Inspect and replace all worn or damaged parts when rebuilding cylinders.

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Pneumatic Cylinders

Micro-Air

Features

Series 01

Micro-Air Cylinders are ideal for small part positioning, clamping and ejecting. Also they're the perfect choice for applications where small bore, medium duty, repairable cylinders are preferred. Prelubed, they're suitable for operations without externally applied lubrication.

- Micro-Air Cylinders are repairable. Service kits are available to extend the useable life of the cylinder.
- Micro-Air Cylinders operate on air pressure to 200 p.s.i. (14 bar). A tough little cylinder that can handle the pressures!
- Superior performance over a wide temperature range – 0° to 180° F (-18° to 82° C), even to 300° F (149° C) when Viton seals are used (consult factory).
- Micro-Air Cylinders have superior wear characteristics, thanks to the hard coated aluminum tubing I.D. In addition to an internal hardness of 60 Rockwell C, the barrel has an internal finish of 16 microinches or better.
- Micro-Air Cylinders are equipped with Series 303 stainless steel piston rods for corrosion resistance. Also, the ground and polished finish on the rods minimizes friction, providing longer packing life.
- Micro-Air Cylinders provide greater durability than disposable cylinders.
- Double end-mount cylinders can also be used as a pivot mount. Pivot pin included with each cylinder.



Performance Specs

Bore Sizes: 1/2", 3/4", and 1-1/8"
Maximum Output Force: 199 pounds (1-1/8" bore)
Standard Operating Temperature range: 0° to 180° F (-18° to 82° C)
Viton Seals Models: For high heat applications. Consult factory.
 Range of mounting styles and attachable mounts/ accessories to meet nearly any application requirement.

Ordering

01 XX - XXXX - 0 XX

BORE SIZE

51	1/2 in
76	3/4 in.
18	1-1/8 in.

STROKE LENGTH

WHOLE INCHES	FRACTIONS
0 = 0 in	0 = None
1 = 1 in	1 = 1/8 in
2 = 2 in	2 = 1/4 in
3 = 3 in	3 = 3/8 in
4 = 4 in	4 = 1/2 in
5 = 5 in	5 = 5/8 in
6 = 6 in	6 = 3/4 in
	7 = 7/8 in

CYLINDER TYPE AND MOUNTING STYLE

1009	Double Acting, Double End Mount and Pivot Mount, BUNA-N Seals
5029	Double Acting, Nose Mount, Rear Port, BUNA-N Seals
1309	Double Acting, Double End Mount and Pivot Mount, Viton Seals
5329	Double Acting, Nose Mount, Rear Port, Viton Seals

(1/2" Increments, 1/2" through 6")

NOTE: Highlighted selections denote most popular models.

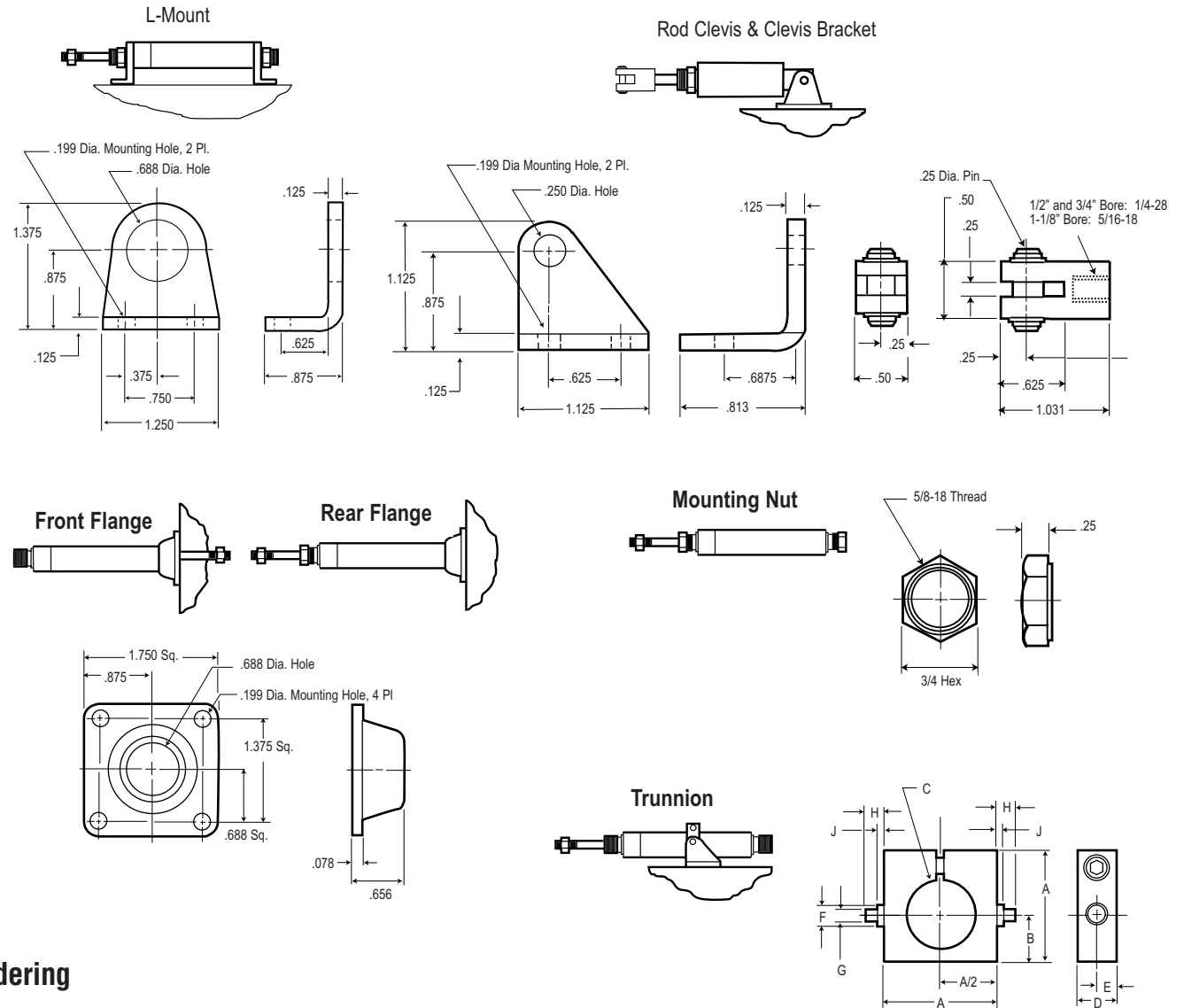
Maximum stroke length - 6-7/8-inches.
 Consult factory for the other stroke requirements.

Pneumatic Cylinders

Micro-Air

Dimensional Data

Series 01



Ordering

Mounting Kit

	Cylinder Bore (Inches)		
	1/2	3/4	1-1/8
L-MOUNTS (2 Qty) *	20515	20515	20515
FLANGE MOUNT *	20516	20516	20516
MOUNTING NUT (2 Qty)	20514-1	20514-1	20514-1
CLEVIS BRACKET	20519	20519	20519
TRUNNION	-	20523	20524
TRUNNION BRACKETS	-	20561	-
ROD CLEVIS	20517	20517	20518-1

* NOTE: Mounting nuts included.

Reference	Cylinder Bore (Inches)		
	1/2	3/4	1-1/8

Trunnion Dimensions

A	1.50	1.50	2.25
B	.625	.625	.875
C Dia.	.703	.953	1.391
D	.500	.500	.750
E	.250	.250	.375
F Dia.	-	-	.563
G Dia. ± .002	.250	.250	.437
H ± .010	.250	.250	.438
J	-	-	.0625

* 20561 Trunnion Bracket Kit (right and left brackets) is used for 20523 Trunnion. Reference Clevis bracket dimensions.

Pneumatic Cylinders

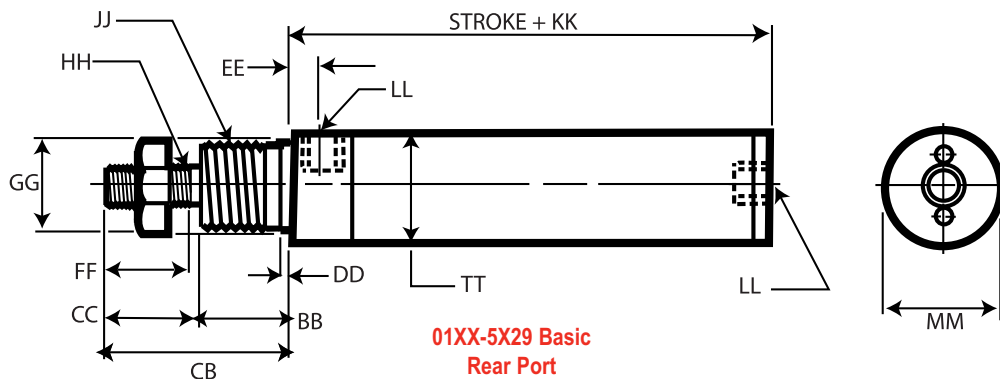
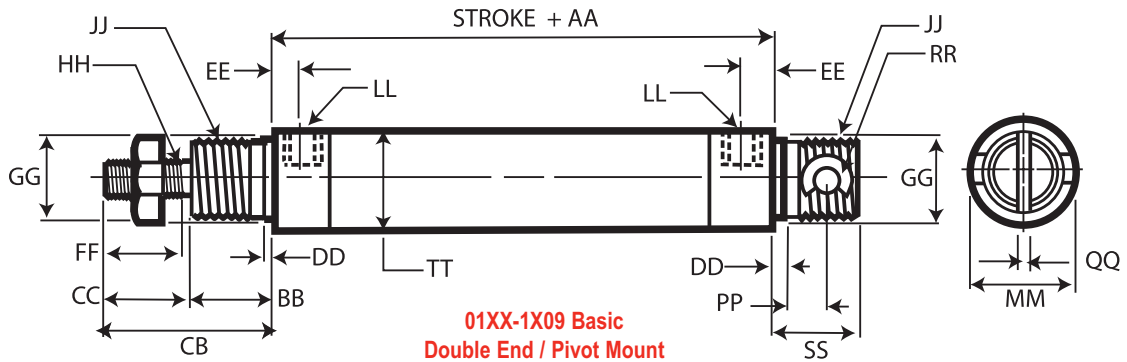
Micro-Air

Dimensional Data

Series 01

Reference	CYLINDER BORE (INCHES)		
	1/2	3/4	1-1/8
Rod Diameter	1/4	1/4	5/16
AA	2.438	2.438	2.688
BB	.625	.625	.625
CC	.750	.750	.750
CB	1.375	1.375	1.375
DD	.047	.047	.047
EE	.281	.281	.281
FF*	.719	.719	.719
GG (± .002)	.682	.682	.682
HH	1/4-28 UNF	1/4-28 UNF	5/16-18 UNC
JJ (UNF-2A)	5/8-18	5/8-18	5/8-18
KK	2	2	2
LL (NPTF)	1/8-27	1/8-27	1/8-27
MM	.787	.912	1.350**
PP	.375	.375	.375
QQ (SLOT) ± .002	.130	.130	.130
RR (PIN)	.250	.250	.250
SS	.625	.625	.625
TT DIA.	.700	.950	1.375

* Note: FF shows total thread, including run out.
 ** On rear head only of 5029 dimension is 1.291.



Features

Series S

Silverair round cylinders are designed for application in OEM and MRO applications where a disposable, light duty cylinder is preferred. Prelubed, they're suitable for operations without externally applied lubrication. Constructed of stainless steel and aluminum, they stand up to the attack of corrosive environments.

- Silverair cylinders feature stainless steel (Series 304) barrels. Drawn and polished internal diameters have superior lube-holding characteristics for a low friction surface that gives smooth performance and outstanding cycle life.
- Piston rods are centerless ground and polished Series 303 stainless steel, providing smooth rod movement.
- Lightweight aluminum heads feature full flow ports for maximum air flow and smooth response.
- Piston rod threads are roll formed to provide superior strength and durability.
- U-cup design on piston seals provides continuous cylinder barrel contact, minimizes blow-by and offers longer seal life than O-ring piston seals.
- The oil-permeated bronze rod bushing is precision ball sized for reduced friction and increased cylinder life.
- Return springs on single-acting cylinders are made from a high tensile alloy for exceptional performance and long service life.
- Silverair cylinders are prelubricated, so they're ideal in applications where external lubrication can't be supplied.



Performance Specifications

Bore Sizes:	1/2", 3/4", 1-1/16", 1-1/4", 1-1/2", 2" and 2-1/2"
Air Pressure:	to 200 p.s.i. (14 bar)
Operating Temperature Range:	-40° to 160° F (18° to 82° C)
Maximum Output Force:	982 pounds (2-1/2-inch bore cylinder)
Viton Seals Models:	For high heat applications. Consult factory.

Range of mounting styles and attachable mounts/accessories covers wide range of application requirements.

Magnetic pistons available for use with Hall Effect or Reed Switches.

Ordering

See following page.

Ordering

Include dashes. Dashes are significant.

S X XX - X X X X - XXX

SERIES

S Stainless Steel

CYLINDER TYPE

S Single Acting, Spring Return (Not available on 25 bore size)

D Double Acting

R Single Acting, Spring Extend (Not available on 25 bore size)

H Single Acting, Hex Rod (Non-rotating rod)
(Spring return only) Not available on 14, 17, 20 or 25 bore sizes)

BORE SIZE

05 1/2 in

07 3/4 in.

11 1-1/16 in.

14 1-1/4 in. (Not available on type SH)

15 1-1/2 in.

17 1-3/4 in. (Not available on type SH)

20 2 in. (Not available on type SH)

25 2-1/2 in. (Not available on type SS, SR or SH)

MOUNTING STYLE

B Block Mount (Available on 05, 07, 11 and 15 bore size only)
(Not available on type SH)

D Double Rod End (Double Acting Only)

N Nose Mount

P Universal Mount (Pivot or Double End)

*Silverair attachable mounts must be ordered separately.
See page 14.*

Note A: Bumpers

- Not available with magnetic piston option.
- Standard on double rod ends.
- Do not affect external dimensions.

Note B: Wearstrip is standard on double-acting nose mount, universal mount and block front mount of 5" or more of stroke. Also on single acting, spring extend cylinders with 3" or more of stroke. Not available on 1/2" bore cylinders. Not available on single acting, hex rod (non-rotating rod)

Note: Highlighted selections denote most popular models.

STROKE LENGTH

WHOLE INCHES

00 = 0 in

01 = 1 in

02 = 2 in

03 = 3 in

04 = 4 in

05 = 5 in

06 = 6 in

10 = 10 in

etc.

FRACTIONS

0 = None

1 = 1/8 in

2 = 1/4 in

3 = 3/8 in

4 = 1/2 in

5 = 5/8 in

6 = 3/4 in

7 = 7/8 in

For recommended maximum stroke lengths, per type, see pages 16 through 21.

(1/2" Increments, 1/2" through 6")

WEARSTRIP (Note B)

4 None (standard)

W Wearstrip

PACKING

B Buna N

V Viton

MAGNET/ BUMPERS (Note A)

4 No Bumpers, no magnet

B Bumpers

M Magnetic Piston (Not available in 1/2" bore or for single-acting cylinders).

For switch information, see page 23.

Ordering

Series S (Mounting Kits)

		CYLINDER BORE (INCHES)					
1/2	3/4	1-1/16	1-1/4	1-1/2	1-3/4	2	2-1/2
L-MOUNT (Single Acting)							
Order Mounting Nut below.							
118108-5	118108-7	118108-11	118108-14	118108-14	118108-17	118108-20	118108-25
L-MOUNT (Double Acting)							
Order Mounting Nut below.							
118108-50	118108-11	118108-11	118108-14	118108-14	118108-17	118108-20	118108-25
MOUNTING NUT (Single Acting*)							
118109-5	118109-7	118109-11	118109-14	118109-14	118109-17	118109-20	118109-25
MOUNTING NUT (Double Acting)							
118109-50	118109-11	118109-11	118109-14	118109-14	118109-17	118109-20	118109-25
PIVOT BRACKET (Pivot Pin Included)							
117523-5	117523-7	117523-7	117523-14	117523-15	117523-15	117523-20	117523-20
ROD CLEVIS (Pivot Pin Included)							
117555-5	117555-7	117555-11	117555-14	117555-14	117555-17	117555-17	117555-17
PIVOT PINS (Standard Equipment)							
Pin							
118119-5	118119-7	118119-7	118119-14	-	-	118119-20	-
Retainer							
118592-5	118592-5	118592-5	118592-5	118592-15	118592-15	118592-15	-
Optional Press Fit Pin							
118121-5	118121-7	118121-7	118121-14	118121-15	118121-15	-	-

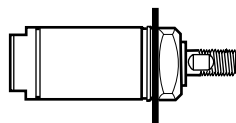
FOR DOUBLE END MOUNTING OF SINGLE-ACTING CYLINDERS, ORDER THE FOLLOWING:

1/2-inch bore	One 118108-5 L-Mount and one 118109-5 Nut for rear mounting thread. One 118108-50 L-Mount and one 118109-50 Nut for front mounting thread.
3/4-inch bore	Two 118108-7 L-Mounts, one 118109-7 Nut for rear mounting thread and one 118109-11 Nut for front mounting thread.

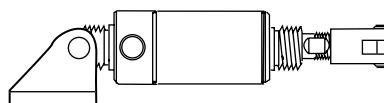
NOTE: Silverair accessories are bright zinc plated steel.



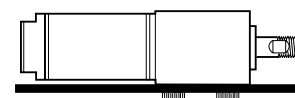
L-Mount



Mounting Nut



Pivot Bracket and Rod Clevis



Block Front Mount

Dimensional Data

Series S (Mounting Kit)

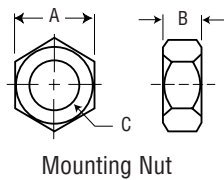
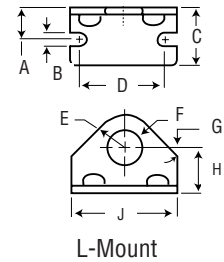
Dim Ref	CYLINDER BORE (INCHES)												
	1/2		3/4		1-1/16		1-1/4		1-1/2		2		2-1/2
	Single Acting	Double Acting	Single Acting	Double Acting	All Types	All Types	All Types	All Types	All Types	All Types	All Types	All Types	All Types

L-Mount Bracket

A	.31	.31	.44	.56	.56	.75	.75	.94	1.00	1.00
B	.19	.19	.19	.27	.27	.28	.28	.34	.34	.34
C	.62	.62	.75	1.00	1.00	1.50	1.50	1.50	1.62	1.62
D	1.00	1.00	1.25	1.50	1.50	1.89	1.89	2.25	2.25	2.88
E	.37	.37	.40	.56	.56	.75	.75	.88	1.00	1.25
F	.38	.44	.50	.63	.63	.76	.76	1.04	1.38	1.50
G	56°	56°	45°	45°	45°	49°	49°	52°	60°	63°
H	.57	.57	.69	.81	.81	1.00	1.00	1.25	1.50	1.75
J	1.38	1.38	1.63	1.88	1.88	2.50	2.50	3.00	3.00	3.75

Mounting Nut

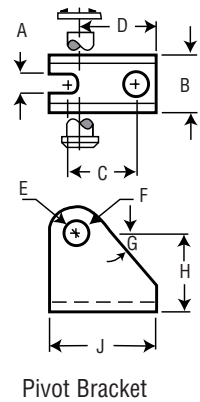
A	.56	.68	.75	.93	.93	1.12	1.12	1.50	1.85	2.06
B	.22	.25	.31	.37	.37	.42	.42	.56	.50	.50
C	3/8-24	7/16-20	1/2-20	5/8-18	5/8-18	3/4-16	3/4-16	1-14	1-1/4-12	1-3/8-12



Dim Ref	CYLINDER BORE (INCHES)								
	1/2 All Types	3/4 All Types	1-1/16 All Types	1-1/4 All Types	1-1/2 All Types	1-3/4 All Types	2 All Types	2-1/2 All Types	

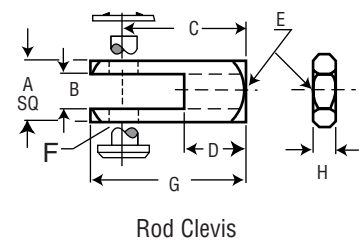
Pivot Bracket

A	.20	.26	.26	.32	.39	.39	.45	.45
B	.52	.65	.65	.77	.96	.96	1.20	1.20
C	.43	.75	.75	.75	1.00	1.00	1.00	1.00
D	.54	.87	.87	.94	1.25	1.25	1.43	1.43
E	.22	.31	.31	.31	.38	.38	.38	.38
F	.16	.26	.26	.26	.38	.38	.38	.38
G	50°	53°	53°	53°	52°	52°	48°	48°
H	.64	.87	.87	1.06	1.37	1.37	1.68	1.68
J	.75	1.19	1.19	1.25	1.63	1.63	1.81	1.81



Rod Clevis

A	.38	.50	.50	.75	.75	.75	.75	.75
B	.19	.25	.25	.38	.38	.38	.38	.38
C	.75	.94	.94	1.30	1.30	1.30	1.30	1.30
D	.38	.50	.50	.75	.75	.75	.75	.75
E	10-32	1/4-28	5/16-24	7/16-20	7/16-20	1/2-20	1/2-20	1/2-20
F	.19	.25	.25	.38	.38	.38	.38	.38
G	.94	1.20	1.20	1.70	1.70	1.70	1.70	1.70
H	.12	.16	.16	.25	.25	.31	.31	.31



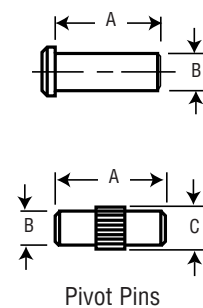
Pivot Pin

As supplied with Pivot Bracket:

A	.69	.81	.81	.94	1.13	1.13	1.44	1.44
B	.15	.25	.25	.25	.37	.37	.37	.37

For press fit into pivot hole:

A	.50	.75	.75	.87	1.12	1.12	-	-
B	.15	.24	.24	.24	.37	.37	-	-
C	.17	.26	.26	.26	.39	.39	-	-



Performance Specifications

Series S (Spring Return, Nose Mount)

Model SSXX-N4B4-XXX - (Max. Stroke - 4 inches)	
Bore sizes:	1/2", 3/4", 1-1/16", 1-1/4", 1-1/2" 1-3/4", 2"
Hex Mounting Nut:	Standard (except on 2-inch models).
Options:	Wearstrip (except on 1/2-inch bore), bumper, Viton
Accessories:	L-mount, rod clevis
Notes:	No rod bushing on 1/2-inch models - front head is hard anodized.

Model SHXX-N4B4-XXX - (Max. Stroke - 4 inches)	
Nonrotating	
Bore sizes:	1/2", 3/4", 1-1/16", 1-1/2"
Hex Mounting Nut:	Standard
Options:	Wearstrip (except on 1/2-inch bore),
Accessories:	L-mount, rod clevis
Notes:	No rod bushing - front head is hard anodized.

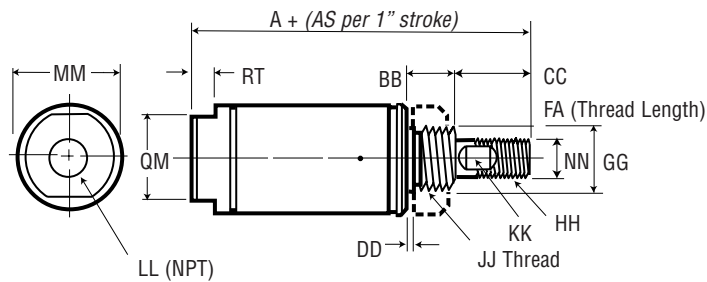
Series S (Spring Return, Universal Mount)

Model SSXX-P4B4-XXX - (Max. Stroke - 4 inches)	
Bore sizes:	1/2", 3/4", 1-1/16", 1-1/4", 1-1/2" 1-3/4", 2"
Options:	Wearstrip (except on 1/2-inch bore), bumper, Viton
Accessories:	Pivot bracket, rod clevis, L-mount, mounting nut. Order mounting nuts as required.
Notes:	No rod bushing on 1/2-inch models - front head is hard anodized.

Model SHXX-P4B4-XXX - (Max. Stroke - 4 inches)	
Nonrotating	
Bore sizes:	1/2", 3/4", 1-1/16", 1-1/2"
Options:	Wearstrip (except on 1/2-inch bore), bumper, Viton
Accessories:	Pivot bracket, rod clevis, L-mount, mounting nut. Order mounting nuts as required.
Notes:	No rod bushing - front head is hard anodized.

Dimensional Data

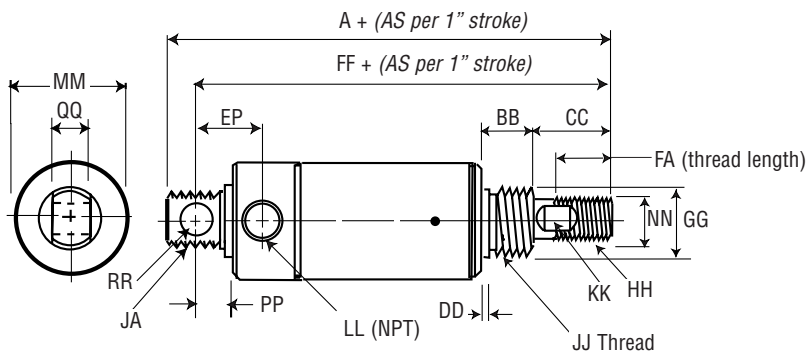
Series S (Spring Return, Nose Mount)



Spring Forces

Bore Size	Spring Force (lbs.)	
	Normal	Actuated
1/2"	1	2
3/4"	1.5	5
1-1/16"	4	8
1-1/4"	7	14
1-1/2"	6	12
1-3/4"	12	24
2"	15	30

Series S (Spring Return, Universal Mount)



Dimensional Data

Series S

Dim Code	Cylinder Description	CYLINDER BORE (INCHES)						
		1/2	3/4	1-1/16	1-1/4	1-1/2	1-3/4	2
Single Acting								
A	SSXX-N4B4-XXX	1.81	2.00	2.56	3.41	3.19	3.85	4.17
A	SHXX-N4B4-XXX	2.06	2.25	2.68	–	3.44	–	–
A	SSXX-P4B4-XXX	2.50	3.06	3.44	4.50	4.25	5.41	5.54
A	SHXX-P4B4-XXX	2.75	3.31	3.56	–	4.50	–	–
AS	SSXX-N4B4-XXX	1.88	1.69	1.56	1.81	1.69	2.00	2.00
AS	SHXX-N4B4-XXX	1.88	1.69	1.56	–	1.69	–	–
AS	SSXX-P4B4-XXX	1.88	1.69	1.56	1.81	1.69	2.00	2.00
AS	SHXX-P4B4-XXX	1.88	1.69	1.56	–	1.69	–	–
BB	SSXX-N4B4-XXX	.31	.44	.50	.62	.62	.75	.81
BB	SHXX-N4B4-XXX	.31	.44	.50	–	.62	–	–
BB	SSXX-P4B4-XXX	.31	.44	.50	.62	.62	.75	.81
BB	SHXX-P4B4-XXX	.31	.44	.50	–	.62	.75	.81
CC	SSXX-XXXX-XXX	.50	.50	.62	1.00	1.00	1.19	–
CC	SHXX-XXXX-XXX	.75	.75	.75	–	1.25	–	–
DD	All Types	.04	.07	.07	.07	.07	.09	.12
EP	All Types	.42	.66	.62	.91	.81	.98	1.00
FA	All Types	.50	.50	.50	.50	.75	.88	.88
FF	SSXX-X4B4-XXX	2.25	2.77	3.16	4.14	3.88	4.91	5.11
GG	All Types	.375	.500	.625	.750	.750	1.03	1.375
HH	All Types	10-32	1/4-28	5/16-24	7/16-20	7/16-20	1/2-20	1/2-20
JA	SSXX-N4B4-XXX	7/16-20	5/8-18	5/8-18	3/4-16	3/4-16	1-14	1-1/4-12
JA	SHXX-N4B4-XXX	3/8-24	5/8-18	5/8-18	–	3/4-16	–	–
JJ	All Types	3/8-24	1/2-20	5/8-18	3/4-16	3/4-16	1-14	1-1/4-12
KK	Wrench Flat	None	None	.25	.38	.38	.44	.50
LL	All Types	10-32	1/8	1/8	1/8	1/8	1/4	1/4
MM	All Types	.56	.81	1.12	1.31	1.55	1.81	2.07
NN	Standard Rod	.187	.250	.312	.437	.437	.500	.625
NN	Hex Flats	.187	.250	.375	–	.437	–	–
PP	All Types	.25	.34	.34	.41	.50	.50	.57
QM	All Types	.37	.62	.87	.87	.82	1.25	1.25
QQ	All Types	.31	.38	.38	.50	.62	.62	.75
RR	All Types	.16	.25	.25	.25	.38	.38	.38
RT	All Types	.12	.16	.25	.18	.25	.25	.31

Performance Specifications

Series S (Spring Extend, Nose Mount)

Model SRXX-N4B4-XXX - (Max. Stroke - 4 inches)	
Bore sizes:	1/2", 3/4", 1-1/16", 1-1/4", 1-1/2" 1-3/4", 2"
Hex Mounting Nut:	Standard
Options:	Bumper, Viton
Accessories:	Rod clevis, L-mount
Wearstrip:	Not available on 1/2-inch bore. Standard with 3 inches of stroke, or more (optional on shorter strokes).
Notes:	No rod bushing on 1/2-inch models - front head is hard anodized.

Series S (Block Front Mount - Spring Extend or Spring Return)

Model SSXX-B4B4-XXX - (Max. Stroke - 4 inches) (Spring Return)	
Bore sizes:	1/2", 3/4", 1-1/16"
Options:	Wearstrip (except on 1/2-inch bore), bumper, Viton
Accessories:	Rod clevis
Notes:	No rod bushing on 1/2-inch models - front head is hard anodized. Head is hard anodized.

Series S (Spring Extend, Universal Mount)

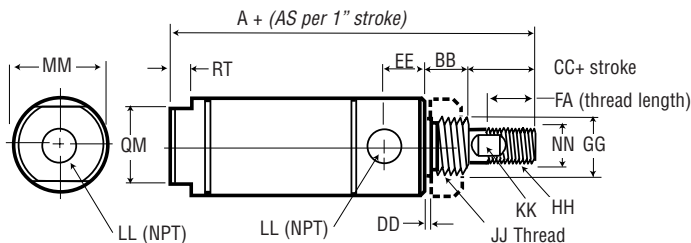
Model SRXX-P4B4-XXX - (Max. Stroke - 4 inches)	
Bore sizes:	1/2", 3/4", 1-1/16", 1-1/4", 1-1/2" 1-3/4", 2"
Options:	Bumper, Viton
Accessories:	Pivot bracket, rod clevis, L-mount, mounting nut.
Wearstrip:	Not available on 1/2-inch bore. Standard with 3 inches of stroke, or more (optional on shorter strokes).
Notes:	No rod bushing on 1/2-inch models - front head is hard anodized.

Model SRXX-B4B4-XXX (Spring Extend, Illustrated) (Max. Stroke - 4 inches)

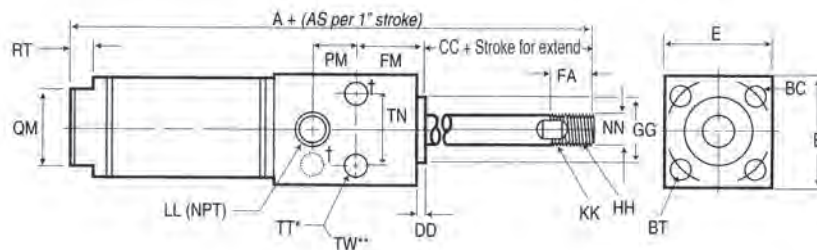
Bore sizes:	1/2", 3/4", 1-1/16"
Options:	Bumper, Viton
Accessories:	Rod clevis
Wearstrip:	Not available on 1/2-inch bore. Standard with 3 inches of stroke, or more (optional on shorter strokes).
Notes:	No rod bushing on 1/2-inch models - front head is hard anodized.

Dimensional Data

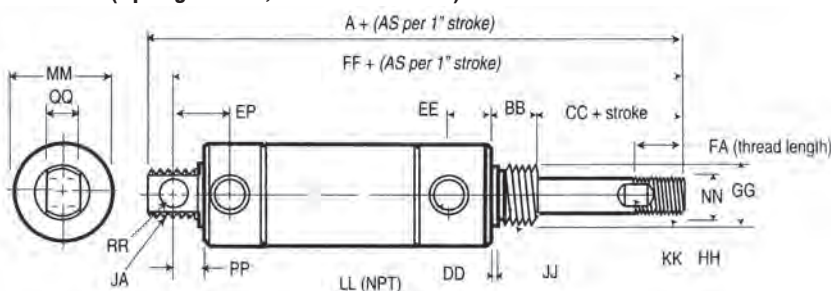
Series S (Spring Extend, Nose Mount)



Series S (Block Front Mount - Spring Extend or Spring Return)



Series S (Spring Extend, Universal Mount)



Spring Forces

Bore Size	Spring Force (lbs.)	
	Normal	Actuated
1/2"	1	2
3/4"	1.5	5
1-1/16"	4	8
1-1/4"	7	14
1-1/2"	6	12
1-3/4"	12	24
2"	15	30

* TT - Two thru holes drilled and counterbored on port side for cap screw size listed.

** TW - Above thru holes tapped on opposite side for additional mounting option.

† Mounting hole locations for 1/2-inch models.

Dimensional Data

Series S

Dim Code	Cylinder Description	CYLINDER BORE (INCHES)						
		1/2	3/4	1-1/16	1-1/4	1-1/2	1-3/4	2
Single Acting								
A	SRXX-N4B4-XXX	2.42	2.78	3.28	4.25	4.00	5.03	5.11
A	SRXX-P4B4-XXX	3.12	3.84	4.15	5.33	5.06	6.59	6.48
A	SSXX-B4B4-XXX	2.42	3.34	4.28	–	5.00	–	–
A	SRXX-B4B4-XXX	2.42	3.34	4.28	–	5.18	–	–
AS	SRXX-N4B4-XXX	1.44	2.69	2.56	2.81	2.69	3.00	3.00
AS	SRXX-P4B4-XXX	1.44	2.69	2.56	2.81	2.69	3.00	3.00
AS	SSXX-B4B4-XXX	1.88	1.69	1.56	–	1.69	–	–
AS	SRXX-B4B4-XXX	2.88	2.69	2.56	–	2.69	–	–
BB	All Types	.41	.50	.50	.62	.62	.75	.81
BC	Bolt Circle Dia.	.75	1.00	1.25	–	1.75	–	–
BT	Threaded Hole	8-32(2)	10-32(2)	10-32(2)	–	1/4-20	–	–
CC	SRXX-N4B4-XXX	.50	.50	.62	1.00	1.00	1.19	1.25
CC	SRXX-P4B4-XXX	.50	.50	.62	1.00	1.00	1.19	1.25
CC	SRXX-B4B4-XXX	.50	1.06	1.12	–	1.50	–	–
CC	SSXX-B4B4-XXX	.50	1.06	1.12	–	1.50	–	–
DD	Block Front Mount	.06	.09	.09	–	.12	–	–
DD	All Others	.04	.07	.07	.07	.07	.09	.12
E	Block Front Mount	.75	1.00	1.25	–	1.75	–	–
EE	All Types	.37	.48	.52	.69	.62	.72	.69
EP	SRXX-P4B4-XXX	.42	.66	.62	.91	.81	.98	1.00
FA	Block Front	.50	.75	.75	–	1.25	–	–
FA	All Others	.50	.50	.50	.50	.75	.88	.88
FF	SRXX-P4B4-XXX	5.76	3.55	3.87	4.97	4.69	6.09	6.05
FM	Block Front Mount	.31	.48	.72	–	1.00	–	–
GG	Block Front Mount	.437	.625	.750	–	1.00	–	–
GG	SRXX-XXXX-XXX	.437	.625	.625	.750	.750	1.03	1.375
HH	All Types	10-32	1/4-28	5/16-24	7/16-20	7/16-20	1/2-20	1/2-20
JA	SRXX-P4B4-XXX	7/16-20	5/8-18	5/8-18	3/4-16	3/4-16	1-14	1-1/4-12
JJ	All Types	7/16-20	5/8-18	5/8-18	3/4-16	3/4-16	1-14	1-1/4-12
KK	Wrench Flat	None	None	.25	.38	.38	.44	.50
LL	Block Front Mount	10-32	1/8	1/8	1/8	1/4	–	–
LL	All Others	10-32	1/8	1/8	1/8	1/8	1/4	1/4
MM	All Types	.62	.88	1.12	1.31	1.55	1.81	2.07
NN	All Types	.187	.250	.312	.437	.437	.500	.625
PM	Block Front Mount	.44	.51	.54	–	.66	–	–
PP	SRXX-P4B4-XXX	.25	.34	.34	.41	.50	.50	.57
QM	All Types	.37	.62	.87	.87	.82	1.25	1.25
QQ	SRXX-P4B4-XXX	.31	.38	.38	.50	.62	.62	.75
RR	SRXX-P4B4-XXX	.16	.25	.25	.25	.38	.38	.38
RT	All Types	.12	.16	.25	.18	.25	.25	.31
TN	Block Front Mount	.44	.62	.81	–	1.12	–	–
TT	Block Front Mount	8-32	10-32	10-32	–	1/4-20	–	–
TW	Block Front Mount	–	1/4-20	1/4-20	–	5/16-18	–	–

Performance Specifications

Series S (Nose Mount)

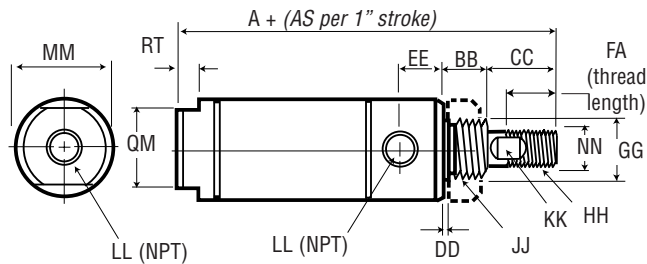
Model SDXX-N4B4-XXX - (Max. Stroke - 12 inches)	
Bore sizes:	1/2", 3/4", 1-1/16", 1-1/4", 1-1/2" 1-3/4", 2", 2-1/2"
Hex Mounting Nut:	Standard (Except on 2 and 2-1/2-inch models).
Options:	Bumper, Viton, Internal Magnet
Accessories:	Rod clevis, L-mount
Wearstrip:	Not available on 1/2-inch bore. Standard with 5 inches of stroke, or more (optional on shorter strokes).
Notes:	No rod bushing on 1/2-inch models - front head is hard anodized.

