CILCAT-1006

Clippard Minimatic®

Manufacturer of Pneumatic & Electronic Control Devices

- Cylinders
- Control Valves
- Electronic Valves
- Modular Valves
- Fittings & Hose
- Air Preparation

Orders

Place your order with your nearest distributor or directly on www.clippard.com

Technical Support

Get answers to your questions from experienced application specialists at your distributor or Clippard's Technical Support Group.

Distributors

A fully-trained, professional distributor network markets and supports Clippard products worldwide. To assure quality performance, close customer contact is maintained through a network of over 100 stocking distributors, with over 800 fluid power specialists.

International Sales

Ordering from around the world? Visit www.clippard.com to find the distributor in your area.

Mailing Address & Phone

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7390 Colerain Avenue
Cincinnati, Ohio 45239
513-521-4261 • Fax: 513-521-4464

Clippard Europe Sales Office
Parc Scientifique Einstein
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BE-1348 Louvain-la-Neuve, Belgium
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Contact Us by e-mail

sales@clippard.com

On-Line Ordering & Information

Go to our web site to learn more about Clippard. You will find helpful downloads, detailed product information, CAD files, conversion tables, product configurators and more.

www.clippard.com

Toll Free - 877-245-6247

Clippard Minimatic®

Leonard Clippard founded Clippard Instrument Laboratory, Inc. in 1941. The initial product line consisted of electronic test equipment and radio frequency coils. The manufacturing of these products required machinery employing the use of small, yet powerful, pneumatic cylinders and valves. Since no such products were commercially available, Leonard Clippard designed and built his own. Because the need for these components was widespread, particularly in manufacturing automated fixturing, Clippard presented them as a new product line in 1949.

Until his retirement in 1977, Leonard Clippard continued to be a pioneer in miniature pneumatic components. Today, the company is managed by William L. Clippard III, president and Robert L. Clippard, vice-president; the Minimatic® line has grown to include over 5,000 standard products.

The people of Clippard have many unique talents and abilities. They have built a wealth of experience in all aspects of miniature pneumatics. The company's headquarters are located in Cincinnati, Ohio. All sales and corporate offices are housed there as well as the manufacture of valves, modules, and fittings. Clippard runs over 25 automatic screw machines and 12 CNC machining centers to make most of its component parts. Some parts are also purchased from carefully selected vendors, most of which have a long term relationship with Clippard.

Extensive secondary operations and assembly complete the core of manufacturing. The unique aspect is the extensive use of Clippard products on all machinery, fixtures, and jigs throughout the plant, most of which are custom made in Clippard's own shop. Clippard Minimatics® are widely used to speed and improve production. Few other manufacturers can demonstrate such an earnest commitment to the value of their own products.

In nearby Fairfield, Ohio, Clippard built a new plant in 1998 to manufacture electronic interface valves and air cylinders. Situated on 16.9, acres this facility has plenty of room for growth. In Madison, Indiana, a small subsidiary makes acrylic modular circuit subplates. The fourth Clippard facility is four thousand miles away, a sales and distribution center, Clippard Europe S.A., in Belgium.

Visitors to the Clippard plants are most impressed not just with machines and facilities, but with the people. Indeed these achievements are not accidental. Clippard has honed its policies and procedures to create a positive and efficient workplace. Things like job enrichment, cross training, safety training, process controls, individual empowerment, and continuing education opportunities have made our work-force second to none.

Mission

The people at Clippard recognize the importance of keeping business and manufacturing thriving in a rapidly changing world economy. Today's fast-paced, industrial market demands productivity. By supplying high quality miniature pneumatic components at affordable prices, along with expert application assistance, Clippard makes the benefits of increased productivity available to everyone.

Markets Served

Clippard's worldwide distributor network has grown to include offices in 30 countries and throughout the U.S., providing quality components for an unlimited list of applications. From a simple two step machine process, to complex automation of sophisticated machinery, Clippard Minimatics® are used virtually everywhere for control, interface, sensing, logic, and actuation functions. This broad range of applications spans a variety of industries including: machinery, packaging, textiles, medical equipment, animation, agriculture, material handling, mobile equipment, assembly, recreation, electronics, food processing, coatings, security, chemicals, construction, testing, mining, and many more.

Product Lines

Some of the many products offered include Minimatic® valves, cylinders, fittings, modular components, push buttons, stainless steel cylinders, electronic manifold cards, circuit analyzers, and prepiped circuit manifold subplates. Special components designed for customer's OEM applications are also available.

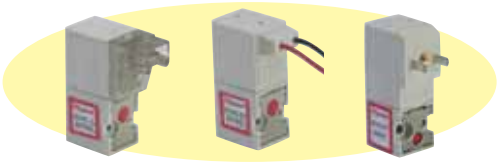
Quality

Quality remains a primary feature with every product Clippard produces. This is achieved through the excellence in manufacturing practices and craftsmanship that has continued throughout the years. The high standards set by Leonard Clippard, in company relationships with customers, distributors, suppliers. And employees continue to be upheld. The company motto, "Quality People, Quality Products," emphasizes the important role every employee plays in maintaining the company's reputation.

NEW PRODUCTS!

Some of Clippard's exciting new product include:

Page(s)



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Fittings, Hose & Tubing Cont'd.

NEW! Air Preparation Eqt.339-358

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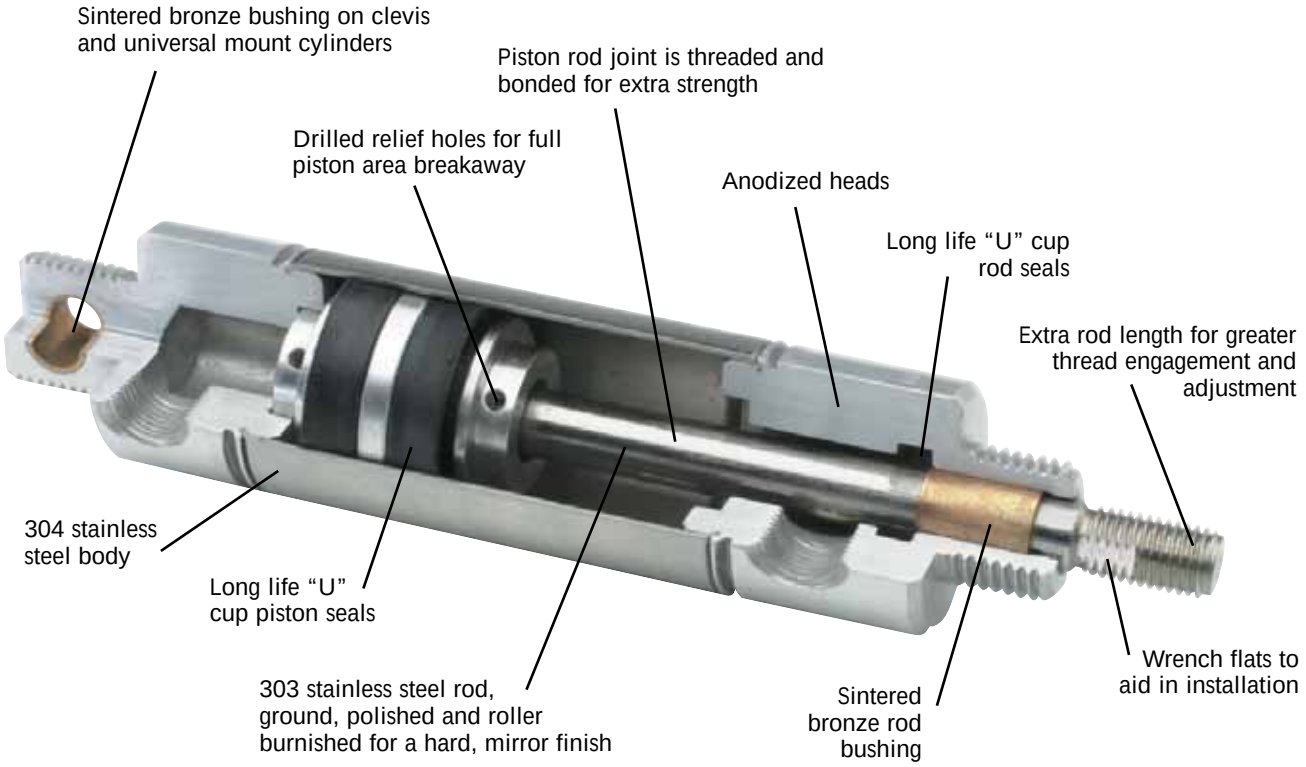
Stainless Steel Cylinder Construction

In the early 1950's, Clippard introduced miniature pneumatic cylinders and valves to industry. No other manufacturer can boast of the same experience or knowledge of miniature components.

Air cylinders have always been an integral part of the Clippard Minimatic® line. Over the years Clippard has responded to requests from cylinder users to provide additional sizes of air cylinders and auxiliary support products. While competitively priced, these products maintain the Clippard standard for quality and reliability that has been the industry standard for many years.



Features

- Polished I.D. 304 stainless steel tubes for low breakaway
- Precision rolled construction for a solid, leakproof cylinder at a reasonable price
- Machined aluminum heads are clear anodized for extra protection against corrosion
- Cylinder heads are machined from one side for better concentricity
- Sintered bronze rod bushing
- Sintered bronze clevis bushing on all clevis and universal mount cylinders
- Rods are threaded and bonded to pistons
- Repairable rod seal on 28 through 48 series
- Ground, polished and roller burnished 303 stainless rods provide a smoother rod finish that protects rod seals, giving longer life
- Full piston area breakaway to assure full power from the beginning of each stroke
- Buna-N "U"-cup piston seals for full power, low friction and trouble-free performance
- Buna-N "U"-cup rod seals for leakproof operation
- Temperature range: 32˚ to 230˚F
- Maximum pressure: 250 psig

NUMBERING SYSTEM

❑ - ❑ - ❑ - ❑ - ❑ - ❑ - ❑

Mounting Type
S - Stud
U - Universal
C - Clevis
F - Front Block
E - End Stud
T - Trunnion

Cylinder Type
D - Double Acting
S - Single Acting
R - Reverse Acting
F - Front Spring Bias
B - Back Spring Bias

Rod Type
D - Double Ended Rod
R - Rotating Rod
N - Non-Rotating Rod
H - Hollow Rod

Bore
05 - 5/16"
08 - 1/2"
10 - 5/8"
12 - 3/4"
14 - 7/8"
17 - 1 1/16"
20 - 1 1/4"
24 - 1 1/2"
28 - 1 3/4"
32 - 2"
40 - 2 1/2"
48 - 3"

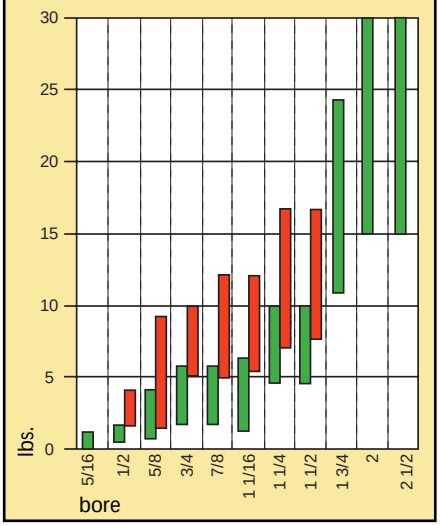
Stroke
In inches & fractions of an inch

Options
B - Bumpers
V - Fluorocarbon Seals
C - Cushions
MB - Magnetic Piston for Hall Effect sensors (includes bumpers)
F - Cushion Front End
R - Cushion Rear End
W - Rod Wiper
S - Side Ported
H - Heavy Spring
P - Rotated Ports

Not all combinations are available - consult factory

SPECIFICATIONS

STAINLESS STEEL CYLINDER
STANDARD & HEAVY SPRING FORCES

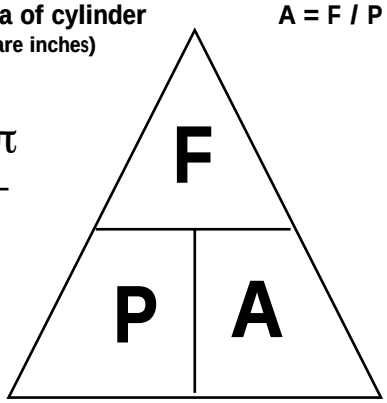


Bore Size	5/16"	1/2"	5/8"	3/4"	7/8"	1-1/16"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"	3"
Force Factor - Extend (Area)	0.07	0.19	0.31	0.44	0.60	0.88	1.2	1.7	2.4	3.1	4.9	7.0
Rod Size	1/8"	3/16"	3/16"	1/4"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	5/8"	3/4"
Rod Area	0.01	0.03	0.03	0.05	0.05	0.08	0.11	0.15	0.20	0.31	0.31	0.44
Force Factor - Retract (Area)	0.06	0.16	0.28	0.39	0.55	0.80	1.09	1.55	2.20	2.90	4.59	6.56

The force required, operating air pressure and cylinder bore are all factors that must be determined or known when sizing an air cylinder. If two are known the other is easily calculated per the formulas and triangle shown below.

Area is derived using either of the following formulas: **Diameter ² x 0.7854 or Radius ² x π**

F - Force or load in pounds **F = P x A**
P - Pressure **P = F / A**
A - Area of cylinder (square inches) **A = F / P**



Standard Spring Forces (lbs)

Bore	5/16"	1/2"	5/8"	3/4"	7/8"	1-1/16"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"
At Rest	0.5	0.9	1.3	3.0	3.0	2.0	4.5	4.5	11.0	15.0	15.0
Compressed	1.0	2.0	4.0	6.0	6.0	7.0	10.0	10.0	24.0	30.0	30.0

Heavy Spring Forces (lbs)

Bore	5/16"	1/2"	5/8"	3/4"	7/8"	1-1/16"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"
At Rest	N/A	2.0	3.3	5.0	5.0	5.5	8.5	8.5	N/A	N/A	N/A
Compressed	N/A	4.0	9.0	10.0	10.0	13.0	17.0	17.0	N/A	N/A	N/A

OPTIONS

The following options are available with Clippard stainless steel cylinders. Available options are shown by the abbreviations noted in the information shown with each standard cylinder.

Fluorocarbon Seals -V

This option is used in applications where chemical resistance, compatibility and temperature become an issue. Temperature ranges: -20 up to 400°F.

Cushions -C

(Front Cushion Only) -F
(Rear Cushion Only) -R

Clippard's cushion cylinders offer an adjustable cushion to slow the cylinder near the end of the stroke to reduce impact and prolong cylinder life. Our adjustment needle is held captive to prevent the needle from blowing out. The cushion can be adjusted to have a dead stop 1/2" from end of stroke or adjusted to have virtually no effect on the action of the cylinder. See specific cylinder specifications for availability of this option.

No Rod Threads -N

Rods are provided with no threads when this option is ordered.

Magnetic Piston -MB

A magnet is attached to the piston that will actuate the Hall Effect and reed switches. This option also includes bumpers and extends the overall length of the cylinder. Switches and clamps need to be ordered separately. For more information see page 83 on Clippard's Hall Effect and reed switches. For multiple reed switches we need a 1" stroke or more. Maximum temperature 300˚ F.

Rod Wipers -W

Rod Wipers are added to cylinders in applications where a liquid wash could dry out the rod seals of a double acting cylinder.

Non-standard Options

Extra Rod Extensions
Thread Modifications
Silk Screening Private Labels

If you can't find a cylinder to suit your needs call your Clippard distributor to inquire about custom cylinders.

Bumpers -B

Internal polyurethane bumpers are supplied for applications where the cylinder is cycled with a light load and/or high speeds. The elastic bumpers reduce noise and shock to the load. Use of this option may add to the overall length of the cylinder. See specific cylinder listings on the following pages for availability and details of the overall length added. Maximum temperature 200˚ F.

Side Ported -S

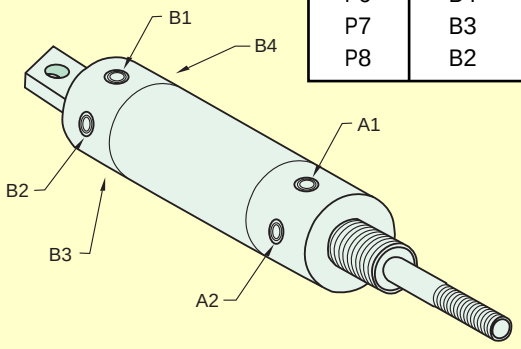
Side ported rear heads are sometimes needed when the standard cylinder has the rear port out the back. This option changes the design of the rear head so the rear port is located on the side of the cylinder. Overall length of cylinder changes with this option.

Heavy Spring -H

In single acting, reverse acting or spring bias cylinders the standard spring force can be changed by ordering the -H option. The spring forces for the heavy springs are shown on page 3.

Rotated Ports

Option #	Rear Port	Front Port
P2	B2	A2
P3	B1	A2
P4	B4	A2
P5	B3	A2
P6	B4	A1
P7	B3	A1
P8	B2	A1



This option is used in applications where ports need to be rotated to accommodate a specific space requirement or port orientation for the fittings and tube attachments. The diagram explains the options and orientation of the ports. See the specific cylinder to find availability of these options.

STROKE LENGTHS

Standard stroke lengths for each bore size and cylinder style are listed in this catalog. Non-standard stroke lengths (not listed in the catalog) up to 24" for single acting cylinders and 36" for double acting cylinders are available. Stroke length should be specified in inches and fractions of an inch. Consult the factory for other requirements.

In applications, attention should be given to minimizing the side load on the rod to insure a smooth stroke without binding. Also, in applications where the cylinder rod is subjected to an unsupported column load, the load on the rod should be less than the force shown in the table below to prevent buckling of the rod.

Maximum Load (lbs) to Prevent Buckling of the Rod

Rod dia.	Rod Length								
	1"	5"	10"	15"	20"	25"	30"	35"	40"
1/8"	110	12	3	1.3					
3/16"	262	59	15	6.6	3.7				
1/4"	478	190	47	21	12	7.5			
5/16"	756	451	116	52	29	19	13		
3/8"	1091	786	240	106	60	38	27	20	
7/16"	1490	1184	444	197	111	71	49	36	28
1/2"	1950	1645	757	336	189	120	84	62	47
5/8"	3055	2750	1795	821	462	295	205	150	115
3/4"	4405	4100	3140	1700	950	613	425	312	240

Rod Thread	Bore Size	Series	Rod Size	Rod Flats
#5-40 UNC-2A	5/16"	05	1/8"	none
#10-32 UNF-2A	1/2"	08	3/16"	none
#10-32 UNF-2A	5/8"	10	3/16"	none
1/4-28 UNF-2A	3/4"	12	1/4"	0.218
1/4-28 UNF-2A	7/8"	14	1/4"	0.218
5/16-24 UNF-2A	1 1/16"	17	5/16"	0.250
3/8-24 UNF-2A	1 1/4"	20	3/8"	0.312
7/16-20 UNF-2A	1 1/2"	24	7/16"	0.375
1/2-20 UNF-2A	1 3/4"	28	1/2"	0.437
1/2-20 UNF-2A	2"	32	5/8"	0.500
1/2-20 UNF-2A	2 1/2"	40	5/8"	0.500
5/8-18 UNF-2A	3"	48	3/4"	0.625

CUSTOM CYLINDERS

If your application requires a custom feature that you do not see in our catalog please contact our distributor in your area for assistance. We manufacture a wide variety of special cylinders. Examples of our custom cylinder capabilities would include: stroke and rod modifications, special mounting configurations and ports, seal and lubrication options, integrated valving and adjustable stroke cylinders. We also provide application based special cylinder design for those customers having unique parameters.

FREE CYLINDER SAMPLE PROGRAM

We invite competitive comparisons. If you are an OEM that uses air cylinders, Clippard will provide a free sample for your evaluation. Contact us or your local distributor and ask for the "Free Sample CILinder" request form.

POSITION SENSORS

Clippard pneumatic cylinders are available with a choice of magnetically operated position sensors. The magnetic reed switch or Hall Effect sensor . . . on cylinders equipped with magnetic piston option.

Hall Effect Position Sensors

Clippard Hall Effect sensors offer the user more accurate sensing of piston location for the ultimate in pneumatic system control.

The Hall Effect sensor operates with Clippard stainless steel pneumatic cylinders equipped with internal magnets on the pistons. By accurately sensing the magnetic field of the piston when it passes beneath the sensor, the position of the rod piston is determined, and a feedback signal is created.
See page 59.

Reed Switches

The Clippard RS magnetic reed switches have power ranges to 25 watts, current up to 1.5 amperes and a rated life span of 10 million cycles. Plan to use them where the high performance of the Clippard HS Hall Effect switch is not required.

Two models are available: 36 volts or 200 volts AC/DC. Each is a SPST normally open configuration. When the cylinder's magnet-equipped piston moves to a location where the magnet is positioned below the reed switch, the switch sends a feedback signal to indicate piston location. In the 36 VDC model, an LED provides switch closing indication.
See page 59.

ACCESSORIES

Mounting Hardware

For efficient power and easy mounting, Clippard has designed and manufactured brackets suitable for each cylinder shown in this catalog.

These products are shown on the last page of each corresponding bore size and include clevis mounting brackets, foot mounting brackets, rod clevis assemblies and rod eye assemblies. Extra mounting nuts are available.

Flow Controls

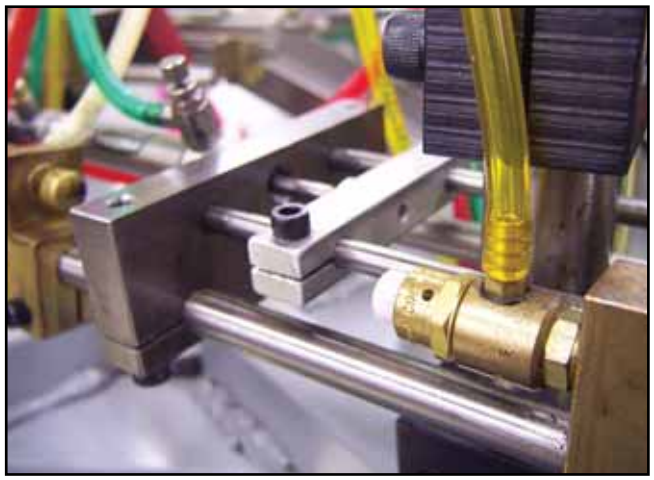
Clippard offers a large variety of flow controls and needle valves for adjusting the speed of the cylinder. Several models are available from fine adjustments to coarse adjustments in a variety of mounting configurations.
See pages 154 through 157.

Quick Exhaust Valves

The primary function of a quick exhaust valve is to increase cylinder speed. This also enables the use of smaller directional valves and longer control lines. Offered with several port configurations from #10-32 models up to 1/4".
See pages 159 and 160.

Limit Valves

A limit valve is the best way to have a mechanical limit to return air signals to control valves or circuits. Clippard offers limit valves in ports ranging from #3-56 up to 1/8" NPT, high force and heavy duty limits as well as non-contact sensing valves.
See Control Valves section.

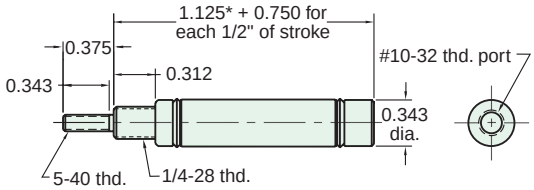


SSR-05-❑-❑

Single Acting

Mount: Stud
Type: Rotating Rod
Options: B, V, S, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
Spring Compressed: 1 lbs. **Spring At Rest:** 0.5 lbs.
For bumpers add .250
For S option add .220



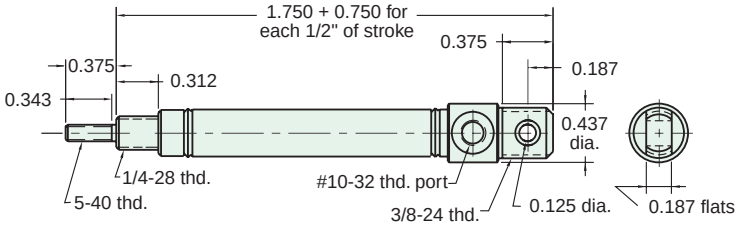
Nut included, but not shown on drawing

USR-05-❑-❑

Single Acting

Mount: Universal
Type: Rotating Rod
Options: B, V, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
Spring Compressed: 1 lbs. **Spring At Rest:** 0.5 lbs.
For bumpers add .250



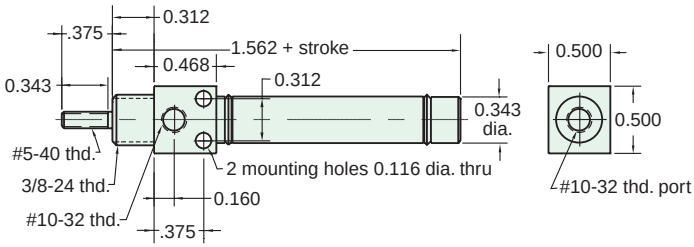
Nuts included, but not shown on drawing

SDR-05-❑-❑

Double Acting

Mount: Stud
Type: Rotating Rod
Options: B, V, P6, P7, P8, S, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
For bumpers add .250
For S option add .220



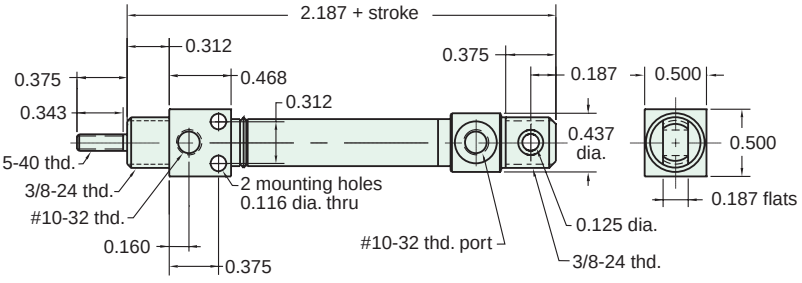
Nut included, but not shown on drawing

UDR-05-❑-❑

Double Acting

Mount: Universal
Type: Rotating Rod
Options: B, V, P2, P3, P4, P5, P6, P7, P8, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
For bumpers add .250



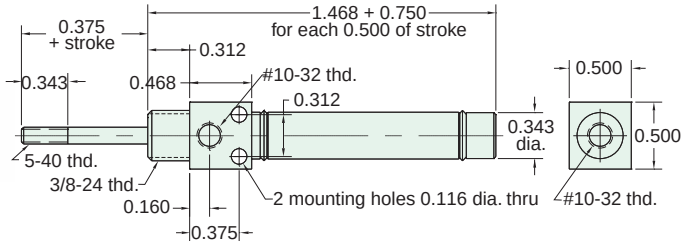
Nuts included, but not shown on drawing

SRR-05-❑-❑

Reverse Acting

Mount: Stud
Type: Rotating Rod
Options: B, V, N

Standard Stroke Lengths: 1/2”, 1”, 1-1/2”, 2”, 3”, 4”
Spring Compressed: 1 lbs. **Spring At Rest:** 0.5 lbs.
For bumpers add .250



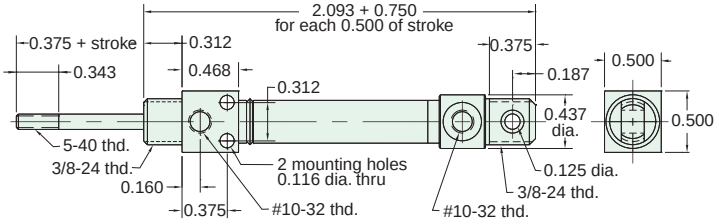
Nuts included, but not shown on drawing

URR-05-❑-❑

Reverse Acting

Mount: Universal
Type: Rotating Rod
Options: B, V, P2, P3, P4, P5, P6, P7, P8, N

Standard Stroke Lengths: 1/2”, 1”, 1-1/2”, 2”, 3”, 4”
Spring Compressed: 1 lbs. **Spring At Rest:** 0.5 lbs.
For bumpers add .250

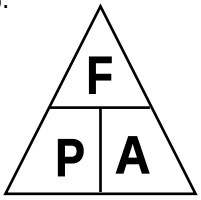


Nuts included, but not shown on drawing

Force Factor

The “force factor” is the nominal area of the cylinder bore size. The chart to the right provides theoretical forces in both the extend and retract stroke of all available bore sizes.

These values are theoretical and make no allowance for friction which varies with the bore size. It is recommended that a 25% safety factor be allowed when selecting a cylinder bore for normal load movement. In high speed applications that number should be at least 40%.

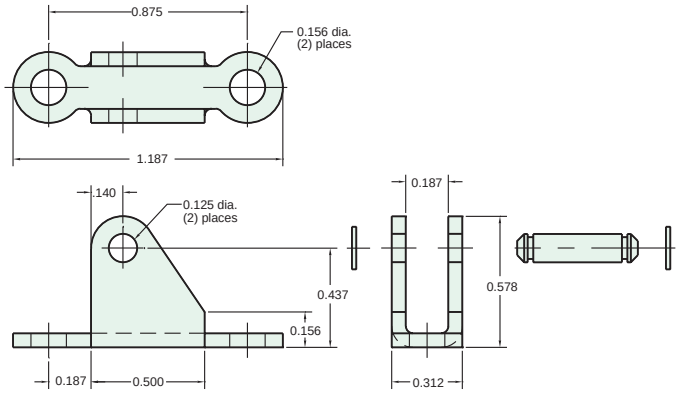


The extend and retract values differ due to the rod diameter.

Bore Size	5/16”	1/2”	5/8”	3/4”	7/8”	1-1/16”	1-1/4”	1-1/2”	1-3/4”	2”	2-1/2”	3”
Force Factor - Extend (area)	0.07	0.19	0.31	0.44	0.60	0.88	1.2	1.7	2.4	3.1	4.9	7.0
Rod Size	1/8”	3/16”	3/16”	1/4”	1/4”	5/16”	3/8”	7/16”	1/2”	5/8”	5/8”	3/4”
Rod Area	0.01	0.03	0.03	0.05	0.05	0.08	0.11	0.15	00.20	0.20	0.31	0.44
Force Factor - Retract (area)	0.06	0.16	0.28	0.39	0.55	0.80	1.09	1.55	2.2	2.9	4.59	6.56
20 psig - Extend (lbs)	1.4	3.8	6.2	8.8	12.0	17.6	24.0	34.0	48.0	62.0	98.0	140.0
20 psig - Retract (lbs)	1.16	3.25	5.65	7.82	11.02	16.07	21.79	31.0	44.07	58.07	91.86	131.16
50 psig - Extend (lbs)	3.5	9.5	15.5	22.0	30.0	44.0	60.0	85.0	120.0	155.0	245.0	350.0
50 psig - Retract (lbs)	2.9	8.13	14.13	19.55	27.55	40.17	54.48	77.5	110.18	145.18	229.66	327.91
80 psig - Extend (lbs)	5.6	15.2	24.8	35.2	48.0	70.4	96.0	136.0	192.0	248.0	392.0	560.0
80 psig - Retract (lbs)	4.64	13.0	22.6	31.27	44.07	64.26	87.17	124.0	176.29	232.29	367.46	524.66

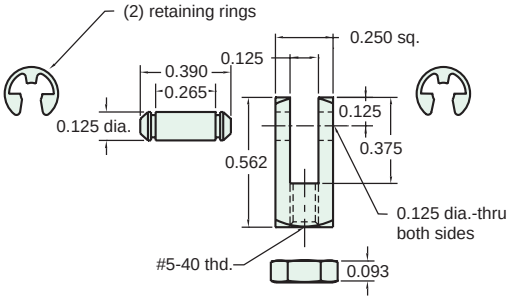
CB-0595

Clevis Bracket
Material: steel, bright zinc plated



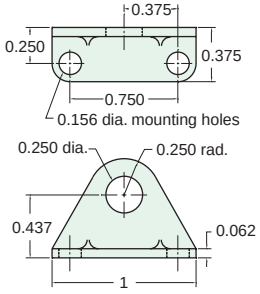
RC-0581

Rod Clevis
Material: steel, bright zinc plated



FB-0591

Foot Bracket
Material: steel, bright zinc plated



Mounting Nuts

Stud Nut

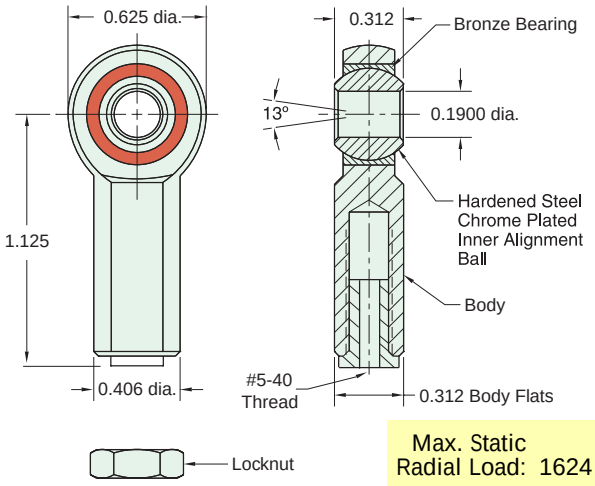
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N04-28A	7/16”	5/32”	1/4-28
N04-28B	3/8”	1/8”	1/4-28
N06-24A	9/16”	7/32”	3/8-24
N06-24B	1/2”	1/8”	3/8-24

Rod Nut

Part Number	Across Flats	Nut Thickness	Nut (Thread)
N02-40	1/4”	3/32”	#5-40

RE-0585

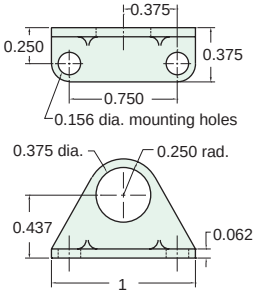
Rod End
Material: steel, bright zinc plated body



Max. Static
Radial Load: 1624 lbs.
Fits Rod
Thread Size: #5-40

FB-0592

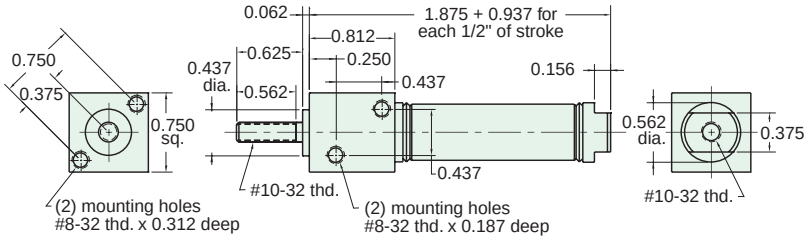
Foot Bracket
Material: steel, bright zinc plated



FSR-08-❑-❑

Single Acting

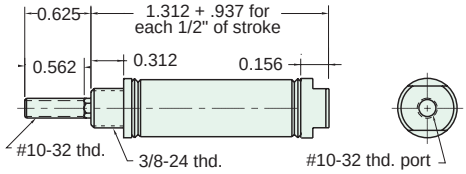
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 2 lbs. **Spring At Rest:** 0.9 lbs.
Options: MB, B, H, V, S, N
For bumpers add .500" For magnetic bumpers add .812
For S option add .187



SSN-08-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 2 lbs. **Spring At Rest:** 0.9 lbs.
Options: MB, B, H, V, S, N
For bumpers add .500" For magnetic bumpers add .812
For S option add .187

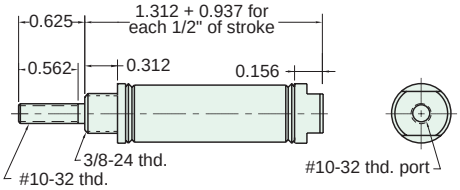


Nuts included, but not shown on drawing

SSR-08-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 2 lbs. **Spring At Rest:** 0.9 lbs.
Options: MB, B, H, V, S, N
For bumpers add .500" For magnetic bumpers add .812
For S option add .187

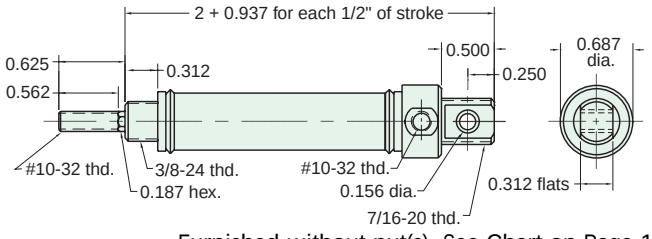


Nuts included, but not shown on drawing

USN-08-❑-❑

Single Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 2 lbs. **Spring At Rest:** 0.9 lbs.
Options: MB, B, H, V, P6, N
Bumpers add .500
For magnetic bumpers add .812

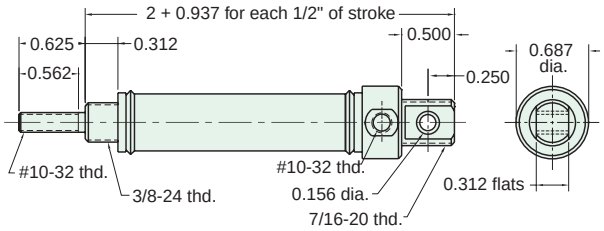


Furnished without nut(s). See Chart on Page 14.

USR-08-❑-❑

Single Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 2 lbs. **Spring At Rest:** 0.9 lbs.
Options: MB, B, H, V, P6, N
Bumpers add .500 For magnetic bumpers add .812

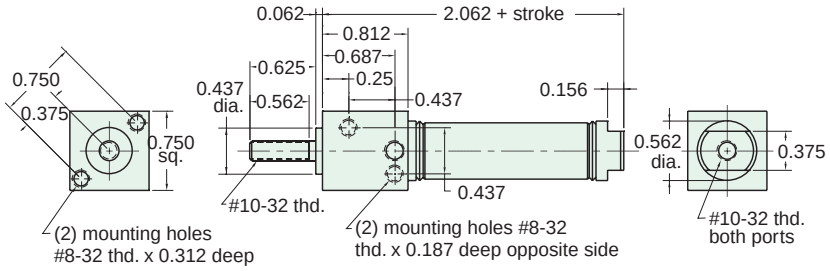


Furnished without nut(s). See Chart on Page 14.

FDR-08-❑-❑

Double Acting

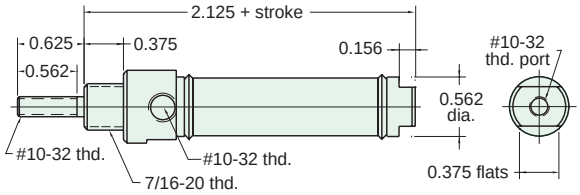
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod
Options: MB, B, V, P6, P7, P8, S, N
Bumpers add .500 For magnetic bumpers add .812
For S option add .187



SDR-08-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod
Options: MB, B, V, P6, P7, P8, S, N
For bumpers add .500
For magnetic bumpers add .812
For S option add .187

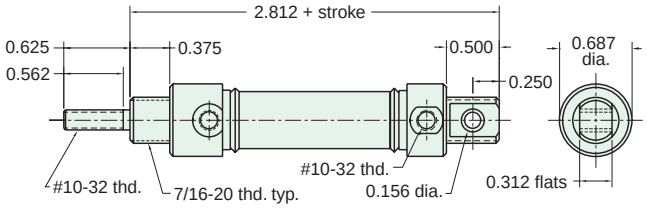


Nut included, but not shown on drawing

UDR-08-❑-❑

Double Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod
Options: MB, B, V, P2, P3, P4, P5, P6, P7, P8, N
For bumpers add .500
For magnetic bumpers add .812



Furnished without nut(s). See Chart on Page 14.

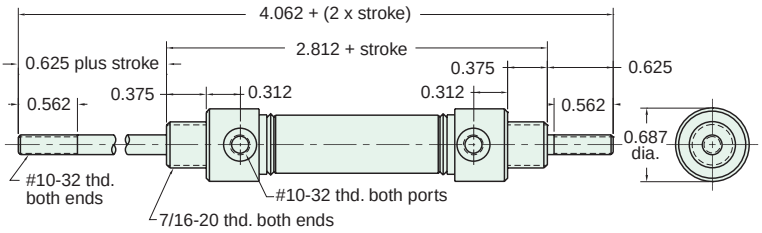
SDD-08-❑-❑

Double Acting

Mount: Stud
Type: Double Rod
Options: MB, B, V, P6, P7, P8, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"

For bumpers add .500
For Magnetic Bumper add .812



Nut included, but not shown on drawing

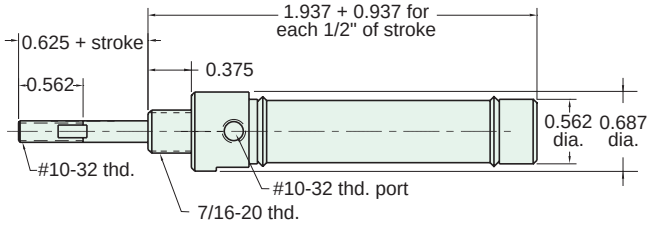
SRR-08-❑-❑

Reverse Acting

Mount: Stud
Type: Rotating Rod
Options: MB, B, H, V, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
Spring Compressed: 2 lbs. **Spring At Rest:** 0.9 lbs.

For bumpers add .500
For Magnetic Bumper add .812



Nut included, but not shown on drawing

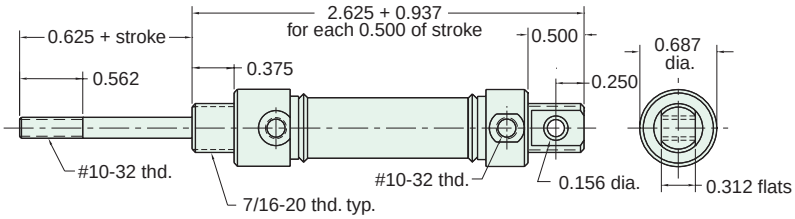
URR-08-❑-❑

Reverse Acting

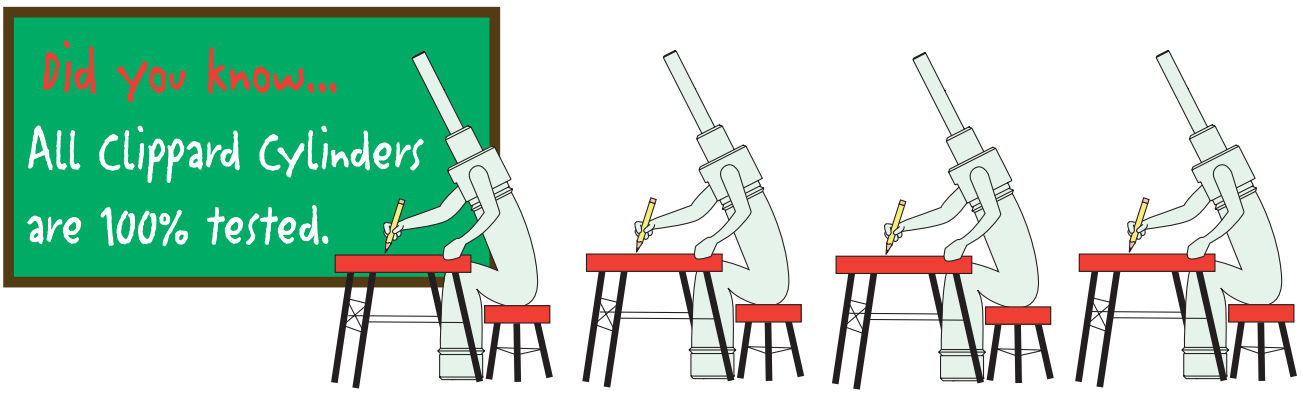
Mount: Universal
Type: Rotating Rod
Options: MB, B, H, V, P6, P7, P8, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
Spring Compressed: 2 lbs. **Spring At Rest:** 0.9 lbs.

For bumpers add .500
For Magnetic Bumper add .812

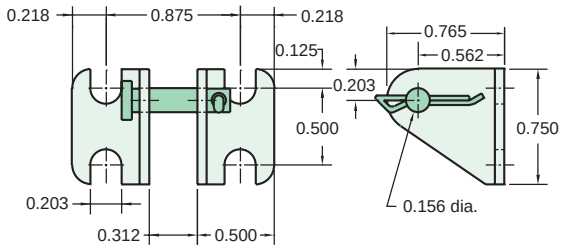


Furnished without nut(s). See Chart on Page 14.



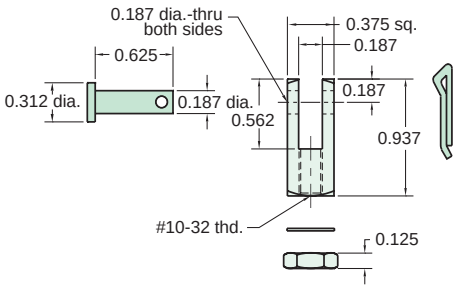
CB-0895

Clevis Bracket
Material: steel, bright zinc plated



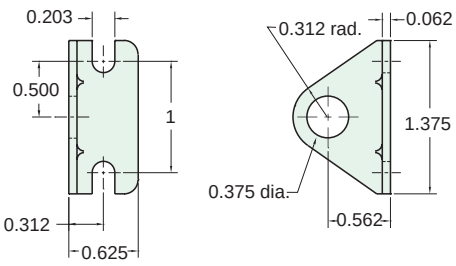
RC-0881

Rod Clevis
Material: steel, bright zinc plated



FB-0891

Foot Bracket
Material: steel, bright zinc plated



Mounting Nuts

Stud Nut

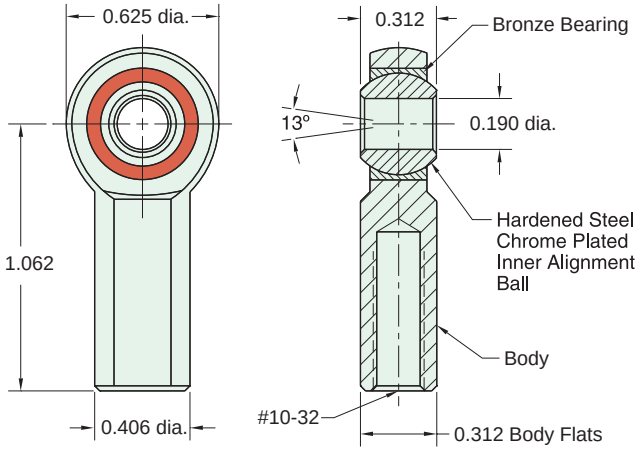
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N06-24A	9/16"	7/32"	3/8-24
N06-24B	1/2"	1/8"	3/8-24
N07-20	11/16"	1/4"	7/16-20

Rod Nut

Part Number	Across Flats	Nut Thickness	Nut (Thread)
N03-32	3/8"	1/8"	#10-32

RE-0885

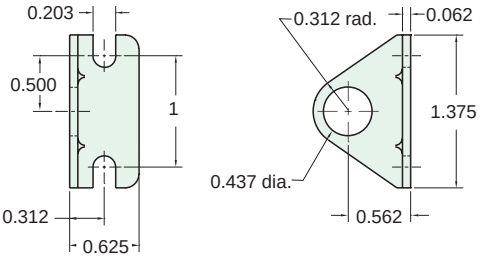
Rod End
Material: steel, bright zinc plated body



Max. Static Radial Load: 1624 lbs.
Fits Rod Thread Size: #10-32

FB-0892

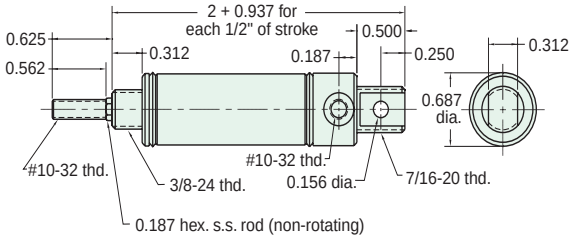
Foot Bracket
Material: steel, bright zinc plated



USN-10-❑-❑

Single Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 4 lbs. **Spring At Rest:** 1.3 lbs.
Options: MB, B, H, V, P6, N For bumpers add .500. For magnetic bumpers add .812

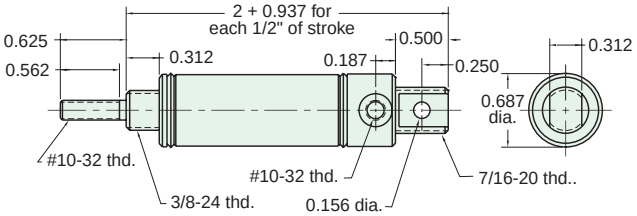


Furnished without nut(s). See Chart on Page 18.

USR-10-❑-❑

Single Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 4 lbs. **Spring At Rest:** 1.3 lbs.
Options: MB, B, H, V, P6, N For bumpers add .500. For magnetic bumpers add .812

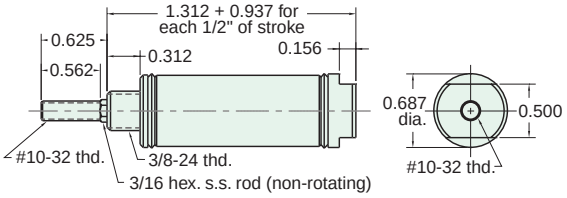


Furnished without nut(s). See Chart on Page 18.

SSN-10-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 4 lbs. **Spring At Rest:** 1.3 lbs.
Options: MB, B, H, V, S, N For bumpers add .500. For magnetic bumpers add .812

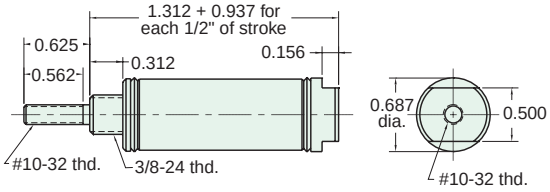


Nut included, but not shown on drawing

SSR-10-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 4 lbs. **Spring At Rest:** 1.3 lbs.
Options: MB, B, H, V, S, N For bumpers add .500. For magnetic bumpers add .812

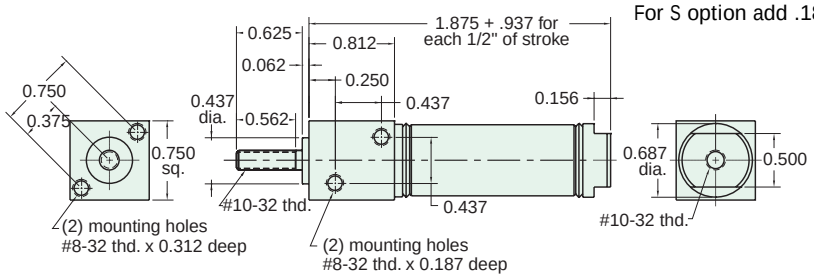


Nut included, but not shown on drawing

FSR-10-❑-❑

Single Acting

Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 4 lbs. **Spring At Rest:** 1.3 lbs.
Options: MB, B, H, V, S, N For bumpers add .500. For magnetic bumpers add .812
For S option add .187

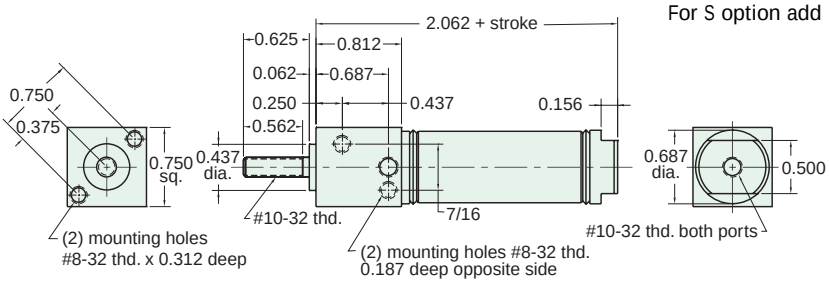


Furnished without nut(s). See Chart on Page 18.

FDR-10-❑-❑

Double Acting

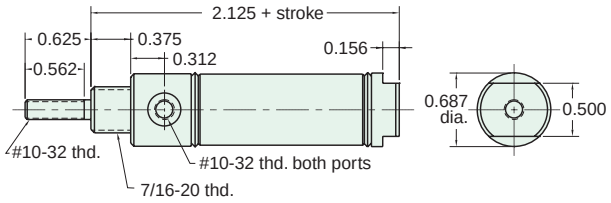
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod
Options: MB, B, V, P6, P7, P8, S, N For bumpers add .500
For magnetic bumpers add .812
For S option add .187



SDR-10-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod
Options: MB, B, V, P6, P7, P8, S, N For bumpers add .500
For magnetic bumpers add .812
For S option add .187

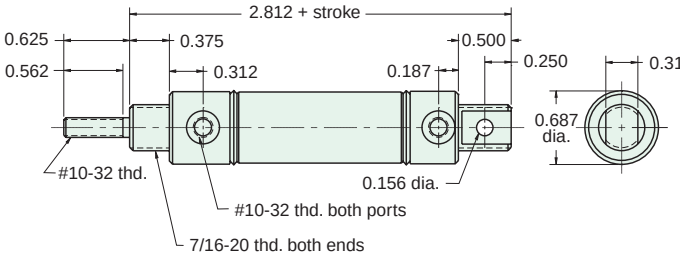


Nut included, but not shown on drawing

UDR-10-❑-❑

Double Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", ", 1-1/2", 2", 3", 4"
Type: Rotating Rod
Options: MB, B, V, P2, P3, P4, P5, P6, P7, P8, N For bumpers add .500
For magnetic bumpers add .812



Furnished without nut(s). See Chart on Page 18.

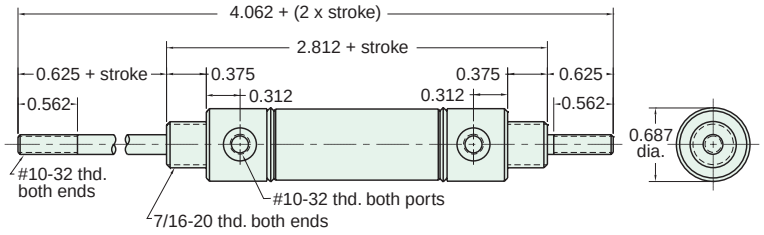
SDD-10-❑-❑

Double Acting

Mount: Stud
Type: Double Rod
Options: MB, B, V, P6, P7, P8, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3', 4"

For bumpers add .500
For magnetic bumpers add .812



Nut included, but not shown on drawing

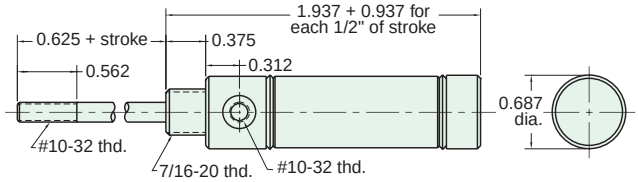
SRR-10-❑-❑

Reverse Acting

Mount: Stud
Type: Rotating Rod
Options: MB, B, H, V, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
Spring Compressed: 4 lbs. **Spring At Rest:** 1.3 lbs.

For bumpers add .500
For magnetic bumpers add .812



Nut included, but not shown on drawing

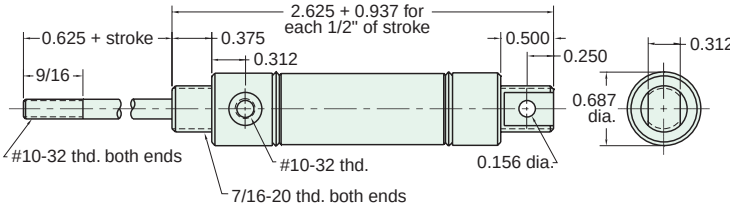
URR-10-❑-❑

Reverse Acting

Mount: Universal
Type: Rotating Rod
Options: MB, B, H, V, P6, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4"
Spring Compressed: 4 lbs. **Spring At Rest:** 1.3 lbs.

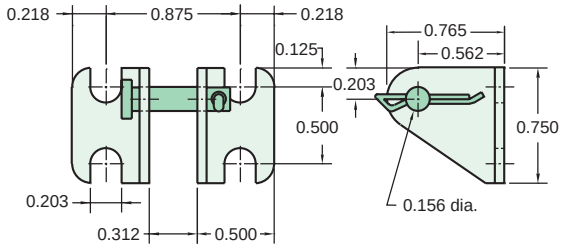
For bumpers add .500
For magnetic bumpers add .812



Furnished without nut(s). See Chart on Page 18.

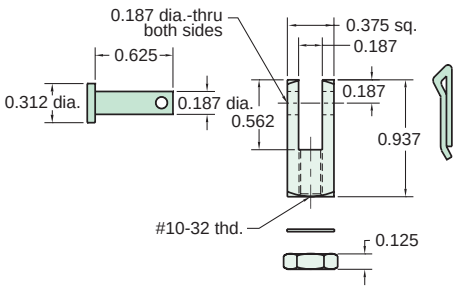
CB-0895

Clevis Bracket
Material: steel, bright zinc plated



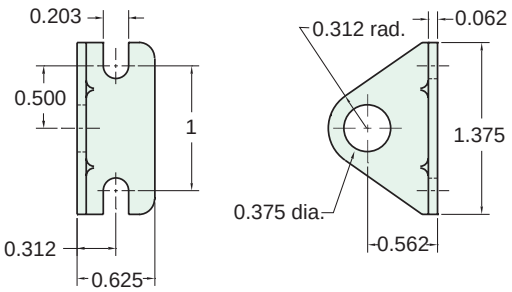
RC-0881

Rod Clevis
Material: steel, bright zinc plated



FB-0891

Foot Bracket
Material: steel, bright zinc plated



Mounting Nuts

Stud Nut

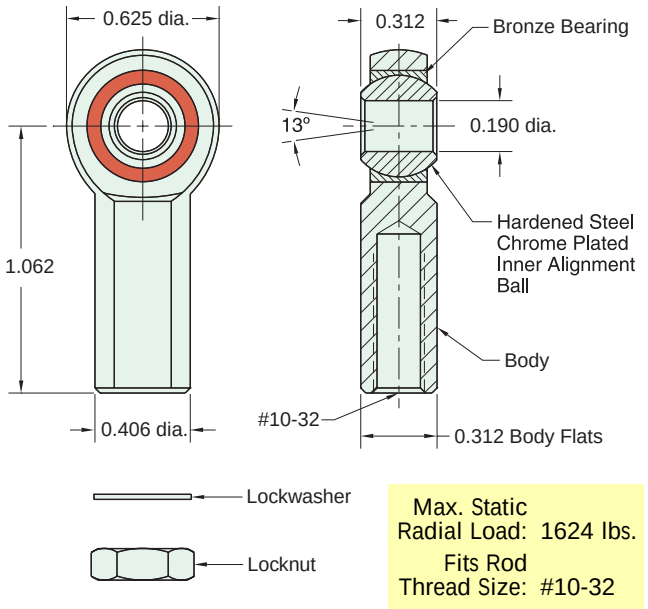
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N06-24A	9/16”	7/32”	3/8-24
N06-24B	1/2”	1/8”	3/8-24
N07-20	11/16”	1/4”	7/16-20

Rod Nut

Part Number	Across Flats	Nut Thickness	Nut (Thread)
N03-32	3/8”	1/8”	#10-32

RE-0885

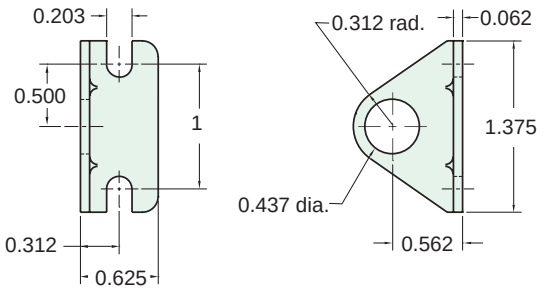
Rod End
Material: steel, bright zinc plated body



Max. Static Radial Load: 1624 lbs.
Fits Rod Thread Size: #10-32

FB-0892

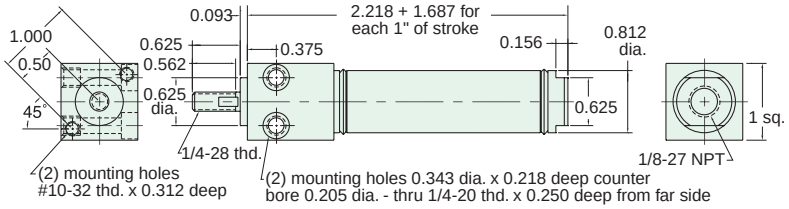
Foot Bracket
Material: steel, bright zinc plated



FSR-12-❑-❑

Single Acting

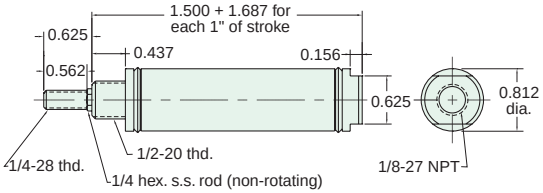
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, B, H, V, S, N
For bumpers add .500. For magnetic bumpers add .812
For S option add .437



SSN-12-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, B, H, V, S, N
For bumpers add .500. For magnetic bumpers add .812
For S option add .437

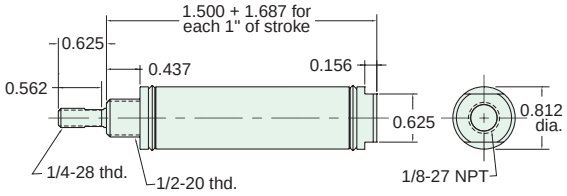


Nut included, but not shown on drawing

SSR-12-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, B, H, V, S, N
For bumpers add .500. For magnetic bumpers add .812
For S option add .437

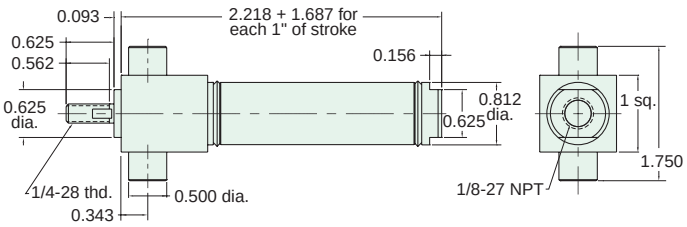


Nut included, but not shown on drawing

TSR-12-❑-❑

Single Acting

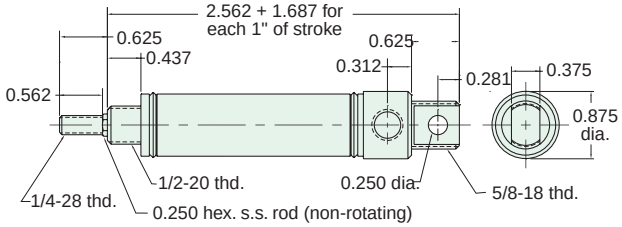
Mount: Trunnion **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, B, H, V, S, N
For bumpers add .500. For magnetic bumpers add .812
For S option add .437



USN-12-❑-❑

Single Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, B, H, V, P6, N
For bumpers add .500. For magnetic bumpers add .812

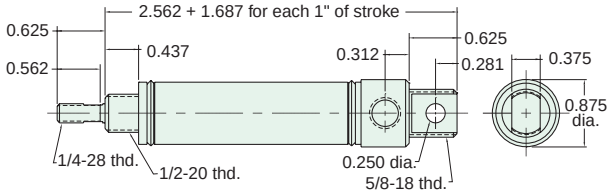


Furnished without nut(s). See Chart on Page 24.

USR-12-❑-❑

Single Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, B, H, V, P6, N
For bumpers add .500. For magnetic bumpers add .812

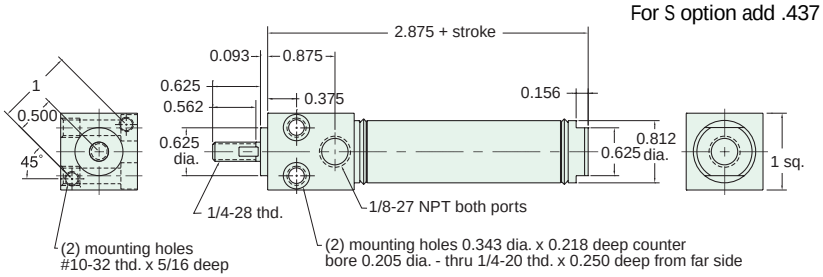


Furnished without nut(s). See Chart on Page 24.