Series S (Universal Mount)

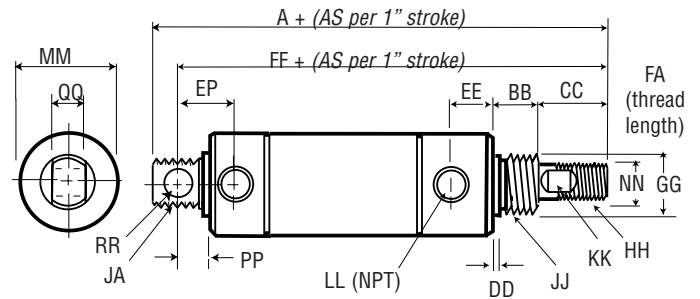
Model SDXX-P4B4-XXX - (Max. Stroke - 12 inches)	
Bore sizes:	1/2", 3/4", 1-1/16", 1-1/4", 1-1/2" 1-3/4", 2", 2-1/2"
Options:	Bumper, Viton, Internal Magnet
Accessories:	Pivot bracket, rod clevis, L-mount, mounting nut.
Wearstrip:	Not available on 1/2-inch bore. Standard with 5 inches of stroke, or more (optional on shorter strokes).
Notes:	No rod bushing on 1/2-inch models - front head is hard anodized.

Dimensional Data

Series S (Nose Mount)



Series S (Universal Mount)



Dim Code	Cylinder Description	CYLINDER BORE (INCHES)							
		1/2	3/4	1-1/16	1-1/4	1-1/2	1-3/4	2	2-1/2
Double Acting									
A	SDXX-N4B4-XXX	2.62	3.47	3.75	4.75	4.44	5.57	5.56	5.56
A	SDXX-P4B4-XXX	3.31	4.54	4.62	5.83	5.50	7.13	6.93	6.93
AS	All Types	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
BB	All Types	.41	.50	.50	.62	.62	.75	.81	.81
CC	All Types	.50	.50	.62	1.00	1.00	1.19	1.25	1.25
DD	All Types	.04	.07	.07	.07	.07	.09	.12	.12
EE	All Types	.37	.48	.52	.69	.62	.72	.69	.69
EP	SDXX-P4B4-XXX	.42	.66	.62	.91	.81	.98	1.0	1.0
FA	All Types	.50	.50	.50	.75	.75	.88	.88	.88
FF	SDXX-P4B4-XXX	6.12	4.25	4.34	5.47	5.12	6.63	6.50	6.50
GG	All Types	.437	.625	.625	.750	.750	1.030	1.50	1.50
HH	All Types	10-32	1/4-28	5/16-24	7/16-20	7/16-20	1/2-20	1/2-20	1/2-20
JJ	All Types	7/16-20	5/8-18	5/8-18	3/4-16	3/4-16	1-14	1-1/4-12	1-3/8-12
KK	All Types	None	None	.25	.38	.38	.44	.50	.50
LL	All Types	10-32	1/8	1/8	1/8	1/8	1/4	1/4	1/4
MM	All Types	.62	.88	1.12	1.31	1.55	1.81	2.07	2.62
NN	All Types	.187	.250	.312	.437	.437	.500	.625	.625
PP	SDXX-P4B4-XXX	.25	.34	.34	.41	.50	.50	.57	.57
QM	SDXX-N4B4-XXX	.37	.62	.87	.87	.87	1.25	1.25	1.75
QQ	SDXX-P4B4-XXX	.31	.38	.38	.50	.62	.62	.75	.75
RR	SDXX-P4B4-XXX	.16	.25	.25	.25	.38	.38	.38	.38
RT	SDXX-N4B4-XXX	.12	.16	.25	.18	.25	.25	.31	.31

Performance Specifications

Series S (Double Rod End, Double End Mount)

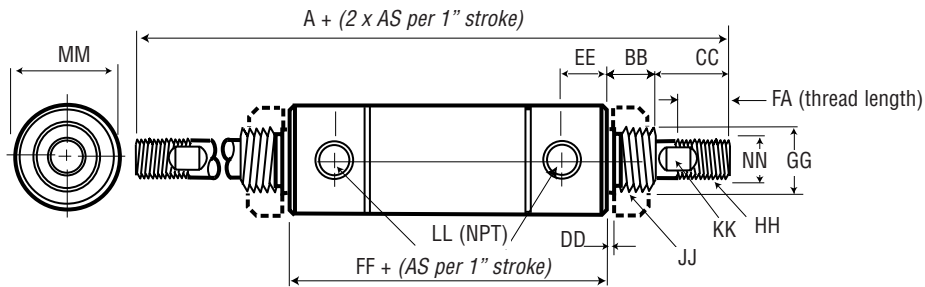
Model SDXX-D4B4-XXX - (Max. Stroke - 12 inches)	
Bore sizes:	1/2", 3/4", 1-1/16", 1-1/4", 1-1/2" 1-3/4", 2", 2-1/2"
Hex Mounting Nut:	Standard (Except on 2 and 2-1/2"-inch models) and bumpers.
Options:	Viton, wearstrip.
Accessories:	L-mount, rod clevis, mounting nut (2, 2-1/2"-inch models)
Notes:	No rod bushing on 1/2-inch models - heads are hard anodized.

Series S (Block Front Mount)

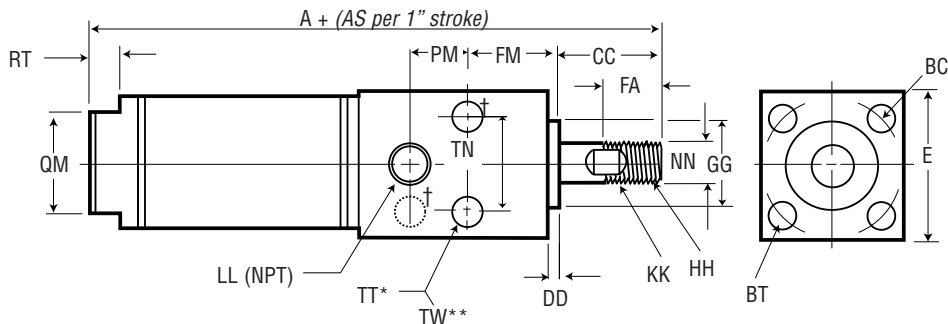
Model SDXX-B4B4-XXX - (Max. Stroke - 12 inches)	
Bore sizes:	1/2", 3/4", 1-1/16"
Options:	Wearstrip, Bumpers, Viton, Internal Magnet
Accessories:	Rod clevis
Wearstrip:	Not available on 1/2-inch bore. Standard with 5 inches of stroke, or more (optional on shorter strokes).
Notes:	No rod bushing on 1/2-inch models - front head is hard anodized. Wearstrip not available on 1/2-inch bore. Wearstrip is standard with 5 inches of stroke, or more (optional on shorter strokes).

Dimensional Data

Series S (Double Rod End, Double End Mount)



Series S (Block Front Mount)



* TT - Two thru holes drilled and counterbored on port side for cap screw size listed.

** TW - Above thru holes tapped on opposite side for additional mounting option.

† Mounting hole locations for 1/2-inch models.

Dimensional Data

Series S

Dim Code	Cylinder Description	CYLINDER BORE (INCHES)							
		1/2	3/4	1-1/16	1-1/4	1-1/2	1-3/4	2	2-1/2
Double Acting									
A	SDXX-D4B4-XXX	3.88	5.03	5.32	6.83	6.63	8.57	8.31	8.31
A	Block Front Mount	2.62	4.03	4.75	–	5.44	–	–	–
AS	Block Front Mount	1.00	1.00	1.00	–	1.00	–	–	–
AS	SDXX-D4B4-XXX	.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00
BB	SDXX-D4B4-XXX	.41	.50	.50	.62	.62	.75	.81	.81
BC	Bolt Circle Dia.	.75	1.00	1.25	–	1.75	–	–	–
BT	Threaded Hole	8-32	10-32	10-32	–	1/4-20	–	–	–
CC	Block Front Mount	.50	1.06	1.12	–	1.50	–	–	–
CC	SDXX-D4B4-XXX	.50	.50	.62	1.00	1.00	1.19	1.25	1.25
DD	Block Front Mount	.06	.09	.09	–	.12	–	–	–
DD	SDXX-D4B4-XXX	.04	.07	.07	.07	.07	.09	.12	.12
E	Block Front Mount	.75	1.00	1.25	–	1.75	–	–	–
EE	SDXX-D4B4-XXX	.37	.48	.52	.69	.62	.72	.69	.69
FA	Block Front Mount	.50	.75	.75	–	1.25	–	–	–
FA	SDXX-D4B4-XXX	.50	.50	.50	.75	.75	.88	.88	.88
FF	SDXX-D4B4-XXX	2.07	3.03	3.07	3.58	3.39	4.69	4.19	4.19
FM	Block Front Mount	.31	.48	.72	–	1.00	–	–	–
GG	Block Front Mount	.437	.625	.750	–	1.00	–	–	–
GG	SDXX-D4B4-XXX	.437	.625	.625	.750	.750	1.030	1.50	1.50
HH	All Types	10-32	1/4-28	5/16-24	7/16-20	7/16-20	1/2-20	1/2-20	1/2-20
JJ	SDXX-D4B4-XXX	7/16-20	5/8-18	5/8-18	3/4-16	3/4-16	1-14	1-1/4-12	1-3/8-12
KK	All Types	None	None	.25	.38	.38	.44	.50	.50
LL	All Types	10-32	1/8	1/8	1/8	1/8	1/4	1/4	1/4
MM	SDXX-D4B4-XXX	.62	.88	1.12	1.31	1.55	1.81	2.07	2.62
NN	All Types	.187	.250	.312	.437	.437	.500	.625	.625
PM	Block Front Mount	.44	.51	.54	–	.66	–	–	–
QM	Block Front Mount	.37	.62	.87	–	.87	–	–	–
RT	Block Front Mount	.12	.16	.25	–	.25	–	–	–
TN	Block Front Mount	.44	.62	.81	–	1.12	–	–	–
TT	Block Front Mount	8-32	10-32	10-32	–	1/4-20	–	–	–
TW	Block Front Mount	–	1/4-20	1/4-20	–	5/16-18	–	–	–

Features

Series S (Hall Effect Switches)

Hall Effect Sensors are typically used in conjunction with computers, programmable controllers or other solid state devices to sense and process cylinder rod proximity. The solid state circuitry in this sinking switch (NPN) provides clean, fast output without “bounce.” The 300 mW power capability restricts its use to low power loads. One switch kit fits all Silverair cylinders for reduced and simplified inventory. 3/8 inch effective area per switch. For two switches, a minimum of 1-inch stroke is recommended.

Series S (Reed Switches)

Epoxy encapsulated reed switches are ideal for harsh environments. One switch kit fits all Silverair cylinders for reduced and simplified inventory. 50 watt reed is common in all sensors. Model 117045-300 lights up during reed engagement in low voltage applications. Model 117045-500 lights up over wide voltage range. Model 117045-100 is a basic sensor with no LED.



Performance Specifications

Series S (Hall Effect Switches)

Input Voltage:	5 to 24 VDC
Input Current:	25 mA maximum
Output Voltage Drop:	0.4 VDC maximum
Output Current:	330 mA maximum
Power Dissipation:	300 mW maximum
Temperature Range:	-20° to 185°F (-29° to 85°C)

Series S (Reed Switches)

Contacts:	Normally open
Contact Rating:	50 W maximum
Switching Current:	1 A maximum
Initial Contact Resistance:	1 Ohm
Minimum Break Down Voltage:	225 VDC, 275 VAC
Temperature Range:	-40° to 200°F (-40° to 93°C)

Technical Information:

1. Do not exceed specification, permanent damage to the sensor may occur.
2. For reed switch type sensors, polarity must be observed for the proper functioning of LED. Connect the brown wire in series with load positive (+) and the blue wire to negative (-) or power source space. If the polarity is reversed, reed switch remains functional but LED will remain in “OFF” state.
3. For solid-state type sensors, polarity must also be observed. Connect brown wire to the positive (+) and the blue to the negative (-) of DC power source. The black wire must connect to the load ONLY. If the black wire is accidentally connected to the power source, permanent damage to the sensor may occur.
4. An external protection circuit may be required if the reed switch is used with inductive load, such as relay or solenoid. For DC inductive load, attach an external diode parallel to the load and use R -C circuit parallel with AC inductive load.
5. Keep sensors away from stray magnetic field to prevent malfunctions.
6. When using reed switch with capacitive load or if the lead wire length exceeds 10-meter, and inductor must be installed in series with the sensor to prevent damage (Sticking effect).

Ordering

Series S (Hall Effect Switches)

Model No.	Description
118123-100	w/LED, 5-24 VDC, 24 inch leads (includes 118124 Mounting Kit)
118123-200	w/LED, 5-24 VDC, 144 inch leads (includes 118124 Mounting Kit)

Series S (Reed Switches)

One 118124 Mounting Kit is included with each Reed Switch

Model No.	Description
117045-100	No LED, 120 VAC or 200 VDC max., 24 inch leads
117045-200	No LED, 120 VAC or 200 VDC max., 144 inch leads
117045-300	w/LED, 5-24 VAC/DC max., 24 inch leads
117045-400	w/LED, 5-24 VAC/DC max., 144 inch leads
117045-500	w/LED, 120 VAC or 200 VDC max., 24 inch leads
117045-600	w/LED, 120 VAC or 200 VDC max., 144 inch leads

Pneumatic Cylinders

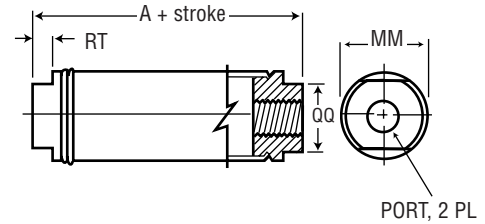
Silverair™ Volume Chambers

Features

Series S (Stainless Steel Volume Chambers)

Volume chambers are used wherever there is the need to accumulate or store a volume of air or vacuum, such as a time delay in a circuit.

- Stainless steel body and aluminum endcaps offer excellent corrosion resistance in adverse environments.
- Available in lengths up to 24 inches, at 1/8-inch increments, providing a capability to meet very specific pneumatic accumulator applications.



Performance Specifications

Operating Pressures:	0 - 200 PSIG (14 bar)
Temperatures Ranges:	-40° to 160°F, ambient (-40° to 71°C)
Operation:	Compressed air or with vacuum

Volume (ci)	Cylinder Bore (Inches)			
	3/4	1-1/16	1-1/2	2
Add per 1.0 inch of length	.44	.89	1.77	3.14
Basic Volume (add to total)	.41	.92	1.80	4.44

Ordering

Reference	Cylinder Bore (Inches)			
	3/4	1-1/16	1-1/2	2
A	1.91	2.18	2.26	2.81
MM	.81	1.11	1.55	2.07
QQ	.62	.88	.88	1.25
RT	.16	.25	.25	.32
PORT	.125	.125	.125	.25

11811 X - XXX

BORE SIZE

- 5 3/4 inch
- 6 1-1/16 inch**
- 7 1-1/2 inch
- 8 2 inch

CHAMBER LENGTH

(1" Increments, 1" through 4")

WHOLE INCHES FRACTIONS

- | | |
|------------|------------|
| 00 = 0 in | 0 = None |
| 01 = 1 in | 1 = 1/8 in |
| 02 = 2 in | 2 = 1/4 in |
| 03 = 3 in | 3 = 3/8 in |
| 04 = 4 in | 4 = 1/2 in |
| 05 = 5 in | 5 = 5/8 in |
| 06 = 6 in | 6 = 3/4 in |
| 10 = 10 in | 7 = 7/8 in |
- etc.

- Under 1" stroke, use 00 and fraction designation.

Example: 1/2" stroke = 004

Note: Highlighted selections denotes most popular models.

Pneumatic Cylinders

Premair™ Composite

Features

- Corrosion-Resistant Composite Construction
- Superior Wear; Longer Service Life than Metal Cylinders
- Lighter Weight than Metal Cylinders
- Quiet Operation: No “Pinging”
- User-adjustable Port Location
- Factory Lubricated
- Dent-Resistant
- All-Stainless Accessories
- Five Year Warranty

Technical Data

Temperature Range:	-20° to 200°F (-25° to 95°C)
Pressure Range:	200 PSI (4 PSI Breakaway)
Chemical Compatibility:	Delrin® compositions have excellent resistance to a wide variety of solvents, esters, oils, greases, gasoline and other petroleum hydrocarbons. They resist weak acids and bases, but are not recommended for uses outside of pH range 4 to 9.
DuPont Delrin® Product and Properties Guide, page 9 H-41651-1. For detailed information about Dupont Delrin®, contact DuPont Polymers at (302) 999-4592.	
Comparative Data:	30% lighter vs. Metal 2 x Wear life of Metal

Patented Prema-Lok™ Sealed End-Cap Retention/Rotation System

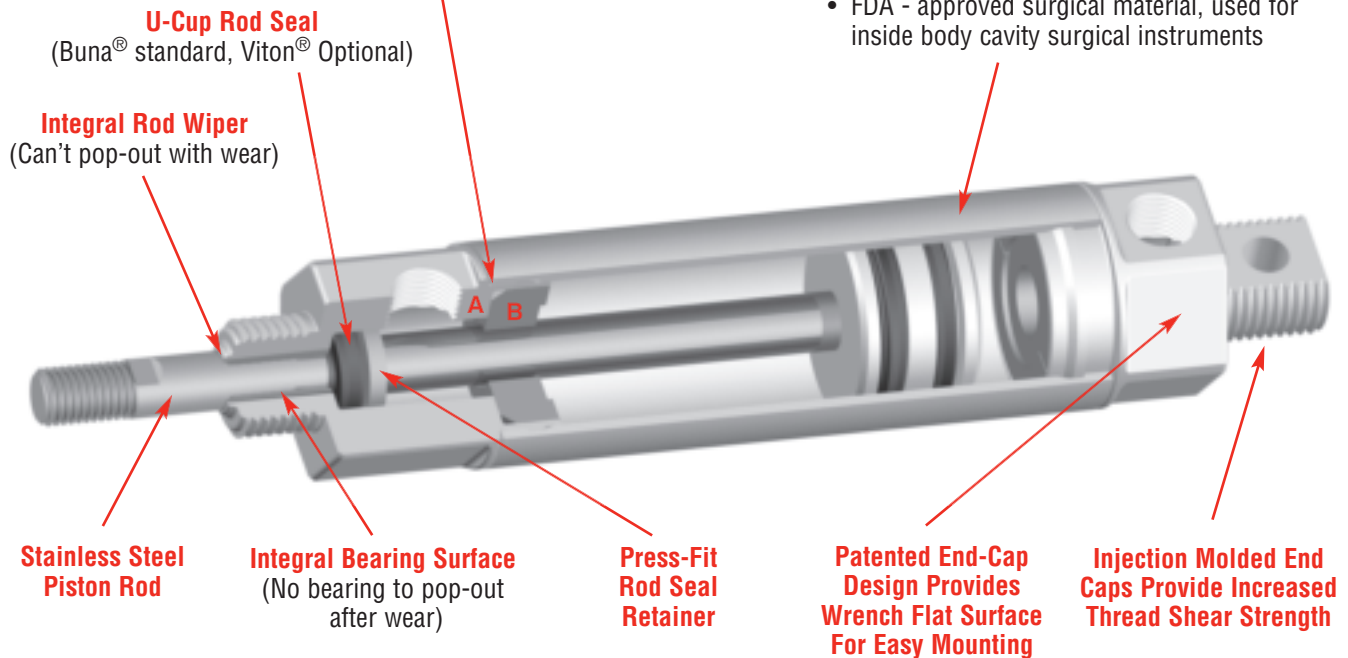
Premair is making cylinder installation and positioning easier than ever! Premair’s patented* port-positioning design permits quick, accurate adjustment without the time loss and headaches of special ordering, not to mention added inventory. All you do is order one model, set it and forget it.

- (A) Press-fit end caps are permanently retained and provide seal
- (B) Secondary “wedge” insures permanent retention and leak-proof seal
- Press-fit end cap design also permits end cap rotation

Composite Body

Patented, Continuous Cross-Wound Thermo-Set Epoxy Provides:

- Corrosion resistance
- Dent/wear resistance
- Lighter weight than metal
- FDA - approved surgical material, used for inside body cavity surgical instruments

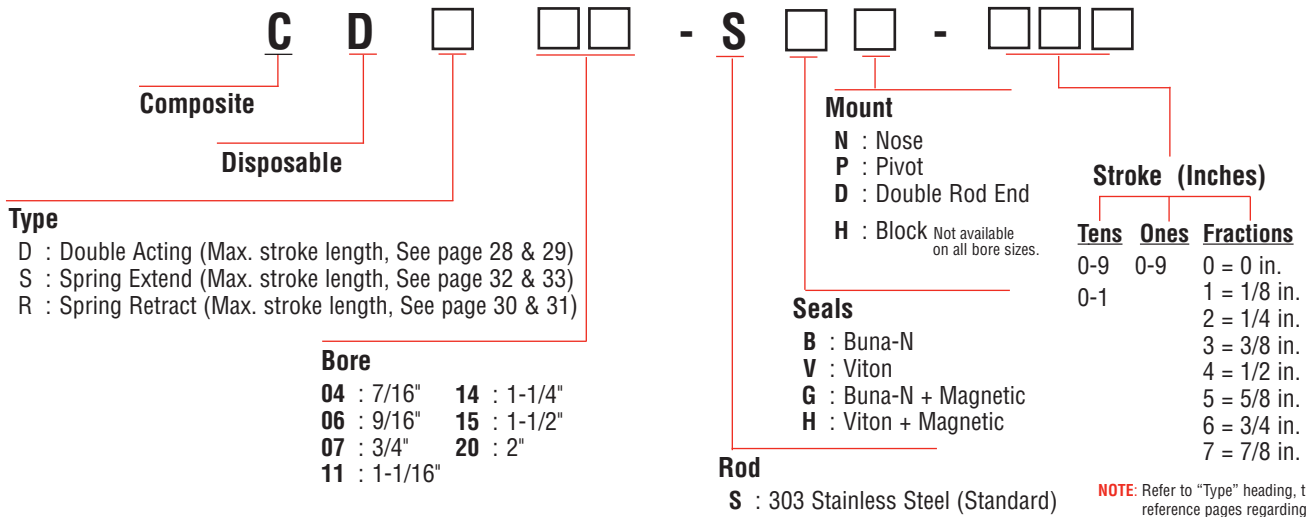


* Multiple patents applied for. Additional patents pending.

Pneumatic Cylinders

Premair™ Composite

Ordering / Most Popular Models



Most Popular (Standard) Models

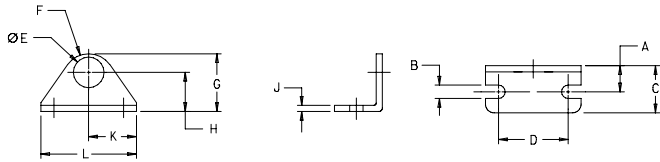
CDD04-SBH-004-K	CDD07-SBH-024-K	CDD11-SBH-024-K	CDD14-SBN-024-K	CDD15-SBP-040-K	CDR07-SBP-004-K
CDD04-SBH-010-K	CDD07-SBH-030-K	CDD11-SBH-030-K	CDD14-SBN-030-K	CDD15-SBP-060-K	CDR07-SBP-010-K
CDD04-SBH-014-K	CDD07-SBH-040-K	CDD11-SBH-040-K	CDD14-SBN-040-K	CDD15-SBP-080-K	CDR07-SBP-014-K
CDD04-SBH-020-K	CDD07-SBH-050-K	CDD11-SBH-050-K	CDD14-SBN-050-K	CDD20-SBN-010-K	CDR07-SBP-020-K
CDD04-SBH-024-K	CDD07-SBH-060-K	CDD11-SBH-060-K	CDD14-SBN-060-K	CDD20-SBN-014-K	CDR11-SBN-004-K
CDD04-SBH-030-K	CDD07-SBN-004-K	CDD11-SBN-004-K	CDD14-SBN-070-K	CDD20-SBN-020-K	CDR11-SBN-010-K
CDD04-SBH-040-K	CDD07-SBN-010-K	CDD11-SBN-010-K	CDD14-SBN-080-K	CDD20-SBN-024-K	CDR11-SBN-014-K
CDD04-SBN-004-K	CDD07-SBN-014-K	CDD11-SBN-014-K	CDD14-SBN-090-K	CDD20-SBN-030-K	CDR11-SBN-020-K
CDD04-SBN-010-K	CDD07-SBN-020-K	CDD11-SBN-020-K	CDD14-SBN-100-K	CDD20-SBN-040-K	CDR14-SBN-004-K
CDD04-SBN-014-K	CDD07-SBN-024-K	CDD11-SBN-024-K	CDD14-SBN-110-K	CDD20-SBN-060-K	CDR14-SBN-010-K
CDD04-SBN-020-K	CDD07-SBN-030-K	CDD11-SBN-030-K	CDD14-SBN-120-K	CDD20-SBN-080-K	CDR14-SBN-014-K
CDD04-SBN-024-K	CDD07-SBN-040-K	CDD11-SBN-040-K	CDD14-SBP-004-K	CDD20-SBP-010-K	CDR14-SBN-020-K
CDD04-SBN-030-K	CDD07-SBN-050-K	CDD11-SBN-050-K	CDD14-SBP-010-K	CDD20-SBP-014-K	CDR14-SBN-024-K
CDD04-SBN-040-K	CDD07-SBN-060-K	CDD11-SBN-060-K	CDD14-SBP-014-K	CDD20-SBP-020-K	CDR14-SBN-030-K
CDD04-SBP-004-K	CDD07-SBN-070-K	CDD11-SBN-070-K	CDD14-SBP-020-K	CDD20-SBP-024-K	CDR14-SBP-004-K
CDD04-SBP-010-K	CDD07-SBN-080-K	CDD11-SBN-080-K	CDD14-SBP-024-K	CDD20-SBP-030-K	CDR14-SBP-010-K
CDD04-SBP-014-K	CDD07-SBN-090-K	CDD11-SBN-090-K	CDD14-SBP-030-K	CDD20-SBP-040-K	CDR14-SBP-014-K
CDD04-SBP-020-K	CDD07-SBN-100-K	CDD11-SBN-100-K	CDD14-SBP-040-K	CDD20-SBP-060-K	CDR14-SBP-020-K
CDD04-SBP-024-K	CDD07-SBN-110-K	CDD11-SBN-110-K	CDD14-SBP-050-K	CDD20-SBP-080-K	CDS06-SBN-004-K
CDD04-SBP-030-K	CDD07-SBN-120-K	CDD11-SBN-120-K	CDD14-SBP-060-K	CDR04-SBN-004-K	CDS06-SBN-010-K
CDD04-SBP-040-K	CDD07-SBP-004-K	CDD11-SBP-004-K	CDD14-SBP-070-K	CDR04-SBN-010-K	CDS06-SBN-014-K
CDD06-SBN-004-K	CDD07-SBP-010-K	CDD11-SBP-010-K	CDD14-SBP-080-K	CDR04-SBN-014-K	CDS06-SBP-004-K
CDD06-SBN-010-K	CDD07-SBP-014-K	CDD11-SBP-014-K	CDD14-SBP-090-K	CDR04-SBN-020-K	CDS06-SBP-010-K
CDD06-SBN-014-K	CDD07-SBP-020-K	CDD11-SBP-020-K	CDD14-SBP-100-K	CDR04-SBP-004-K	CDS07-SBN-004-K
CDD06-SBN-020-K	CDD07-SBP-024-K	CDD11-SBP-024-K	CDD14-SBP-110-K	CDR04-SBP-010-K	CDS07-SBN-010-K
CDD06-SBN-024-K	CDD07-SBP-030-K	CDD11-SBP-030-K	CDD14-SBP-120-K	CDR04-SBP-014-K	CDS07-SBN-014-K
CDD06-SBN-030-K	CDD07-SBP-040-K	CDD11-SBP-040-K	CDD15-SBN-004-K	CDR04-SBP-020-K	CDS07-SBP-004-K
CDD06-SBN-040-K	CDD07-SBP-050-K	CDD11-SBP-050-K	CDD15-SBN-010-K	CDR06-SBN-004-K	CDS07-SBP-010-K
CDD06-SBP-004-K	CDD07-SBP-060-K	CDD11-SBP-060-K	CDD15-SBN-014-K	CDR06-SBN-010-K	CDS07-SBP-014-K
CDD06-SBP-010-K	CDD07-SBP-070-K	CDD11-SBP-070-K	CDD15-SBN-020-K	CDR06-SBN-014-K	CDS11-SBN-004-K
CDD06-SBP-014-K	CDD07-SBP-080-K	CDD11-SBP-080-K	CDD15-SBN-030-K	CDR06-SBN-020-K	CDS11-SBN-010-K
CDD06-SBP-020-K	CDD07-SBP-090-K	CDD11-SBP-090-K	CDD15-SBN-040-K	CDR06-SBP-004-K	CDS11-SBN-014-K
CDD06-SBP-024-K	CDD07-SBP-100-K	CDD11-SBP-100-K	CDD15-SBN-060-K	CDR06-SBP-010-K	CDS11-SBN-020-K
CDD06-SBP-030-K	CDD07-SBP-110-K	CDD11-SBP-110-K	CDD15-SBN-080-K	CDR06-SBP-014-K	CDS11-SBP-004-K
CDD06-SBP-040-K	CDD07-SBP-120-K	CDD11-SBP-120-K	CDD15-SBP-004-K	CDR06-SBP-020-K	CDS11-SBP-010-K
CDD07-SBH-004-K	CDD11-SBH-004-K	CDD14-SBN-004-K	CDD15-SBP-010-K	CDR07-SBN-004-K	CDS11-SBP-014-K
CDD07-SBH-010-K	CDD11-SBH-010-K	CDD14-SBN-010-K	CDD15-SBP-014-K	CDR07-SBN-010-K	CDS11-SBP-020-K
CDD07-SBH-014-K	CDD11-SBH-014-K	CDD14-SBN-014-K	CDD15-SBP-020-K	CDR07-SBN-014-K	
CDD07-SBH-020-K	CDD11-SBH-020-K	CDD14-SBN-020-K	CDD15-SBP-030-K	CDR07-SBN-020-K	

Pneumatic Cylinders

Premair™ Composite

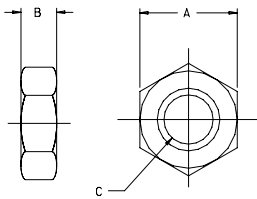
Accessories (All Stainless Steel)

L-Mount Kit (One Bracket, One Nut)



Bore	7/16"(.04)	9/16"(.06)	3/4"(.07)	1-1/16"(.11)	1-1/4"(.14)	1-1/2"(.15)	2"(.20)
A	0.38	0.38	0.56	0.56	0.75	0.75	1
B	0.19	0.19	0.27	0.27	0.28	0.28	0.34
C	0.69	0.69	1	1	1.5	1.5	1.62
D	1	1	1.5	1.5	1.88	1.88	2.25
E (Dia.)	0.44	0.44	0.63	0.63	0.75	1	1.38
F (Rad.)	0.38	0.38	0.56	0.56	0.75	.75	1
G	0.83	0.83	1.38	1.38	1.75	1.75	2.5
H	0.56	0.56	0.81	0.81	1	1	1.5
J	0.09	0.09	0.13	0.13	0.13	0.13	0.25
K	0.69	0.69	0.94	0.94	1.25	1.25	1.56
L	1.38	1.38	1.88	1.88	2.5	2.5	3.12
Model	114020-056	114020-056	114020-106	114020-106	114020-125	114020-150	114020-200

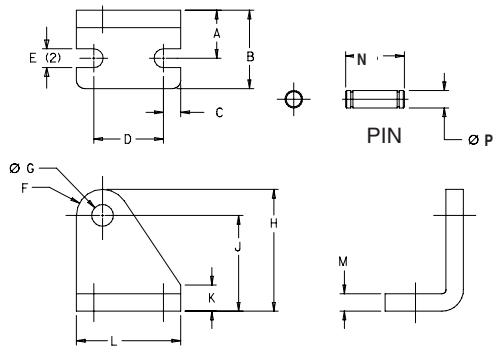
Mounting Nut (Nuts Sold Individually)



Bore	7/16"(.04)	9/16"(.06)	3/4"(.07)	1-1/16"(.11)	1-1/4"(.14)	1-1/2"(.15)	2"(.20)
A	0.69	0.69	0.94	0.94	1.13	1.5	1.88
B	0.25	0.25	0.38	0.38	0.42	0.55	0.50
C	7/16-20	7/16-20	5/8-18	5/8-18	3/4-16	1-12	1 1/4-12
Model	114021-056	114021-056	114021-106	114021-106	114021-125	114021-150	114021-200

Pivot Bracket Kit (Two Piece)

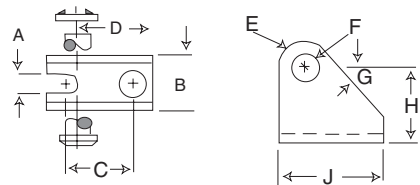
(Left Bracket, Right Bracket, Pivot Pin, 2 E-Clips)



Bore	7/16"(.04)	9/16"(.06)	3/4"(.07)	1-1/16"(.11)	1-1/4"(.14)	1-1/2"(.15)	2"(.20)
A	0.28	0.28	0.44	0.44	0.44	0.62	0.69
B	0.5	0.5	0.81	0.81	0.81	1	1.13
C	0.13	0.13	0.19	0.19	0.19	0.25	0.25
D	0.5	0.5	0.75	0.75	0.75	1	1
E	0.19	0.19	0.27	0.27	0.27	0.27	0.27
F (Rad.)	0.2	0.2	0.31	0.31	0.31	0.38	0.38
G (Dia.)	0.16	0.16	0.25	0.25	0.25	0.38	0.38
H	0.77	0.77	1.19	1.19	1.19	1.75	1.75
J	0.56	0.56	0.88	0.88	0.88	1.38	1.38
K	0.13	0.13	0.25	0.25	0.25	0.25	0.38
L	0.75	0.75	1.13	1.13	1.13	1.50	1.50
M	0.06	0.06	0.13	0.13	0.13	0.13	0.25
N	0.602	0.602	0.829	0.829	0.954	1.10	1.48
P	0.156	0.156	0.250	0.250	0.250	.375	.375
Model	114022-043	114022-043	114022-075	114022-075	114022-125	114022-150	114022-200

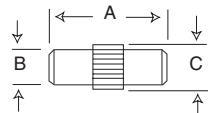
U-Pivot Bracket Kit (Single Piece)

(Bracket, Pivot Pin, 2 E-Clips)



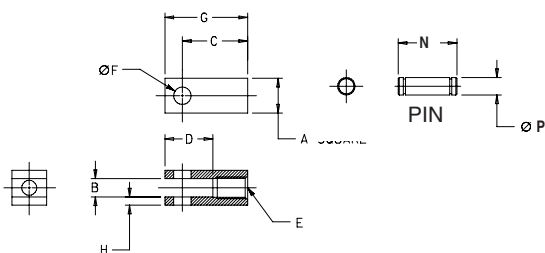
Bore	7/16"(.04)	9/16"(.06)	3/4"(.07)	1-1/16"(.11)	1-1/4"(.14)	1-1/2"(.15)	2"(.20)
A	.20	.20	0.26	0.26	0.32	.39	.45
B	.52	.52	0.65	0.65	0.77	.96	1.20
C	.43	.43	0.75	0.75	0.75	1.00	1.00
D	.54	.54	0.87	0.87	0.94	1.25	1.43
E (Rad.)	.22	.22	0.31	0.31	0.31	.38	.38
(Dia.)	.16	.16	0.26	0.26	0.26	.38	.38
G	50°	50°	53°	53°	53°	52°	48°
H	.64	.64	0.87	0.87	1.06	1.37	1.68
J	.75	.75	1.19	1.19	1.25	1.63	1.81
Model	114570-043	114570-0043	114570-075	114570-075	114570-125	114570-150	114570-200

Optional Press Fit Pin



Bore	7/16"(.04)	9/16"(.06)	3/4"(.07)	1-1/16"(.11)	1-1/4"(.14)	1-1/2"(.15)	2"(.20)
A	.50	.50	0.75	0.75	0.87	1.13	N/A
B	.15	.15	0.24	0.24	0.24	.37	N/A
C	.17	.17	0.26	0.26	0.26	.39	N/A
Model	114634-056	114634-056	114634-106	114634-106	114634-125	114634-150	N/A

Rod Clevis Kit (Rod Clevis, Clevis Pin, Jam Nut and 2 E-Clips)

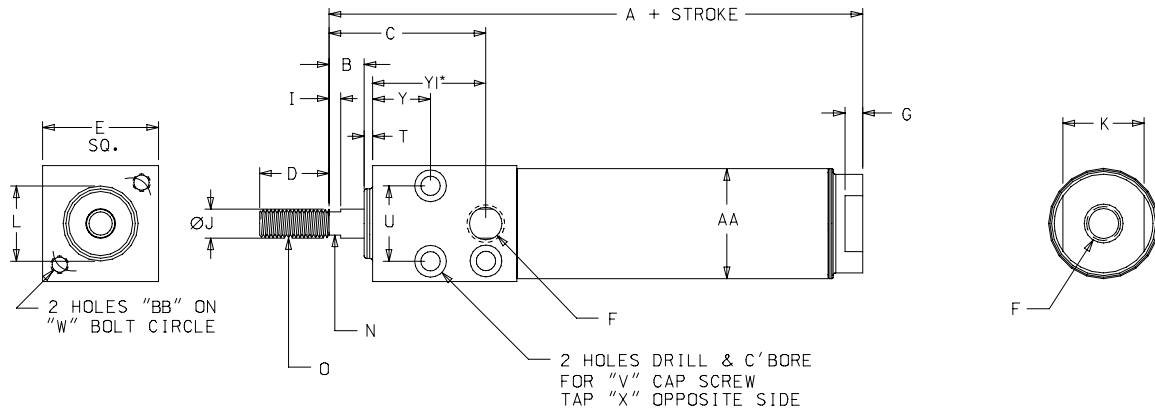


Bore	7/16"(.04)	9/16"(.06)	3/4"(.07)	1-1/16"(.11)	1-1/4"(.14)	1-1/2"(.15)	2"(.20)
A	0.38	0.38	0.5	0.5	0.75	0.75	0.75
B	0.19	0.19	0.25	0.25	0.38	0.38	0.38
C	0.75	0.75	0.94	0.94	1.31	1.31	1.31
D	0.56	0.56	0.69	0.69	0.94	0.94	0.94
E	#10-32	#10-32	1/4-28	5/16-24	7/16-20	7/16-20	1/2-20
F (Dia.)	0.19	0.19	0.25	0.25	0.38	0.38	0.38
G	0.94	0.94	1.19	1.19	1.69	1.69	1.69
H	0.09	0.09	0.13	0.13	0.19	0.19	0.19
N	0.55	0.56	0.700	0.700	1.03	1.03	1.03
P (Dia.)	0.187	0.19	0.25	0.25	0.375	0.38	0.38
Model	114023-043	114023-043	114023-075	114023-106	114023-125	114023-125	114023-200

Pneumatic Cylinders

Premair™ Composite

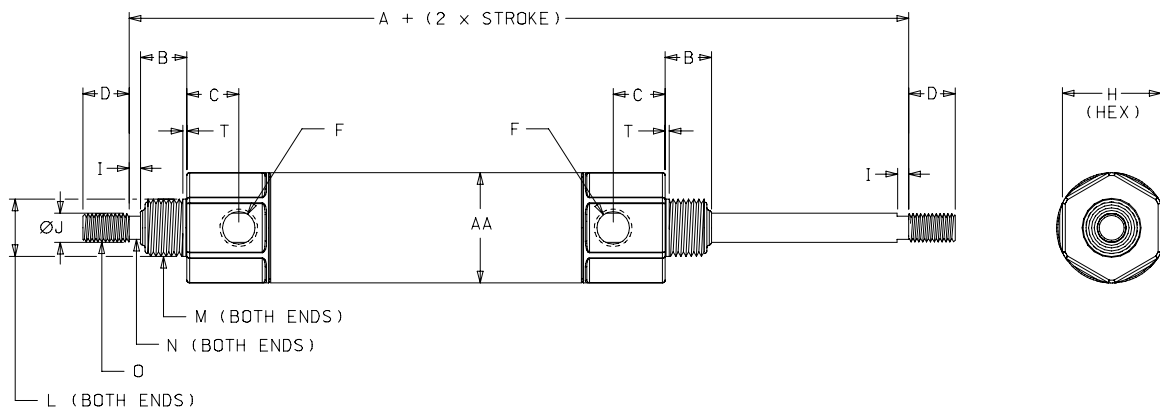
Dimensional Data



DOUBLE ACTING / BLOCK MOUNT (Maximum Stroke 12")

Bore	7/16" (04)	9/16" (06)	3/4" (07)	1-1/16" (11)	1-1/4" (12)	1-1/2" (15)	2" (20)	Bore	7/16" (04)	9/16" (06)	3/4" (07)	1-1/16" (11)	1-1/4" (14)	1-1/2" (15)	2" (20)
A	2.13	-	3.22	3.75	-	4.19	-	N	-	-	0.22	0.25	-	0.38	-
B	-	-	0.25	0.38	-	0.38	-	O	10-32	-	1/4-28	5/16-24	-	7/16-20 UNF-2A	-
C	0.72	-	1.34	1.63	-	1.91	-	T	0.06	-	0.09	0.09	-	0.09	-
D	0.5	-	0.75	0.75	-	1.25	-	U	0.44	-	0.63	0.81	-	1.69	-
E	0.75	-	1	1.25	-	1.75	-	V	-	-	#10-32	#10-32	-	1/4"	-
F	10-32	-	1/8 NPT	1/8 NPT	-	1/4 NPT	-	W	0.75	-	1.00	1.25	-	1.750	-
G	0.19	-	0.19	0.19	-	0.25	-	X	#8-32	-	1/4-20 UNC-28	1/4-20 UNC-28	-	5/16-18 UNC-2B	-
I	-	-	0.25	0.25	-	0.25	-	Y	0.25	-	0.38	0.63	-	0.88	-
J	0.19	-	0.25	0.31	-	0.44	-	Y1*	0.69	-	-	-	-	-	-
K	0.38	-	0.63	0.88	-	1.50	-	AA	0.56	-	0.88	1.19	-	1.69	-
L	0.44	-	0.63	0.75	-	1	-	BB	#8-32	-	#10-32	#10-32	-	1/4-20 UNC-2B	-

* - 7/16" Bore Only



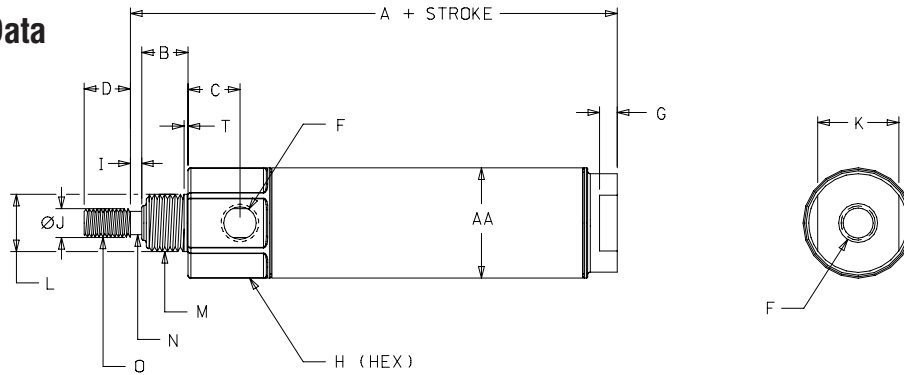
DOUBLE ACTING / DOUBLE ROD END (Maximum Stroke 12", 6" for 7/16" and 9/16" Bore)

Bore	7/16" (04)	9/16" (06)	3/4" (07)	1-1/16" (11)	1-1/4" (12)	1-1/2" (15)	2" (20)	Bore	7/16" (04)	9/16" (06)	3/4" (07)	1-1/16" (11)	1-1/4" (14)	1-1/2" (15)	2" (20)
A	2.81	2.94	4	4.38	5.56	5.12	6.56	J	0.19	0.19	0.25	0.31	0.44	0.44	0.62
B	0.38	0.38	0.5	0.5	0.63	0.63	0.81	L	.433/.437	.433/.437	.621/.624	.621/.624	.746/.749	.746/.749	1.372/1.375
C	0.34	0.34	0.47	0.56	0.75	0.33	0.74	M	7/16-20	7/16-20	5/8-18	5/8-18	3/4-16	1-12 UNF-2A	1 1/4-12 UNF-2A
D	0.5	0.5	0.5	0.5	0.75	0.75	0.88	N	-	-	-	0.25	0.38	0.38	0.50
F	#10-32	#10-32	1/8 NPT	1/8 NPT	1/8 NPT	1/8 NPT	1/4 NPT	O	#10-32	#10-32	1/4-28	5/16-24	7/16-20	7/16-20 UNF-2A	1/2-20 UNF-2A
H	0.56	0.69	0.88	1.06	1.25	-	-	T	0.05	0.06	0.09	0.09	0.09	0.09	0.13
I	-	-	-	0.13	0.25	0.25	0.31	AA	0.56	0.69	0.88	1.19	1.38	1.69	2.23

Pneumatic Cylinders

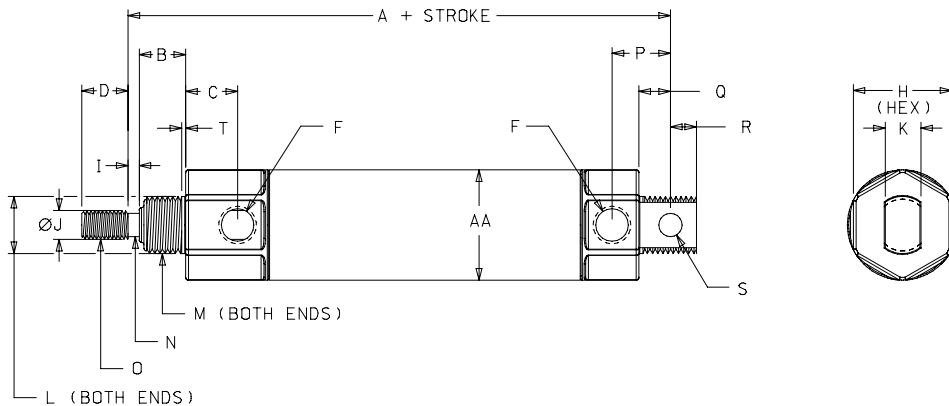
Premair™ Composite

Dimensional Data



DOUBLE ACTING / NOSE MOUNT (Maximum Stroke 12")

Bore	7/16" (04)	9/16" (06)	3/4" (07)	1-1/16" (11)	1-1/4" (12)	1-1/2" (15)	2" (20)	Bore	7/16" (04)	9/16" (06)	3/4" (07)	1-1/16" (11)	1-1/4" (14)	1-1/2" (15)	2" (20)
A	2.13	2.28	2.97	3.13	4	3.69	4.69	J	0.19	0.19	0.25	0.31	0.44	0.44	0.62
B	0.38	0.38	0.5	0.5	0.62	0.63	0.81	K	0.38	0.50	0.62	0.88	0.88	0.62	1.25
C	0.34	0.34	0.47	0.56	0.75	0.74	0.74	L	.433/.437	.433/.437	.621/.624	.621/.624	.746/.749	.746/.769	1.372/1.375
D	0.5	0.5	0.5	0.5	0.75	0.75	0.88	M	7/16-20	7/16-20	5/8-18	5/8-18	3/4-16	1-12 UNF-2A	1 1/4-12 UNF-2A
F	#10-32	#10-32	1/8 NPT	1/8 NPT	1/8 NPT	1/8 NPT	1/4 NPT	N	-	-	-	0.25	0.38	0.38	0.50
G	0.19	0.19	0.19	0.19	0.19	0.25	0.31	O	#10-32	#10-32	1/4-28	5/16-24	7/16-20	7/16-20 UNF-2A	1/2-20 UNF-2A
H	0.56	0.69	0.88	1.06	1.25	-	-	T	0.05	0.06	0.09	0.09	0.09	0.09	0.13
I	-	-	-	0.13	0.25	0.25	0.31	AA	0.56	0.69	0.88	1.19	1.38	1.69	2.23



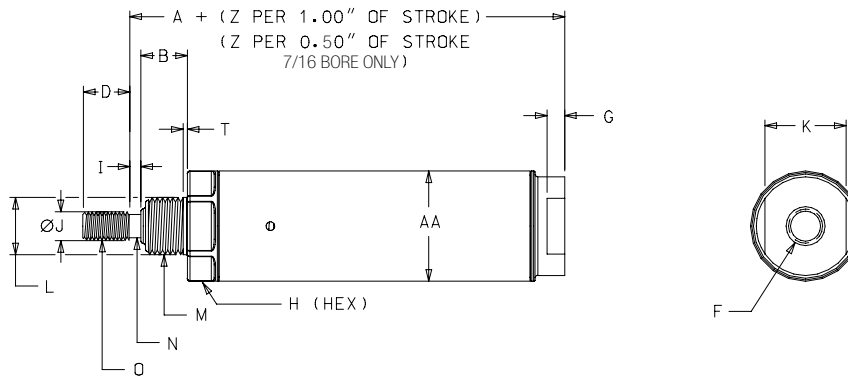
DOUBLE ACTING / PIVOT MOUNT (Maximum Stroke 32", 12" for 7/16" and 9/16" Bore)

Bore	7/16" (04)	9/16" (06)	3/4" (07)	1-1/16" (11)	1-1/4" (12)	1-1/2" (15)	2" (20)	Bore	7/16" (04)	9/16" (06)	3/4" (07)	1-1/16" (11)	1-1/4" (14)	1-1/2" (15)	2" (20)
A	2.56	2.56	3.75	3.84	4.72	4.38	5.62	M	7/16-20	7/16-20	5/8-18	5/8-18	3/4-16	1-12 UNF-2A	1 1/4-12 UNF-2A
B	0.38	0.38	0.5	0.5	0.63	0.63	0.81	N	-	-	-	0.25	0.38	0.38	0.50
C	0.34	0.34	0.47	0.56	0.62	0.74	0.74	O	#10-32	#10-32	1/4-28	5/16-24	7/16-20	7/16-20 UNF-2A	1/2-20 UNF-2A
D	0.5	0.5	0.5	0.5	0.75	0.75	0.88	P	0.44	0.44	0.69	0.63	0.78	0.81	1.03
F	#10-32	#10-32	1/8 NPT	1/8 NPT	1/8 NPT	1/8 NPT	1/4 NPT	Q	0.25	0.25	0.34	0.34	0.41	0.41	0.56
H	0.56	0.69	0.88	1.06	1.25	-	-	R	0.25	0.25	0.28	0.28	0.41	0.38	0.44
I	-	-	-	0.13	0.25	0.25	0.31	S	0.156	0.156	0.25	0.25	0.25	0.375	0.375
J	0.19	0.19	0.25	0.31	0.44	0.44	0.62	T	0.05	0.06	0.09	0.09	0.09	0.09	0.13
K	0.31	0.31	0.38	0.38	0.5	0.62	0.75	AA	0.56	0.69	0.88	1.19	1.38	1.69	2.23
L	.433/.437	.433/.437	.621/.624	.621/.624	.746/.749	.746/.749	1.372/1.375								

Pneumatic Cylinders

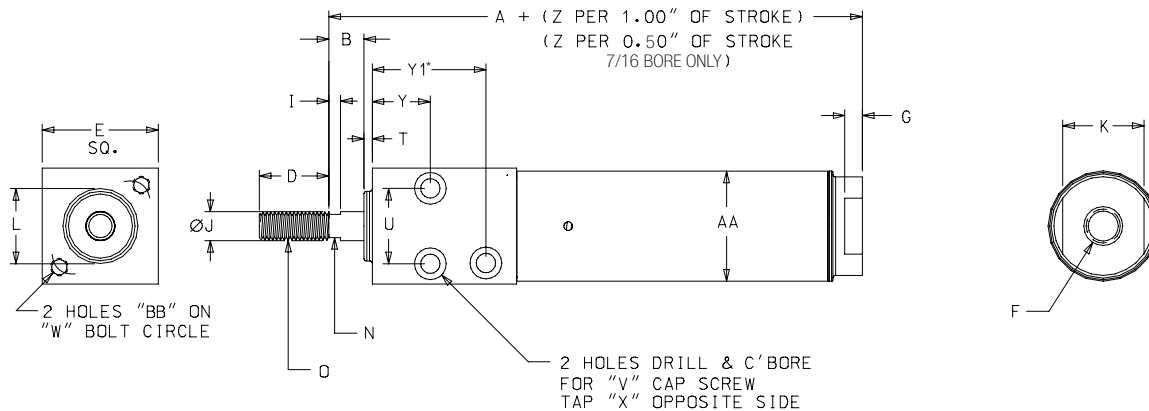
Premair™ Composite

Dimensional Data



SINGLE ACTING / SPRING RETRACT / NOSE MOUNT (Maximum Stroke 6")

Bore	7/16"(04)	9/16"(06)	3/4"(07)	1-1/16"(11)	1-1/4"(12)	1-1/2"(15)	2"(20)	Bore	7/16"(04)	9/16"(06)	3/4"(07)	1-1/16"(11)	1-1/4"(14)	1-1/2"(15)	2"(20)
A	1.31	1.53	1.5	2.06	2.66	2.44	3.29	K	0.38	0.5	0.62	0.88	0.88	0.62	0.75
B	0.31	0.38	0.5	0.5	0.63	0.63	0.81	L	.433/.437	.433/.437	.621/.624	.621/.624	.746/.749	.746/.749	1.372/1.375
C	0.34	0.38	0.47	0.56	0.75	0.74	0.74	M	7/16-20	7/16-20	5/8-18	5/8-18	3/4-16	1-12 UNF-2A	1 1/4-12 UNF-2A
D	0.5	0.5	0.5	0.5	0.75	0.75	0.88	N	-	-	-	0.25	0.38	0.38	0.50
F	#10-32	#10-32	1/8 NPT	1/8 NPT	1/8 NPT	1/8 NPT	1/4 NPT	O	#10-32	#10-32	1/4-28	5/16-24	7/16-20	7/16-20 UNF-2A	1/2-20 UNF-2A
G	0.19	0.19	0.19	0.19	0.19	0.25	0.31	T	0.05	0.06	0.09	0.09	0.093	0.09	0.13
H	0.56	0.69	0.88	1.06	1.25	-	-	Z	0.94	1.63	1.69	1.56	1.81	1.69	2.00
I	-	-	-	0.13	0.25	0.25	0.31	AA	0.56	0.69	0.88	1.19	1.38	1.69	2.23
J	0.19	0.19	0.25	0.31	0.44	0.44	0.62								



SINGLE ACTING / SPRING RETRACT / BLOCK MOUNT (Maximum Stroke 6")

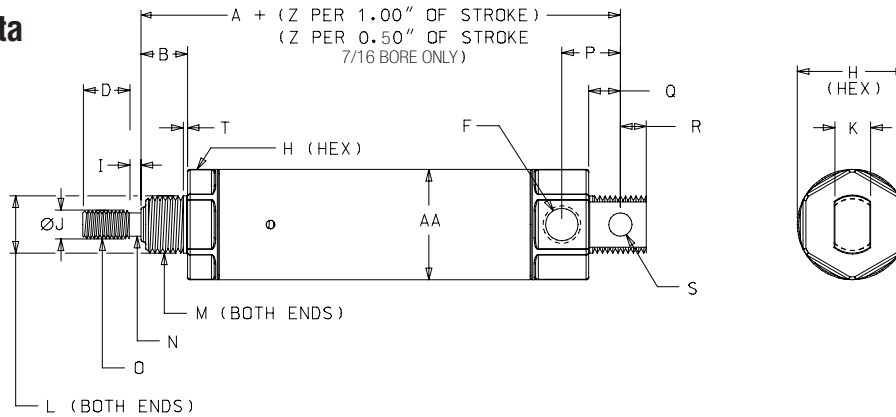
Bore	7/16"(04)	3/4"(07)	1-1/16"(11)	1-1/2"(15)	2"(20)	Bore	7/16"(04)	3/4"(07)	1-1/16"(11)	1-1/2"(15)	2"(20)
A	1.94	2.56	3.13	3.87	-	Q	-	-	-	-	-
B	-	0.25	0.38	-	-	R	-	-	-	-	-
D	0.5	0.75	0.75	1.25	-	S	-	-	-	-	-
E	0.75	1	1.25	1.75	-	T	0.06	0.09	0.09	0.09	-
F	#10-32	1/8 NPT	1/8 NPT	1/8 NPT	-	U	0.44	0.63	0.81	1.69	-
G	0.19	0.19	0.19	0.25	-	V	-	#10-32	#10-32	1/4"	-
I	-	0.25	0.25	0.25	-	W	0.75	1.00	1.25	1.750	-
J	0.19	0.25	0.31	0.44	-	X	#8-32	1/4-20 UNC-2B	1/4-20 UNC-2B	5/16-18 UNC-2B	-
K	0.38	0.63	0.88	0.62	-	Y	0.25	0.38	0.63	0.88	-
L	0.44	0.63	0.75	1	-	Y1	0.69	-	-	-	-
M	-	-	-	-	-	Z	.94 **	1.69	1.81	1.69	-
N	-	0.22	0.25	0.38	-	AA	0.56	0.88	1.19	1.69	-
O	#10-32	1/4-28	5/16-24	7/16-20 UNF-2A	-	BB	#8-32	#10-32	#10-32	-	-
P	-	-	-	-	-						

* - 7/16" Bore Only ** - Per .500" Stroke (7/16" Bore Only)

Pneumatic Cylinders

Premair™ Composite

Dimensional Data



SINGLE ACTING / SPRING RETRACT / PIVOT MOUNT (Maximum Stroke 6")

	Bore 7/16" (04) 9/16" (06) 3/4" (07) 1-1/16" (11) 1-1/4" (14) 1-1/2" (15) 2" (20)							Bore 7/16" (04) 9/16" (06) 3/4" (07) 1-1/16" (11) 1-1/4" (14) 1-1/2" (15) 2" (20)							
A	1.75	1.81	2.28	2.66	3.38	3.12	4.23	N	-	-	-	0.25	0.38	0.38	0.50
B	0.31	0.38	0.5	0.5	0.63	0.63	0.81	O	#10-32	#10-32	1/4-28	5/16-24	7/16-20	7/16-20 UNF-2A	1/2-20 UNF-2A
D	0.5	0.5	0.5	0.5	0.75	0.75	0.88	P	0.44	0.44	0.69	0.63	0.78	0.81	1.03
F	#10-32	#10-32	1/8 NPT	1/8 NPT	1/8 NPT	1/8 NPT	1/4 NPT	Q	0.25	0.25	0.34	0.34	0.41	0.41	0.56
H	0.56	0.69	0.88	1.06	1.25	-	-	R	0.25	0.19	0.28	0.28	0.41	0.38	0.44
I	-	-	-	0.13	0.25	0.25	0.31	S	0.156	0.156	0.25	0.25	0.25	0.375	0.375
J	0.19	0.19	0.25	0.31	0.44	0.44	0.62	T	0.05	0.06	0.09	0.09	0.09	0.09	0.13
K	0.31	0.31	0.38	0.38	0.5	0.62	0.75	Z	0.94**	1.63	1.69	1.56	1.81	1.69	2
L	.433/.437	.433/.437	.621/.624	.621/.624	.746/.749	.746/.749	1.372/1.375	AA	0.56	0.69	0.88	1.19	1.38	1.69	2.23
M	7/16-20	7/16-20	5/8-18	5/8-18	3/4-16	1-12 UNF-2A	1 1/4-12 UNF-2A								

** - Per .500" Stroke (7/16" Bore Only)

Switches (Specifications/Ordering)

Model Number	114406-1	114406-2	114406-3	114407-1	114407-2	114407-3	114416-1	114416-2	114416-3
Lead Length/Type	1m bare	3m bare	Plug	1m bare	3m bare	Plug	1m bare	3m bare	Plug
Lead Color	Gray			Black			Grey		
Switch Type	REED			PNP(SOURCING)			NPN (SINKING)		
Input Voltage	100 Vdc, 120VAC			4.5V-30 Vdc			4.5V-30 Vdc		
Operating Current	5-40mA, Max. 50mA			Max. 50m @30 VDC			Max. 50m @ 30 VDC		
Detecting Distance	2.0 mm			3.0 mm			3.0 mm		
Sensing Area	12mm			5mm			5mm		
Location from Tip									
Detecting Width	-			2.0 mm			2.0 mm		
Response Time	1 mSec. Min.			1 mSec. Min.			1 mSec. Min.		
LED	5mA Min.			Min. 1mA @ 5Vdc (Max. 9mA @ 24 Vdc)					
LED Color	Red			Red			Red		
Protection	Reverse Battery								
Shock Vibration	MIL-STD-810E								
Environmental	IP67 and VL94VO								

NOTE: Plug is 8mm 3 pin PICO Connector

Switch Bracket kit

Kit includes clamp, cradle and stainless steel screw. Switches are designed to nest in cradle, cradle is affixed to cylinder using posilock snap. Switches can be fine adjusted in cradle.

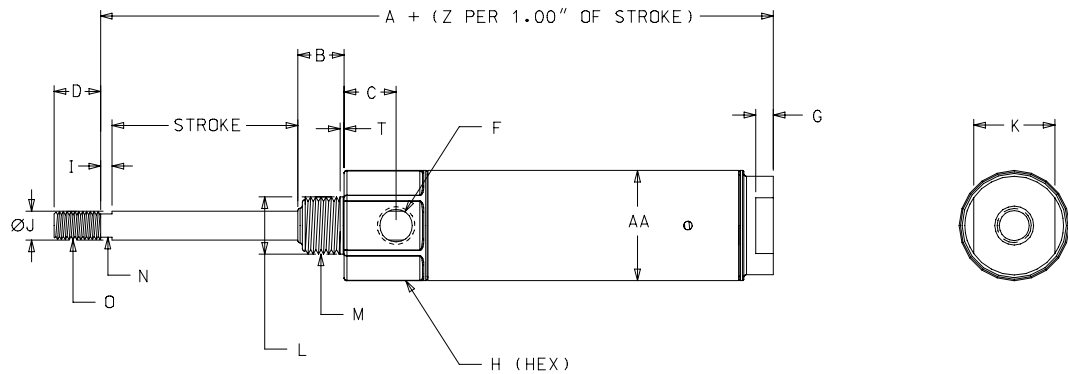
Bore Size	7/16"	9/16"	3/4"	1-1/16"	1-1/4"	1-1/2"	2"
Model No.	114701-043	114701-056	114701-075	114701-106	114701-125	114701-150	114701-200



Pneumatic Cylinders

Premair™ Composite

Dimensional Data



SINGLE ACTING / SPRING EXTEND / NOSE MOUNT (Maximum Stroke 6")

Bore	7/16" (04)	9/16" (06)	3/4" (07)	1-1/16" (11)	1-1/4" (14)	1-1/2" (15)	2" (20)	Bore	7/16" (04)	9/16" (06)	3/4" (07)	1-1/16" (11)	1-1/4" (14)	1-1/2" (15)	2" (20)
A	1.78	2	2.31	2.38	3.31	3.25	4.23	K	0.38	0.5	0.38	0.38	0.5	0.62	0.75
B	0.38	0.38	0.5	0.5	0.63	0.63	0.81	L	.433/.437	.433/.437	.621/.624	.621/.624	.746/.749	.746/.749	1.372/1.375
C	0.34	0.34	0.47	0.56	0.62	0.74	0.74	M	7/16-20	7/16-20	5/8-18	5/8-18	3/4-16	1-12 UNF-2A	1 1/4-12 UNF-2A
D	0.5	0.5	0.5	0.5	0.75	0.75	0.88	N	-	-	-	0.25	0.38	0.38	0.50
F	#10-32	#10-32	1/8 NPT	1/8 NPT	1/8 NPT	1/8 NPT	1/4 NPT	O	#10-32	#10-32	1/4-28	5/16-24	7/16-20	7/16-20 UNF-2A	1/2-20 UNF-2A
G	0.19	0.19	0.19	0.19	0.19	0.25	0.31	T	0.05	0.06	0.09	0.09	0.09	0.09	0.13
H	0.63	0.75	0.94	1.19	1.38	-	-	Z	1.44	1.63	2.69	2.81	2.81	2.69	3.00
I	-	-	-	0.13	0.25	0.25	0.31	AA	0.56	0.69	0.88	1.19	1.38	1.69	2.23
J	0.19	0.19	0.25	0.31	0.44	0.44	0.62								

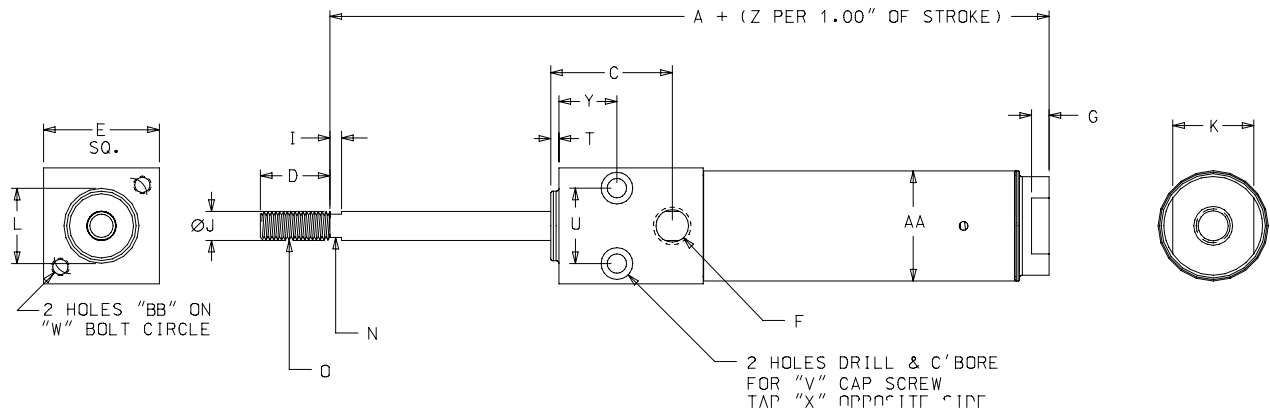
Spring Forces

Bore Size	Relaxed (lbs.)	Compressed (lbs.)
5/16"	.5	1
7/16"	1	2
9/16"	2	4
3/4"	3	6
7/8"	3	6
1-1/16"	3	6
1-1/4"	7.5	15
1-1/2"	7	14
1-3/4"	11	24
2"	15	30

Pneumatic Cylinders

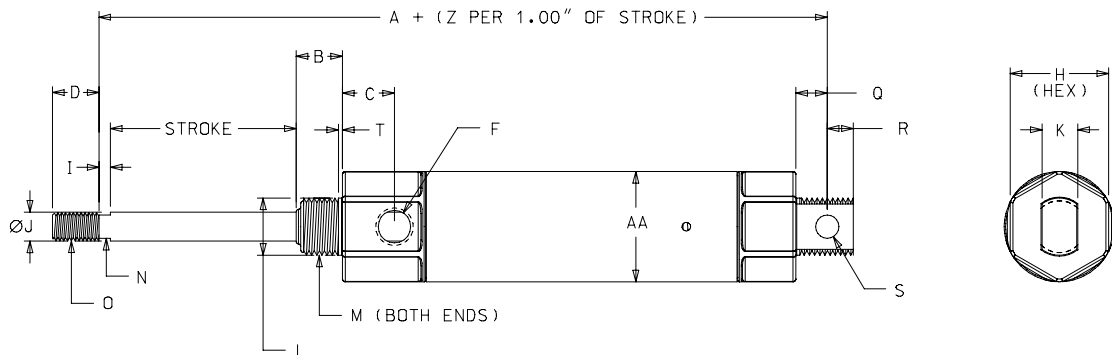
Premair™ Composite

Dimensional Data



SINGLE ACTING / SPRING EXTEND / BLOCK MOUNT (Maximum Stroke 6")

Bore	3/4" (07)	1-1/16" (11)	1-1/2" (15)	Bore	3/4" (07)	1-1/16" (11)	1-1/2" (15)
A	2.56	3.13	3.87	O	1/4-28	5/16-24	7/16-20 UNF-2A
C	0.88	1.16	1.91	T	0.09	0.09	0.09
D	0.75	0.75	1.25	U	0.63	0.81	1.69
E	1	1.25	1.75	V	#10-32	#10-32	1/4"
F	1/8 NPT	1/8 NPT	1/4 NPT	W	1	1.25	1.750
G	0.19	0.19	0.25	X	1/4-20 UNC-2B	1/4-20 UNC-2B	5/16-18 UNC-2B
I	0.13	0.13	0.25	Y	0.38	0.63	0.88
J	0.25	0.31	0.44	Z	2.69	2.81	2.69
K	0.63	0.88	0.62	AA	0.94	1.19	1.69
L	0.625	0.75	1	BB	#10-32	#10-32	
N	0.22	0.25	0.38				



SINGLE ACTING / SPRING EXTEND / PIVOT MOUNT (Maximum Stroke 6")

Bore	7/16" (04)	9/16" (06)	3/4" (07)	1-1/16" (11)	1-1/4" (14)	1-1/2" (15)	2" (20)	Bore	7/16" (04)	9/16" (06)	3/4" (07)	1-1/16" (11)	1-1/4" (14)	1-1/2" (15)	2" (20)
A	2.22	2.31	2.44	2.66	3.78	3.94	5.17	M	7/16-20	7/16-20	5/8-18	5/8-18	3/4-16	1-12 UNF-2A	1 1/4-12 UNF-2A
B	0.38	0.38	0.5	0.5	0.63	0.63	0.81	N	-	-	-	0.25	0.38	0.38	0.50
C	0.34	0.34	0.47	0.56	0.62	0.74	0.74	O	#10-32	#10-32	1/4-28	5/16-24	7/16-20	7/16-20 UNF-2A	1/2-20 UNF-2A
D	0.5	0.5	0.5	0.5	0.75	0.75	0.88	Q	0.25	0.25	0.34	0.34	0.41	0.41	0.56
F	#10-32	#10-32	1/8 NPT	1/8 NPT	1/8 NPT	1/8 NPT	1/4 NPT	R	0.25	0.25	0.28	0.28	0.41	0.38	0.44
H	0.56	0.69	0.88	1.06	1.25	-	-	S	0.16	0.16	0.25	0.25	0.25	0.375	0.375
I	-	-	-	0.13	0.25	0.25	0.31	T	0.05	0.06	0.09	0.09	0.09	0.09	0.13
J	0.19	0.19	0.25	0.31	0.44	0.44	0.62	Z	1.44	2.63	2.69	2.81	2.81	2.69	3.00
K	0.31	0.31	0.38	0.38	0.5	0.62	0.75	AA	0.56	0.69	0.88	1.19	1.38	1.69	2.23
L	.433/.437	.433/.437	.621/.624	.621/.624	.746/.749	.746/.749	1.372/1.375								

Features

Series 23, 24, & 28

Economair round cylinders are medium to heavy-duty units that can be installed anywhere that a repairable cylinder is desired. Prelubed, they're suitable for operation without externally applied lubrication. Unique endcap retention design provides a concentric assembly, resulting in a service life superior to tie rod cylinder construction.