FDR-12-❑-❑

Double Acting

Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod
Options: MB, B, W, V, P6, P7, P8, S, N
For bumpers add .500
For magnetic bumpers add .812
For S option add .437

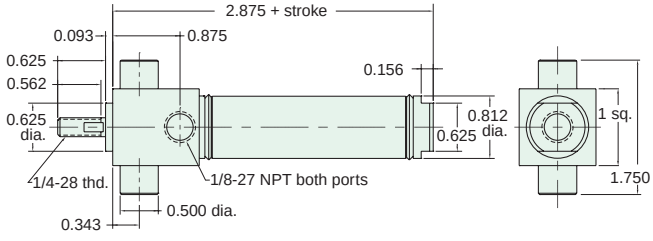


Furnished without nut(s). See Chart on Page 24.

TDR-12-❑-❑

Double Acting

Mount: Trunnion **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod
Options: MB, B, W, V, S, N
For bumpers add .500
For magnetic bumpers add .812
For S option add .437



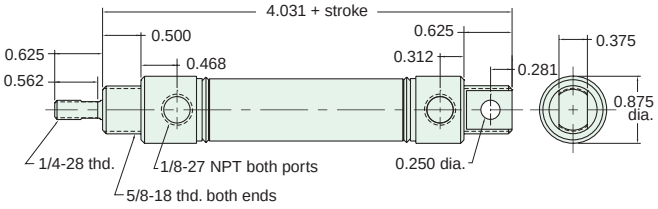
UDR-12-❑-❑

Double Acting

Mount: Stud
Type: Rotating rod
Options: C, F, R, MB, B, W, V, P2, P3, P4, P5, P6, P7, P8, M, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4" 5", 6", 8", 10", 12

For bumpers add .500
For magnetic bumpers add .812
For magnet add .312



Furnished without nut(s). See Chart on Page 24.

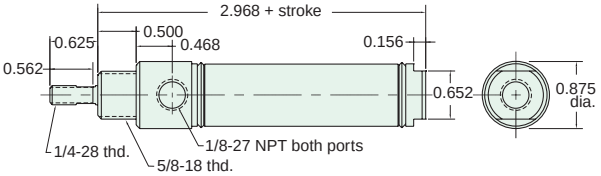
SDR-12-❑-❑

Double Acting

Mount: Stud
Type: Rotating Rod
Options: C, F, R, MB, B, W, V, P6, P7, P8, S, M, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"

For bumpers add .500
For magnetic bumpers add .812
For C, F, R & S options add .437
For magnet add .312



Nuts included, but not shown on drawing
For C, F, & R options use side ported rear head

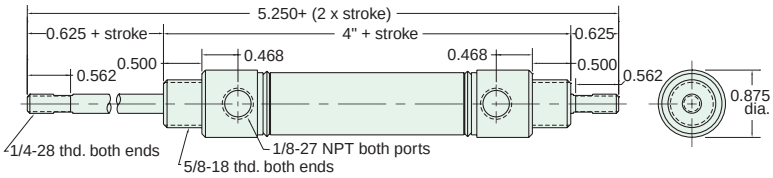
SDD-12-❑-❑

Double Acting

Mount: Stud
Type: Double Rod
Options: C, F, MB, B, W, V, P6, P7, P8, M, N

Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"

Bumpers add .500. For magnetic bumpers add .812
For CM, FM add .312



Nuts included, but not shown on drawing

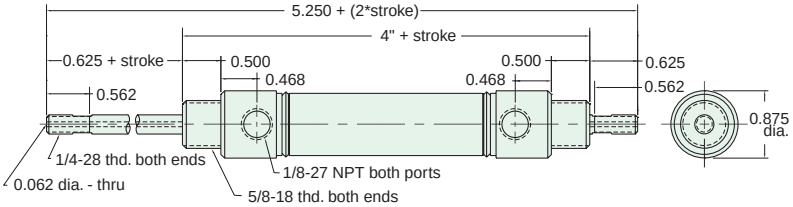
SDH-12-❑-❑

Double Acting

Mount: Stud
Type: Hollow Rod
Options: C, F, MB, B, W, V, P6, P7, P8, M, N

Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"

For bumpers add .500
For magnetic bumpers add .812
For CM, FM add .312



Nuts included, but not shown on drawing

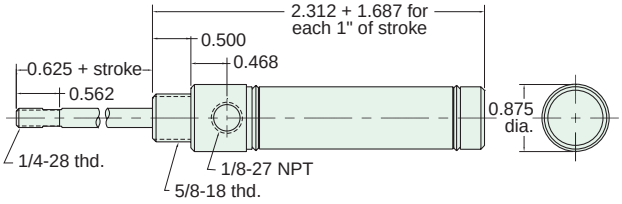
3/4" Bore Stainless Steel Cylinder

SRR-12-❑-❑

Reverse Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, B, H, W, V, N

For bumpers add .375
For magnetic bumpers add .687



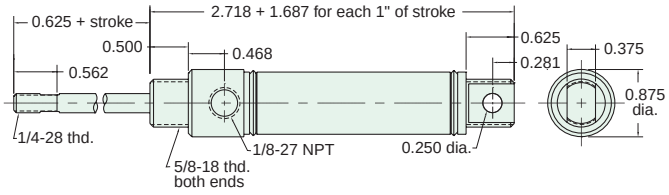
Nut included, but not shown on drawing

URR-12-❑-❑

Reverse Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, B, H, W, V, P6, N

For bumpers add .500
For magnetic bumpers add .812



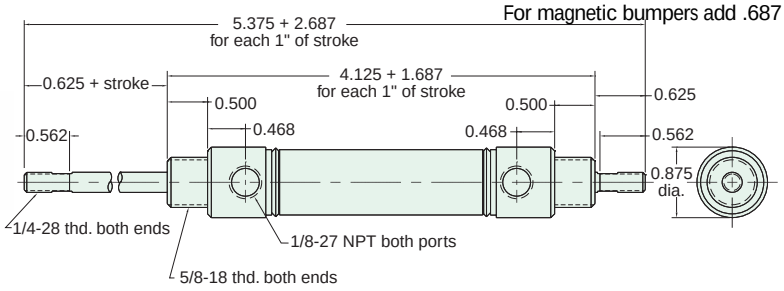
Furnished without nut(s). See Chart on Page 24.

SFD-12-❑-❑

Double Acting, Spring Bias

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Double Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, B, H, W, V, P6, P7, P8, N

For bumpers add .375
For magnetic bumpers add .687



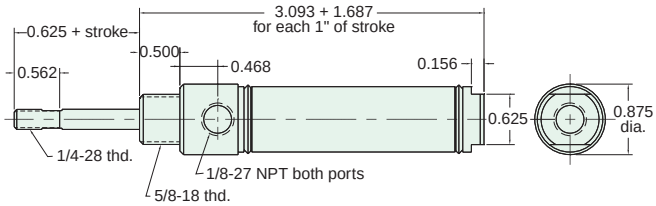
Nuts included, but not shown on drawing

SBR-12-❑-❑

Double Acting, Rear Spring Bias

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, B, H, W, V, P6, P7, P8, S, N

For bumpers add .375
For magnetic bumpers add .687
For S option add .437



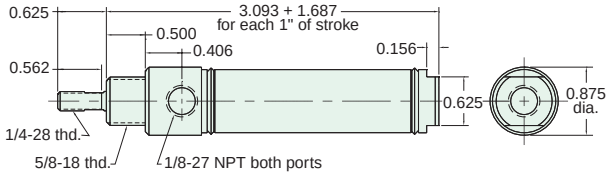
Nut included, but not shown on drawing

SFR-12-❑-❑

Double Acting, Front Spring Bias

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, B, H, W, V, P6, P7, P8, S, N

For bumpers add .375
For magnetic bumpers add .687
For S option add .437



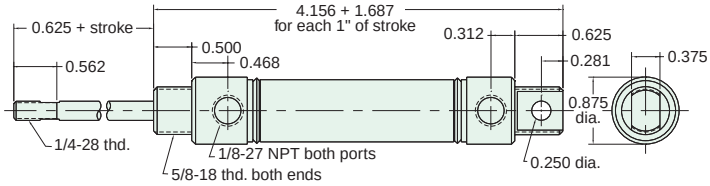
Nut included, but not shown on drawing

UBR-12-❑-❑

Double Acting, Rear Spring Bias

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, B, H, W, V, P2, P3, P4, P5, P6, P7, P8, N

For bumpers add .375
For magnetic bumpers add .687



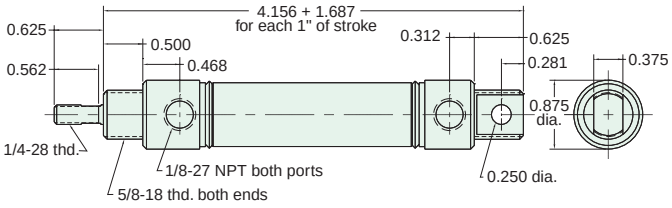
Furnished without nut(s). See Chart on Page 24.

UFR-12-❑-❑

Double Acting, Front Spring Bias

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, B, H, W, V, P2, P3, P4, P5, P6, P7, P8, N

For bumpers add .375
For magnetic bumpers add .687



Furnished without nut(s). See Chart on Page 24.

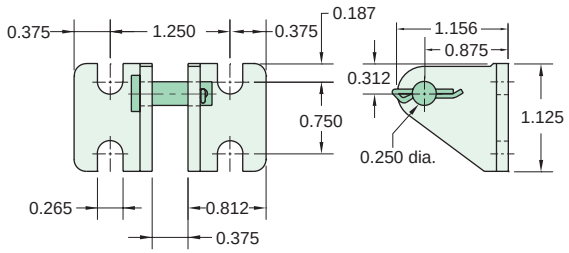
CAD 2D & 3D Models Available

2D & 3D CAD models of all Clippard stainless steel cylinders are now available via www.clippard.com/cylinders/. A wide range of formats are offered for your convenience. Clippard's on-line, state-of-the-art cylinder configurator allows users to build their own cylinder exactly to the required specifications, and then view the details, drawings, CAD models, pricing and much more!

www.clippard.com/cylinders/

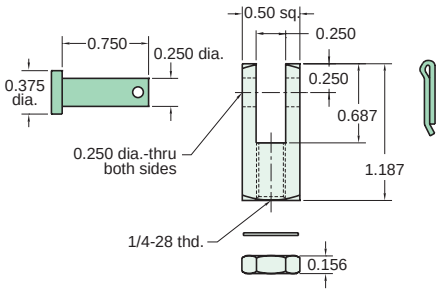
CB-1795

Clevis Bracket
Material: steel, bright zinc plated



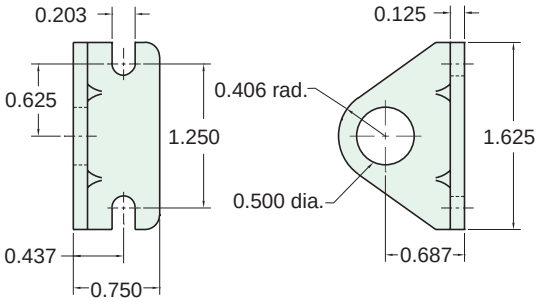
RC-1281

Rod Clevis
Material: steel, bright zinc plated



FB-1291

Foot Bracket
Material: steel, bright zinc plated



Mounting Nuts

Stud Nut

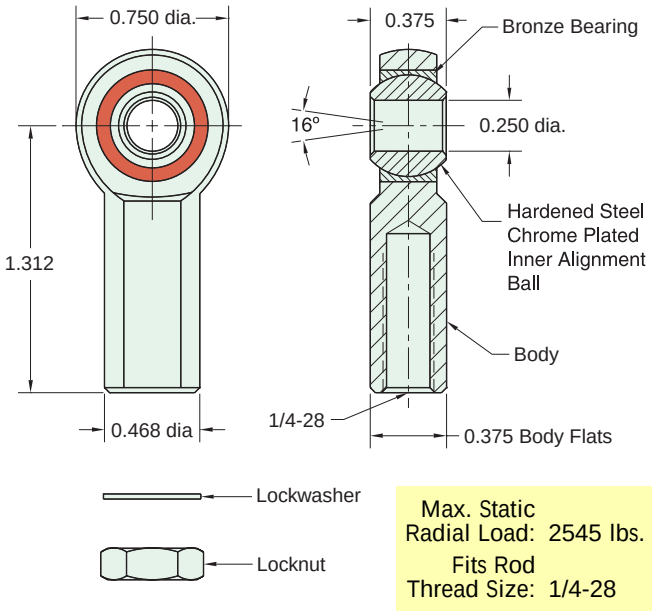
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N08-20	3/4”	5/16”	1/2-20
N10-18	15/16”	3/8”	5/8-18

Rod Nut

Part Number	Across Flats	Nut Thickness	Nut (Thread)
N04-28A	7/16”	5/32”	1/4-28
N04-28B	3/8”	1/8”	1/4-28

RE-1285

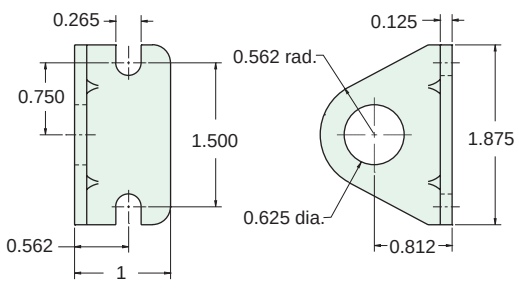
Rod End
Material: steel, bright zinc plated body



Max. Static
Radial Load: 2545 lbs.
Fits Rod
Thread Size: 1/4-28

FB-1791

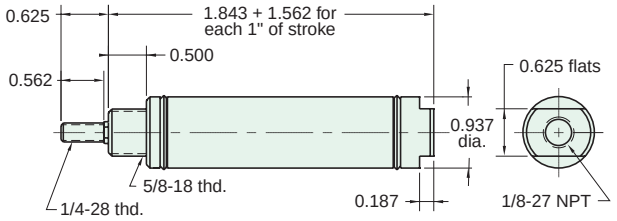
Foot Bracket
Material: steel, bright zinc plated



SSN-14-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, H, V, S, N **Bumpers are standard.** For magnetic bumpers add .312
For S option add .281

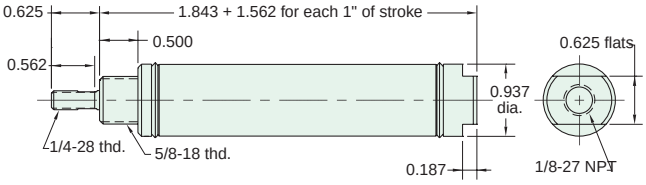


Nut included, but not shown on drawing

SSR-14-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, H, V, S, N **Bumpers are standard.** For magnetic bumpers add .312
For S option add .281

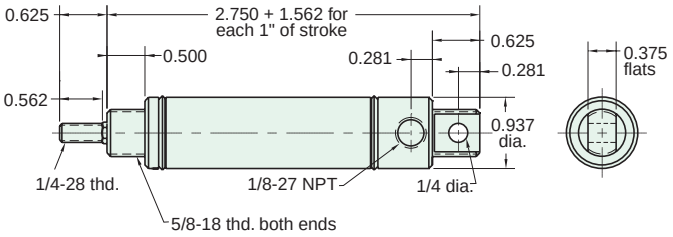


Nut included, but not shown on drawing

USN-14-❑-❑

Single Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, H, V, P2, P3, P4, P5, P6, P7, P8, N **Bumpers are standard.** For magnetic bumpers add .312



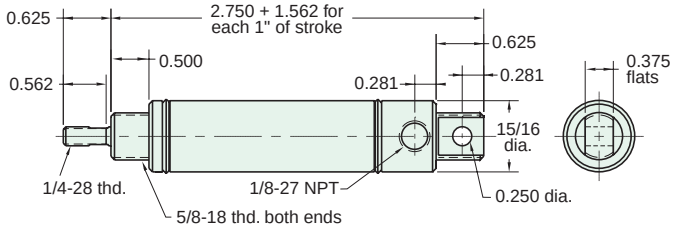
Furnished without nut(s). See Chart on Page 28.

USR-14-❑-❑

Single Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, H, V, P2, P3, P4, P5, P6, P7, P8, N **Bumpers are standard.** For magnetic bumpers add .312

Furnished without nut(s) See chart on page 28



Furnished without nut(s). See Chart on Page 28.

SDR-14-❑-❑

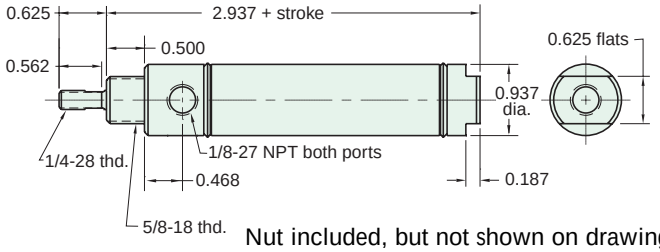
Double Acting

Mount: Stud
Type: Rotating Rod
Options: C, F, R, MB, W, V, P6, P7, P8, S, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"

Bumpers are standard
For magnetic bumpers add .312

For C, F, R and S option add .281



Nut included, but not shown on drawing

For C, F, & R options use side ported rear head

UDR-14-❑-❑

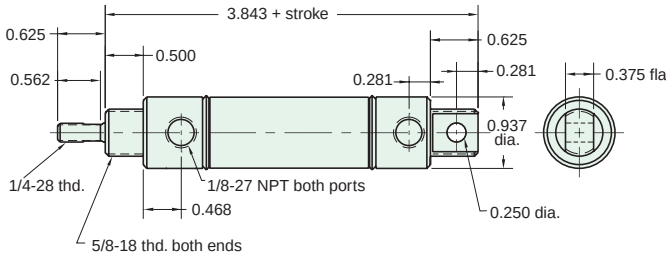
Double Acting

Mount: Universal
Type: Rotating Rod
Options: C, F, R, MB, W, V, P2, P3, P4, P5, P6, P7, P8, N

Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"

Furnished without nut(s) See chart on page 28

Bumpers are standard
For magnetic bumpers add .312



Furnished without nut(s). See Chart on Page 28.

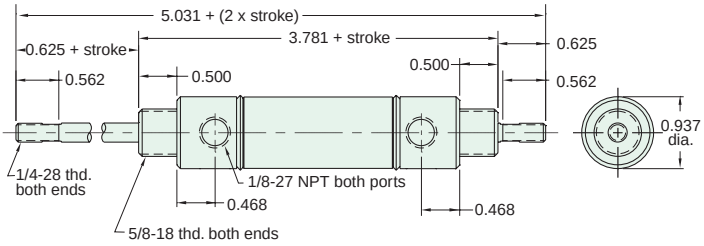
SDD-14-❑-❑

Double Acting

Mount: Stud
Type: Double Rod
Options: C, F, MB, W, V, P6, P7, P8, N

Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"

Bumpers are standard
For magnetic bumpers add .312



Nuts included, but not shown on drawing

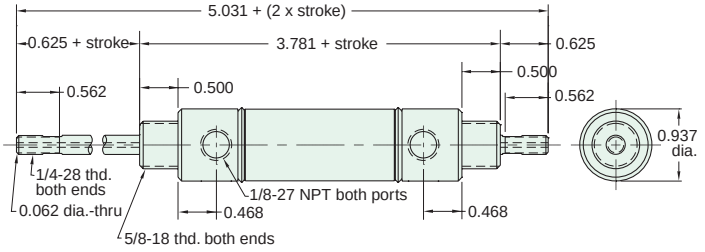
SDH-14-❑-❑

Double Acting

Mount: Stud
Type: Hollow Rod
Options: C, F, MB, W, V, P6, P7, P8, N

Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"

Bumpers are standard
For magnetic bumpers add .312



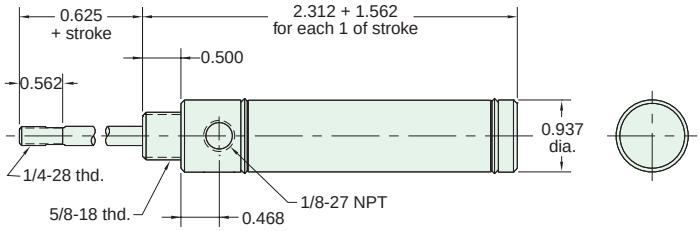
Nuts included, but not shown on drawing

SRR-14-❑-❑

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, H, W, V, N **Bumpers are standard**

Reverse Acting

For magnetic bumpers add .312



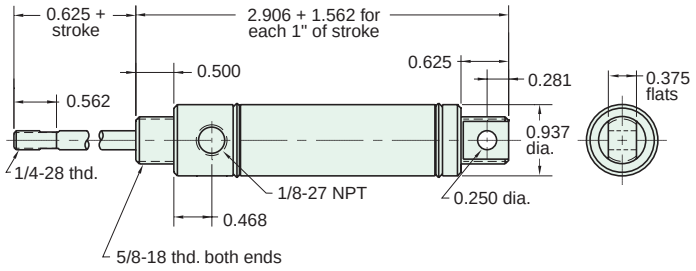
Nut included, but not shown on drawing

URR-14-❑-❑

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 6 lbs. **Spring At Rest:** 3 lbs.
Options: MB, H, W, V, P6, P7, P8, N **Bumpers are standard**

Reverse Acting

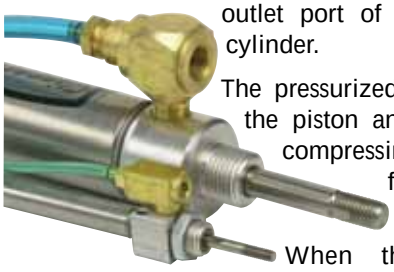
For magnetic bumpers add .312



Furnished without nut(s). See Chart on Page 28.

J-Series Exhaust Valve

In a typical application the exhaust valve is installed in the inlet of a spring return or double acting pneumatic cylinder. Supply air from a control valve is directed into the inlet port of the exhaust valve. The Buna-N poppet seals the exhaust port and allows air to flow from the outlet port of the valve into the cylinder.

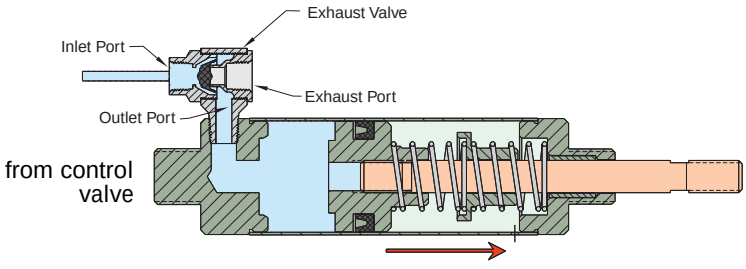


The pressurized air pushes against the piston and extends the rod, compressing the spring, until full rod extension is achieved.

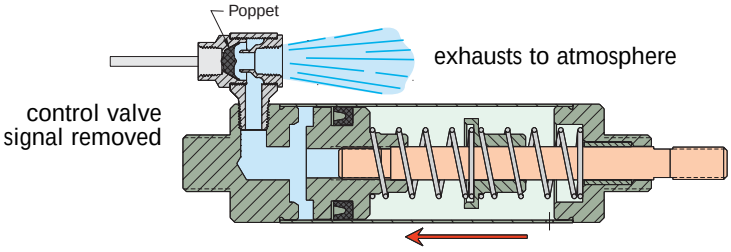
When the control valve exhausts air from the exhaust valve inlet port, the Buna-N poppet shifts to seal the inlet port and open the exhaust port to the cylinder. The pressurized air is allowed to exhaust directly through the exhaust valve to atmosphere.

Normally the air must travel back through the long air line to the control valve to exhaust. By mounting the exhaust valve directly on the cylinder, the piston retracts quickly since the distance to atmosphere is very short and unrestricted.

Cylinder Extends

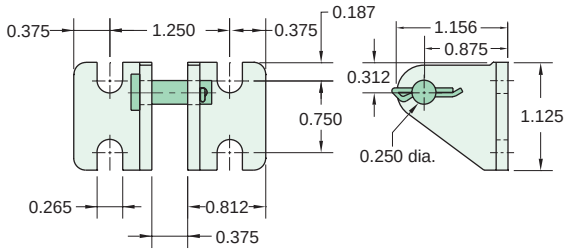


Cylinder Retracts - *Fast!*



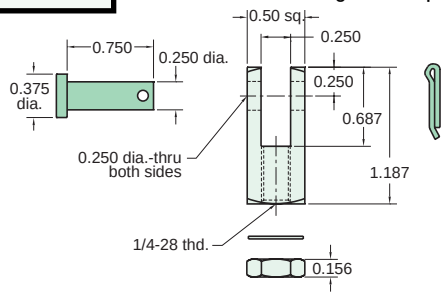
CB-1795

Clevis Bracket
Material: steel, bright zinc plated



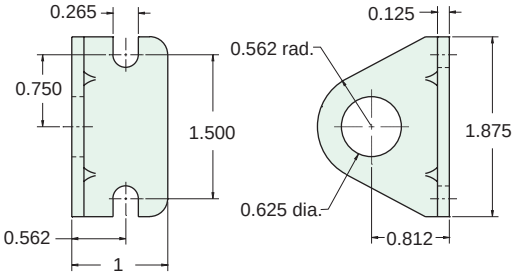
RC-1281

Rod Clevis
Material: steel, bright zinc plated



FB-1791

Foot Bracket
Material: steel, bright zinc plated



Mounting Nuts

Stud Nut

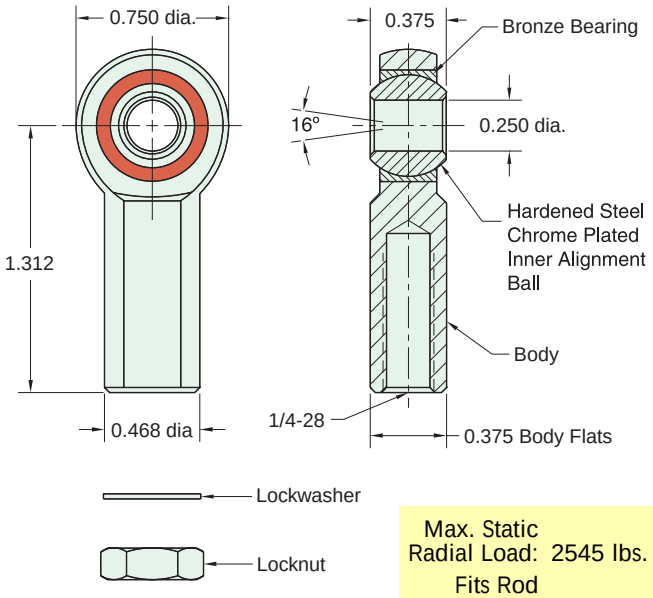
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N10-18	15/16”	3/8”	5/8-18

Rod Nut

Part Number	Across Flats	Nut Thickness	Nut (Thread)
N04-28A	7/16”	5/32”	1/4-28
N04-28B	3/8”	1/8”	1/4-28

RE-1285

Rod End
Material: steel, bright zinc plated body

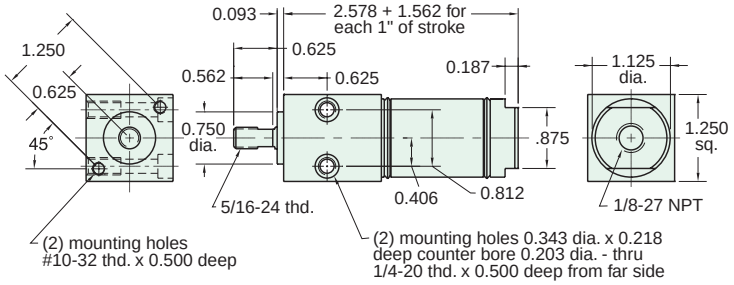


Max. Static
Radial Load: 2545 lbs.
Fits Rod
Thread Size: 1/4-28

FSR-17-❑-❑

Single Acting

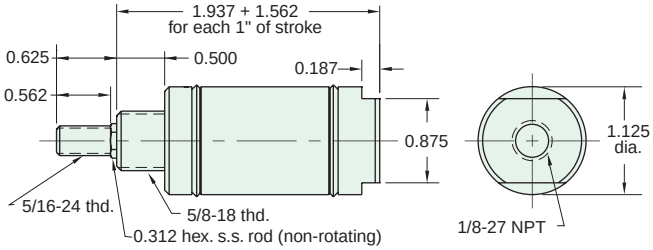
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 7 lbs. **Spring At Rest:** 2 lbs.
Options: MB, B, H, V, S, N
For magnetic bumpers add .312
For S option add .250



SSN-17-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 7 lbs. **Spring At Rest:** 2 lbs.
Options: MB, B, H, V, S, N
For magnetic bumpers add .312
For S option add .250

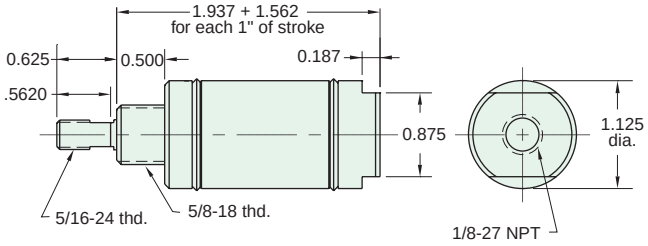


Nut included, but not shown on drawing

SSR-17-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 7 lbs. **Spring At Rest:** 2 lbs.
Options: MB, B, H, V, S, N
For magnetic bumpers add .312

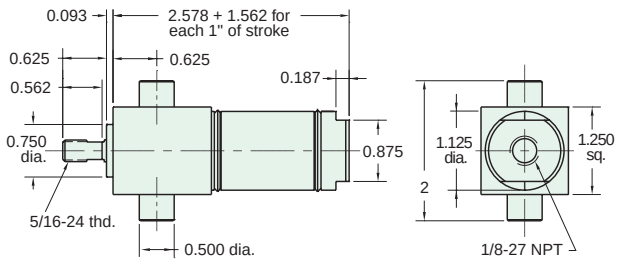


Nut included, but not shown on drawing

TSR-17-❑-❑

Single Acting

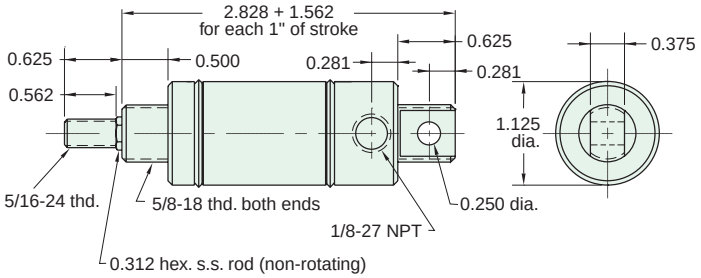
Mount: Trunnion **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 7 lbs. **Spring At Rest:** 2 lbs.
Options: MB, B, H, V, S, N
For magnetic bumpers add .312
For S option add .250



USN-17-❑-❑

Single Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 7 lbs. **Spring At Rest:** 2 lbs.
Options: MB, B, H, V, P6, N
For magnetic bumpers add .312

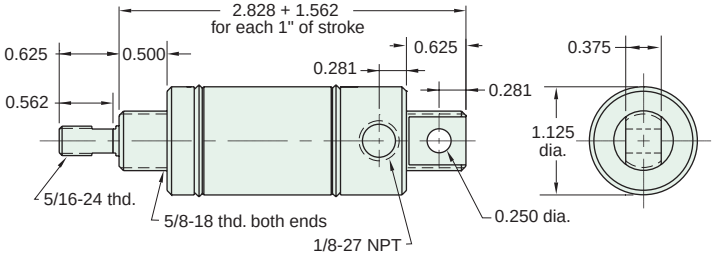


Furnished without nut(s). See Chart on Page 34.

USR-17-❑-❑

Single Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 7 lbs. **Spring At Rest:** 2 lbs.
Options: MB, B, H, V, P6, N
For magnetic bumpers add .312

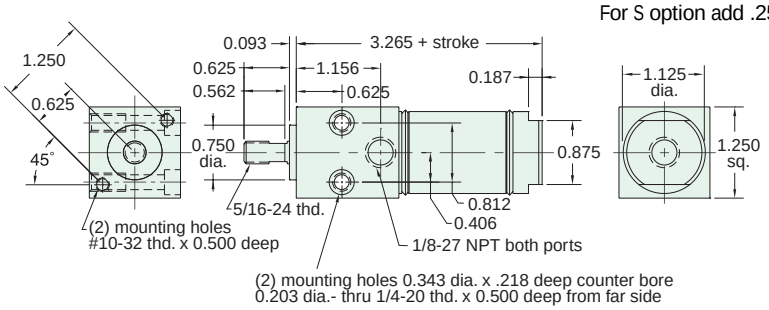


Furnished without nut(s). See Chart on Page 34.

FDR-17-❑-❑

Double Acting

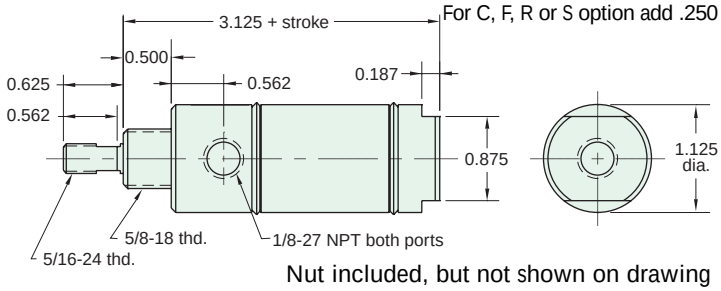
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod
Options: MB, B, W, V, P6, P7, P8, S, N
For magnetic bumpers add .312
For S option add .250



SDR-17-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod
Options: C, F, R, MB, B, W, V, P6, P7, P8, S, N
For magnetic bumpers add .312
For C, F, R or S option add .250



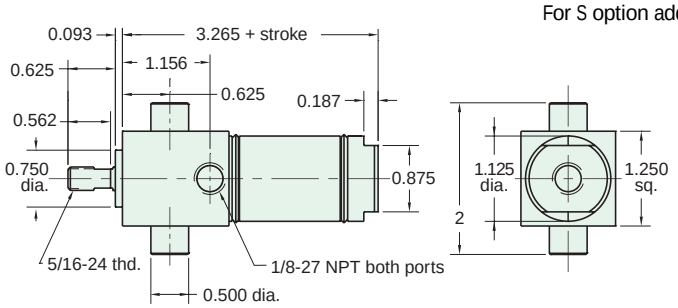
Nut included, but not shown on drawing
For C, F, & R options use side ported rear head

TDR-17-❑-❑

Double Acting

Mount: Trunnion **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod
Options: MB, B, W, V, S, N

For magnetic bumpers add .312
For S option add .250

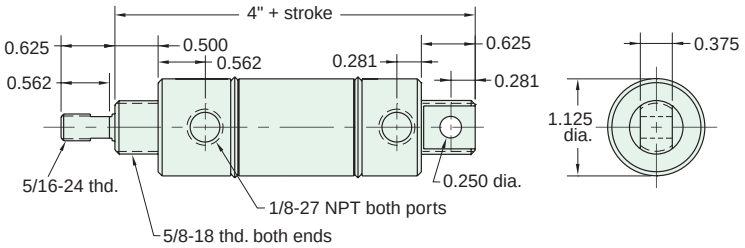


UDR-17-❑-❑

Double Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4" 5", 6", 8", 10", 12"
Type: Rotating Rod
Options: C, F, R, MB, B, W, V, P2, P3, P4, P5, P6, P7, P8, N

For magnetic bumpers add .312



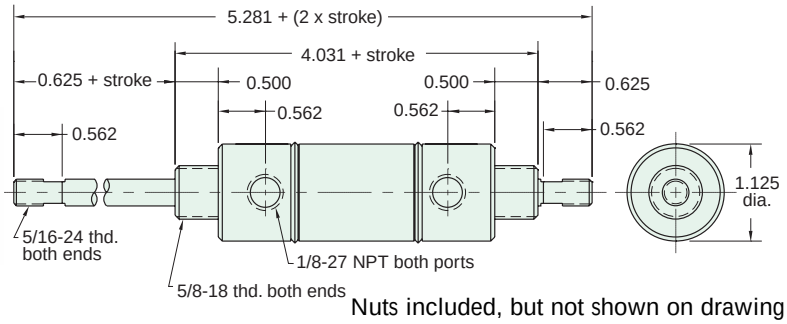
Furnished without nut(s). See Chart on Page 34.

SDD-17-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Double Rod
Options: C, F, R, MB, B, W, V, P6, P7, P8, N

For magnetic bumpers add .312



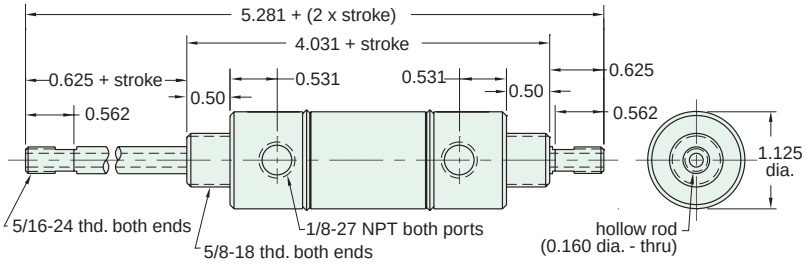
Nuts included, but not shown on drawing

SDH-17-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Hollow Rod
Options: C, F, MB, B, W, V, P6, P7, P8, N

For magnetic bumpers add .312

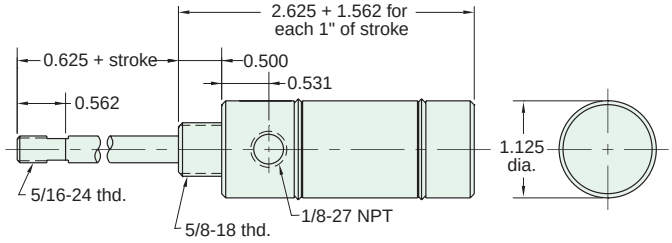


Nuts included, but not shown on drawing

SRR-17-❑-❑

Reverse Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 7 lbs. **Spring At Rest:** 2 lbs.
Options: MB, B, H, W, V, N
For magnetic bumpers add .312

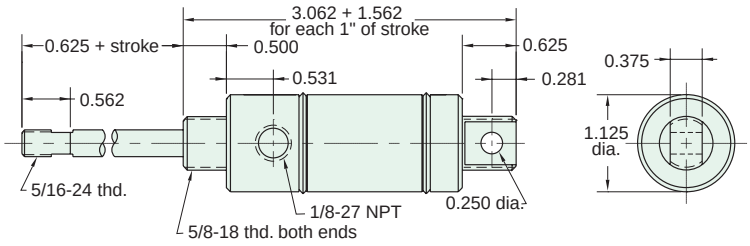


Nuts included, but not shown on drawing

URR-17-❑-❑

Reverse Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 7 lbs. **Spring At Rest:** 2 lbs.
Options: MB, B, H, W, V, P6, N
For magnetic bumpers add .312

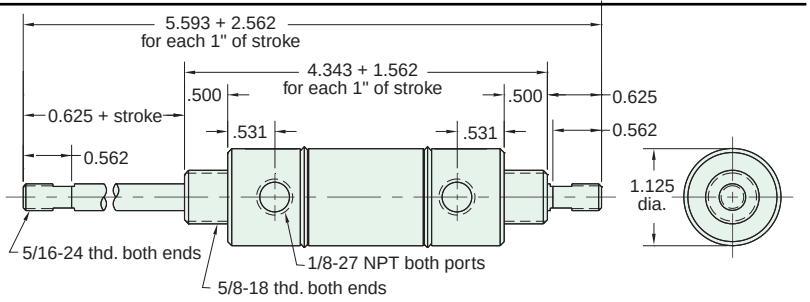


Furnished without nut(s). See Chart on Page 34.

SFD-17-❑-❑

Spring Bias

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Double Rod **Spring Compressed:** 7 lbs. **Spring At Rest:** 2 lbs.
Options: MB, B, H, W, V, P6, P7, P8, N
For magnetic bumpers add .312

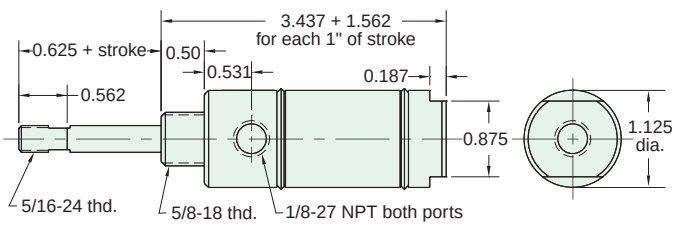


Nuts included, but not shown on drawing

SBR-17-❑-❑

Double Acting Rear Spring Bias

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 7 lbs. **Spring At Rest:** 2 lbs.
Options: MB, B, H, W, V, P6, P7, P8, S, N
For magnetic bumpers add .312
For S option add .250



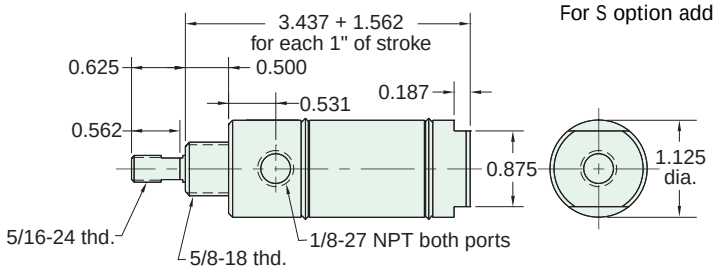
Nut included, but not shown on drawing

SFR-17-❑-❑

Double Acting, Spring Bias

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 7 lbs. **Spring At Rest:** 2 lbs.
Options: MB, B, H, W, V, P6, P7, P8, S, N

For magnetic bumpers add .312
For S option add .250



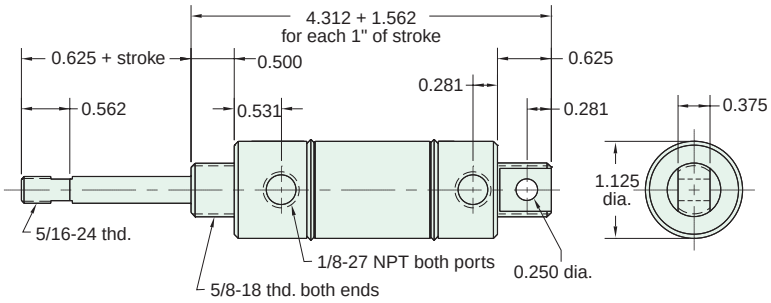
Nut included, but not shown on drawing

UBR-17-❑-❑

Double Acting, Rear Spring Bias

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 7 lbs. **Spring At Rest:** 2 lbs.
Options: MB, B, H, W, V, P2, P3, P4, P5, P6, P7, P8, N

For magnetic bumpers add .312



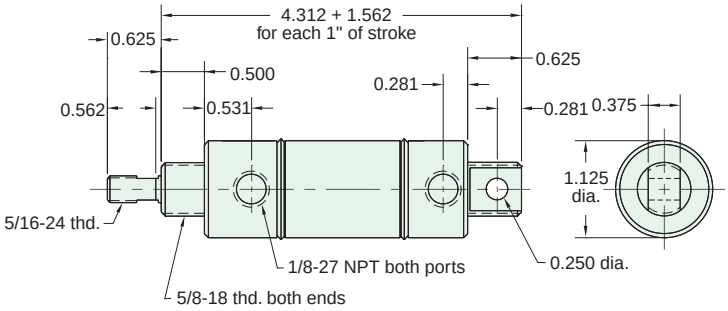
Furnished without nut(s). See Chart on Page 34.

UFR-17-❑-❑

Double Acting Front Spring Bias

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 7 lbs. **Spring At Rest:** 2 lbs.
Options: MB, B, H, W, V, P2, P3, P4, P5, P6, P7, P8, N

For magnetic bumpers add .312



Furnished without nut(s). See Chart on Page 34.

Mounting Nuts

Stud Nut

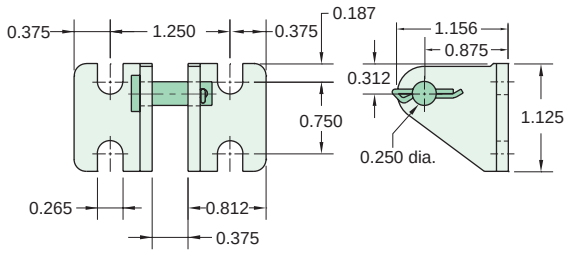
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N10-18	15/16”	3/8”	5/8-18

Rod Nut

Part Number	Across Flats	Nut Thickness	Nut (Thread)
N05-24	1/2”	3/16”	5/16-24

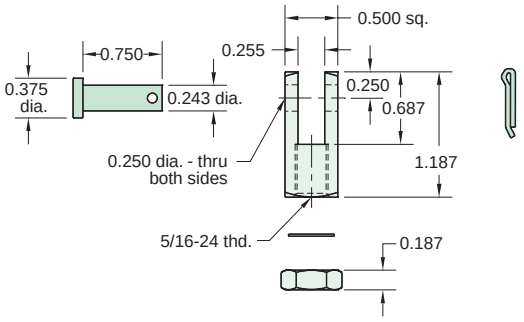
CB-1795

Clevis Bracket
Material: steel, bright zinc plated



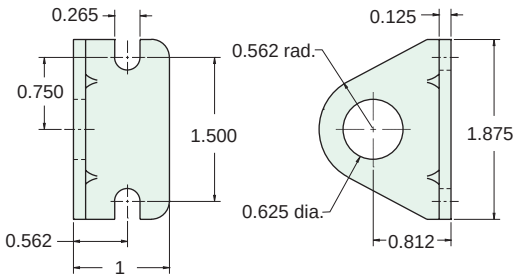
RC-1781

Rod Clevis
Material: steel, bright zinc plated



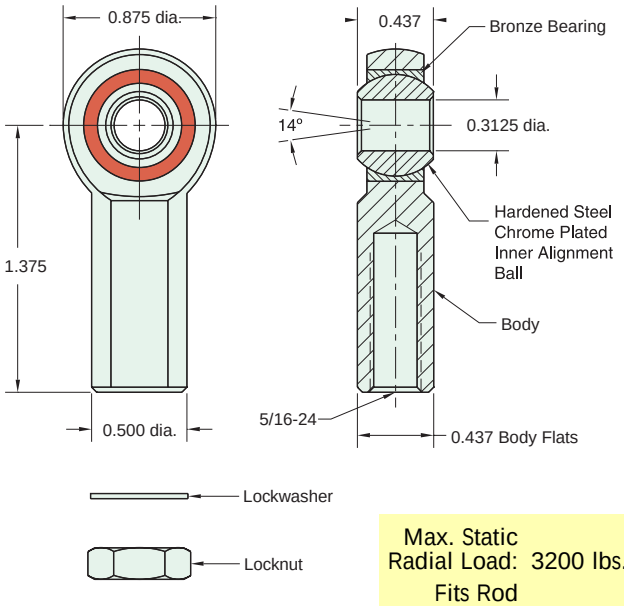
FB-1791

Foot Bracket
Material: steel, bright zinc plated



RE-1785

Rod End
Material: steel, bright zinc plated body



Max. Static
Radial Load: 3200 lbs.
Fits Rod
Thread Size: 5/16-24

1 1/4" Bore Stainless Steel Cylinder

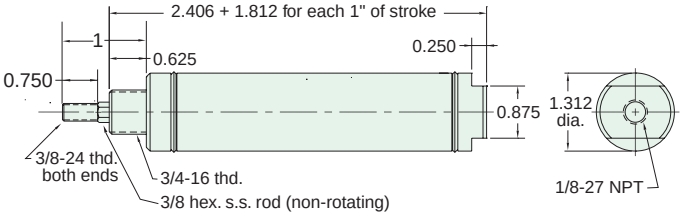
Note: The 1 1/4" bore is also available with a 7/16-20 threaded rod. Order -LR option.

SSN-20-❑-❑

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4.5 lbs.
Options: MB, B, H, V, S, N

Single Acting

For S option add .312



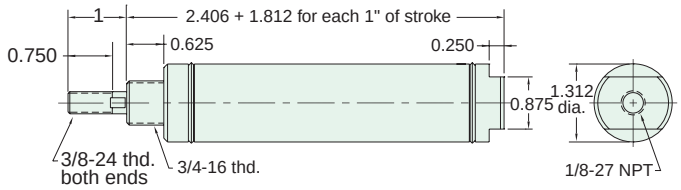
Nut included, but not shown on drawing

SSR-20-❑-❑

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4.5 lbs.
Options: MB, B, H, V, S, N

Single Acting

For S option add .312

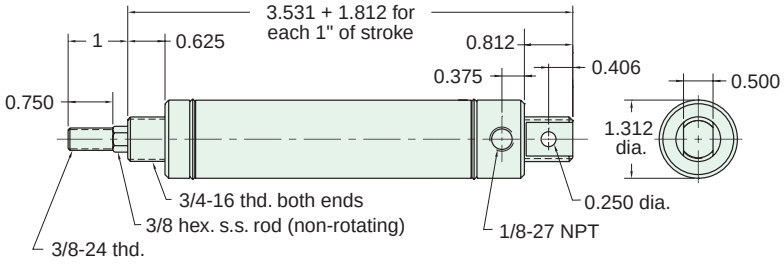


Nut included, but not shown on drawing

USN-20-❑-❑

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4.5 lbs.
Options: MB, B, H, V, P2, P3, P4, P5, P6, P7, P8, N For magnetic bumpers add .312

Single Acting

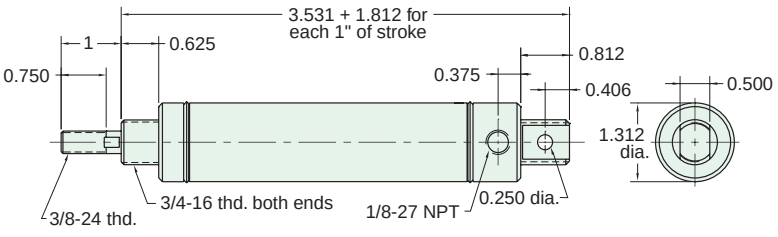


Furnished without nut(s). See Chart on Page 38.

USR-20-❑-❑

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4.5 lbs.
Options: MB, B, H, V, P2, P3, P4, P5, P6, P7, P8, N For magnetic bumpers add .312

Single Acting



Furnished without nut(s). See Chart on Page 38.

1 1/4" Bore Stainless Steel Cylinder

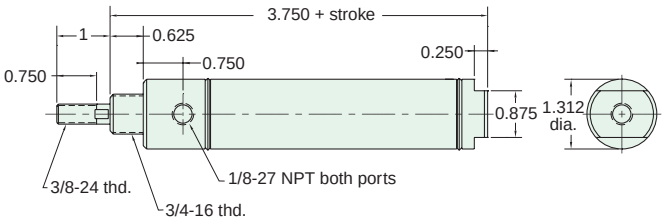
Note: The 1 1/4" bore is also available with a 7/16-20 threaded rod. Order -LR option.

SDR-20-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod
Options: C, F, R, MB, B, W, V, P6, P7, P8, S, N

For magnetic bumpers add .312
For C, F, R and S option add .312



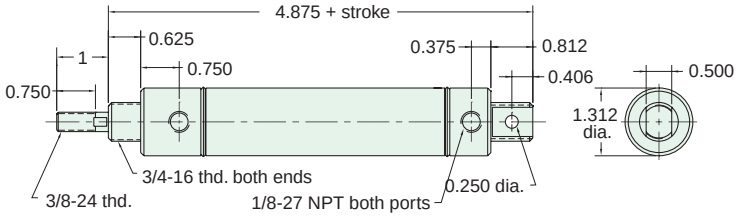
Nut included, but not shown on drawing
For C, F, & R options use side ported rear head

UDR-20-❑-❑

Double Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod 6, 8", 10", 12
Options: C, F, R, MB, B, W, V, P2, P3, P4, P5, P6, P7, P8, N

For magnetic bumpers add .312



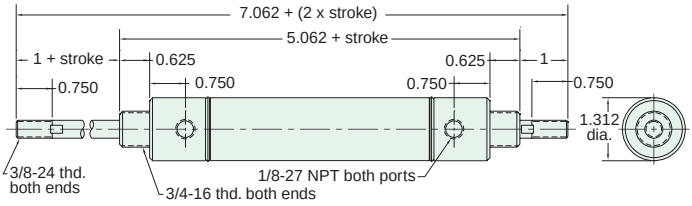
Furnished without nut(s). See Chart on Page 38.

SDD-20-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Double Rod
Options: C, F, MB, B, W, V, P6, P7, P8, N

For magnetic bumpers add .312



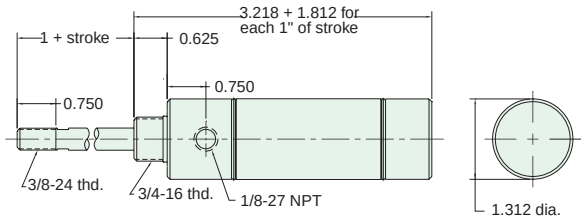
Nuts included, but not shown on drawing

SRR-20-❑-❑

Reverse Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4.5 lbs.
Options: MB, B, H, W, V, N

For magnetic bumpers add .312



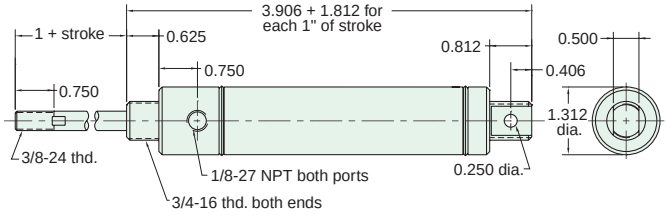
Nuts included, but not shown on drawing

Note: The 1 1/4" bore is also available with a 7/16-20 threaded rod. Order -LR option.

URR-20-❑-❑

Reverse Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4.5 lbs.
Options: MB, B, H, W, V, P6, N



Furnished without nut(s). See Chart on Page 38.

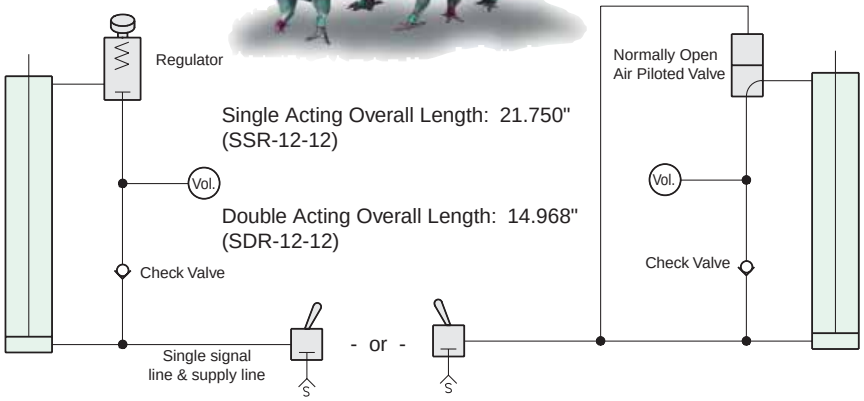
Application Story

ap·pli·ca·tion \ap-l ə-'kâ-sh ən\ n 1 : the act of applying 2 : assiduous attention 3 : REQUEST; also : a form used in making a request 4 : something placed or spread on a surface 5 : capacity for use

Clippard Applications Have Gone to the Birds

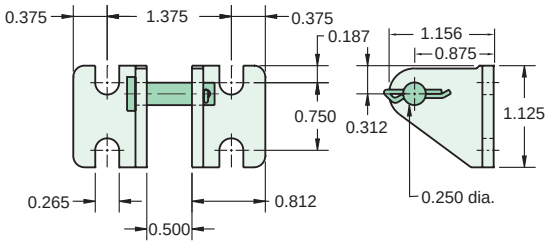
Pneumatic automation plays a role on the roof tops of Clippard. Over time, pigeons become unruffled by the presence of a motionless plastic owl. By automating several owls throughout the area to pop up out of 8 inch PVC pipes, the pigeon problem has flown away.

While this application only requires a single acting cylinder, they tend to be longer than double acting cylinders of the same stroke. To fit the cylinder inside of the owl and have enough stroke to raise it fully, these wise old birds used double acting cylinders with a little circuitry to make them act like single acting cylinders.



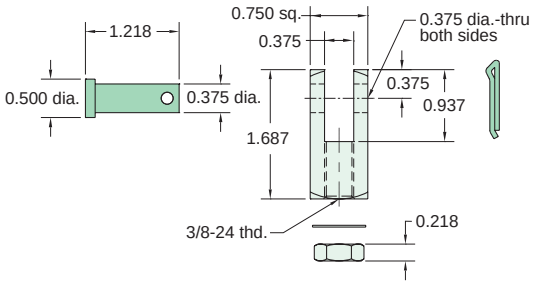
CB-2095

Clevis Bracket
Material: steel, bright zinc plated



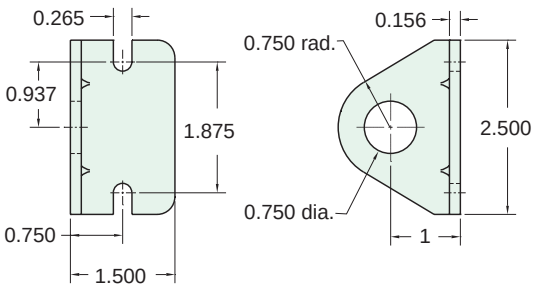
RC-2081

Rod Clevis
Material: steel, bright zinc plated



FB-2491

Foot Bracket
Material: steel, bright zinc plated



Mounting Nuts

Stud Nut

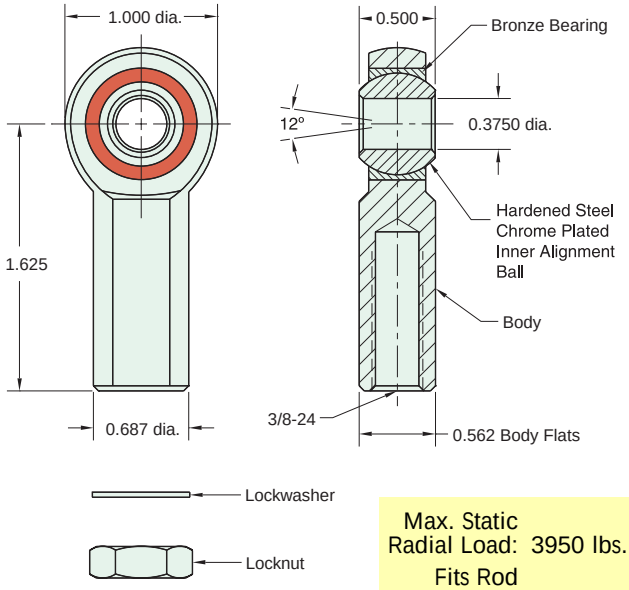
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N12-16	1 3/32"	27/64"	3/4-16

Rod Nut

Part Number	Across Flats	Nut Thickness	Nut (Thread)
N06-24A	9/16"	7/32"	3/8-24
N06-24B	1/2"	1/8"	3/8-24

RE-2085

Rod End
Material: steel, bright zinc plated body

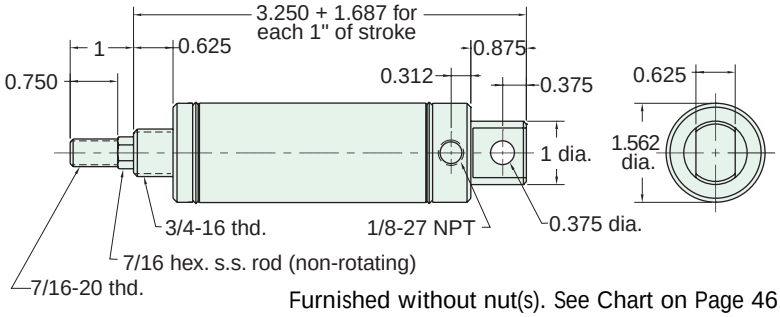


Max. Static Radial Load: 3950 lbs.
Fits Rod Thread Size: 3/8-24

CSN-24-❑-❑

Single Acting

Mount: Clevis **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, V, P6, N For magnetic bumpers add .312

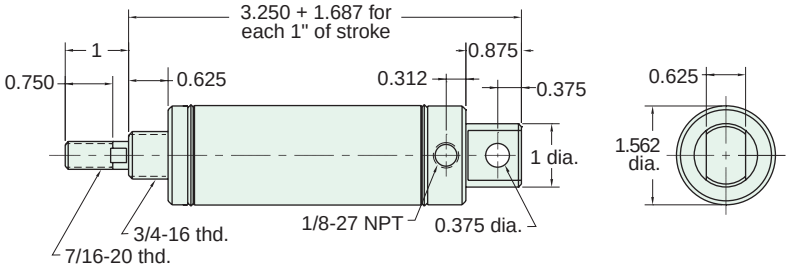


Furnished without nut(s). See Chart on Page 46.

CSR-24-❑-❑

Single Acting

Mount: Clevis **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, V, P6, N For magnetic bumpers add .312

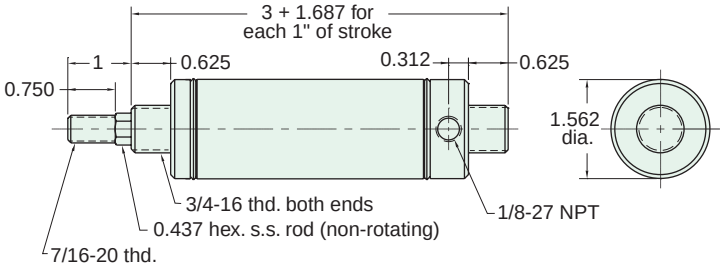


Furnished without nut(s). See Chart on Page 46.