- Cylinder heads are high tensile strength aluminum alloy, retained by a feed ring wire, a simple design that eliminates excess cylinder weight and bulk.
- The barrel I.D. is hard-coated aluminum with a Rockwell C60 hardness. A finish of 16 microinches or better insures low friction and smooth operation.
- Piston rod is ground and polished, hard-chrome plated steel for minimum friction and maximum packing life. Optional 303 stainless steel is excellent for corrosion resistance and washdown applications (303 stainless steel is standard on 1-1/8-inch bore cylinders).
- Adjustable cushions provide excellent control of cylinder deceleration. Full range adjustability (except fixed cushions on 1-1/8-inch bore).
- High grade, self-lubricating bronze rod bearing reduces friction and promotes smooth operation.
- Piston seal selection insures job-matched performance - Buna N O-ring, Low Friction U-cup and self-lubricating packings available.
- Wear compensating rod wiper protects internal seals and parts from dirt, grit and debris.
- NPTF dry seal pipe threads on ports.
- Optional self-lubricating U-cup seals reduce drag and promote extra cylinder life.
- Cylinder is repairable so instead of buying complete new units, repair kits can be used.



Performance Specifications

Bore Sizes:	1-1/8", 1-1/2", 2", 2-1/2", 3" and 4"
Maximum Output Force:	2,513 pounds (4-inch bore).
Air Pressure:	To 200 p.s.i. (14 bar). May be operated hydraulically (200 p.s.i., nonshock).
Operating Temperature Range:	0° to 180° F (-18° to 82° C).
Seals:	Viton seals available for high heat applications. Consult factory.
Notes:	Wide range of mounting styles and attachable mounting hardware/ accessories allows cylinders to be applied in nearly any pneumatic application.



U-cup and Magnetic Piston Options

Pneumatic Cylinders

Economair®

Ordering

Series 23, 24, & 28

Include dashes (-). The dashes are significant.

2X **XX** - **X** **X** **X9** - **XXX**

(1" Increments, 1" through 10" plus 1 1/2", 2 1/2" and 3 1/2")

SERIES NO.

- 23** Noncushioned
- 24** Cushioned, Both Ends
- 28** Magnetic Piston, Cushioned Both Ends

NOTE: 1-1/8 inch bore not available

BORE SIZE

- 18** 1-1/8 in
- 15** 1-1/2 in
- 20** 2 in
- 25** 2-1/2 in
- 30** 3 in
- 40** 4 in

CYLINDER TYPE

- 1** Double Acting, Rear Tang
- 5** Double Acting, No Rear Tang
- 2** Double Acting, Double Rod

NOTE: Not Available in Series 28

Economair mounts must be ordered separately, see below.

STROKE LENGTH

WHOLE INCHES	FRACTIONS
00 = 0 in	0 = 0 in
01 = 1 in	1 = 1/8 in
02 = 2 in	2 = 1/4 in
03 = 3 in	3 = 3/8 in
04 = 4 in	4 = 1/2 in
05 = 5 in	5 = 5/8 in
06 = 6 in	6 = 3/4 in
◇ ◇	7 = 7/8 in
to to	
99 99 in	

OPTIONS

- 09** Standard Rod
- 89** 303 Stainless Steel Rod — Standard on 1-1/8" bore cylinder.

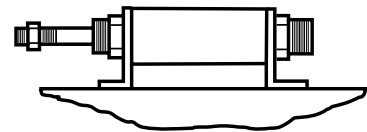
PACKING

- 0** O-Ring, Nitrile
 - 2** O-Ring, Low Friction
 - 3** O-Ring, Viton
 - 4** Lip, Nitrile (pneumatic)
 - 5** Lip, Self-Lubricating (low friction)
 - 6** Lip, Viton
- Not available in Series 28
- These packings add one inch to cylinder length.
Vitons not available in Series 28

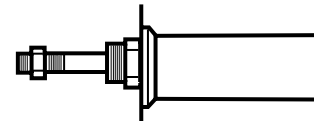
Note: Highlighted selections denote most popular models.

Mounts

	Cylinder Bore (Inches)					
	1-1/8	1-1/2	2	2-1/2	3	4
L-Mount (2 qty.)	20533	20534	20534	20535	20535	20536
Flange Mount	20537	20538	20538	20539	20539	20540
Clevis Bracket	20546	20547	20547	20548	20548	20549
Mounting Nut (2 qty.)	20529	20530	20530	20531	20531	20532
Trunnion	20524	20556	20557	20558	20559	20560
Aluminum Rod Clevis	—	20542	20543	20544	20544	20545
Steel Rod Clevis	20541	115906	115907	115908	115908	115909



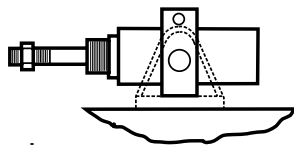
L-Mount



Flange Mount



Mounting Nut



Trunnion



Rod Clevis & Clevis Bracket

Note: Order cylinder, rod clevis and clevis bracket separately.
Every Economair Cylinder includes rod nut.
Trunnion Mount does not include pillow block.

Pneumatic Cylinders

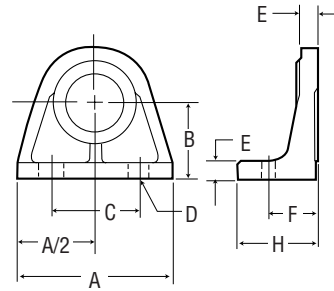
Economair® - Dimensional Data

Dimensional Data

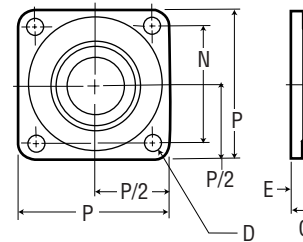
Series 23, 24, & 28

Reference	Cylinder Bore (Inches)					
	1-1/8	1-1/2	2	2-1/2	3	4
Rod dia.	0.38	0.50	0.63	0.75	0.75	1.00
A	1.625	3.00	3.00	4.00	4.00	5.00
B	1.281	1.50	1.50	2.00	2.00	2.625
C	1.00	1.688	1.688	2.25	2.25	3.00
D-dia.*	.250	.250	.250	.375	.375	.438
E	.250	.313	.313	.375	.375	.438
F	.625	.906	.906	1.219	1.219	1.469
G	.375	.500	.500	.625	.625	.750
H	1.00	1.531	1.531	2.094	2.094	2.531
J	.750	1.00	1.00	1.25	1.25	1.188
K	.375	.469	.469	.781	.781	.781
L-HEX	1.0625	1.438	1.438	2.0625	2.0625	2.50
M-dia.	1.25	1.75	1.75	2.438	2.438	2.938
N	2.00	2.50	2.50	3.375	3.375	4.00
P	2.50	3.25	3.25	4.50	4.50	5.188
Q	.688	.594	.594	.719	.719	.844
R	1.219	1.750	1.750	2.375	2.375	3.00
S	.313	.313	.313	.375	.375	.438
T	2.250	3.00	3.00	4.00	4.00	5.00
U	1.75	2.25	2.25	3.00	3.00	3.75
V	1.75	2.25	2.25	2.688	2.688	3.375
W	1.406	1.75	1.75	2.0625	2.0625	2.625
X	.750	1.00	1.00	1.25	1.25	1.50
Y-dia.*	.250	.3125	.3125	.438	.4375	.625
Z	.656	.688	.688	.875	.875	1.063
ZZ	.3125	.375	.375	.500	.500	.625
TA	3.125	4.125	4.125	5.375	5.625	7.125
TB	2.25	3.00	3.00	3.75	4.25	5.50
TC-dia.	.438	.500	.500	.750	.750	.750
TD	2.00	2.625	3.125	4.00	4.50	5.75
TE	.875	1.125	1.375	1.875	2.125	2.688
TF	.750	1.250	1.250	1.50	1.50	1.50
TG-dia.*	.250	.3125	.3125	.4375	.4375	.500
TH-Thd.	3/8-16	1/2-13	5/8-11	3/4-10	3/4-10	1-8
TK	-	2.0625	2.0625	2.50	2.50	3.25
TL	-	.875	.875	1.00	1.00	1.325
TM	-	1.0625	1.0625	1.438	1.438	1.938
TN	-	1.813	1.00	1.813	1.813	1.50

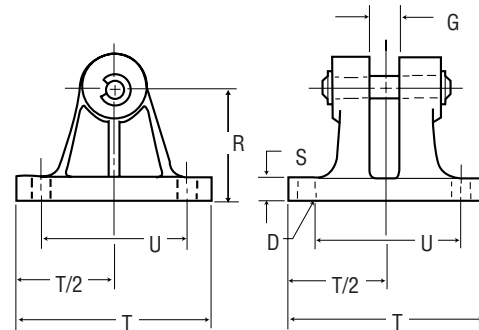
*Bolt or pin diameter



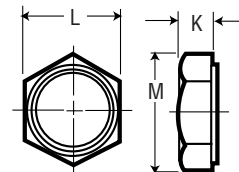
L-Type



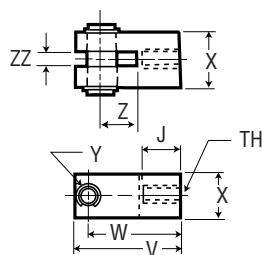
Flange



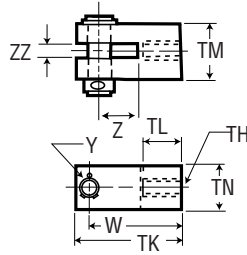
Clevis Bracket



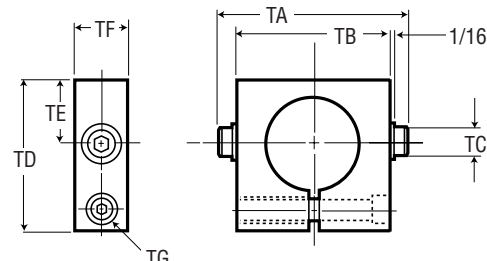
Mounting Nut



Steel Rod Clevis



Aluminum Rod Clevis



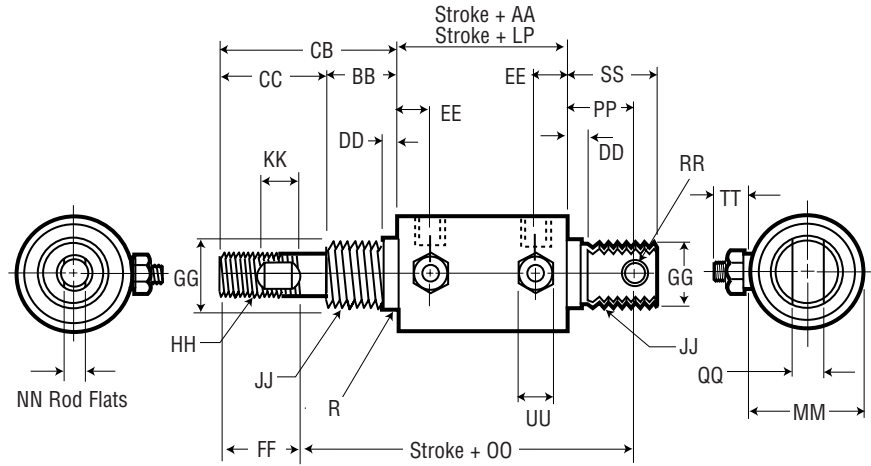
Trunnion

Pneumatic Cylinders

Economair® - Dimensional Data

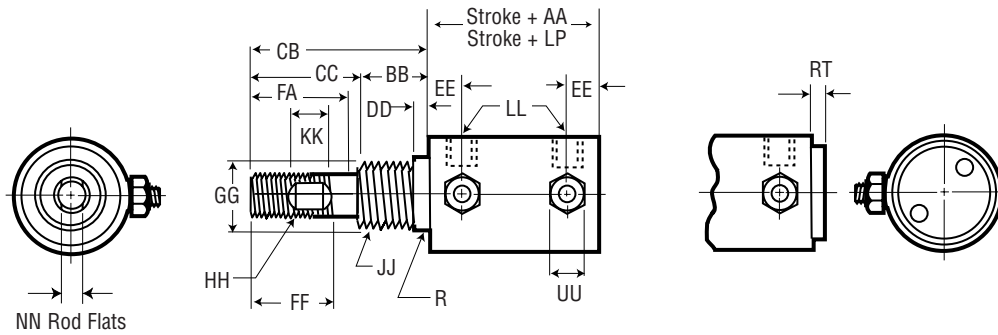
Dimensional Data

Series 23, 24, & 28 (Double Acting with Tang)



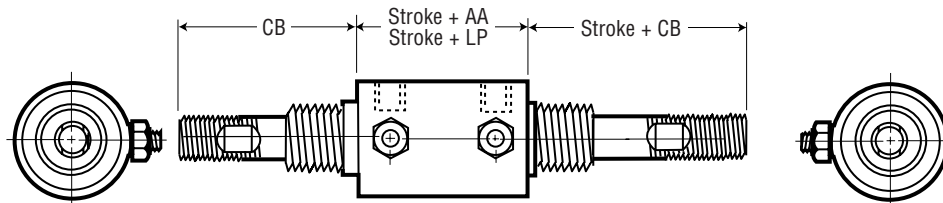
AA = Double acting with O-ring or low friction packing.
 LP = Double acting with U cup packing.

(Double Acting, No Tang)



AA = Double acting with O-ring or low friction packing.
 LP = Double acting with U cup packing.

(Double Acting, Double Ended)



Pneumatic Cylinders

Economair® - Dimensional Data

Dimensional Data

Series 23, 24, & 28

Dimensional Reference	Cylinder Bore (Inches)					
	1-1/8	1-1/2	2	2-1/2	3	4
Rod Diameter	.38	.50	.63	.75	.75	1.00
Stroke Factor AA*	2.031	2.625	2.625	2.875	2.875	4.00
Stroke Factor LP**	3.031	3.625	3.625	3.875	3.875	5.00
BB	.750	1.00	1.00	1.250	1.250	1.250
CB	1.750	2.438	2.438	2.938	2.938	3.500
CC	1.00	1.438	1.438	1.688	1.688	2.250
DD	.125	.219	.219	.344	.344	.406
EE	.422	.516	.516	.563	.563	.813
FA	.781	1.156	1.156	1.375	1.375	1.750
FF▲	.875	1.250	1.250	1.50	1.50	1.875
(± .002) GG	.748	1.057	1.057	1.432	1.432	1.777
(UNC-2A) HH	3/8-16	1/2-13	5/8-11	3/4-10	3/4-10	1-8
JJ	3/4-16	1-1/16-18	1-1/16-18	1-3/8-12	1-3/8-12	1-3/4-12
	UNF-2A	UNEF-2A	UNEF-2A	UNF-2A	UNF-2A	UN-2A
KK	.313	.500	.500	.500	.500	.500
(NPTF) LL	1/8-27	1/4-18	1/4-18	3/8-18	3/8-18	1/2-14
MM	1.375	1.750	2.250	2.750	3.250	4.250
NN	.313	.406	.500	.625	.625	.875
OO	3.594	4.688	4.688	5.688	5.688	7.063
PP	.688	.875	.875	1.375	1.375	1.438
QQ	.375	.500	.500	.625	.625	.750
(RAD.) R	.016	.016	.016	.094	.094	.094
RR	.250	.313	.313	.438	.438	.500
RT	–	.172	–	.438	.438	.438
SS	.969	1.25	1.25	2.00	2.00	2.188
TT	–	.438	.438	.438	.438	.438
UU	–	.500	.500	.500	.625	.625

* Double acting with O-ring or low friction packing

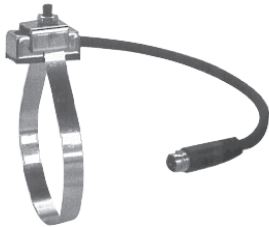
** Double acting with U-cup packing

▲ FF shows total thread, including run out.

Switches (Specifications / Ordering)

Switch

Model Number	119581-1	119581-2	119581-3	119582-1	119582-2	119582-3	119583-1	119583-2	119583-3
Lead Length/Type	1m bare	3m bare	Plug	1m bare	3m bare	Plug	1m bare	3m bare	Plug
Lead Color	Black			Grey			Black		
Switch Type	REED			PNP(SOURCING)			NPN (SINKING)		
Input Voltage	100 VDC, 125 VAC Max.			10 - 30 VDC			5 - 30 VDC		
	-			-			5 - 100mA @ 5V		
Operating Current	300mA (150mA Inductive)			7 - 100mA @ 12V			10 - 200mA @ 12V		
	-			14 - 200mA @ 24V			20 - 200mA @ 24V		
Detecting Distance	2.5 mm			1.5 mm			1.5 mm		
Detecting Width	-			3.0 mm			3.0 mm		
Response Time	1 mSec. Min.			-			-		
LED Function	18mA Min.			1mA Min.			1mA Min.		

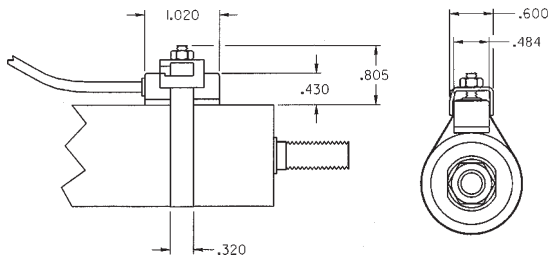


Switch Mounting Brackets

Bore	Model Number
1-1/8"	119897-18
1-1/2"	119897-15
2"	119897-20
2-1/2"	119897-25
3"	119897-30
4"	119897-40

Note: Order bracket and switch separately.

(Switch Bracket)



Technical Information:

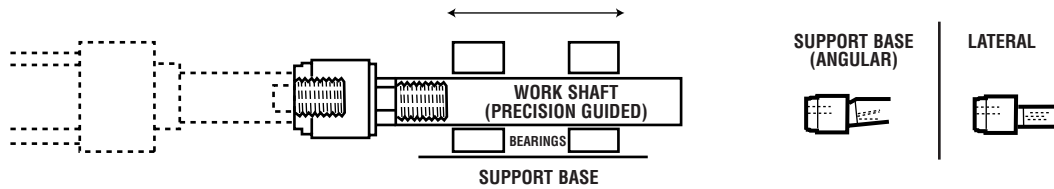
1. Do not exceed specification, permanent damage to the sensor may occur.
2. For reed switch type sensors, polarity must be observed for the proper functioning of LED. Connect the brown wire in series with load positive (+) and the blue wire to negative (-) or power source space. If the polarity is reversed, reed switch remains functional but LED will remain in "OFF" state.
3. For solid-state type sensors, polarity must also be observed. Connect brown wire to the positive (+) and the blue to the negative (-) of DC power source. The black wire must connect to the load ONLY. If the black wire is accidentally connected to the power source, permanent damage to the sensor may occur.
4. An external protection circuit may be required if the reed switch is used with inductive load, such as relay or solenoid. For DC inductive load, attach an external diode parallel to the load and use R-C circuit parallel with AC inductive load.
5. Keep sensors away from stray magnetic field to prevent malfunctions.
6. When using reed switch with capacitive load or if the lead wire length exceeds 10-meter, and inductor must be installed in series with the sensor to prevent damage (Sticking effect).

Pneumatic Cylinders

Rod Alignment Cylinders

Features

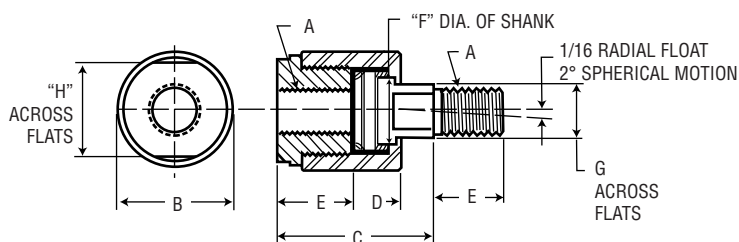
- Slide applications no longer require costly precision cylinder machining for mounting fixed or rigid guide.
- Friction due to misalignment is eliminated, increasing cylinder efficiency.
- An angular error of 2° and 1/16 inch lateral misalignment on push and pull stroke is compensated.
- Cylinder and component wear is reduced, providing increased reliability.
- Field alignment problems are rectified.
- All components are heat treated for improved corrosion resistance, wear resistance, and fatigue properties.



Ordering

Coupler Number	Dimensions								Max. Pull At Yields (Pounds)
	A	B	C	D	E	F	G	H	
118683	3/8-16	.875	1.25	.25	.625	.313	.313	.75	5,000
118684	7/16-20	1.25	2.00	.50	.75	.625	.50	1.00	10,000
118685	1/2-20	1.25	2.00	.50	.75	.625	.50	1.00	14,000
118686	1/2-13	1.25	2.00	.50	.75	.625	.50	1.00	14,000
118687	5/8-18	1.25	2.00	.50	.75	.625	.50	1.00	19,000
118688	3/4-16	1.75	2.31	.50	1.125	.97	.813	1.50	34,000
118689	3/4-10	1.75	2.31	.50	1.125	.97	.813	1.50	34,000
118690	7/8-14	1.75	2.31	.50	1.125	.97	.813	1.50	39,000
118691	1-14	2.50	2.94	.50	1.625	1.375	1.16	2.25	64,000
118692	1-8	2.50	2.94	.50	1.625	1.375	1.16	2.25	64,000
118693	1-1/4-12	2.50	2.94	.50	1.625	1.375	1.16	2.25	78,000
118694	1-3/8-12	2.50	2.94	.50	1.625	1.375	1.16	2.25	78,000
118695	1-1/2-12	3.25	4.375	.812	2.25	1.375	1.50	3.00	134,000

Dimensional Data



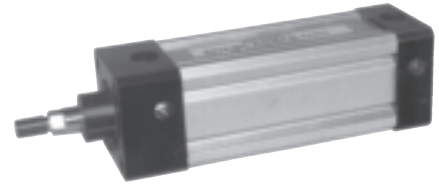
Provenair®...

The Most Flexible Cylinder for New or Retrofit Designs

Your best creations are only as good as their parts. Ensure performance to your customer's expectations by including ARO Provenair Cylinders in your original specifications. They are precision built using the latest extrusion technologies and feature a profiled barrel that is not only good looking, but eliminates cumbersome and dirt-catching tie rods. At the same time, the profiled barrel provides superior strength compared to traditional tie rod constructed cylinders. Provenair end caps, mounts, and rod end accessories - even our position sensor brackets, are protected against corrosion. To maximize cycle life, every Provenair has a factory-installed Teflon® wearband on the piston. A "Floating" rod bushing provides smooth strokes and maximized wear; reduced galling compared to bronze bushings.

Maintenance and repair of ARO Provenair Cylinders is very simple and fast. The rod bushing is retained by a stainless steel spiro retaining ring and is easily removed with a small screwdriver. The retaining ring slides off the rod along with the bushing and its captive seals. There are no small screws to lose on the floor or under your machine, and no seals to fall inside the cylinder. Replacement of the reciprocating assembly and its seals is equally simple and, unlike tie rod cylinders, you needn't worry about equalizing torque on the Provenair tie bolts!

Provenair is flexible, you can change it to fit most of your application requirements. Factory installed mounts save you time, but you may easily change your Provenair Cylinder mount



with an ARO mounting kit. If you require an oversized rod diameter, Provenair converts easily - right on your machine! Simply specify the piston rod diameter, thread style, and material (chrome steel or stainless steel) when ordering the replacement reciprocating assembly; order a rod bushing for the new piston rod diameter and you're ready to install. Your original Provenair now needs a magnetic piston? Order a magnet and easily install it and you can select from three types of attachable position sensors.

- Tie bolt construction eliminates rod binding and tie rod torque problems. (Series AN up to 4" bore)
- Series SN all stainless steel cylinders are corrosion resistant and have tie rods.
- Rugged thick walled tubes resist denting.
- NFPA repairable and interchangeable.
- 15 NFPA mounting styles.
- Factory lubricated grease that won't wash out.
- Optional 303 S.S. piston rods provide corrosion resistance. (STD. Series SN)
- Optional oversized rods available to provide extra column strength. (Series AN and SN)
- Optional slippery seals enhance smooth operation and are self-lubricating.
- Available in 1-1/2", 2", 2-1/2", 3-1/4" and 4" bore sizes with extruded barrel (as shown). (Series AN)
- Larger bore sizes 5", 6", 8" and 10" bores have prestressed steel tie rods. (Series AN)
- Series SN, all stainless steel cylinders available in 1-1/2, 2, 2-1/2, 3-1/4, 4, 5, 6 and 8" bores.
- SN series cylinders have S.S. tie rods.
- Operates on air pressure up to 250 p.s.i.
- Output forces up to 19,635 lbs. (10" bore at 250 p.s.i.).
- Std. operating temp: 0° to 185°(F), -18° to 82° (C).
- Rotated ports are optional.
- Viton seals for high heat applications (up to 300° F, 149° C)

Performance Specifications

Aluminum NFPA Interchangeable	
Bore sizes:	1-1/2", 2", 2-1/2", 3-1/4", 4", 5", 6", 8" and 10"
Seals:	Buna-N, Viton or Slippery (Aluminum alloy piston with lip-type seals)
Barrel:	Profiled Extrusion (5", 6", 8" and 10" have tie rods.) (Patented)
Bushings:	"Floating" Rod bushings for low friction, superior wear and side load resistance
Switches:	Metal Jacketed
Piston Rods:	Chrome plated ground and polished high tensile steel
Options:	Optional Piston Magnet Double Rod End 303 S.S. Piston Rods Studded male rods for 50% stronger threads than cold rolled thread rod ends
Stainless Steel NFPA Interchangeable	
Bore sizes:	1-1/2", 2", 2-1/2", 3-1/4", 4", 5", 6", and 8"
Rod Bushing:	Bronze
Rod Wiper:	Teflon®
External Components:	303/304 – End caps, tie rods, piston rods, mounts (barrel is 316)
Mounting Styles:	15 NFPA
Options:	Optional adjustable cushions Piston Magnet Viton Seals (Wiper Teflon) Double rod ends

"GripRidge" gives a better bracket fastening surface. Brackets and switches stay-put.



Retained cushion adjustment needles

Lightweight aluminum body resists dents.

End caps and mounts resist common coolants, cleaners, lubricants and corrosion.

Ordering

Series AN (1-1/2' thru 10" Bore)

Aluminum NFPA

Include dashes (-). Dashes are significant.

A N X X X - X X X X X - X X X

ACTUATORS

Aluminum actuators begin with A

SERIES (NFPA)

All Provenair Cylinders are Series N

TYPE

- A** Double Acting, Single Rod
- B** Double Acting, Double Rod

BORE SIZE

Note: 5", 6", 8" & 10" bores have tie rods.

Q 1- 1/2"	W 3-1/4"	6 6"
S 2"	4 4"	8 8"
T 2- 1/2"	5 5"	Y 10"

ROD DIAMETER

- K** 5/8" **Note:** Available in 1-1/2", 2" and 2-1/2" bores only.
- M** 1" **Note:** Available in 2", 2-1/2", 3-1/4", 4" and 5" bores only.
- P** 1 3/8" **Note:** Available in 3-1/4", 4", 5", 6" and 8" bores only.
- Q** 1 3/4" **Note:** Available in 6", 8" and 10" bores only.
- S** 2" **Note:** Available in 10" bores only.

ROD STYLE

A Chrome, Std Male (KK ₁)	K S.S., Female (KK ₁)
B Chrome, Intermed. Male(KK ₂)	L S.S., No Threads
C Chrome, Full Male (CC)	1 KK ₁ Chrome, Studded
D Chrome, Female (KK ₁)	2 KK ₂ Chrome, Studded
F Chrome, No Threads	3 CC Chrome, Studded
G S.S., Standard Male (KK ₁)	4 KK ₁ SS, Studded
H S.S., Intermediate Male (KK ₂)	5 KK ₂ SS, Studded
J S.S., Full Male (CC)	6 CC SS, Studded

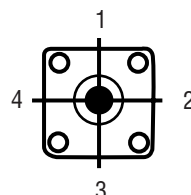
SEALS

B Buna-N	G Buna-N + Magnetic Piston
V Viton	H Viton + Magnetic Piston
S Slippery	J Slippery + Magnetic Piston

CUSHIONS

X No Cushions	H Cushion Head End (Rod End)
B Cushion Both Ends	C Cushion Cap End

Note: Highlighted selections denotes most popular models.



Determine port location looking at rod end of cylinder.

STROKE

Whole Inches

00 = 0 in	0 = 0 in
01 = 1 in	1 = 1/8 in
02 = 2 in	2 = 1/4 in
03 = 3 in	3 = 3/8 in
04 = 4 in	4 = 1/2 in
05 = 5 in	5 = 5/8 in
06 = 6 in	6 = 3/4 in
07 = 7 in	7 = 7/8 in
08 = 8 in	
09 = 9 in	
10 = 10 in	
11 = 11 in	
12 = 12 in	
13 = 13 in	
14 = 14 in	
15 = 15 in	
16 = 16 in	
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86 = 86 in	
87 = 87 in	
88 = 88 in	
89 = 89 in	
90 = 90 in	
91 = 91 in	
92 = 92 in	
93 = 93 in	
94 = 94 in	
95 = 95 in	
96 = 96 in	
97 = 97 in	
98 = 98 in	
99 = 99 in	

Note:

Maximum stroke 99 7/8", for longer strokes consult factory. Stroke lengths 20" and longer may require stop tubes, see page 7.

MOUNT

(8" and 10" Bore ME3, ME4)
(Mounts must be factory installed on 5", 6", 8" and 10" Bore)

A MS1	P MT1
B MS4**	Q MX1
C MP1**	T MX2
D MP2**	U MX3
F MF1/ME3**	X No Mount
H MF2/ME4**	1 FMB*
K MP4*	2 FMC*
L MS7*	3 FMH*
M MT2	4 FMB/MS4*

All mounts available through 8" Bore except:

* 1 1/2" - 4" Bore Only

** Available 1 1/2" - 10" Bore

PORT LOCATION

(MS4 mounts: Port locations other than "A", call factory. Trunnion mounts: ports "A" or "C" only.)

A H1, C1 (Std.)	F H2, C1
B H1, C2	G H2, C2
C H1, C3	H H2, C3
D H1, C4	J H2, C4

Ordering

Series SN (1-1/2' thru 8" Bore)

NOTE: All SN Series Cylinders have tie rods.

Stainless Steel NFPA

Include dashes (-). Dashes are significant.

S N X X X - X X X X X - X X X

ACTUATORS

Stainless Steel actuators begin with S

SERIES (NFPA)

All Provenair Cylinders are Series N

TYPE

- A** Double Acting, Single Rod
- B** Double Acting, Double Rod **Note:** Not available in 8" bore.

BORE SIZE

Q 1- 1/2"	W 3-1/4"	6 6"
S 2"	4 4"	8 8"
T 2- 1/2"	5 5"	

ROD DIAMETER

- K** 5/8" **Note:** Available in 1-1/2", 2" and 2-1/2" bores only.
- M** 1" **Note:** Available in 2", 2-1/2", 3-1/4", 4" and 5" bores only.
- P** 1 3/8" **Note:** Available in 3-1/4", 4", 5", 6" and 8" bores only.
- Q** 1 3/4" **Note:** Available in 6" and 8" bores only.

ROD STYLE

- G** S.S., Standard Male (KK₁)
- H** S.S., Intermediate Male (KK₂)
- J** S.S., Full Male (CC)
- K** S.S., Female (KK₁)
- L** S.S., No Threads

SEALS

- B** Buna-N
- V** Viton
- S** Slippery
- G** Buna-N + Magnetic Piston **Note:** Teflon Wiper Std.
- H** Viton + Magnetic Piston
- J** Slippery + Magnetic Piston

CUSHIONS

- X** No Cushions
- B** Cushion Both Ends
- H** Cushion Head End (Rod End)
- C** Cushion Cap End

STROKE

Whole Inches

00 = 0 in	0 = 0 in
01 = 1 in	1 = 1/8 in
02 = 2 in	2 = 1/4 in
03 = 3 in	3 = 3/8 in
04 = 4 in	4 = 1/2 in
05 = 5 in	5 = 5/8 in
06 = 6 in	6 = 3/4 in
↑	7 = 7/8 in
to	
99 = 99 in	

Note:
Maximum stroke 99 7/8", for longer strokes consult factory. Stroke lengths 20" and longer may require stop tubes, see page 7.

MOUNT

(8" Bore ME3, ME4)
(Mounts must be factory installed.)

- B** MS4**
- C** MP1**
- F** MF1/ME3**
- H** MF2/ME4**
- K** MP4*
- M** MT2
- P** MT1
- Q** MX1
- T** MX2
- U** MX3
- X** No Mount

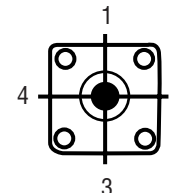
* 1 1/2" - 6" Bore Only
** 1 1/2" - 4" Bore Only

PORT LOCATION

(MS4 mounts: Port locations other than "A", call factory. Trunnion mounts: ports "A" or "C" only.)

- A** H1, C1 (Std.)
- B** H1, C2
- C** H1, C3
- D** H1, C4
- F** H2, C1
- G** H2, C2
- H** H2, C3
- J** H2, C4

NOTE: S.S. Cylinders are made to order, contact factory for lead time.



Determine port location looking at rod end of cylinder.

Attachable Mounting Kits for Series AN

Series AN (1-1/2" Thru 4" Bore)

Mounting Kits with Long Screws

Mount styles B (MS4) and X (No mounts) use mounting kits with long screws to attach through cap into barrel of cylinders.

	1 1/2"	2"	2 1/2"	3 1/4"	4"
MS7 Side End Lugs (Steel)	119618	119619	119620	119621	119622
MF1 Rect. Flange (Steel)	119633	119634	119635	119636	119637
MF2 Rect. Flange (Steel)	119646	119647	119648	119649	119650
MP2 HD Clevis (Iron) *	119623	119624	119625	119626	119627
MP4 HD Eye (Iron)	119628	119629	119630	119631	119632
MS2 Side Lugs (Alum.)	119638	119639	119640	119641	119642
MP1 Fixed Clevis (Alum.) *	119796	119797	119798	119799	119800



Mounting Kits with Short Screws

Mount styles 1 (FMB), 2 (FMC) and 3 (FMH) use mounting kits with short screws to attach to female sleeve bolts.

	1 1/2"	2"	2 1/2"	3 1/4"	4"
MS7 Side End Lugs (Steel)	115277	115278	115279	115280	115281
MP2 HD Clevis (Iron) *	118696	118697	118698	118699	118700
MP4 HD Eye (Iron)	118701	118702	118703	118704	118705
MF1, MF2 Flange (Steel)	115282	115283	115284	115285	115286
MP1 Fixed Clevis (Alum.) *	115477	115478		115480	115481
MP2 Det. Clevis (Alum.) *	115287	115288	115289	115290	115291
MP4 Det. Clevis (Alum.) *	115292	115293	115294	115295	115296
MT1 Head Trunnion (Alum.)	116357	116358			116361
MT2 Head Trunnion (Alum.)	116357	116358			116361



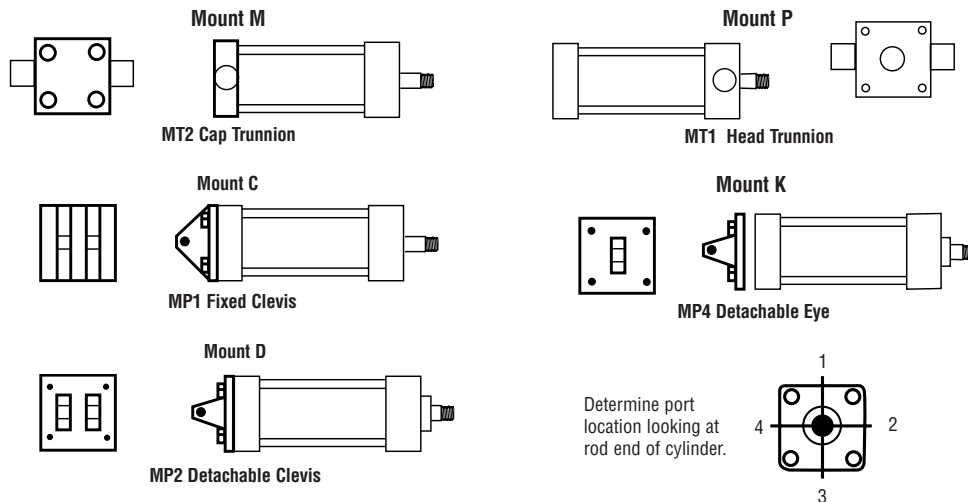
Above kits Include all necessary hardware to complete mounting to Provenair cylinders. AN Series only.

*Pivot pin included in kit. (Kits not available for 5", 6", 8", or 10" Bores) (Kits not available for SN Models)

MX1, 2 or 3 Tie Rod Extensions 117822-1 117822-2 117822-2 117822-3 117822-3

MX1 requires two tie rod extension bolt kits (four extension studs per kit). Extension bolts can only be used in female retaining bolt mounts: Use mounts 1, 2, 3 or contact factory for conversion kits.

Factory Installed Mounts



Note: Not all mounts are available on stainless steel models.

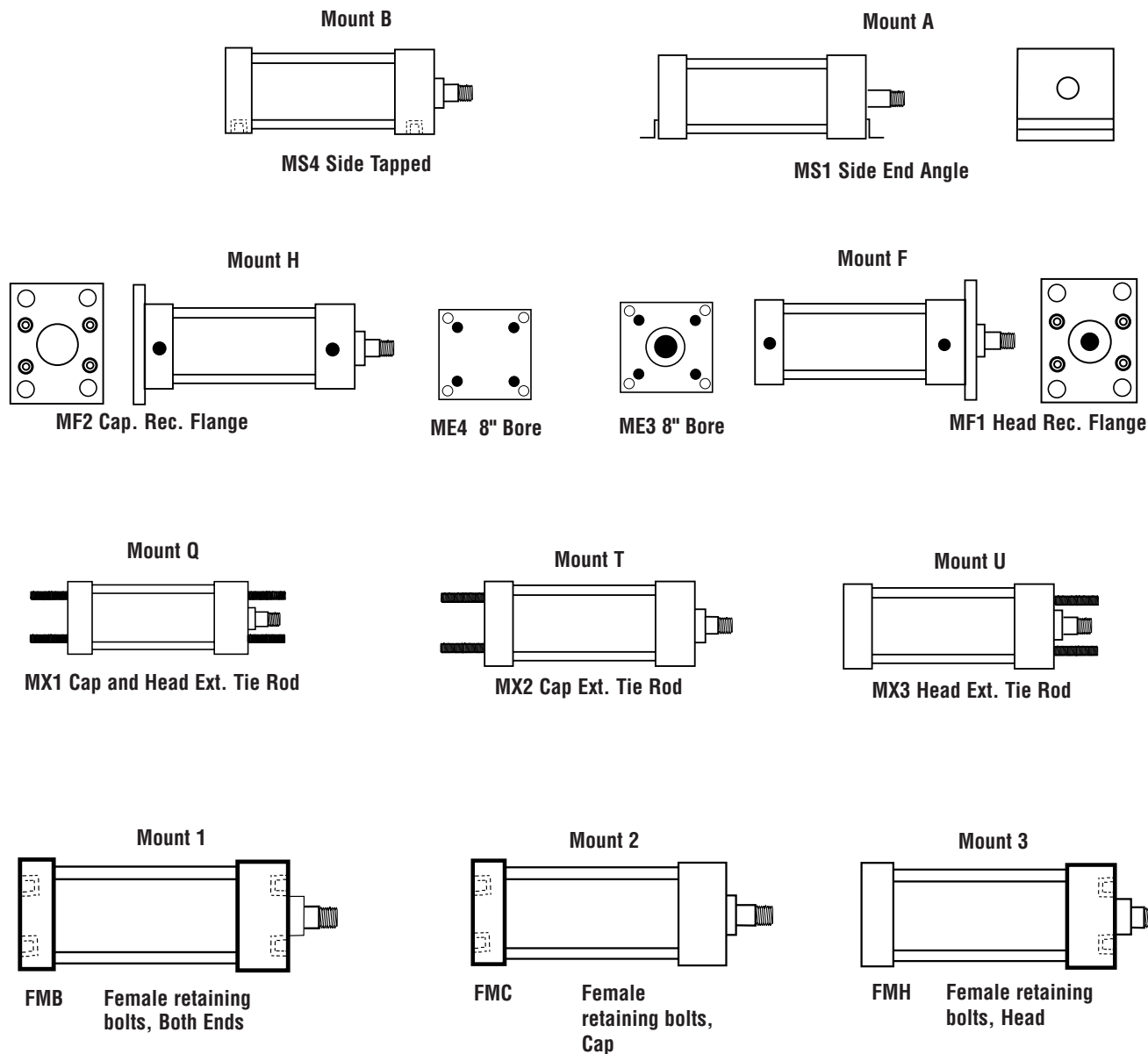
Pneumatic Cylinders

Provenair® - Dimensional Data

Mounting Data

Series AN, SN (1-1/2" Thru 10" Bore)

Factory Installed Mounts



Note: Mounts H & F 8" and 10" bore cylinders use oversized end cap as shown (ME3 or ME4). A steel rectangular flange plate is used for all MF1 or MF2 (1 1/2 thru 6" bore).

Note: Not all mounts are available on stainless steel models (Series SN)

Pneumatic Cylinders

Provenair® - Dimensional Data

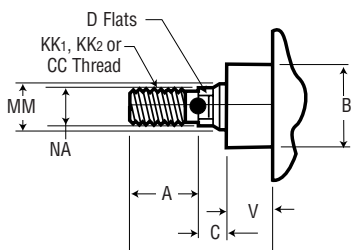
Dimensional Data

Series AN, SN (Rod End)

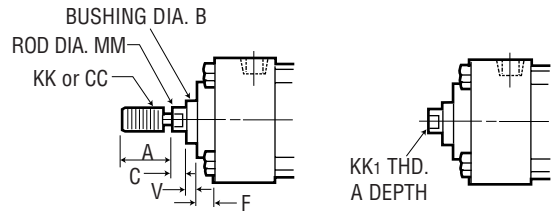
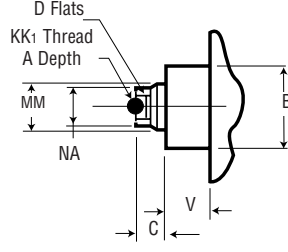
Rod End Dimensions for 1-1/2" – 10" Bore Sizes

	Cylinder Bore (Inches)							
	1-1/2, 2, 2-1/2	2, 2-1/2	3-1/4, 4	3-1/4, 4	5	5, 6, 8	6, 8, 10	10
Rod Diameter (Inches)	5/8	1	1	1-3/8	1	1-3/8	1-3/4	2
KK1 THD. (M OR F)	7/16"-20	3/4"-16	3/4"-16	1"-14	3/4"-16	1"-14	1-1/4"-12	1-1/2"-12
KK2 THD. (MALE)	1/2"-20	7/8"-14	7/8"-14	1-1/4"-12	7/8"-14	1-1/4"-12	1-1/2"-12	1-3/4"-12
CC (MALE)	5/8"-18	1"-14	1"-14	1-3/8"-12	1"-14	1-3/8"-12	1-3/4"-12	2"-12
A	.75	1.13	1.13	1.63	1.13	1.63	2.00	2.25
B	1.13	1.50	1.50	1.50	1.50	2.00	2.38	2.38
C	.34	.62	.48	.60	.50	.63	.75	.88
D	.50	.88	.88	.81	.81	1.13	1.50	1.75
F	.325	.325	.625	.625	.625	.625	.625	.75
MM	.625	1.00	1.00	1.00	1.00	1.375	1.75	2.00
V	.66	.75	.89	1.02	.25	.38	.38 *	.38
	-	-	-	-	-	-	*(.50 on 10")	-

Selection of oversize piston rod affects the following dimensions: ZB, ZC, ZD, ZE, ZF, ZL, ZM, XC, XD, XE, XG, XJ, XS, XT, V, W, WF, C, V, LA. See rod end dimensions.

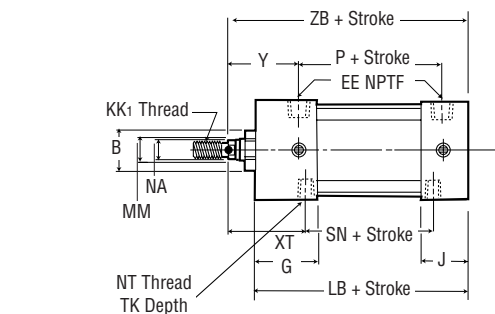


Series AN, SN Bore Sizes 1-1/2", 2", 2-1/2", 3-1/4", 4"

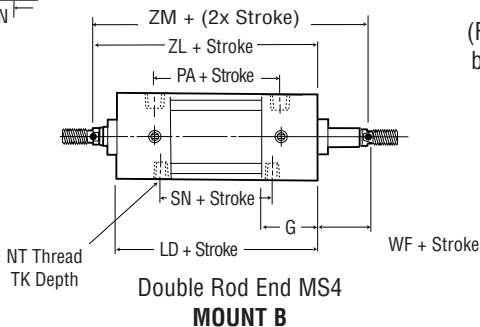
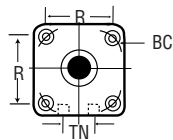


Series AN Bore Sizes 5", 6", 8", 10"
Series SN all Bore Sizes

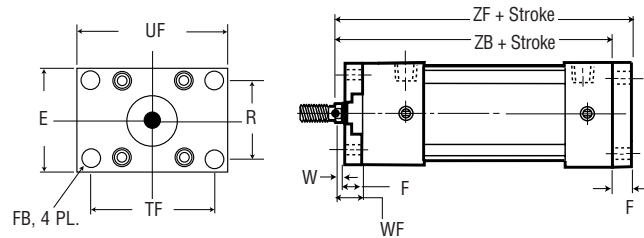
Series AN, SN (With Standard Rod)



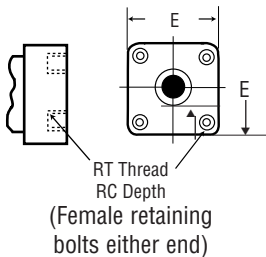
Side Tapped MS4
MOUNT B



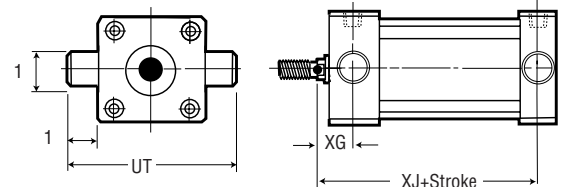
Double Rod End MS4
MOUNT B



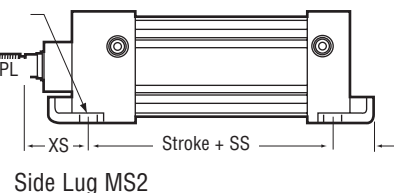
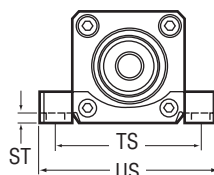
Rect. Flange - Head-MF1, Cap-MF2
MOUNT F & H (1 1/2" - 4" BORE ONLY)



RT Thread
RC Depth
(Female retaining
bolts either end)



Head Trunnion MT1
Cap Trunnion MT2
MOUNT M & P



Side Lug MS2

Dimensional Information see page 48

Pneumatic Cylinders

Provenair® - Dimensional Data

Dimensional Data

Series AN, SN (1-1/2" Thru 4" Bore w/standard rod)

	Cylinder Bore (Inches)				
	1-1/2	2	2-1/2	3-1/4	4
B	1.13	1.13	1.13	1.50	1.50
BC	2.02	2.60	3.10	3.90	4.70
E	2.00	2.50	3.00	3.75	4.50
EE	3/8-18	3/8-18	3/8-18	1/2-14	1/2-14
F	.38	.38	.38	.63	.63
FB	.31	.38	.38	.44	.44
G	1.44	1.44	1.44	1.69	1.69
J	.94	.94	.94	1.19	1.19
KK1 (thread)	7/16-20	7/16-20	7/16-20	3/4-16	3/4-16
LB	3.62	3.62	3.75	4.25	4.25
LD	4.12	4.12	4.25	4.75	4.75
MM (rod dia.)	5/8	5/8	5/8	1.00	1.00
NA	.59	.59	.59	.97	.97
NT	1/4-20	5/16-18	3/8-16	1/2-13	1/2-13
P	2.25	2.25	2.38	2.62	2.62
PA	2.75	2.75	2.88	3.12	3.12
R	1.43	1.84	2.19	2.76	3.32
RC	.41	.538	.41	.599	.44
RT	1/4-28	5/16-24	5/16-24	3/8-24	3/8-24
SB	.38	.38	.38	.50	.50
SN	2.25	2.25	2.38	2.63	2.63
SS	2.88	2.88	3.00	3.25	3.25
ST	.56	.69	.81	1.00	1.19
SX	.34	.34	.34	.47	.47
SY1	1.34	1.53	1.53	2.13	2.19
SY2	.94	1.13	1.13	1.50	1.56
TF	2.75	3.38	3.88	4.69	5.44
TK	.38	.43	.69	.75	.75
TN	.63	.88	1.25	1.50	2.06
TS	2.75	3.25	3.75	4.75	5.50
UF	3.38	4.13	4.63	5.50	6.25
US	3.50	3.69	4.50	5.75	6.50
UT	4.00	4.50	5.00	5.75	6.50
W	.66	.66	.66	.75	.75
WF*	1.00	1.00	1.00	1.38	1.38
XG*	1.75	1.75	1.75	2.25	2.25
XJ*	4.12	4.12	4.25	5.00	5.00
XS*	1.38	1.38	1.38	1.88	1.88
XT*	1.94	1.94	1.94	2.44	2.44
Y*	1.94	1.94	1.94	2.44	2.44
ZB*	4.63	4.63	4.75	5.63	5.63
ZF*	5.00	5.00	5.12	6.25	6.25
ZL*	5.12	5.12	5.25	6.12	6.12
ZM*	6.15	6.15	6.27	7.52	7.52

* Oversize piston rod option affects these dimensions.
See rod end dimensions.

MEETING THE STANDARDS.

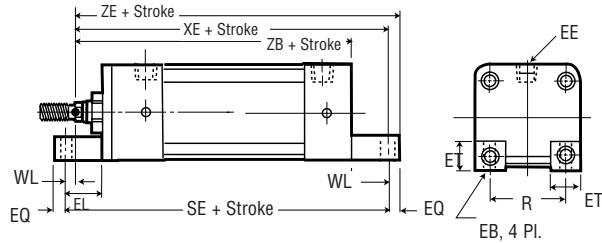
ARO Provenair Cylinders meet NFPA standards. Use valves that meet the highest standards – ARO Alpha and Genesis Valves. Alpha valves are available in body ported and sub-base configurations. Genesis valves are available in sub-base configuration only and have convenient “plug-into-the-base” electronics.



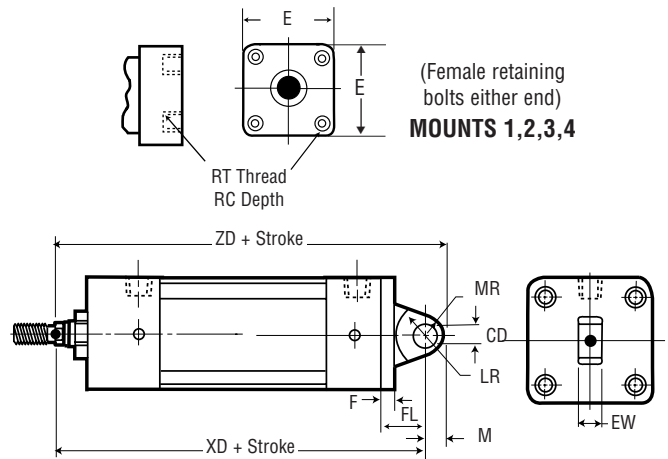
Pneumatic Cylinders Provenair® - Dimensional Data

Dimensional Data

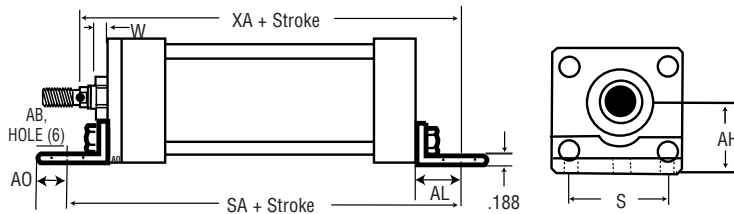
Series AN, SN (1-1/2" Thru 10" Bore w/standard rod)



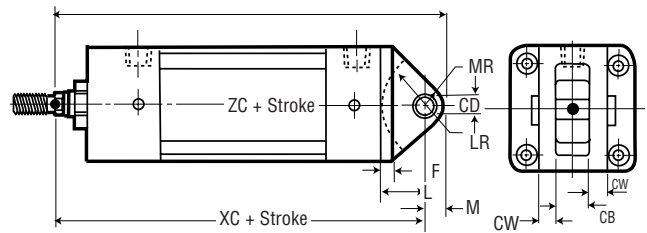
Side End Lugs MS7
MOUNT L



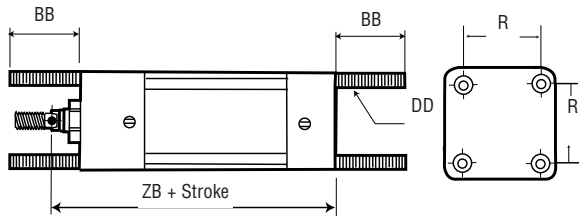
Detachable Eye MP4
MOUNT K



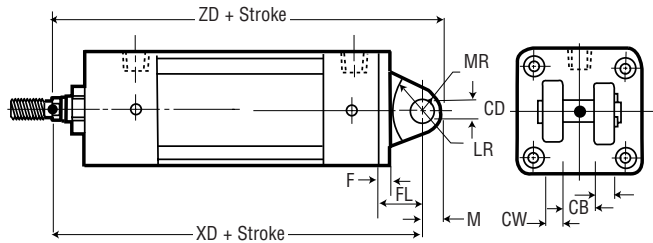
Angle Mount MS1
MOUNT A



Fixed Clevis MP1
MOUNT C



Tie Rod Mounts
MX1 Extended Both Ends MX3 Extended Head End
MOUNT Q, T & U



Detachable Clevis MP2
MOUNT D (AN Series only)

Dimensional Data Series AN (1-1/2" Thru 4" Bore w/standard rod)

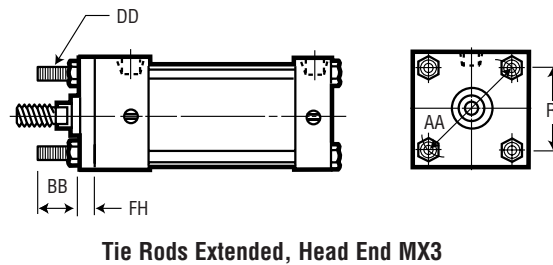
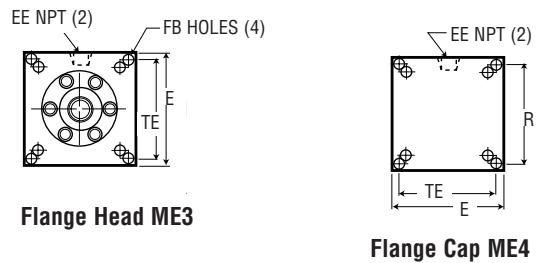
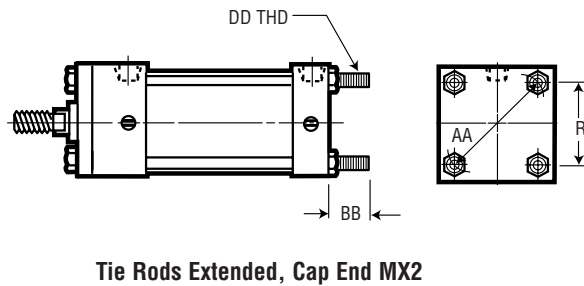
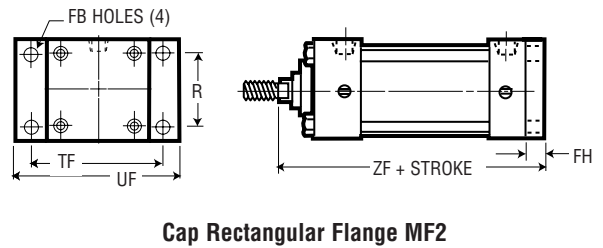
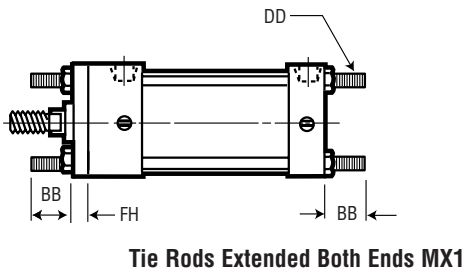
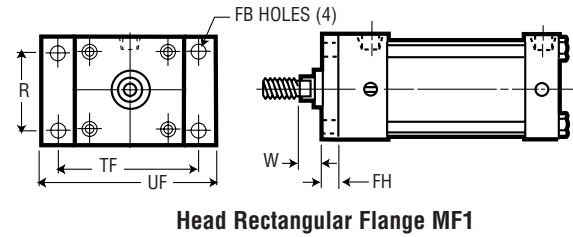
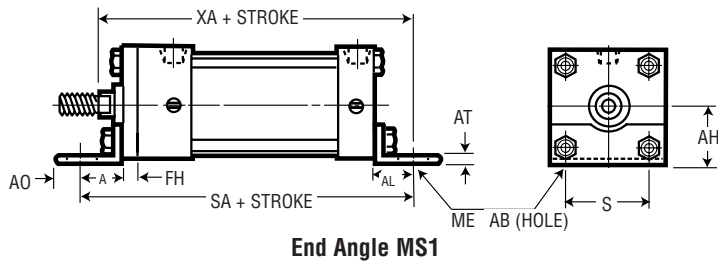
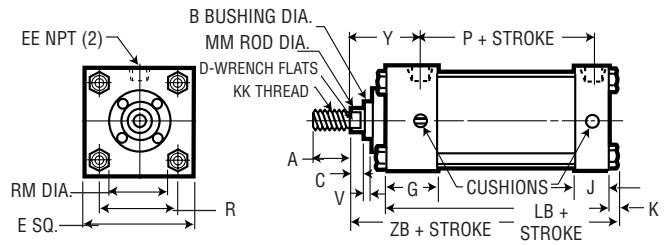
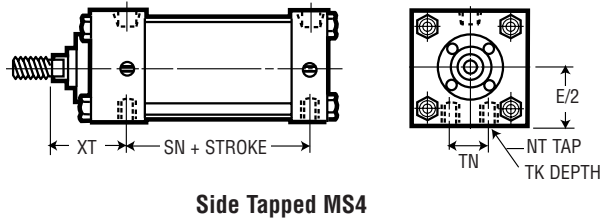
	Cylinder Bore (Inches)					Cylinder Bore (Inches)					Cylinder Bore (Inches)						
	1-1/2	2	2-1/2	3-1/4	4	1-1/2	2	2-1/2	3-1/4	4	1-1/2	2	2-1/2	3-1/4	4		
AB	.38	.38	.38	.50	.50	EQ	.25	.31	.31	.38	.38	SE	5.50	5.88	6.25	6.63	6.88
AH	1.18	1.44	1.62	1.94	2.25	ET	.56	.69	.81	1.00	1.19	W*	.66	.66	.66	.75	.75
AL	1.00	1.00	1.00	1.25	1.25	EW	.75	.75	.75	1.25	1.25	WL	.14	.33	.45	.13	.25
AO	.38	.38	.38	.50	.50	F	.38	.38	.38	.63	.63	XA	5.62	5.62	5.75	6.88	6.88
BB	1.00	1.13	1.13	1.38	1.38	KK1 (Thread)	7/16-20	7/16-20	7/16-20	3/4-16	3/4-16	XC*	5.38	5.38	5.50	6.88	6.88
CB	.75	.75	.75	1.25	1.25	FL	1-1/8	1-1/8	1-1/8	1-7/8	1-7/8	XD*	5.75	5.75	5.88	7.50	7.50
CD	.50	.50	.50	.75	.75	L	3/4	3/4	3/4	1-1/4	1-1/4	XE*	5.38	5.56	5.81	6.50	6.63
CW	.50	.50	.50	.63	.63	LR	3/4	3/4	3/4	1-1/4	1-1/4	ZB*	4.63	4.63	4.75	5.63	5.63
DD	1/4-28	5/16-24	5/16-24	3/8-24	3/8-24	M	5/8	5/8	5/8	7/8	7/8	ZC*	5.84	5.88	6.00	7.63	7.63
E	2.00	2.50	3.00	3.75	4.50	MR	.47	.50	.50	.75	.75	ZD*	6.22	6.25	6.38	8.25	8.25
EB	.28	.34	.34	.38	.38	R	1.43	1.84	2.19	2.76	3.32	ZE*	5.63	5.84	6.13	6.88	7.00
EE (NPTF)	3/8-18	3/8-18	3/8-18	1/2-14	1/2-14	S	1.25	1.75	2.25	2.75	3.50	* Oversize piston rod option affects these dimensions.					
EL	.75	.94	1.06	.88	1.00	SA	6.00	6.00	6.12	7.38	7.38						

Pneumatic Cylinders

Provenair® - Dimensional Data

Dimensional Data

Series AN, SN (5", 6", 8" and 10" Bore)



Pneumatic Cylinders

Provenair® - Dimensional Data

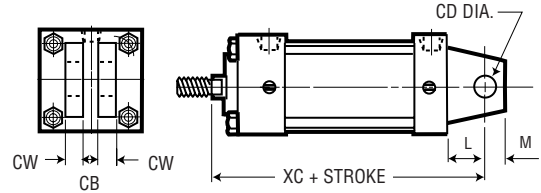
Dimensional Data

Provenair Mounts

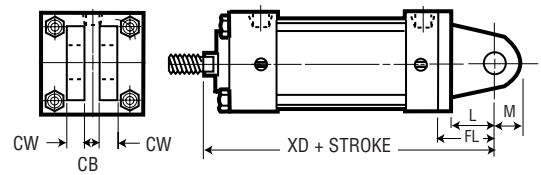
Series AN, SN (5", 6", 8", & 10" Bore)

ROD	CYLINDER BORE (INCHES)							
	5 1	5 1-3/8	6 1-3/8	6 1-3/4	8 1-3/8	8 1-3/4	10 1-3/4	
A	1.13	1.63	1.63	2.00	1.63	2.00	2.00	
AA	5.18	5.18	6.90	6.90	9.10	9.10	11.20	
AB	.69	.69	.81	.81	.81	.81	—	
AH	2.88	2.88	3.25	3.25	4.25	4.25	—	
AL	1.38	1.38	1.38	1.38	1.81	1.81	—	
AO	.63	.63	.63	.63	.69	.69	—	
AT	.19	.19	.19	.19	.25	.25	—	
B	1.50	2.00	2.00	2.38	2.00	2.38	2.38	
BB	1.81	1.81	1.81	1.81	2.31	2.31	2.69	
C	.50	.63	.63	.75	.63	.75	.75	
CB	1.25	1.25	1.50	1.50	1.50	1.50	2.00	
CD	.75	.75	1.00	1.00	1.00	1.00	1.38	
CW	.63	.63	.75	.75	.75	.75	1.00	
D	.81	1.13	1.13	1.50	1.13	1.50	1.50	
DD	1/2"-20	1/2"-20	1/2"-20	1/2"-20	5/8"-18	5/8"-18	3/4"-16	
E	5.50	5.50	6.50	6.50	8.50	8.50	10.63	
EE(NPTF)	1/2	1/2	3/4	3/4	3/4	3/4	1.00	
F	.63	.63	.63	.75	.63	.75	.63	
FB	.56	.56	.56	.56	.69	.69	.81	
FH	.63	.63	.75	.75	—	—	.63	
FL	2.13	2.13	2.25	2.25	—	—	—	
G	1.75	1.75	2.00	2.00	2.00	2.00	2.25	
J	1.25	1.25	1.50	1.50	1.50	1.50	2.00	
K	.44	.44	.50	.50	.63	.63	.69	
KK1 THREAD	3/4-16	1-14	1-14	1-1/4-12	1-14	1-1/4-12	1-1/4-12	
L	1.25	1.25	1.50	1.50	1.50	1.50	2.13	
LB	4.25	4.25	5.00	5.00	5.13	5.13	6.38	
LD	4.75	4.75	5.50	5.50	5.63	5.63	6.63	
M	.88	.88	1.00	1.00	1.00	1.00	1.38	
MM	1	1-3/8	1-3/8	1-3/4	1-3/8	1-3/4	1-3/4	
NT	5/8"-11	5/8"-11	3/4"-10	3/4"-10	3/4"-10	3/4"-10	1-8	
P	2.63	2.63	3.00	3.00	3.13	3.13	4.31	
R	4.10	4.10	4.88	4.88	7.57	7.57	7.92	
RM	2.63	3.38	3.38	3.50	3.38	3.50	3.50	
S	4.25	4.25	5.25	5.25	7.13	7.13	7.13	
SA	7.63	7.63	8.50	8.50	8.75	8.75	—	
SN	2.88	2.88	3.13	3.13	3.25	3.25	4.13	
TD	1.00	1.00	1.38	1.38	1.38	1.38	—	
TE	—	—	—	—	7.57	7.57	9.40	
TF	6.63	6.63	7.63	7.63	7.57*	7.57*	—	
TK	1.00	1.00	1.13	1.13	1.13	1.13	1.50	
TL	1.00	1.00	1.38	1.38	1.38	1.38	—	
TN	2.69	2.69	3.25	3.25	4.50	4.50	5.50	
UF	7.63	7.63	8.63	8.63	—	—	—	
UT	7.50	7.50	9.25	9.25	11.25	11.25	—	
V	.25	.38	.38	.38	.38	.38	.50	
W	.75	1.00	.88	1.13	1.63	1.88	1.88	
XA	7.00	7.25	8.00	8.25	8.56	8.81	—	
XC	6.88	7.13	8.13	8.38	8.25	8.50	10.38	
XD	7.75	8.00	8.88	9.13	—	—	—	
XG	2.25	2.50	2.63	2.88	2.63	2.88	—	
XJ	5.00	5.25	5.88	6.13	6.00	6.25	—	
XT	2.31	2.56	2.81	3.06	2.81	3.06	3.13	
Y	2.44	2.44	2.88	2.88	2.88	2.88	3.00	
ZB	6.06	6.31	7.13	7.38	7.38	7.63	8.94	
ZF	6.50	6.75	7.38	7.63	6.75	7.00	8.25	
ZM	7.75	8.25	8.75	9.25	8.88	9.38	10.63	

* R Dimension on 8" bore.

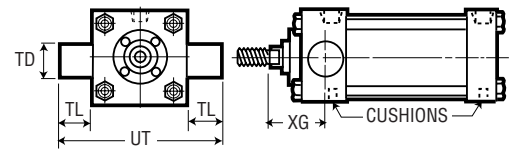


Fixed Clevis MP1

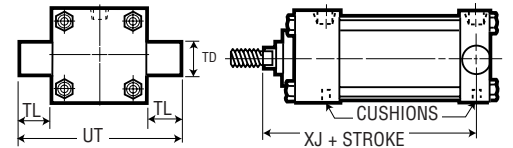


Detachable Clevis MP2
(Not available on 8-inch bore)

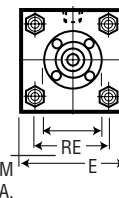
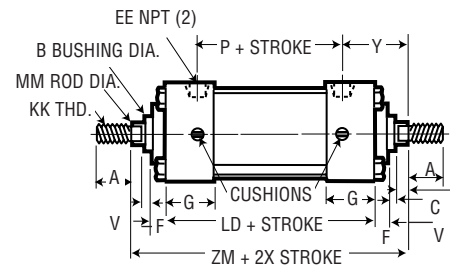
Cap Rectangular Flange MF2



Head Trunnion MT1



Cap Trunnion MT2



Double Rod End

Pneumatic Cylinders

Provenair® - Dimensional Data

Accessories

Series AN (5/8" thru 1-3/4" Rod)

Socket Head Rod Studs

	ROD DIAMETER (INCHES)			
	5/8	1	1-3/8	1-3/4
	Stud Thread Part Number	Stud Thread Part Number	Stud Thread Part Number	
KK1	7/16"-20 x 3/4"	3/4"-16 x 1-1/8"	1"-14 x 1-1/8"	—
	117812-101	117812-201	117812-301	
KK1 (2 x length)	7/16"-20 x 1-1/2"	3/4"-16 x 2-1/4"	1"-14 x 2-1/4"	—
	117812-121	117812-221	117812-321	
KK2 (1st oversize)	1/2"-20 x 3/4"	7/8"-14 x 1-1/8"	1-1/4"-12 x 1-5/8"	—
	117812-102	117812-202	117812-302	
CC Full (2nd oversize)	5/8"-18 x 3/4"	1"-14 x 1-1/8"	1-3/8"-12 x 1-5/8"	—
	117812-103	117812-203	117812-303	

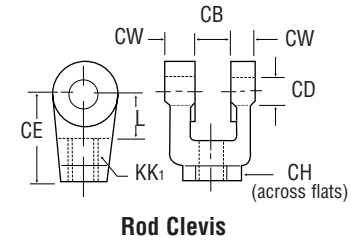
	Rod Thread			
	7/16-20	3/4-16	1-14	1-1/4-12
ROD CLEVIS KIT (includes pin)	116183	116046	116049	116052
ROD EYE KIT	116184	116047	116050	116053
CLEVIS PIN	115299	115300	—	—
PIVOT PIN	—	—	116048	116051
Mating parts to rod end accessories and mounting brackets				
Clevis Bracket (Iron)	—	117206-5	117206-6	—
Eye Bracket (Iron)	—	117205-5	117205-6	—

Dimensional Data

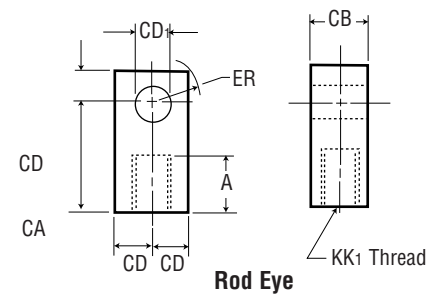
ROD DIAMETER (INCHES)	5/8	1	1-3/8	1-3/4
Rod Eye, Rod Clevis and Pin				
A	.75	1.13	1.63	2.00
CA	1.50	2.06	2.81	3.44
CB	.75	1.25	1.50	2.00
CD	.50	.75	1.00	1.38
CD1	.44	.75	—	—
CE	1.50	2.38	3.13	4.13
CH	1.00	1.25	1.50	2.00
CW	.50	.63	.75	1.00
ER	.72	1.06	1.00	1.38
HP	.156	.156	—	—
KK1	7/16-20	3/4-16	1-14	1 1/4-12
L	.75	1.25	1.50	2.13
LH	2.25	3.13	3.75	5.00
LP	2.10	2.75	3.25	4.50

Mating parts to rod end accessories and mounting brackets

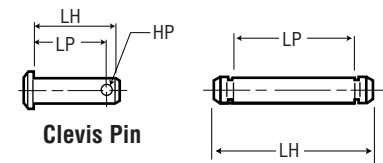
BA	—	2.56	3.25	—
CB	—	1.25	1.50	—
CD	—	.75	1.00	—
CW	—	.63	.75	—
DD DIA.	—	.53	.66	—
DD TAP	—	1/2-20	5/8-18	—
E	—	3.50	4.50	—
F	—	.63	.75	—
FL	—	1.88	2.25	—
M	—	.75	1.00	—



Rod Clevis



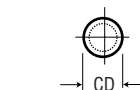
Rod Eye



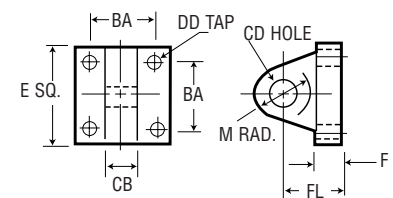
Clevis Pin



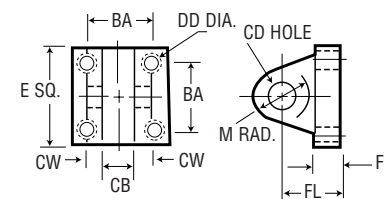
Pivot Pin



Use for Both Pins



Eye Bracket*



Clevis Bracket*

* These accessory brackets attach to mating cylinder mounts. See Cylinder Mounting Dimensions on page 129.