ESN-24-❑-❑

Single Acting

Mount: End **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, V, N For magnetic bumpers add .312

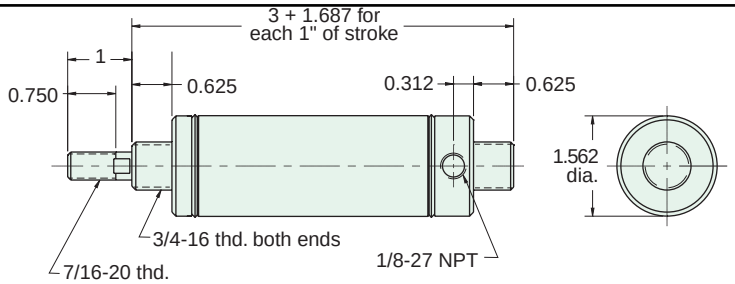


Nuts included, but not shown on drawing

ESR-24-❑-❑

Single Acting

Mount: End **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, V, N For magnetic bumpers add .312

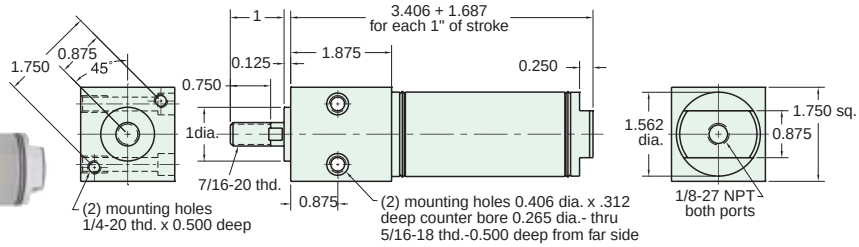


Nut included, but not shown on drawing

FSR-24-❑-❑

Single Acting

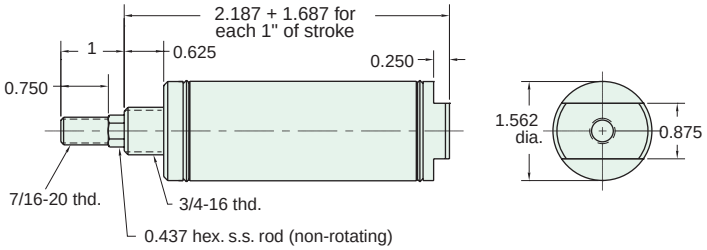
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, V, S, N
For magnetic bumpers add .312
For S option add .187



SSN-24-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, V, S, N
For magnetic bumpers add .312
For S option add .187

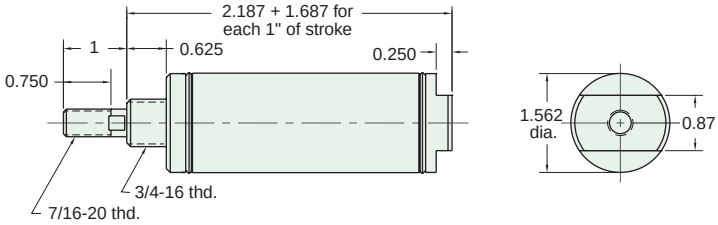


Nut included, but not shown on drawing

SSR-24-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, V, S, N
For magnetic bumpers add .312
For S option add .187

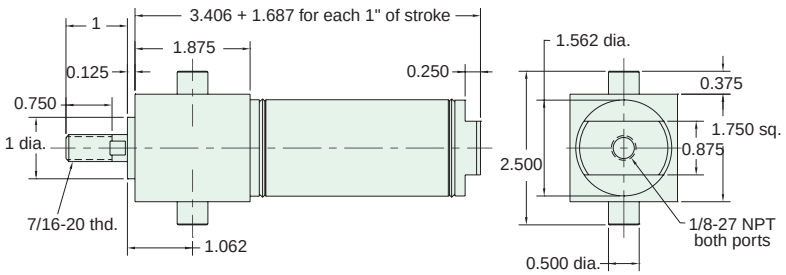


Nut included, but not shown on drawing

TSR-24-❑-❑

Single Acting

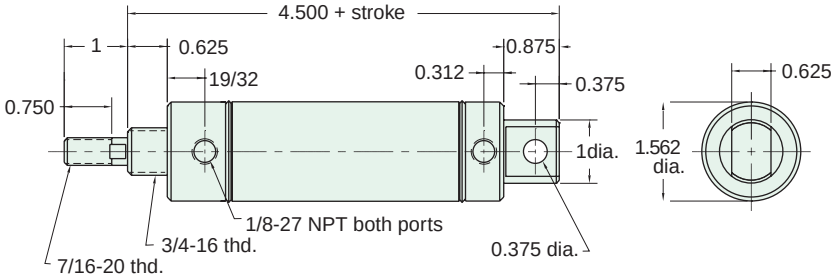
Mount: Trunnion **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, V, S, N
For magnetic bumpers add .312
For S option add .187



CDR-24-❑-❑

Double Acting

Mount: Clevis **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
6, 8", 10", 12"
Type: Rotating Rod
Options: C, F, R, MB, B, W, V, P2, P3, P4, P5, P6, P7, P8, N
For magnetic bumpers add .312

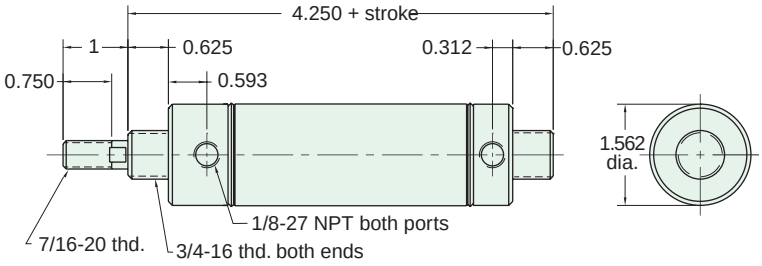


Furnished without nut(s). See Chart on Page 46.

EDR-24-❑-❑

Double Acting

Mount: End **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 6, 8", 10", 12"
Type: Rotating Rod
Options: C, F, R, MB, B, W, V, P6, P7, P8, N
For magnetic bumpers add .312

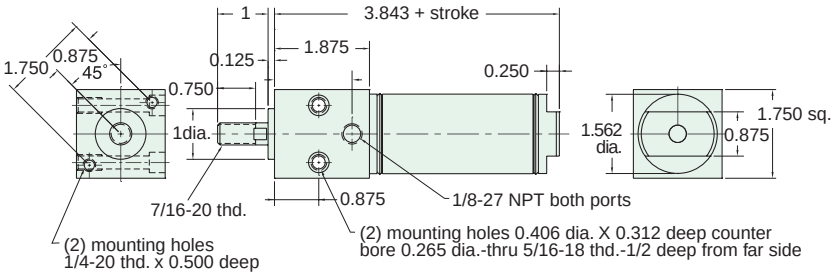


Nuts included, but not shown on drawing

FDR-24-❑-❑

Double Acting

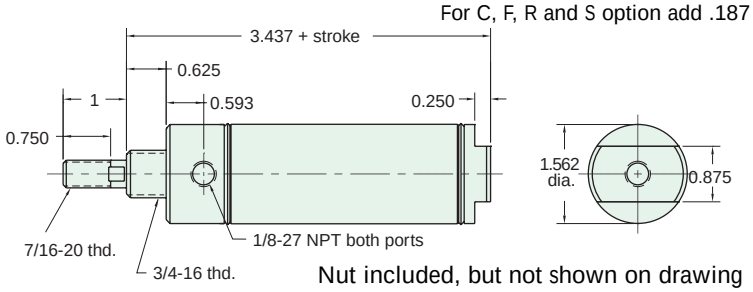
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod
Options: MB, B, W, V, P6, P7, P8, S, N
For magnetic bumpers add .312
For S option add .187



SDR-24-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 6, 8", 10", 12"
Type: Rotating Rod
Options: C, F, R, MB, B, W, V, P6, P7, P8, S, N
For magnetic bumpers add .312
For C, F, R and S option add .187



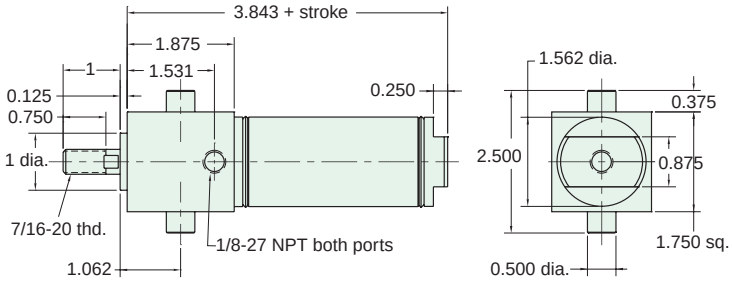
Nut included, but not shown on drawing
For C, F, & R options use side ported rear head

TDR-24-❑-❑

Double Acting

Mount: Trunnion **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod
Options: MB, B, W, V, S, N

For magnetic bumpers add .312
For S option add .187

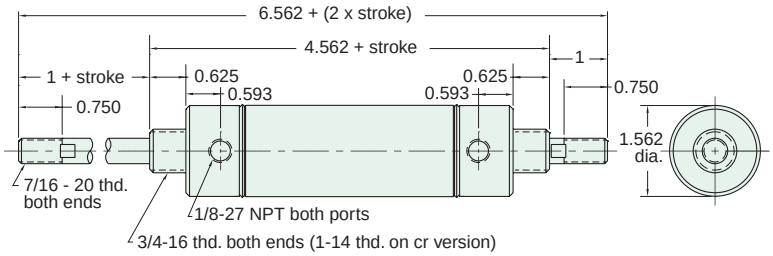


SDD-24-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6", 8", 10", 12"
Type: Double Rod
Options: C, F, MB, B, W, V, P6, P7, P8, N

For magnetic bumpers add .312



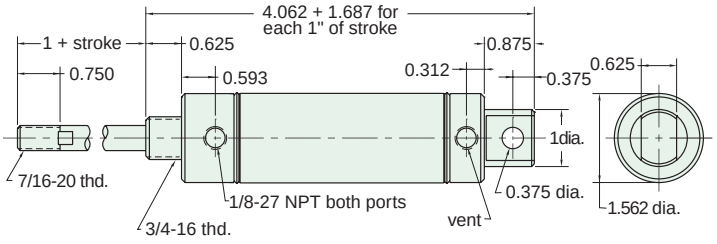
Nuts included, but not shown on drawing

CRR-24-❑-❑

Reverse Acting

Mount: Clevis **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, W, V, P6, P7, P8, N

For magnetic bumpers add .312



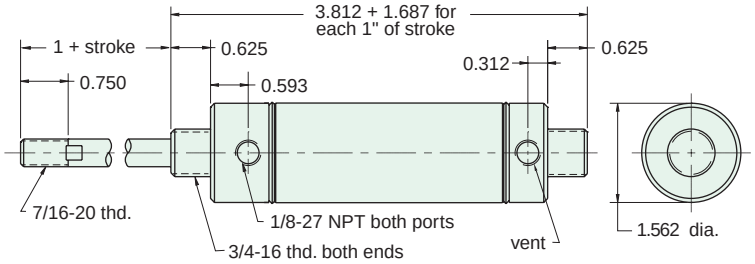
Furnished without nut(s). See Chart on Page 46.

ERR-24-❑-❑

Reverse Acting

Mount: End **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, W, V, N

For magnetic bumpers add .312

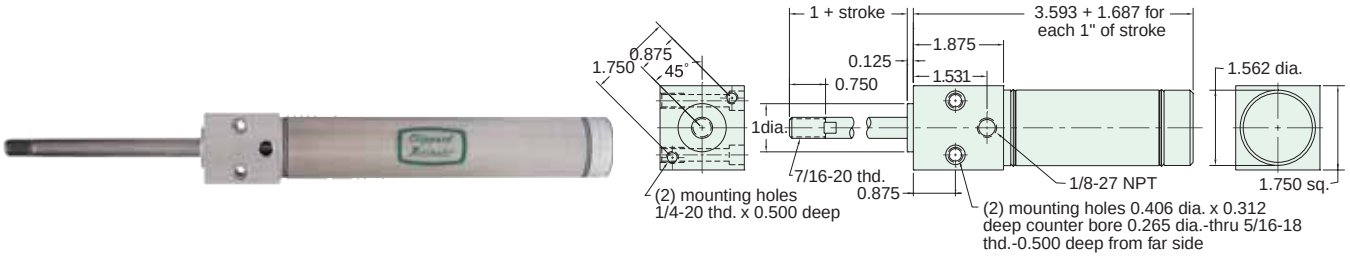


Nuts included, but not shown on drawing

FRR-24-❑-❑

Reverse Acting

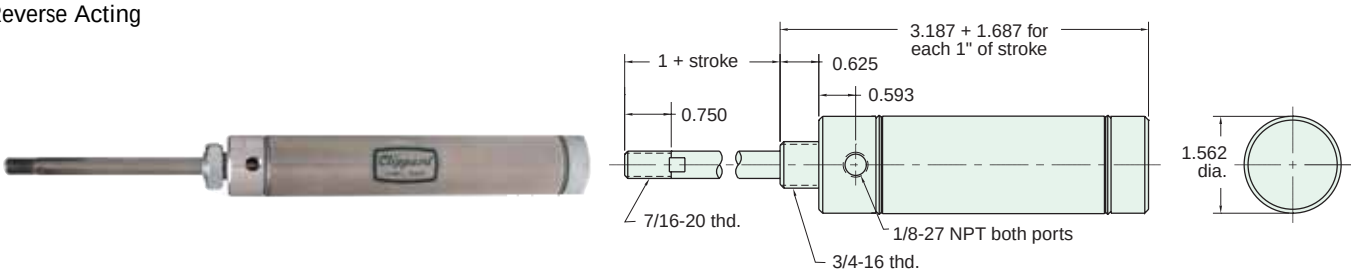
Mount: Front **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, W, V, N For magnetic bumpers add .312



SRR-24-❑-❑

Reverse Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, W, V, N For magnetic bumpers add .312

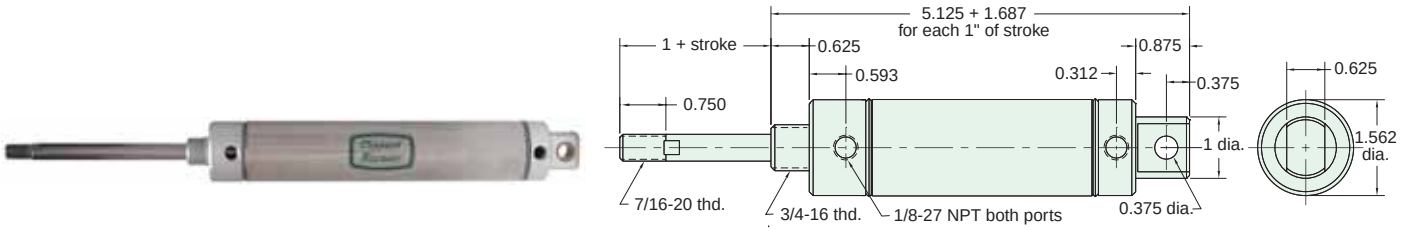


Nut included, but not shown on drawing

CBR-24-❑-❑

Double Acting, Spring Bias

Mount: Clevis **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, W, V, P2, P3, P4, P5, P6, P7, P8, N For magnetic bumpers add .312

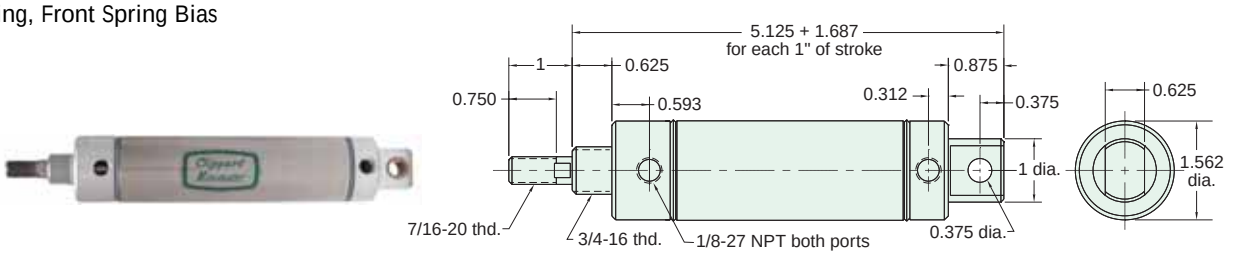


Furnished without nut(s). See Chart on Page 46.

CFR-24-❑-❑

Double Acting, Front Spring Bias

Mount: Clevis **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, W, V, P2, P3, P4, P5, P6, P7 P8, N For magnetic bumpers add .312



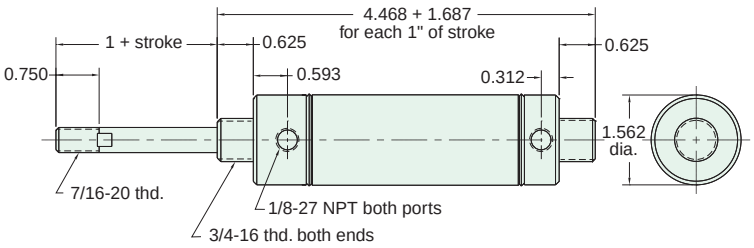
Furnished without nut(s). See Chart on Page 46.

1 1/2" Bore Stainless Steel Cylinder

EBR-24-❑-❑

Double Acting, Rear Spring Bias

Mount: End **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, W, V, P6, P7, P8, N
For magnetic bumpers add .312

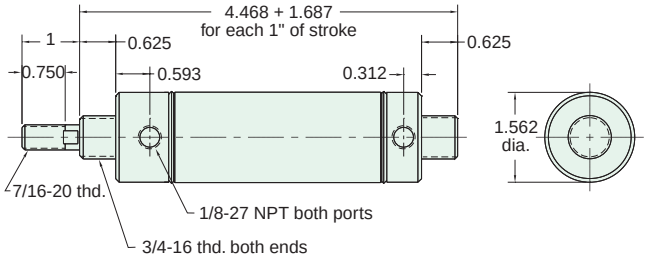


Nuts included, but not shown on drawing

EFR-24-❑-❑

Double Acting, Front Spring Bias

Mount: End **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, W, V, P6, P7, P8, N
For magnetic bumpers add .312

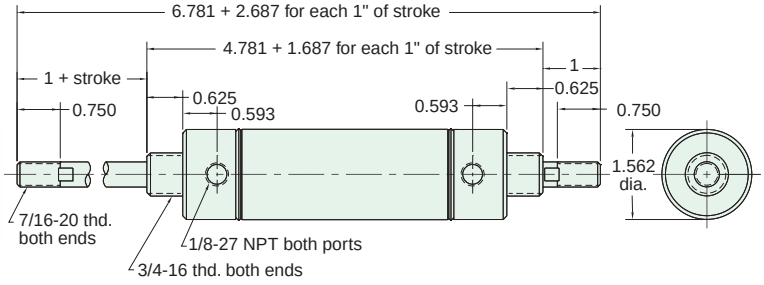


Nuts included, but not shown on drawing

SFD-24-❑-❑

Double Acting, Front Spring Bias

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Double Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, W, V, P6, P7, P8, N
For magnetic bumpers add .312

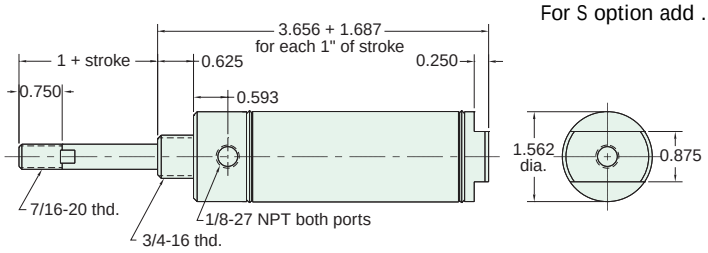


Nuts included, but not shown on drawing

SBR-24-❑-❑

Double Acting, Rear Spring Bias

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, W, V, P6, P7, P8, S, N
For magnetic bumpers add .312
For S option add .187



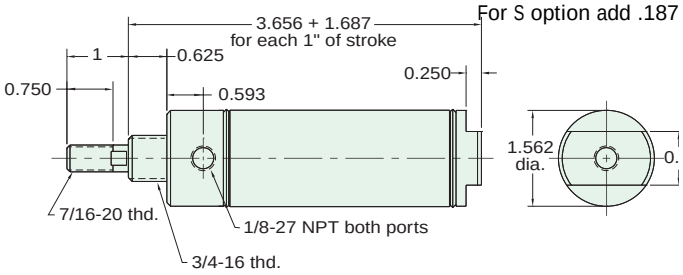
Nuts included, but not shown on drawing

SFR-24-❑-❑

Double Acting, Front Spring Bias

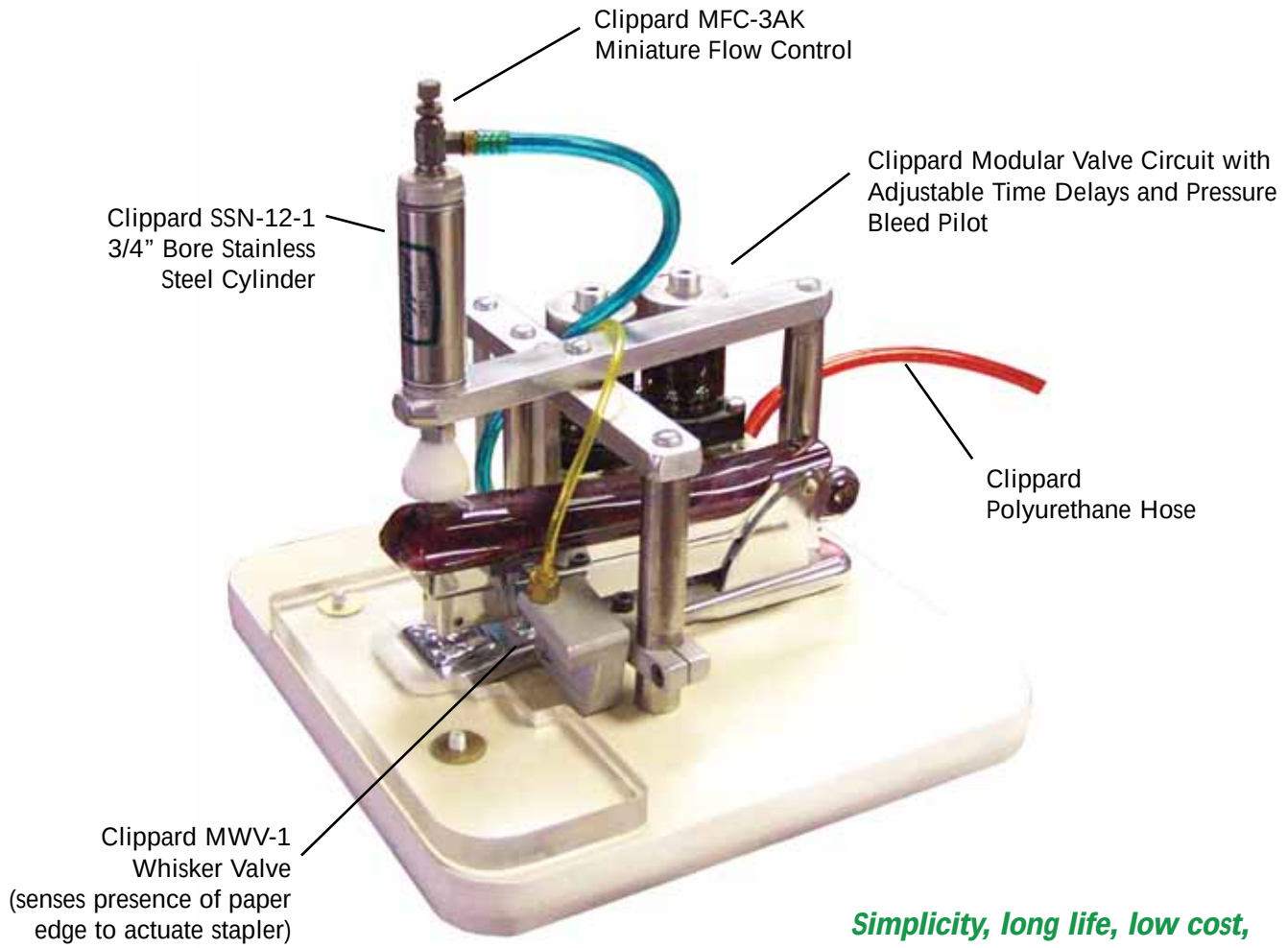
Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 10 lbs. **Spring At Rest:** 4 1/2 lbs.
Options: MB, B, H, W, V, P6, P7, P8, S, N For magnetic bumpers add .312

For S option add .187



Nut included, but not shown on drawing

Pneumatic Stapler



Simplicity, long life, low cost, ease of maintenance and high power are combined in this unique office stapler application.

Mounting Nuts

Stud Nut

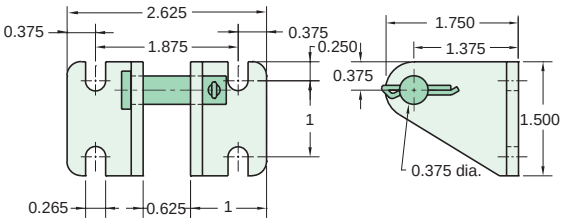
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N12-16	1 3/32"	27/64"	3/4-16

Rod Nut

Part Number	Across Flats	Nut Thickness	Nut (Thread)
N07-20	11/16"	1/4"	7/16-20

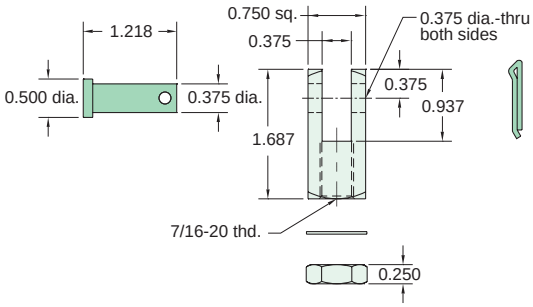
CB-2495

Clevis Bracket
Material: steel, bright zinc plated



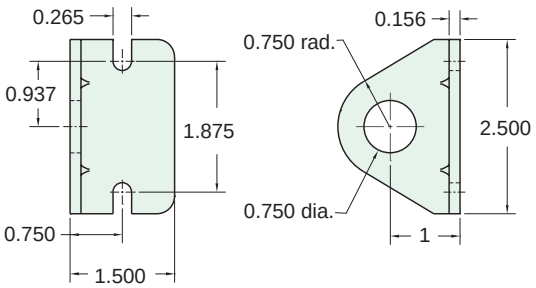
RC-2481

Rod Clevis
Material: steel, bright zinc plated



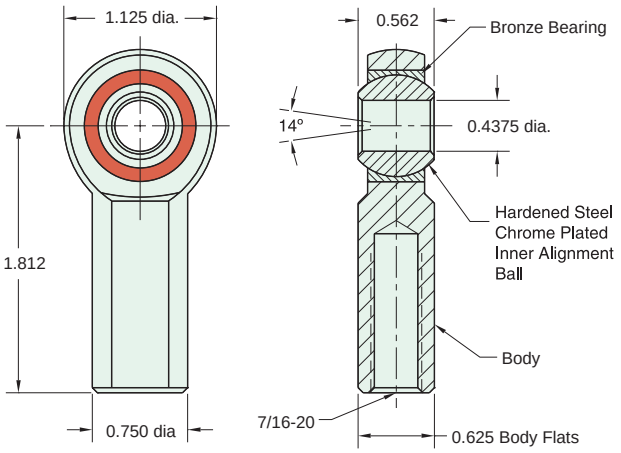
FB-2491

Foot Bracket
Material: steel, bright zinc plated



RE-2485

Rod End
Material: steel, bright zinc plated body

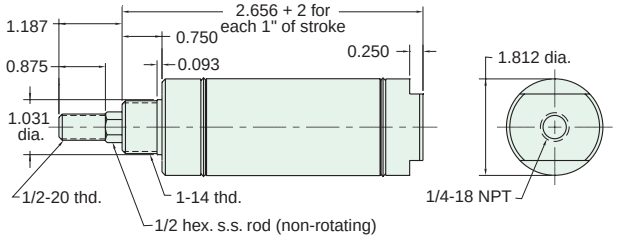


Max. Static Radial Load: 4,300 lbs.
Fits Rod Thread Size: 7/16-24

SSN-28-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 24 lbs. **Spring At Rest:** 11 lbs.
Options: MB, V, S, N **Bumpers are standard** For magnetic bumpers add .312
For S option add .562

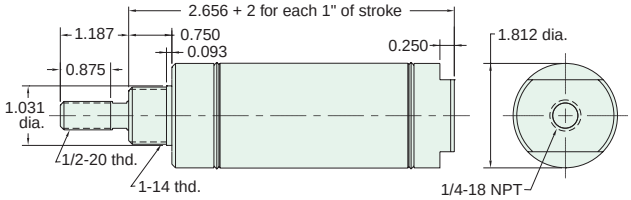


Nut included, but not shown on drawing

SSR-28-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 24 lbs. **Spring At Rest:** 11 lbs.
Options: MB, V, S, N **Bumpers are standard** For magnetic bumpers add .312
For S option add .562

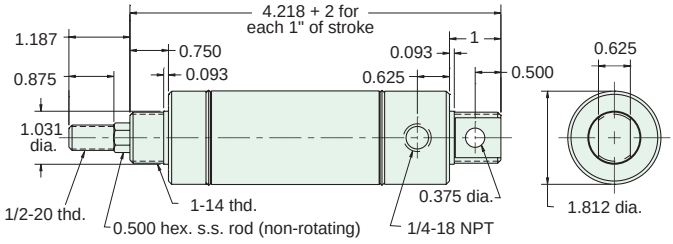


Nut included, but not shown on drawing

USN-28-❑-❑

Single Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Non-Rotating Rod **Spring Compressed:** 24 lbs. **Spring At Rest:** 11 lbs.
Options: MB, V, P2, P3, P4, P5, P6, P7, P8, N **Bumpers are standard** For magnetic bumpers add .312

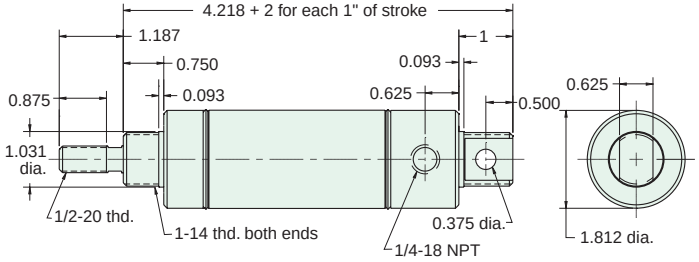


Furnished without nut(s). See Chart on Page 50.

USR-28-❑-❑

Single Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 24 lbs. **Spring At Rest:** 11 lbs.
Options: MB, V, P2, P3, P4, P5, P6, P7, P8, N **Bumpers are standard** For magnetic bumpers add .312



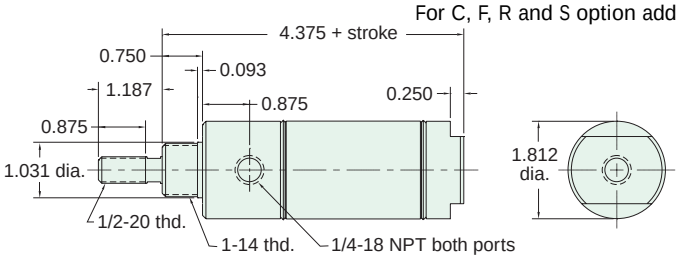
Furnished without nut(s). See Chart on Page 50.

SDR-28-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod
Options: C, F, R, MB, W, V, P6, P7, P8, S, N

Bumpers are standard
For magnetic bumpers add .312
For C, F, R and S option add .562



Nut included, but not shown on drawing

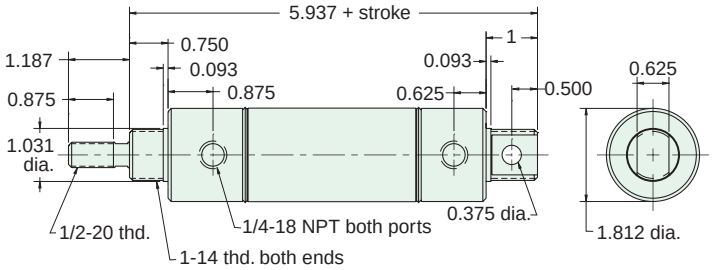
For C, F, & R options use side ported rear head

UDR-28-❑-❑

Double Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 6, 8", 10", 12"
Type: Rotating Rod
Options: C, F, R, MB, W, V, P2, P3, P4, P5, P6, P7, P8, N

Bumpers are standard
For magnetic bumpers add .312



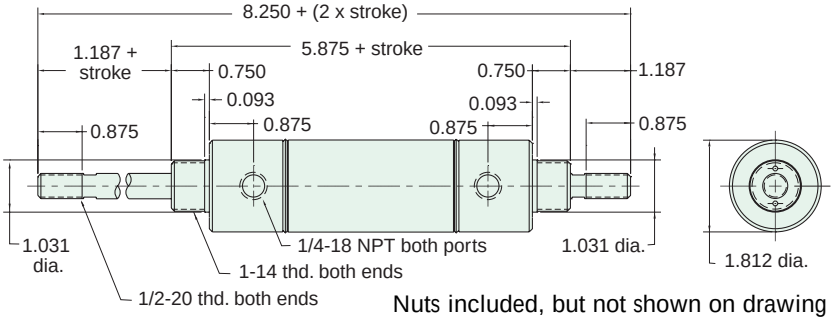
Furnished without nut(s). See Chart on Page 50.

SDD-28-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6", 8", 10", 12"
Type: Double Rod
Options: C, F, MB, W, V, P6, P7, P8, N

Bumpers are standard
For magnetic bumpers add .312



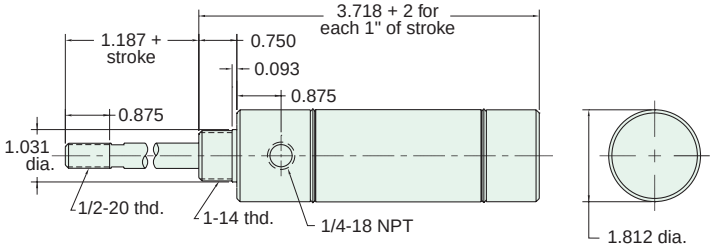
Nuts included, but not shown on drawing

SRR-28-❑-❑

Reverse Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 24 lbs. **Spring At Rest:** 11 lbs.
Options: MB, W, V, N

Bumpers are standard
For magnetic bumpers add .312



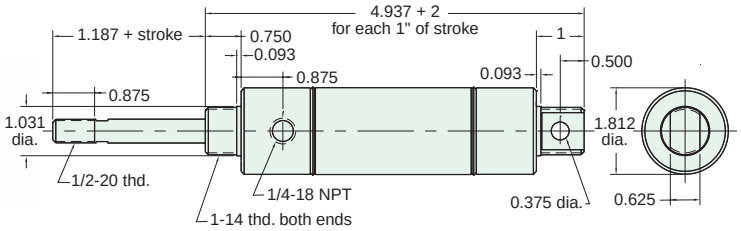
Nut included, but not shown on drawing

URR-28-❑-❑

Reverse Acting

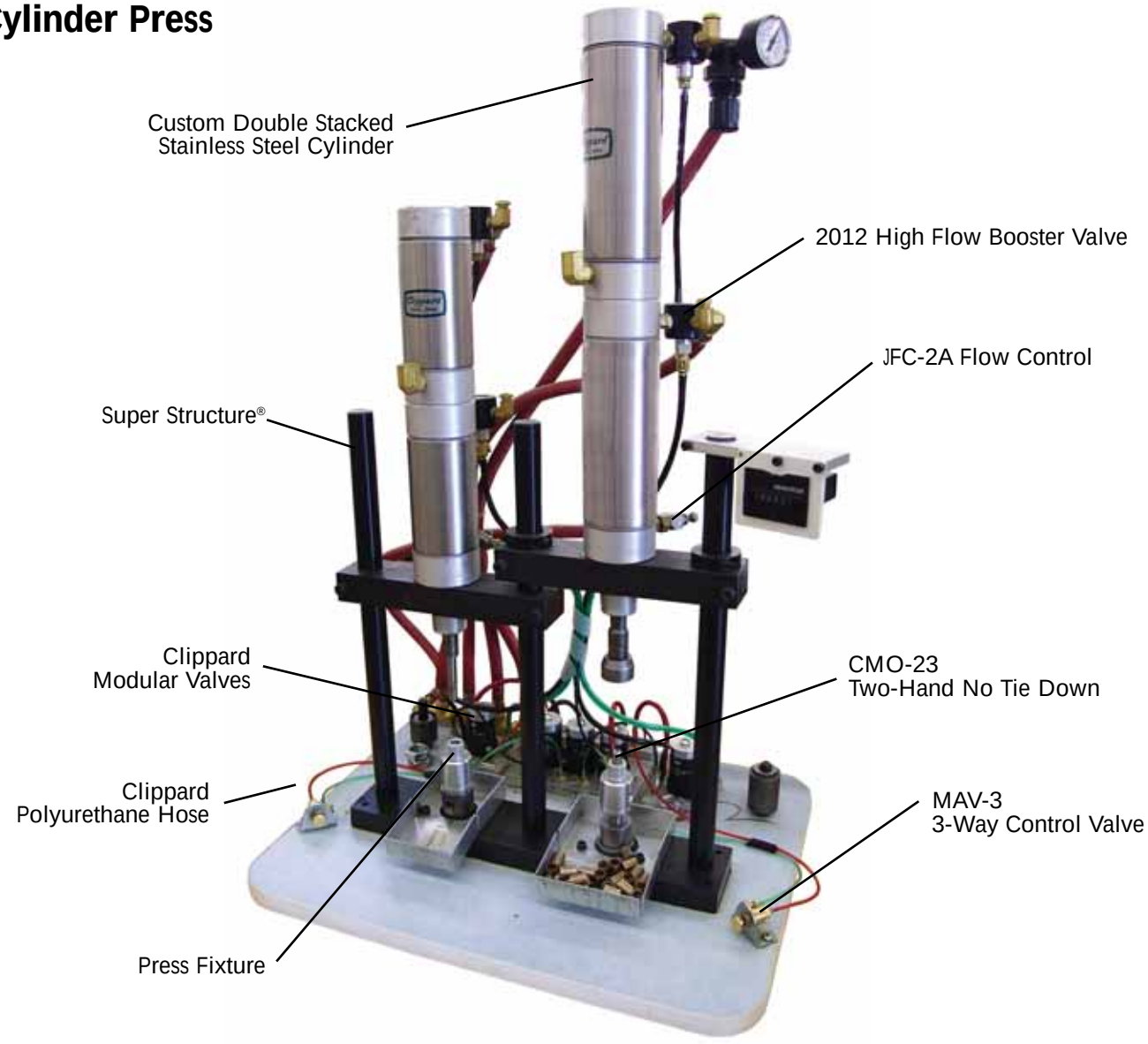
Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 24 lbs. **Spring At Rest:** 11 lbs.
Options: MB, W, V, P6, N **Bumpers are standard**

For magnetic bumpers add .312



Furnished without nut(s). See Chart on Page 50.

Dual Double Stacked Cylinder Press



Mounting Nuts

Stud Nut

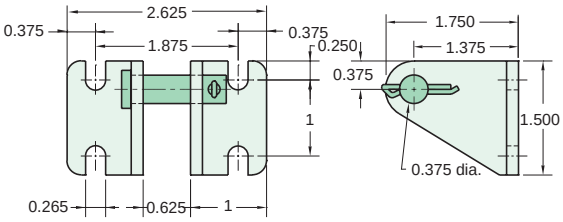
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N16-14	1 1/2”	35/64”	1-14

Rod Nut

Part Number	Across Flats	Nut Thickness	Nut (Thread)
N07-20	11/16”	1/4”	7/16-20

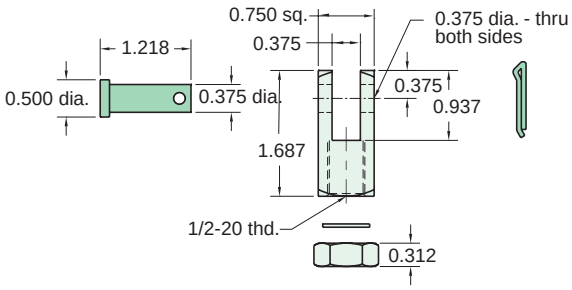
CB-2495

Clevis Bracket
Material: steel, bright zinc plated



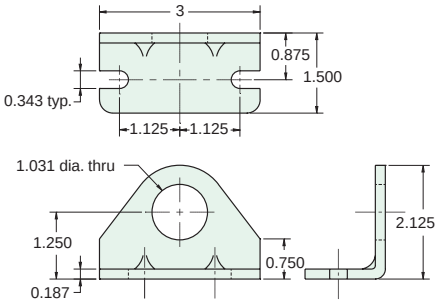
RC-3281

Rod Clevis
Material: steel, bright zinc plated



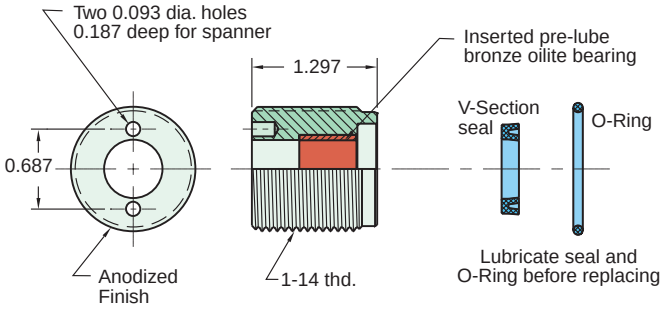
FB-2891

Foot Bracket
Material: steel, bright zinc plated



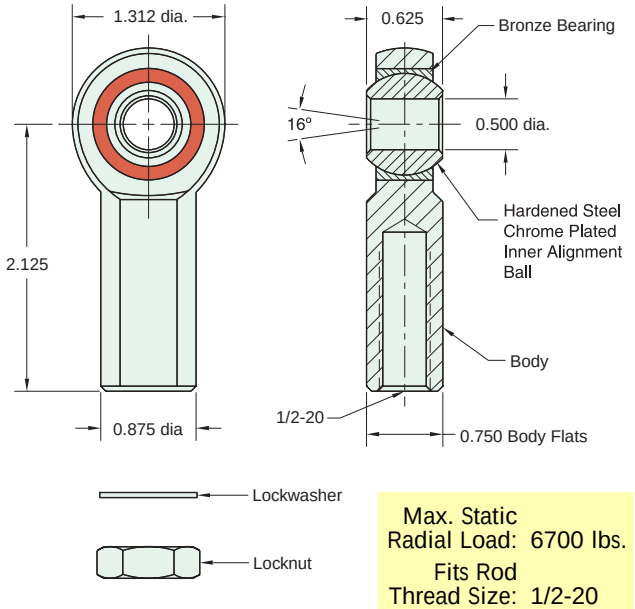
RK-2899

Replaceable Rod Seal
Material: aluminum body



RE-3285

Rod End
Material: steel, bright zinc plated body

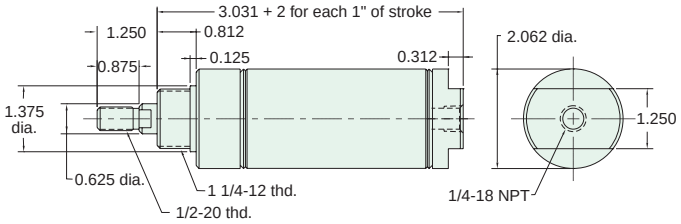


Max. Static Radial Load: 6700 lbs.
Fits Rod Thread Size: 1/2-20

SSR-32-❑-❑

Single Acting

Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6", 7, 8", 10", 12"
Type: Rotating Rod **Spring Compressed:** 30 lbs. **Spring At Rest:** 15 lbs.
Options: MB, B, V, S, N For magnetic bumpers add .312
For S option add .375

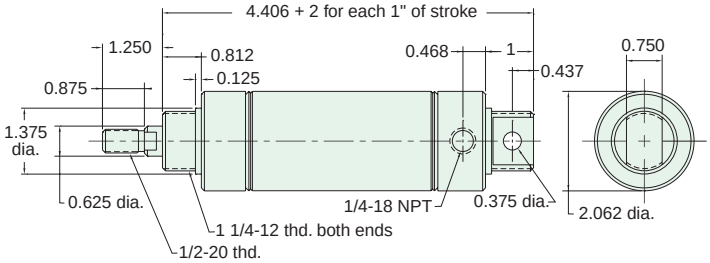


Nut included, but not shown on drawing

USR-32-❑-❑

Single Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 30 lbs. **Spring At Rest:** 15 lbs.
Options: MB, B, V, N For magnetic bumpers add .312

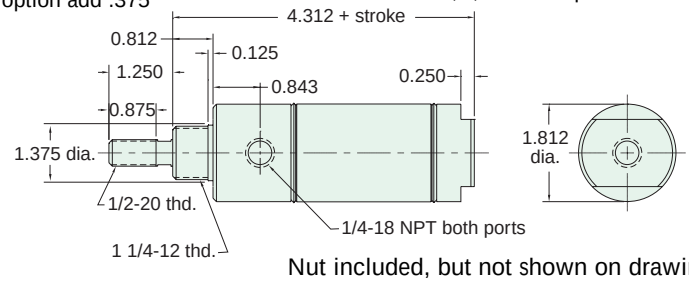


Furnished without nut(s). See Chart on Page 54.

SDR-32-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Type: Rotating Rod
Options: C, F, R, MB, B, W, V, P6, P7, P8, S, N For magnetic bumpers add .312
For S option add .375 For C, F, R and S options add .375

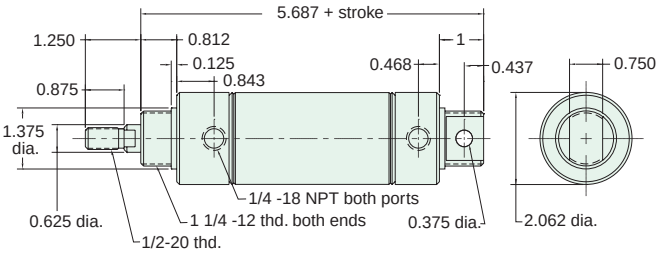


Nut included, but not shown on drawing
For C, F, & R options use side ported rear head

UDR-32-❑-❑

Double Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod 5", 6", 7, 8", 10", 12"
Options: C, F, R, MB, B, W, V, P2, P3, P4, P5, P6, P7, P8, N For magnetic bumpers add .312



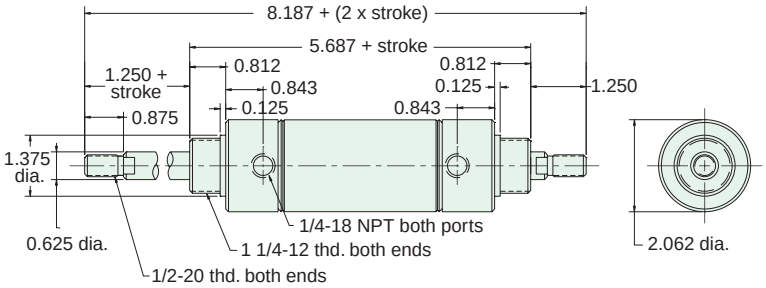
Furnished without nut(s). See Chart on Page 54.

2" Bore Stainless Steel Cylinder

SDD-32-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6", 8", 10", 12"
Type: Double Rod
Options: C, F, MB, B, W, V, P2, P3, P4, P5, P6, P7, P8, N For magnetic bumpers add .312

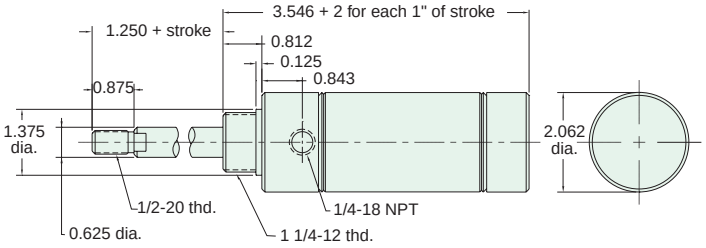


Nuts included, but not shown on drawing

SRR-32-❑-❑

Reverse Acting

Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Rotating Rod **Spring Compressed:** 30 lbs. **Spring At Rest:** 15 lbs.
Options: MB, B, W, V, N For magnetic bumpers add .312

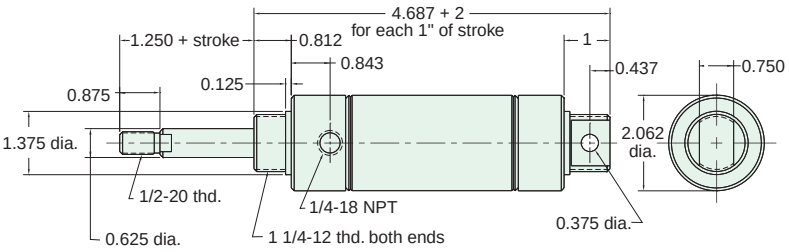


Nut included, but not shown on drawing

URR-32-❑-❑

Reverse Acting

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 30 lbs. **Spring At Rest:** 15 lbs.
Options: MB, B, W, V, P6, N For magnetic bumpers add .312

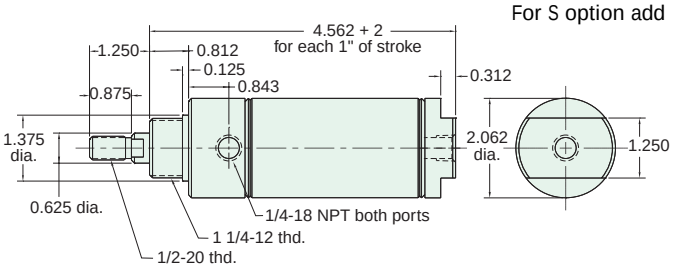


Furnished without nut(s). See Chart on Page 54.

SFR-32-❑-❑

Spring Bias

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 30 lbs. **Spring At Rest:** 15 lbs.
Options: MB, B, W, V, P6, P7, P8, S, N For magnetic bumpers add .312
For S option add .375

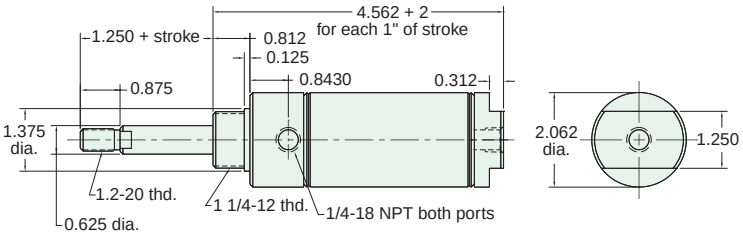


Nut included, but not shown on drawing

SBR-32-❑-❑

Spring Bias

Mount: Stud **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 30 lbs. **Spring At Rest:** 15 lbs.
Options: MB, B, W, V, P6, P7, P8, S, N For magnetic bumpers add .312
For S option add .375

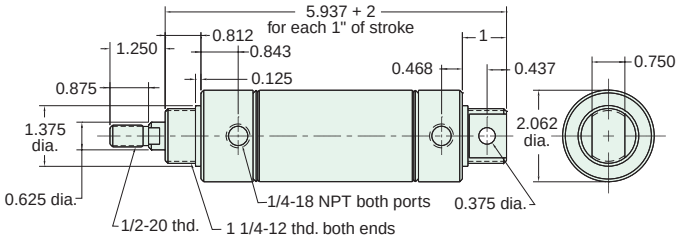


Nut included, but not shown on drawing

UFR-32-❑-❑

Spring Bias

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 30 lbs. **Spring At Rest:** 15 lbs.
Options: MB, B, W, V, P2, P3, P4, P5, P6, P7, P8, N For magnetic bumpers add .312

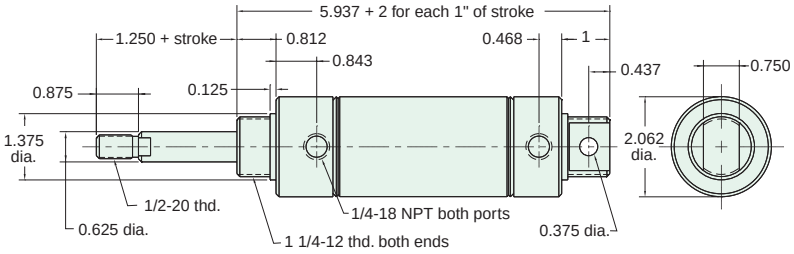


Furnished without nut(s). See Chart on Page 54.

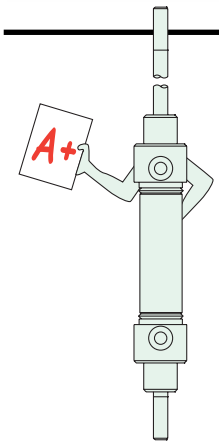
UBR-32-❑-❑

Spring Bias

Mount: Universal **Standard Stroke Lengths:** 1/2", 1", 1-1/2", 2", 3", 4"
Type: Rotating Rod **Spring Compressed:** 30 lbs. **Spring At Rest:** 15 lbs.
Options: MB, B, W, V, P2, P3, P4, P5, P6, P7, P8, N For magnetic bumpers add .312

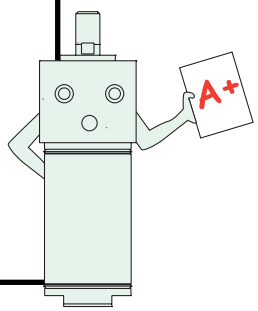


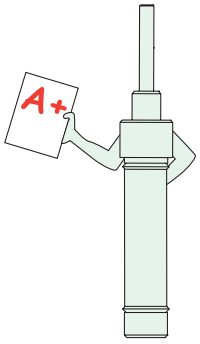
Furnished without nut(s). See Chart on Page 54.



Did you know...

All Clippard Cylinders are 100% tested.





Mounting Nuts

Stud Nut

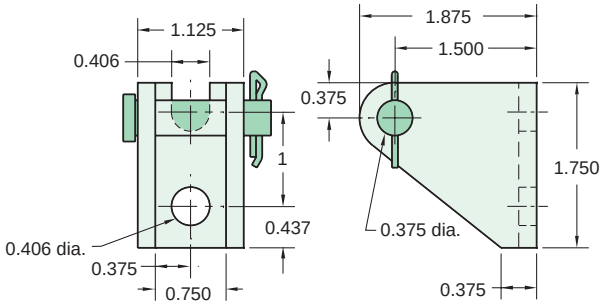
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N20-12	1 3/4"	7/16"	1 1/4-12

Rod Nut

Part Number	Across Flats	Nut Thickness	Nut (Thread)
N08-20	3/4"	5/16"	1/2-20

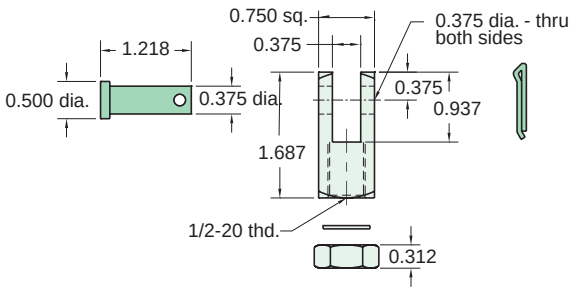
CB-3295

Clevis Bracket
Material: steel, bright zinc plated



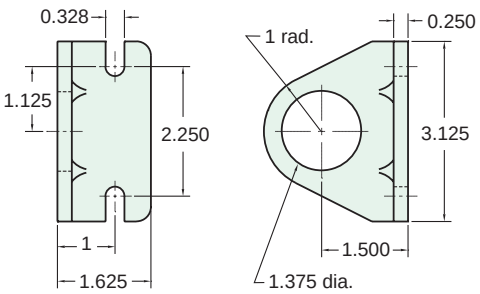
RC-3281

Rod Clevis
Material: steel, bright zinc plated



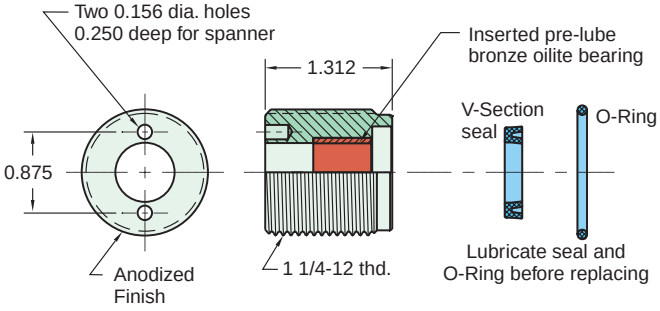
FB-3291

Foot Bracket
Material: steel, bright zinc plated



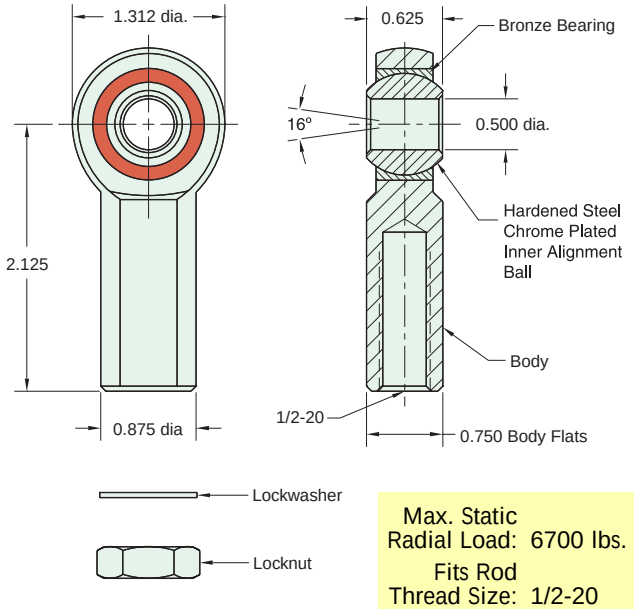
RK-3299

Replaceable Rod Seal
Material: aluminum body



RE-3285

Rod End
Material: steel, bright zinc plated body



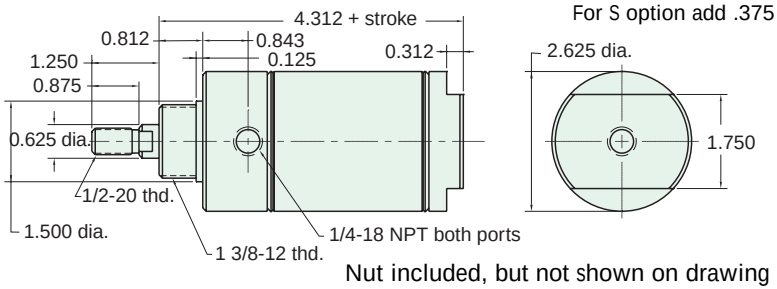
Max. Static Radial Load: 6700 lbs.
Fits Rod Thread Size: 1/2-20

SDR-40-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Rotating Rod
Options: C, F, R, MB, W, V, P6, P7, P8, S, N

Bumpers are standard
For magnetic bumpers add .312
For S option add .375



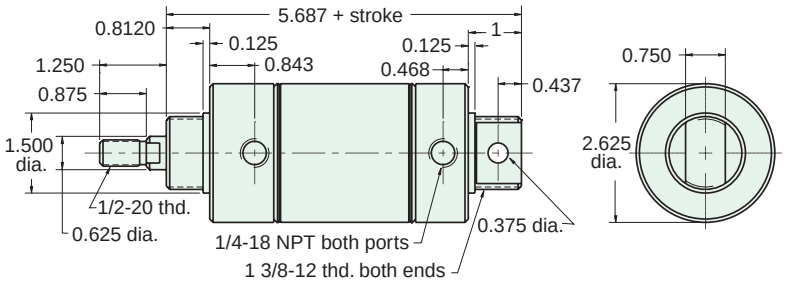
Nut included, but not shown on drawing

For C, F, & R options use side ported rear head

UDR-40-❑-❑

Double Acting

Mount: Universal **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6", 7", 8",
Type: Rotating Rod 10", 12"
Options: C, F, R, MB, W, V, P2, P3, P4, P5, P6, P7, P8, N **Bumpers are standard** For magnetic bumpers add .312

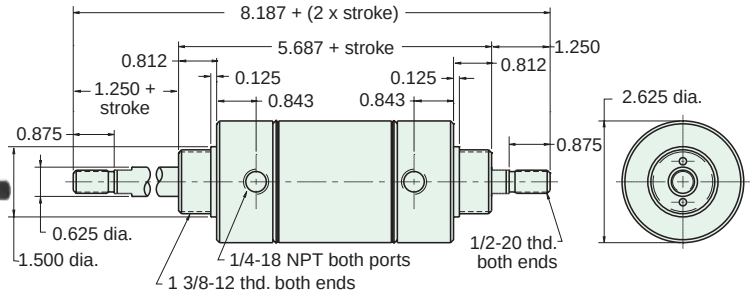


Furnished without nut(s). See Chart on Page 56.

SDD-40-❑-❑

Double Acting

Mount: Stud **Standard Stroke Lengths:** 1", 2", 3", 4", 5", 6", 8", 10", 12"
Type: Double Rod
Options: C, F, R, MB, W, V, P6, P7, P8, N **Bumpers are standard** For magnetic bumpers add .312



Nut included, but not shown on drawing

Mounting Nuts

Stud Nut

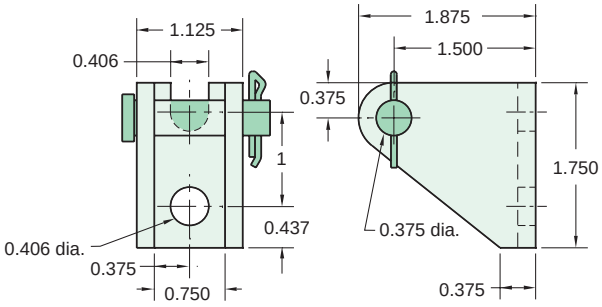
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N22-12	1 7/8"	1/2"	1 3/8-12

Rod Nut

Part Number	Across Flats	Nut Thickness	Nut (Thread)
N08-20	3/4"	5/16"	1/2-20

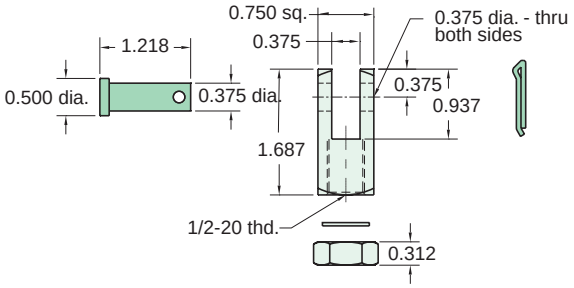
CB-3295

Clevis Bracket
Material: steel, bright zinc plated



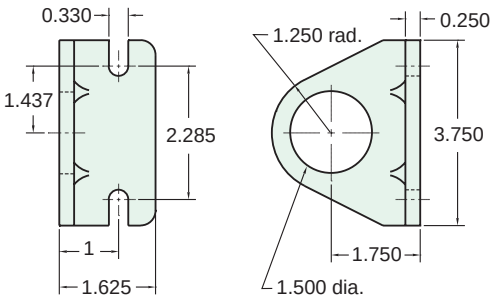
RC-3281

Rod Clevis
Material: steel, bright zinc plated



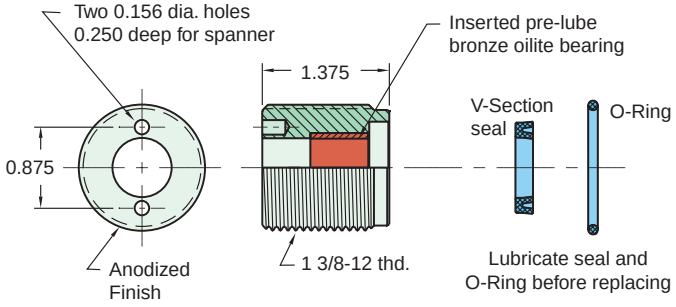
FB-4091

Foot Bracket
Material: steel, bright zinc plated



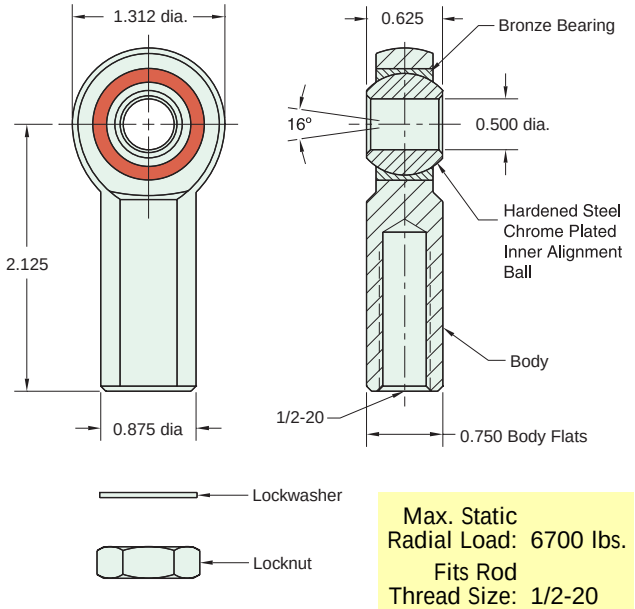
RK-4099

Replaceable Rod Seal
Material: aluminum body



RE-3285

Rod End
Material: steel, bright zinc plated body



Max. Static
Radial Load: 6700 lbs.
Fits Rod
Thread Size: 1/2-20

SDR-48-❑-❑

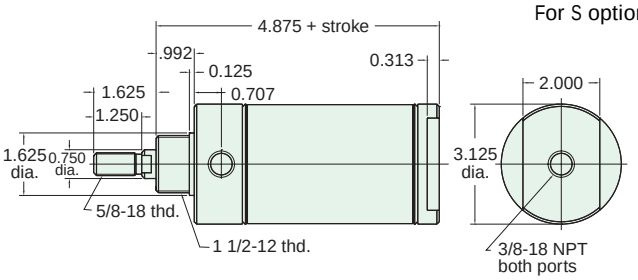
Double Acting

Mount: Stud
Type: Rotating Rod
Options: MB, W, V, P6, P7, P8, S, N

Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"

Bumpers are standard
No additional length for bumpers

For S option add .437



Nut included, but not shown on drawing

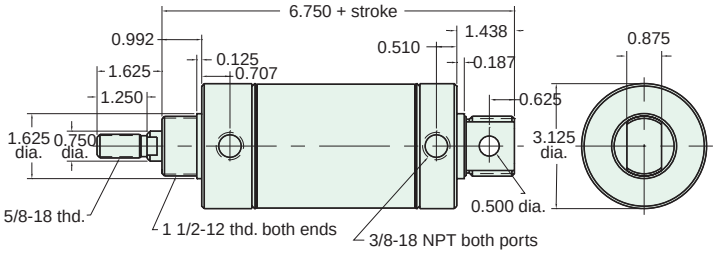
UDR-48-❑-❑

Double Acting

Mount: Universal
Type: Rotating Rod 12"
Options: MB, W, V, P2, P3, P4, P5, P6, P7, P8, N

Standard Stroke Lengths: 1", 2", 3", 4", 5", 6", 7, 8", 10",

Bumpers are standard
No additional length for bumpers



Furnished without nut(s). See Chart on Page 58.