Pneumatic Cylinders

Provenair®

Ordering

Tanks & Reservoirs (1-1/2" thru 4" Bore)

Two Provenair tank styles provide unique capabilities for your applications.

Style A, air-over-oil tanks provide the smooth control hydraulic systems are known for, without the expense, using shop air.

Style T reservoirs provide a supply of air near the point of use, allowing your system to use a smaller compressor or smaller system supply lines.

Sight glass available in Style A only



Air/Oil Tank
250 P.S.I.



Air Reservoir

Include dashes (-). Dashes are significant.

A N T X X - X X X X X - X X X

ACTUATORS
All actuators begin with A

SERIES (N)
All Provenair Cylinders are Series N

TYPE
T Tank

BORE SIZE
Q 1- 1/2" W 3-1/4"
S 2" 4 4"
T 2- 1/2"

ENTER X IN THIS POSITION

TANK STYLE
A Air / Oil T Air Reservoir

SEALS
B Buna-N V Viton

SIGHT GLASS LOCATION
X = None A = 1 B = 2 C = 4
(X must be used with Tank Style T)

PORT LOCATION MS4 mounts: Port locations other than "A", call factory.
A H1, C1 (Std.) D H1, C4 G H2, C2 U H4, C4
B H1, C2 F H2, C1 J H2, C4

MOUNT
A MS1 B MS4 L MS7 X No Mount

STROKE

Whole Inches		Fractions	
00 =	0 in	0 =	0 in
01 =	1 in	1 =	1/8 in
02 =	2 in	2 =	1/4 in
03 =	3 in	3 =	3/8 in
04 =	4 in	4 =	1/2 in
05 =	5 in	5 =	5/8 in
06 =	6 in	6 =	3/4 in
↑	↑	7 =	7/8 in
to	to		
99 =	99 in		

Note: Maximum stroke 99 7/8", for longer strokes consult factory.

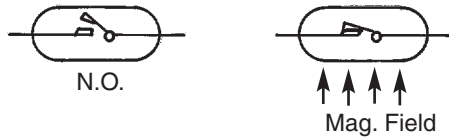
Style T
Minimum stroke 2".

Style A
Note: Sight glass (required)
Minimum 5" stroke.

Position Sensors (Switches)

Reed Switches

Switch is normally open, load can be attached to BROWN or BLUE lead. The BROWN lead is the higher potential side of the switch. In a magnetic field, the two reeds are brought into contact to “make” the circuit. Reed switches have black, ‘two wire’ leads.



Switch Mounting Brackets

Bore	Model Number
1-1/2"	119584
2", 2-1/2"	119585
3-1/4" and 4"	119586

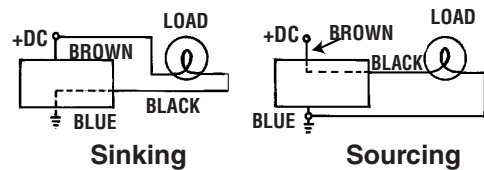
Note: Operating temperature is 14 - 140° F and the environmental rating is IEC IP 67 in all three switch types. Std. Red LED requires min 18 mA.

Switch Specifications

Model Number	119581-1	119581-2	119581-3	119582-1	119582-2	119582-3	119583-1	119583-2	119583-3
Lead Length/Type	1m bare	3m bare	Plug	1m bare	3m bare	Plug	1m bare	3m bare	Plug
Lead Color	Black			Grey			Black		
Switch Type	REED			PNP(SOURCING)			NPN (SINKING)		
Input Voltage	100 VDC, 125 VAC Max.			10 - 30 VDC			5 - 30 VDC		
Operating Current	300mA (150mA Inductive)			7 - 100mA @ 12V 14 - 200mA @ 24V			5 - 100mA @ 5V 10 - 200mA @ 12V 20 - 200mA @ 24V		
Detecting Distance	2.5 mm			1.5 mm			1.5 mm		
Detecting Width	-			3.0 mm			3.0 mm		
Response Time	1 mSec. Min.			-			-		
LED Function	18mA Min.			1mA Min.			1mA Min.		

Hall Effect Switches

It is important to note that Hall Effect switches must always have current through them to work. In a magnetic field, the semiconductor generates a voltage across the sense leads. Removing the magnetic field returns the switch to its normally open state. Hall effect switches have ‘three wire’ leads. Black leads are sinking (NPN). Grey leads are sourcing (PNP). Load is controller.



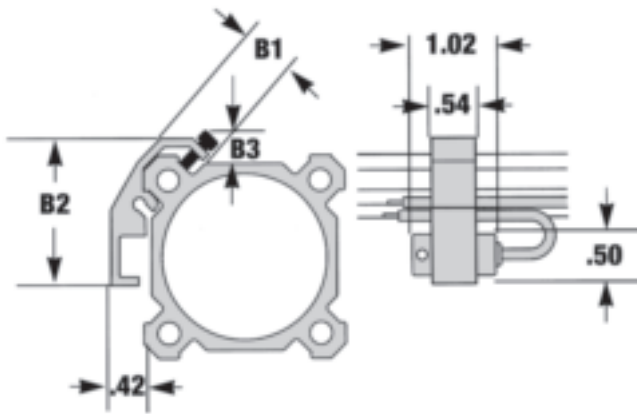
There are two types of Hall Effect switches. Each is connected differently. Check your PLC for the input method used. Sinking (NPN) will sink current to ground. Sourcing (PNP) will provide current from the +VDC.

Technical Information:

1. Do not exceed specification, permanent damage to the sensor may occur.
2. For reed switch type sensors, polarity must be observed for the proper functioning of LED. Connect the brown wire in series with load positive (+) and the blue wire to negative (-) or power source space. If the polarity is reversed, reed switch remains functional but LED will remain in “OFF” state.
3. For solid-state type sensors, polarity must also be observed. Connect brown wire to the positive (+) and the blue to the negative (-) of DC power source. The black wire must connect to the load ONLY. If the black wire is accidentally connected to the power source, permanent damage to the sensor may occur.
4. An external protection circuit may be required if the reed switch is used with inductive load, such as relay or solenoid. For DC inductive load, attach an external diode parallel to the load and use R - C circuit parallel with AC inductive load.
5. Keep sensors away from stray magnetic field to prevent malfunctions.
6. When using reed switch with capacitive load or if the lead wire length exceeds 10-meter, and inductor must be installed in series with the sensor to prevent damage (Sticking effect).

Pneumatic Cylinders Provenair® - Dimensional Data

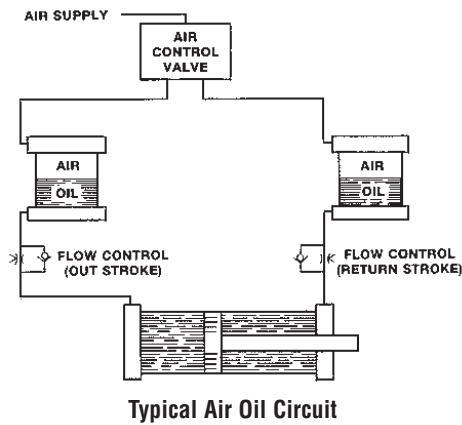
Dimensional Data



Cylinder Bore (Inches)

	1 1/2"	2 & 2 1/2"	3 1/4" & 4"
B1	.51	.60	.80
B2	1.50	1.77	2.45
B3	.26	.26	.33

Useable Volume Finder



Useable Volume Finder

	Bore	Style A	Style T
Q	1-1/2"	1.33	1.77
S	2"	2.36	3.14
T	2-1/2"	3.68	4.91
W	3-1/4"	6.22	8.29
4	4"	9.42	12.56

Style T or A

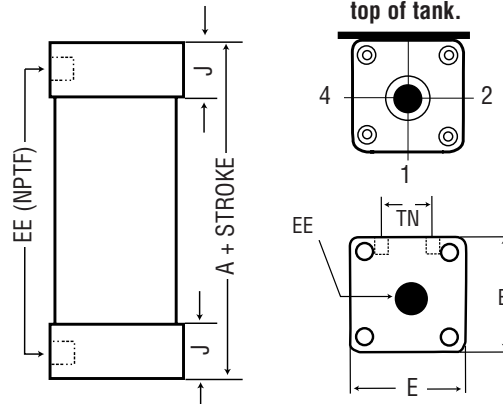
Derive required circuit volume (V) in Cu. In.

Divide (V) by factor from chart above to determine stroke (enter stroke value into model number).

Find unit length by adding stroke to dimension A from tank dimension table.

Tank Dimensions

Determine port and sight glass locations looking at top of tank.



Fill Port available in Style A only

Tank Dimensions

	BORE	A	J	TN	E	EE NPTF
Q	1-1/2"	2.005	0.94	0.63	2	3/8-18
S	2"	2.005	0.94	0.88	2.5	3/8-18
T	2-1/2"	2.005	0.94	1.25	3	3/8-18
W	3-1/4"	2.505	1.19	1.50	3.75	1/2-14
4	4"	2.505	1.19	2.06	4.5	1/2-14

Pneumatic Cylinders

Repair Kits & Valve/Cylinder Manifold

Ordering

Repair Kits (Single Rod End Rod Bushings Provenair Series)

	Cylinder Bore Size (Inches)								
	1-1/2	2	2	2-1/2	2-1/2	3-1/4	3-1/4	4	4
Rod Diameter	5/8	5/8	1	5/8	1	1	1-3/8	1	1-3/8
Series AN Bushing	119454	119455	119456	119455	119456	119457	119458	119457	119458
Series SN Bronze Bushing	114171	114171	114172	114171	114172	114172	114173	114172	114173

Order two kits for double rod end cylinders.

	Cylinder Bore Size (Inches)								
	5	5	6	6	8	8	10	10	
Rod Diameter	-	1	1-3/8	1-3/8	1-3/4	1-3/8	1-3/4	1-3/4	2
Series AN Bushing	-	115074	115075	115075	115076	115075	115076	115076	114130
Series SN Bronze Bushing	-	114172	114173	114172	114173	114173	114174	114174	114175

Micro-Air Series 01 (Seal Kits)

BORE SIZE	1/2	3/4	1-1/8
	7150	7151	7152

Seal Kits (Economair Series)

Cylinder Model Number

EXAMPLE: **28 20 - 5 3 09-040**

To order a repair kit, 1) Obtain model number from label on cylinder. 2) Write "RK" for Repair Kit and 3) Using number from cylinder label, construct proper kit number as directed below.

Order Kit No.:

RK 24 20 - 1 3

For All Models Write in RK

BORE SIZE

Take bore size from model number:

18, 15, 20, 25, 30 or 40.

SERIES NUMBER

If 23, (Noncushion), write **23**

If 24 (Cushion), 27 (Cushion, Pin Actuated), or 28 (Cushion, Magnetic) write **24**

CYLINDER TYPE

If 1, 3, 4, 5, 6, or 7, write **1.**

If 2, write **2.**

PACKING

Take packing identifier from model number: **0, 2, 3, 4, 5, 6, or 8**

Only these numbers are used.

Reciprocating Assembly (Economair Series)

Cylinder Model Number

EXAMPLE: **28 20 - 2 3 8 9-040**

To order a reciprocating assembly, 1) Obtain model number from label on cylinder. 2) Write "RA" for reciprocating assembly and 3) Using number from cylinder label, construct proper assembly number as directed below.

Order Assembly No.:

RA 24 20 - 2 0 8 - XXX

For All Models Write in RA

BORE SIZE

Take bore size from model number:

18, 15, 20, 25, 30 or 40.

SERIES NUMBER

If 23, (Noncushion), write **23**

If 24 (Cushion), 27 (Cushion, Pin Actuated), write **24**

If 25 (Bumper) or 29 (Bumper, Magnetic), write **25**

If 28 (Magnetic), write **28**

STROKE

CYLINDER TYPE

If 1, 3, 4, 5, 6, or 7, write **1.**

If 2, write **2.**

PACKING

Take packing identifier from model number:

if **0 or 3** write **0**

if **2**, write **2**

if **4, 5 or 6** write **4**

ROD MATERIAL PACKING

0 Standard Chrome

8 Stainless Steel

EXAMPLE RECIPROCATING ASSEMBLY MODEL NUMBER:

RA 24 20 - 2 0 8 - 0 4 0

Supplies a stainless steel rod with 2" O-ring piston for a double rod end, 4" stroke.

Pneumatic Cylinders

Repair Kits

Cylinder Model Number	S	A	N	X	X	X	-	X	X	X	Not Used	X	X	-	X	X	X	Not Used	
Repair Kit Model Number	S	K	R	K	N	X	X	X	-	X	B								

To order a repair kit, use the model number from the cylinder label. Provenair repair kits start with the letters "RKN", "SKN" and appear in the first three positions. Using the numbers from the cylinder label, construct the remainder of the Repair Kit or number as directed below.

Repair Kit Designators
S or R and K for Repair Kit, N for Provenair.

Type
 Double-Acting Single Rod = **A**
 Double Acting Double Rod = **B**

Bore Size
 1 1/2" **Q** 2" **S** 2 1/2" **T** 3 1/4" **W** 4" **4** 5" **5** 6" **6** 8" **8** 10" **Y**

Rod Diameter
 5/8" **K** 1" **M** 1-3/8" **P** 1 3/4" **Q** 2" **S**

Rod Style Not Used

Replacement Seals
 Buna-N **B** Buna-N + Mag. Pist. G (Use **B**)
 Viton **V** Viton + Mag. Pist. H (Use **V**)
 Self-Lube **S** Self-Lube Slippery + Mag. Pist. J (Use **S**)

Replacement Cushion Seals (All Seal Kits Use "B")

No Cushion Seals	X
Cushions Both Ends	B
Cushion Cap	C
Cushion Head	H

Port Location Not Used, Mounts Not Used, Stroke Not Used

EXAMPLE REPAIR KIT MODEL: R K N A W M - V B

Supplies all Viton seals for a single rod end, 3 1/4" bore, 1" diameter piston rod cylinder. Kit includes Teflon wearband and Viton cushion seals for both ends.

Cylinder Model Number	S	A	N	X	X	X	-	X	X	X	Not Used	X	X	-	X	X	X	Not Used	
Reciprocating Assembly No.	R	S	R	A	N	X	X	X	-	X	X								

Reciprocating Assembly designators

Type
 Double-Acting Single Rod = **A**
 Double Acting Double Rod = **B**

Bore Size
 1 1/2" **Q** 2" **S** 2 1/2" **T** 3 1/4" **W** 4" **4** 5" **5** 6" **6** 8" **8** 10" **Y**

Rod Diameter
 5/8" **K** 1" **M** 1-3/8" **P** 1-3/4" **Q** 2" **S**

Rod Style

A Chrome, Std Male (KK1)	G S.S., Standard Male (KK1)
B Chrome, Intermed. Male (KK2)	H S.S., Intermediate Male (KK2)
C Chrome, Full Male (CC)	J S.S., Full Male (CC)
D Chrome, Female (KK1)	K S.S., Female (KK1)
F Chrome, No Threads	L S.S., No Threads

Seals Not Used

Replacement Cushioned or Non Cushioned

No Cushion Seals	X
Cushions Both Ends	B
Cushion Cap	C
Cushion Head	H

Port Location Not Used, Mounts Not Used

EXAMPLE RECIPROCATING ASSEMBLY MODEL: R A N A S K - A H - 1 2 0

To order a reciprocating assembly, use the model number from the cylinder label. Provenair reciprocating assemblies start with the letters "RAN" or "RSN" and appear in the first three positions. Using the numbers from the cylinder label, construct the remainder of the reciprocating assembly number as directed at left.

Stroke
 To order a reciprocating assembly, use the model number from the cylinder label. Provenair reciprocating assemblies start with the letters "RAN" or "RSN" and appear in the first three positions. Using the numbers from the cylinder label, construct the remainder of the reciprocating assembly number as directed at left.

Supplies 5/8" diameter chrome rod, KK1 threads, cushion head end, 12" stroke and 2" diameter piston for single rod end cylinder.

Pneumatic Cylinders

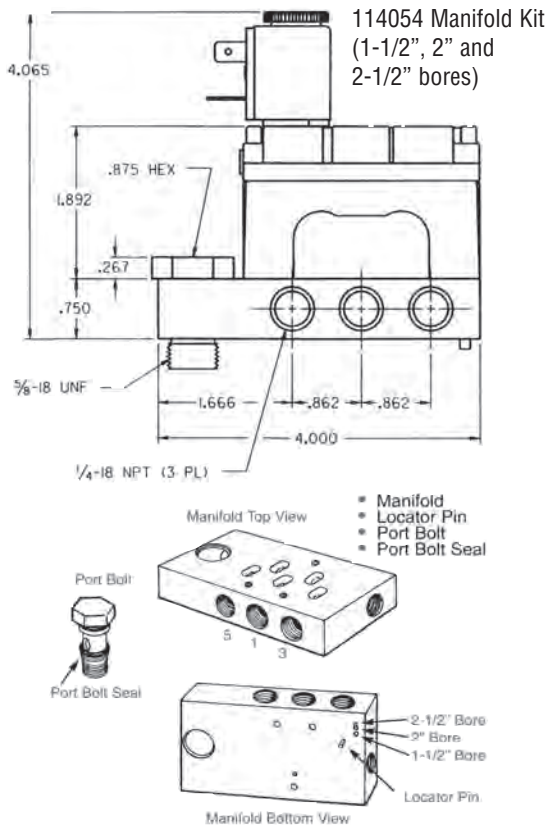
Valve/Cylinder Manifold

Features

- Mount any Alpha subbase valve to any NFPA cylinder
- Obtain maximum cylinder response and speeds
- Provides “clean” valve mounting method
- Mounts at cap or head end of cylinder
- Operates any NFPA Cylinder up to 2-1/2” bore
- Any stroke length (Minimum 3”)

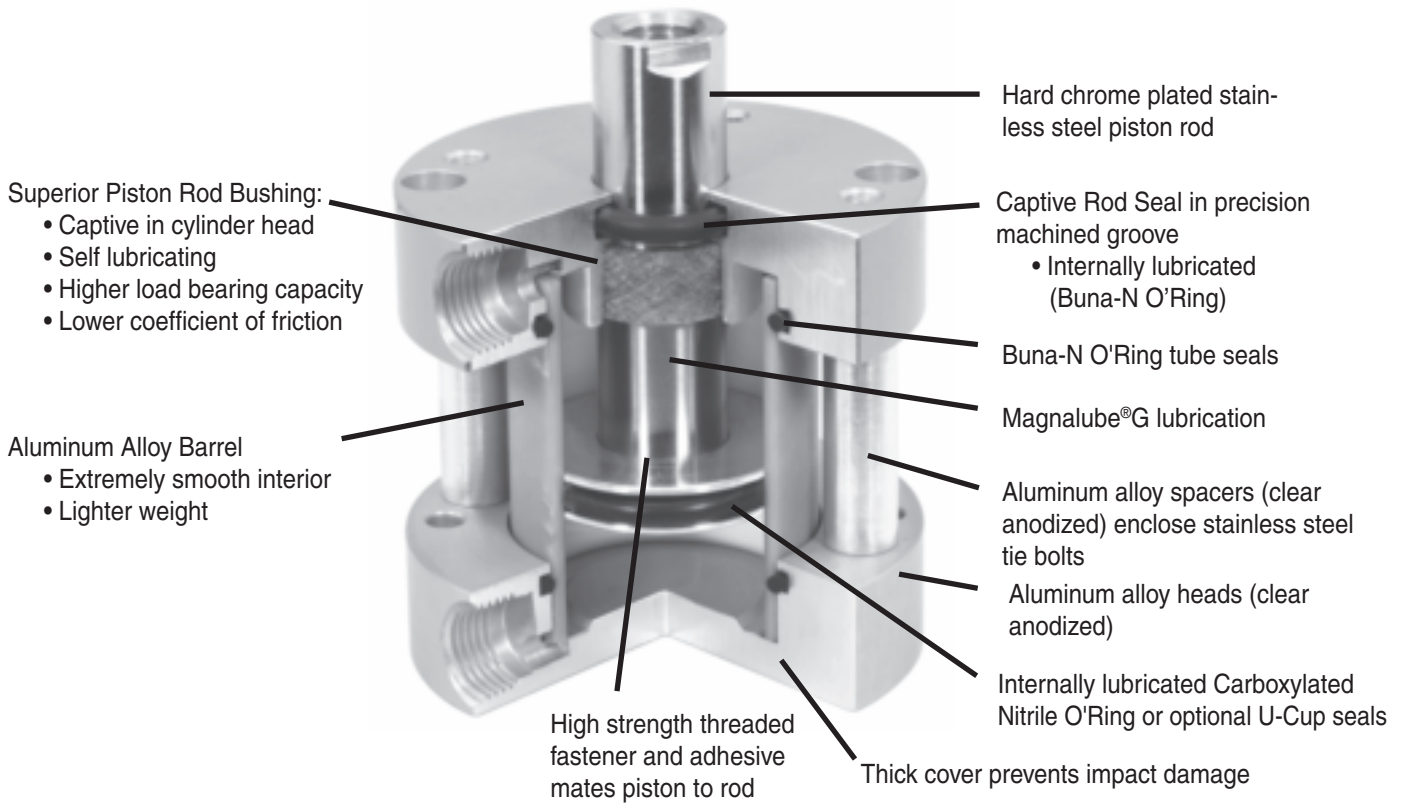


Dimensional Data



Compact Cylinders Premair Series

Premair™ Series Compact, Composite, Interchangeable Cylinders



Superior Interchangeable Industrial Air Cylinders

Big Value in a Compact Package— Stainless steel tie bolts and aluminum spacers lock precision machined heads tightly around a heavy walled, aluminum alloy cylinder barrel. The barrel's extremely smooth, self-lubricating interior surface insures highly reliable performance and extended seal life.

Compact Cylinders Premair Series



Available in 4 styles

- Double acting, single end rod (Model SCC)
- Double acting, double end rod (Model SCD)
- Single acting, spring retract rod (Model SCS)
- Reverse acting, spring extend rod (Model SCR)

8 Bore sizes 1/2" thru 4" Strokes to 4" standard

Ratings

- Body Aluminum Alloy
- Heads Clear anodized aluminum alloy
- Tie Bolts Stainless steel
- Rod Chrome plated stainless steel
- Piston Aluminum alloy
- Rod end Female thread with wrench flats
- Ports Position #1
- Seals Internally lubricated Nitrile
- Lubrication Magnalube®-G
- Rod bushing High density iron
- Stroke tolerance ± 1/64"
- Media Air
- Pressure rating, maximum 250 psi
- Minimum recommended operating pressure 15 psi
- Temperature rating
Cylinder -25° to +225°F
(-32° to +121°C)
- Temperature rating
Electronic sensors -5° to +175°F
(-20° to +80°C)

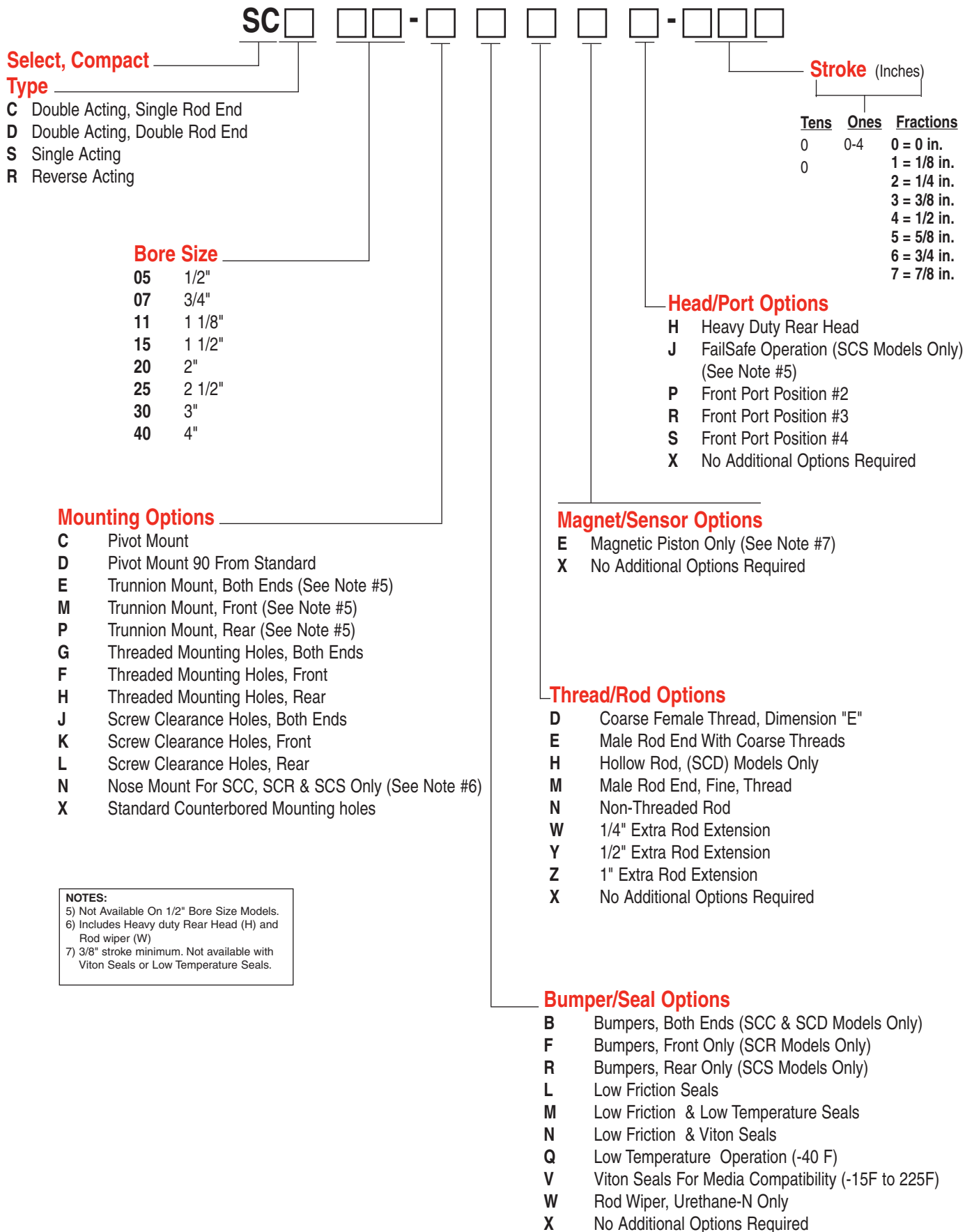
Spring Forces

Bore (in.)	Maximum Force	Spring Rate (lbs/inch) for Stroke Range			
		0.12 to 1" Stroke	1.001 to 2" Stroke	2.001 to 3" Stroke	3.001 to 4" Stroke
1/2 (05)	5.25	4.25	1.75	1.24	0.88
3/4 (07)	10.00	6.00	2.50	1.76	1.25
1-1/8 (11)	11.50	6.00	2.50	1.76	1.25
1-1/2 (15)	13.00	5.50	2.25	1.60	1.13
2 (20)	13.00	5.50	2.25	1.60	1.13
2-1/2 (25)	25.00	6.50	2.75	1.93	1.38
3 (30)	25.00	6.50	2.75	1.93	1.38
4 (40)	25.00	6.50	2.75	1.93	1.38

Cylinder Sizing Guide

Bore Diameter (in.)	1/2	3/4	1-1/8	1-1/2	2	2 1/2	3	4
Rod Diameter (in.)	0.25	0.31	0.50	0.63	0.75	0.75	0.88	1.00
Rod Area	0.05	0.08	0.19	0.31	0.44	0.44	0.60	0.79
Push Area (Single Rod)	0.20	0.44	0.88	1.76	3.14	4.91	7.07	12.57
Push Area (Double Rod)	0.15	0.36	0.69	1.45	2.66	4.47	6.47	11.78
Pull Area	0.15	0.36	0.69	1.45	2.66	4.47	6.47	11.78

Compact Cylinders Premair Series



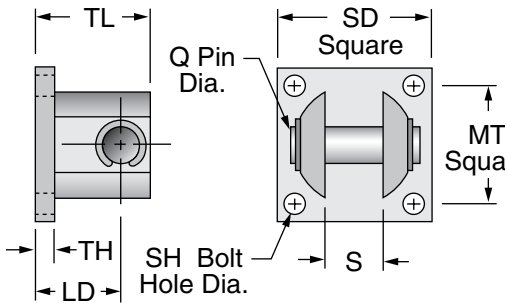
Compact Cylinders Premair Series

Accessories

Selection Guide	
Accessory	Standard Series
Clevis Bracket	✓
Trunnion Bracket	✓
Rod Pivot	✓

Clevis Bracket

Anodized aluminum alloy
Chrome plated steel pin included

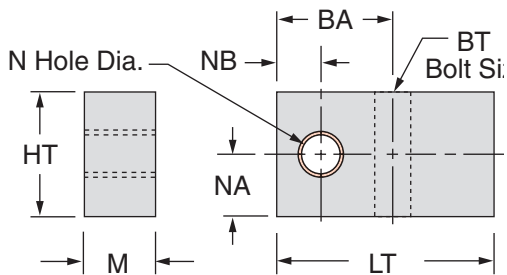


The bracket is intended for mounting with either a rod pivot or pivot mount; it is not intended to mount directly with the rear cylinder head.

Dimensions (inches)									
Kit No.	Bore	LD	MT	Q	S	SH	SD	TH	TL
SCABC-1	1/2 (05)	0.56	0.75	0.187	0.39	#6	1.00	0.16	0.78
	3/4 (07)								
	1-1/8 (11)								
SCABC-2	1-1/2 (15)	0.94	1.38	0.375	0.75	#10	1.75	0.22	1.34
	2 (20)								
SCABC-3	2-1/2 (25)	1.25	2.00	0.625	1.00	0.25	2.50	0.25	1.81
	3 (30)								
	4 (40)								

Trunnion Bracket (pair)

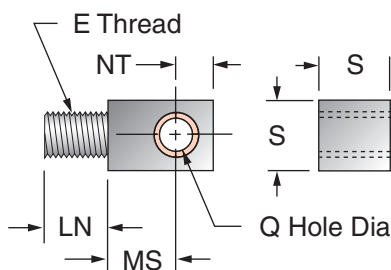
Anodized aluminum alloy
complete with bronze pivot bushings



Dimensions (inches)									
Kit No.	Bore	BA	BT	HT	LT	M	N	NA	NB
SCABT-1	3/4 (07)	0.56	#10	0.63	1.12	0.31	0.126	0.30	0.22
	1-1/8 (11)								
SCABT-2	1-1/2 (15)	0.81	1/4	0.88	1.50	0.50	0.251	0.38	0.31
	2 (20)								
SCABT-3	2-1/2 (25)	0.94	5/16	1.00	1.63	0.63	0.313	0.45	0.38
	3 (30)								
SCABT-4	4 (40)	1.06	3/8	1.25	1.88	0.75	0.376	0.55	0.44

Rod Pivot

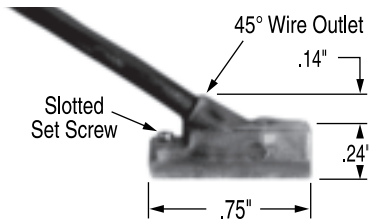
Steel with bronze pivot bushing and nut



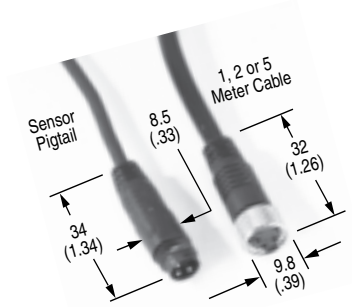
Dimensions (inches)							
Kit No.	Bore	E	LN	MS	NT	Q	S
SCARP-0	1/2 (05)	#8-32 UNC	0.38	0.47	0.25	0.187	0.38
SCARP-1	3/4 (07)	#10-32 UNF	0.38	0.47	0.25	0.187	0.38
SCARP-2	1-1/8 (11)	5/16-24 UNF	0.63	0.47	0.25	0.187	0.38
SCARP-3	1-1/2 (15)	3/8-24 UNF	0.63	0.72	0.44	0.375	0.75
SCARP-4	2 (20)	1/2-20 UNF	0.75	0.72	0.44	0.375	0.75
	2-1/2 (25)						
SCARP-5	3 (30)	5/8-18 UNF	0.88	1.00	0.63	0.625	1.00
SCARP-6	4 (40)	3/4-16 UNF	0.88	1.00	0.63	0.625	1.00

Compact Cylinders Magnetic Position Sensing

Sensor Specifications & Ordering Information



- Encased in a plastic housing, dovetail style electronic sensors are corrosion resistant. 45° wire outlet allows close mounting.
- Two methods of mounting are available:
 1. Tie bolt spacer mounted clamps
 2. Adhesive mounted dovetail extrusions
- **Order sensors separately from the table below**

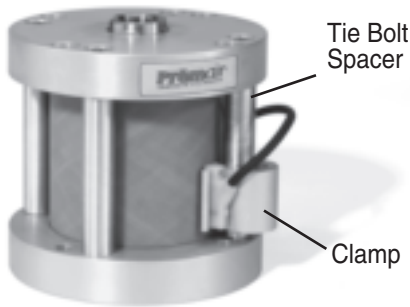


Ordering Guide – Dovetail Style Magnetic Sensor with LED				Sensor Temperature Range -20° to +80° C (-4° to +176° F)		Female Cordsets for Quick Disconnect	
Sensor Type	Prewired 9 ft. Part No.	Quick Disconnect Part No.*	Wire Leads	Electrical Characteristics			
Electronic	SCAMS-1	SCAMS-3	3	Sourcing PNP 6-24 VDC, 0.20 Amp Max current, 0.5 Voltage Drop			
Electronic	SCAMS-2	SCAMS-4	3	Sinking NPN 6-24 VDC, 0.20 Amp Max current, 0.5 Voltage Drop			

Length	Part No.
2 Meters	SCAFC-2
5 Meters	SCAFC-5

Note: Quick disconnect styles are supplied with 6 inch pigtail with male connector. Order female cordsets separately.*

Position sensors with spacer mounted clamps

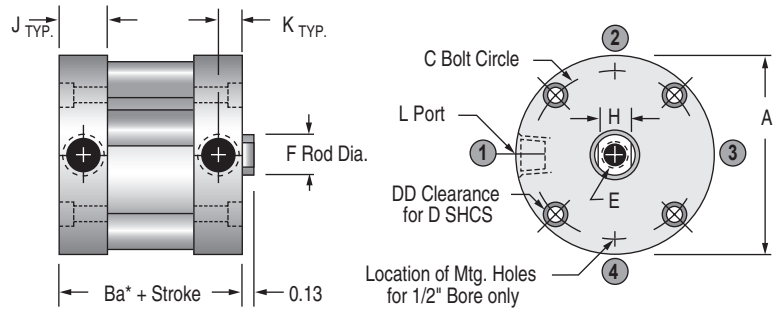


Clamp Selection Guide						
Part No.	SCAMC-1	SCAMC-2	SCAMC-3	SCAMC-4	SCAMC-5	SCAMC-6
To Fit Bore	1/2"	3/4"	1-1/8"	1-1/2" & 2"	2-1/2" & 3"	4"

Order clamps and sensors separately

Compact Cylinders
Premair Series

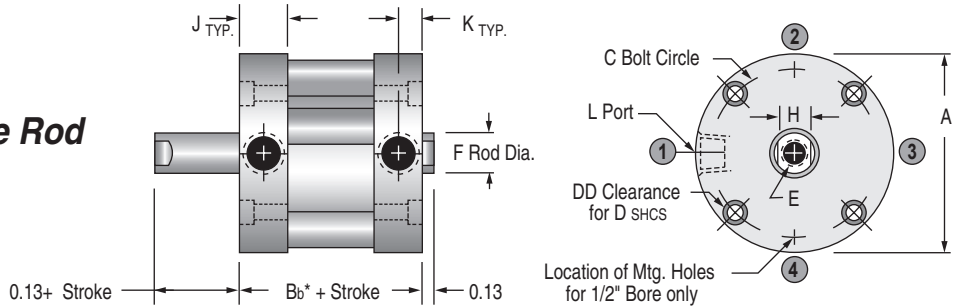
Model SCC
Double Acting, Single Rod



***Note: Some options effect cylinder length**

Standard Strokes – All Models: • 1/8 • 1/4 • 3/8 • 1/2 • 5/8 • 3/4 • 7/8 • 1 • 1-1/4 • 1-1/2 • 1-3/4 • 2 • 2-1/2 • 3 • 3-1/2 • 4

Model SCD
Double Acting, Double Rod



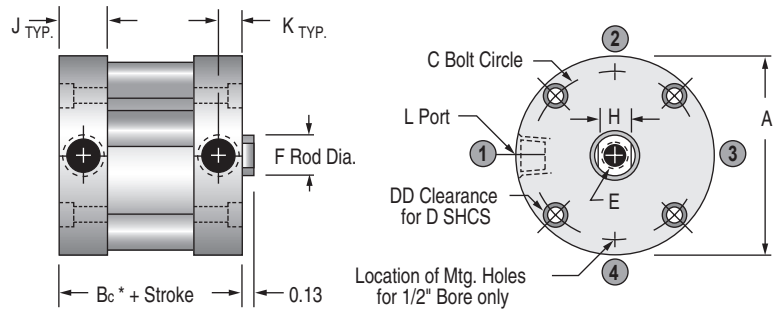
***Note: Some options effect cylinder length**

Dimensions (inches)

Bore	A	Ba*	Bb*	Bc* for Stroke Range				Bd* for Stroke Range				C	DD
				0-1	1.001-2	2.001-3	3.001-4	0-1	1.001-2	2.001-3	3.001-4		
				1/2 (05)	1.12	0.56	0.69	0.81	1.38	1.96	2.52		
3/4 (07)	1.50	0.56	0.69	0.81	1.38	1.94	2.50	1.06	1.62	2.19	2.75	1.22	4
1-1/8 (11)	2.00	0.88	0.94	0.88	1.50	2.13	2.75	1.38	2.00	2.63	3.25	1.69	4
1-1/2 (15)	2.62	0.88	1.00	0.88	1.50	2.13	2.75	1.38	2.00	2.63	3.25	2.19	4
2 (20)	3.12	0.94	1.06	0.94	1.56	2.19	2.81	1.44	2.06	2.69	NA	2.69	4
2-1/2 (25)	3.75	1.19	1.31	1.19	2.06	2.94	3.81	1.94	2.81	2.81	NA	3.25	4
3 (30)	4.25	1.25	1.38	1.25	2.12	3.00	3.88	2.00	2.88	2.88	NA	3.78	4
4 (40)	5.50	1.56	1.69	1.56	2.44	3.31	4.19	2.31	3.19	3.19	NA	4.94	4

Compact Cylinders
Premair Series

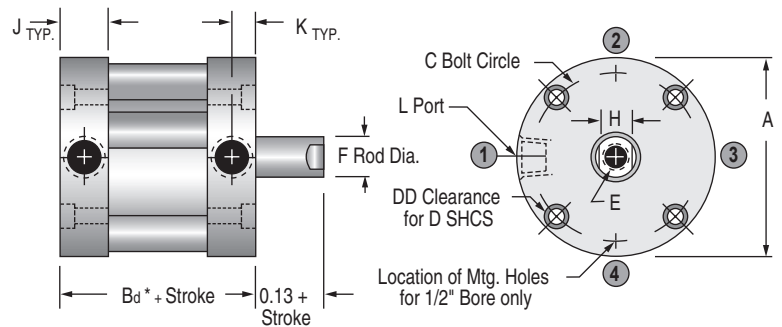
Model SCS
Single Acting, Spring Retract



***Note: Some options effect cylinder length**

Standard Strokes – All Models: • 1/8 • 1/4 • 3/8 • 1/2 • 5/8 • 3/4 • 7/8 • 1 • 1-1/4 • 1-1/2 • 1-3/4 • 2

Model SCR
Reverse Acting, Spring Extend



Approximate Cylinder Weights (ounces) SCC, SCS, SCD, SCR

Bore	SCC, SCS		SCD			SCR		Nose Mount Option Adder to Base Weight
	Base	Adder per 1/8 of Stroke	Base	Adder per 1/8 of Stroke	Adder per 1/8 of Stroke for -H Option	Base	Adder per 1/8 of Stroke	
1/2 (05)	1.2	0.08	1.3	0.15	0.1	1.3	0.08	0.1
3/4 (07)	1.9	0.1	2.1	0.2	0.15	2.0	0.1	0.2
1-1/8 (11)	4.9	0.3	5.8	0.4	0.3	5.3	0.3	1.1
1-1/2 (15)	9.6	0.4	11.2	0.6	0.5	10.5	0.4	1.8
2 (20)	13.0	0.5	15.2	0.7	0.6	14.0	0.5	2.7
2-1/2 (25)	22.4	0.6	28.0	0.8	0.7	25.0	0.6	3.1
3 (30)	28.9	0.8	38.0	1.1	0.9	32.5	0.8	3.5
4 (40)	55.7	1.0	71.8	1.3	1.1	61.8	1.0	5.9

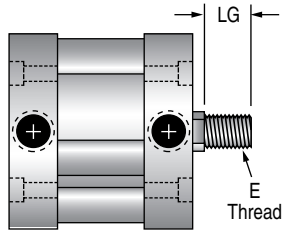
Dimensions (inches)

Bore	D	E Standard	E Depth for Stroke Range		F	H	J	K	L
			1/8 – 1/2	5/8 +					
1/2 (05)	#4	#8-32 UNC	0.30-0.46	0.46	0.25	0.22	0.34	0.14	#10-32 UNF
3/4 (07)	#6	#10-32 UNF	0.30-0.46	0.46	0.31	0.25	0.34	0.14	#10-32 UNF
1-1/8 (11)	#6	5/16-24 UNF	0.37-0.63	0.70	0.50	0.44	0.50	0.25	1/8 NPT
1-1/2 (15)	#10	3/8-24 UNF	0.37-0.70	0.70	0.63	0.50	0.50	0.25	1/8 NPT
2 (20)	#10	1/2-20 UNF	0.30-0.63	0.70	0.75	0.63	0.53	0.25	1/8 NPT
2-1/2 (25)	1/4	1/2-20 UNF	0.42-0.70	0.70	0.75	0.63	0.66	0.33	1/4 NPT
3 (30)	1/4	5/8-18 UNF	0.45-0.73	0.73	0.88	0.75	0.69	0.33	1/4 NPT
4 (40)	5/16	3/4-16 UNF	0.40-0.70	0.80	1.00	0.88	0.84	0.42	3/8 NPT

Compact Cylinders
Premair Series

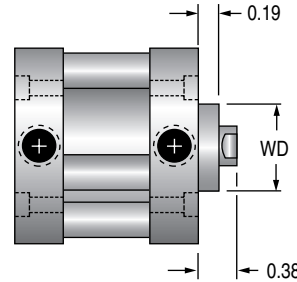
Model Options

Male Rod Ends



Thread Sizes		
E Thread		
Bore	M (Fine)	LG
1/2 (05)	#8-32 UNC	0.38
3/4 (07)	#10-32 UNF	0.38
1-1/8 (11)	5/16-24 UNF	0.50
1-1/2 (15)	3/8-24 UNF	0.50
2 (20)	1/2-20 UNF	0.63
2-1/2 (25)	1/2-20 UNF	0.63
3 (30)	5/8-18 UNF	0.75
4 (40)	3/4-16 UNF	0.75

Rod Wiper
(Buna-N only)

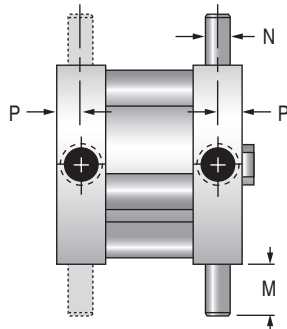


Boss Dia.	
Bore	WD
1/2 (05)	0.56
3/4 (07)	0.69
1-1/8 (11)	0.88
1-1/2 (15)	1.00
2 (20)	1.13
2-1/2 (25)	1.13
3 (30)	1.25
4 (40)	1.38

Mounting Options

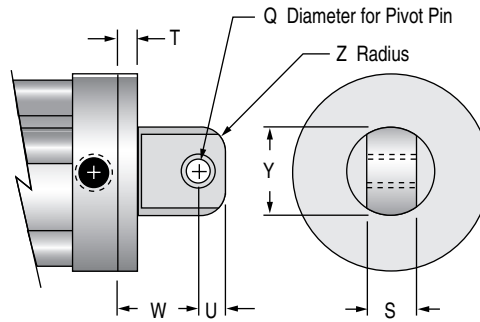
Trunnion Mount

Available rear, front or both.
Not available on 1/2" bore.



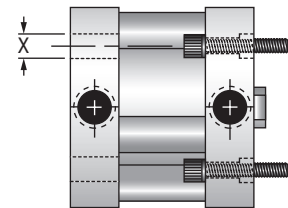
Pivot Mount

Complete with bronze pivot bushing.
Not available as an accessory.



Screw Clearance Holes

Available either or both ends.



Dimensions (inches)												
Bore	M	N	P	Q	S	T	U	W	X	Y	Z	
1/2 (05)	NA	NA	NA	0.19	0.38	0.19	0.25	0.75	0.17	0.63	0.19	
3/4 (07)	0.31	0.125	0.17	0.19	0.38	0.19	0.25	0.75	0.23	0.75	0.19	
1-1/8 (11)	0.50	0.250	0.25	0.19	0.38	0.25	0.25	0.81	0.25	0.75	0.19	
1-1/2 (15)	0.50	0.250	0.25	0.38	0.75	0.25	0.44	1.19	0.34	1.38	0.38	
2 (20)	0.50	0.250	0.25	0.38	0.75	0.31	0.44	1.25	0.34	1.38	0.38	
2-1/2 (25)	0.63	0.312	0.33	0.38	0.75	0.38	0.44	1.31	0.41	1.38	0.38	
3 (30)	0.63	0.312	0.33	0.63	1.00	0.38	0.56	1.69	0.41	1.88	0.38	
4 (40)	0.75	0.375	0.42	0.63	1.00	0.44	0.56	1.75	0.50	1.88	0.38	

Compact Cylinders Premair Series

Deviations from Standard Dimensions

	Length Adder (inches)				
	Low Friction Seals	Heavy Duty Rear Head [‡]	Magnetic Position Sensing [†] (E or M)		
			SCC, SCD	SCS	SCR
1/2 (05)	0.25	0.13	0.88	0.63	0.38
3/4 (07)	0.25	0.13	0.88	0.88	0.88
1-1/8 (11)	0.38	0.19	0.88	0.88	0.88
1-1/2 (15)	0.38	0.19	0.88	0.88	0.88
2 (20)	0.38	0.19	0.88	0.88	0.88
2-1/2 (25)	0.38	0.25	0.88	0.88	0.88
3 (30)	0.50	0.25	0.88	0.88	0.88
4 (40)	0.50	0.38	0.88	0.88	0.88

[‡] Heavy duty rear head is recommended for applications where the cylinder is mounted on the front face or trunnion-mounted, and impact loading (20 or more cycles/minute) occurs between the piston and rear head. It increases the overall length of the cylinder as shown.

[†] A minimum stroke of 3/8" is required to sense end-of-stroke positions. For low friction seals used in conjunction with magnetic position sensing, use "E" or "M" sensor options only.

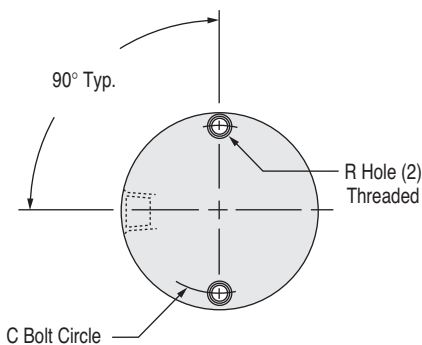
Hollow Rod Option

Bore	Hole Diameter	
	Female Rod Thread	Male Rod Thread
1/2 (05)	0.14	N/A
3/4 (07)	0.14	0.09
1-1/8 (11)	0.22	0.16
1-1/2 (15)	0.28	0.19
2 (20)	0.38	0.25
2-1/2 (25)	0.38	0.25
3 (30)	0.44	0.31
4 (40)	0.50	0.38

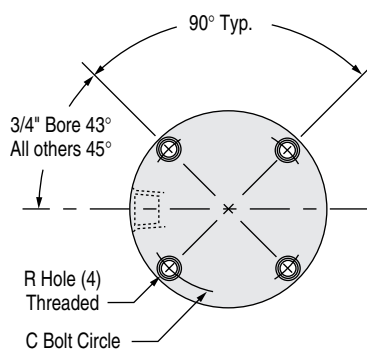
Threaded Mounting Holes

1/2" Bore

Available either or both ends.



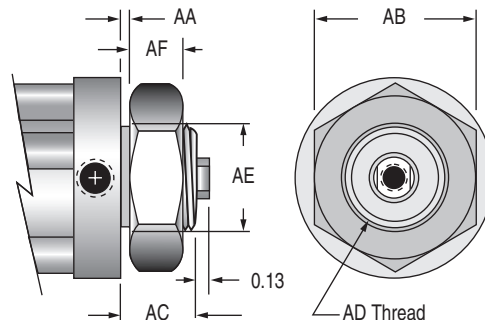
3/4" Bore & Up



Nose Mount

Available on SCC, SCS, SCR.

Included heavy duty rear head. See length adder above.



Dimensions (inches)								
Bore	AA	AB	AC	AD	AE	AF	C	R
1/2 (05)	.06	0.75 Hex	.38	1/2 – 20 UNF-2A	.50	.31	0.88	#4 – 40 UNC
3/4 (07)	.06	0.75 Hex	.38	5/8 – 18 UNF-2A	.62	.25	1.22	#6 – 32 UNC
1-1/8 (11)	.13	1.50 Hex	.75	1 – 14 UNF-2A	1.00	.55	1.69	#6 – 32 UNC
1-1/2 (15)	.13	1.88 Hex	.75	1-1/4 – 12 UNF-2A	1.25	.52	2.19	# 10 – 24 UNC
2 (20)	.19	1.88 Hex	.88	1-3/8 – 12 UNF-2A	1.38	.52	2.69	# 10 – 24 UNC
2-1/2 (25)	.25	1.88 Hex	1.00	1-3/8 – 12 UNF-2A	1.38	.52	3.25	1/4 – 20 UNC
3 (30)	.25	1.88 Hex	1.00	1-3/8 – 12 UNF-2A	1.38	.52	3.78	1/4 – 20 UNC
4 (40)	.19	2.62 Hex	1.12	1-3/4 – 12 UN-2A	1.75	.88	4.94	5/16 – 18 UNC

Maximum Torque for Nose Mount Option

Bore	Foot-Pounds
1/2 (05)	12
3/4 (07)	28
1-1/8 (11)	100
1-1/2 (15)	120
2 (20)	130
2-1/2 (25)	130
3 (30)	130
4 (40)	150

Compact Cylinders
Premair Series



10 Bore Sizes
12mm thru 100mm

- NPT Ports
- Stainless Steel Rod
- Space Saving Design
- Buna Seals Standard
- Light Weight Aluminum Body
- Metric Female Rod Threads Standard

Low-profile, aluminum cylinders are designed for compact, space-saving applications. All models have magnetic pistons and are switch-ready for accurate position sensing. Low-profile, solid state switches slide into machined grooves located on the cylinder body. Viton seals for higher temperature rating than nitrile. Stainless steel piston rods are hard chrome plated for superior wear and corrosion resistance. Piston is attached to rod with a flat head screw to minimize pounding and vibration. Mounting through holes are threaded for easy mounting hardware installation.

Ratings

- FluidAIR
- Max. Operating Pressure140 PSI
- Min. Operating Pressure7 PSI
- Ambient and Fluid Temperature ...15-140 F (-10 - 60 C)
- LubricationNot Required
- CushionNone
- Rod End ThreadFemale (standard)
- Stroke Tolerance0.039 in (+10/-0mm)
- MountingThrough Hole (Standard)
- Piston Speed2-20inch/sec (50-500mm/sec)

Cylinder Force

Cylinder Force
Bore Size

Bore Size	Operating Pressure PSI		
	50	75	100
012(1/2 nom)	8.7	13.1	17.5
	6.6	9.8	13.1
016(5/8 nom)	15.6	23.4	31.2
	11.7	17.5	23.4
020(3/4 nom)	24.3	36.5	48.6
	18.2	27.3	36.5
025(1 nom)	38	57	76
	29.3	43.9	58.5
032(1 1/4 nom)	62.3	93.5	12.5
	46.8	70.1	93.5

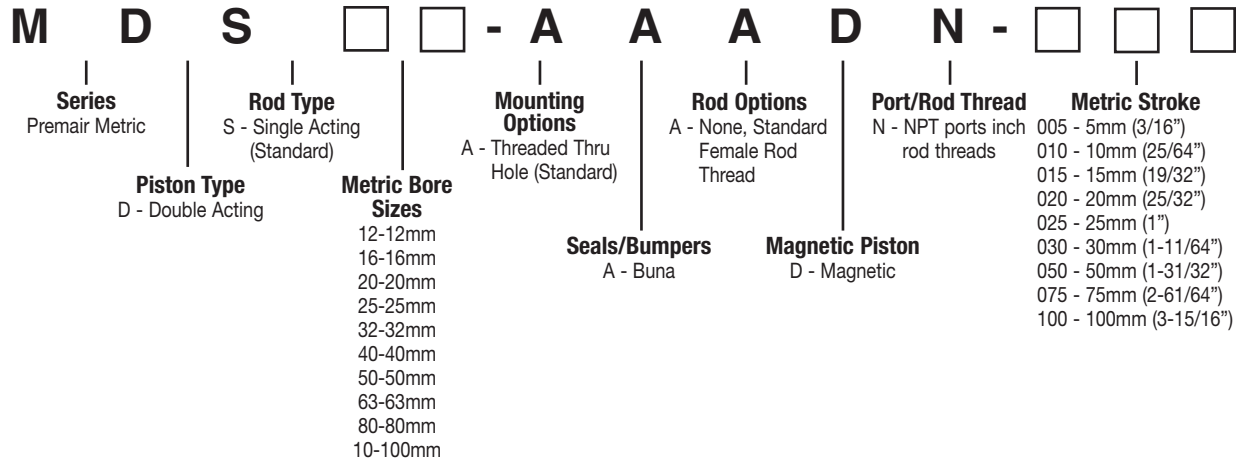
Bore Size **Operating Pressure PSI**

Bore Size	Operating Pressure PSI		
	50	75	100
040(1 1/2 nom)	97.4	146	195
	81.8	123	164
050(2 nom)	152	228	304
	128	192	256
063(2 1/2 nom)	242	362	483
	217	326	434
080(3 1/4 nom)	390	584	779
	352	527	703
100(4 nom)	62.3	93.5	12.5
	554	831	1108

Basic Cylinder Weights

Bore (in)	5 (.20)	10 (.39)	15 (.59)	20 (.79)	25 (.98)	30 (1.18)	35 (1.38)	40 (1.57)	45 (1.77)	50 (1.97)	75 (2.95)	100 (3.94)
1/2	0.110	0.126	0.141	0.157	0.172	0.187	-	-	-	-	-	-
5/8	0.157	0.181	0.207	0.232	0.256	0.280	-	-	-	-	-	-
3/4	0.229	0.271	0.315	0.359	0.406	0.450	0.494	0.540	0.584	0.631	-	-
1	0.284	0.331	0.395	0.423	0.472	0.518	0.564	0.613	0.657	0.706	-	-
1-1/4	0.571	0.598	0.624	0.650	0.701	0.750	0.800	0.851	0.902	0.961	1.22	1.47
1-1/2	0.752	0.805	0.858	0.908	0.953	0.997	1.05	1.09	1.14	1.2	1.44	1.68
2	-	1.10	1.17	1.25	1.34	1.43	1.5	1.58	1.66	1.78	2.18	2.5
2-1/2	-	1.60	1.69	1.78	1.87	1.97	2.06	2.15	2.23	2.38	2.84	3.29
3-1/4	-	3.53	3.74	4.0	4.16	4.36	4.57	4.78	4.99	5.28	6.31	7.33
4	-	5.55	5.68	5.81	6.05	6.29	6.52	6.75	6.97	7.31	8.45	9.59

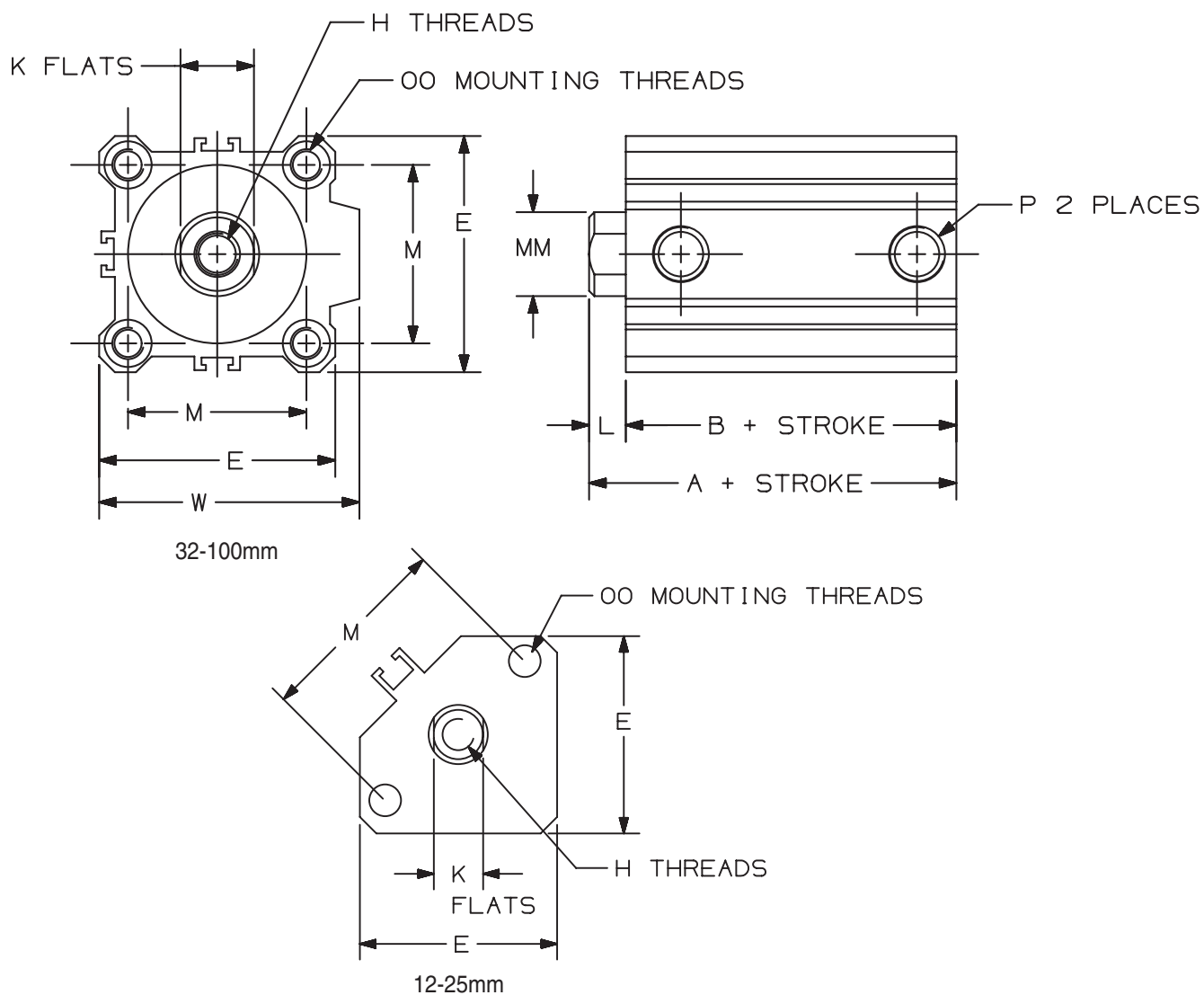
Compact Cylinders Premair Series



Available Models

Bore(mm)	Stroke (mm)	Model number	Bore(mm)	Stroke (mm)	Model number
12	.5	MDS12-AAADN-005	40	.35	MDS40-AAADN-035
12	.10	MDS12-AAADN-010	40	.40	MDS40-AAADN-040
12	.15	MDS12-AAADN-015	40	.45	MDS40-AAADN-045
12	.20	MDS12-AAADN-020	40	.50	MDS40-AAADN-050
12	.25	MDS12-AAADN-025	40	.75	MDS40-AAADN-075
12	.30	MDS12-AAADN-030	40	1.00	MDS40-AAADN-100
16	.5	MDS16-AAADN-005	50	.10	MDS50-AAADN-010
16	.10	MDS16-AAADN-010	50	.15	MDS50-AAADN-015
16	.15	MDS16-AAADN-015	50	.20	MDS50-AAADN-020
16	.20	MDS16-AAADN-020	50	.25	MDS50-AAADN-025
16	.25	MDS16-AAADN-025	50	.30	MDS50-AAADN-030
16	.30	MDS16-AAADN-030	50	.35	MDS50-AAADN-035
20	.5	MDS20-AAADN-005	50	.40	MDS50-AAADN-040
20	.10	MDS20-AAADN-010	50	.45	MDS50-AAADN-045
20	.15	MDS20-AAADN-015	50	.50	MDS50-AAADN-050
20	.20	MDS20-AAADN-020	50	.75	MDS50-AAADN-075
20	.25	MDS20-AAADN-025	50	1.00	MDS50-AAADN-100
20	.30	MDS20-AAADN-030	63	.10	MDS63-AAADN-010
20	.35	MDS20-AAADN-035	63	.15	MDS63-AAADN-015
20	.40	MDS20-AAADN-040	63	.20	MDS63-AAADN-020
20	.45	MDS20-AAADN-045	63	.25	MDS63-AAADN-025
20	.50	MDS20-AAADN-050	63	.30	MDS63-AAADN-030
25	.5	MDS25-AAADN-005	63	.35	MDS63-AAADN-035
25	.10	MDS25-AAADN-010	63	.40	MDS63-AAADN-040
25	.15	MDS25-AAADN-015	63	.45	MDS63-AAADN-045
25	.20	MDS25-AAADN-020	63	.50	MDS63-AAADN-050
25	.25	MDS25-AAADN-025	63	.75	MDS63-AAADN-075
25	.30	MDS25-AAADN-030	63	1.00	MDS63-AAADN-100
25	.35	MDS25-AAADN-035	80	.10	MDS80-AAADN-010
25	.40	MDS25-AAADN-040	80	.15	MDS80-AAADN-015
25	.45	MDS25-AAADN-045	80	.20	MDS80-AAADN-020
25	.50	MDS25-AAADN-050	80	.25	MDS80-AAADN-025
32	.5	MDS32-AAADN-005	80	.30	MDS80-AAADN-030
32	.10	MDS32-AAADN-010	80	.35	MDS80-AAADN-035
32	.15	MDS32-AAADN-015	80	.40	MDS80-AAADN-040
32	.20	MDS32-AAADN-020	80	.45	MDS80-AAADN-045
32	.25	MDS32-AAADN-025	80	.50	MDS80-AAADN-050
32	.30	MDS32-AAADN-030	80	.75	MDS80-AAADN-075
32	.35	MDS32-AAADN-035	80	1.00	MDS80-AAADN-100
32	.40	MDS32-AAADN-040	10	.10	MDS10-AAADN-010
32	.45	MDS32-AAADN-045	10	.15	MDS10-AAADN-015
32	.50	MDS32-AAADN-050	10	.20	MDS10-AAADN-020
32	.75	MDS32-AAADN-075	10	.25	MDS10-AAADN-025
32	1.00	MDS32-AAADN-100	10	.30	MDS10-AAADN-030
40	.5	MDS40-AAADN-005	10	.35	MDS10-AAADN-035
40	.10	MDS40-AAADN-010	10	.40	MDS10-AAADN-040
40	.15	MDS40-AAADN-015	10	.45	MDS10-AAADN-045
40	.20	MDS40-AAADN-020	10	.50	MDS10-AAADN-050
40	.25	MDS40-AAADN-025	10	.75	MDS10-AAADN-075
40	.30	MDS40-AAADN-030	10	1.00	MDS10-AAADN-100

Compact Cylinders Premair Series



Dimensions mm (inch)

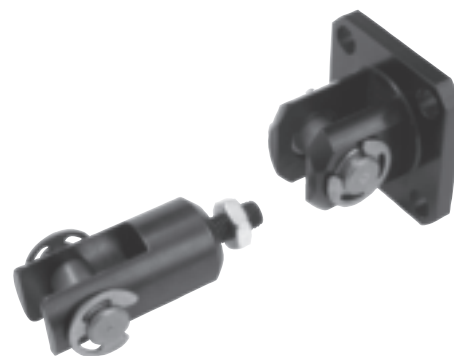
BORE mm (Nom. In.)	A	B	E	H (Inch)	K	L	M	MM	OO	P (NPT)	W
12 (1/2)	31.5 (1.24)	28.0 (1.10)	25 (0.98)	8-32	5 (0.20)	3.5 (0.14)	22 (0.87)	6 (0.236)	6.5 (0.26)	10-32	23 (0.90)
16 (5/8)	34.0 (1.34)	30.5 (1.20)	29 (1.14)	8-32	6 (0.24)	3.5 (0.14)	28 (1.10)	8 (0.315)	6.5 (0.26)	10-32	27.2 (1.07)
20 (3/4)	36.0 (1.42)	31.5 (1.24)	36 (1.42)	10-32	8 (.031)	4.5 (0.18)	36 (1.42)	10 (0.394)	9 (0.35)	10-32	31.2 (1.23)
25 (1)	37.5 (1.48)	32.5 (1.28)	40 (1.57)	1/4-28	10 (0.39)	5 (0.20)	40 (1.57)	12 (0.472)	9 (0.35)	10-32	36.9 (1.45)
32 (1-1/4)	40.0 (1.57)	33.0 (1.30)	44.5 (1.75)	5/16-24	14 (0.55)	7 (0.28)	34 (1.34)	16 (0.630)	9 (0.35)	1/8	49.3 (1.94)
40 (1-1/2)	46.5 (1.83)	39.5 (1.56)	52 (2.05)	3/8-24	14 (0.55)	7 (0.28)	40 (1.57)	16 (0.630)	9 (0.35)	1/8	57 (2.24)
50 (2)	48.5 (1.91)	40.5 (1.59)	63.7 (2.51)	1/2-20	17 (0.67)	8 (0.31)	50 (1.97)	20 (0.787)	11 (0.43)	1/4	70.6 (2.78)
63 (2-1/2)	54.0 (2.13)	46.0 (1.81)	76.7 (3.02)	1/2-20	17 (0.67)	8 (0.31)	60 (2.36)	20 (0.787)	14 (0.55)	1/4	83.6 (3.29)
80 (3-1/4)	63.5 (2.50)	53.5 (2.11)	97.8 (3.85)	5/8-18	22 (0.87)	10 (0.39)	77 (3.03)	25 (0.984)	17.5 (0.69)	3/8	104 (4.09)
100 (4)	75.0 (2.95)	63.0 (2.48)	115.3 (4.54)	3/4-16	27 (1.06)	12 (0.47)	94 (3.70)	30 (1.181)	17.5 (0.69)	3/8	121.9 (4.80)

Compact Cylinders
Premair Series

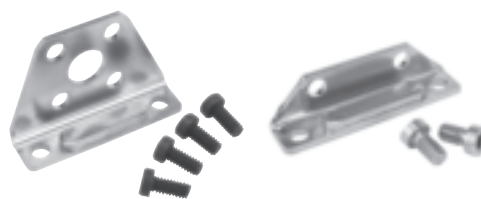
Rod Clevis		
Bore mm (in)	Inch Part Number	Metric Part Number
12 (1/2)	114818-12	114819-12
16 (5/8)	114818-16	114819-16
20 (3/4)	114818-20	114819-20
25 (1)	114818-25	114819-25
32 (1-1/4)	114818-32	114819-32
40 (1-1/2)	114818-40	114819-32
50 (2)	114818-50	114819-50
63 (2-1/2)	114818-50	114819-50
80 (3-1/4)	114818-80	114819-80
100 (4)	114818-100	



Double Clevis rod clevis & rear clevis		
Bore mm (in)	Part Number	Overall Length
12 (1/2)	114817-12	3/4
16 (5/8)	114817-16	53/64
20 (3/4)	114817-20	1 1/16
25 (1)	114817-25	1 1/12
32 (1-1/4)	114817-32	1 1/12
40 (1-1/2)	114817-40	1 17/64
50 (2)	114817-50	1 21/32
63 (2-1/2)	114817-63	1 47/64
80 (3-1/4)	114817-80	2 7/32
100 (4)	114817-100	4 27/32

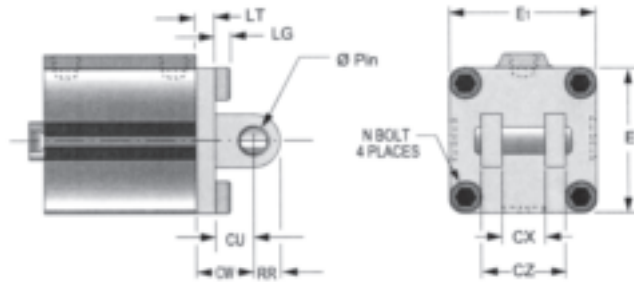


Flange Mount	
Bore mm (in)	Part Number
12 (1/2)	114815-12
16 (5/8)	114815-16
20 (3/4)	114815-20
25 (1)	114815-25
32 (1-1/4)	114815-32
40 (1-1/2)	114815-40
50 (2)	114815-50
63 (2-1/2)	114815-63
80 (3-1/4)	114815-80
100 (4)	114815-100



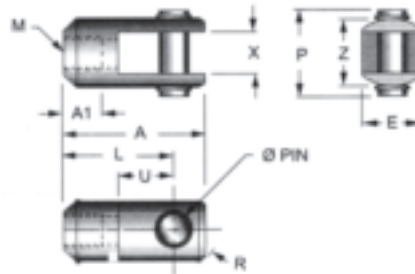
Foot Mount	
Bore mm (in)	Part Number
12 (1/2)	114816-12
16 (5/8)	114816-16
20 (3/4)	114816-20
25 (1)	114816-25
32 (1-1/4)	114816-32
40 (1-1/2)	114816-40
50 (2)	114816-50
63 (2-1/2)	114816-63
80 (3-1/4)	114816-80
100 (4)	114816-100

Compact Cylinders
Premair Series



Double Clevis
Dimensions-inch

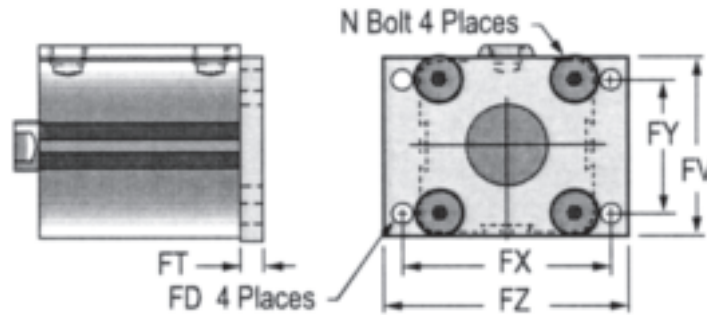
Bore (in)	Pin (in)	CW	CU	CX	CZ	LT	LG	RR	E1	N (bolt)
12 (1/2)	0.187	0.55	0.28	0.02	0.39	0.20	0.11	0.24	0.98	M4x.07
16 (5/8)	0.187	0.59	0.39	0.03	0.47	0.20	0.11	0.24	1.14	M4x.07
20 (3/4)	0.312	0.71	0.47	0.33	0.63	0.20	0.16	0.35	1.42	M6x1.0
25 (1)	0.375	0.79	0.55	0.41	0.79	0.20	0.16	0.39	1.57	M6x1.0
32 (1-1/4)	0.375	0.79	0.55	0.72	1.42	0.24	0.16	0.39	1.75	M6x1.0
40 (1-1/2)	0.375	0.87	0.55	0.72	1.42	0.31	0.16	0.39	2.05	M6x1.0
50 (2)	0.500	1.10	0.79	0.88	1.73	0.31	0.20	0.55	2.51	M8x1.25
63 (2-1/2)	0.500	1.18	0.79	0.88	1.73	0.39	0.24	0.55	3.02	M10x1.5
80 (3-1/4)	0.750	1.50	1.07	1.11	2.20	0.43	0.28	0.71	3.85	M12x1.75
100 (4)	0.875	1.77	1.22	1.27	2.52	0.55	0.28	0.87	4.54	M12x1.75