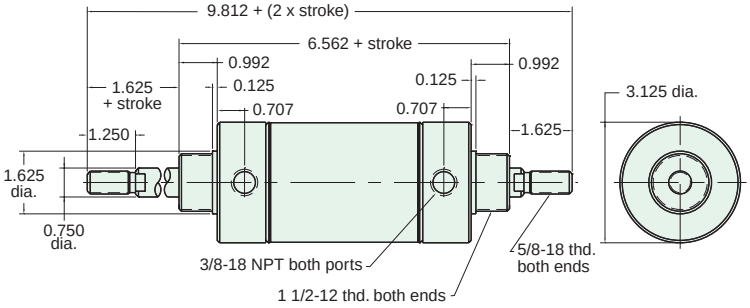
SDD-48-❑-❑

Double Acting

Mount: Stud
Type: Double Rod
Options: MB, W, V, P6, P7, P8, N

Standard Stroke Lengths: 1", 2", 3", 4", 5", 6", 8", 10", 12"

Bumpers are standard
No additional length for bumpers



Nuts included, but not shown on drawing

Did you know...

Minimatic®
Minimetric
Fluidamp®
Octoport®
Air-2-Electric® and Air Force One® are all Clippard's registered trademarks.

Mounting Nuts

Stud Nut

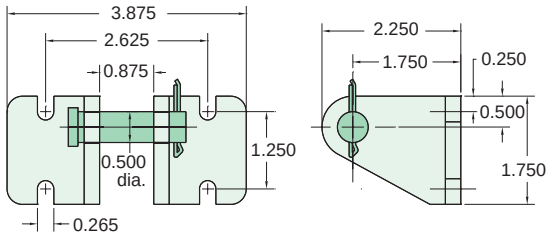
Part Number	Across Flats	Nut Thickness	Nut (Thread)
N24-12	2 1/4"	1/2"	1 1/2-12

Rod Nut

Part Number	Across Flats	Nut Thickness	Nut (Thread)
N08-20	3/4"	5/16"	1/2-20

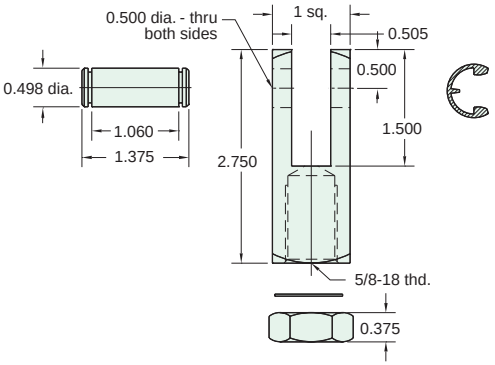
CB-4895

Clevis Bracket
Material: steel, bright zinc plated



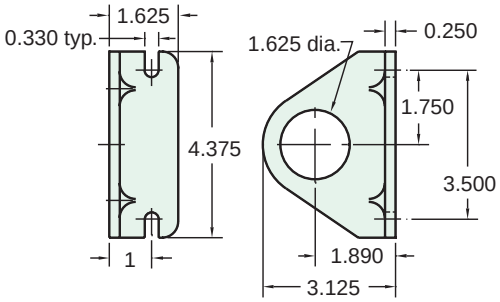
RC-4881

Rod Clevis
Material: steel, bright zinc plated



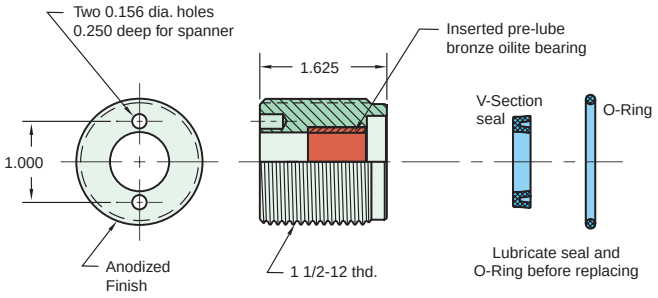
FB-4891

Foot Bracket
Material: steel, bright zinc plated



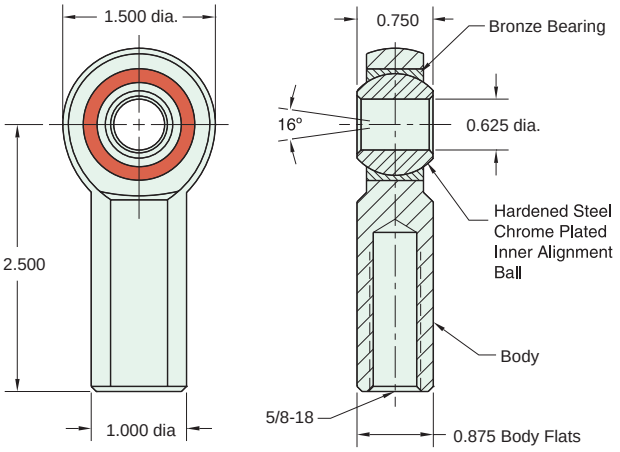
RK-4899

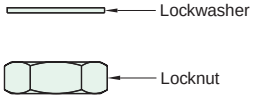
Replaceable Rod Seal
Material: aluminum body



RE-4885

Rod End
Material: steel, bright zinc plated body



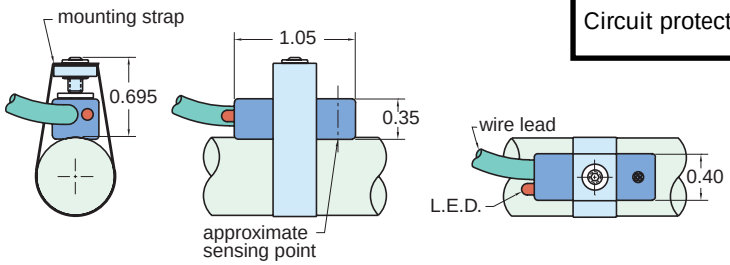


Max. Static Radial Load: 7400 lbs.
Fits Rod Thread Size: 5/8-18

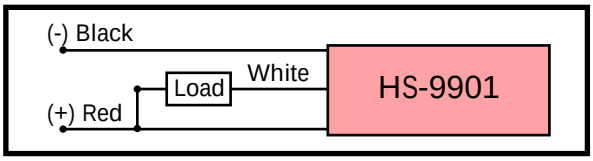
HS-9901

Hall Effect Sensors

Output type	Sinking (open collector output)
Input voltage (Vin)	5 to 28 VDC
Operation temp.	0 to 185˚F
Input current (Iin)	25 mA maximum
Output voltage drop	.4 VDC maximum
Output current (Iout)	Iout = .3 Vin, 300 mA maximum
Power dissipation	300 mW maximum
Lead Wire	22 ga. x 4 ft. also avail. in 12 ft. length HS-9901-12
Circuit protection	Reverse polarity protected, transient voltage protected and false pulse protected.



Hall Effect Wiring Diagram

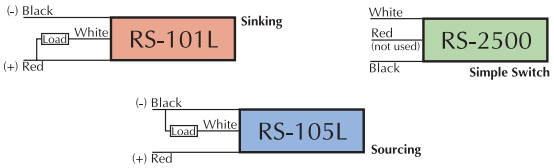


RS-

Magnetic Reed Switch

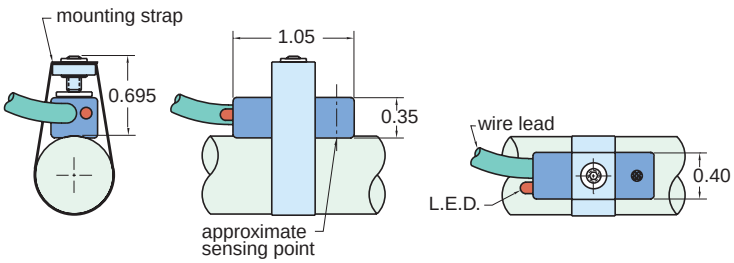
RS-101L • RS-105L • RS-2500

Circuit Diagram



Part Number	RS-101L	RS-105L	RS-2500
Output Type	Sinking	Sourcing	Simple Switch
Power Range	10w		25w
Supply Voltage	3 to 36 VAC or VDC		220 VAC or VDC
Current Range	1.0 A max.		
LED	Provided	Provided	Not Provided
Lead Wire	22 ga. x 4 ft.		
Operating Temp.	0 to 300˚		
Rated Life	10,000,000 cycles		
Housing	molded plastic		
Response Time	1 mSec		
Switching Logic	SPST normally open		

RS-101L & RS-105L RS-101L, RS-105L & RS-2500



RS-105L pictured

Universal Clamps

SC-08 • SC-10 • SC-12 • SC-14 • SC-17 • SC-20
SC-24 • SC-28 • SC-32 • SC-40 • SC48

Clippard's stainless steel clamps are designed to be used with the Hall Effect and the reed switch. All clamps should be ordered based upon the size of the cylinder on which it will be mounted. The part numbers show the bore size using the numerical code. Each clamp is 0.375 wide stainless steel, and is equipped with a locking screw with #5-40 threads.

AIR VOLUME TANKS

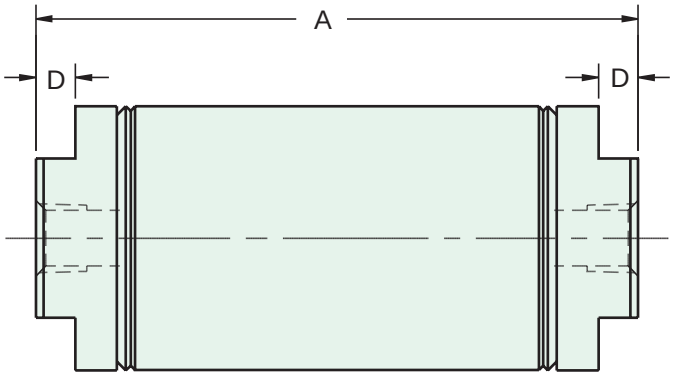
AVT-❑-❑

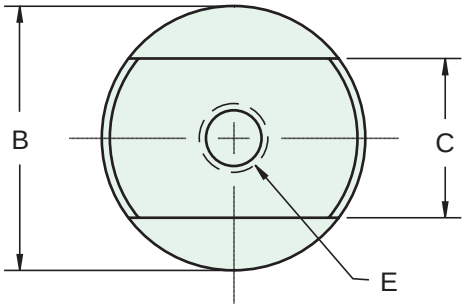
AVT-12-1	AVT-17-2 AVT-17-3	AVT-24-4 AVT-24-6	AVT-24-8 AVT-24-10	AVT-32-12 AVT-32-14	AVT-32-16

Additional models are available upon request

Clippard offers a line of air volume tanks suitable for use with Clippard air components. Using the same quality rolled construction as Clippard stainless steel cylinders, tanks are manufactured to exacting standards. Each is provided with a threaded port at both ends. See chart for volume capacity, dimensions, and port information.

For additional corrosion resistance Clippard can offer air volume tanks with Delrin® heads. Call for more information.





FEATURES

- Volumes from 1 to 16 cu. in.
- Ten models
- 304 stainless steel tubes
- Precision rolled construction
- Easy to connect, mount and use in your circuits
- Anodized aluminum heads
- Maximum pressure 250 psig

Part Number	Volume Cubic In.	A	B	C	D	E
AVT-12-1	1.0	3.281	0.812	0.625	0.156	1/8 27
AVT-17-2	2.0	3.593	1.125	0.875	0.187	1/8 27
AVT-17-3	3.0	4.718	1.125	0.875	0.187	1/8 27
AVT-24-4	4.0	3.687	1.562	0.875	0.250	1/8 27
AVT-24-6	6.0	4.843	1.562	0.875	0.250	1/8 27
AVT-24-8	8.0	5.968	1.562	0.875	0.250	1/8 27
AVT-24-10	10.0	7.093	1.562	0.875	0.250	1/8 27
AVT-32-12	12.0	5.718	2.062	1.250	0.312	1/4 18
AVT-32-14	14.0	6.343	2.062	1.250	0.312	1/4 18
AVT-32-16	16.0	6.968	2.062	1.250	0.312	1/4 18

Options

B = Bumpers

V = Viton Seals

Clippard's metric cylinders offer all of the advantages of Clippard's high quality, reliable stainless steel cylinders—available with metric threads. Five bore sizes ranging from 8 mm to 25 mm with stroke lengths of 10 mm to 160 mm are offered.

Features

- Polished I.D. 304 stainless steel tubes for low breakaway provides smooth action
- Typical breakaway less than 1/2 bar
- Precision double rolled construction for solid, leak-proof cylinders
- Sintered bronze rod bushing reduces wear and friction
- Sintered bronze clevis bushing on all clevis mount cylinders means less wear
- Rods are threaded and bonded to pistons
- Ground, polished, and roller burnished 303 stainless steel rod saves seal wear
- Full piston area breakaway to assure full power from the beginning of each stroke
- Buna-N "U" cup piston and rod seals for reliable leak-free operation
- Temperature range: -35˚ to 110˚C
- Maximum pressure of 17 bar

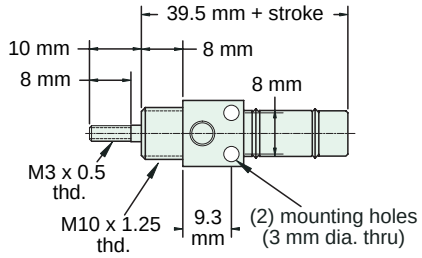
Nominal Bore Size	8 mm	12 mm	16 mm	20 mm	25 mm
Actual Bore Size	7.9 mm	12.7 mm	15.9 mm	19.1 mm	26.9 mm
Series Number*	05	08	10	12	17
Rod Diameter	3.1 mm	4.8 mm	4.8 mm	6.4 mm	7.9 mm
Rod Thread	M3 x 0.5	M4 x 0.7	M4 x 0.7	M6 x 1.0	M8 x 1.25
Mounting Thread	M10 x 1.25	M12 x 1.25	M12 x 1.25	M16 x 1.5	M16 x 1.5
Port Size (Optional)	M5	M5	M5	M5 (R1/8)	G1/8 (R1/8)
Spring Force (SSR & USR)	4.4 N	8.9 N	17.8 N	26.7 N	31.1 N
Clevis Pin Diameter	4 mm	4 mm	4 mm	8 mm	8 mm
Clevis Width	4 mm	8 mm	8 mm	10 mm	10 mm

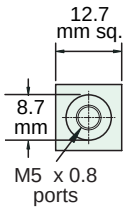
M-SDR-05-❑-❑

Double Acting

Mount: Stud
Type: Rotating Rod
Options: B, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm





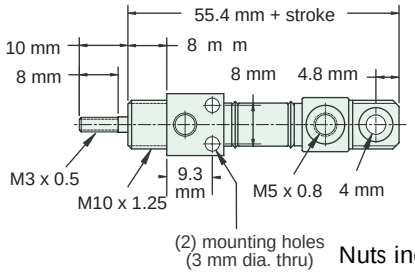
Nut included, but not shown on drawing

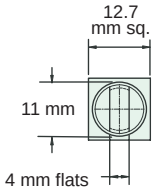
M-UDR-05-❑-❑

Double Acting

Mount: Universal
Type: Rotating Rod
Options: B, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm





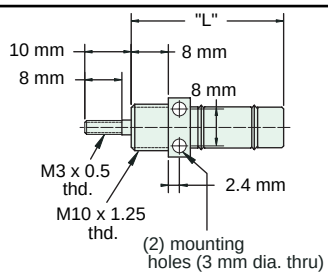
Nuts included, but not shown on drawing

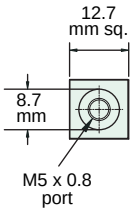
M-SSR-05-❑-❑

Single Acting

Mount: Stud
Type: Rotating Rod
Options: B, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm





Nut included, but not shown on drawing

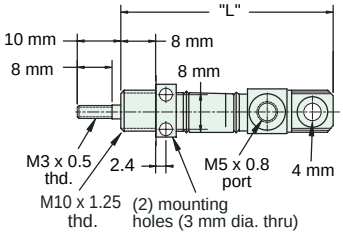
"L" (mm) for Standard Strokes						
Stroke	**10**	**25**	**40**	**50**	**80**	**100**
	46	68	95	105	154	181

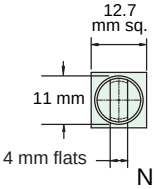
M-USR-05-❑-❑

Single Acting

Mount: Universal
Type: Rotating Rod
Options: B, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm





Nuts included, but not shown on drawing

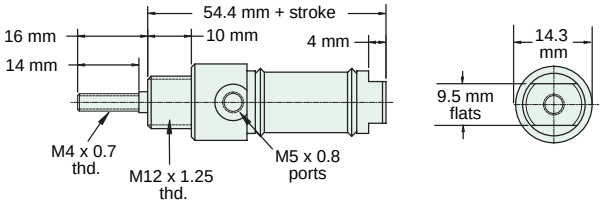
"L" (mm) for Standard Strokes						
Stroke	**10**	**25**	**40**	**50**	**80**	**100**
	62	83.5	111	121	170	197

M-SDR-08-❑-❑

Double Acting

Mount: Stud
Type: Rotating Rod
Options: B, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm, 125 mm, 160 mm



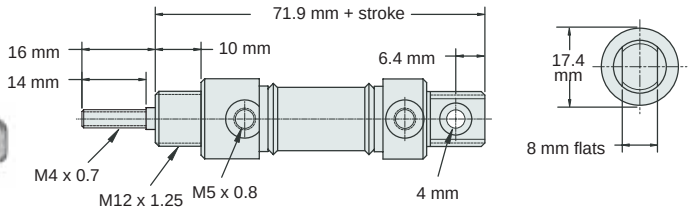
Nut included, but not shown on drawing

M-UDR-08-❑-❑

Double Acting

Mount: Universal
Type: Rotating Rod
Options: B, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm, 125 mm, 160 mm



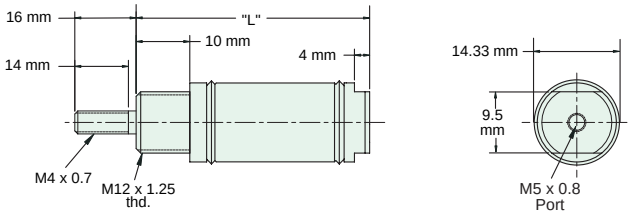
Furnished without nut(s). Order Part No. NM10-125.

M-SSR-08-❑-❑

Single Acting

Mount: Stud
Type: Rotating Rod
Options: B, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm



Nut included, but not shown on drawing

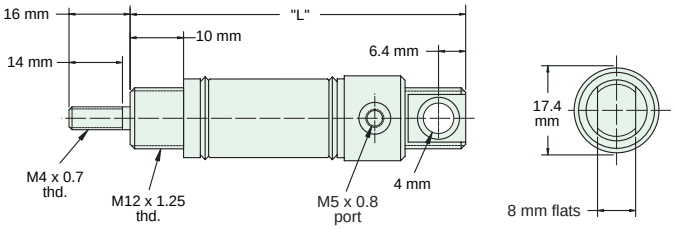
"L" (mm) for Standard Strokes						
Stroke	**10**	**25**	**40**	**50**	**80**	**100**
	56	83	120	130	193	224

M-USR-08-❑-❑

Single Acting

Mount: Universal
Type: Rotating Rod
Options: B, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm



Furnished without nut(s). Order Part No. NM10-125.

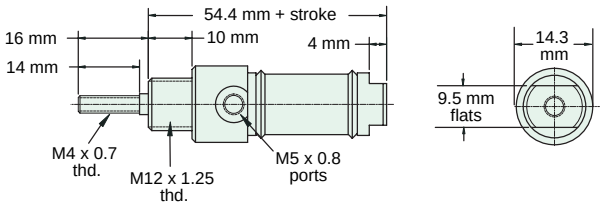
"L" (mm) for Standard Strokes						
Stroke	**10**	**25**	**40**	**50**	**80**	**100**
	73	100	137	141	210	241

M-SDR-10-❑-❑

Double Acting

Mount: Stud
Type: Rotating Rod
Options: B, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm, 125 mm, 160 mm, 200 mm, 250 mm



Nut included, but not shown on drawing

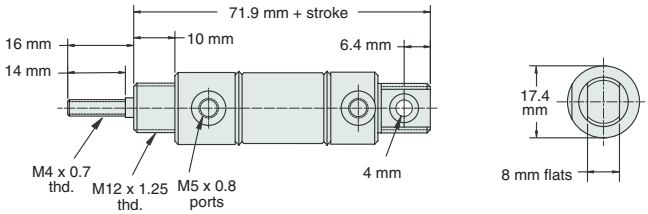
M-UDR-10-❑-❑

Double Acting

Mount: Universal
Type: Rotating Rod
Options: B, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm, 125 mm, 160 mm, 200 mm, 250 mm

Mounting nuts not included. Part No. NM12-125 may be ordered separately.



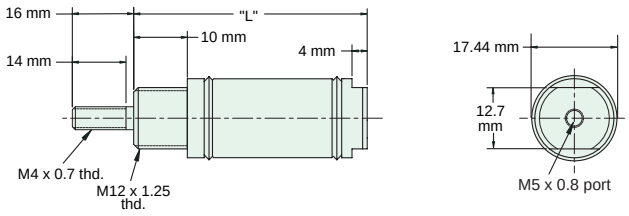
Furnished without nut(s). Order Part No. NM12-125.

M-SSR-10-❑-❑

Single Acting

Mount: Stud
Type: Rotating Rod
Options: B, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm, 125 mm, 160 mm



Nut included, but not shown on drawing

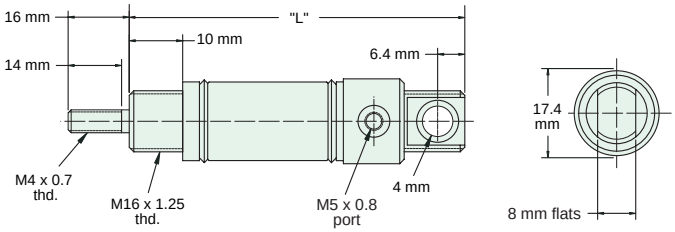
"L" (mm) for Standard Strokes								
Stroke	**10**	**25**	**40**	**50**	**80**	**100**	**125**	**160**
	56	83	120	130	193	224	260	329

M-USR-10-❑-❑

Single Acting

Mount: Universal
Type: Rotating Rod
Options: B, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm, 125 mm, 160 mm



Furnished without nut(s). Order Part No. NM12-125.

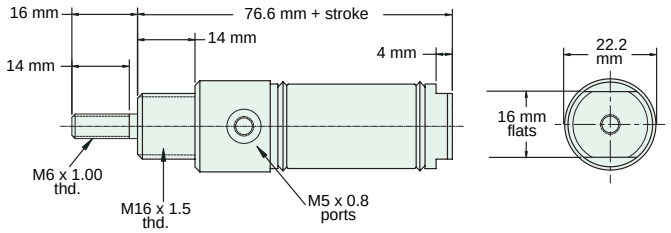
"L" (mm) for Standard Strokes								
Stroke	**10**	**25**	**40**	**50**	**80**	**100**	**125**	**160**
	73	100	137	141	210	241	278	346

M-SDR-12-❑-❑

Double Acting

Mount: Stud
Type: Rotating Rod
Options: B, R, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm, 125 mm, 160 mm, 200 mm, 250 mm, 300 mm, 350 mm, 400 mm, 450 mm, 500 mm, 550 mm, 600 mm



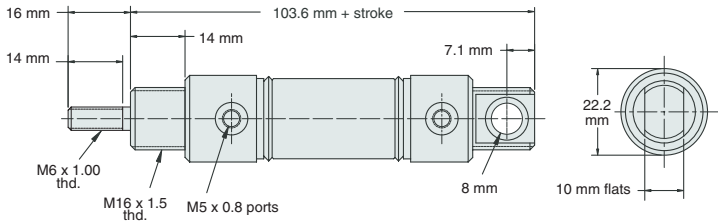
Nut included, but not shown on drawing

M-UDR-12-❑-❑

Double Acting

Mount: Universal
Type: Rotating Rod
Options: B, R, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm, 125 mm, 160 mm, 200 mm, 250 mm, 300 mm, 350 mm, 400 mm, 450 mm, 500 mm, 550 mm, 600 mm



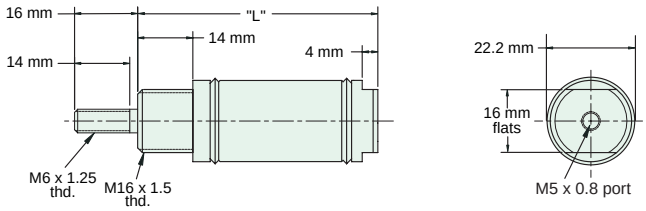
Furnished without nut(s). Order Part No. NM16-150.

M-SSR-12-❑-❑

Single Acting

Mount: Stud
Type: Rotating Rod
Options: B, R, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm, 125 mm, 160 mm



Nut included, but not shown on drawing

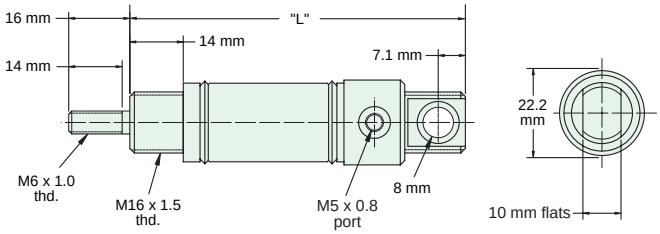
"L" (mm) for Standard Strokes								
Stroke	**10**	**25**	**40**	**50**	**80**	**100**	**125**	**160**
	68	83	116	126	191	211	254	324

M-USR-12-❑-❑

Single Acting

Mount: Universal
Type: Rotating Rod
Options: B, R, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm, 125 mm, 160 mm



Furnished without nut(s). Order Part No. NM16-150.

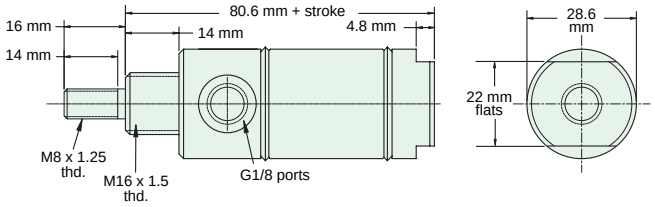
"L" (mm) for Standard Strokes								
Stroke	**10**	**25**	**40**	**50**	**80**	**100**	**125**	**160**
	95	110	143	153	218	238	281	351

M-SDR-17-❑-❑

Double Acting

Mount: Stud
Type: Rotating Rod
Options: B, R, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm, 125 mm, 160 mm



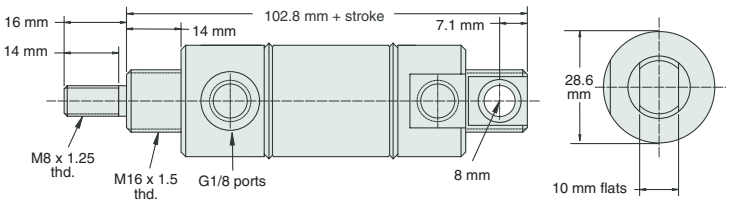
Nut included, but not shown on drawing

M-UDR-17-❑-❑

Double Acting

Mount: Universal
Type: Rotating Rod
Options: B, R, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm, 125 mm, 160 mm



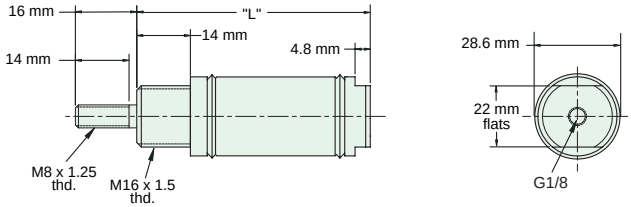
Furnished without nut(s). Order Part No. NM16-150.

M-SSR-17-❑-❑

Single Acting

Mount: Stud
Type: Rotating Rod
Options: B, R, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm, 125 mm, 160 mm



Nut included, but not shown on drawing

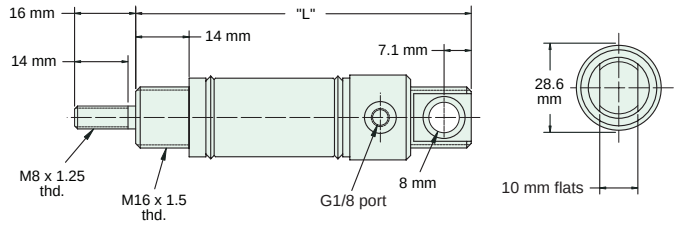
"L" (mm) for Standard Strokes								
Stroke	**10**	**25**	**40**	**50**	**80**	**100**	**125**	**160**
	75	90	120	129	188	208	247	311

M-USR-17-❑-❑

Single Acting

Mount: Universal
Type: Rotating Rod
Options: B, R, V

Standard Stroke Lengths: 10 mm, 25 mm, 40 mm, 50 mm, 80 mm, 100 mm, 125 mm, 160 mm



Furnished without nut(s). Order Part No. NM16-150.

"L" (mm) for Standard Strokes								
Stroke	**10**	**25**	**40**	**50**	**80**	**100**	**125**	**160**
	97	112	142	151	210	230	269	333

Clippard's line of Delrin® head stainless steel cylinders offer all of the advantages of Clippard's high quality, reliable stainless steel cylinders, with the added benefit of corrosion resistance. These cylinders are ideal for applications where equipment cleanliness is critical, since they can be put to work in harsh environments requiring frequent use of hot water and chemicals.

Clippard corrosion resistant cylinders are available in bore sizes ranging from 5/8" to 1 1/2". Standard stroke lengths range from 1/2" to 6". The cylinder tubes and rods are made of stainless steel. The rods are ground, polished, and roller burnished. Buna-N® seals are standard with a Fluorocarbon option available for compatibility. A magnetic piston is also optional.

These lightweight cylinders have a temperature range from 32˚ F to 180˚ F, and have a pressure rating of 150 psig (air). A variety of mounting styles are available.

Delrin® is a registered trademark of E.I. DuPont Co.

Corrosion Resistant Cylinder

Numbering System

C R - ❑ ❑ ❑ - ❑ - ❑ - ❑

C R — Corrosion Resistant Stainless Steel Cylinders

Mounting Type (❑)
S - Stud
U - Universal

Action (❑)
D - Double Acting

Rod Type (❑)
D - Double Ended Rod
R - Rotating Rod

Bore (❑)
10 - 5/8”
12 - 3/4”
17 - 1 1/16”
20 - 1 1/4”
24 - 1 1/2”

Stroke (❑)
in inches

Options (❑)
Blank - No Options
V - Viton Seals
M - Magnetic Piston

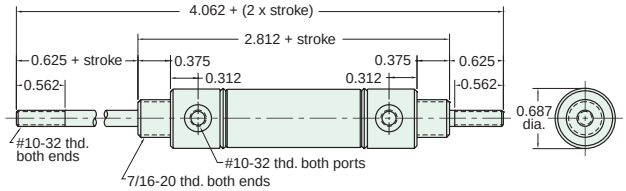
Features

- Delrin® heads with a positive double seal
- Available with magnetic pistons
- 303 stainless steel ground, polished and roller burnished piston rods
- Precision rolled construction for a solid leakproof cylinder
- Buna-N seals (Fluorocarbon optional for compatibility only)
- 304 stainless steel tube
- Pressure Range 0 to 150 psig
- Temperature range: 32° to 180° F
- Optional stainless steel mounting nuts
- Aluminum alloy pistons, optional Delrin® pistons available; consult factory

CR-SDD-10-❑-❑

Double Acting

Mount: Stud
Type: Double Rod
Standard Stroke Lengths: 1/2”, 1”, 1-1/2”, 2”, 3”, 4”
Options: M, V, N, P2, P3, P4, P5, P6, P7, P8
For magnetic option add .312

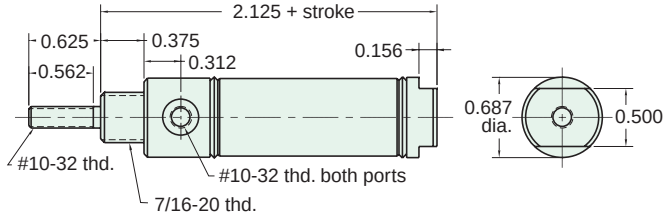


Furnished without nut(s). Order Part No. N07-20-SS.

CR-SDR-10-❑-❑

Double Acting

Mount: Stud
Type: Rotating Rod
Standard Stroke Lengths: 1/2”, 1”, 1-1/2”, 2”, 3”, 4”
Options: M, V, N
For magnetic option add .312

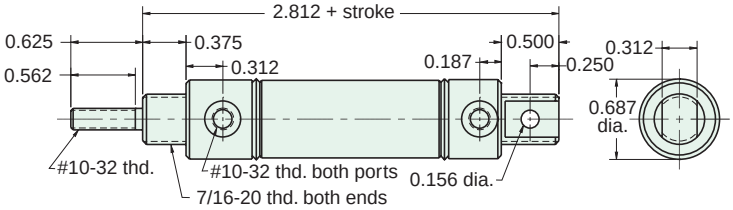


Furnished without nut(s). Order Part No. N07-20-SS.

CR-UDR-10-❑-❑

Double Acting

Mount: Universal
Type: Rotating Rod
Standard Stroke Lengths: 1/2”, 1”, 1-1/2”, 2”, 3”, 4”
Options: M, V, N, P2, P3, P4, P5, P6, P7, P8
For magnetic option add .312

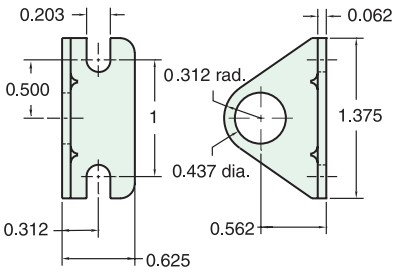


Furnished without nut(s). Order Part No. N07-20-SS.

Stainless Steel Mounting

Foot Bracket
Model Number: FB-0892-SS

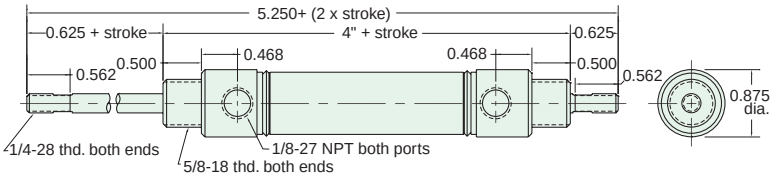
Nut
Model Number: N07-20-SS
Max. Torque in lbs.: 4.0



CR-SDD-12-❑-❑

Double Acting

Mount: Stud
Type: Double Rod
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Options: M, V, N, P2, P3, P4, P5, P6, P7, P8
For magnetic option add .312

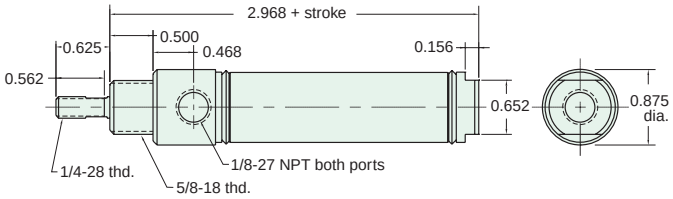


Furnished without nut(s). Order Part No. N10-18-SS.

CR-SDR-12-❑-❑

Double Acting

Mount: Stud
Type: Rotating Rod
Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Options: M, V, N, P6, P7, P8
For magnetic option add .312

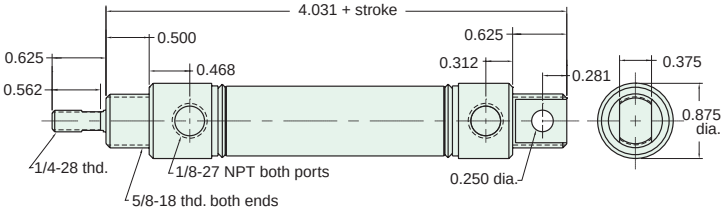


Furnished without nut(s). Order Part No. N10-18-SS.

CR-UDR-12-❑-❑

Double Acting

Mount: Stud
Type: Rotating Rod
Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4", 5", 6", 8", 10", 12"
Options: M, V, N, P2, P3, P4, P5, P6, P7, P8
For magnetic option add .312

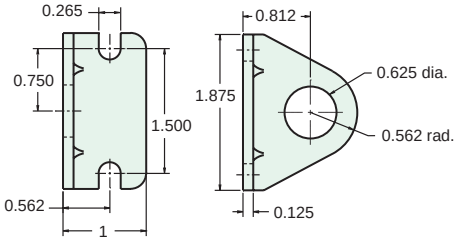


Furnished without nut(s). Order Part No. N10-18-SS.

Stainless Steel Mounting

Foot Bracket
Model Number: FB-1791-SS

Nut
Model Number: N10-18-SS
Max. Torque in lbs.: 12



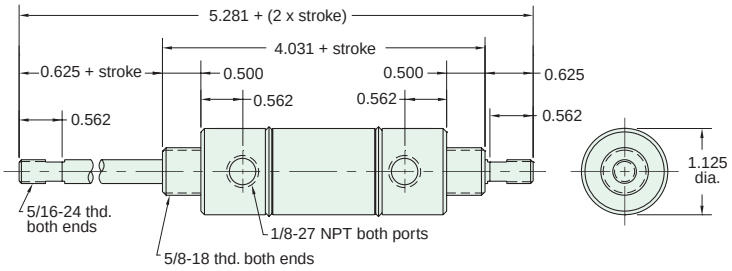
CR-SDD-17-❑-❑

Mount: Stud
Type: Double Rod

Standard Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”
Options: M, V, N, P6, P7, P8

For magnetic option add .312

Double Acting



Furnished without nut(s). Order Part No. N10-18-SS.

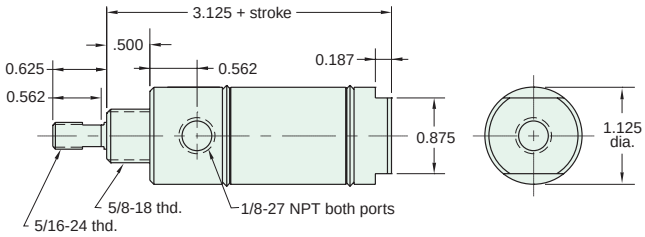
CR-SDR-17-❑-❑

Mount: Stud
Type: Rotating Rod

Standard Stroke Lengths: 1/2”, 1”, 1-1/2”, 2”, 3”, 4”, 5”, 6”
Options: M, V, N

For magnetic option add .312

Double Acting



Furnished without nut(s). Order Part No. N10-18-SS.

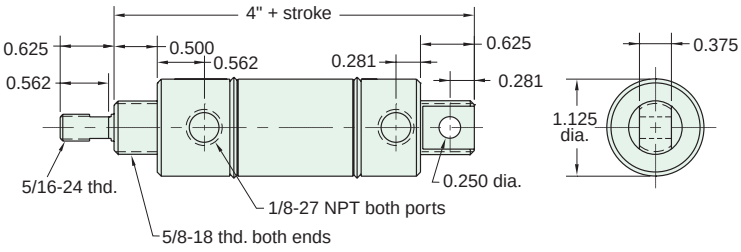
CR-UDR-17-❑-❑

Mount: Stud
Type: Rotating Rod

Standard Stroke Lengths: 1/2”, 1”, 1-1/2”, 2”, 3”, 4”, 5”, 6”,
Options: M, V, N, P2, P3, P4, P5, P6, P7, P8

For magnetic option add .312

Double Acting

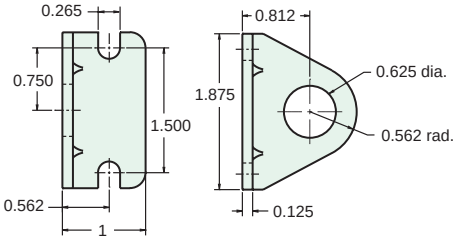


Furnished without nut(s). Order Part No. N10-18-SS.

Stainless Steel Mounting

Foot Bracket
Model Number: FB-1791-SS

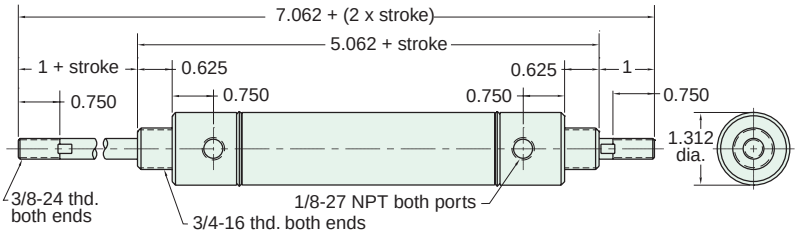
Nut
Model Number: N10-18-SS
Max. Torque in lbs.: 12



CR-SDD-20-❑-❑

Mount: Stud
Type: Double Rod
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6"
Options: M, V, N, P6, P7, P8
For magnetic option add .312

Double Acting

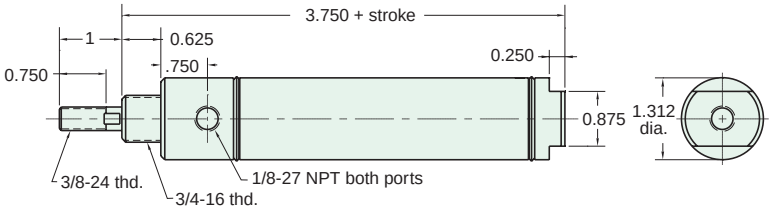


Furnished without nut(s). Order Part No. N12-16-SS.

CR-SDR-20-❑-❑

Mount: Stud
Type: Rotating Rod
Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Options: M, V, N
For magnetic option add .312

Double Acting

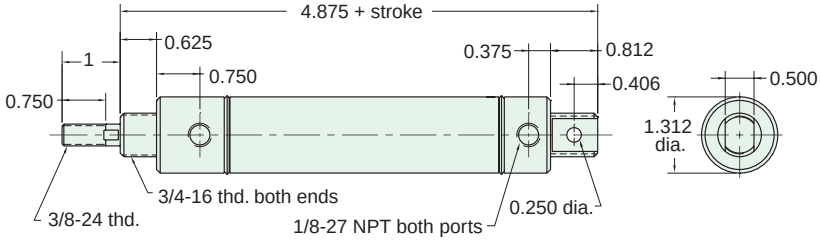


Furnished without nut(s). Order Part No. N12-16-SS.

CR-UDR-20-❑-❑

Mount: Universal
Type: Rotating Rod
Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4", 5", 6", 8", 10", 12"
Options: M, V, N, P2, P3, P4, P5, P6, P7, P8
For magnetic option add .312

Double Acting

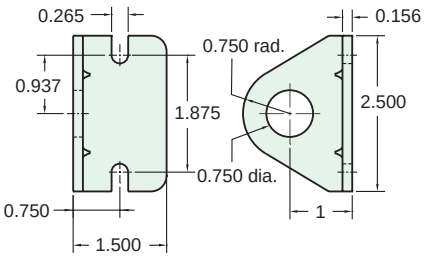


Furnished without nut(s). Order Part No. N12-16-SS.

Stainless Steel Mounting

Foot Bracket
Model Number: FB-2491-SS

Nut
Model Number: N12-16-SS
Max. Torque in lbs.: 20

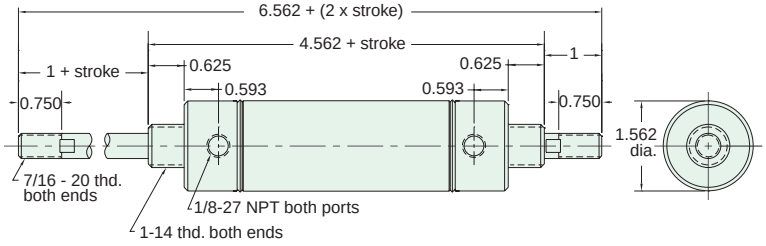


CR-SDD-24-❑-❑

Double Acting

Mount: Stud
Type: Double Rod
Standard Stroke Lengths: 1", 2", 3", 4", 5", 6", 8", 10", 12"
Options: M, V, N, P6, P7, P8

For magnetic option add .312



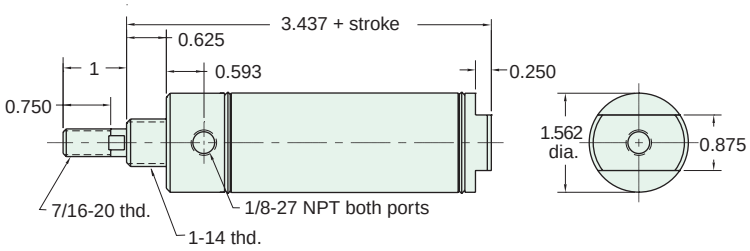
Furnished without nut(s). Order Part No. N16-14-SS.

CR-SDR-24-❑-❑

Double Acting

Mount: Stud
Type: Rotating Rod
Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4", 5", 6"
Options: M, V, N

For magnetic option add .312



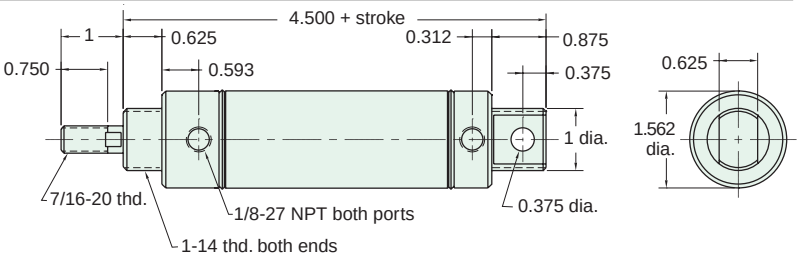
Furnished without nut(s). Order Part No. N16-14-SS.

CR-UDR-24-❑-❑

Double Acting

Mount: Universal
Type: Rotating Rod
Standard Stroke Lengths: 1/2", 1", 1-1/2", 2", 3", 4", 5", 6", 8", 10", 12"
Options: M, V, N, P2, P3, P4, P5, P6, P7, P8

For magnetic option add .312

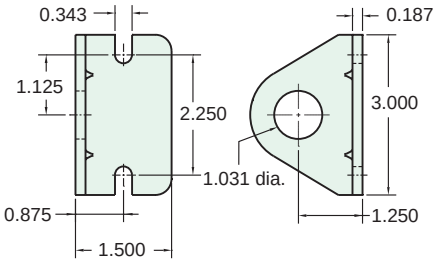


Furnished without nut(s). Order Part No. N16-14-SS.

Stainless Steel Mounting

Foot Bracket
Model Number: FB-2891-SS

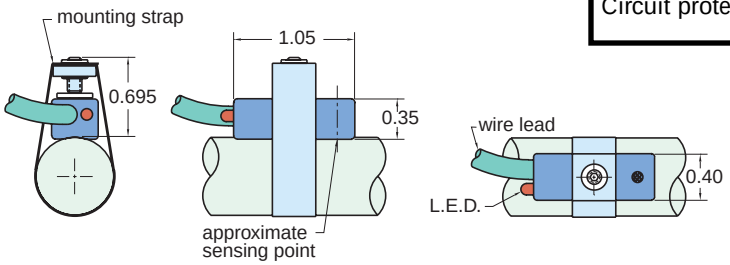
Nut
Model Number: N16-14-SS
Max. Torque in lbs.: 30



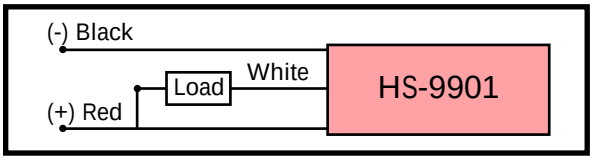
HS-9901

Hall Effect Sensor

Output type	Sinking (open collector output)
Input voltage (Vin)	5 to 28 VDC
Operation temp.	0 to 185˚F
Input current (Iin)	25 mA maximum
Output voltage drop	0.4 VDC maximum
Output current (Iout)	Iout = 0.3 Vin, 300 mA maximum
Power dissipation	300 mW maximum
Lead Wire	22 ga. x 4 ft. also avail. in 12 ft. length HS-9901-12
Circuit protection	Reverse polarity protected, transient voltage protected and false pulse protected.



Hall Effect Wiring Diagram

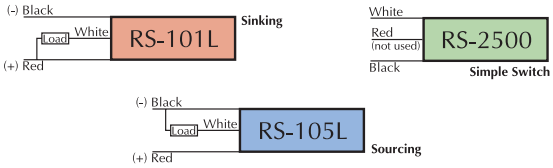


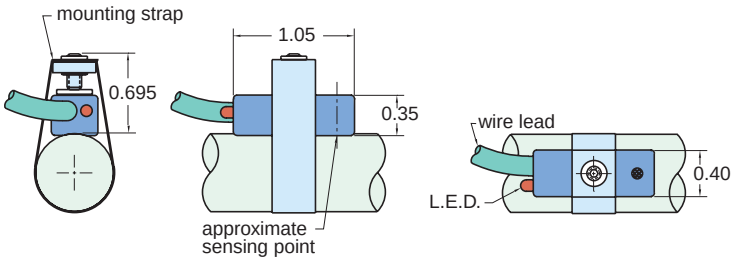
RS-

Magnetic Reed Switch

RS-101L • RS-105L • RS-2500

Circuit Diagram





Part Number	RS-101L	RS-105L	RS-2500
Output Type	Sinking	Sourcing	Simple Switch
Power Range	10w		25w
Supply Voltage	3 to 36 VAC or VDC		220 VAC or VDC
Current Range	1.0 A max.		
LED	Provided	Provided	Not Provided
Lead Wire	22 ga. x 4 ft.		
Operating Temp.	0 to 300˚		
Rated Life	10,000,000 cycles		
Housing	molded plastic		
Response Time	1 mSec		
Switching Logic	SPST normally open		

RS-101L & RS-105L RS-101L, RS-105L & RS-2500

RS-2500 pictured

Universal Clamps

SC-08 • SC-10 • SC-12 • SC-14 • SC-17 • SC-20
SC-24 • SC-28 • SC-32 • SC-40 • SC48

Clippard's stainless steel clamps are designed to be used with the Hall Effect and the reed switch. All clamps should be ordered based upon the size of the cylinder on which it will be mounted. The part numbers show the bore size using the numerical code. Each clamp is 3/8" wide stainless steel, and is equipped with a locking screw with #5-40 threads.

Clippard Instrument Laboratory, Inc. Air Force One® compact cylinders are available in double acting, spring return, spring extend and double rod models. Hall Effect sensors and magnetic piston versions are also available.

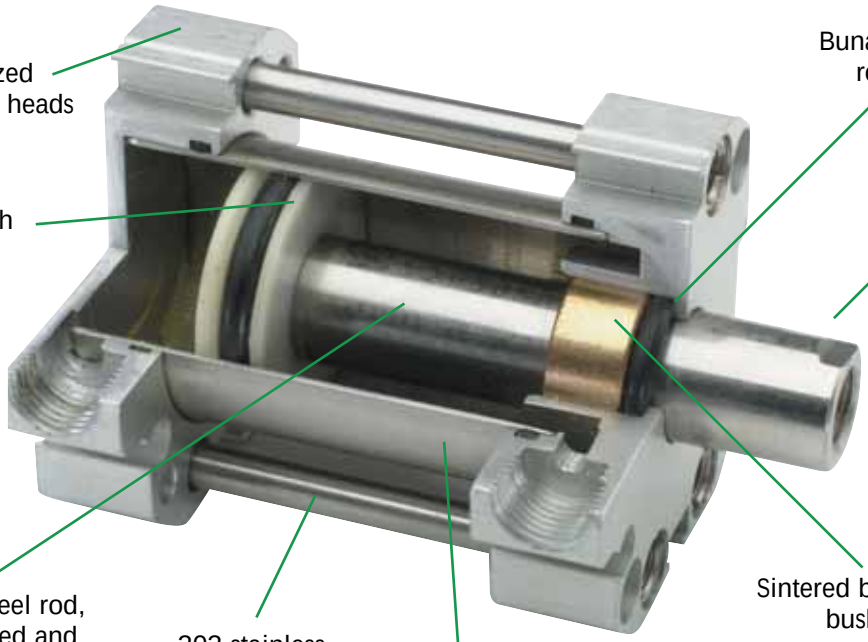
The AFO cylinder features include a stainless steel tube and roller burnished piston rod. This means longer rod and piston seal life. For corrosive environments, where dirt and abrasives may be ingested, and cause seals to wear faster than normally expected, the AFO offers the benefit of tie rod construction. This enables seals to be replaced, rather than replacing the entire cylinder. The non-corrosive construction of the AFO cylinder body is reliable in abrasive environments, able to withstand the toughest conditions.

The various mounting configurations available in the AFO cylinders assure freedom to interchange with most cylinders on the market. This means most systems can be upgraded to include quality AFO cylinders.

Air Force One Compact Cylinder

Features

- Oil impregnated sintered bronze rod bushing
- Available with magnetic pistons
- 303 stainless steel ground, polished and roller burnished piston rods
- Double acting, spring return, spring extend & double rod cylinders
- 304 stainless steel tube
- Temperature range: 30° F to 180° F
- Anodized aluminum heads
- Air pressure rating to 250 psig



Delrin® is a registered trademark of E.I. DuPont Co.

Numbering System

A F - ❑ ❑ ❑ - ❑ - ❑ - ❑

AF — Air Force One® Compact Cylinder

Mounting Type
B - Bottom Mount
F - Front Mount
R - Rear Mount
U - Universal
T - Thread

Cylinder Type
D - Double Acting
S - Single Acting (Spring Return)
R - Reverse Acting (Spring Extend)

Rod Type
R - Rotating Rod
D - Double Rod

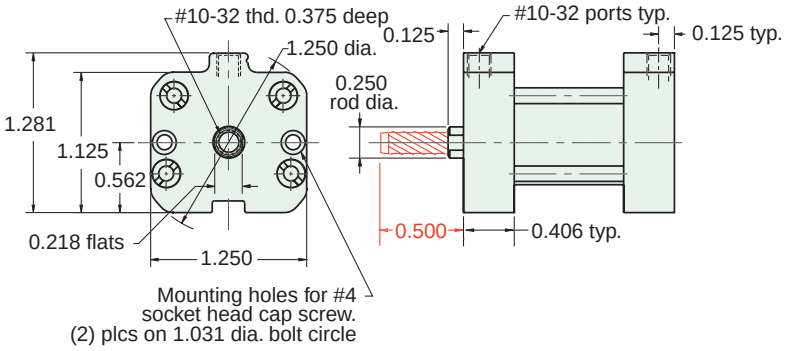
Bore
10 - 5/8”
12 - 3/4”
17 - 1 1/16”
24 - 1 1/2”
32 - 2”
40 - 2 1/2”

Stroke
1/4” - 4”
in 1/8” increments

Options
Blank - No Options
V - Viton Seals
M - Magnetic Piston
T - Threaded Rod

A F - ❑ ❑ ❑ - 1 0 - ❑

Add 7/8” for Magnetic Piston

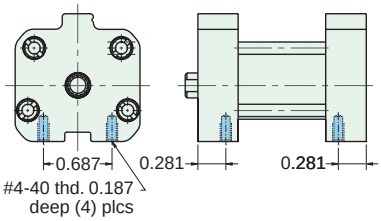


For rod with male thread option, add -T to the end of the part number after Stroke

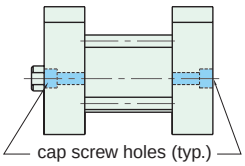
See page 76 for Air Force One numbering system

Mounting Styles

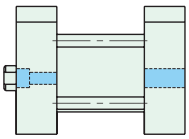
Five mounting styles give you versatility and fast, easy installation.



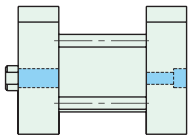
Bottom Mount
AF-Bxx-10-x



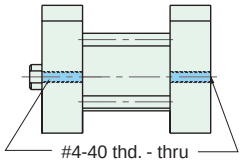
Universal Mount
AF-Uxx-10-x



Front Mount
AF-Fxx-10-x



Rear Mount
AF-Rxx-10-x

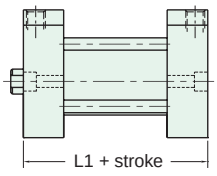


Thread Mount
AF-Txx-10-x

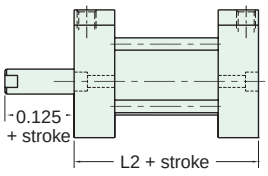
Cylinder Lengths

“L”	Stroke	Spring Return	Spring Extend
L1	1/4” - 1”	13/16”	
L1	1 1/8” - 2”	1 3/8”	
L1	2 1/8” - 3”	1 15/16”	
L1	3 1/8” - 4”	2 1/2”	
L2	1/4” - 1”		1 1/16”
L2	1 1/8” - 2”		1 5/8”
L2	2 1/8” - 3”		2 3/16”
L2	3 1/8” - 4”		2 3/4”

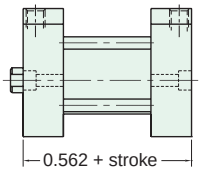
Overall length of body is stroke plus “L”



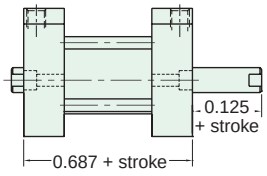
Spring Return
AF-xSR-10-x



Spring Extend
AF-xRR-10-x



Double Acting
Single Rod
AF-xDR-10-x

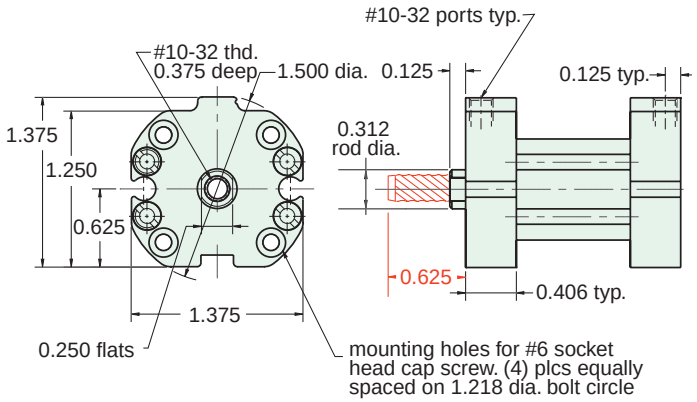


Double Acting
Double Rod
AF-xDD-10-x

Spring Forces	
Spring Return	
Compressed	At Rest
5.750 lbs.	1.500 lbs.
Spring Extend	
Compressed	At Rest
5.750 lbs.	1.500 lbs.

A F - ❑ ❑ ❑ - 1 2 - ❑

Add 7/8” for Magnetic Piston

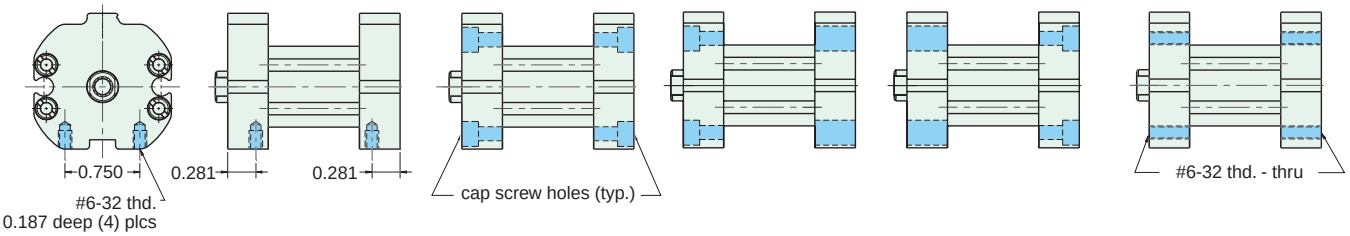


For rod with male thread option, add -T to the end of the part number after Stroke

See page 76 for Air Force One numbering system

Mounting Styles

Five mounting styles give you versatility and fast, easy installation.



Bottom Mount AF-Bxx-12-x

Universal Mount AF-Uxx-12-x

Front Mount AF-Fxx-12-x

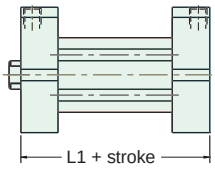
Rear Mount AF-Rxx-12-x

Thread Mount AF-Txx-12-x

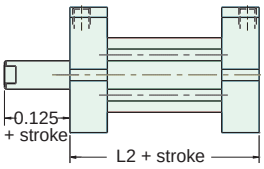
Cylinder Lengths

“L”	Stroke	Spring Return	Spring Extend
L1	1/4” - 1”	13/16”	
L1	1 1/8” - 2”	1 3/8”	
L1	2 1/8” - 3”	1 15/16”	
L1	3 1/8” - 4”	2 1/2”	
L2	1/4” - 1”		1 1/16”
L2	1 1/8” - 2”		1 5/8”
L2	2 1/8” - 3”		2 3/16”
L2	3 1/8” - 4”		2 3/4”

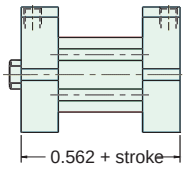
Overall length of body is stroke plus “L”



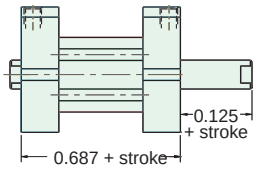
Spring Return AF-xSR-12-x



Spring Extend AF-xRR-12-x



Double Acting Single Rod AF-xDR-12-x

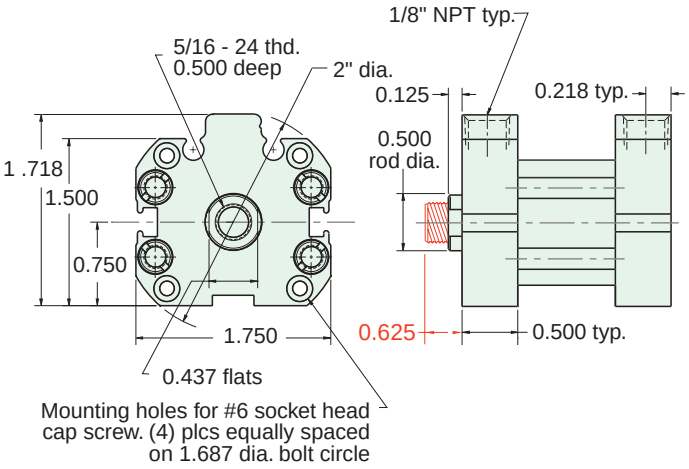


Double Acting Double Rod AF-xDD-12-x

Spring Forces	
Spring Return	
Compressed	At Rest
10 lbs.	4 lbs.
Spring Extend	
Compressed	At Rest
10 lbs.	4 lbs.

A F - ❑ ❑ ❑ - 1 7 - ❑

Add 7/8” for Magnetic Piston



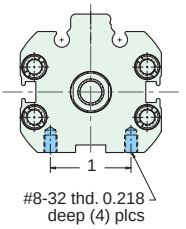
Mounting holes for #6 socket head cap screw. (4) plcs equally spaced on 1.687 dia. bolt circle

For rod with male thread option, add -T to the end of the part number after Stroke

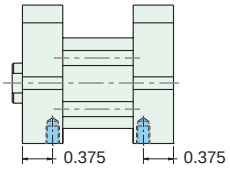
See page 76 for Air Force One numbering system

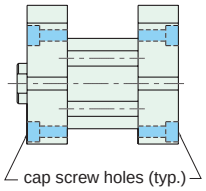
Mounting Styles

Five mounting styles give you versatility and fast, easy installation.

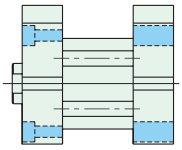


Bottom Mount
AF-Bxx-17-x

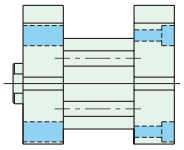




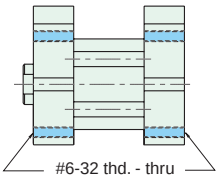
Universal Mount
AF-Uxx-17-x



Front Mount
AF-Fxx-17-x



Rear Mount
AF-Rxx-17-x

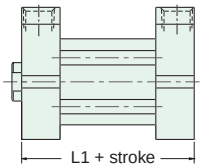


Thread Mount
AF-Txx-17-x

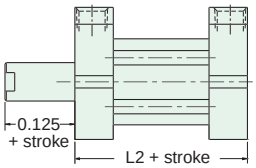
Cylinder Lengths

“L”	Stroke	Spring Return	Spring Extend
L1	1/4” - 1”	7/8”	
L1	1 1/8” - 2”	1 1/2”	
L1	2 1/8” - 3”	2 1/8”	
L1	3 1/8” - 4”	2 3/4”	
L2	1/4” - 1”		1 3/8”
L2	1 1/8” - 2”		2”
L2	2 1/8” - 3”		2 5/8”
L2	3 1/8” - 4”		3 1/4”

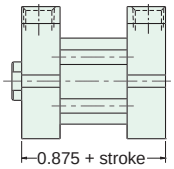
Overall length of body is stroke plus “L”



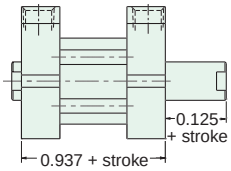
Spring Return
AF-xSR-17-x



Spring Extend
AF-xRR-17-x



Double Acting
Single Rod
AF-xDR-17-x

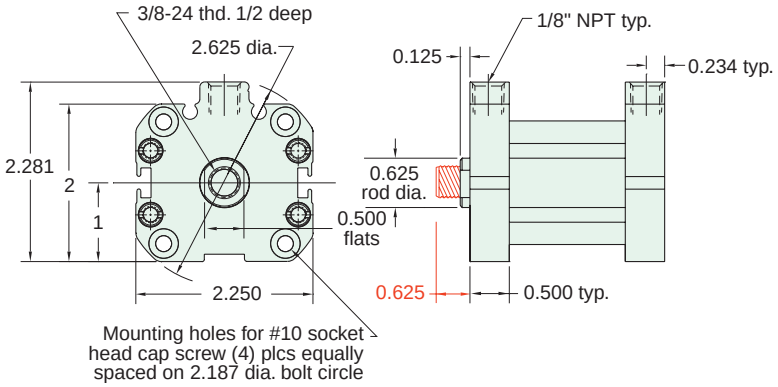


Double Acting
Double Rod
AF-xDD-17-x

Spring Forces	
Spring Return	
Compressed	At Rest
11.500 lbs.	5.500 lbs.
Spring Extend	
Compressed	At Rest
11.500 lbs.	5.500 lbs.

A F - ❑ ❑ ❑ - 2 4 - ❑

Add 7/8” for Magnetic Piston

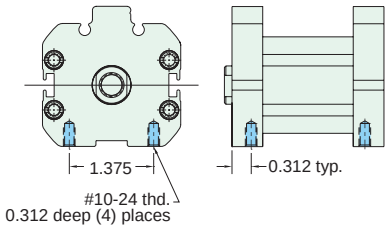


For rod with male thread option, add -T to the end of the part number after Stroke

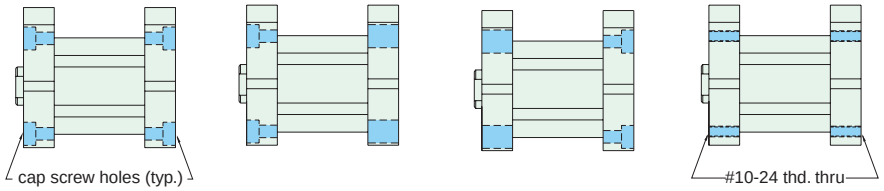
See page 76 for Air Force One numbering system

Mounting Styles

Five mounting styles give you versatility and fast, easy installation.



Bottom Mount
AF-Bxx-24-x



Universal Mount
AF-Uxx-24-x

Front Mount
AF-Fxx-24-x

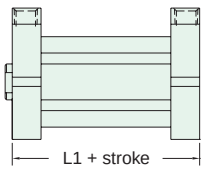
Rear Mount
AF-Rxx-24-x

Thread Mount
AF-Txx-24-x

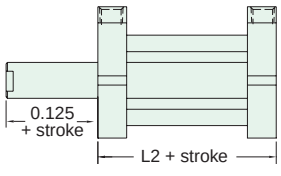
Cylinder Lengths

“L”	Stroke	Spring Return	Spring Extend
L1	1/4” - 1”	7/8”	
L1	1 1/8” - 2”	1 1/2”	
L1	2 1/8” - 3”	2 1/8”	
L1	3 1/8” - 4”	2 3/4”	
L2	1/4” - 1”		1 3/8”
L2	1 1/8” - 2”		2”
L2	2 1/8” - 3”		2 5/8”
L2	3 1/8” - 4”		3 1/4”

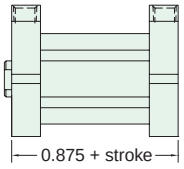
Overall length of body is stroke plus “L”



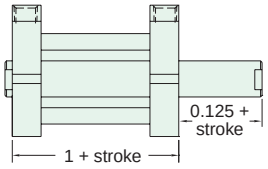
Spring Return
AF-xSR-24-x



Spring Extend
AF-xRR-24-x



Double Acting
Single Rod
AF-xDR-24-x

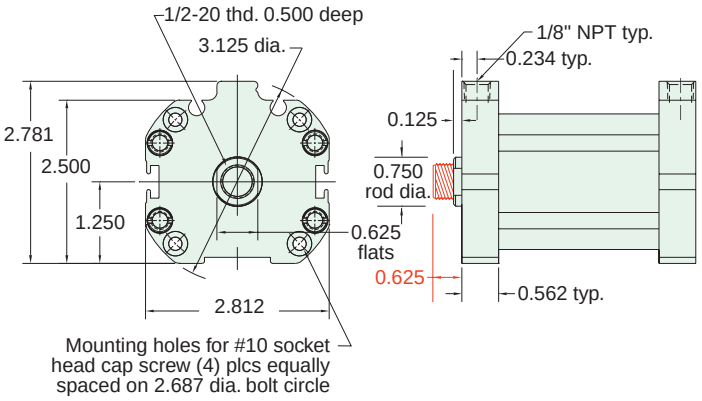


Double Acting
Double Rod
AF-xDD-24-x

Spring Forces	
Spring Return	
Compressed	At Rest
13 lbs.	7.500 lbs.
Spring Extend	
Compressed	At Rest
13 lbs.	7.500 lbs.

A F - ❑ ❑ ❑ - 3 2 - ❑

Add 7/8" for Magnetic Piston

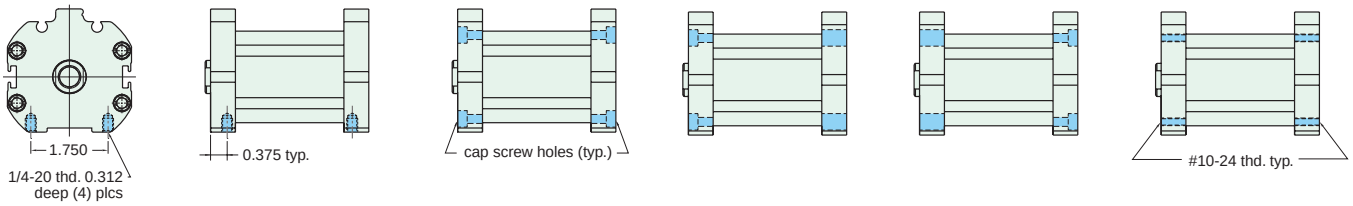


For rod with male thread option, add -T to the end of the part number after Stroke

See page 76 for Air Force One numbering system

MOUNTING STYLES

Five mounting styles give you versatility and fast, easy installation.



Bottom Mount AF-Bxx-32-x

Universal Mount AF-Uxx-32-x

Front Mount AF-Fxx-32-x

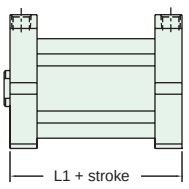
Rear Mount AF-Rxx-32-x

Thread Mount AF-Txx-32-x

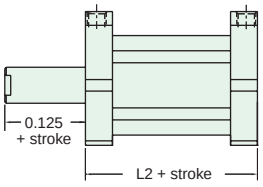
CYLINDER LENGTHS

"L"	Stroke	Spring Return	Spring Extend
L1	1/4" - 1"	15/16"	
L1	1 1/8" - 2"	1 9/16"	
L1	2 1/8" - 3"	2 3/16"	
L1	3 1/8" - 4"	2 13/16"	
L2	1/4" - 1"		1 7/16"
L2	1 1/8" - 2"		2 1/16"
L2	2 1/8" - 3"		2 11/16"
L2	3 1/8" - 4"		3 5/16"

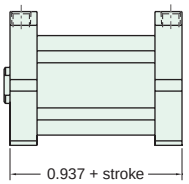
Overall length of body is stroke plus "L"



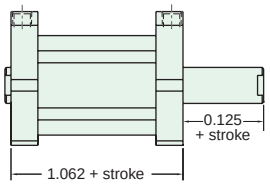
Spring Return AF-xSR-32-x



Spring Extend AF-xRR-32-x



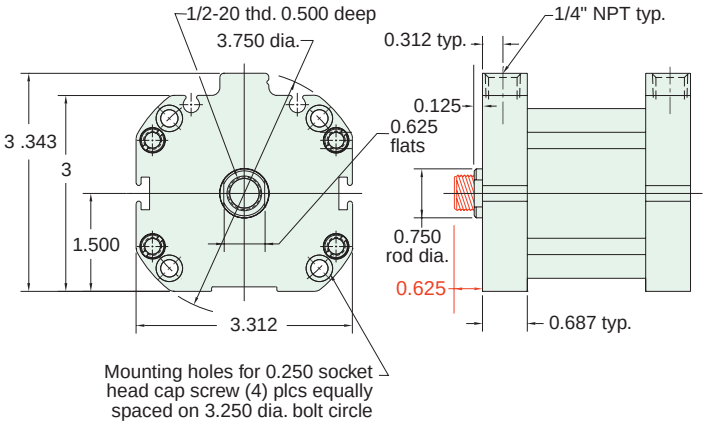
Double Acting Single Rod AF-xDR-32-x



Double Acting Double Rod AF-xDD-32-x

Spring Forces	
Spring Return	
Compressed	At Rest
13 lbs.	7.500 lbs.
Spring Extend	
Compressed	At Rest
13 lbs.	7.500 lbs.

A F - ❑ ❑ ❑ - 4 0 - ❑



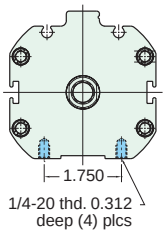
Add 7/8" for Magnetic Piston

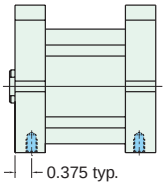
For rod with male thread option, add -T to the end of the part number after Stroke

See page 76 for Air Force One numbering system

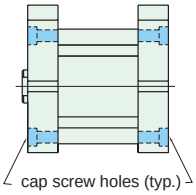
Mounting Styles

Five mounting styles give you versatility and fast, easy installation.

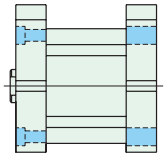




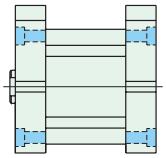
Bottom Mount
AF-Bxx-40-x



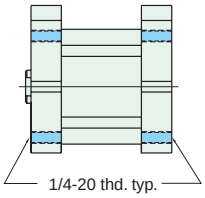
Universal Mount
AF-Uxx-40-x



Front Mount
AF-Fxx-40-x



Rear Mount
AF-Rxx-40-x

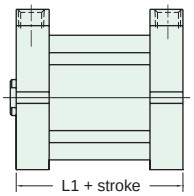


Thread Mount
AF-Txx-40-x

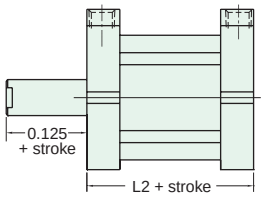
Cylinder Lengths

"L"	Stroke	Spring Return	Spring Extend
L1	1/4" - 1"	1 3/16"	
L1	1 1/8" - 2"	2 1/16"	
L1	2 1/8" - 3"	2 15/16"	
L1	3 1/8" - 4"	3 13/16"	
L2	1/4" - 1"		1 15/16"
L2	1 1/8" - 2"		2 13/16"
L2	2 1/8" - 3"		3 11/16"
L2	3 1/8" - 4"		4 9/16"

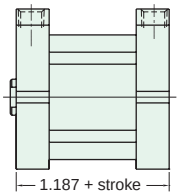
Overall length of body is stroke plus "L"



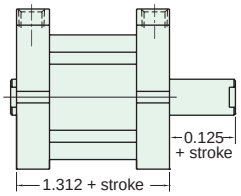
Spring Return
AF-xSR-40-x



Spring Extend
AF-xRR-40-x



Double Acting
Single Rod
AF-xDR-40-x



Double Acting
Double Rod
AF-xDD-40-x

Spring Forces	
Spring Return	
Compressed	At Rest
25 lbs.	18.500 lbs.
Spring Extend	
Compressed	At Rest
25 lbs.	18.500 lbs.

Air Force One® Hall Sensors Numbering System

A F H S - ❑ ❑

AFHS
Air
Force
Hall
Switch

Switch Type
N - Sinking (NPN)
P - Sourcing (PNP)
C - Mating Cable Only
(No hall sensors, available with Q6 & Q16 options only)

Connection
4 - 4' Wire Lead
12 - 12' Wire Lead
Q - 8 mm dia. 3 pin Quick Connect
Q6 - 8 mm dia. 3 pin Quick Connect with 6' mating cable
Q16 - 8 mm dia. 3 pin Quick Connect with 16' mating cable

Magnetic Pistons

Additional Length Required for Magnetic Piston

Add 7/8" to all bore sizes and mounting styles to accommodate the magnetic piston. Low friction U-Cup style piston seals are standard on all magnetic pistons. A minimum stroke of 3/8" is required for effective use of Hall Effect sensors.

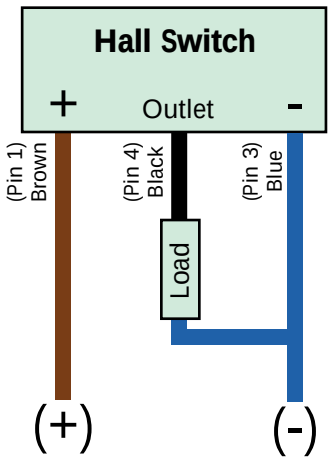
Magnetic Piston

A specialized magnet is attached to the piston that will actuate the Clippard Hall Effect sensors. This allows one or more of these dependable electronic sensor/switches to accurately determine the position of the cylinder rod. To order cylinders with magnetic pistons, specify model numbers that end with -M. Hall Effect sensors must be ordered separately.

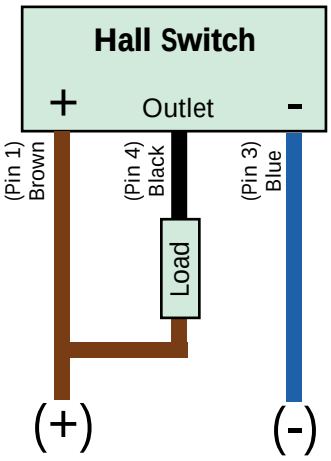
Electrical Specifications

Output Type:	Sinking or Sourcing
Input Voltage:	6 to 28 VDC
Input Current:(no load)	15 mA maximum
Voltage Drop:	0.5 VDC maximum
Output Current:	300 mA maximum
Switching Power:	7.2 Watts maximum
Circuit Protection:	Reverse Polarity Protected Transient Voltage Protected
Temperature Range:	0 -175˚ F
LED Indicator	

Sourcing PNP

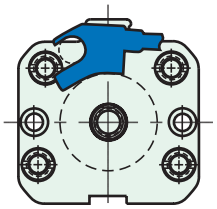


Sinking NPN

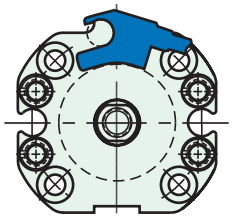


Magnetic Piston & Hall Effect Sensors

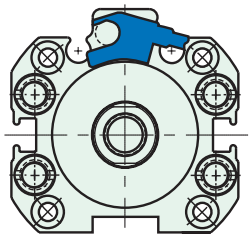
When ordered with the M option an extra rod is added to the AFO for mounting and positioning the switch.



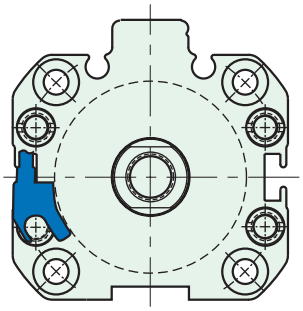
5/8" Bore



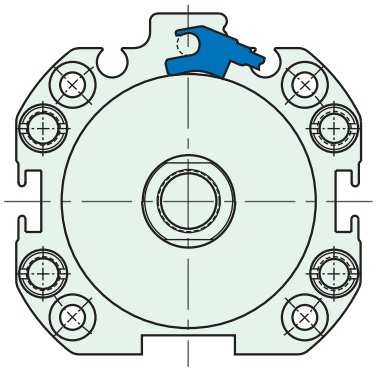
3/4" Bore



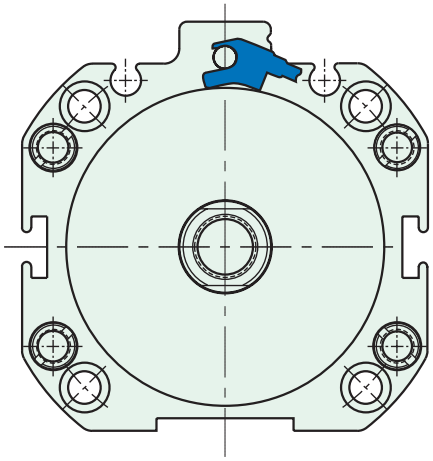
1 1/16" Bore



1 1/2" Bore



2" Bore



2 1/2" Bore

Hall Effect Sensors

Position Sensing Switch

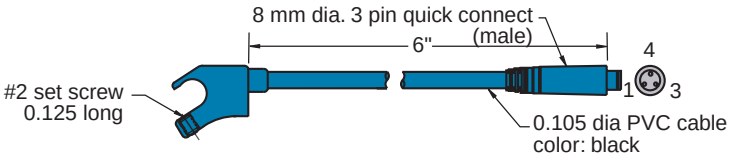
Clippard offers the solid state circuitry of the Hall Effect Switch to reliably detect the presence of a magnet attached to the piston. Clippard's Hall Effect Switch incorporates an LED to visually show switch actuation. The Hall Effect Switch is offered in sinking (NPN) and sourcing (PNP) and with a variety of cable configurations.

Locating Hall Effect Sensors on Cylinders

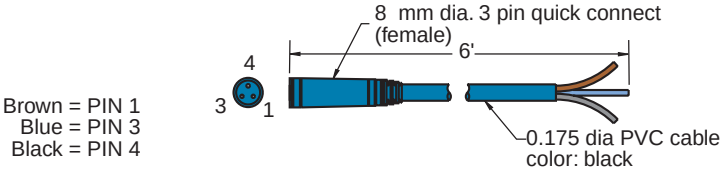
Cylinders ordered with magnetic pistons come with an additional attached rod* on which the Hall Effect Switch can be attached. The Switch snaps onto the rod and can be slid into the desired location. A set screw is used to lock the Hall Effect Switch in place.

* Additional rod is not used on 1 1/2" Bore Cyl.
Hall Effect Switch can mount directly to any tie rod.

(AFHS - N - 4 shown)

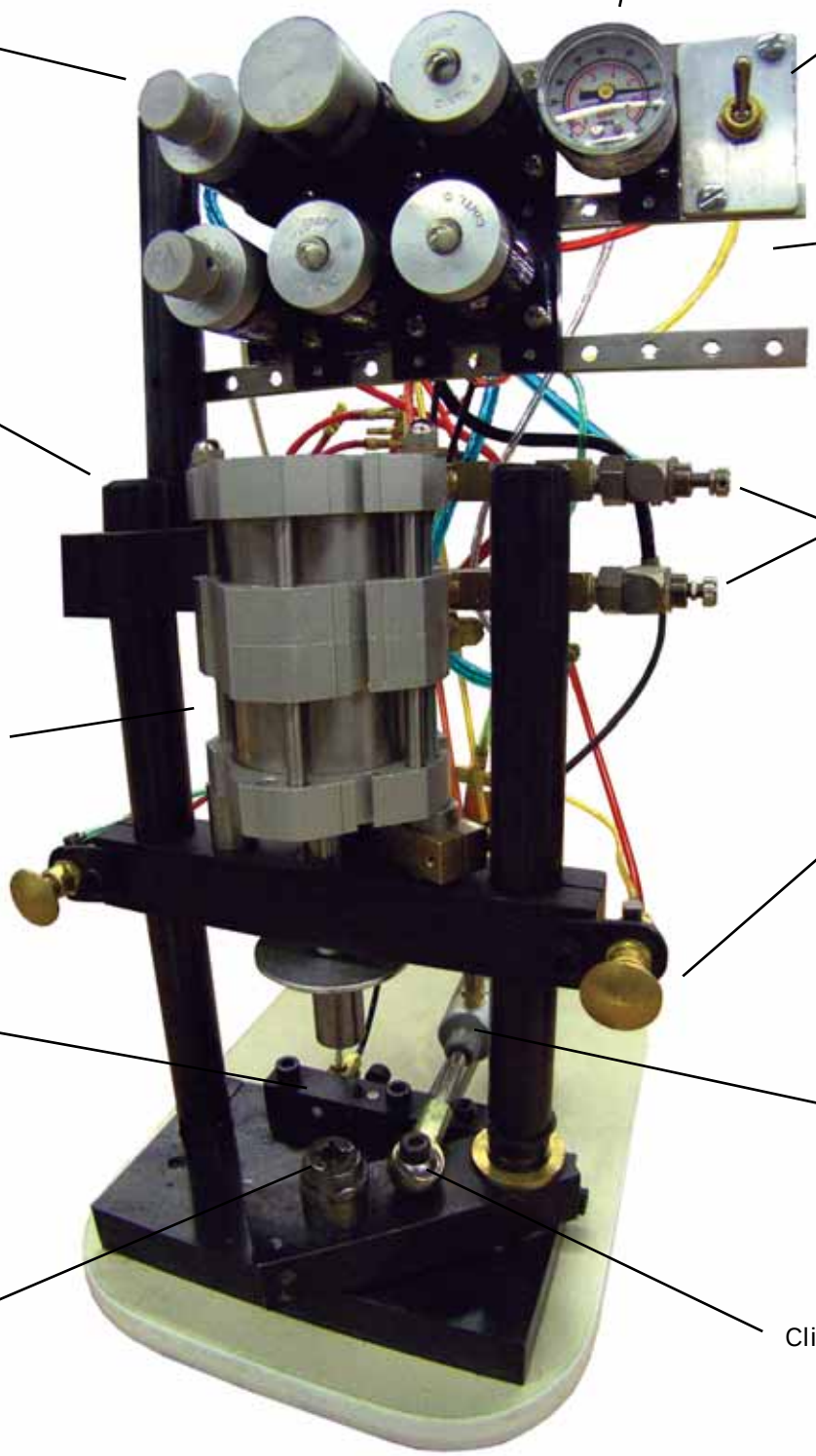


(AFHS - P - Q shown)



(AFHS - C - Q6 shown)

Miniature Swing-In Press Fixture



Clippard PG-100 Pressure Gauge

Clippard TV-3S Toggle Valve On - Off Switch

Clippard's Modular Valve Two Hand No Tie Down Clamping Circuit with Adjustable Pressure and Auto Sequencing Control

Clippard Polyurethane Hose

"Super Structure" Clippard's Squeeze Block Adjustable Fixturing

Clippard JFC-3A Flow Control Valve

Special Double Stack Clippard AFO Cylinder

Clippard MAV-3 Limit Valve with Push Button

Clippard MAV-3 Limit Valve

Clippard UDR-14-1 7/8 Bore Stainless Steel Cylinder

Press Fixture

Clippard Swivel Rod End

Clippard offers more types of miniature pneumatic cylinders for the designer's convenience, including: spring return, spring extend, air retract, double-acting and double rod models. From sub-miniature (5/32" bore) to heavy duty (1 1/8" bore), the extensive Clippard line provides a wide selection of bore sizes to suit any application requirement. An even wider range of strokes are available in the complete Clippard line of miniature cylinders, in stroke sizes ranging from 1/4" to 20".

FEATURES

- Rods are threaded and bonded to piston
- The original miniature pneumatic cylinder
- Buna-N "U"-cup rod seals for smooth leakproof operation
- Buna-N "U"-cup piston seals for full power, low friction and trouble-free performance
- 100% tested
- Pneumatic & hydraulic performance
- Sturdy, compact and long life
- Temperature range: 30° F to 180° F

The Clippard line offers numerous choices in the mounting of Clippard Minimatic® cylinders. The cylinders are provided in several types of mounting styles including plain end, stud mount, block mount, and clevis mount (male and female). In addition, a complementary line of mounting hardware, including brackets, male and female clevises and Clippard's Minimatic® super structures are available for almost any application.

Clippard cylinders are of original design, pioneered by the world's most experienced manufacturer of miniature pneumatic equipment. They are of the finest OEM quality, fully tested for outstanding performance and long life. Special steps in manufacture insure the high quality of Clippard cylinders. These include: ground, polished and roller burnished rods to protect seals and provide smooth action; tube I.D. precision through "ballizing" with carbide precision balls; high precision screw machine parts manufacture, based on concentric design that lends itself to close tolerance machining. The reputation Clippard has earned in the field is a result of our policy to test every cylinder (100%) we manufacture.

Every Cylinder is 100% tested

Cylinder Tubes:
Machined from heavy wall, cold-drawn brass tubing; ballized internally for precise size, fine finish and low seal friction; 1 1/8" bore: hard coat aluminum

Piston Rods:
Except where otherwise specified, all rods are stainless steel, ground, polished and roller burnished for long seal life, low friction and smooth action

Pistons:
Brass in all models except aluminum in 7/8" bore single acting series

Springs:
Stainless steel for long life and resistance to corrosion

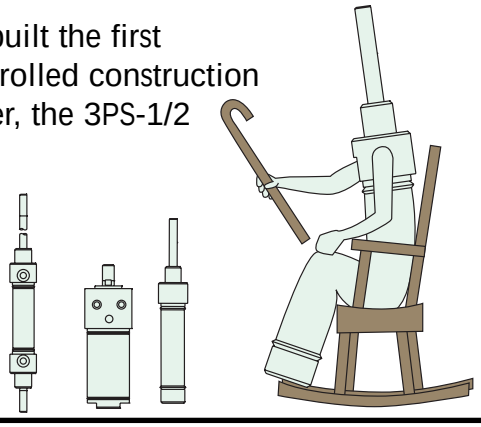
Seals:
Buna-N compound, impervious to a wide range of hydraulic fluids, liquids, and gases; rod seals replaceable on models where applicable; piston seals replaceable only on threaded construction models

Bumpers:
Resilient bumpers of Buna-N or polyurethane absorb shock, increase life and reduce noise level

Finish:
All external brass parts are "bright-dipped" to resist corrosion and preserve finished appearance; 1 1/8" bore: hard coated aluminum with black oxide steel heads

Did you know...

Clippard built the first miniature rolled construction air cylinder, the 3PS-1/2 in 1949.



MINIMATIC® CYLINDER

Minimatic® Cylinders	pg.	Engineering Data			Design Features						Remarks
		Medium	Force Factor	Rec. Max. Working Pres.	Piston Seals	Rod Seals	Rod Dia.	Rod End	Ports Tapped	Construction	
5/32" Bore Spring Return	89	Air	0.02	150 psig	U-Cup		0.062"	Plain	#10-32 #3-56	Rolled or Welded	45° Tapered rod end on SM-2 Spring force extend- 2 oz. Spring force compressed- 5 oz.
1/4" Bore 6.35 mm Spring Return	89	Air	0.05	125 psig	U-Cup		0.135"	Thd.	#10-32	Rolled	Spring force extend- 6 oz. Spring force compressed-10 oz.
3/8" Bore Spring Return	90	Air	0.10	125 psig	U-Cup		3/16"	Plain	#10-32	RF Silver Soldered	Model 3PS-1/2 is rolled construction with non-rotating thd. brass rod, others; non-thd. stainless steel Spring force extend- 12 oz. Spring force compressed- 30 oz.
3/8" Bore Double Acting	91	Air & Hyd.	0.10	125 psig-Air	U-Cup	Vee Ring	1/8"	Plain	#10-32	RF Silver Soldered	
3/8" Bore Spring Extend Air Retract	90	Air	0.10	125 psig	U-Cup		1/8"	Thd.	#10-32	RF Silver Soldered	Min. of 14 psig to retract Spring force extend- 12 oz. Spring force compressed- 30 oz.
9/16" Bore Spring Return	92	Air	0.22	125 psig	U-Cup		3/16"	Plain	#10-32	RF Silver Soldered	9PS-3/4 & 9SS-3/4 have non-rotating, thd., stainless steel rods, others; non-thd., stainless steel Spring force extend- 1.6 oz. Spring force compressed- 3.7 oz.
9/16" Bore Double Acting	92	Air & Hyd.	0.22	125 psig-Air	U-Cup	Vee Ring	3/16"	Plain	#10-32	RF Silver Soldered	
9/16" Bore Spring Extend Air Retract	92	Air	0.22	250 psig	U-Cup	Vee Ring	1/4"	Thd.	#10-32	Threaded	Min. of 19 psig to retract Spring force extend- 2 lb. Spring force compressed- 4 lb.
9/16" Bore Heavy Duty Spring Return	94	Air	0.20	250 psig	U-Cup		1/4"	Thd.	1/16" NPT	Threaded	Spring force extend- 2 lb. Spring force compressed- 4 lb.
9/16" Bore Heavy Duty Double Acting	95 **	Air &	0.20 Hyd.	250 psig-Air 1000 psig-Hyd.*	T-Ring	Vee Ring	1/4"	Thd.	1/16" NPT	Threaded	
7/8" Bore Spring Return	96	Air	0.60	250 psig	U-Cup		1/4"	Thd.	1/8" NPT	Threaded	Sintered bronze rod bushing Spring force extend- 7 lb. Spring force compressed- 12 lb.
7/8" Bore Double Acting	97 **	Air & Hyd.	0.60	250 psig-Air 1000 psig-Hyd.*	T-Ring	Vee Ring	1/4"	Thd.	1/8" NPT	Threaded	Sintered bronze rod bushing
7/8" Bore Spring Extend Air Retract	96	Air	0.60	250 psig	U-Cup	Vee Ring	1/4"	Thd.	1/8" NPT	Threaded	Min. of 23 psig to retract Spring force extend- 7 lb. Spring force compressed- 12 lb.
1-1/8" Bore Double Acting	99 **	Air	1.0	250 psig	U-Cup	Vee Ring	3/8"	Thd.	1/8" NPT	Threaded	Sintered bronze rod bushing Low friction - 2 psig to operate
1-1/8" Bore Spring Return	98	Air	1.0	250 psig	U-Cup		3/8"	Thd.	1/8" NPT	Threaded	Spring force extend- 8 lb. Spring force compressed- 12 lb.

Quick Cylinder Computations:
Cylinder Force = Force Factor x Pressure
Displacement = Force Factor x Stroke
(Force factor given in table above equals effective piston area)

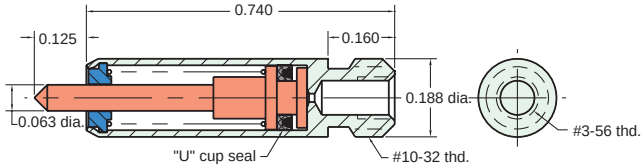
**NOTE: Double rods also available in these models.
Temperature: 30° F to +230° F
*Consult factory for hydraulic applications

SM-2

Single Acting

Bore: 5/32”
Mount: Rear Thread
Type: Spring Return

Available Stroke Lengths: 1/4
Materials: Stainless steel body, piston & rod, Buna-N U-cup, Beryllium copper spring



SM-3-❑

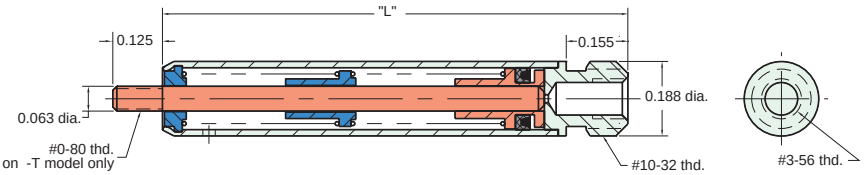
Single Acting

Bore: 5/32”
Mount: Rear Thread
Type: Spring Return

Model	SM-3-2	SM-3-3	SM-3-4
Stroke	1/2”	3/4”	1”
Length “L”	1.171	1.593	2

Materials: Stainless steel tube and rod, brass piston, Buna-N U-cup

To order: Add stroke length to the end of the part number



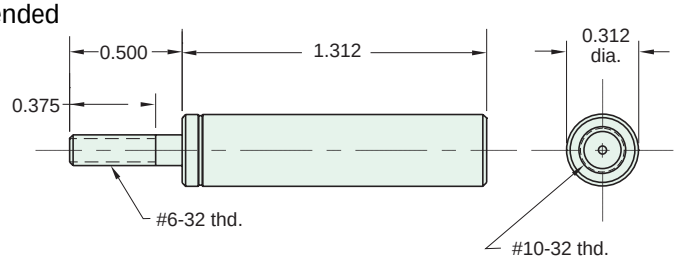
SM-6

Single Acting

Bore: 1/4”
Mount: Body*
Type: Spring Return

Available Stroke Lengths: 3/8”
Materials: Brass body, Buna-N U-cup, stainless steel piston & rod

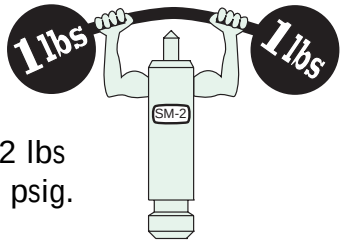
*Super structure recommended



Nut included, but not shown on drawing

Super structure 12327 pictured here is recommended for mounting the SM-6 cylinder. For more information see page 105.

Did you know...



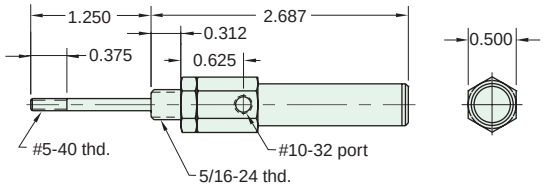
The tiny SM-2 cylinder gives 2 lbs of force at 100 psig.

3/8" Bore Brass Minimatic® Cylinder

3SS-AR-1/2

Mount: Stud
Type: Single Acting Spring Extended
Available Stroke Lengths: 1/2"

Add **-N** to the end of the part number for a non-threaded rod



Rod nut included, but not shown on drawing

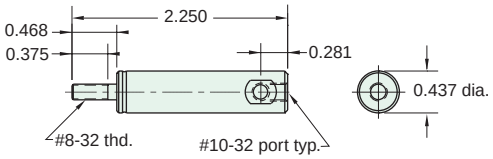
3PS-1/2

First Cylinder - 1949

Mount: Body*
Type: Single Acting Spring Return
Available Stroke Lengths: 1/2"
Ports: End or Side
Brass Rod - non-rotating

Add **-N** to the end of the part number for a non-threaded rod

*Super Structure recommended



Rod nut included, but not shown on drawing

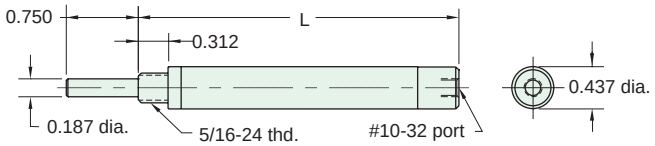
3SS-❑

Mount: Stud
Type: Single Acting Spring Return

Stroke	1/2"	1"	2"	3"
Length "L"	2.093	3.343	5.218	7.093

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a #10-32 x 1/2" rod thread



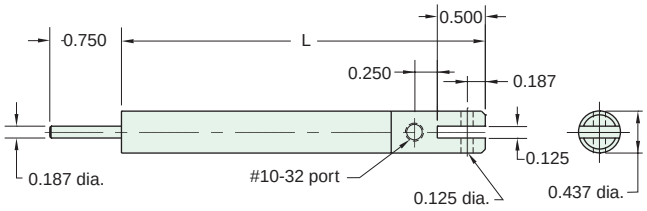
3CS-❑

Mount: Clevis
Type: Single Acting Spring Return

Stroke	1/2"	1"	2"	3"
Length "L"	2.468	3.406	5.281	7.156

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a #10-32 x 1/2" rod thread

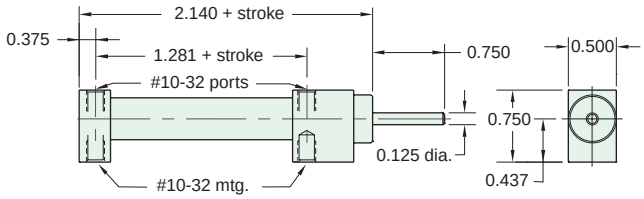


3BDS-❑

Mount: Block **Available Stroke Lengths:** 1", 2", 3", 4", 5", 6"
Type: Double Acting

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a #5-40 x 1/2" rod thread

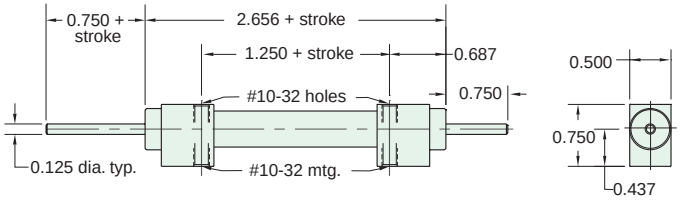


3BDD-❑

Mount: Block **Available Stroke Lengths:** 1", 2", 3", 4"
Type: Double Acting
Double Rod

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a #5-40 x 1/2" rod thread

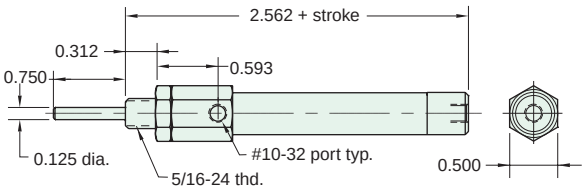


3SD-❑

Mount: Stud **Available Stroke Lengths:** 1", 2", 3", 4"
Type: Double Acting

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a #5-40 x 1/2" rod thread



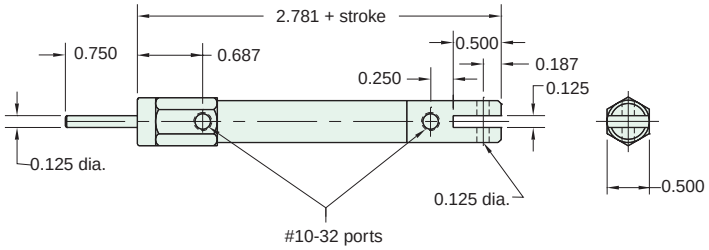
Nut included, but not shown on drawing

3CD-❑

Mount: Clevis **Available Stroke Lengths:** 1", 2", 3", 4"
Type: Double Acting

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a #5-40 x 1/2" rod thread



9/16" Bore Brass Minimatic® Cylinder

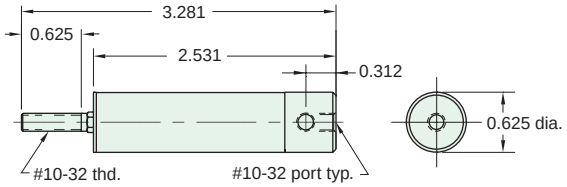
9PS-3/4

Mount: Body*
Type: Single Acting Spring Return

Available Stroke Lengths: 3/4"
Non-Rotating Shaft

Add **-N** to the end of the part number for a non-threaded rod

*Super Structure recommended



Rod nut included, but not shown on drawing

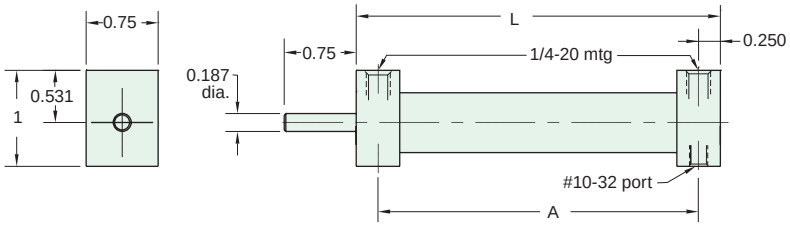
9BS-❑

Mount: Block
Type: Single Acting Spring Return

Stroke	3/4"	1 1/2"	2 1/4"	3"
Length "L"	2.750	4.218	5.593	6.937
"A"	2.312	3.750	5.125	6.500

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a #10-32 x 1/2" rod thread



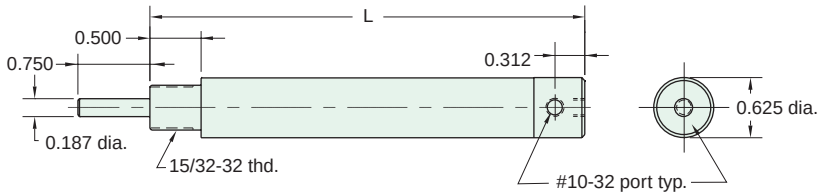
9SS-❑

Mount: Stud
Type: Single Acting Spring Return

Stroke	3/4"	1 1/2"	2 1/4"	3"
Length "L"	3.031	4.531	5.875	7.250

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a #10-32 x 1/2" rod thread



Rod nut included, but not shown on drawing

Note: On 3/4" stroke rod is hexagonal stainless steel (non-rotating) and threaded #10-32 x 5/8

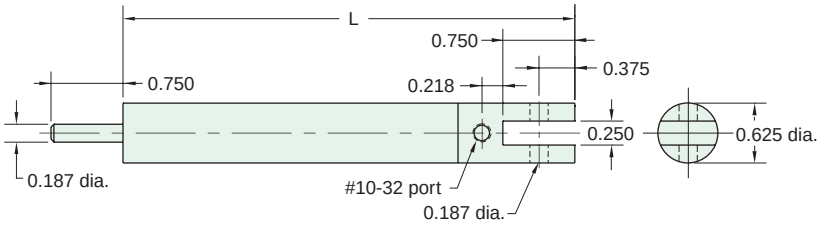
9CS-❑

Mount: Clevis
Type: Single Acting Spring Return

Stroke	3/4"	1 1/2"	2 1/4"	3"
Length "L"	3.343	4.687	6.062	7.406

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a #10-32 x 1/2" rod thread

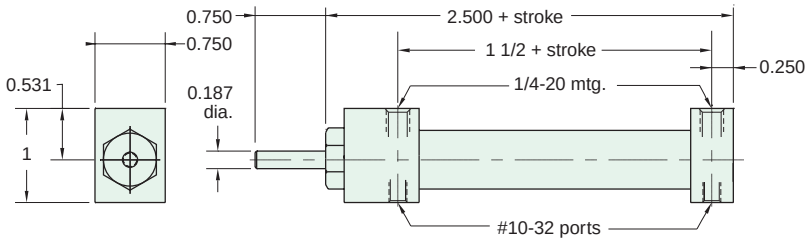


9BDS-❑

Mount: Block
Type: Double Acting
Available Stroke Lengths: 1", 2", 3", 4", 5", 6"

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a #10-32 x 1/2" rod thread

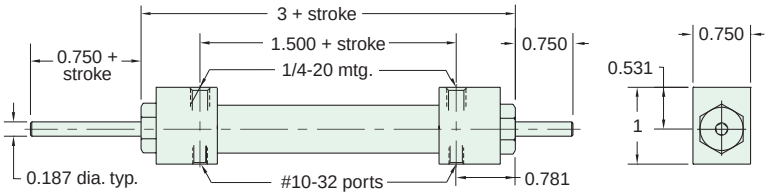


9BDD-❑

Mount: Block
Type: Double Acting
Double Rod
Available Stroke Lengths: 1", 2", 3", 4", 5", 6"

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a #10-32 x 1/2" rod thread

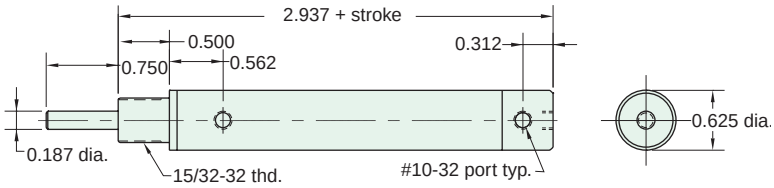


9SD-❑

Mount: Stud
Type: Double Acting
Available Stroke Lengths: 1", 2", 3", 4", 5", 6"

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a #10-32 x 1/2" rod thread



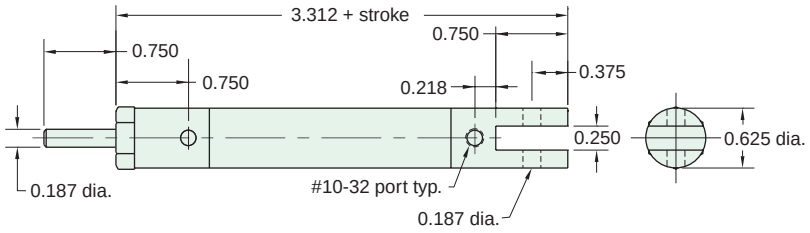
Nut included, but not shown on drawing

9CD-❑

Mount: Clevis
Type: Double Acting
Available Stroke Lengths: 1", 2", 3", 4", 5", 6"

To order: Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a #10-32 x 1/2" rod thread

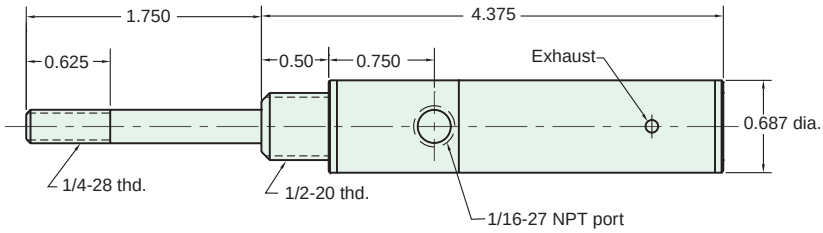


9/16" Bore Brass Heavy Duty Cylinder

9SS-AR-1

Mount: Stud
Type: Single Acting Spring Extended
Available Stroke Lengths: 1"

Add **-N** to the end of the part number for a non-threaded rod



Nut included, but not shown on drawing

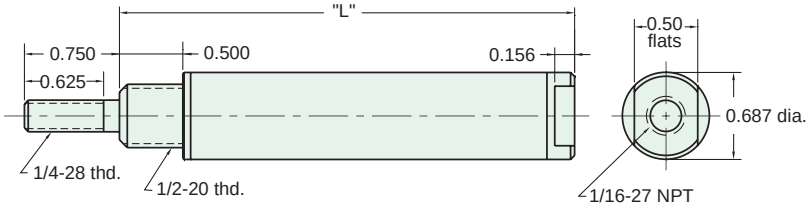
H9S-❑S

Mount: Stud
Type: Single Acting Spring Return

Stroke	1"	2"	3"
Length "L"	3.593	5.250	6.906

To order: Indicate stroke in box ❑

Add **-N** to the end of the part number for a non-threaded rod



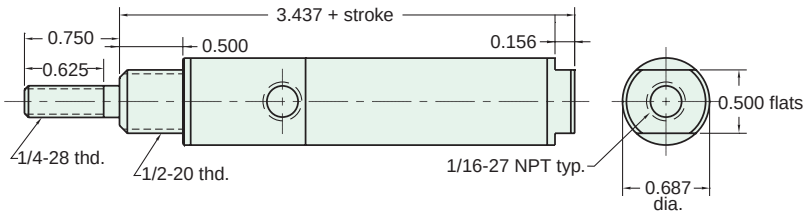
Nut included, but not shown on drawing

H9S-❑D

Mount: Stud
Type: Double Acting
Available Stroke Lengths: 1", 2", 3", 4", 5", 6"

To order: Indicate stroke in box ❑

Add **-N** to the end of the part number for a non-threaded rod



Nut included, but not shown on drawing

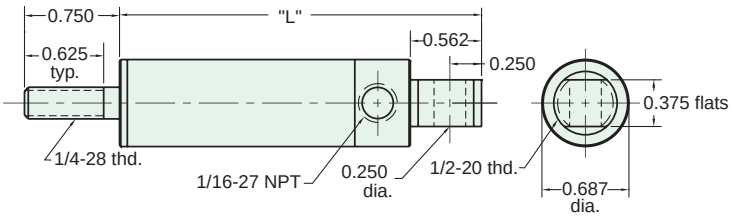
H9C-❑S

Mount: Clevis
Type: Single Acting Spring Return

Stroke	1"	2"	3"
Length "L"	3.875	5.531	7.187

To order: Indicate stroke in box ❑

Add **-N** to the end of the part number for a non-threaded rod



Nut included, but not shown on drawing

9/16” Bore Brass Heavy Duty Cylinder

Consult factory for hydraulic applications

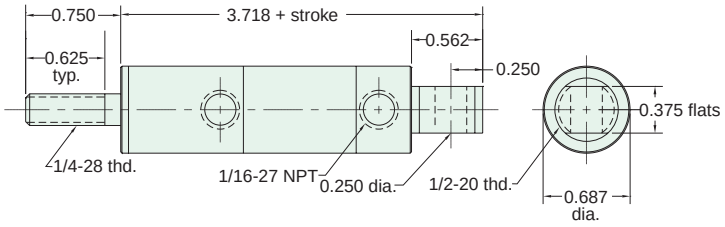
Note: Maximum recommended hydraulic working pressure for heavy duty cylinders is 1000 psig.

H9C-❑D

Mount: Clevis
Type: Double Acting
Available Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”

To order: Indicate stroke in box ❑

Add **-N** to the end of the part number for a non-threaded rod



Nuts included, but not shown on drawing

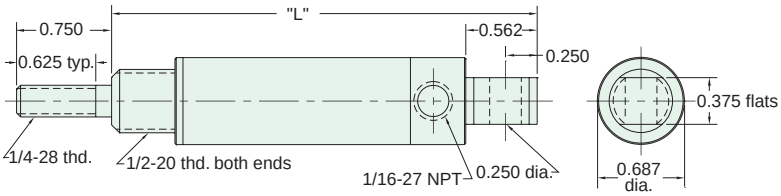
H9U-❑S

Mount: Universal
Type: Single Acting Spring Return

Stroke	1”	2”	3”
Length “L”	4.375”	6.031	7.687

To order: Indicate stroke in box ❑

Add **-N** to the end of the part number for a non-threaded rod



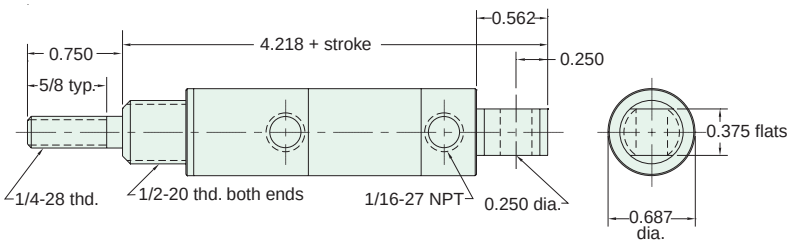
Nuts included, but not shown on drawing

H9U-❑D

Mount: Universal
Type: Double Acting
Available Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”

To order: Indicate stroke in box ❑

Add **-N** to the end of the part number for a non-threaded rod



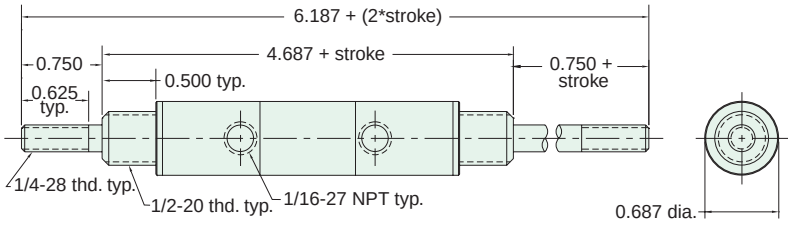
Nuts included, but not shown on drawing

H9D-❑D

Mount: Stud
Type: Double Acting Double Rod
Available Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”

To order: Indicate stroke in box ❑

Add **-N** to the end of the part number for a non-threaded rod



Nuts included, but not shown on drawing

7/8" Bore Brass Heavy Duty Cylinder

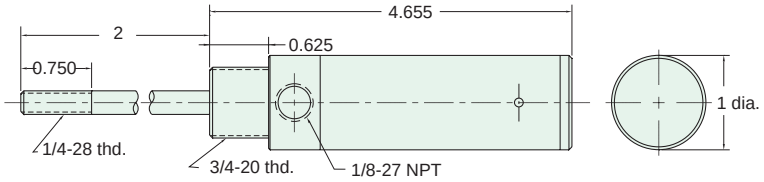
Consult factory for hydraulic applications

7SS-AR-1

Mount: Stud
Type: Single Acting
Spring Extended

Available Stroke Lengths: 1"

Add **-N** to the end of the part number for a non-threaded rod



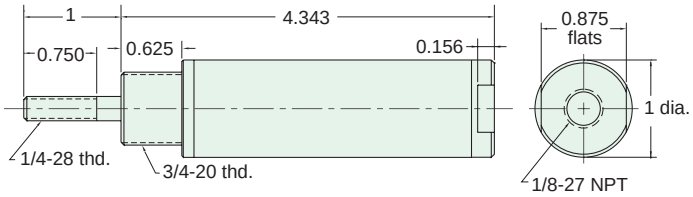
Nut included, but not shown on drawing

7SS-1

Mount: Stud
Type: Single Acting
Spring Return

Available Stroke Lengths: 1"

Add **-N** to the end of the part number for a non-threaded rod



Nut included, but not shown on drawing

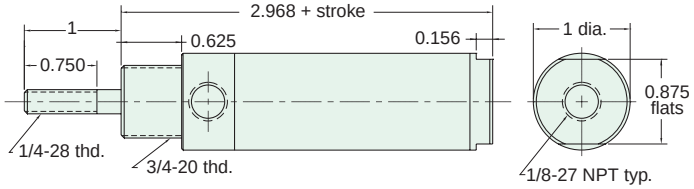
7SD-❑

Mount: Stud
Type: Double Acting

Available Stroke Lengths: 1", 2", 3", 5", 7", 9"

To order: Add stroke length to the end of the part number

Add **-N** to the end of the part number for a non-threaded rod



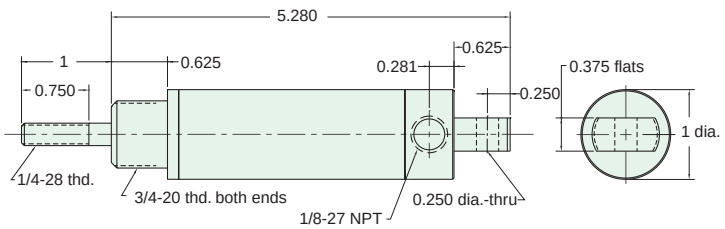
Nut included, but not shown on drawing

7S-1

Mount: Universal
Type: Single Acting
Spring Return

Available Stroke Lengths: 1"

Add **-N** to the end of the part number for a non-threaded rod



Nuts included, but not shown on drawing

7/8” Bore Brass Heavy Duty Cylinder

Consult factory for hydraulic applications

Note: Maximum recommended hydraulic working pressure for heavy duty cylinders is 1000 psig.

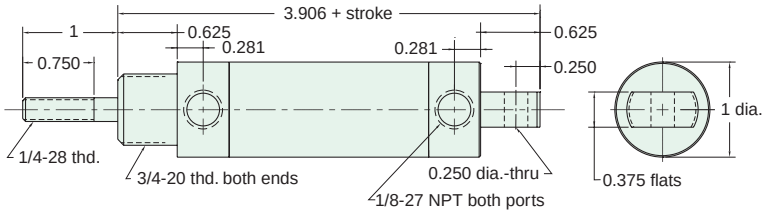
7D-❑

Mount: Universal **Available Stroke Lengths:** 1”, 2”, 3”, 5”, 7”, 9”

Type: Double Acting

To order: Add stroke length to the end of the part number

Add **-N** to the end of the part number for a non-threaded rod



Nut included, but not shown on drawing

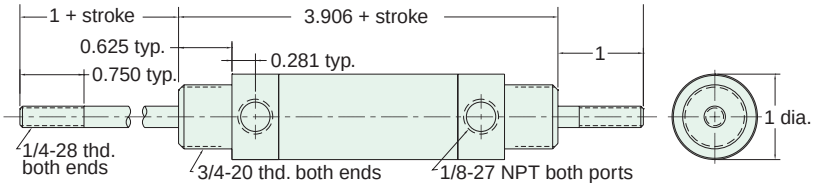
7DD-❑

Mount: Universal **Available Stroke Lengths:** 1”, 2”, 3”, 5”, 7”, 9”

Type: Double Acting
Double Rod

To order: Add stroke length to the end of the part number

Add **-N** to the end of the part number for a non-threaded rod



Nut included, but not shown on drawing

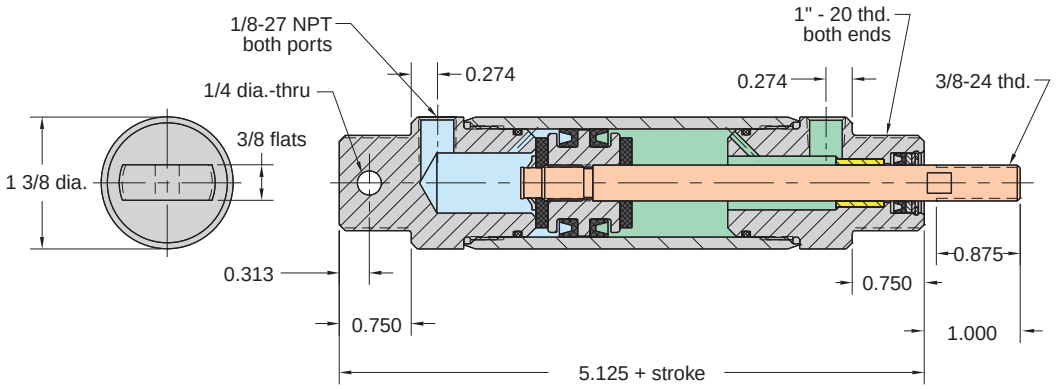
Did you know...

Leonard Clippard made the prototype cylinder piston seals by punching leather disks from his kids old shoe tongues.