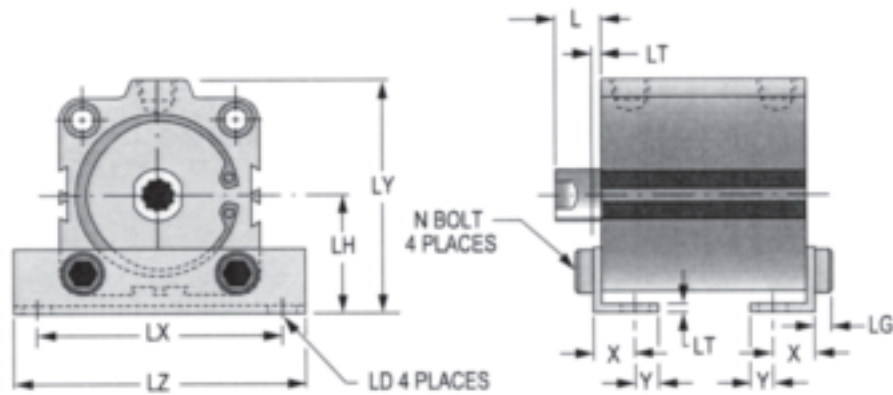
Rod Clevis
Dimensions-inch

Bore mm (in)	L	U	X	Z	P	E	A1	A	R	M (thds) inch
12 (1/2)	0.63	0.27	0.21	0.39	0.55	0.39	0.24	0.85	0.25	#8-32
16 (5/8)	0.83	0.39	0.26	0.47	0.63	0.47	0.24	1.10	0.47	#8-32
20 (3/4)	0.98	0.45	0.33	0.63	0.83	0.63	0.24	1.34	0.41	#10-32
25 (1)	1.18	0.55	0.41	0.78	0.98	0.78	0.31	1.61	0.50	1/4-28
32 (1-1/4)	1.18	0.55	0.72	1.44	1.61	0.87	0.63	1.65	0.47	5/16-24
40 (1-1/2)	1.18	0.55	0.72	1.44	1.61	0.87	0.63	1.65	0.47	3/8-24
50 (2)	1.57	0.79	0.88	1.75	1.97	1.10	0.79	2.20	0.63	1/2-20
63 (2-1/2)	1.57	0.79	0.88	1.75	1.97	1.10	0.79	2.20	0.63	1/2-20
80 (3-1/4)	1.97	1.06	1.12	2.19	2.46	1.50	0.91	2.80	0.83	5/8-18
100 (4)	2.17	1.22	1.28	2.50	2.78	1.73	0.95	3.11	0.95	3/4-16

Compact Cylinders Premair Series



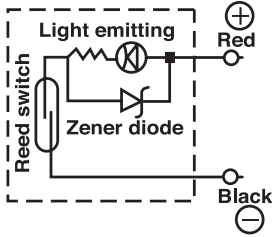
Flange Mount								
Dimensions-inch								
Bore mm (in)	FT	L	N Bolt	FD	FY	FX	FV	FZ
12 (1/2)	0.22	0.31	M4 x 0.7	1.80	-	1.77	0.98	2.17
16 (5/8)	0.22	0.31	M4 x 0.7	1.80	-	1.77	1.18	2.17
20 (3/4)	0.31	0.26	M6 x 1.0	0.26	-	1.89	1.54	2.36
25 (1)	0.31	0.28	M6 x 1.0	0.26	-	2.05	1.65	2.52
32 (1-1/4)	0.31	0.35	M6 x 1.0	0.22	1.34	2.20	1.89	2.56
40 (1-1/2)	0.31	0.35	M6 x 1.0	0.22	1.57	2.44	2.13	2.83
50 (2)	0.35	0.35	M8 x 1.25	0.26	1.97	2.99	2.64	3.50
63 (2-1/2)	0.35	0.35	M10 x 1.50	0.35	2.36	3.62	3.15	4.25
80 (3-1/4)	0.43	0.35	M12 x 1.75	0.43	3.03	4.57	3.90	5.28
100 (4)	0.43	0.43	M12 x 1.75	0.43	3.70	5.35	4.61	6.06



Foot Mount										
Dimensions-inch										
Bore mm (in)	LD	LH	LX	LY	LZ	L	LT	X	Y	LG
12 (1/2)	0.18	0.67	1.34	1.16	1.73	0.53	0.08	0.31	0.18	0.11
16 (5/8)	0.18	0.75	1.50	1.32	1.89	0.53	0.08	0.31	0.20	0.11
20 (3/4)	0.26	0.94	1.89	1.65	2.44	0.57	0.13	0.36	0.23	0.16
25 (1)	0.26	1.02	2.05	1.81	2.60	0.59	0.13	0.42	0.23	0.16
32 (1-1/4)	0.26	1.18	2.24	2.24	2.80	0.67	0.13	0.44	0.23	0.16
40 (1-1/2)	0.26	1.30	2.52	2.52	3.07	0.67	0.13	0.44	0.28	0.60
50 (2)	0.35	1.54	3.11	3.07	3.74	0.71	0.13	0.58	0.31	0.20
63 (2-1/2)	0.43	1.81	3.74	3.60	4.45	0.71	0.13	0.64	0.35	0.24
80 (3-1/4)	0.51	2.32	4.65	4.49	5.51	0.79	0.18	0.77	0.43	0.28
100 (4)	0.51	2.80	5.39	5.35	6.38	0.87	0.24	0.91	0.49	0.28

Compact Cylinders
Premair Series

Sensors



SENSORS			
Part Number	Type	Switching Current	Switching Voltage
114811	Reed Sensor	0.5 Amp. Max	0-120VDC/VAC
114812	Reed Sensor	0.03 Amp Max.	5-120VDC/VAC
114813	Sourcing Sensor	0.20 Amp Max.	Sourcing PNP 6-24VDC
114814	Sinking Sensor	0.20 Amp Max.	Sinking NPN 6-24VDC

MODEL	114811	114812	114813	114814
TYPE	REED	REED	PNP(SOURCING)	NPN(SINKING)
LEAD	2 WIRE	2 WIRE	3 WIRE	3 WIRE
LEAD	PREWIRED 9'	PREWIRED 9'	PREWIRED 9'	PREWIRED 9'
INPUT VOLTAGE	0-120VDC/VAC	5-120 VDC/VAC	6-24 VDC	6-24 VDC
MAX WATTAGE	10	4	0.2	0.2
VOLTAGE DROP		2	0.5	0.5
LED	N/A	YES	YES	YES

Repair Kits (Round and Square Cylinders)

Round						
BORE	BUNA	VITON	LOW TEMP	LOW FRICTION	LOW FRICTION + VITON	LOW FRICTION + LOW TEMP
1/2"	RKSC05-B	RKSC05-V	RKSC05-Q	RKSC05-L	RKSC05-N	RKSC05-M
3/4"	RKSC07-B	RKSC07-V	RKSC07-Q	RKSC07-L	RKSC07-N	RKSC07-M
1-1/8"	RKSC11-B	RKSC11-V	RKSC11-Q	RKSC11-L	RKSC11-N	RKSC11-M
1-1/2"	RKSC15-B	RKSC15-V	RKSC15-Q	RKSC15-L	RKSC15-N	RKSC15-M
2"	RKSC20-B	RKSC20-V	RKSC20-Q	RKSC20-L	RKSC20-N	RKSC20-M
2-1/2"	RKSC25-B	RKSC25-V	RKSC25-Q	RKSC25-L	RKSC25-N	RKSC25-M
3"	RKSC30-B	RKSC30-V	RKSC30-Q	RKSC30-L	RKSC30-N	RKSC30-M
4"	RKSC40-B	RKSC40-V	RKSC40-Q	RKSC40-L	RKSC40-N	RKSC40-M

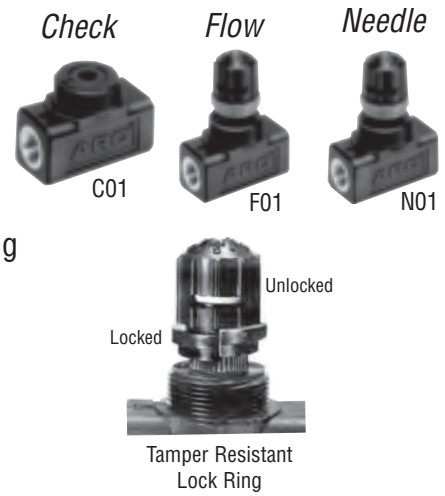
Square	
mm (in)	
12 (1/2)	RKM012-V
16 (5/8)	RKM016-V
20 (3/4)	RKM020-V
25 (1)	RKM025-V
32 (1-1/4)	RKM032-V
40 (1-1/2)	RKM040-V
50 (2)	RKM050-V
63 (2-1/2)	RKM063-V
80 (3-1/4)	RKM080-V
100 (4)	RKM100-V

Pneumatic Valves Flow Controls

Features

In-Line, Composite

- Four Stage, tapered needle design provides infinite control settings.
- Composite body is tough and corrosion resistant.
- Color-coded micrometer & calibrated adjustment knob provide instant reference points for repeat settings. Press red locking ring down prevents adjustment. Tamper resistant wire supplied in package.
- Units are threaded for easy remote panel mounting. Order panel nuts below.
- Needle Valve is available with stainless steel needle & inserts. Order 104104-NS2.



Ordering

104104 - X XX		XX	
Valve Type		Port Size	
Code	Description	Code	Description
C	Check Valve	01	1/8-27 NPTF
F	Flow Control	02	1/4-18 NPTF
N	Needle Valve	03	3/8-18 NPTF
		04	1/2-14 NPTF
		06	3/4-14 NPTF
		* S2	1/4-18 NPTF Stainless Steel inserts & stem & viton seals

* Available on needle valve only.

Panel Mounting Nuts

104096
104094

Port Size

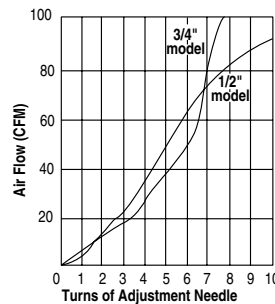
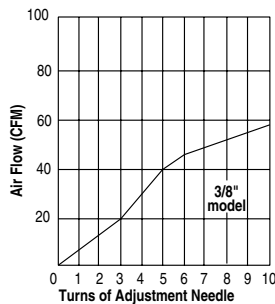
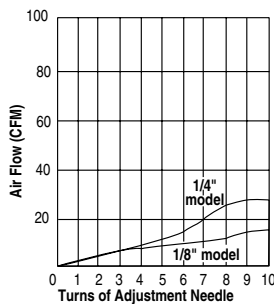
1/8" & 1/4"
3/8", 1/2" & 3/4"

Performance Specifications

Operating Pressure:
200 PSI (13.8 bar)

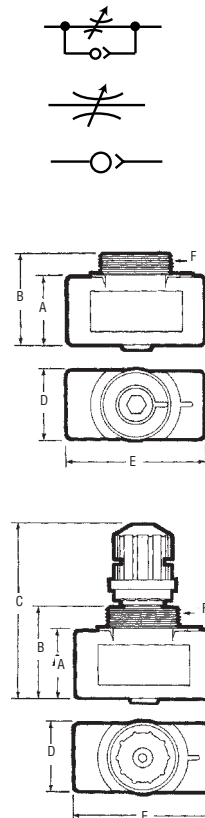
Operating Temperature:
0° - 200°F (-18° - 93°C)

Flow:
100 PSI Inlet



MODEL	PORT* NPT(F)	A	B	C		D	E	F
		inches (mm)	inches (mm)	Min.	Max.	inches (mm)	inches (mm)	inches (mm)
01	1/8-27	15/16 (23.8)	1-11/32 (34.1)	2-33/64 (63.9)	2-53/64 (71.6)	15/16 (23.8)	1-29/32 (48.4)	1-20 UNEF-2A
02	1/4-18	15/16 (23.8)	1-11/32 (34.1)	2-33/64 (63.9)	2-53/64 (71.6)	15/16 (23.8)	1-29/32 (48.4)	1-20 UNEF-2A
03	3/8-18	1-5/16 (33.3)	1-11/16 (42.9)	3-23/64 (85.3)	3-55/64 (97.8)	1-5/16 (33.3)	2-27/32 (72.2)	1-3/16-18 UNEF-2A
04	1/2-14	1-5/16 (33.3)	1-11/16 (42.9)	3-23/64 (85.3)	3-55/64 (97.8)	1-5/16 (33.3)	2-27/32 (72.2)	1-3/16-18 UNEF-2A
06	3/4-14	1-9/16 (39.7)	2 (50.8)	3-43/64 (93.3)	4-11/64 (105.7)	1-9/16 (39.7)	3 (76.2)	1-3/16-18 UNEF-2A

Dimensional Data



Pneumatic Valves Flow Controls

Features

- 360° swivel eases tube alignment. Preapplied thread sealant eliminates Teflon taping.
- Choose threaded or instant tube fitting inlets; slotted or knob flow adjustment.
- Sturdy components include nickel-plated brass body, black anodized aluminum swivel, Buna-N seals and a stainless steel spring.
- Ready for installation on all ARO and competitive cylinders.
- Consult factory for BSP size models.



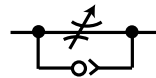
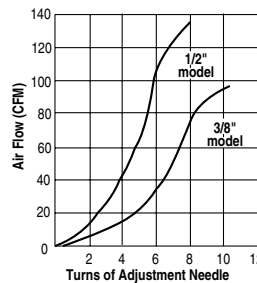
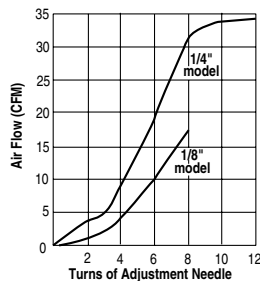
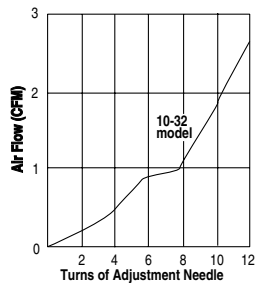
Ordering

SLOTTED ADJUST				KNOB ADJUST			
119307-XXX		119309-XXX		119308-XXX		119310-XXX	
Male x Female thd	Description	Male thd x fitting	Description	Male x Female thd	Description	Male thd x fitting	Description
XXX Male x Female		xxx Male x Tubing		xxx Male x Female		XXX Male x Tubing	
103	10-32x10-32	103	10-32 x 5/32"	125	1/8" x 1/8" NPT	120	1/8" x 5/32"
125	1/8" x 1/8" NPT	120	1/8" x 5/32"	250	1/4" x 1/4" NPT	125	1/8" x 1/4"
250	1/4" x 1/4" NPT	125	1/8v x 1/4"	375	3/8" x 3/8" NPT	250	1/4" x 1/4"
375	3/8" x 3/8" NPT	250	1/4" x 1/4"	500	1/2" x 1/2" NPT	255	1/4" x 3/8"
500	1/2" x 1/2" NPT	255	1/4" x 3/8"			375	3/8" x 3/8"
		375	3/8" x 3/8"				

Performance Specifications

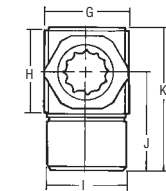
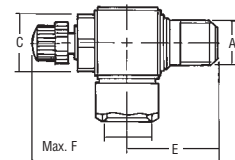
Operating Pressure: 15-150 PSI (1-10 bar)

Operating Temperature:
-32°F - 158°F

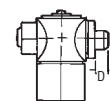
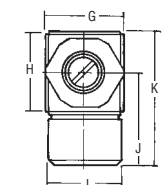
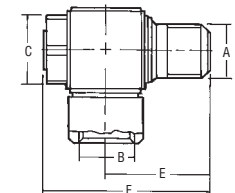


Dimensional Data

KNOB ADJUST



SLOTTED ADJUST



	PORT SIZE "A" & "B"	"C" inches (mm)	"D" inches (mm)	"E" inches (mm)	"F" inches (mm)	"G" inches (mm)	"H" inches (mm)	"I" inches (mm)	"J" inches (mm)	"K" inches (mm)
SLOTTED ADJUST	10/32	5/16 (8)	1/8 (3.2)	27/64 (11)	53/64 (21)	27/64 (11)	11/32 (9)	7/16 (11)	37/64 (14.7)	53/64 (21.1)
	1/8	1/2 (13)	0	25/32 (19.8)	1-17/64 (32)	19/32 (15)	19/32 (15)	33/64 (13)	47/64 (18.5)	1-3/64 (26.7)
	1/4	43/64 (17)	0	1-1/64 (25.8)	1-39/64 (41)	3/4 (19)	3/4 (19)	23/32 (18)	7/8 (22.5)	1-19/64 (32.9)
	3/8	7/8 (22)	0	1-9/64 (29)	1-27/32 (47)	29/32 (23)	29/32 (23)	29/32 (23)	1-1/8 (28.5)	1-39/64 (41)
	1/2	1-1/16 (27)	0	1-27/64 (36)	2-9/32 (58)	1-7/64 (28)	1-7/64 (28)	63/64 (25)	1-7/32 (31)	1-53/64 (46.3)
KNOB ADJUST	1/8	33/64 (13)	0	25/32 (19.8)	1-7/8 (47.5)	19/32 (15)	19/32 (15)	33/64 (13)	47/64 (18.5)	1-3/64 (26.7)
	1/4	43/64 (17)	0	1-1/64 (25.8)	2-9/32 (58)	3/4 (19)	3/4 (19)	45/64 (18)	57/64 (22.5)	1-19/64 (32.9)
	3/8	7/8 (22)	0	1-9/64 (29)	2-37/64 (65.5)	29/32 (23)	29/32 (23)	29/32 (23)	1-1/8 (28.5)	1-39/64 (41)
	1/2	1-1/16 (27)	0	1-27/64 (36)	3-5/32 (80)	1-7/64 (28)	1-7/64 (28)	63/64 (25)	1-7/32 (31)	1-53/64 (46.3)

Air System Components

Ordering

Standard Filters

Designed to remove rust, scale, condensed water and other debris from compressed air lines which may cause wear and premature failure of tools, valves, cylinders and other pneumatic equipment.

Port Size	Model	Filter Element	Flow* cfm	Bowl	Bowl Size	Drain	Max. Inlet Pressure
1/8" & 1/4" Port - ARO Module/Air 1000 Series							
1/8"	F25111-200	20 Micron	28	Polycarbonate/Guard	1.0 oz.	Manual	200 PSIG
1/4"	F25121-200	20 Micron	38	Polycarbonate/Guard	1.0 oz.	Manual	200 PSIG
1/4" & 3/8" & 1/2" Port - ARO Module/Air 2000 Series							
1/4"	F25221-110	40 Micron	54	Metal w/sight glass	6.0 oz.	Manual	175 PSIG
3/8"	F25231-110	40 Micron	100	Metal w/sight glass	6.0 oz.	Manual	175 PSIG
1/2"	F25241-110	40 Micron	122	Metal w/sight glass	6.0 oz.	Manual	175 PSIG
3/4" & 1" Port - ARO Super-Duty Series							
3/4"	F25451-110	40 Micron	345	Metal w/sight glass	32 oz.	Manual	250 PSIG
1"	F25461-110	40 Micron	345	Metal w/sight glass	32 oz.	Manual	250 PSIG

* Air Flow is at 90 PSI Inlet and 5 PSI pressure drop.



F25121-200

Coalescing Filters

Designed for paint spraying, instrumentation, controls and other applications where the delivered air must be free of oil and fine particles. Effective in removing 99.9% of oil aerosols. Also effective in removing debris particles down to .3 micron. Recommended for use in conjunction with an upstream filter to maximize the life of replacement element.

Port Size	Model	Filter Element	Flow* cfm	Bowl	Bowl Size	Drain	Max. Inlet Pressure
1/8" & 1/4" Port - ARO Module/Air 1000 Series							
1/8"	F25111-300	Coalescing	15	Polycarbonate	1.0 oz.	Manual	200 PSIG
1/4"	F25121-300	Coalescing	17	Polycarbonate	1.0 oz.	Manual	200 PSIG
1/4" & 3/8" & 1/2" Port - ARO Module/Air 2000 Series							
1/4"	F25221-310	Coalescing	40	Metal w/sight glass	6.0 oz.	Manual	175 PSIG
3/8"	F25231-310	Coalescing	51	Metal w/sight glass	6.0 oz.	Manual	175 PSIG
1/2"	F25241-310	Coalescing	53	Metal w/sight glass	6.0 oz.	Manual	175 PSIG
3/4" & 1" Port - ARO Super-Duty Series							
3/4"	F25452-310	Coalescing	50	Metal w/sight glass	32 oz.	Manual	250 PSIG
1"	F25462-310	Coalescing	150	Metal w/sight glass	32 oz.	Manual	250 PSIG

* Air Flow is at 90 PSI Inlet and 5 PSI pressure drop.



F25221-110



F25451-110

Accessories

Part Number	Description	Part Number	Description
ARO Module/Air 1000 Series		ARO Module/Air 2000 Series	
29660-2	20 Micron Element	100031-1	40 Micron Element
29586	Coalescing Element	100032	Coalescing Element
104257	Service Kit	104068	Auto Drain Kit
104264	Auto Drain Kit	104204	Metal w/sight glass
104258	Polycarbonate Bowl	104176	Service Kit
104259	Composite Bowl	ARO Super/Duty Series	
		104119	40 Micron Element
		104231	Coalescing Element
		104116	Service Kit
		104068	Auto Drain
		104163	Sight Glass Kit

Air System Components

Ordering

Piggyback Filter/Regulators

Combined air filtration and regulation in a single, compact unit. Saves space for added system design flexibility. Piggyback Filter Regulators supplied with pressure gauge.

Port Size	Model	Pressure Range	Filter Element	Flow* cfm	Bowl	Bowl Size	Drain	Max. Inlet Pressure
1/8" & 1/4" Port - ARO Module/Air 1000 Series								
1/8"	P29112-600	5-125 PSIG	20 Micron	12	Polycarbonate/Guard	1.0 oz.	Manual	200 PSIG
1/4"	P29122-600	5-125 PSIG	20 Micron	12	Polycarbonate/Guard	1.0 oz.	Manual	200 PSIG
1/4" & 3/8" & 1/2" Port - ARO Module/Air 2000 Series								
1/4"	P29221-610	5-125 PSIG	40 Micron	93	Metal w/sight glass	6.0 oz.	Manual	175 PSIG
3/8"	P29231-610	5-125 PSIG	40 Micron	135	Metal w/sight glass	6.0 oz.	Manual	175 PSIG
1/2"	P29241-610	5-125 PSIG	40 Micron	140	Metal w/sight glass	6.0 oz.	Manual	175 PSIG

* Air Flow is at 90 PSI Inlet and 5 PSI pressure drop.



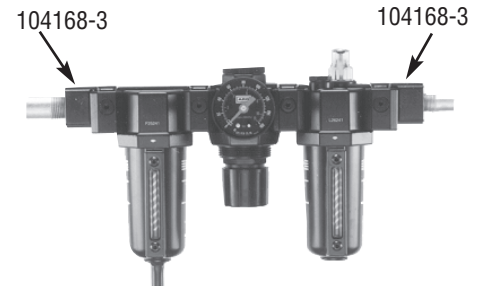
Accessories

ARO Module/Air 2000 FRL Components

A. Threaded Pipe Adapters - Model 104168 ()

Pipe adapters allow a single component or assembled combo to be removed for service without disturbing hard piping. Also allows for different pipe diameters (in and out) in the plumbing installation. Kit includes two adapters and two spacer kits.

Port Size	Model
1/4"	104168-2
3/8"	104168-3
1/2"	104168-4
3/4"	104168-5



B. Safety Shutoff, Lockout Valve - Model 104174 ()

Exhaust-type safety shutoff valve can be used in either a modular arrangement, with out FRL's or as a stand alone unit. Should be installed upstream from the FRL, and is ideal for isolating and depressurizing a downstream unit requiring maintenance. Valve may be locked in the exhaust position.

Port Size	Model
1/4"	104174-2
3/8"	104174-3
1/2"	104174-4



104174-2

C. Modular Spacer Kit - Model 104167

One spacer kit is required to connect any two components or accessories. Kit includes the spacer block, two clamps and two O-rings. Fits all port sizes.

104167



D. T-Type Wall Mounting Bracket - Model 104171

T-Type Brackets provide heavy duty wall mounting of a single unit or multiple units in a modular arrangement. Kit includes a spacer, bracket and clamp.

104171



E. Modular Manifold Block - Model 104170

Provides four additional 1/4" NPT ports for greater circuit design flexibility. Kit includes manifold, two spacer kits and three hole plugs.



F. Wall Mounting Kit - Model 104172

May be used to mount FRL combo units which include a regulator, "Piggyback" Filter/Regulator units, or individual regulators. Kit includes Model 29623 Bracket and Model 104173 Panel Mounting Nut. Bracket and Nut may be ordered individually.



104172

Air System Components

Air Line Relieving Regulators

Provide controlled, consistent air pressure as required for specific pneumatic equipment connected to the compressed air system. Relieving models vent downstream overpressure. Available spring options enable convenient pressure range conversions as requirements change. Unit supplied with gauge.



Port Size	Model	Pressure Range	Flow* cfm	Gauge Port	Max. Inlet Pressure
1/8" & 1/4" Port - ARO Module/Air 1000 Series					
1/8"	R27111-600	0-125 PSIG	13	1/8"	250 PSIG
1/4"	R27121-600	0-125 PSIG	13	1/8"	250 PSIG
1/4" & 3/8" & 1/2" Port - ARO Module/Air Series					
1/4"	R27221-600	5-125 PSIG	105	1/4"	200 PSIG
3/8"	R27231-600	5-125 PSIG	106	1/4"	200 PSIG
1/2"	R27241-600	5-125 PSIG	125	1/4"	200 PSIG
1/2" & 3/4" & 1" Port - ARO Heavy-Duty Series					
1/2"	27344-600	5-125 PSIG	256	1/4"	250 PSIG
3/4"	27354-600	5-125 PSIG	287	1/4"	250 PSIG
1"	27364-600	5-125 PSIG	293	1/4"	250 PSIG

* Air Flow is at 90 PSI Inlet and 5 PSI pressure drop.

Accessories



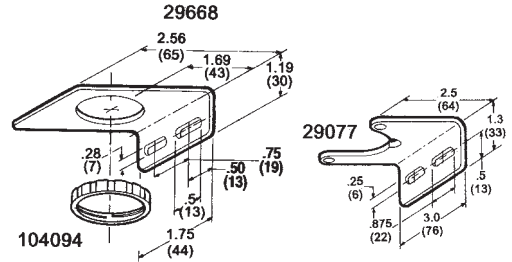
29850



100067



104172



Air Line Relieving Regulators

ARO Module/Air 1000 Series

Part Number	Description
29846	Gauge, 0-15 PSIG
29863	Gauge, 0-60 PSIG
29850	Gauge, 0-160 PSIG
100095-160	Gauge, 0-150 PSIG
29668	Mounting Bracket
104094	Panel Mounting Nut
104255	Service Kit, Relieving Models

ARO Module/Air 2000 Series

Part Number	Description
100067	Gauge, 0-160 PSIG
104172	Wall Mount Kit (Includes Bracket & Panel Nut)
104173	Panel Mounting Nut
104175	Tamper Resistant Kit
104177	Service Kit, Relieving Models
29728	Gauge, 0-160 PSIG Bottomport

ARO Heavy-Duty Series

Part Number	Description
100067	Gauge, 0-160 PSIG
100083	Gauge, 0-300 PSIG
29960	Service Kit
29077	Wall Mounting Bracket

Air System Components

Ordering

Fog-Type Lubricators

Help ensure that pneumatic devices receive the required lubrication to maintain operating performance, reduce wear and prolong service life. They are designed to provide the correct amount of oil needed for most general applications in a pneumatic system, delivering a constant ratio of oil to CFM. Precise oil feed adjustment allows the proper oil delivery rate. Lubricators should be installed close to the downstream application to ensure effective distribution of oil to the pneumatic components.

Port Size	Model	Flow* cfm	Bowl	Bowl Size	Max. Inlet Pressure
1/8" & 1/4" Port - ARO Module/Air 1000 Series					
1/8"	L26111-100	41	Polycarbonate/Guard	1.0 oz.	200 PSIG
1/4"	L26121-100	60	Polycarbonate/Guard	1.0 oz.	200 PSIG
1/4" & 3/8" & 1/2" Port - ARO Module/Air Series					
1/4"	L26221-110	75	Metal w/sight glass	6.0 oz.	175 PSIG
3/8"	L26231-110	100	Metal w/sight glass	6.0 oz.	175 PSIG
1/2"	L26241-110	110	Metal w/sight glass	6.0 oz.	175 PSIG
3/4" & 1" Port - ARO Super-Duty Series					
3/4"	L26451-110	190	Metal w/sight glass	32 oz.	250 PSIG
1"	L26461-110	200	Metal w/sight glass	32 oz.	250 PSIG

* Air Flow is at 90 PSI Inlet and 5 PSI pressure drop.

Lubricator

Part Number	Description
ARO Module/Air 1000 Series	
104181	Service Kit
104260	Polycarbonate Bowl
104261	Composite Bowl
104262	Mounting Bracket
ARO Module/Air 2000 Series	
104181	Service Kit
104205	Metal Bowl w/sight Glass
ARO Super-Duty Series	
104118	Service Kit
104163	Sight Glass Kit

Accessories

Air Line Lubricator Oil

ARO Lubricating Oil is recommended for use with pneumatic power tools, motors, valves, cylinders and hoists. It is specially formulated for use in air line lubricators. Proper and regular lubrication helps ensure longer, trouble-free operation by reducing wear, saving power and cutting equipment maintenance costs.

ARO Lubricating Oil is available in 1-quart containers and may be ordered by specifying part number 29665. (Available in cases of 12).

Viscosity:	100-200 S.S.U. @ 100°F (38° C) min. aniline point of 200°F (93°C)
Class:	II Lubricant
Approx. SEA No:	Light SAE 10, non-detergent.



L26121-100



L26221-110



L26451-110



29665

Warnings

General Information

Warnings

Harmful Compressor Oils & Other Materials

Some oils used in air compressors contain chemicals harmful to Buna-N seals, if not adequately filtered at the compressor. The most common of these oils, in addition to other harmful material, are listed below.

COMPRESSOR OILS	COMPRESSOR OILS	OTHER MATERIALS
Cellulube No. 150 & 220	Phrano	Garlock No. 98403 (Polyurethane)
Haskel No. 568-023	Pydraul AC	Parco No. 3106 (Neoprene)
Houghton & Co. Oil No. 1120, No. 1130, No. 1055	Sears Regular Motor Oil	Some Loctite Compounds
Houtosafe 1000	Sinclair Oil "Lily White" (Polyurethane)	Stillman No. SR269-75
Kano Kroil	Skydrol	Stillman No. SR513-70 (Neoprene)
Keyston Penetrating Oil No. 2 & No. 500 Oils	Tenneco Anderol No. 495	
Marvel Mystery Oil		

CAUTION: Compounded oils containing graphite and fillers are not recommended for use with cylinders.

Air & Lubrication Requirement

AIR PRESSURE: Limited to 200 psig (14 bar) **FILTRATION:** 40 Micron. Proper moisture removal and filtration of contaminates will promote good service life and operation. Install an air regulator to control the operating pressure, insure smooth operation and conserve energy.

LUBRICATION: All valve components have been lubricated at the factory and can be operated without additional air line lubrication. Minimal lubrication may extend the life of the valve. 50 Series, E-Series and K-Series Valves use o-ring seals. For maximum performance and life expectancy, standard air line lubrication should be used. If air line cylinders or other air line devices, used in conjunction with ARO valve, require lubrication, be sure the lubricating oils used are compatible with the valve seals and are of sufficient viscosity to assure adequate lubrication.

ARO recommends an oil lubricant with a viscosity of 100-200 SUS at 100° F and an airline point above 200° F.

NOTICE: The use of compound oils containing graphite filters, extremely low viscosities and other non-fluid lubricants is not recommended. **RECOMMENDED:** ARO 29665 air line lubricator oil is available in one quart containers.

Warning

The following are hazards or unsafe practices which could result in severe personal injury, death or substantial property damage. Heed the following. Use safeguards. Insure that provisions are made to prevent the valve from being accidentally operated (actuated.)

Hazardous Air Pressure. Shut off, disconnect and relieve any trapped air pressure from system before performing service or maintenance.

Hazardous Voltage. Do not attempt any service without disconnecting all electrical supply sources.

NOTICE: Genesis Series Valves must be grounded.

Do not use the valve as a safety device or to operate or control the operation of full revolution clutch systems or brake systems on power presses or similar equipment. These valves are not intended for such applications. Do not subject the valve to any condition that exceeds the limits set forth in the specifications for a particular valve model. Keep all hoses, electrical wiring, fittings and connections in good working condition. Damaged air pressure hoses, electrical wiring, or connections, could cause accidental valve operation (actuation). Only allow qualified technicians to install or maintain the valve system. It is necessary to have a thorough understanding of the operation and application of all valves being used in a particular system and how they interact with the other components of the system.

General Information

To obtain information or to receive technical literature for specific cylinders: contact ARO Customer Service at (800) 495-0276 or contact your nearest ARO distributor. Selected parts are provided in kit form. The ARO Parts List/Service Instructions contain Repair Kit information and complete Service

Parts information and are available upon request. Order Manuals as shown. The following Operator's Manuals are available.

Operator's Manual	Part Number
ARO CYLINDERS	119999-27
PROVENAIR	119999-30
ECONOMAIR	119999-16
MICROAIR	119999-41
PREMAIR COMPACTS	119999-78
PROVENAIR TANKS	119999-032

Cylinders Warranty

Five Year Product Warranty

The ARO Cylinders, in this catalog are backed up by our famous 5-year warranty, as a measure of the confidence we place in the quality of these products. A confidence that you can share.

FIVE-YEAR WARRANTY

Ingersoll Rand/ARO warrants to the original use purchaser of Ingersoll Rand/ARO manufactured cylinders that Ingersoll Rand/ARO will repair or replace, free of charges, including return shipping costs within the Continental United States of America, any such product which under normal use and service proves defective in material or workmanship, as determined by Ingersoll Rand/ARO Inspection, within FIVE YEARS from date of shipment from Ingersoll Rand/ARO, provided the claimed defective product, or part thereof, is promptly returned to the Ingersoll Rand/ARO factory or Ingersoll Rand/ARO authorized warranty repair center with transportation prepaid.

This warranty does not cover failure of parts or components due to normal wear or damage, which in the judgment of Ingersoll Rand/ARO, arises from misuse, abrasion, corrosion, negligence, accident, substitution of non-Ingersoll Rand/ARO parts, faulty installation or tampering.

If Ingersoll Rand/ARO Inspection discloses no defect in material or workmanship, repair or replacement and return will be made at customary charges.

This warranty covers Ingersoll Rand/ARO manufactured products shipped on or after July 4, 1988.

Equipment not covered by Ingersoll Rand/ARO warranty: accessories or components of equipment sold by Ingersoll Rand/ARO that are not manufactured by Ingersoll Rand/ARO (such as switches, hoses, gasoline engines, etc.) are subject to the warranty, if any, of their manufacturer. Ingersoll Rand/ARO will provide the purchaser with reasonable assistance in making such claims.

The foregoing warranty supersedes, voids and is in lieu of all or any other warranties, express or implied, and no warranty or merchantability or fitness for particular purpose is intended or made. Ingersoll Rand/ARO's sole obligation and the original use purchaser's sole remedy is as stated above and in no event shall Ingersoll Rand/ARO be liable for any special, direct, indirect, incidental, consequential or other damages, or expenses of any nature including, without limitation, loss of profits or production time incurred by the original use purchaser or any other party.



Ingersoll Rand Industrial Technologies provides products, services, and solutions to enhance the efficiency and productivity of our commercial, industrial, and process customers. Our innovative products include air compressors, air systems components, tools, pumps, material and fluid handling systems and microturbines.

www.irttools.com/aro