1 1/8” Bore Heavy Duty Aluminum Cylinder

Features

- Very low breakaway force - allows for a consistent stroke speed (no sudden jumps)
- Hard-anodized aluminum body - attractive, yet durable
- Force factor of 1 - 100 psig input provides 100 lbs. output force
- Available in many stroke lengths (even up to 8 ft. in special quantities!)
- Brass piston, stainless steel rod

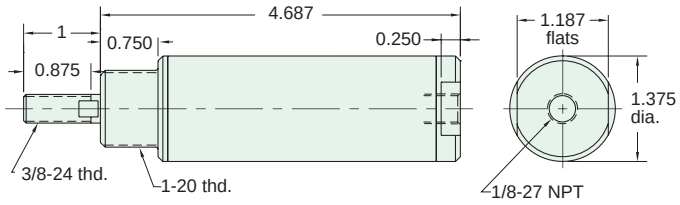


18SS-1

Mount: Stud
Type: Single Acting
Spring Return

Available Stroke Lengths: 1”

Add **-N** to the end of the part number for a non-threaded rod



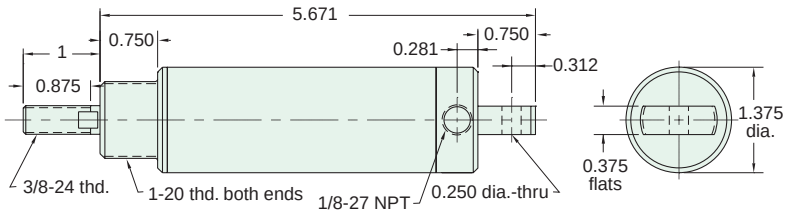
Nut included, but not shown on drawing

18S-1

Mount: Universal
Type: Single Acting
Spring Return

Available Stroke Lengths: 1”

Add **-N** to the end of the part number for a non-threaded rod



Nuts included, but not shown on drawing

1 1/8” Bore Heavy Duty Aluminum Cylinder

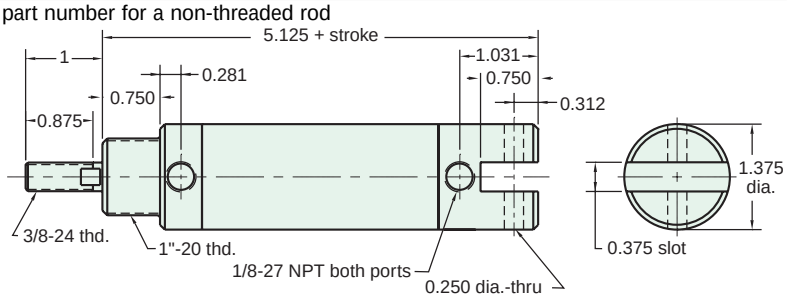
18CSD-❑

Mount: Clevis
Type: Double Acting

Available Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”, 7”, 8”, 9”, 10”, 12”, 14”, 16”, 18”, 20”

To order: Add stroke length to the end of the part number

Add **-N** to the end of the part number for a non-threaded rod



Nut included, but not shown on drawing

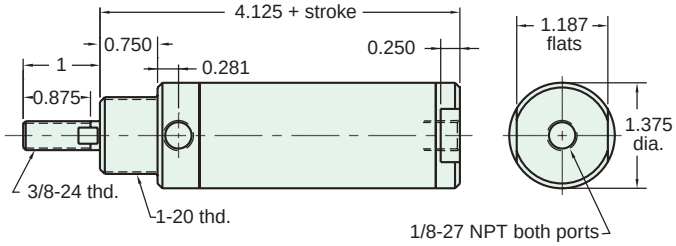
18SD-❑

Mount: Stud
Type: Double Acting

Available Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”, ‘7, 8”, 9”, 10”, 12”, 14”, 16”, 18’, 20”

To order: Add stroke length to the end of the part number

Add **-N** to the end of the part number for a non-threaded rod



Nut included, but not shown on drawing

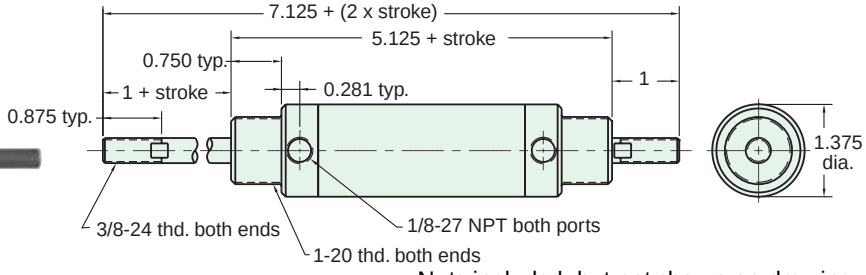
18DD-❑

Mount: Stud
Type: Double Acting Double Rod

Available Stroke Lengths: 1”, 2”, 3”, 6”

To order: Add stroke length to the end of the part number

Add **-N** to the end of the part number for a non-threaded rod



Nuts included, but not shown on drawing

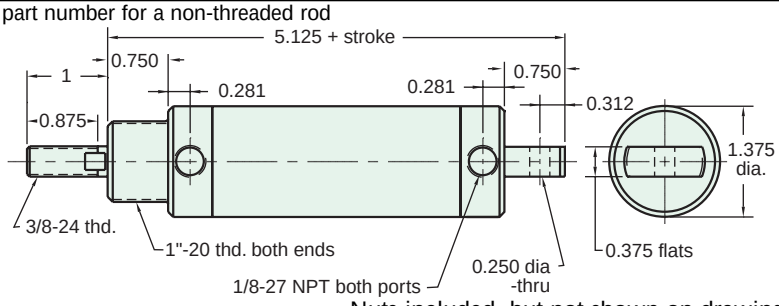
18D-❑

Mount: Universal
Type: Double Acting

Available Stroke Lengths: 1”, 2”, 3”, 4”, 5”, 6”, 7”, 8”, 9”, 10”, 12”, 14”, 16,” 18”, 20”

To order: Add stroke length to the end of the part number

Add **-N** to the end of the part number for a non-threaded rod

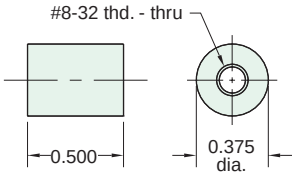


Nuts included, but not shown on drawing

3/8" Bore Mounting Brackets

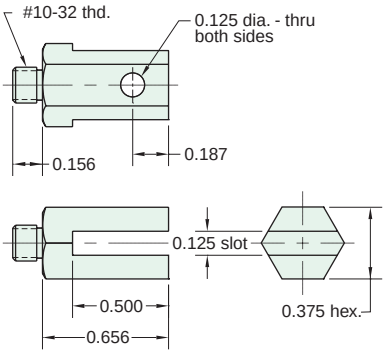
11767

Ceramic Insulator
Use with cylinder having #8-32 threaded shaft to insulate cylinder from heat or electricity



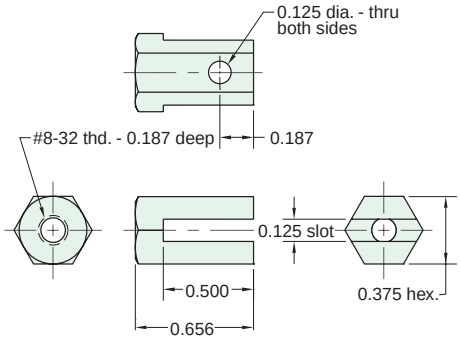
11996

Male Clevis
Mounts in rear of cylinder tapped #10-32



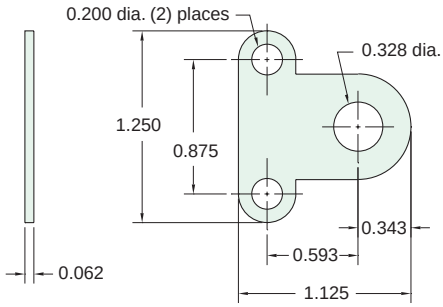
11997

Female Clevis
Use with cylinder having #8-32 threaded shaft



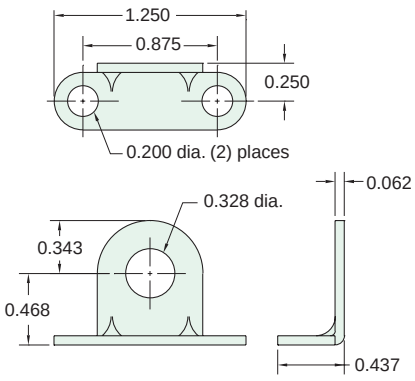
11917-2

Mounting Bracket (flat)



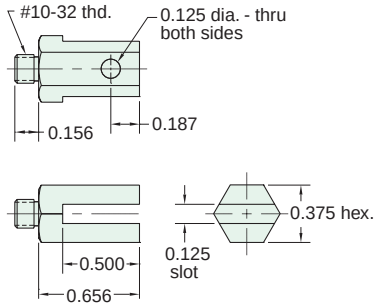
11918-2

Mounting Bracket (angled)



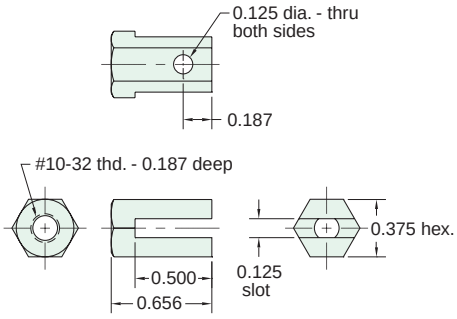
11996 Male Clevis

Mounts in rear of cylinder tapped #10-32

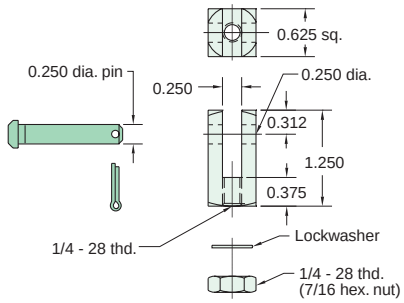


15009 Female Clevis

For use with cylinders having #10-32 threaded shaft

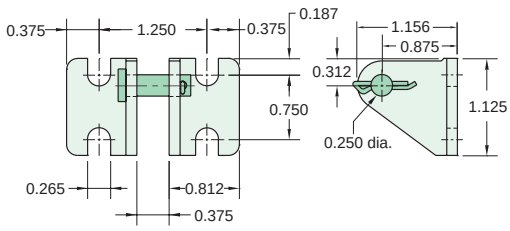


15015 Rod Clevis Assembly

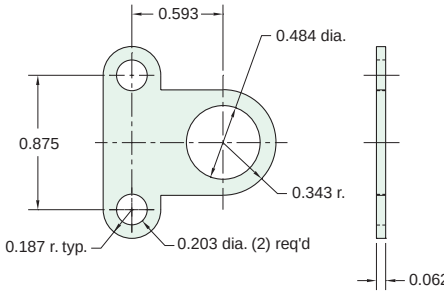


CB-1795 Clevis Bracket

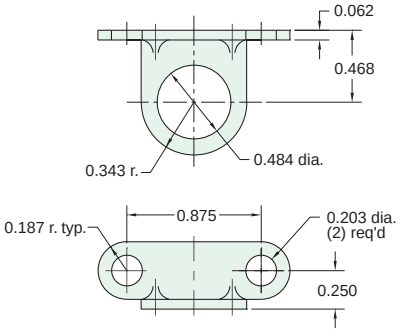
Material: steel, bright zinc plated



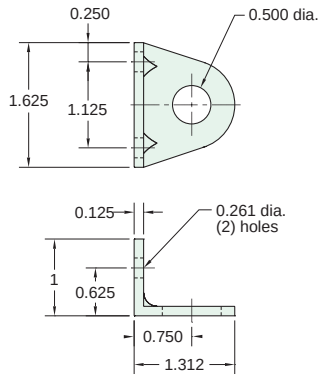
11917-1 Mounting Bracket (flat)



11918-1 Mounting Bracket (angled)

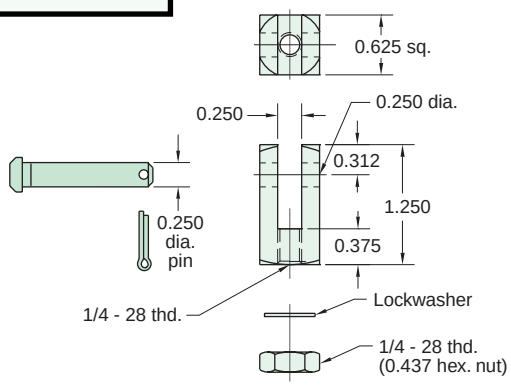


15018-2 Mounting Bracket (angled)



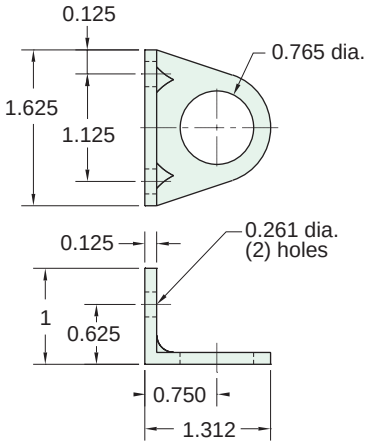
15015

Rod Clevis Assembly



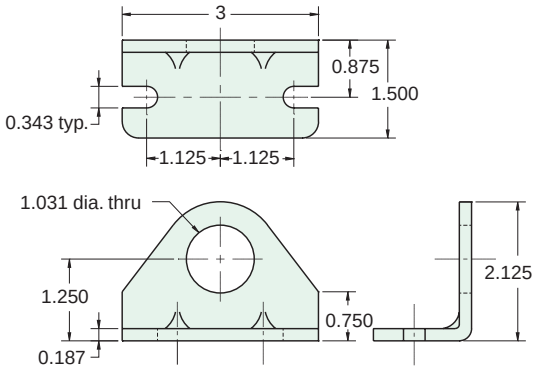
15018-1

Foot Mounting Bracket



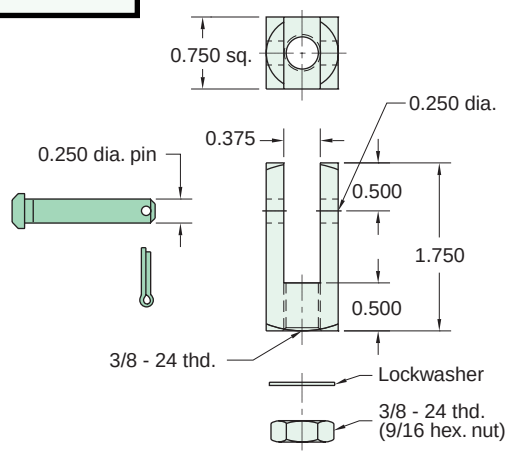
FB-2891

Foot Mounting Bracket



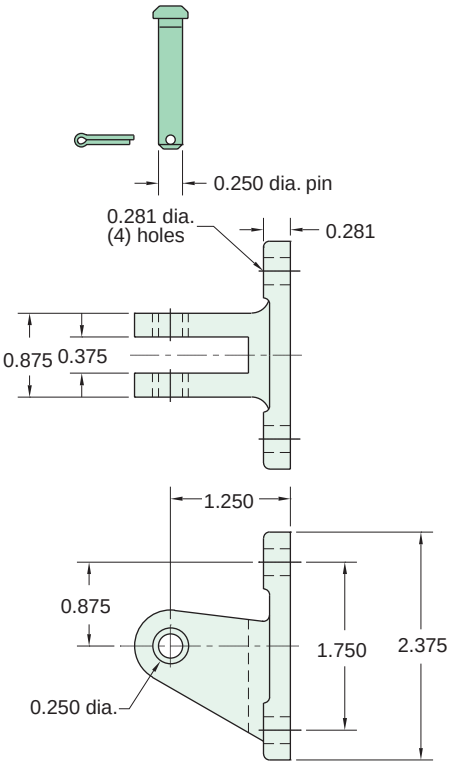
12346

Rod Clevis Assembly



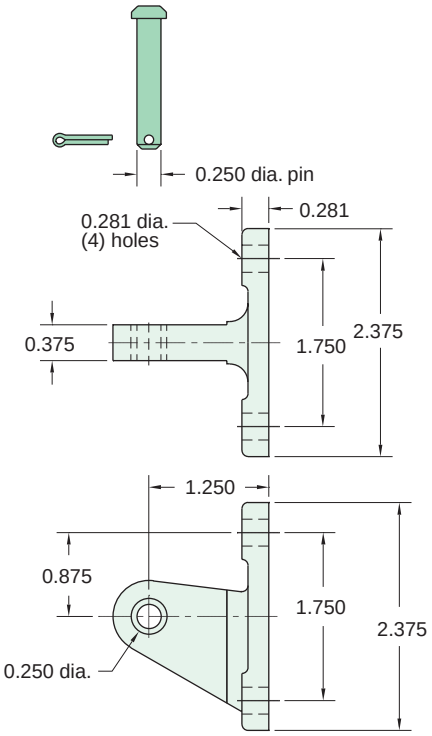
12456

Female Clevis Mounting Bracket



12458

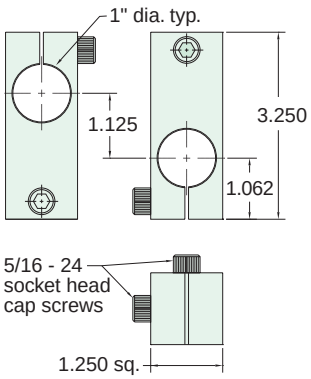
Male Clevis Mounting Bracket



Here's a building block concept to speed construction of small equipment, fixtures, jigs and tooling. Machined steel blocks adapt to any position on the column and base. Offset extensions are provided through use of fixture and block mounting shafts of various lengths. Use of proper size brass slotted adapter permits mounting small bore cylinders or other parts. Column base is drilled for mounting. The Super Structure is extremely solid and secure, yet fully adjustable.

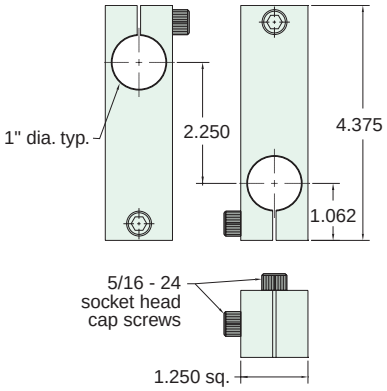
12361

Perpendicular mounting block
(black oxide finished steel)



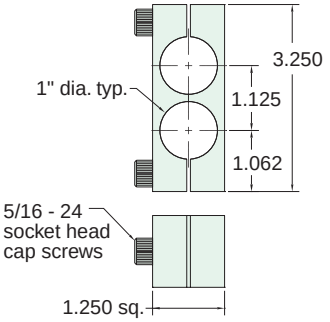
12362

Perpendicular mounting block
(black oxide finished steel)



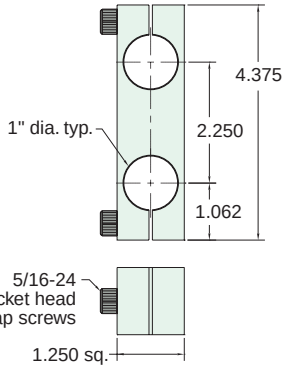
12363

Inline mounting block
(black oxide finished steel)



12364

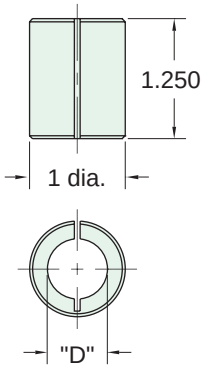
Inline mounting block
(black oxide finished steel)



12365-❑

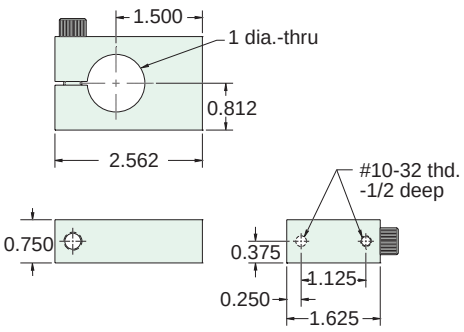
Part #	12365-1	12365-2	12365-3
"D" dia.	0.437	0.625	0.687

Slotted adapters (brass)



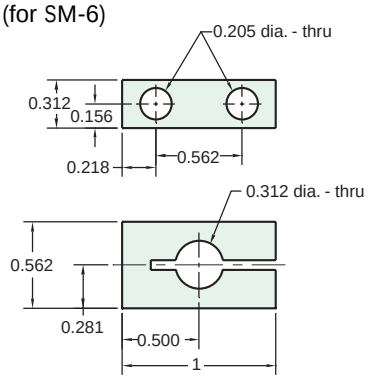
12369

Bracket mounting adapter block



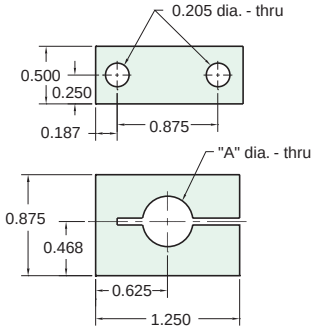
12327

Cylinder mounting squeeze block
(for SM-6)



12326-❑

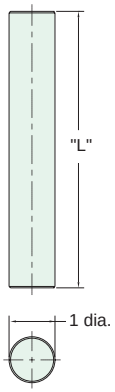
Cylinder mounting squeeze blocks
(for 3/8" & 9/16" standard bore)



Part #	"A"	
12326-1	5/8"	(for 9/16" stand. bore cylinder)
12326-2	7/16"	(for 3/8" stand. bore cylinder)

12366-❑

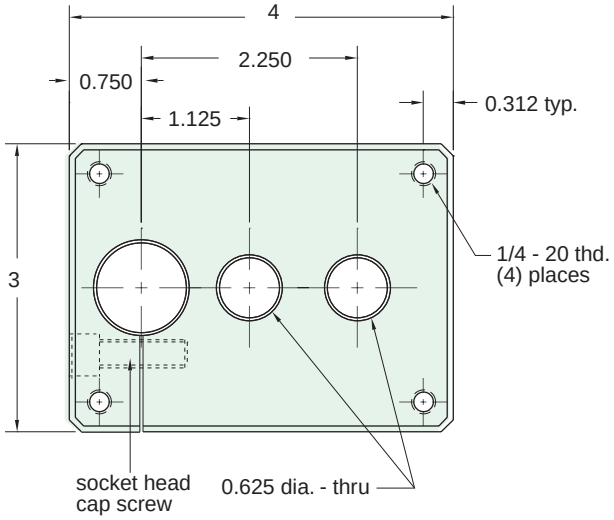
Fixture and bracket mounting shafts
(black oxide finished steel)

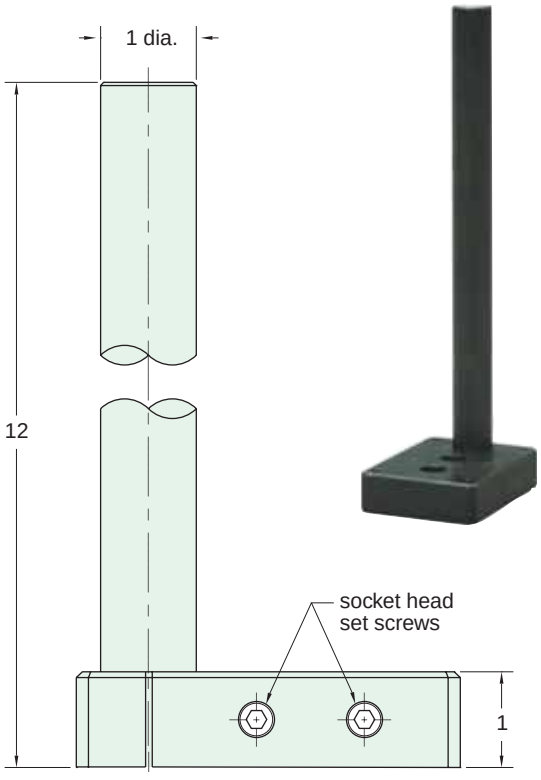


Part #	"L"
12366-4	4"
12366-6	6"
12366-8	8"
12366-10	10"
12366-12	12"
12366-14	14"
12366-16	16"
12366-18	18"
12366-20	20"

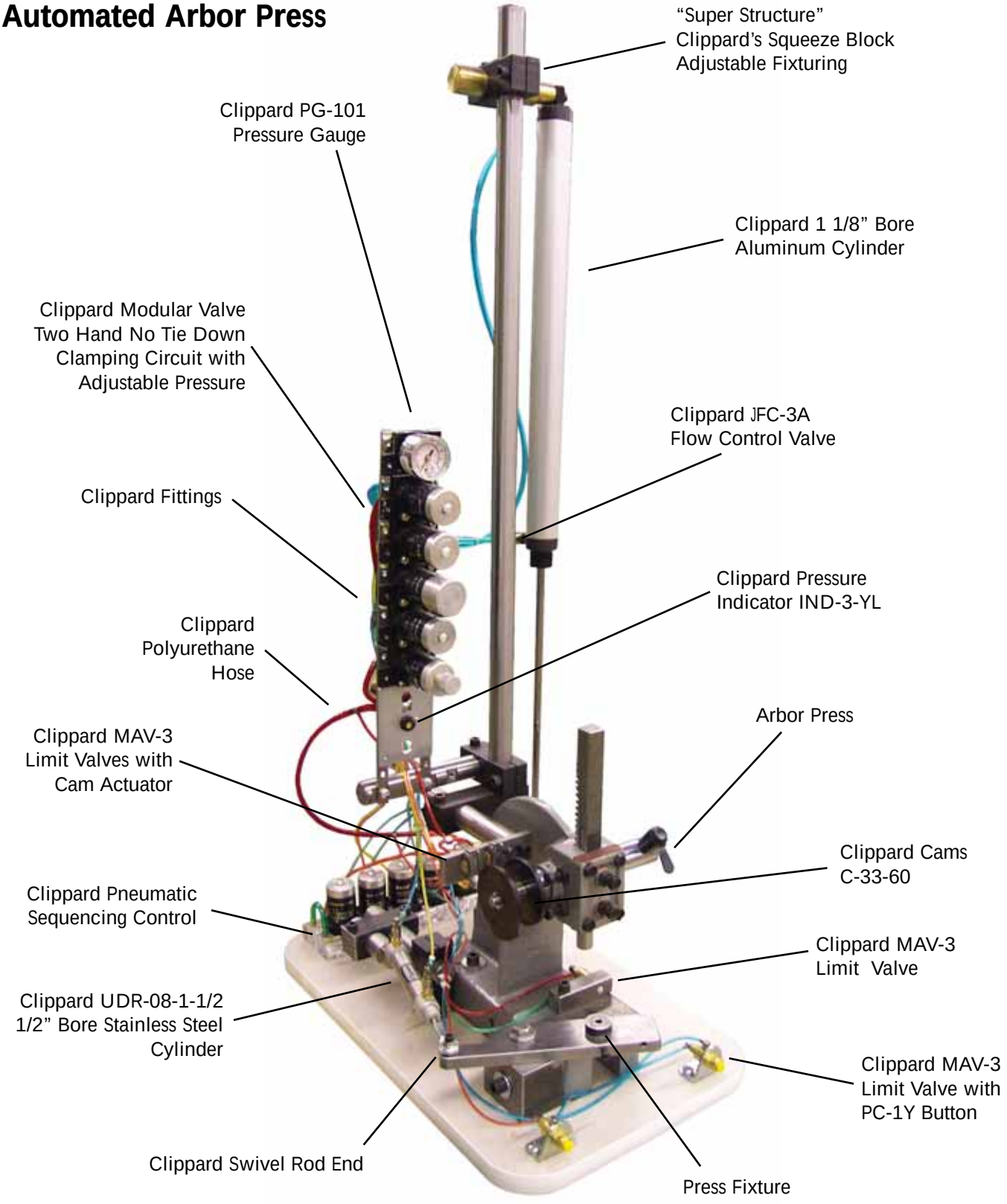
CMB

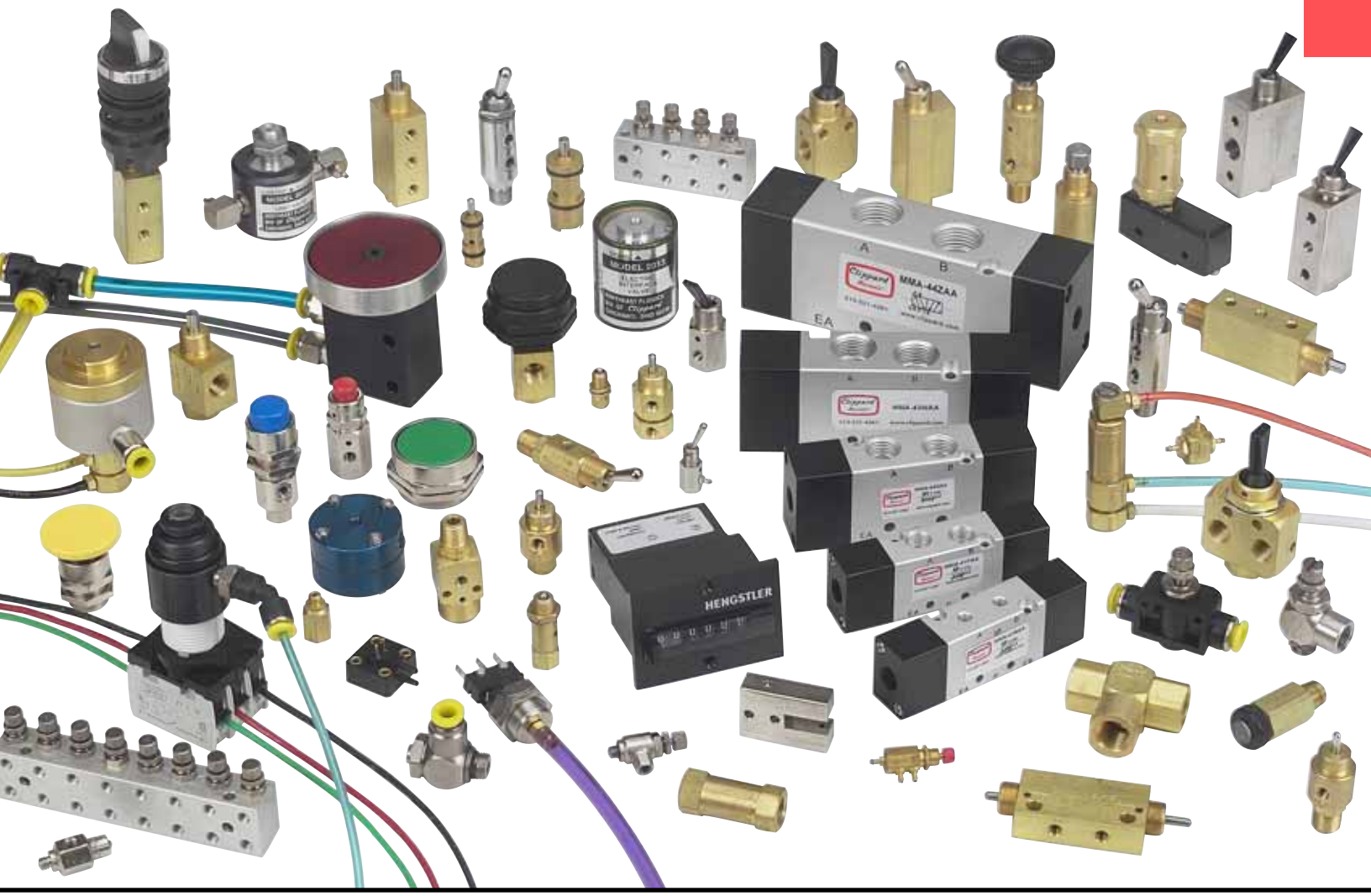
Column and mounting base
(black oxide finished steel)





Miniature Swing-In Automated Arbor Press

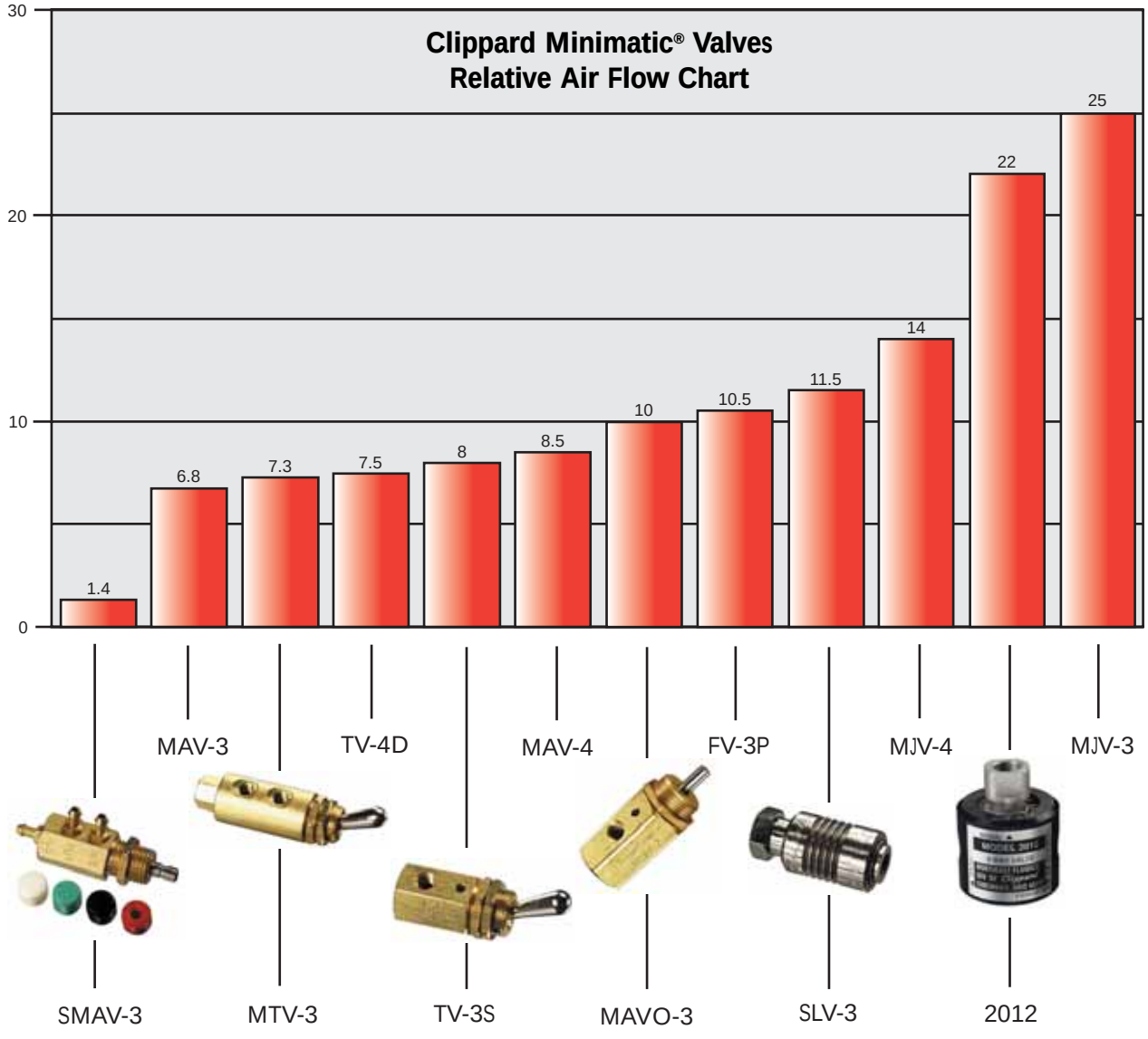




Every air system is unique . . . and Clippard has the air valve you need. Clippard control valves are available in poppet or spool design; 2-, 3-, or 4-way functions, in sizes from #3-56 and #10-32 (M5) through 1/8" NPT (G1/8) ports; and for pressures to 300 psig/21 bar. They are available with solenoid, air pilot, manual and mechanical actuators. Mounting styles include inline, panel mount, manifold mount or clearance holes for mounting screws.

When designing a pneumatic system, choose the proper size for each component. A valve of insufficient capacity may cause an entire system to operate slower than expected. Conversely, utilizing a valve which possesses greater capacity than is actually required results in needless size and often leads to excessive speed, impact, wear, and air consumption.

The chart below shows the variety of valve flows available from Clippard. It can be used as a guide to determine the proper valve for an actual application.



2-Way Valves

	Order No.	Style	Flow (@ 100 psig/7 bar)	Ports			Normally-Open	Normally-Closed	Momentary/Detented	Brass Toggle	Plastic Toggle	Page No.
				Inlet	Outlet	Exhaust						
Toggle Valves	MTV-2	Poppet	7.3 scfm	#10-32	#10-32	-		▲	D	▲		114
	MTV-2-M5	Poppet	175 l/min	M5	M5	-		▲	D	▲		114
	MTV-2P	Poppet	7.3 scfm	1/8" NPT	#10-32	-		▲	D	▲		114
	TV-2S	Spool	8 scfm	#10-32	#10-32	-		▲	D	▲		114
	TV-2S-M5	Spool	190 l/min	M5	M5	-		▲	D	▲		114
	TV-2SF	Spool	8 scfm	#10-32	#10-32	-		▲	D		▲	114
	TV-2SF-M5	Spool	190 l/min	M5	M5	-		▲	D		▲	114
	TV-2SP	Spool	8 scfm	1/8" NPT	#10-32	-		▲	D	▲		114
	TV-2SFP	Spool	8 scfm	1/8" NPT	#10-32	-		▲	D		▲	114
	TV-2M	Poppet	8 scfm	#10-32	#10-32	-		▲	M	▲		114
	TV-2M-M5	Poppet	190 l/min	M5	M5	-		▲	M	▲		114
	TV-2MF	Poppet	8 scfm	#10-32	#10-32	-		▲	M		▲	114
	TV-2MF-M5	Poppet	190 l/min	M5	M5	-		▲	M		▲	114
	TV-2MP	Poppet	6.8 scfm	1/8" NPT	#10-32	-		▲	M	▲		115
	TV-2MFP	Poppet	6.8 scfm	1/8" NPT	#10-32	-		▲	M		▲	115
	TVO-2M	Poppet	8 scfm	#10-32	#10-32	-	▲		M	▲		115
	TVO-2M-M5	Poppet	190 l/min	M5	M5	-	▲		M	▲		115
	TVO-2MF	Poppet	8 scfm	#10-32	#10-32	-	▲		M		▲	115
	TVO-2MF-M5	Poppet	190 l/min	M5	M5	-	▲		M		▲	115
	TVO-2MP	Poppet	6.8 scfm	1/8" NPT	#10-32	-	▲		M	▲		115
	TVO-2MFP	Poppet	6.8 scfm	1/8" NPT	#10-32	-	▲		M		▲	115
Stem Valves	MAV-2	Poppet	6.8 scfm	#10-32	#10-32	-		▲				116
	MAV-2-M5	Poppet	170 l/min	M5	M5	-		▲				116
	MAV-2P	Poppet	6.8 scfm	1/8" NPT	#10-32	-		▲				116
	MAV-2C	Poppet	6 scfm	-	-	-		▲				116
	MJV-2C	Poppet	22 scfm	-	-	-		▲				117
	MAV-2R	Poppet	6.8 scfm	#10-32	#10-32	-		▲				116
	MAV-2R-M5	Poppet	170 l/min	M5	M5	-		▲				116
	MAVO-2	Spool	10 scfm	#10-32	#10-32	-	▲					116
	MAVO-2-M5	Spool	245 l/min	M5	M5	-	▲					116
	MAVO-2P	Spool	10 scfm	1/8" NPT	#10-32	-	▲					117
	MAVO-2C	Spool	10 scfm	-	-	-	▲					116
	MJV-2	Poppet	25 scfm	1/8" NPT	1/8" NPT	-		▲				117
	MJV-2-MG	Poppet	600 l/min	G1/8	G1/8	-		▲				117
	MJVO-2	Spool	12 scfm	1/8" NPT	1/8" NPT	-	▲					117
	MJVO-2-MG	Spool	600 l/min	G1/8	G1/8	-	▲					117
	MJVO-2C	Spool	15 scfm	-	-	-	▲					117
Air-Piloted	PAV-2	Poppet	6.8 scfm	1/8" NPT	#10-32	-		▲				118
	PAV-2P	Poppet	6.8 scfm	1/8" NPT	1/8" NPT	-		▲				118
	PAVO-2	Poppet	11.6 scfm	#10-32	#10-32	-	▲					118
	PAVO-2P	Poppet	11.6 scfm	#10-32	1/8" NPT	-	▲					118

3-Way Valves

Toggle Valves

Order No.	Style	Flow (@ 100 psig/7 bar)	Ports			Normally-Open	Normally-Closed	Momentary/Detented	Brass Toggle	Plastic Toggle	Page No.
			Inlet	Outlet	Exhaust						
MTV-3	Poppet	7 scfm	#10-32	#10-32	#10-32		▲	D	▲		119
MTV-3-M5	Poppet	175 l/min	M5	M5	M5		▲	D	▲		119
MTV-3P	Poppet	7 scfm	1/8" NPT	#10-32	#10-32		▲	D	▲		119
MJTV-3	Poppet	25 scfm	1/8" NPT	1/8" NPT	1/8" NPT		▲	D	▲		120
MJTV-3-MG	Poppet	600 l/min	G1/8	G1/8	G1/8		▲	D	▲		120
FTV-3	Spool	10 scfm	#10-32	#10-32	#10-32		▲	D	▲		121
FTV-3-M5	Spool	240 l/min	M5	M5	M5		▲	D	▲		121
FTV-3F	Spool	10 scfm	#10-32	#10-32	#10-32		▲	D		▲	121
FTV-3F-M5	Spool	130 l/min	M5	M5	M5		▲	D		▲	121
FTV-3P	Spool	10.5 scfm	1/8" NPT	1/8" NPT	1/8" NPT		▲	D	▲		121
FTV-3-MG	Spool	250 l/min	G1/8	G1/8	G1/8		▲	D	▲		121
FTV-3FP	Spool	10.5 scfm	1/8" NPT	1/8" NPT	1/8" NPT		▲	D		▲	121
FTV-3F-MG	Spool	250 l/min	G1/8	G1/8	G1/8		▲	D		▲	121
TV-3S	Spool	8 scfm	#10-32	#10-32	hole in body		▲	D	▲		119
TV-3S-M5	Spool	190 l/min	M5	M5	hole in body		▲	D	▲		119
TV-3SF	Spool	8 scfm	#10-32	#10-32	hole in body		▲	D		▲	119
TV-3SF-M5	Spool	190 l/min	M5	M5	hole in body		▲	D		▲	119
TV-3SP	Spool	8 scfm	1/8" NPT	#10-32	hole in body		▲	D	▲		119
TV-3SFP	Spool	8 scfm	1/8" NPT	#10-32	hole in body		▲	D		▲	119
TV-3M	Spool	6.8 scfm	#10-32	#10-32	hole in body		▲	M	▲		119
TV-3M-M5	Spool	170 l/min	M5	M5	hole in body		▲	M	▲		119
TV-3MF	Spool	6.8 scfm	#10-32	#10-32	hole in body		▲	M		▲	119
TV-3MF-M5	Spool	170 l/min	M5	M5	hole in body		▲	M		▲	119
TV-3MP	Spool	6.8 scfm	1/8" NPT	#10-32	hole in body		▲	M	▲		120
TV-3MFP	Spool	6.8 scfm	1/8" NPT	#10-32	hole in body		▲	M		▲	120
TVO-3M	Spool	6.8 scfm	#10-32	#10-32	hole in body	▲		M	▲		120
TVO-3M-M5	Spool	170 l/min	M5	M5	hole in body	▲		M	▲		120
TVO-3MF	Spool	6.8 scfm	#10-32	#10-32	hole in body	▲		M		▲	120
TVO-3MF-M5	Spool	170 l/min	M5	M5	hole in body	▲		M		▲	120
TVO-3MP	Spool	6.8 scfm	1/8" NPT	#10-32	hole in body	▲		M	▲		120
TVO-3MFP	Spool	6.8 scfm	1/8" NPT	#10-32	hole in body	▲		M		▲	120
SMTV-3	Spool	1.4 scfm	#3-56*	#3-56*	hole in body	▲	▲	D	▲		121

3-Way Valves Cont'd.

	Order No.	Style	Flow (@ 100 psig/7 bar)	Ports			Normally-Open	Normally-Closed	Momentary/Detented	Brass Toggle	Plastic Toggle	Page No.
				Inlet	Outlet	Exhaust						
Stem Valves	FV-3	Spool	10 scfm	#10-32	#10-32	through stem	▲	▲				123
	FV-3-M5	Spool	240 l/min	M5	M5	through stem	▲	▲				123
	FV-3-MG	Spool	240 l/min	G1/8	G1/8	through stem	▲	▲				123
	FV-3D	Spool	10 scfm	#10-32	#10-32	through stem	▲	▲				123
	FV-3D-M5	Spool	240 l/min	M5	M5	through stem	▲	▲				123
	FV-3DP	Spool	10.5 scfm	1/8" NPT	1/8" NPT	through stem	▲	▲				123
	FV-3D-MG	Spool	240 l/min	G1/8	G1/8	through stem	▲	▲				123
	FV-3P	Spool	10.5 scfm	1/8" NPT	1/8" NPT	through stem	▲	▲				123
	MAV-3	Poppet	6.8 scfm	#10-32	#10-32	through stem		▲				122
	MAV-3-M5	Poppet	170 l/min	M5	M5	through stem		▲				122
	MAV-3P	Poppet	6.8 scfm	1/8" NPT	#10-32	through stem		▲				122
	MAV-3C	Poppet	6 scfm	-	-	through stem		▲				122
	MAV-3R	Poppet	6.8 scfm	#10-32	#10-32	through stem		▲				122
	MAV-3R-M5	Poppet	170 l/min	M5	M5	through stem		▲				122
	MAVO-3	Spool	10 scfm	#10-32	#10-32	holes in body	▲					122
	MAVO-3-M5	Spool	245 l/min	M5	M5	holes in body	▲					122
	MAVO-3P	Spool	10 scfm	#10-32	#10-32	holes in body	▲					122
	MAVO-3C	Spool	10 scfm	-	-	holes in body	▲					122
	MJV-3	Poppet	25 scfm	1/8" NPT	1/8" NPT	through stem		▲				123
	MJV-3-MG	Poppet	600 l/min	G1/8	G1/8	through stem		▲				123
	MJV-3C	Poppet	22 scfm	-	-	through stem		▲				123
	MJVO-3	Spool	12 scfm	1/8" NPT	1/8" NPT	holes in body	▲					123
	MJVO-3-MG	Spool	600 l/min	G1/8	G1/8	holes in body	▲					123
	MJVO-3C	Spool	15 scfm	-	-	holes in body	▲					123
	SMAV-3	Spool	1.4 scfm	#3-56	#3-56	#3-56	▲	▲				121
	PAV-3	Poppet	6.8 scfm	#10-32	#10-32	holes in body		▲				124
	PAV-3P	Poppet	6.8 scfm	#10-32	1/8" NPT	holes in body		▲				124
	PAVO-3	Poppet	11.6 scfm	#10-32	#10-32	holes in body	▲					124
	PAVO-3P	Poppet	11.6 scfm	#10-32	1/8" NPT	holes in body	▲					124

4-Way Valves

	Order No.	Style	Flow (@ 100 psig/7 bar)	Ports			Normally-Open	Normally-Closed	Momentary/Detented	Brass Toggle	Plastic Toggle	Page No.
				Inlet	Outlet	Exhaust						
Toggle Valves	TV-4D	Spool	7.5 scfm	#10-32	#10-32	holes in body		▲	D		▲	126
	TV-4D-M5	Spool	180 l/min	M5	M5	holes in body		▲	D		▲	126
	TV-4M	Spool	7.5 scfm	#10-32	#10-32	holes in body		▲	D		▲	126
	TV-4M-M5	Spool	180 l/min	M5	M5	holes in body		▲	D		▲	126
	TV-4DM	Spool	7.5 scfm	#10-32	#10-32	holes in body		▲	D		▲	126
	TV-4DM-M5	Spool	180 l/min	M5	M5	holes in body		▲	D		▲	126
	TV-4DP	Spool	7.5 scfm	1/8” NPT	1/8” NPT	holes in body		▲	D		▲	126
	TV-4MP	Spool	7.5 scfm	1/8” NPT	1/8” NPT	holes in body		▲	D		▲	126
	TV-4DMP	Spool	7.5 scfm	1/8” NPT	1/8” NPT	holes in body		▲	D		▲	126
	MTV-4	Spool	10 scfm	#10-32	#10-32	holes in body	▲	▲	D	▲		125
	MTV-4-M5	Spool	240 l/min	M5	M5	holes in body	▲	▲	D	▲		125
	MTV-4F	Spool	10 scfm	#10-32	#10-32	holes in body	▲	▲	D		▲	125
	MTV-4F-M5	Spool	240 l/min	M5	M5	holes in body	▲	▲	D		▲	125
	MJTV-4	Spool	10.5 scfm	1/8” NPT	1/8” NPT	holes in body	▲	▲	D	▲		125
	MJTV-4-MG	Spool	250 l/min	G1/8	G1/8	holes in body	▲	▲	D	▲		125
	MJTV-4F	Spool	10.5 scfm	1/8” NPT	1/8” NPT	holes in body	▲	▲	D		▲	125
	MJTV-4F-MG	Spool	250 l/min	G1/8	G1/8	holes in body	▲	▲	D		▲	125
	MTV-5	Spool	10 scfm	#10-32	#10-32	#10-32	▲	▲	D	▲		125
	MTV-5-M5	Spool	240 l/min	M5	M5	M5	▲	▲	D	▲		125
	MTV-5F	Spool	10 scfm	#10-32	#10-32	#10-32	▲	▲	D		▲	125
	MTV-5F-M5	Spool	240 l/min	M5	M5	M5	▲	▲	D		▲	125
	MJTV-5	Spool	10.5 scfm	1/8” NPT	1/8” NPT	1/8” NPT	▲	▲	D	▲		125
	MJTV-5-MG	Spool	250 l/min	G1/8	G1/8	G1/8	▲	▲	D	▲		125
	MJTV-5F	Spool	10.5 scfm	1/8” NPT	1/8” NPT	1/8” NPT	▲	▲	D		▲	125
	MJTV-5F-MG	Spool	250 l/min	G1/8	G1/8	G1/8	▲	▲	D		▲	125
Stem Valves	MAV-4	Spool	8.5 scfm	#10-32	#10-32	holes in body	▲	▲				128
	MAV-4-M5	Spool	240 l/min	M5	M5	holes in body	▲	▲				128
	MAV-4D	Spool	8.5 scfm	#10-32	#10-32	holes in body	▲	▲				128
	MAV-4D-M5	Spool	240 l/min	M5	M5	holes in body	▲	▲				128
	MJV-4	Spool	14 scfm	1/8” NPT	1/8” NPT	holes in body	▲	▲				128
	MJV-4-MG	Spool	396 l/min	G1/8	G1/8	holes in body	▲	▲				128
	MJV-4D	Spool	14 scfm	1/8” NPT	1/8” NPT	holes in body	▲	▲				128
	MJV-4D-MG	Spool	396 l/min	G1/8	G1/8	holes in body	▲	▲				128
	FV-4	Spool	10 scfm	#10-32	#10-32	holes in body	▲	▲				128
	FV-4-M5	Spool	240 l/min	M5	M5	holes in body	▲	▲				128
	FV-4-MG	Spool	250 l/min	G1/8	G1/8	holes in body	▲	▲				128
	FV-4P	Spool	10.5 scfm	1/8” NPT	1/8” NPT	holes in body	▲	▲				128

4-Way Valves Cont'd.

	Order No.	Style	Flow (@ 100 psig/7 bar)	Ports			Normally-Open	Normally-Closed	Momentary/Detented	Brass Toggle	Plastic Toggle	Page No.
				Inlet	Outlet	Exhaust						
Stem Valves	FV-4-MG	Spool	250 l/min	G1/8	G1/8	holes in body	▲	▲				128
	FV-4D	Spool	10 scfm	#10-32	#10-32	holes in body	▲	▲				128
	FV-4D-M5	Spool	240 l/min	M5	M5	holes in body	▲	▲				128
	FV-4DP	Spool	10.5 scfm	1/8" NPT	1/8" NPT	holes in body	▲	▲				128
	FV-4D-MG	Spool	250 l/min	G1/8	G1/8	holes in body	▲	▲				128
	FV-5	Spool	10 scfm	#10-32	#10-32	#10-32	▲	▲				129
	FV-5-M5	Spool	240 l/min	M5	M5	#10-32	▲	▲				129
	FV-5P	Spool	10.5 scfm	1/8" NPT	1/8" NPT	1/8" NPT	▲	▲				129
	FV-5-MG	Spool	250 l/min	G1/8	G1/8	G1/8	▲	▲				129
	FV-5D	Spool	10 scfm	#10-32	#10-32	#10-32	▲	▲				129
	FV-5D-M5	Spool	240 l/min	M5	M5	M5	▲	▲				129
	FV-5DP	Spool	10.5 scfm	1/8" NPT	1/8" NPT	1/8" NPT	▲	▲				129
	FV-5D-MG	Spool	250 l/min	G1/8	G1/8	G1/8	▲	▲				129

Options

-NP Nickel Plating

This option provides a bright finish on brass parts for decorative purposes that also protects the surface from corrosion and tarnishing. It has a nominal thickness of 0.0015", and does not affect the fit or function of the part.

-ENP Electroless Nickel Plating

This option provides a low luster finish on brass parts for decorative purposes that also protects the surface from corrosion and tarnishing. It has a nominal thickness of 0.0002", and does not affect the fit or function of the part.

-V Viton

This option replaces the standard Buna-N seals with Viton seals either for high temperature (up to + 400˚F) applications or those that require Viton for chemical compatibility.

Temperature Range

All Control Valves in this section have a temperature range of 32° to 230°F/0° to 110°C

Clippard miniature valves and associated products have evolved into a widely used system of fluid power control devices, known for quality, value and performance.

Over the past five decades, a diverse range of industries in the U.S. and throughout the world have come to rely on Minimatics to control machines, systems, and processes through an unlimited list of applications. Clippard quality in design, engineering, manufacturing, as well as an expansive product offering, make Minimatics the preferred choice for miniature and subminiature pneumatic applications.

Recognized as the original and most complete line of miniature fluid power components, Clippard's Minimatic line is available across the globe through a network of fully-trained, stocking distributors. Clippard and our distributors stand ready to provide expert application assistance, support, and technical answers, to help you achieve the highest level of performance in your system.

2-WAY TOGGLE VALVES

2-way valves are the simplest pneumatic component— their function is merely to turn an air supply on and off. They may best be compared to a water faucet; in the "on" position water flows from inlet to outlet, and in the "off" position the water flow is stopped. 2-way toggle valves may have a poppet or spool, and may be either a 2 position or have a momentary actuation.

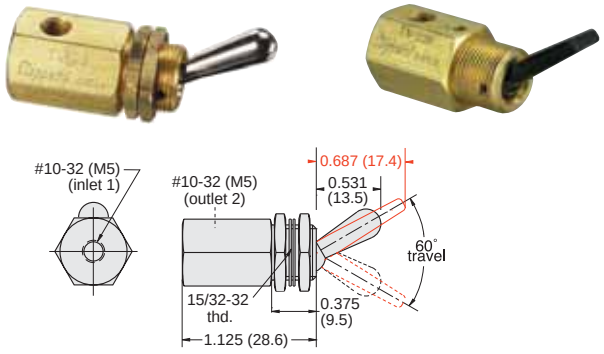
Medium: Air, Water or Oil

Materials: Brass body, Buna-N seals, stainless steel stem and spring

Force For Full Stem Travel: 12 oz. nominal

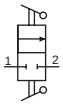
Mounting: 15/32-32 thread. Nuts and lockwashers furnished.

2 Position Spool Valves



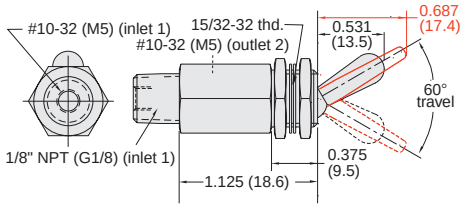
Input Pressure: 150 psig/10 bar max.

Air Flow: 4.5 SCFM @ 50 psig; 8.0 SCFM @ 100 psig; 190 l/min @ 6 bar



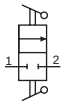
Part No.	Description
TV-2S	.2 Position Spool Valve, NP Brass Toggle, #10-32
TV-2S-M5	.2 Position Spool Valve, NP Brass Toggle, M5
TV-2SF	.2 Position Spool Valve, Plastic Toggle, #10-32
TV-2SF-M5	.2 Position Spool Valve, Plastic Toggle, M5

2 Position Spool Valves with 1/8" NPT Inlet



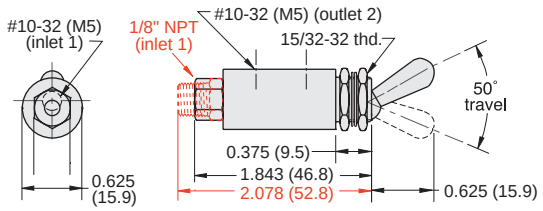
Input Pressure: 150 psig max.

Air Flow: 4.5 SCFM @ 50 psig; 8.0 SCFM @ 100 psig;



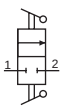
Part No.	Description
TV-2SP	.2 Position Spool Valve, NP Brass Toggle, 1/8"NPT
TV-2SFP	.2 Position Spool Valve, Plastic Toggle, 1/8" NPT

2 Position Poppet Valves



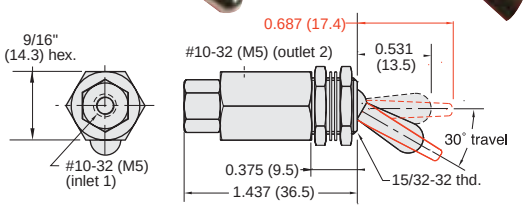
Input Pressure: 150 psig/10 bar max.

Air Flow: 4.0 SCFM @ 50 psig; 7.3 SCFM @ 100 psig; 175 l/min @ 6 bar



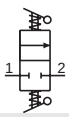
Part No.	Description
MTV-2	.2 Position Poppet Valve, #10-32
MTV-2-M5	.2 Position Poppet Valve, M5
MTV-2P	.2 Position Poppet Valve, 1/8" NPT

2 Position N.C. Poppet with Momentary Actuation



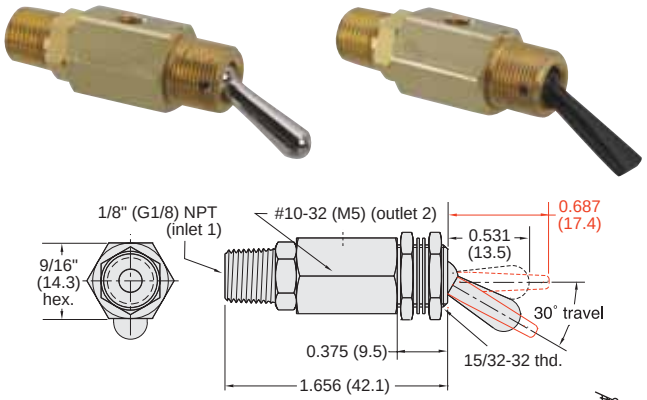
Input Pressure: 150 psig/10 bar max.

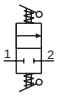
Air Flow: 4.5 SCFM @ 50 psig; 8.0 SCFM@ 100 psig; 175 l/min @ 6 bar



Part No.	Description
TV-2M	.2 Position N.C. Poppet Valve, NP Brass Toggle, #10-32
TV-2M-M5	.2 Position N.C. Poppet Valve, NP Brass Toggle, M5
TV-2MF	.2 Position N.C. Poppet Valve, Plastic Toggle, #10-32
TV-2MF-M5	.2 Position N.C. Poppet Valve, Plastic Toggle, M5

2 Position N.C. Spool w/Momentary Actuation



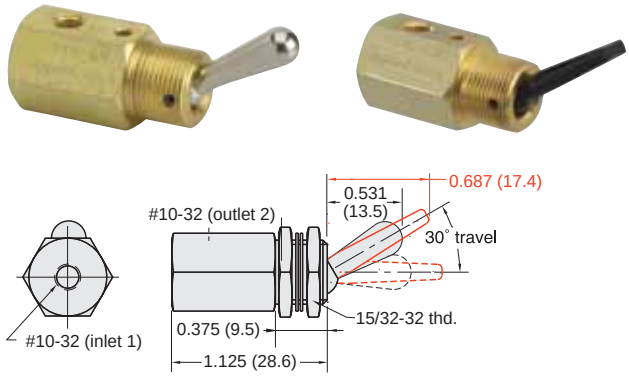


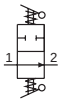
Input Pressure: 150 psig max.

Air Flow: 4.0 SCFM @ 50 psig; 6.8 SCFM @ 100 psig

Part No.	Description
TV-2MP	. . . .2 Position Spool Valve, NP Brass Toggle, 1/8" NPT
TV-2MFP	. . .2 Position Spool Valve, Plastic Toggle, 1/8" NPT

2 Position N.O. Poppet w/Momentary Actuation



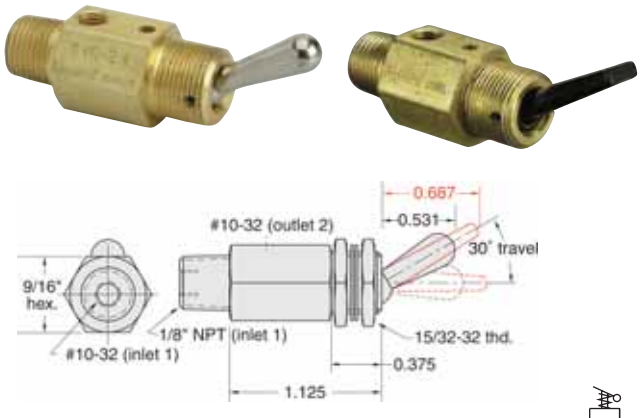


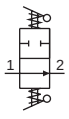
Input Pressure: 150 psig/10 bar max

Air Flow: 4.5 SCFM @ 50 psig; 8.0 SCFM @ 100 psig; 190 l/min @ 6 bar

Part No.	Description
TVO-2M	. . . .2 Position N.O. Poppet Valve, NP Brass Toggle, #10-32
TVO-2M-M5	.2 Position N.O. Poppet Valve, NP Brass Toggle, M5
TVO-2MF	. . . .2 Position N.O. Poppet Valve, Plastic Toggle, #10-32
TVO-2MF-M5	2 Position N.O. Poppet Valve, Plastic Toggle, M5

2 Position N.O. Poppet with Momentary Actuation





Input Pressure: 150 psig max.

Air Flow: 4.0 SCFM @ 50 psig; 6.8 SCFM @ 100 psig

Part No.	Description
TVO-2MP	. . .2 Position Toggle Poppet Valve, NP Brass Toggle
TVO-2MFP	. .2 Position Toggle Poppet Valve, Plastic Toggle

Did you know...

Clippard was the first to use the #10-32 threaded port for Miniature valves, cylinders, and fittings which continues to be the industry standard today.

2-WAY STEM VALVES

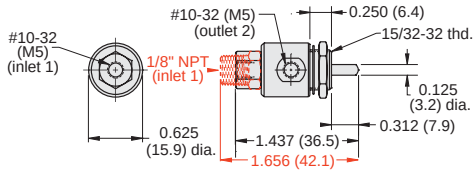
2-way valves are the simplest pneumatic component – their function is merely to turn an air supply on or off. They may be compared to a light switch; in the "ON"on position electricity flows from supply to the light, and in the "off" position the electrical current flow is stopped. 2-way stem valves may have a poppet or spool, and, by depressing the stem, a normally closed (NC) valve is opened and a normally open (NO) valve is closed. A variety of actuators may be attached to the valve such as roller cam followers, manual push buttons or pilot actuators; see the Valve Actuators section of this catalog.

Medium: Air, Water or Oil

Materials: Brass body, Buna-N seals, stainless steel stem and spring

Stem Travel: 1/8" (3.2)

Normally-Closed Poppet 2-Way Valves

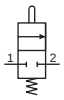


Input Pressure: 300 psig/21 bar max.

Air Flow: 4.0 SCFM @ 50 psig; 6.8 SCFM @ 100 psig; 170 l/min @ 6 bar

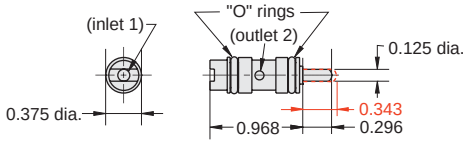
Force For Full Stem Travel: 24 oz. nominal

Mounting: 15/32-32 thread. Nut and lockwasher furnished.



Part No.	Description
MAV-2	.2-Way Normally-Closed Valve, #10-32
MAV-2-M5	.2-Way Normally-Closed Valve, M5
MAV-2P	.2-Way Normally-Closed Valve, 1/8" NPT

Miniature Poppet Cartridge Valves



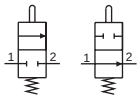
Input Pressure: 300 psig

Air Flow: 3.0 SCFM @ 50 psig; 6.0 SCFM @ 100 psig

Force For Full Stem Travel: 24 oz. nominal

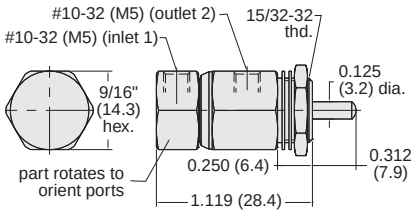
Mounting: Inserts into a 3/8" bore (0.375" ±0.001")

Note: See page 113 for retaining details



Part No.	Description
MAV-2C	.2-Way Normally-Closed Poppet Cartridge Valve
MAVO-2C	.2-Way Normally-Open Poppet Cartridge Valve

N.C. Poppet Valves with Rotatable Inlet

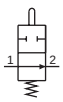


Input Pressure: 300 psig/21 bar max.

Air Flow: 4.0 SCFM @ 50 psig; 6.8 SCFM @ 100 psig; 170 l/min @ 6 bar

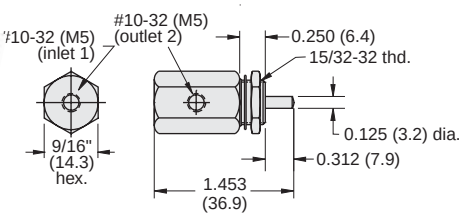
Force For Full Stem Travel: 24 oz. nominal

Mounting: 15/32-32 thread. Nut and lockwasher furnished.



Part No.	Description
MAV-2R	.2-Way Poppet Valve with Rotatable Inlet, #10-32
MAV-2R-M5	.2-Way Poppet Valve with Rotatable Inlet, M5

Normally-Open Spool Valves

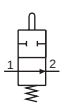


Input Pressure: 150 psig/10 bar max.

Air Flow: 6.0 SCFM @ 50 psig; 10 SCFM @ 100 psig; 245 l/min @ 6 bar

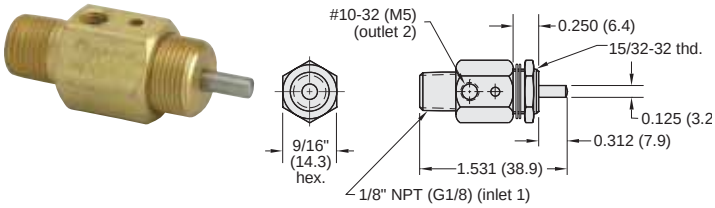
Force For Full Stem Travel: 32 oz. nominal

Mounting: 15/32-32 thread. Nut and lockwasher furnished.



Part No.	Description
MAVO-2	.2-Way Normally-Open Stem Valve, #10-32
MAVO-2-M5	2-Way Normally-Open Stem Valve, M5

Normally-Open Spool Valve

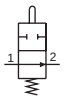


Input Pressure: 150 psig max.

Air Flow: 6 SCFM @ 50 psig; 100 SCFM @ 100 psig

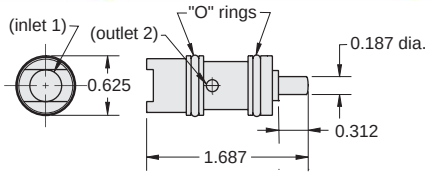
Force For Full Stem Travel: 32 oz. nominal

Mounting: 15/32-32 thread. Nut and lockwasher furnished.



Part No.	Description
MAVO-2P . . .	Normally-Open Spool Valve

J-Series Cartridge Valves



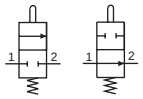
Input Pressure: 300 psig

Air Flow: 11 SCFM @ 50 psig; 22 SCFM @ 100 psig

Force For Full Stem Travel: 24 oz. nominal

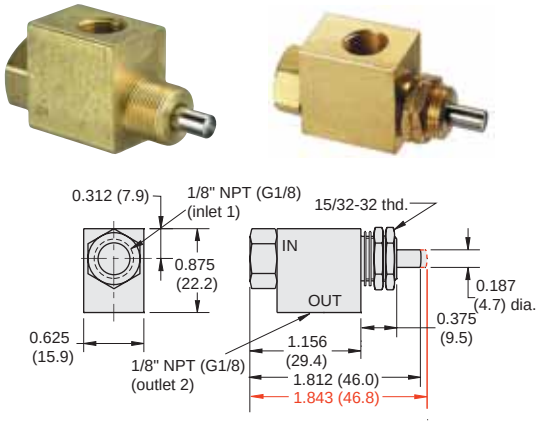
Mounting: Inserts into a 5/8" bore (0.625" ±0.001)

Note: See page 118 for mounting details



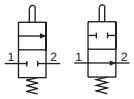
Part No.	Description
MJV-2C	Normally-Closed Poppet Cartridge Valve
MJVO-2C . . .	Normally-Open Poppet Cartridge Valve

J-Series Miniature Poppet Valves



Input Pressure: MJV-2/MJV-2-MG - 300 psig/21 bar max.
MJVO-2/MJVO-2-MG - 150 psig/10 bar max.

Air Flow: MJV-2/MJV-2-MG - 14.0 SCFM @ 50 psig;
25 SCFM @ 100 psig; 600 l/min @ 6 bar
MJVO-2/MJVO-2-MG - 7 SCFM @ 50 psig;
12 SCFM @ 100 psig; 600 l/min @ 6 bar



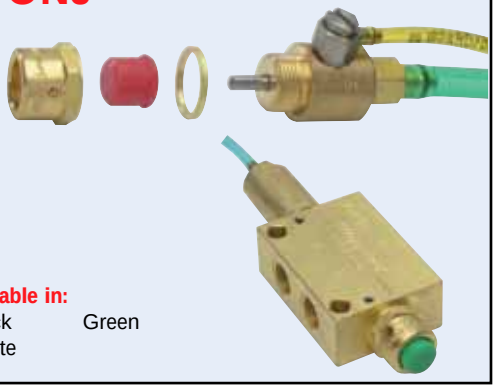
Force For Full Stem Travel: MJV-2/MJV-2-MG - 38 oz. nominal
MJVO-2/MJVO-2-MG - 36 oz. nominal

Mounting: 15/32-32 thread. Nuts and lockwashers furnished.

Part No.	Description
MJV-2	Normally-Closed Poppet Valve, 1/8" NPT
MJV-2-MG . .	Normally-Closed Poppet Valve, G1/8
MJVO-2	Normally-Open Spool Valve, 1/8" NPT
MJVO-2-MG .	Normally-Open Spool Valve, G1/8

Captivated Push Buttons

The small compact size make the push buttons adaptable to panel mounting. Unlike set screw retained buttons, the screw-on design will not allow the button to fall off. Designed to work with Clippard MAV, MJV, and FV series valves, these buttons also help protect the valve by preventing over-traveling of the stem and the potential for side-load on the valve. See page 141 for more information.



Button Housing Available in:
Black Chrome, Nickel Plated, Brass

Button Colors Available in:
Yellow, Black, Green, Red, White

2-WAY AIR-PILOTED VALVES

2-way valves are the simplest pneumatic component – their function is merely to turn an air supply on or off. They may be compared to a beer tap, in the "on" position beer flows from the keg to the mug and in the "off" position the beer flow is stopped. 2-way air piloted valves may have a poppet or spool and when an air signal is applied to the pilot, a normally closed (NC) valve is opened and a normally open (NO) valve is closed. When the pilot signal is removed, the valve reverts back to its original position.

Medium: Air, Water or Oil

Materials: Brass body, Buna-N seals, stainless steel stem and spring

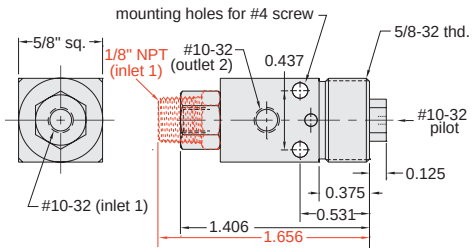
Stem Travel: 1/8"

Mounting: 5/8-32 thread or #4 screw. Nut and lockwasher may be ordered separately. Part Number: PAV-MH

Air Pilot Pressure: 15 psig min.

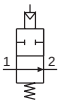
Foot Bracket: FB-1791

Air-Piloted Normally-Closed Poppet Valves



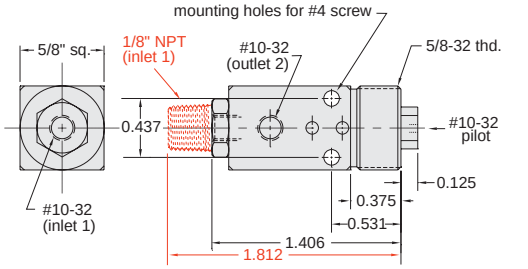
Input Pressure: 300 psig max.

Air Flow: 4.0 SCFM @ 50 psig; 6.8 SCFM @ 100 psig



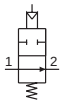
Part No.	Description
PAV-2	Normally-Closed Poppet Valve, #10-32
PAV-2P	Normally-Closed Poppet Valve, 1/8" NPT

Air-Piloted Normally-Open Poppet Valves



Input Pressure: 150 psig max.

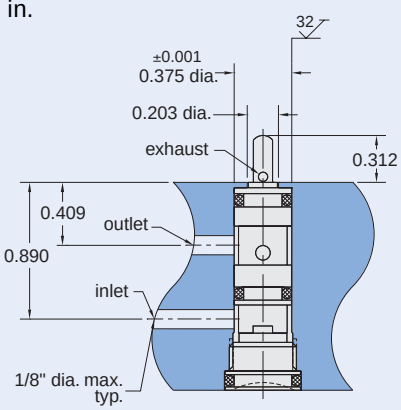
Air Flow: 6.8 SCFM @ 50 psig; 11.6 SCFM @ 100 psig



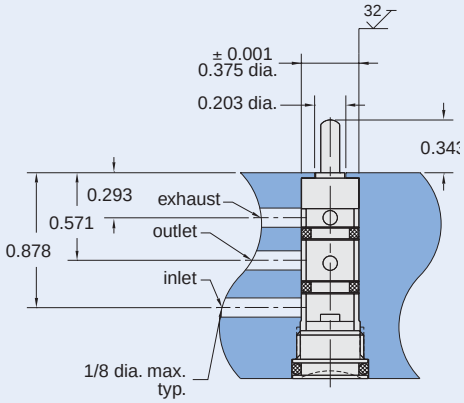
Part No.	Description
PAVO-2	Normally-Open Poppet Valve, #10-32
PAVO-2P	Normally-Open Poppet Valve, 1/8" NPT

CARTRIDGE VALVE MOUNTING

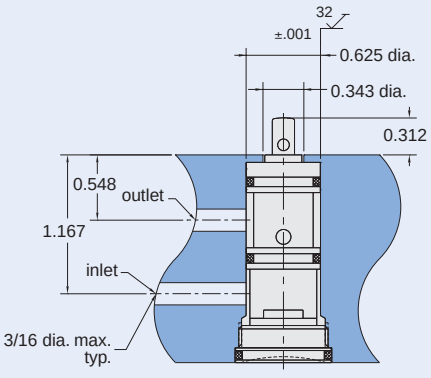
Clippard miniature cartridge valves offer the user flexibility in the application of 2-way and 3-way normally open or normally closed valves. Two sizes are provided: to fit either a 0.375" diameter bore or 0.625" diameter bore. They are used in Clippard heavy duty limit switches and are suitable for pneumatic tools and manifolds or for any use where a valve needs to be built in.



MAV-2C/3C



MAVO-2C/3C



MJV-2C/3C

3-WAY TOGGLE VALVES

3-way valves have a supply, outlet and exhaust port. When the toggle is in the “on” position air flows from the inlet to the outlet and the exhaust port is blocked. Moving the toggle to the “off” position closes the inlet and opens the outlet to an exhaust port which vents the outlet to atmosphere. 3-way toggle valves may have a poppet or spool and by movement of the toggle may either be 2-position or have a momentary actuation.

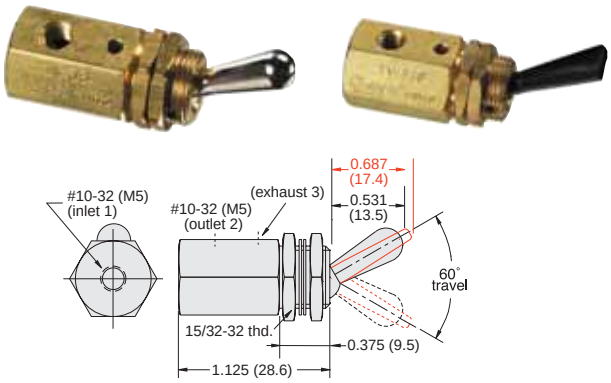
Medium: Air

Materials: Brass body, Buna-N seals, stainless steel stem and spring

Stem Travel: 1/8” (3.2)

Mounting: 15/32-32 thd. Nuts and lockwashers furnished

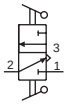
2 Position Spool Valves



Input Pressure: 150 psig/10 bar max.

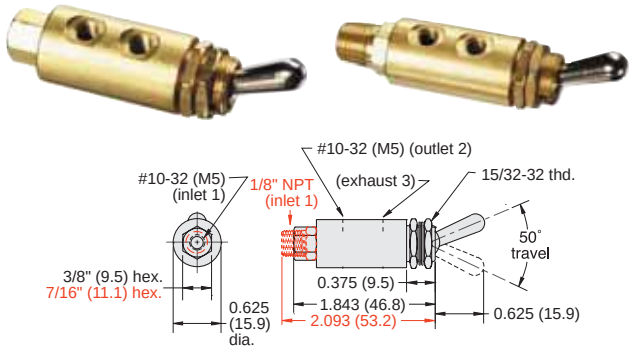
Air Flow: 4.5 SCFM @ 50 psig; 8.0 SCFM @ 100 psig; 190 l/min @ 6 bar

Force For Full Stem Travel: 12 oz. nominal



Part No.	Description
TV-3S	.2 Position Spool Valve, NP Brass Toggle, #10-32
TV-3S-M5	.2 Position Spool Valve, NP Brass Toggle, M5
TV-3SF	.2 Position Spool Valve, Plastic Toggle, #10-32
TV-3SF-M5	.2 Position Spool Valve, Plastic Toggle, M5

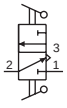
2 Position Poppet Valves



Input Pressure: 150 psig/10 bar max.

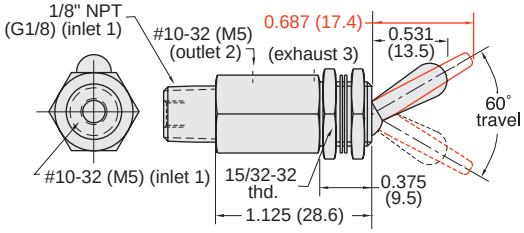
Air Flow: 4.0 SCFM @ 50 psig; 6.8 SCFM @ 100 psig; 175 l/min @ 6 bar

Force For Full Stem Travel: 16 oz. nominal



Part No.	Description
MTV-3	.2 Position Poppet Valve, #10-32, NP Brass Toggle
MTV-3-M5	.2 Position Poppet Valve, M5, NP Brass Toggle
MTV-3P	.2 Position Poppet Valve, 1/8” NPT, NP Brass Toggle

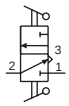
2 Position Spool Valve with 1/8” NPT Inlet



Input Pressure: 150 psig

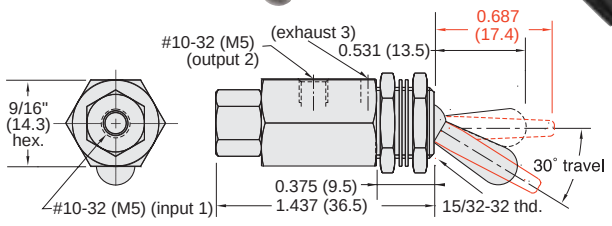
Air Flow: 11.6 SCFM @ 50 psig; 8.0 SCFM @ 100 psig

Force For Full Stem Travel: 12 oz. nominal



Part No.	Description
TV-3SP	.2 Position Spool Valve, NP Brass Toggle
TV-3SFP	.2 Position Spool Valve, Plastic Toggle

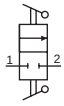
2 Position N.C. Poppet with Momentary Actuation



Input Pressure: 150 psig/10 bar max.

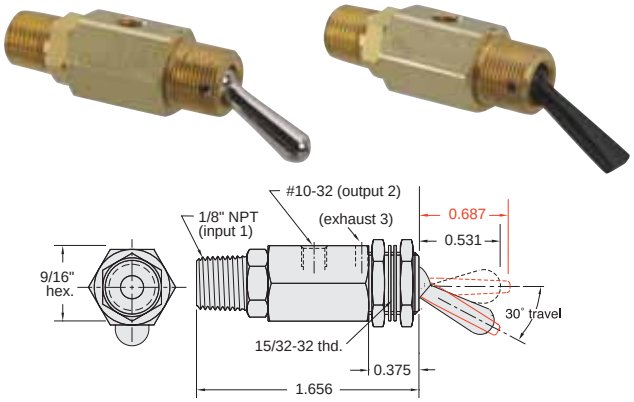
Air Flow: 4.0 SCFM @ 50 psig; 6.8 SCFM @ 100 psig; 175 l/min @ 6 bar

Force For Full Stem Travel: 12 oz. nominal



Part No.	Description
TV-3M	.2 Position Poppet Valve, NP Brass Toggle, #10-32
TV-3M-M5	.2 Position Poppet Valve, NP Brass Toggle, M5
TV-3MF	.2 Position Poppet Valve, Plastic Toggle, #10-32
TV-3MF-M5	.2 Position Poppet Valve, Plastic Toggle, M5

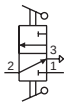
2 Position N.C. Spool w/Momentary Actuation



Input Pressure: 300 psig max.

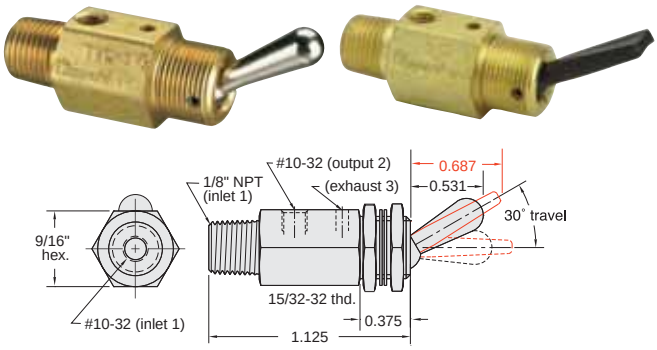
Air Flow: 4.0 SCFM @ 50 psig; 6.8 SCFM @ 100 psig

Force For Full Stem Travel: 12 oz. nominal



Part No.	Description
TV-3MP	. . .2 Position Spool Valve, NP Brass Toggle
TVO-3MFP	. .2 Position Spool Valve, Plastic Toggle

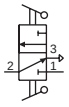
2 Position N.O. Poppet w/Momentary Actuation



Input Pressure: 150 psig max.

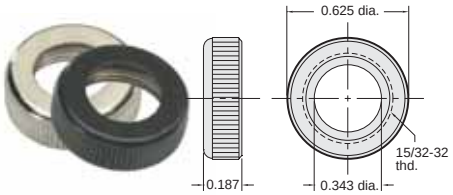
Air Flow: 4.0 SCFM @ 50 psig; 6.8 SCFM @ 100 psig

Force For Full Stem Travel: 12 oz. nominal



Order Information	
TVO-3MP	. . .2 Position Spool Valve, NP Brass Toggle
TVO-3MFP	. .2 Position Spool Valve, Plastic Toggle

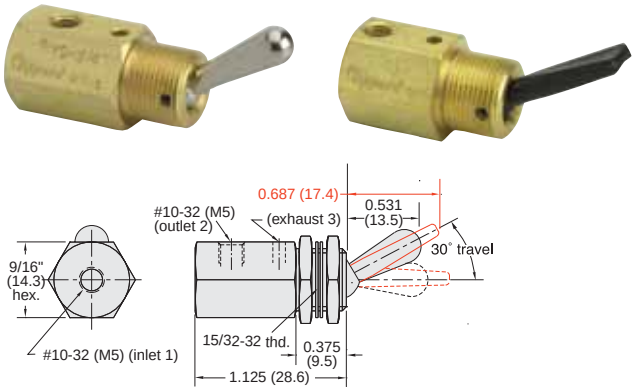
15/32 Panel Mounting Nut



Brass with black or bright nickel finish

Part No.	
11406-1	. . . .Black
11406-2	. . . .Bright

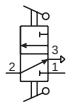
2 Position N.O. Poppet w/Momentary Actuation



Input Pressure: 150 psig/10 bar max.

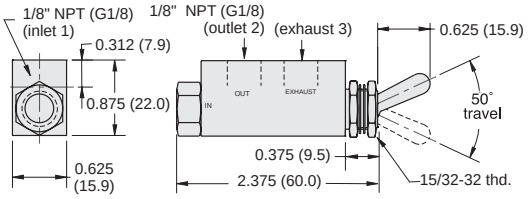
Air Flow: 4.0 SCFM @ 50 psig; 6.8 SCFM @ 100 psig; 170 lpm @ 6 bar

Force For Full Stem Travel: 12 oz. nominal



Part No.	Description
TVO-3M	. . . .2 Position Spool Valve, NP Brass Toggle, #10-32
TVO-3M-M5	.2 Position Spool Valve, NP Brass Toggle, M5
TVO-3MF	. . .2 Position Spool Valve, Plastic Toggle, #10-32
TVO-3MF-M5	2 Position Spool Valve, Plastic Toggle, M5

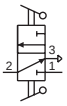
2 Position Poppet Valves



Input Pressure: 300 psig/21 bar max.

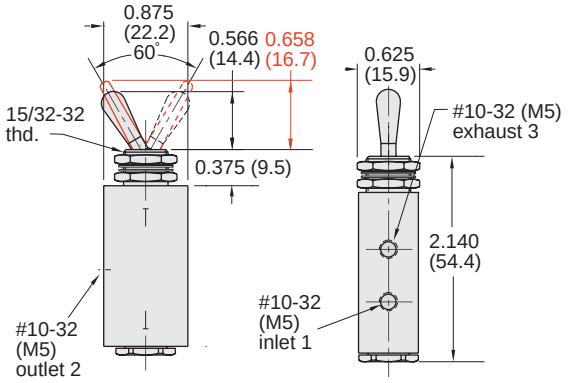
Air Flow: 14 SCFM @ 50 psig; 25 SCFM @ 100 psig; 600 l/min @ 6 bar

Force For Full Stem Travel: 16 oz. nominal



Part No.	Description
MJTV-3	. . . .2 Position Poppet Valve, 1/8" NPT
MJTV-3-MG	.2 Position Poppet Valve, G1/8

2 Position Spool Valves

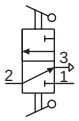


Input Pressure: 150 psig/10 bar max.

Air Flow: 6 SCFM @ 50 psig; 10 SCFM @ 100 psig; 280 l/min @ 6 bar

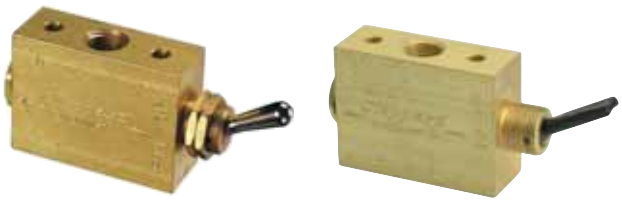
Force For Full Stem Travel: 16 oz. nominal

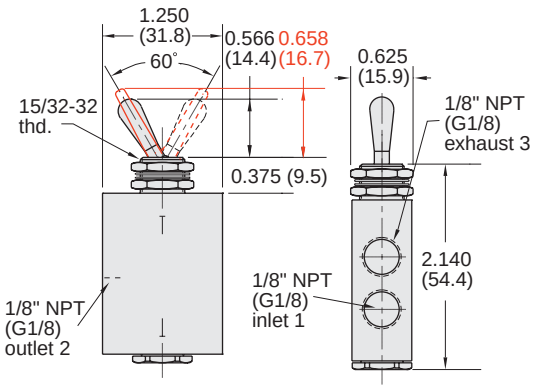
Mounting: 15/32-32 thread. Nuts and lockwashers furnished.



Part No.	Description
FTV-3	.2 Position Spool Valve, NP Brass Toggle, #10-32
FTV-3-M5	.2 Position Spool Valve, NP Brass Toggle, M5
FTV-3F	.2 Position Spool Valve, Plastic Toggle, #10-32
FTV-3F-M5	.2 Position Spool Valve, Plastic Toggle, M5

2 Position Spool Valves



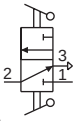


Input Pressure: 150 psig/10 bar max.

Air Flow: 6.5 SCFM @ 50 psig; 10.5 SCFM @ 100 psig; 290 l/min @ 6 bar

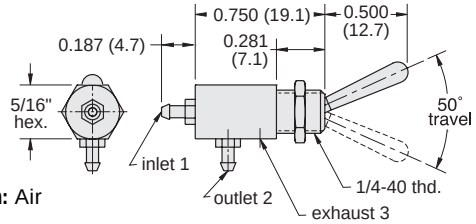
Force For Full Stem Travel: 16 oz. nominal

Mounting: 15/32-32 thread. Nuts and lockwashers furnished.



Part No.	Description
FTV-3P	.2 Position Spool Valve, NP Brass Toggle, 1/8" NPT
FTV-3P-MG	.2 Position Spool Valve, NP Brass Toggle, G1/8
FTV-3FP	.2 Position Spool Valve, Plastic Toggle, 1/8" NPT
FTV-3FP-MG	.2 Position Spool Valve, Plastic Toggle, G1/8

Sub-Miniature Spool Valve



Medium: Air

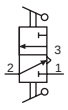
Input Pressure: 100 psig max.

Ports: 3-56 with 1/16" ID Hose Barbs

Air Flow: 1.4 SCFM @ 100 psig

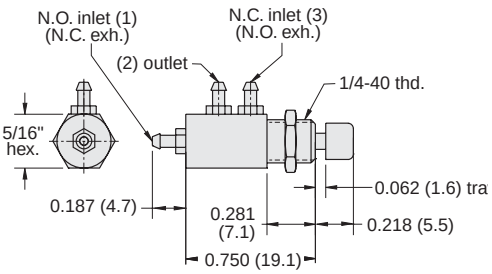
Force For Full Stem Travel: 24 oz. nominal

Spool Material: Delrin®



Part No.	Description
SMTV-3	.Sub-Miniature Spool Valve

Sub-Miniature N.O. or N.C. Spool Valve



Four colors of snap on push buttons included with each valve

Medium: Air

Stem Travel: 1/16"

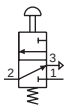
Input Pressure: 100 psig max.

Ports: 3-56 with 1/16" ID Hose Barbs

Air Flow: 1.4 SCFM @ 100 psig

Force For Full Stem Travel: 20 oz. nominal

Spool Material: Delrin®



Part No.	Description
SMAV-3	.Sub-Miniature N.O. or N.C.

3-WAY STEM VALVES

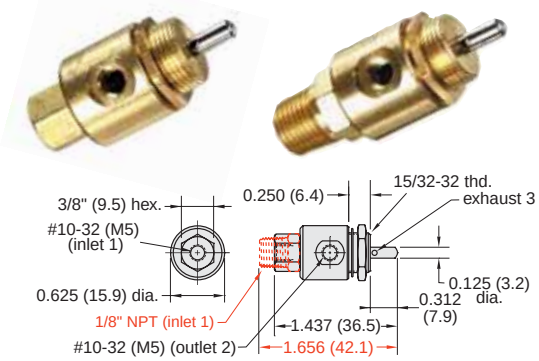
3-way valves are 2-way valves with the added function of exhausting the outlet when the valve is closed. When the stem is depressed, the valve is in the "on' position allowing air to flow from the inlet to the outlet while blocking the exhaust. Releasing the stem closes the inlet and opens the outlet to an exhaust port which vents the outlet to atmosphere. 3-way stem valves may have a poppet or spool and be normally closed (NC) or normally open (NO).

Medium: Air

Materials: Brass body, Buna-N seals, stainless steel stem and spring

Stem Travel: 1/8" (3.2)

Miniature 3-Way Poppet Valves

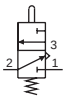


Input Pressure: 300 psig/21 bar max.

Air Flow: 4.0 SCFM @ 50 psig; 6.8 SCFM @ 100 psig; 170 l/min @ 6 bar

Force For Full Stem Travel: 24 oz. nominal

Mounting: 15/32-32 thread. Nut and lockwasher furnished.



Part No.	Description
MAV-3	Miniature Poppet Valve, #10-32
MAV-3-M5	Miniature Poppet Valve, M5
MAV-3P	Miniature Poppet Valve, 1/8" NPT

Miniature Cartridge Valves

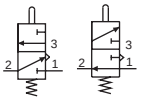
Input Pressure: 300 psig

Air Flow: 3.0 SCFM @ 50 psig; 6.0 SCFM @ 100 psig

Force For Full Stem Travel: 24 oz. nominal

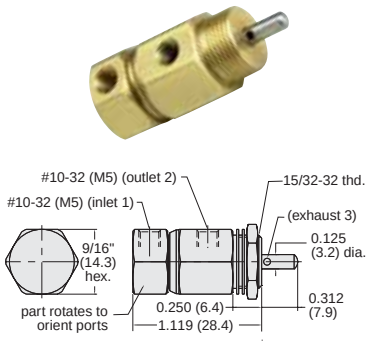
Mounting: Inserts into a 3/8" bore (0.375" 0.001")

Note: See page 118 for mounting details



Part No.	Description
MAV-3C	Normally-Open Poppet Cartridge Valve
MAVO-3C	Normally-Closed Spool Cartridge Valve

N. C. Poppet Valves with Rotatable Inlet

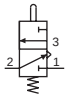


Input Pressure: 300 psig/21 bar max.

Air Flow: 4.0 SCFM @ 50 psig; 6.8 SCFM @ 100 psig; 170 l/min @ 6 bar

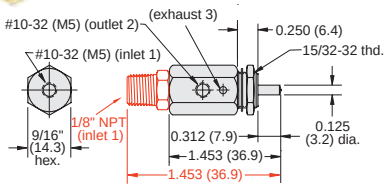
Force For Full Stem Travel: 24 oz. nominal

Mounting: 15/32-32 thread. Nut and lockwasher furnished.



Part No.	Description
MAV-3R	Normally-Closed Valve with Rotatable Inlet, #10-32
MAV-3R-M5	Normally-Closed Valve with Rotatable Inlet, M5

Normally-Open Spool Valves

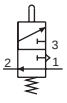


Input Pressure: 150 psig/10 bar max.

Air Flow: 6.0 SCFM @ 50 psig; 10 SCFM @ 100 psig; 245 l/min @ 6 bar

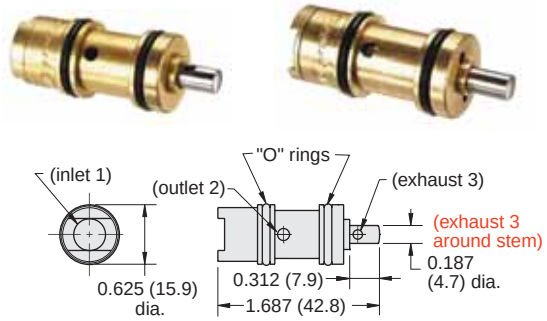
Force For Full Stem Travel: 32 oz. nominal

Mounting: 15/32-32 thread. Nut and lockwasher furnished.



Part No.	Description
MAVO-3	Normally-Open Spool Valve, #10-32
MAVO-3-M5	Normally-Open Spool Valve, M5
MAVO-3P	Normally-Open Spool Valve, 1/8" NPT

J-Series Poppet Cartridge Valves



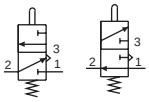
Input Pressure: 300 psig

Air Flow: 11 SCFM @ 50 psig; 22 SCFM @ 100 psig

Force For Full Stem Travel: 38 oz. nominal

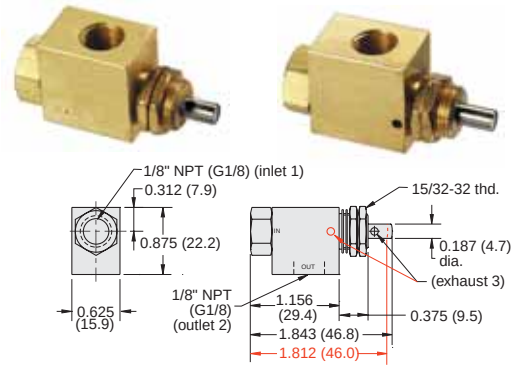
Mounting: Inserts into a 5/8" bore (0.625" ±0.001")

Note: See page 118 for mounting details



Part No.	Description
MJV-3C	3-Way Normally-Closed Poppet Cartridge Valve
MJVO-3C	3-Way Normally-Open Poppet Cartridge Valve

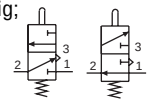
J-Series 3-Way Poppet Valves



Input Pressure: MJV-3/MJV-3-MG - 300 psig/21 bar max.
MJVO-3/MJVO-3-MG - 150 psig/10 bar max.

Air Flow: 14.0 SCFM @ 50 psig; 25 SCFM @ 100 psig; 600 l/min @ 6 bar

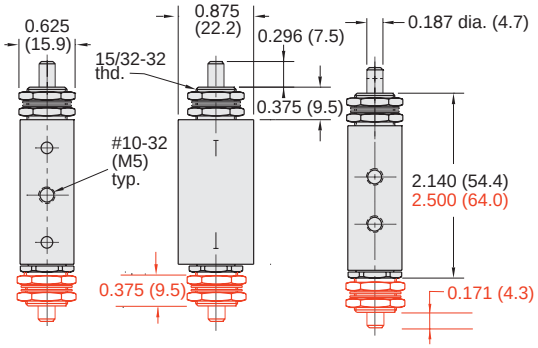
Force For Full Stem Travel: 38 oz. nominal



Mounting: 15/32-32 thread. Nuts and lockwashers furnished.

Part No.	Description
MJV-3	Normally-Closed Valve with Spring Return, 1/8" NPT
MJV-3-MG	Normally-Closed Valve with Spring Return, G1/8
MJVO-3	Normally-Open Spool Valve, 1/8" NPT
MJVO-3-MG	Normally-Open Spool Valve, G1/8

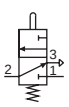
FV-Series 3-Way Spool Valves



Input Pressure: Vacuum to 150 psig/10 bar max.

Air Flow: 6 SCFM @ 50 psig; 10 SCFM @ 100 psig; 240 l/min @ 6 bar

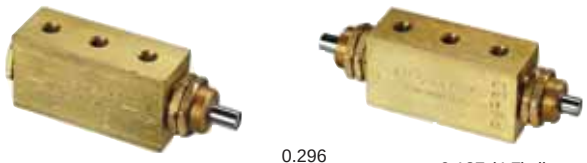
Force For Full Stem Travel: FV-3 & FV-3-M5 - 4 1/2 pounds nominal. FV-3D & FV-3D-M5 - 1 1/2 pounds nominal

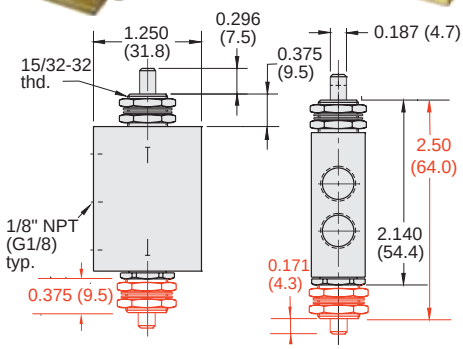


Mounting: 5/32-32 thread. Nuts and lockwashers furnished.

Part No.	Description
FV-3	3-Way Spool Valve, #10-32
FV-3-M5	3-Way Spool Valve, M5
FV-3D	3-Way Two Position Spool Valve, #10-32
FV-3D-M5	3-Way Two Position Spool Valve, M5

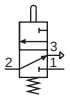
FV-Series 3-Way Spool Valves





Input Pressure: Vacuum to 150 psig/10 bar max.

Air Flow: 6.5 SCFM @ 50 psig; 10.5 SCFM @ 100 psig; 240 l/min @ 6 bar



Force For Full Stem Travel: FV-3P & FV-3-MG - 4 1/2 pounds nominal. FV-3DP & FV-3D-MG - 1 1/2 pounds nominal

Mounting: 5/32-32 thread. Nuts and lockwashers furnished.

Part No.	Description
FV-3P	Spool Plunger Actuated Spring Return Valve, 1/8" NPT
FV-3-MG	Spool Plunger Actuated Spring Return Valve, G1/8
FV-3DP	Spool Double Plunger 2 Position Valve, 1/8" NPT
FV-3D-MG	Spool Double Plunger 2 Position Valve, G1/8

3-WAY AIR-PILOTED VALVES

3-way valves have an inlet, outlet and exhaust port. When an air signal is applied to the pilot of a normally closed (NC) valve the inlet is open to the outlet and the exhaust is blocked; removing the pilot closes the inlet and the outlet is open to the exhaust port which vents to atmosphere. When an air signal is applied to the pilot of a normally open (NO) valve the inlet is blocked and the outlet is vented; removing the pilot signal opens the inlet to the outlet and blocks the exhaust.

Medium: Air only

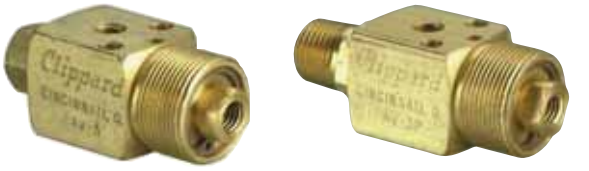
Materials: Brass body, Buna-N seals, stainless steel stem and spring

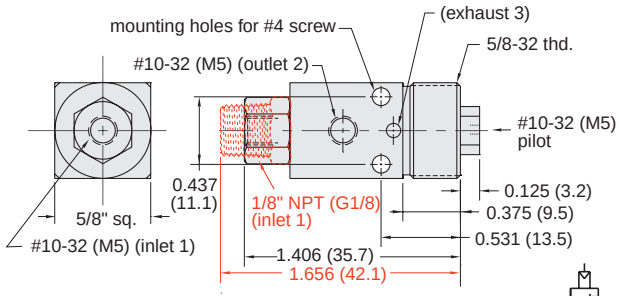
Mounting: 5/8-32 thread or #4 screw. Nut and lockwasher may be ordered separately. Part Number: PAV-MH

Air Pilot Pressure: 15 psig min.

Foot Bracket: FB-1791

Air-Piloted Normally-Closed Poppet Valves



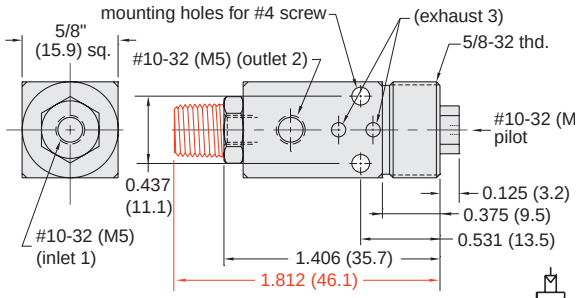


Input Pressure: 300 psig max.

Air Flow: 4.0 SCFM @ 50 psig; 6.8 SCFM @ 100 psig

Part No.	Description
PAV-3	Normally-Closed Poppet Valve, #10-32
PAV-3P	Normally-Closed Poppet Valve, 1/8" NPT

Air-Piloted Normally-Open Poppet Valves

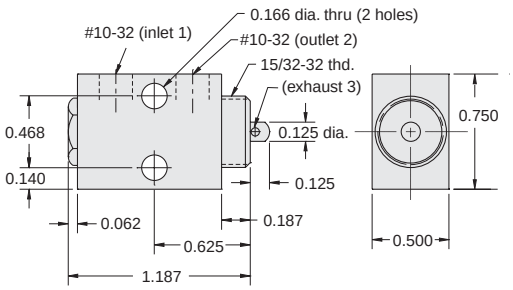


Input Pressure: 150 psig max.

Air Flow: 6.8 SCFM @ 50 psig; 11.6 SCFM @ 100 psig

Part No.	Description
PAVO-3	Normally-Open Poppet Valve, #10-32
PAVO-3P	Normally-Open Poppet Valve, 1/8" NPT

Miniature Limit Valve



Stem Travel: 1/8"

Input Pressure: 150 psig max.

Air Flow: 4 SCFM @ 50 psig; 7 SCFM @ 100 psig

Force for Full Stem Travel: 48 oz. nominal

Mounting: Dual #20 holes or 15/32-32 thd. Nut and lockwasher furnished

Part No.	Description
MLV-3	Normally-Closed Miniature Limit Valve

4-WAY TOGGLE VALVES

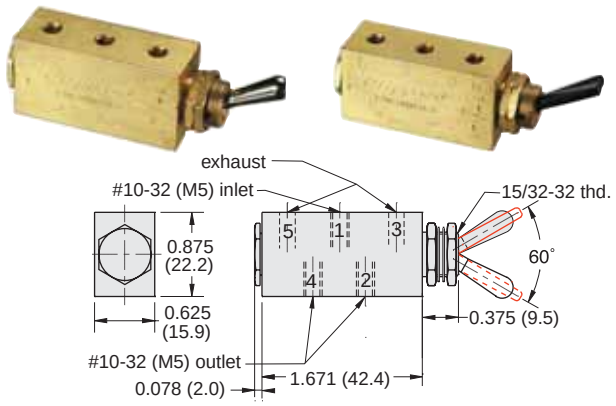
4-way valves can supply and exhaust two different outlets, and are commonly used with double-acting cylinders. When the toggle is in one position air flows from the inlet to one of the outlets. The second outlet is open to the exhaust port which is vented to atmosphere. Moving the toggle to the opposite position opens the inlet to the second outlet while exhausting the first outlet. 4-way toggle valves are spool valves that by movement of the toggle may either be 2-position or have a momentary actuation.

Medium: Air **Stem Travel:** 1/8" (3.2)

Materials: Brass body, Buna-N seals, stainless steel stem and spring

Mounting: 15/32-32 thread. Nuts and lockwashers furnished.

2 Position Spool Valves



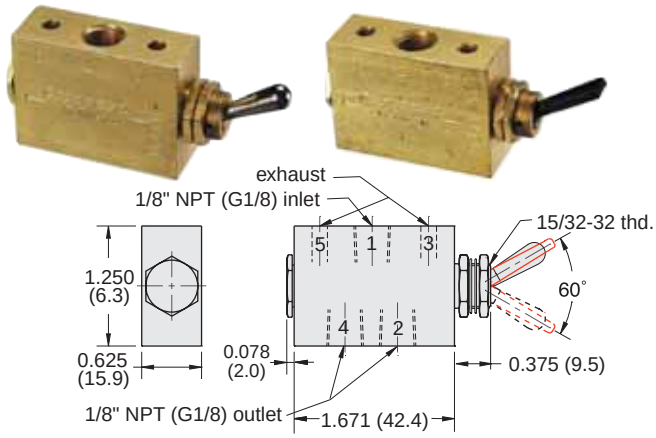
Input Pressure: 150 psig/10 bar max.

Air Flow: 6 SCFM @ 50 psig; 10 SCFM @ 100 psig; 240 l/min @ 6 bar

Force For Full Stem Travel: 12 oz. nominal

Part No.	Description
MTV-4	.2 Position Spool Valve, NP Brass Toggle, #10-32
MTV-4-M5	.2 Position Spool Valve, NP Brass Toggle, M5
MTV-4F	.2 Position Spool Valve, Plastic Toggle, #10-32
MTV-4F-M5	.2 Position Spool Valve, Plastic Toggle, M5

J-Series 2 Position Spool Valves



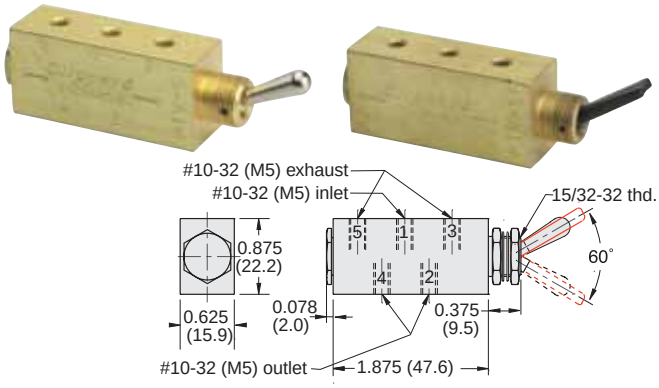
Input Pressure: 150 psig/10 bar max.

Air Flow: 6.5 SCFM @ 50 psig; 10.5 SCFM @ 100 psig; 250 l/min @ 6 bar

Force For Full Stem Travel: 12 oz. nominal

Part No.	Description
MJTV-4	.2 Position Spool Valve, NP Brass Toggle, 1/8" NPT
MJTV-4-MG	.2 Position Spool Valve, NP Brass Toggle, G1/8
MJTV-4F	.2 Position Spool Valve, Plastic Toggle, 1/8" NPT
MJTV-4F-MG	2 Position Spool Valve, Plastic Toggle, G1/8

2 Position Fully-Ported Spool Valves



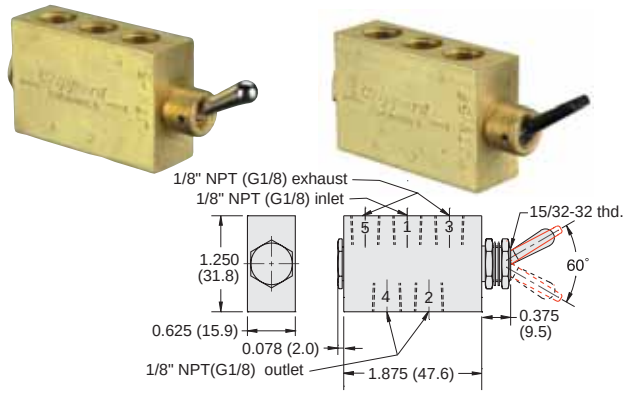
Input Pressure: 150 psig/10 bar max.

Air Flow: 6 SCFM @ 50 psig; 10 SCFM @ 100 psig; 240 l/min @ 6 bar

Force For Full Stem Travel: 16 oz. nominal

Part No.	Description
MTV-5	.2 Position Spool Valve, NP Brass Toggle, #10-32
MTV-5-M5	.2 Position Spool Valve, NP Brass Toggle, M5
MTV-5F	.2 Position Spool Valve, Plastic Toggle, #10-32
MTV-5F-M5	.2 Position Spool Valve, Plastic Toggle, M5

J-Series 2 Position Fully-Ported Spool



Input Pressure: 150 psig/10 bar max.

Air Flow: 6.5 SCFM @ 50 psig; 10.5 SCFM @ 100 psig; 250 l/min @ 6 bar

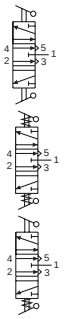
Force For Full Stem Travel: 16 oz. nominal

Part No.	Description
MJTV-5	.2 Position Spool Valve, NP Brass Toggle, 1/8" NPT
MJTV-5-MG	.2 Position Spool Valve, NP Brass Toggle, G1/8
MJTV-5F	.2 Position Spool Valve, Plastic Toggle, 1/8" NPT
MJTV-5F-MG	2 Position Spool Valve, Plastic Toggle, G1/8

3 Position Toggle Valves

By choosing valves with different toggle position options the user can customize the application to best suit the needs. For example, the DM model can be used on the momentary side as a “jog” or “manual” control, and with the detented side for “automatic” or “run” mode.

Valves are made of solid brass, bright dipped finish to resist corrosion; stems and springs are of stainless steel, toggle of black acetyl plastic, and seals of Buna-N rubber.



Model Number				
TV-4D TV-4D-M5 TV-4DP	#10-32 M5 1/8” NPT	Detented	SPRING CENTERED supply blocked both sides exhausted	Detented
TV-4M TV-4M-M5 TV-4MP	#10-32 M5 1/8” NPT	Momentary		Momentary
TV-4DM TV-4DM-M5 TV-4DMP	#10-32 M5 1/8” NPT	Detented		Momentary

Medium: Air

Materials: Brass body, Buna-N seals, stainless steel stem and spring

Input Pressure: 150 psig/10 bar max.

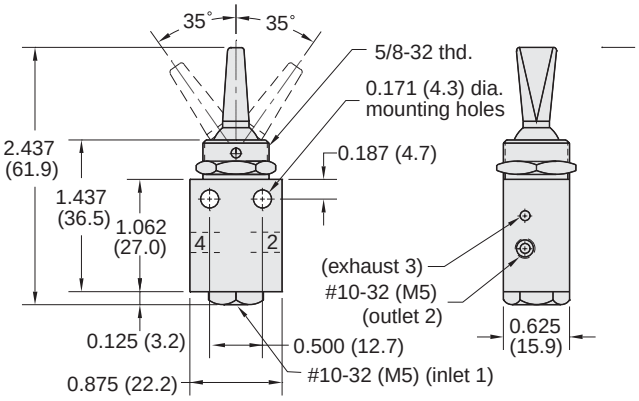
Air Flow: 4.5 SCFM @ 50 psig; 7.5 SCFM @ 100 psig; 180 l/min @ 6 bar

Force For Full Stem Travel: 8 oz. nominal

Toggle: Plastic

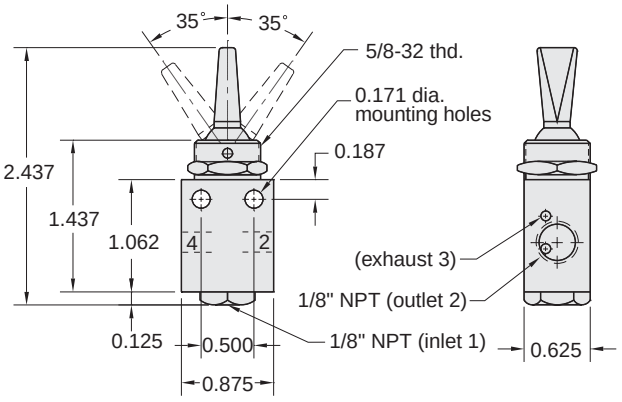
Mounting: 5/8-32 thread. Nut and lockwashers furnished.

3 Position Toggle Valves, #10-32/M5



Part No.	Description
TV-4D	Toggle Valve, Detented/Detented, #10-32
TV-4D-M5 . .	Toggle Valve, Detented/Detented, M5
TV-4M	Toggle Valve, Momentary/Momentary, #10-32
TV-4M-M5 . .	Toggle Valve, M5, Momentary/Momentary, M5
TV-4DM	Toggle Valve, Detented/Momentary, #10-32
TV-4DM-M5 .	Toggle Valve, Detented/Momentary, M5

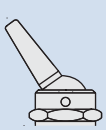
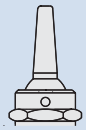
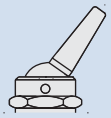
3 Position Toggle Valves, 1/8” NPT



Part No.	Description
TV-4DP	Toggle Valve, Detented/Detented, 1/8” NPT
TV-4MP	Toggle Valve, Momentary/Momentary, 1/8” NPT
TV-4DMP . . .	Toggle Valve, Detented/Momentary, 1/8” NPT

Fill and Bleed Applications

The FBV-3 may be used to pressurize or "fill" a chamber or bladder by depressing the toggle in one direction and then de-pressurize or "bleed" that same chamber or bladder by depressing the toggle in the other direction. Toggling back and forth between the inlet and exhaust provides a fine adjustment of the required pressure in the chamber or bladder.

Model Number				
FBV-3D & FBV-3D-F FBV-3DP	#10-32 1/8" NPT	Detented	SPRING CENTERED all ports blocked	Detented
FBV-3M & FBV-3M-F FBV-3MP	#10-32 1/8" NPT	Momentary		Momentary
FBV-3DM & FBV-3DM-F FBV-3DMP	#10-32 1/8" NPT	Detented		Momentary

Medium: Air

Materials: Brass body, Buna-N seals, stainless steel stem and spring

Input Pressure: 120 psig max.

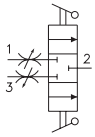
Air Flow:

Adjustable	Full-Flow (-F)
3.0 scfm @ 50 psig	4.5 scfm @ 50 psig
5.0 scfm @ 100 psig	7.5 scfm @ 100 psig

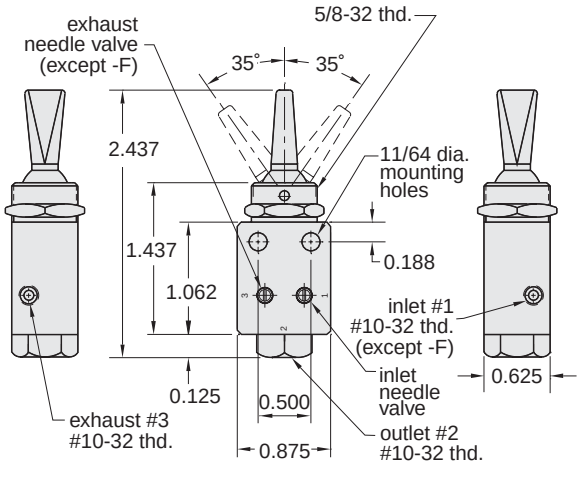
Force For Full Stem Travel: 8 oz. nominal

Toggle: Plastic

Mounting: 5/8-32 thread. Nut and lockwashers furnished. (2) 0.171 mounting holes in body or may be mounted directly on a cylinder

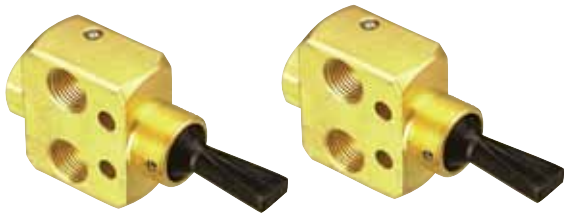


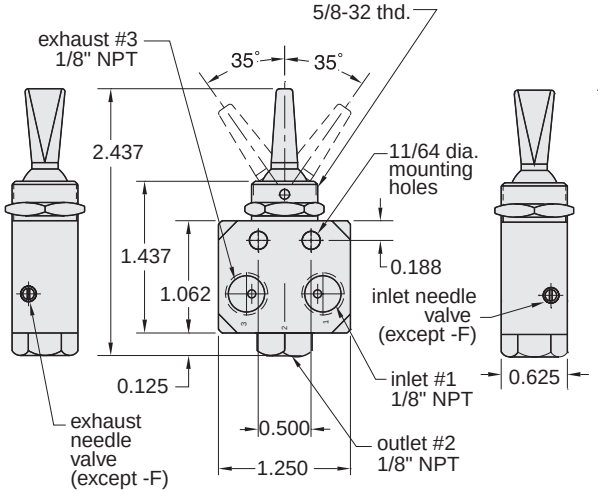
3 Position Fill & Bleed Valves, #10-32



Part No.	Description
FBV-3D	Fill & Bleed Valve, Adjustable, Detented/Detented
FBV-3D-F . . .	Fill & Bleed Valve, Full-Flow, Detented/Detented
FBV-3M	Fill & Bleed Valve, Adjustable, Momentary/Momentary
FBV-3M-F . . .	Fill & Bleed Valve, Full-Flow, Momentary/Momentary
FBV-3DM . . .	Fill & Bleed Valve, Adjustable, Detented/Momentary
FBV-3DM-F .	Fill & Bleed Valve, Full-Flow, Detented/Momentary

3 Position Fill & Bleed Valves, 1/8" NPT





Part No.	Description
FBV-3DP	Fill & Bleed Valve, Adjustable, Detented/Detented
FBV-3DP-F . .	Fill & Bleed Valve, Full-Flow, Detented/Detented
FBV-3MP . . .	Fill & Bleed Valve, Adjustable, Momentary/Momentary
FBV-3MP-F . .	Fill & Bleed Valve, Full-Flow, Momentary/Momentary
FBV-3DMP . .	Fill & Bleed Valve, Adjustable, Detented/Momentary
FBV-3DMP-F	Fill & Bleed Valve, Full-Flow, Detented/Momentary

4-WAY STEM VALVES

4-way valves can supply and exhaust two different outlets, and are commonly used with double-acting cylinders. When the stem is in one position air flows from the inlet to one of the outlets. The second outlet is open to the exhaust port. Moving the stem to the opposite position opens the inlet to the second outlet while exhausting the first outlet. 4-way stem valves are spool valves that may either be spring return or double acting.

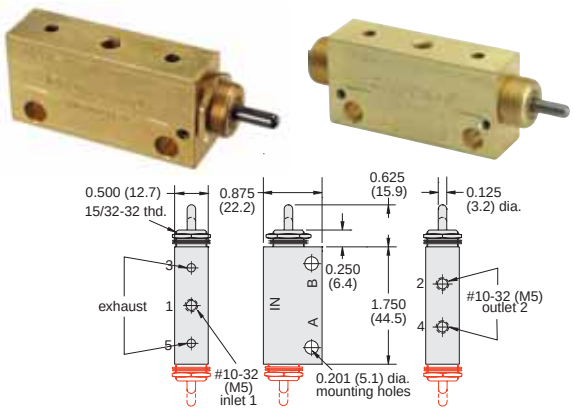
Medium: Air **Stem Travel:** 1/8" (3.2)

Materials: Brass body, Buna-N seals, stainless steel stem and spring

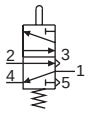
Input Pressure: 150 psig/10 bar max.

Mounting: 15/32-32 thread. Nut and lockwasher furnished.

Miniature 4-Way Spool Valves



Air Flow: 5.0 SCFM @ 50 psig; 8.5 SCFM @ 100 psig; 240 l/min @ 6 bar

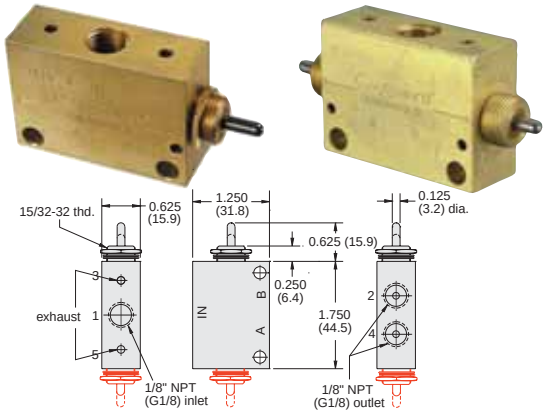


Force For Full Stem Travel: MAV-4 - 38 oz. nominal; MAV-4D - 12 oz. nominal

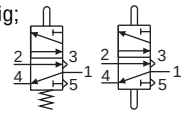
Mounting: Also two 0.201" dia. mounting holes in valve body.

Part No.	Description
MAV-4	Spool Valve with Spring Return, #10-32
MAV-4-M5	Spool Valve with Spring Return, M5
MAV-4D	2 Position Spool Valve, #10-32
MAV-4D-M5	2 Position Spool Valve, M5

J-Series 4-Way Spool Valves



Air Flow: 8.0 SCFM @ 50 psig; 14.0 SCFM @ 100 psig; 390 l/min @ 6 bar

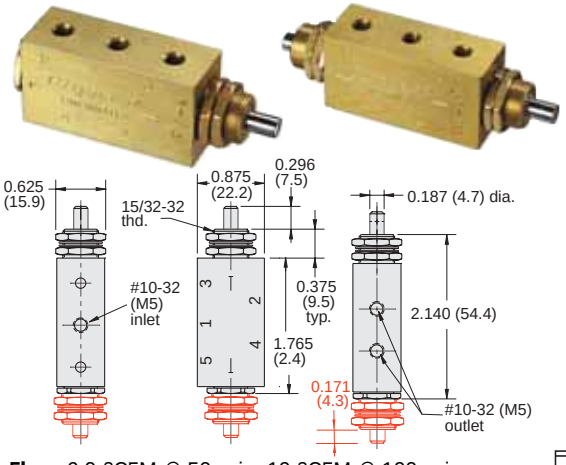


Force For Full Stem Travel: MAV-4 - 38 oz. nominal; MAV-4D - 12 oz. nominal

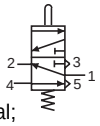
Mounting: Also two 0.201" dia. mounting holes in valve body.

Part No.	Description
MJV-4	Spool Valve with Spring Return, 1/8" NPT
MJV-4-MG	Spool Valve with Spring Return, G1/8
MJV-4D	2 Position Spool Valve, 1/8" NPT
MJV-4D-MG	2 Position Spool Valve, G1/8

FV-Series 4-Way Spool Valves



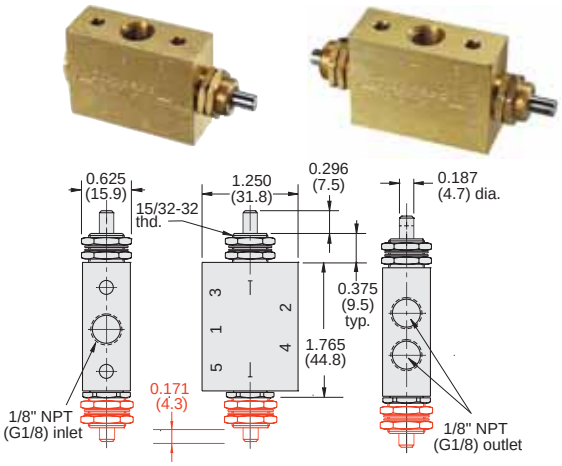
Air Flow: 6.0 SCFM @ 50 psig; 10 SCFM @ 100 psig; 240 l/min @ 6 bar



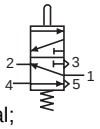
Force For Full Stem Travel: FV-4 & FV-4-M5 - 4 1/2 lb. nominal; FV-4P & FV-4P-M5 - 1 1/2 lb. nominal

Part No.	Description
FV-4	Plunger Actuated Spring Return Valve, #10-32
FV-4-M5	Plunger Actuated Spring Return Valve, M5
FV-4D	2 Position Double Plunger Valve, #10-32
FV-4D-M5	2 Position Double Plunger Valve, M5

FV-Series 4-Way Spool Valves

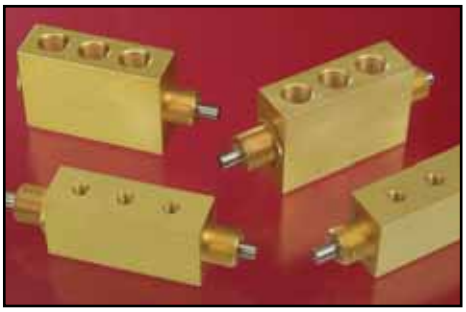


Air Flow: 6.5 SCFM @ 50 psig; 10 SCFM @ 100 psig; 250 l/min@ 6 bar



Force For Full Stem Travel: FV-4P & FV-4-MG - 4 1/2 lb. nominal; FV-4DP & FV-4D-MG - 1 1/2 lb. nominal

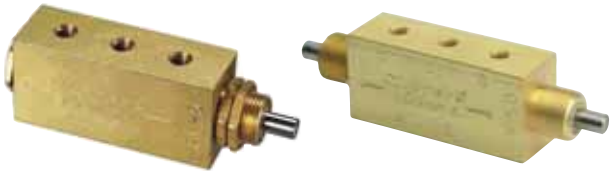
Part No.	Description
FV-4P	Plunger Actuated Spring Return Valve, 1/8" NPT
FV-4-MG	Plunger Actuated Spring Return Valve, G1/8
FV-4DP	2 Position Double Plunger Valve, 1/8" NPT
FV-4D-MG	2 Position Double Plunger Valve, G1/8

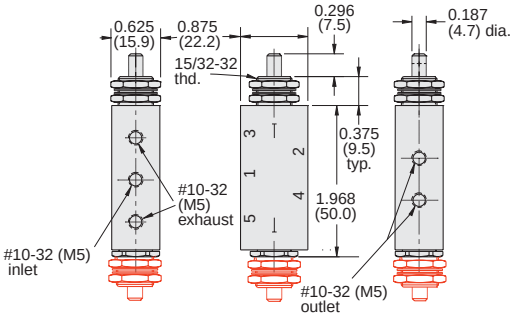


4-WAY FULLY-PORTED STEM VALVES

4-way fully-ported valves have two inlets, two outlets and one exhaust port. When the stem is in one position air flows from one inlet to its outlet while the other inlet is blocked. Moving the stem to the opposite position reverses this action. This may be defined as two 3-way valves, one Normally Closed and one Normally Open operating simultaneously. 4-way fully ported stem valves may either be spring return or double acting. A double acting stem must be moved from one position to the other, a spring return stem will move to the opposite position when released.

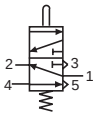
4-Way Fully-Ported Valves





Medium: Air or Oil

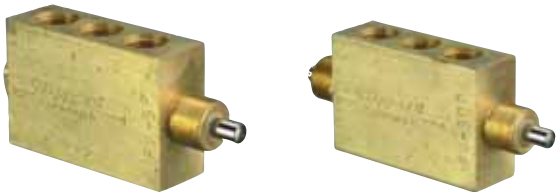
Air Flow: 6.0 SCFM @ 50 psig; 10 SCFM @ 100 psig; 240 l/min @ 6 bar

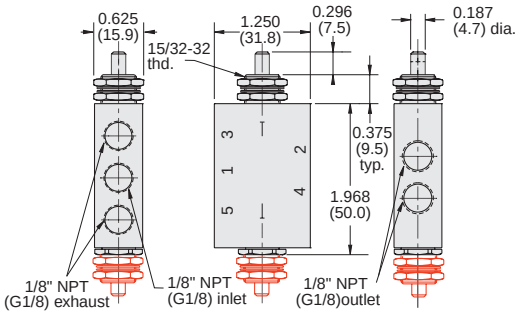


Force For Full Stem Travel: FV-5 & FV-5-M5 - 4 1/2 lb. nominal; FV-5D & FV-5D-M5 - 1 1/2 lb. nominal

Part No.	Description
FV-5	Plunger Actuated Spring Return Valve, #10-32
FV-5-M5	Plunger Actuated Spring Return Valve, M5
FV-5D	2 Position Double Plunger Valve, #10-32
FV-5D-M5	2 Position Double Plunger Valve, M5

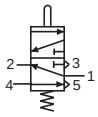
4-Way Fully-Ported Valves





Medium: Air or Oil

Air Flow: 6.5 SCFM @ 50 psig; 10.5 SCFM @ 100 psig; 250 l/min @ 6 bar

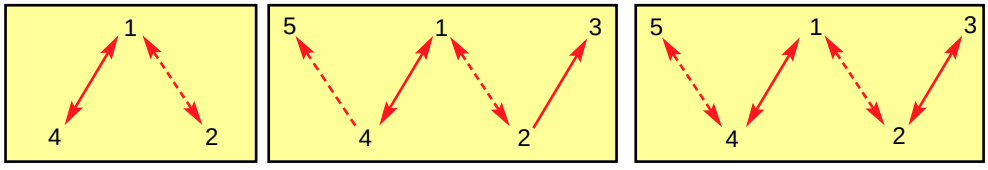


Force For Full Stem Travel: FV-5P & FV-5-MG - 4 1/2 lb. nominal; FV-5DP & FV-5D-MG - 1 1/2 lb. nominal

Part No.	Description
FV-5P	Plunger Actuated Spring Return Valve, 1/8" NPT
FV-5-MG	Plunger Actuated Spring Return Valve, G1/8
FV-5DP	2 Position Double Plunger Valve, 1/8" NPT
FV-5D-MG	2 Position Double Plunger Valve, G1/8

Flow Paths for "FTV & FV" Series

Solid lines indicate flow paths with toggle or stem in one direction. Dotted lines indicate flow paths when the toggle or stem are shifted.



Maximatic®

MAXIMATIC AIR PILOT VALVES

Clippard's Maximatic Air Pilot Valves are available in 3- and 4-way configurations in port sizes from #10-32 thread to 1/2" NPT. They are spool type valves with single or double air pilots with pressure ranges from 0 to 125 psig. Some of the many features of the valve include small size, high flow and competitive pricing.

These valves offer maximum flow in a small package, and are constructed of aluminum, stainless steel and thermoplastic materials. They have a 1/8" NPT external pilot port.

This new line of valves is especially well-suited for packaging, factory automation and OEM fluid power applications.

Type: Spool
Medium: Air (40 micron filtration) and Inert Gas
Operating Range: Single Air Pilot: 20 to 125 psig; all others: see chart below
Materials: Aluminum, Stainless Steel, Thermoplastic
Mounting: Body Ported, Manifold Mount
Maximum Pressure: 125 psig
Temperature Range: 32° to 150°F (0 to 65°C)
Seals: Buna-N

Conforms to ISO 19973-2 test standards.

Minimum Pilot Pressure

	Single Pilot		Double Pilot		Three Position	
Operating Pressure (psig)	20	80	20	80	20	80
Pilot Pressure (psig)	20	35	5	8	20*	20*

** 30 on MMA-41 Series*

3- & 4-Way Valves

Port	Cv	Flow Rate @ 50 psig	Flow Rate @ 100 psig
#10-32	0.58	16 scfm	27 scfm
1/8" NPT	0.67	18 scfm	31 scfm
1/4" NPT	0.89	26 scfm	49 scfm
3/8" NPT	1.68	51 scfm	93 scfm
1/2" NPT	2.79	91 scfm	171 scfm

3-Way Valves

Series No.	Ports Inlet	Ports Outlet	Ports Exhaust	Function	Cv	Flow @ 100 psig
MMA-31NAS	#10-32	#10-32	#10-32	3/2	0.58	27 scfm
MMA-31PAS	1/8" NPT	1/8" NPT	1/8" NPT	3/2	0.67	31 scfm
MMA-32QAS	1/4" NPT	1/4" NPT	1/8" NPT	3/2	0.89	49 scfm
MMA-33WAS	3/8" NPT	3/8" NPT	1/4" NPT	3/2	1.68	93 scfm
MMA-34ZAS	1/2" NPT	1/2" NPT	1/2" NPT	3/2	2.79	171 scfm
MMA-31NAA	#10-32	#10-32	#10-32	3/2	0.58	27 scfm
MMA-31PAA	1/8" NPT	1/8" NPT	1/8" NPT	3/2	0.67	31 scfm
MMA-32QAA	1/4" NPT	1/4" NPT	1/8" NPT	3/2	0.89	49 scfm
MMA-33WAA	3/8" NPT	3/8" NPT	1/4" NPT	3/2	1.68	93 scfm
MMA-34ZAA	1/2" NPT	1/2" NPT	1/2" NPT	3/2	2.79	171 scfm

4-Way Valves

Series No.	Ports Inlet	Ports Outlet	Ports Exhaust	Function	Cv	Flow @ 100 psig	Spool Configuration Closed Center	Exhaust Center	Pressure Center
MMA-41NAS	#10-32	#10-32	#10-32	5/2	0.58	27 scfm			
MMA-41PAS	1/8" NPT	1/8" NPT	1/8" NPT	5/2	0.67	31 scfm			
MMA-42QAS	1/4" NPT	1/4" NPT	1/8" NPT	5/2	0.89	49 scfm			
MMA-43WAS	3/8" NPT	3/8" NPT	1/4" NPT	5/2	1.68	93 scfm			
MMA-44ZAS	1/2" NPT	1/2" NPT	1/2" NPT	5/2	2.79	171 scfm			
MMA-41NAA	#10-32	#10-32	#10-32	5/2	0.58	27 scfm			
MMA-41PAA	1/8" NPT	1/8" NPT	1/8" NPT	5/2	0.67	31 scfm			
MMA-42QAA	1/4" NPT	1/4" NPT	1/8" NPT	5/2	0.89	49 scfm			
MMA-43WAA	3/8" NPT	3/8" NPT	1/4" NPT	5/2	1.68	93 scfm			
MMA-44ZAA	1/2" NPT	1/2" NPT	1/2" NPT	5/2	2.79	171 scfm			
MMA-41NAAC	#10-32	#10-32	#10-32	5/3	0.50	23 scfm	•		
MMA-41PAAC	1/8" NPT	1/8" NPT	1/8" NPT	5/3	0.50	23 scfm	•		
MMA-42QAAC	1/4" NPT	1/4" NPT	1/8" NPT	5/3	0.89	49 scfm	•		
MMA-43WAAC	3/8" NPT	3/8" NPT	1/4" NPT	5/3	1.00	72 scfm	•		
MMA-44ZAAC	1/2" NPT	1/2" NPT	1/2" NPT	5/3	1.68	93 scfm	•		
MMA-41NAAP	#10-32	#10-32	#10-32	5/3	0.50	23 scfm			•
MMA-41PAAP	1/8" NPT	1/8" NPT	1/8" NPT	5/3	0.50	23 scfm			•
MMA-42QAAP	1/4" NPT	1/4" NPT	1/8" NPT	5/3	0.89	49 scfm			•
MMA-43WAAP	3/8" NPT	3/8" NPT	1/4" NPT	5/3	1.00	72 scfm			•
MMA-44ZAAP	1/2" NPT	1/2" NPT	1/2" NPT	5/3	1.68	93 scfm			•
MMA-41NAAE	#10-32	#10-32	#10-32	5/3	0.50	23 scfm		•	
MMA-41PAAE	1/8" NPT	1/8" NPT	1/8" NPT	5/3	0.50	23 scfm		•	
MMA-42QAAE	1/4" NPT	1/4" NPT	1/8" NPT	5/3	0.89	49 scfm		•	
MMA-43WAAE	3/8" NPT	3/8" NPT	1/4" NPT	5/3	1.00	72 scfm		•	
MMA-44ZAAE	1/2" NPT	1/2" NPT	1/2" NPT	5/3	1.68	93 scfm		•	

2-Position Spring Return & Double Valves

MMA-33WAA

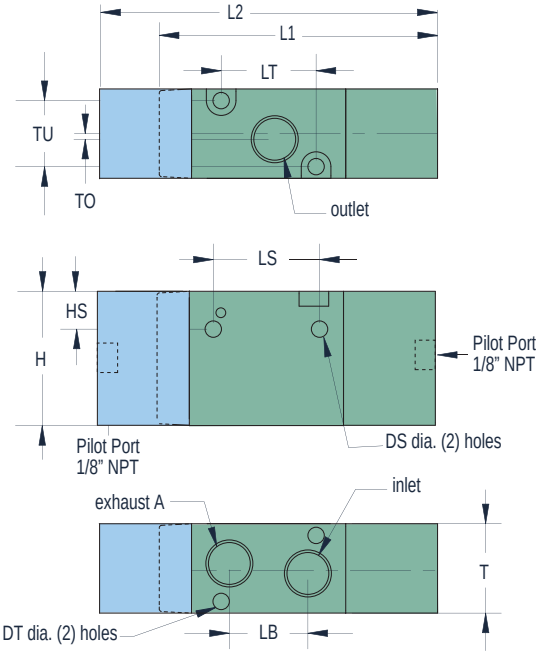
MMA-33WAS

Maximatic® 3-way air piloted valves are either double pilot or single pilot, spring return in #10-32 thread to 1/2" NPT port sizes. These air piloted valves have 1/8" NPT external pilot ports.

Operating Range: Single Air Pilot: 20 to 125 psig; Double Air Pilot: 0 to 125 psig. Refer to Minimum Pilot Pressure Chart on Page 130.
Pilot Pressure: Single Air Pilot: ≥ 20 psig; Double Air Pilot: ≥ 5 psig
Number of Ports: 3
Mounting: Body Ported, Manifold Mount

MAXIMUM Value. Performance.

Base Mounted Manifolds
For a complete offering of Manifolds and other accessories, see page 135.



Dim.	MMA-31	MMA-32	MMA-33	MMA-34
DS	0.13 (3.3)	0.17 (4.3)	0.17 (4.3)	0.22 (5.6)
DT	0.13 (3.3)	0.13 (3.3)	0.17 (4.3)	0.17 (4.3)
H	1.07 (27.2)	1.38 (35.1)	1.58 (40.1)	1.97 (50.0)
HS	0.30 (7.6)	0.31 (7.9)	0.41 (10.4)	0.53 (13.5)
L1	2.23 (56.6)	3.06 (77.7)	3.17 (80.5)	3.80 (96.5)
L2	2.71 (68.8)	3.46 (87.9)	3.80 (96.5)	4.72 (119.9)
LB	0.63 (16.0)	0.71 (18.0)	0.94 (23.9)	1.42 (36.1)
LS	0.83 (21.1)	0.98 (24.9)	1.18 (30.0)	2.01 (51.1)
LT	0.75 (19.1)	1.30 (33.0)	1.38 (35.1)	1.73 (43.9)
T	0.71 (18.0)	0.86 (22.1)	1.06 (26.9)	1.34 (34.0)
TO	0.06 (1.5)	0.06 (1.5)	0.16 (4.1)	0.16 (4.1)
TU	0.71 (18.0)	0.87 (22.1)	1.06 (26.9)	1.34 (34.0)

Spring Return Valves	Double Air Pilot Valves	Inlet	Outlet	Exhaust	Cv/scfm*
MMA-31NAS	MMA-31NAA	#10-32	#10-32	#10-32	0.58/27
MMA-31PAS	MMA-31PAA	1/8" NPT	1/8" NPT	1/8" NPT	0.67/31
MMA-32QAS	MMA-32QAA	1/4" NPT	1/4" NPT	1/8" NPT	0.89/49
MMA-33WAS	MMA-33WAA	3/8" NPT	3/8" NPT	1/4" NPT	1.68/93
MMA-34ZAS	MMA-34ZAA	1/2" NPT	1/2" NPT	1/2" NPT	2.79/171

** scfm based on flow @ 100 psig*

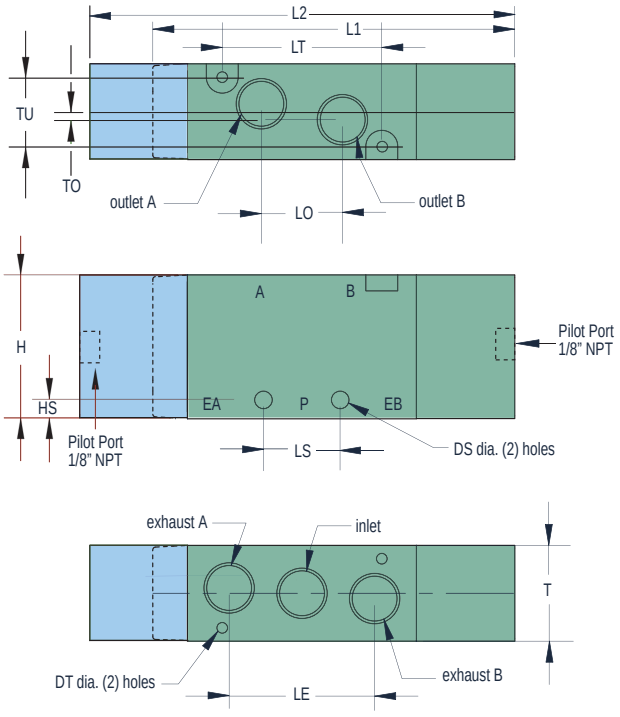
2-Position Spring Return & Double Valves

MMA-42QAS

MMA-44ZAA

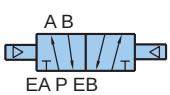
Maximatic® 4-way air piloted valves are either double pilot or single pilot, spring return in #10-32 thread to 1/2" NPT port sizes. These air piloted valves have 1/8" NPT pilot ports.

Operating Range: Single Air Pilot: 20 to 125 psig, Double Air Pilot: 0 to 125 psig. Refer to Minimum Pilot Pressure Chart on Page 130.
Pilot Pressure: Single Air Pilot: ≥ 20 psig; Double Air Pilot: ≥ 5 psig
Number of Ports: 5
Mounting: Body Ported, Manifold Mount



Dim.	MMA-41	MMA-42	MMA-43	MMA-44
DS	0.13 (3.3)	0.17 (4.3)	0.17 (4.3)	0.21 (5.3)
DT	0.13 (3.3)	0.13 (3.3)	0.17 (4.3)	0.17 (4.3)
H	1.07 (27.2)	1.38 (35.1)	1.58 (40.1)	1.97 (50.0)
HS	0.16 (4.1)	0.28 (7.1)	0.26 (6.6)	0.29 (7.4)
L1	2.71 (68.8)	3.06 (77.7)	3.76 (95.5)	4.87 (123.7)
L2	3.16 (80.3)	3.62 (91.9)	4.37 (111.0)	5.43 (137.9)
LE	1.09 (27.7)	1.42 (36.1)	1.77 (45.0)	2.48 (63.0)
LO	0.63 (16.0)	0.74 (18.8)	0.96 (24.4)	1.42 (36.1)
LS	0.63 (16.0)	0.98 (24.9)	0.95 (24.1)	1.11 (28.2)
LT	1.18 (30.0)	1.40 (35.6)	1.97 (50.0)	2.82 (71.6)
T	0.71 (18.0)	0.86 (21.8)	1.06 (26.9)	1.34 (34.0)
TO	0.11 (2.8)	0.13 (3.3)	0.16 (4.1)	0.19 (4.8)
TU	0.50 (12.7)	0.65 (16.5)	0.80 (20.3)	1.07 (27.2)

Spring Return Valves	Double Air Pilot Valves	Inlet	Outlet	Exhaust	Cv/scfm*
MMA-41NAS	MMA-41NAA	#10-32	#10-32	#10-32	0.58/27
MMA-41PAS	MMA-41PAA	1/8" NPT	1/8" NPT	1/8" NPT	0.67/31
MMA-42QAS	MMA-42QAA	1/4" NPT	1/4" NPT	1/8" NPT	0.89/49
MMA-43WAS	MMA-43WAA	3/8" NPT	3/8" NPT	1/4" NPT	1.68/93
MMA-44ZAS	MMA-44ZAA	1/2" NPT	1/2" NPT	1/2" NPT	2.79/171



** scfm based on flow @ 100 psig*

3-Position Double Valves

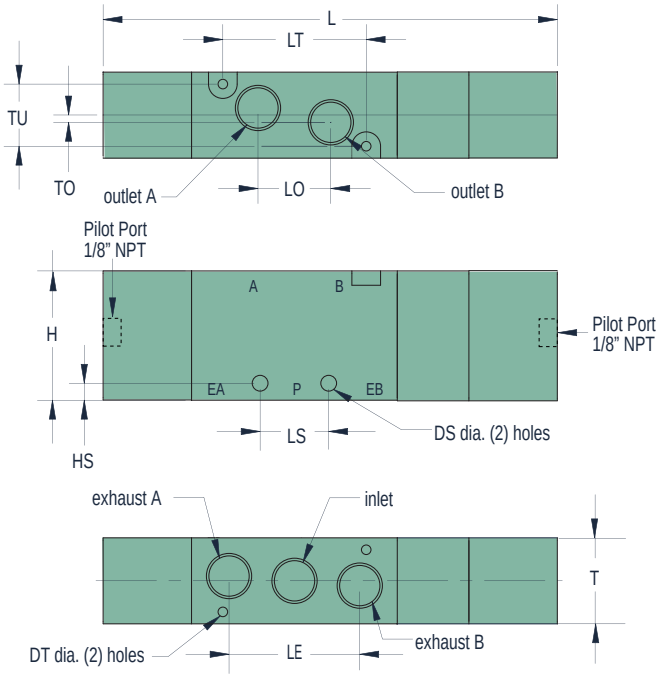
Closed Center, Pressure Center & Exhaust Center

MMA-44ZAAC

Maximatic® 4-way 3-position double air pilot valves with closed center, pressure center or exhaust center spools are available in #10-32 thread to 1/2" NPT port sizes. These air piloted valves have 1/8" NPT external pilot ports.

Operating Range: 0 to 125 psig
Pilot Pressure: ≥ 30 on MMA-41 Series; ≥ 20 on all others
Number of Ports: 5
Mounting: Body Ported, Manifold Mount

MAXIMUM Value. Performance.

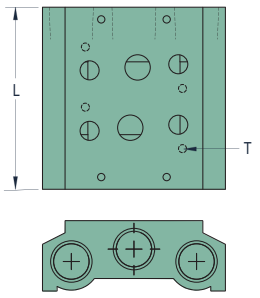


Dim.	MMA-41	MMA-42	MMA-43	MMA-44
DS	0.13 (3.3)	0.17 (4.3)	0.17 (4.3)	0.21 (5.3)
DT	0.13 (3.3)	0.13 (3.3)	0.17 (4.3)	0.17 (4.3)
H	1.07 (27.2)	1.38 (35.1)	1.58 (40.1)	1.97 (50.0)
HS	0.16 (4.1)	0.28 (7.1)	0.26 (6.6)	0.29 (7.4)
L	3.78 (96.0)	4.37 (111.0)	5.13 (130.3)	5.43 (137.9)
LE	1.09 (27.7)	1.42 (36.1)	1.77 (45.0)	2.48 (63.0)
LO	0.63 (16.0)	0.74 (18.8)	0.96 (24.4)	1.42 (36.1)
LS	0.56 (14.2)	0.98 (24.9)	0.95 (24.1)	1.11 (28.2)
LT	1.18 (30.0)	1.40 (35.6)	1.97 (50.00)	2.82 (71.6)
T	0.71 (18.0)	0.86 (21.8)	1.06 (26.9)	1.34 (34.0)
TO	0.11 (2.8)	0.13 (3.3)	0.16 (4.1)	0.19 (4.8)
TU	0.50 (12.7)	0.65 (16.5)	0.80 (20.3)	1.07 (27.2)

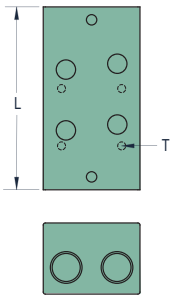
Closed Center	Pressure Center	Exhaust Center	Inlet	Outlet	Exhaust	Cv/scfm*
MMA-41NAAC	**MMA-41NAAP**	**MMA-41NAAE**	#10-32	#10-32	#10-32	0.50/23
MMA-41PAAC	**MMA-41PAAP**	**MMA-41PAAE**	1/8" NPT	1/8" NPT	1/8" NPT	0.50/23
MMA-42QAAC	**MMA-42QAAP**	**MMA-42QAAE**	1/4" NPT	1/4" NPT	1/8" NPT	0.89/49
MMA-43WAAC	**MMA-43WAAP**	**MMA-43WAAE**	3/8" NPT	3/8" NPT	1/4" NPT	1.00/72
MMA-44ZAAC	**MMA-44ZAAP**	**MMA-44ZAAE**	1/2" NPT	1/2" NPT	1/2" NPT	1.68/93

** scfm based on flow @ 100 psig*

Parallel Bar Manifolds



4-Way Manifold



3-Way Manifold

Valve Series	"L" Dimension 2-Station	4-Station	6-Station	8-Station	16-Station	"T" Mtg. Thread
MMA-31/41	2.24 (56.9)	3.73 (94.7)	5.25 (133.4)	6.75 (171.5)	12.69 (322.3)	M4
MMA-32/42	2.71 (68.8)	4.50 (114.3)	6.33 (160.8)	8.13 (206.5)	15.38 (390.7)	M4
MMA-33/43	3.22 (81.8)	5.42 (137.7)	7.62 (193.5)	9.82 (249.4)	18.63 (473.2)	M5
MMA-34/44	3.85 (97.8)	6.56 (166.6)	9.38 (238.3)	12.10 (307.3)	23.11 (587.0)	M5

Parallel circuit manifold bars are available for all sizes of MMA 3- and 4-way valves. Manifolds are made in increments of two stations from two to 16, and are supplied with mounting screws and gaskets. Spare kits are also available which include two screws and a gasket. Blank plate supplied with one gasket, two screws and metal plate.

Valve Series	Manifold Inlet/ Exhaust	Blank Plate	2-Station	4-Station	6-Station	8-Station	16-Station
3-Way Valve Manifolds							
MMA-31	1/8"	MMM-31-B	MMM-31-02	MMM-31-04	MMM-31-06	MMM-31-08	MMM-31-16
MMA-32	1/4"	MMM-32-B	MMM-32-02	MMM-32-04	MMM-32-06	MMM-32-08	MMM-32-16
MMA-33	3/8"	MMM-33-B	MMM-33-02	MMM-33-04	MMM-33-06	MMM-33-08	MMM-33-16
MMA-34	1/2"	MMM-34-B	MMM-34-02	MMM-34-04	MMM-34-06	MMM-34-08	MMM-34-16

3-Way Spare Mounting Kit Hardware

27041-31 . . . . . Hardware Kit for MMA-31 Series Valves
27041-32 . . . . . Hardware Kit for MMA-32 Series Valves
27041-33 . . . . . .Hardware Kit for MMA-33 Series Valves
27041-34 . . . . . .Hardware Kit for MMA-34 Series Valves

Valve Series	Manifold Inlet/ Exhaust	Blank Plate	2-Station	4-Station	6-Station	8-Station	16-Station
4-Way Valve Manifolds							
MMA-41	1/4"	MMM-41-B	MMM-41-02	MMM-41-04	MMM-41-06	MMM-41-08	MMM-41-16
MMA-42	1/4"	MMM-42-B	MMM-42-02	MMM-42-04	MMM-42-06	MMM-42-08	MMM-42-16
MMA-43	3/8"	MMM-43-B	MMM-43-02	MMM-43-04	MMM-43-06	MMM-43-08	MMM-43-16
MMA-44	1/2"	MMM-44-B	MMM-44-02	MMM-44-04	MMM-44-06	MMM-44-08	MMM-44-16

4-Way Spare Mounting Kit Hardware

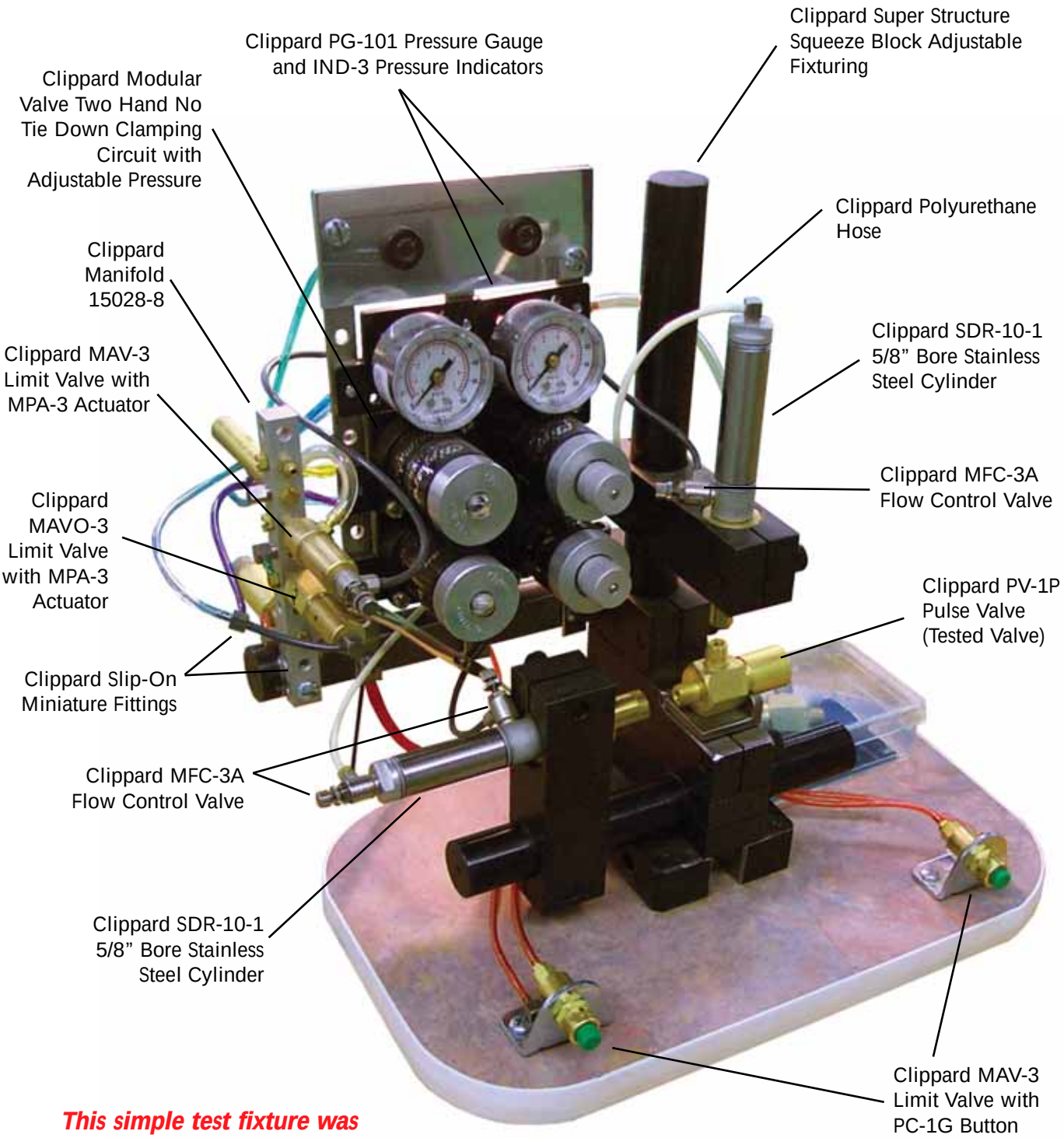
27041-41 . . . . .Hardware Kit for MMA-41 Series Valves
27041-42 . . . . .Hardware Kit for MMA-42 Series Valves 2
27041-43 . . . . . .Hardware Kit for MMA-43 Series Valves
2.7041-44 . . . . .Hardware Kit for MMA-44 Series Valves

Rebuild Kits.

Convenient rebuild kits are available which contain common maintenance items that may be needed during the life of the valve. Each contains a spool, diamond seal, two pilot seals, two pistons with seals, and spring. Consult factory for 3-position kits.

Part No.	
27040-31	3-Way Kit, MMA-31
27040-32	3-Way Kit, MMA-32
27040-33	3-Way Kit, MMA-33
27040-34	3-Way Kit, MMA-34
27040-41	4-Way 2 Pos. Kit, MMA-41
27040-42	4-Way 2 Pos. Kit, MMA-42
27040-43	4-Way 2 Pos. Kit, MMA-43
27040-44	4-Way 2 Pos. Kit, MMA-44

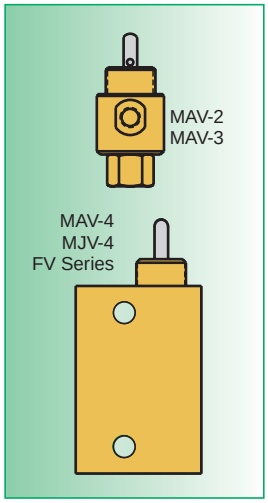
Pneumatic Pulse Valve Leak Tester



This simple test fixture was inexpensively and quickly built using standard Clippard products.

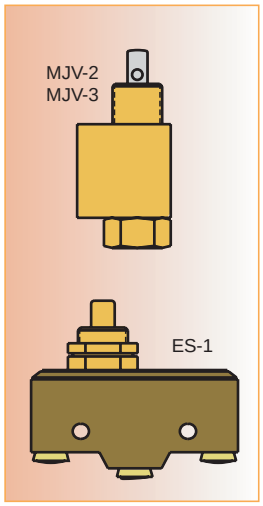
The following valve actuators are compatible with all Clippard MAV, MAVO, MJV, MJVO, ES-1, & FV series valves.

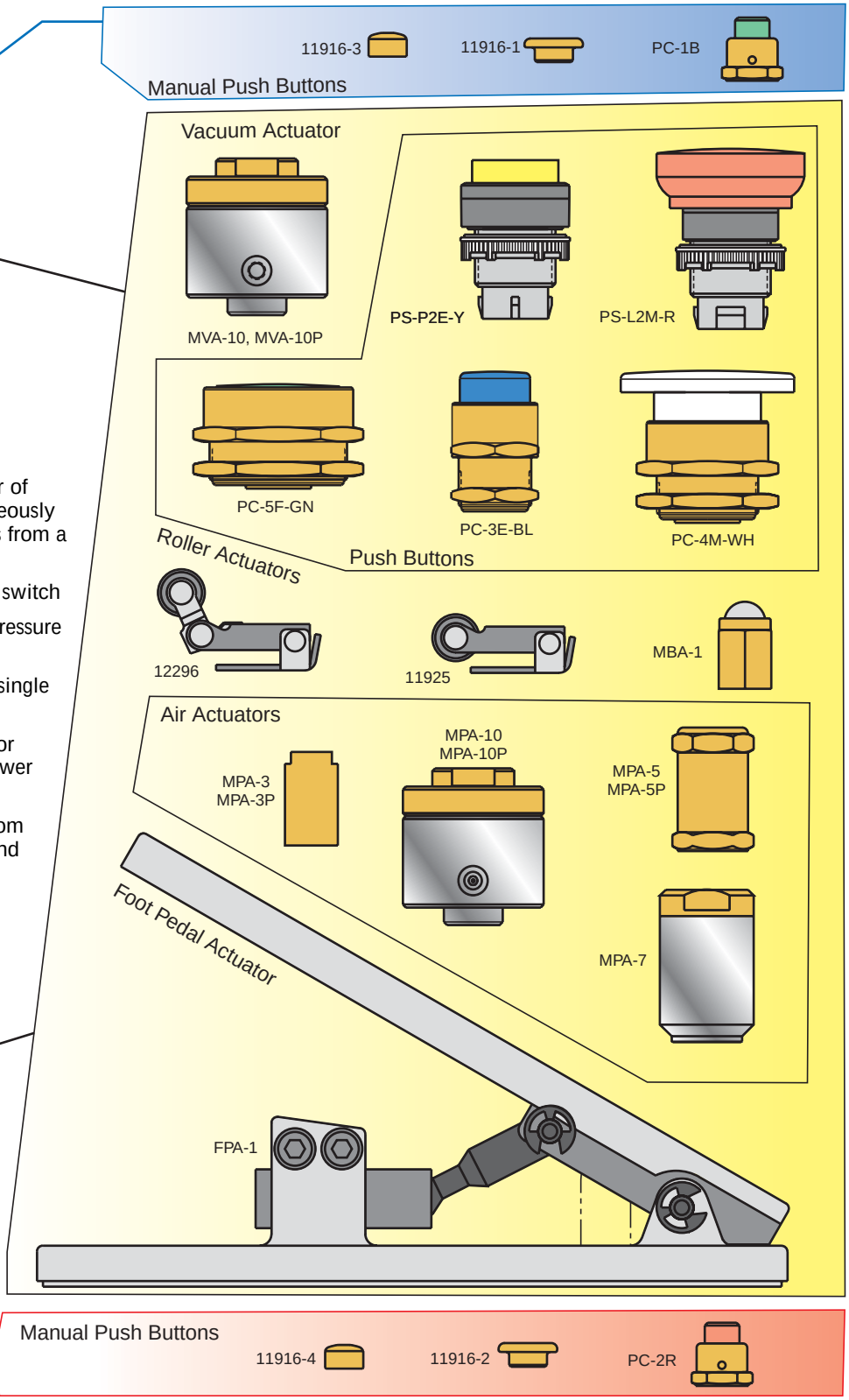
One of the most versatile items in the Clippard line. Permits wide circuit flexibility and allows many control functions to be accomplished pneumatically with less cost, hazards and complexity. Threads onto the tops of our Miniature 2-way, 3-way, and 4-way valves and ES-1 electric switch to provide fast pilot actuation from a pneumatic signal.



MPA Actuators Can:

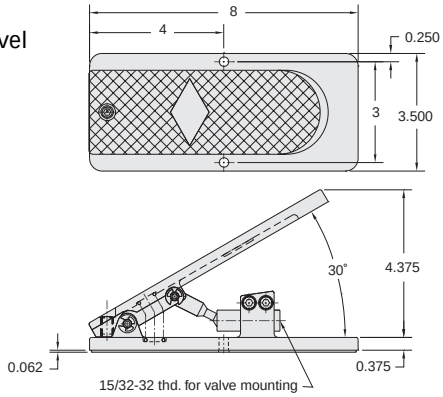
- Remotely actuate any number of valves and switches simultaneously in different strategic locations from a single miniature 3-way valve
- Make an ES-1 into a pressure switch
- Act as an air relay, i.e., one pressure source to another.
- Operate the MAV-4D from a single impulse.
- Serve as a pressure interlock or safety device, i.e., turn off power when pressure fails, etc.
- Provide an electric take off from a pneumatic source to start and stop power, actuate electric counters, indicator lights on panel boards, etc.





Foot Pedal

Adjustable travel foot pedal



Part No.	Description
FPA-1	Adjustable Travel Foot Pedal

Construction: Sturdy cast aluminum and black oxided steel

Control Devices: May be fitted with any Clippard 2-, 3- or 4-way valve or MAR-1C pressure controller with a #15/32-32 mounting thread

Mounting: To floor or other structure with two 9/32" mounting holes stroke plunger adjustable to accommodate a variety of valves

"Hands-free" touch-of-toe operation of endless types of automated and semi-automated machinery and equipment, jigs and fixtures, is possible thru use of this sturdy treadle type foot pedal, combined with Clippard miniature valves, plunger type air pressure controls, and electrical switch.

A sliding link mechanism between treadle and mounting sleeve actuates the component, and a set screw at the back of pedal base adjusts treadle travel.

Pedal is spring loaded at approximately 1/2 lb. for return to "off" position.

Note for MBA-1, 11925 & 12296:

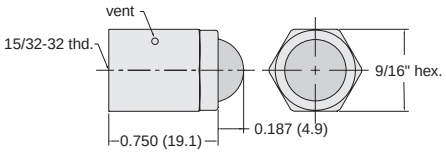
When mounting on a valve, a space should be provided between the body and the actuator according to the chart to the right:

Valve mtg. thd.	MBA-1	11925	12296
0.250 thd length	0.125"	0.062"	0.062"
0.373 thd length	0.218"	0.188"	0.188"

A mounting nut (supplied with valve), mounting bracket or washers should be used to obtain the required spacing.

Ball Cam Actuator

Ball Cam Actuator permits the valves and electrical switch to be operated by mechanical movement depressing the ball from any direction



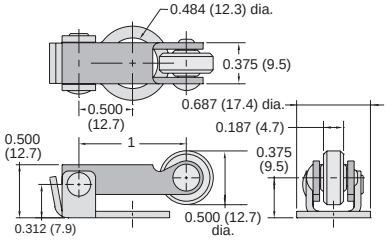
Construction: Body - brass
Ball - stainless steel retained in housing

Operation: Will actuate valve while depressed from any (360°) direction

Mounting: 15/32-32 female to mount to Clippard miniature valves and electric switch

Part No.	Description
MBA-1	Ball Cam Actuator

Roller Cam Actuator



Construction: Stainless steel with nylon roller

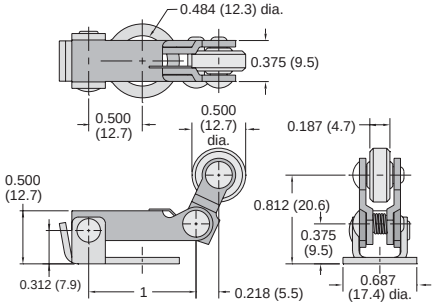
Temperature Range: 32° to 230° F

Mounting: 31/64" dia. mounting hole fits 15/32-32 threaded mounting section of valve bodies

Operation: Mounts to valve body, actuates valve when mechanically depressed; valve spring provides return

Part No.	Description
11925	Roller Cam Follower Actuator

Double-Pivoted Actuator



Construction: Stainless steel with nylon roller

Mounting: 31/64" dia. mounting hole fits 15/32-32 threaded mounting section of valve bodies

Operation: Mounts to valve body, actuates valve when depressed by activating cam or linear travel device in one direction only; no actuation on return travel

Part No.	Description
12296	Roller, Double-Pivoted One-Way Cam Follower Actuator

MINIMUM PRESSURE REQUIRED (psig)*

Clippard Valve	Pressure (psig)				Vacuum (in Hg)	Clippard Valve	Pressure (psig)				Vacuum (in Hg)
	w/MPA3	w/MPA-5	w/MPA-7	w/MPA-10	w/MVA-10		w/MPA3	w/MPA-5	w/MPA-7	w/MPA-10	w/MVA-10
ES-1 Switch	12	4	2	*	*	FV-3	41	15	7.5	4.0	8.2
MAV-2 Valve	23	8	4	2.0	4.2	FV-3P	41	15	7.5	4.0	8.2
MAV-3 Valve	23	8	4	2.0	4.2	FV-4	41	15	7.5	4.0	8.2
MAV-4 Valve	36	11	5.5	3.5	7.2	FV-4P	41	15	7.5	4.0	8.2
MJV-4 Valve	36	11	5.5	3.5	7.2	FV-5	41	15	7.5	4.0	8.2
MAV-4D Valve	13	4	1.5	1.0	2.0	FV-5P	41	15	7.5	4.0	8.2
MJV-4D Valve	13	4	1.5	1.0	2.0	FV-3D	14	5	2.5	1.5	3.2
MJV-2 Valve	30	10	5	3.0	6.2	FV-3DP	14	5	2.5	1.5	3.2
MJV-3 Valve	30	10	5	3.0	6.2	FV-4D	14	5	2.5	1.5	3.2
MAVO-2 Valve	27	9	4.5	2.5	5.2	FV-4DP	14	5	2.5	1.5	3.2
MAVO-3 Valve	27	9	4.5	2.5	5.2	FV-5D	14	5	2.5	1.5	3.2
MJVO-2 Valve	30	10	5	3.0	6.2	FV-5DP	14	5	2.5	1.5	3.2
MJVO-3 Valve	30	10	5	3.0	6.2						

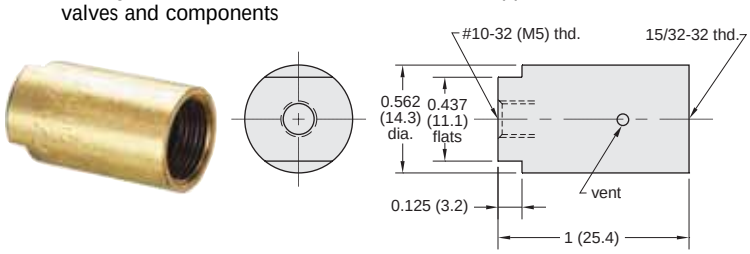
*with 100 psig to valve inlet

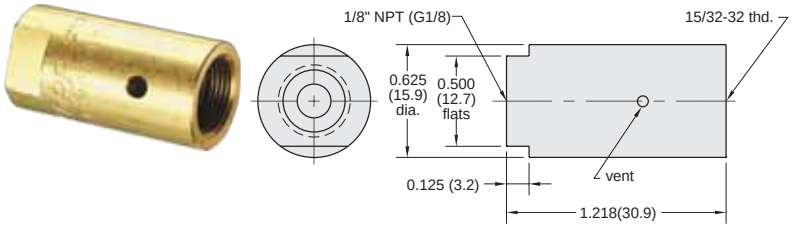
Single Acting Air Pilot Actuators

Input Pressure: 250 psig/17 bar max.

Construction: Body - brass; Springs - stainless steel; Seals - Buna N rubber; Piston - Delrin®

Mounting: 15/32-32 female thread to mount to Clippard miniature valves and components





Bore Size: 0.375 (9.5) **Force Factor:** 0.1

Part No.	Description
MPA-3	Single Acting, Spring Return Actuator, #10-32
MPA-3-M5	Single Acting, Spring Return Actuator, M5
MPA-3P	Single Acting, Spring Return Actuator, 1/8" NPT
MPA-3-MG	Single Acting, Spring Return Actuator, G1/8

Bore Size: 0.625 (15.9) **Force Factor:** 0.3

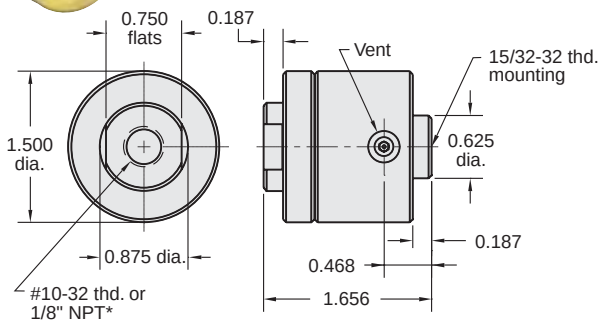
Part No.	Description
MPA-5	Single Acting, Spring Return Actuator, #10-32
MPA-5-M5	Single Acting, Spring Return Actuator, M5 Metric
MPA-5P	Single Acting, Spring Return Actuator, 1/8" NPT
MPA-5-MG	Single Acting, Spring Return Actuator, G1/8

Bore Size: 0.825" (21.0) dia. **Force Factor:** 0.6

Part No.	Description
MPA-7	Single Acting, Spring Return Actuator, 1/8" NPT
MPA-7-MG	Single Acting, Spring Return Actuator, G1/8

Pilot Actuators

Single Acting Spring Return Pilot Actuator



Bore Size: 1.250" dia.

Input Pressure: 150 psig max.

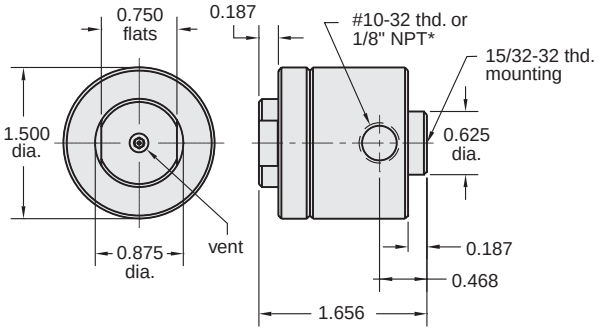
Mounting: 15/32-32 female thread to mount to Clippard Minimatic® valves and components; no spacers or washers are required when assembled to any Clippard valve; may be used with 15018-2 mounting bracket

Force Factor: 1.2

Part No.	Description
MPA-10	Single Acting, Spring Return Actuator, #10-32
MPA-10P	Single Acting, Spring Return Actuator, 1/8" NPT

Vacuum Actuators

Single Acting Spring Return Vacuum Actuator



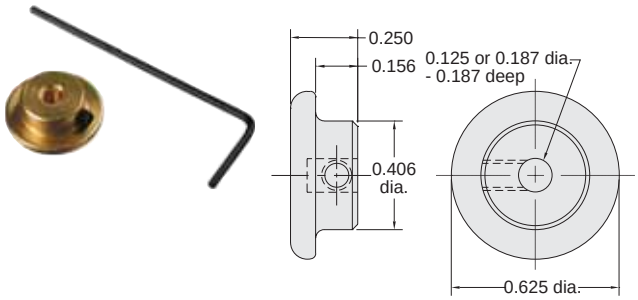
Input Pressure: 30 in. Hg vacuum

Mounting: 15/32-32 female thread to mount to Clippard Minimatic® valves and components; no spacers or washers are required when assembled to any Clippard valve; may be used with 15018-2 mounting bracket

Part No.	Description
MVA-10	Single Acting, Spring Vacuum Actuator, #10-32
MVA-10P	Single Acting, Spring Vacuum Actuator, 1/8" NPT

Push Button Actuators, 5/8"

Round Solid Brass 5/8" dia. Push Button



Use: Mounts directly on valve stem for manual operation of valve; prevents overtravel of valve stem by providing a positive stop

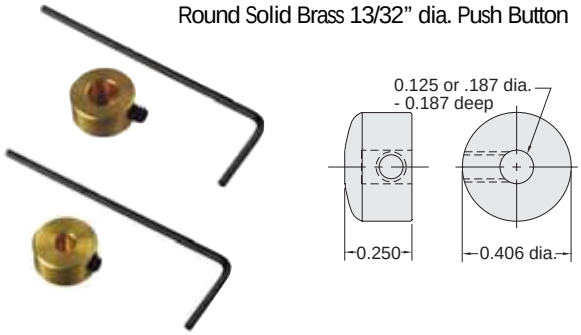
Mounting: 1/8" or 3/16" dia. mounting hole fits valve stems; locks in place by set screw (Allen wrench furnished)

Note: Individually packaged or bulk quantities available

Part No.	Description
11916-1	5/8" Brass Push Button, 1/8" Stem
11916-2	5/8" Brass Push Button, 3/16" Stem

Push Button Actuators, 13/32"

Round Solid Brass 13/32" dia. Push Button



Use: Mounts directly on valve stem for manual operation of valve; small size permits attachment to valve before valve is mounted through 15/32" dia. hole; prevents overtravel of valve stem by providing a positive stop

Mounting: 1/8" or 3/16" dia. mounting hole fits valve stems; locks in place by set screw (Allen wrench furnished)

Note: Individually packaged or bulk quantities available

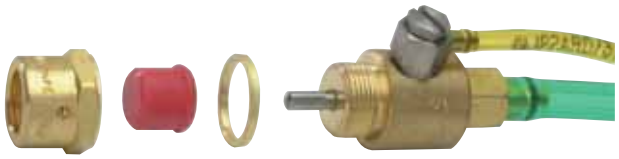
Part No.	Description
11916-3	13/32" Brass Push Button, 1/8" Stem
11916-4	13/32" Brass Push Button, 3/16" Stem

Captivated Push Buttons

Clippard also offers the captivated push button for use with a large variety of stem operated valves. Captivated push buttons are sold as kits, adaptable to either 1/8" diameter stems or 3/16" diameter stems. Each kit includes a colored acetyl push button, brass housing nut, 1/16" brass spacer, and lock washer for assembly. The standard furnished mounting nut has a bright chromate finish. Black chrome or nickel-plated finishes are also available by adding the suffix -BC or -NP to the part number.

Captivated push buttons can be used on individual stem operated valves or in panel mount application by omitting the 1/16" brass spacer. These push buttons are available in a variety of colors, allowing you to color code, or easily differentiate between valves when designing control systems. The design of these push buttons allows maximum actuation of the valve with no overtravel or side load to the valve stem. This assures superior performance and long life.

Captivated push buttons are commonly used as limit valves in conjunction with pneumatic cylinders, slides, and any variety of mechanical actuators. The rugged design coupled with precise actuation of stem operated valves make it perfect for applications where repetitive cycling of the valve is necessary. Designed to work with Clippard MAV, MJV, and FV series, these push buttons integrate easily into Minimatic® systems, providing optimal quality and efficiency in Miniature pneumatic control.



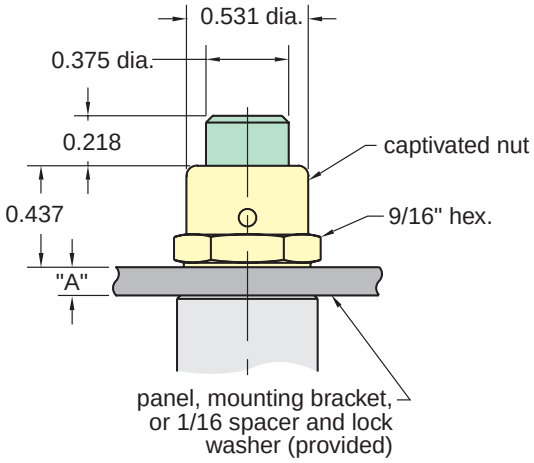
P C - ❑ ❑ (- ❑)

Push Button Captivated

Valve Stem dia.
1 1/8" dia.
2 3/16" dia.

Push Button color
B - Black
G - Green
R - Red
W - White
Y - Yellow

Options
BC - Black chrome
NP - Nickel plated



Spacing Required for Proper Actuation of Push Button

Valve	"A" Dim.
MAV-2, MAV-3 MAVO-2, MAV0-3	3/32"
MAV-4, MAV-4D MJV-4, MJV-4D	5/32"
MJV-2, MJV-3 MJVO-2, MJVO-3 FV-3, FV-4, FV-5	7/32"

Heavy-Duty Push Button Actuators

Heavy Duty Push Button Actuators can be used on individual stem operated valves or in panel mounting applications. These push buttons are available in a variety of colors, allowing you to color code, or easily differentiate between valves when designing control systems. They feature a built-in spring so the button always returns to the extended position when released with no additional load on the valve.

The design of these push buttons allows complete actuation of the valve with no overtravel or side load to the valve assuring superior performance and long life.

P C - ❑ ❑ - ❑ ❑

Push Button Captivated

Size Mounting Thread
3 - 5/8-32 thd. (16 mm)
4 -7/8-32 thd. (22 mm)
5 -1 3/16-28 thd. (30 mm)

Button Style
E - Extended
F - Flush
M - Mushroom

Push Button color
BK - Black **WH** - White **RD** - Red
GN - Green **YL** - Yellow **BL** - Blue
OR - Orange **GR** - Grey
Note: Non-standard colors available; consult factory

Part No.	Description
PC-3E-(color)	. . . .5/8-32 Thd., Extended *(specify color)*

Part No.	Description
PC-4E-(color)	. . . .7/8-32 Thd., Extended *(specify color)*

Part No.	Description
PC-5E-(color)	. .1 3/16-28 Thd., Extended *(specify color)*

Part No.	Description
PC-3F-(color)	. . . .5/8-32 Thd., Flush *(specify color)*

Part No.	Description
PC-4F-(color)	. . . .7/8-32 Thd., Flush *(specify color)*

Part No.	Description
PC-5F-(color)	. .1 3/16-28 Thd., Flush *(specify color)*

Part No.	Description
PC-3M-(color)	. . .5/8-32 Thd., Mushroom *(specify color)*

Part No.	Description
PC-4M-(color)	. . .7/8-32 Thd., Mushroom *(specify color)*

Part No.	Description
PC-5M-(color)	.1 3/16-28 Thd., Mushroom *(specify color)*

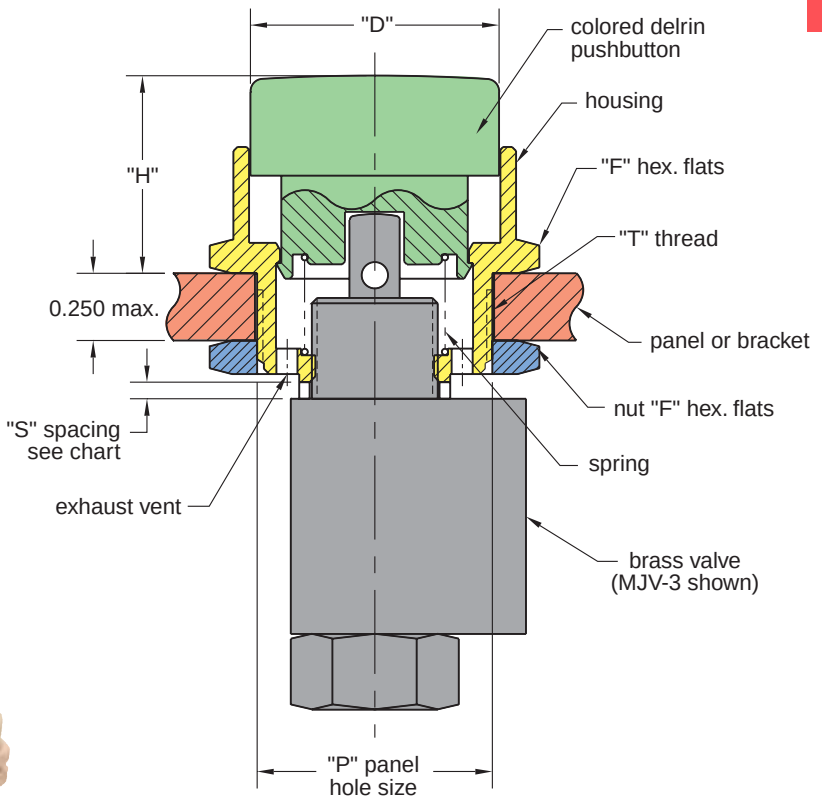
Features

- Assembles directly to the valve; no adapters required
- Ideal for mounting on panels or brackets, up to 1/4" thick panel
- Self-contained assembly; no loose parts
- Stainless steel spring returns button to extended position with no added load to the valve stem
- Three sizes: 16 mm (5/8" dia.), 22 mm (7/8" dia.) and 30 mm (1-3/16" dia.)
- Flush, extended and mushroom style buttons
- Five bright colors for visibility and operator recognition. Other colors available upon request
- Nickel plated brass housing and nut, molded Delrin® button and stainless steel spring for long life and corrosion resistance
- Protects the valve from overtravel and side load

Different valve models vary in mounting thread length, stem extension and stroke. To accommodate these differences, the chart below lists the recommended spacing ("S") to insure complete valve actuation. Provided with each button is a 1/16" thick spacer ring that may be used in place of a panel or bracket to obtain proper spacing. The lockwasher provided may be used with no significant effect on spacing.

DIMENSIONS

SIZE	MODEL	"D" Dia.	"H" Hgt.	"T" Thd.	"P" +1/32 -0 Panel Hole	"F" Hex Flats
5/8-32 (16 mm) mtg. thd.	PC-3E-❑❑	0.625"	0.734"	5/8-32	5/8" dia.	3/4"
	PC-3F-❑❑	0.625"	0.500"			
	PC-3M-❑❑	1.165"	0.906"			
7/8-32 (22 mm) mtg. thd.	PC-4E-❑❑	0.925"	0.734"	7/8-32	7/8" dia.	1-1/16"
	PC-4F-❑❑	0.925"	0.500"			
	PC-4M-❑❑	1.500"	0.906"			
1 3/16-28 (30 mm) mtg. thd.	PC-5E-❑❑	1.165"	0.734"	1 3/16-28	1-3/16" dia.	1-5/16"
	PC-5F-❑❑	1.165"	0.500"			
	PC-5M-❑❑	1.500"	0.906"			



SPACING "S" REQUIRED FOR PROPER VALVE ACTUATION			
Valve series	MAV-2 MAVO-2 MAV-3 MAVO-3	MAV-4 MAV-4D MJV-4 MJV-4D	MJV-2,-3 MJVO-2,-3 FV-3, FV-4, FV-5
• Mounting thd.	1/4"	1/4"	3/8"
• Stem extension	5/16"	3/8"	5/16"
• Valve stroke	1/8"	3/16"	1/8"
"S" Minimum	none	none	1/16"
Maximum	1/16"	1/16"	1/8"

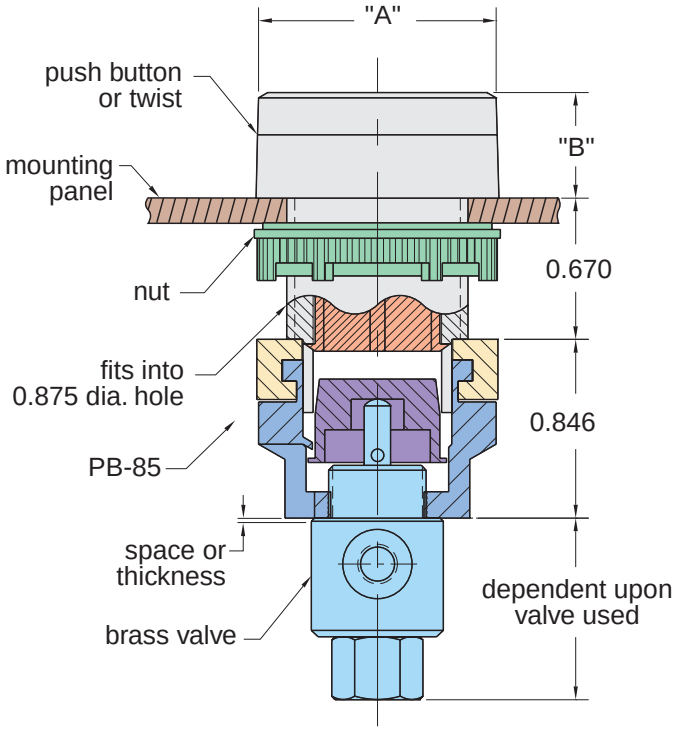
Minimatic® Actuators

Easily actuated, clearly identifiable panel controls are the hallmark of a professional control system.

Whether the system is a single valve machine control . . . or an operating console for controlling complex pneumatic systems . . . you will find the actuator you require.

The line includes round push buttons, in flush, extended, and mushroom styles. Also included are key locking controls, and twist actuators. An electric switch is also available where a combination of electric and pneumatic switching is desired in a single panel.

As shown in the drawing, a PB-85 is required to connect a push button and a Clippard valve.



Dimensions

Size 22			Size 30		
Model	**"A"**	**"B"**	**Model**	**"A"**	**"B"**
PS-P2F	1.156"	0.492"	PL-P2F	1.440"	0.550"
PS-P2E	1.156"	0.736"	PL-P2E	1.440"	0.960"
PS-P2M	1.575"	0.965"	PL-P2M	1.575"	1.043"
PS-L3M	1.575"	0.965"	PL-L3M	1.575"	1.043"
PS-P4K	1.156"	2.320"	PL-P4K	1.440"	2.280"
PS-L4M	1.575"	2.320"	PL-L4M	1.575"	2.280"
PS-T2T	1.156"	1.043"	PL-T2T	1.440"	1.403"
PS-T3T	1.156"	1.043"	PL-T3T	1.440"	1.043"
PS-T3K	1.156"	2.320"	PL-T3K	1.440"	2.280"

Actuator Mounting Chart

The following chart gives the necessary spacing required between the shoulder of the valve and the base of the adapter.

Valves	PB-85
MAV-2, -2P, -2R, -3R, -3, -3P MAVO-2, -3	None
MJV-2, -3 MJVO-2, -3	1/8"
MAV-4, -4D MJV-4, -4D	None
ES-1	None
FV-3, -3P, -3D, -3DP FV-4, -4P, -4D, -4DP FV-5, -5P, -5D, -5DP	1/8"

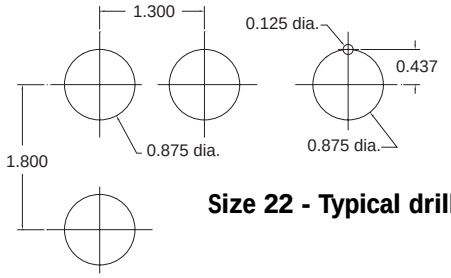
Manual Actuator Features

- Attractive and rugged: precision molded ABS plastic
- Two sizes: 30 mm (1 13/64" dia.) in 20 models
  22 mm (7/8" dia.) in 20 models
- 4 bright colors for visibility and operator recognition
- Flush, extended, and mushroom styles
- Custom adapter mates manual actuator with 26 different Clippard 2-, 3-, and 4-way valves. Valve and adapter slide on and lock onto actuator in seconds. Easily removed.
- Special wrench fits both sizes, speeds assembly
- Actuators may be mounted or dismounted in panel independent of valve and adapter
- 19 legend plates available plus blank plates in each size
- Valve and adapter may be locked onto actuator in any of four positions to ease installation inside panel
- Anti-rotation rings available for secure mounting
- Key lockable push buttons for security and/or safety

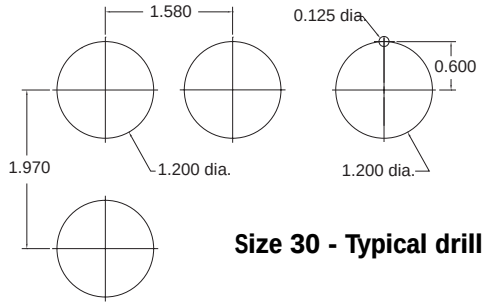
Legend Text	22 Size Part #	33 Size Part #
Blank	PS-01	PL-01
Start	PS-02	PL-02
Stop (red)	PS-03	PL-03
Forward	PS-04	PL-04
Reverse	PS-05	PL-05
Fast	PS-06	PL-06
Slow	PS-07	PL-07
On	PS-08	PL-08
Off (red)	PS-09	PL-09
Reset	PS-10	PL-10
Raise	PS-11	PL-11
Lower	PS-12	PL-12
Emergency Stop (red)	PS-13	PL-13
Run / Jog	PS-31	PL-31
Auto / Hand	PS-32	PL-32
Forward / Reverse	PS-33	PL-33
Fast / Slow	PS-34	PL-34
Open / Close	PS-35	PL-35
Up / Down	PS-36	PL-36
Off / On	PS-37	PL-37

Mounting Clippard Manual Actuators

These drill plans are for units fitted with optional anti-rotation ring



Size 22 - Typical drill plan



Size 30 - Typical drill plan

Legend Plates

Plastic legend plate, two sizes, with a black field and white inscription (red as noted). Inscription plates are interchangeable in both sizes.

Accessories for Manual Actuators

Mounting Wrench

Fits both 22 Size and 30 Size manual actuators.

Part No.	Description
PB-60	Mounting Wrench

Valve Adapter

Adapts all manual actuators to any Clippard standard 2-, 3-, or 4-way brass valve. Made of ZYTEL® ST-901 Supertough Nylon.

Part No.	Description
PB-85	Valve Adapter

Square Bezel

Converts any 22 Size actuator to a square actuator.

Part No.	Description
PS-65	Square Bezel

Replacement Mounting Nut

Mounting nut that holds manual actuators to panel. Included with manual actuators. 22 Size only.

Part No.	Description
PS-55	Replacement Mounting Nut

Anti-Rotation Ring

Holds push button in one position. Included with all twist manual actuators.

Part No.	Description
PS-50	Anti-Rotation Ring, 22 mm
PL-50	Anti-Rotation Ring, 30 mm

Manual Actuators

P ❑ - ❑ ❑ ❑ - ❑

Push Button

Size
S - Small (22 mm)
L - Large (30 mm)

"On" Actuation
P - Push
T - Twist
K - Key
L - Latching (Push)

"Off" Actuation
4 - Key
3 - Twist
2 - Spring

Button Type
F - Flush
E - Extended
M - Mushroom
T - Twist
K - Key

Color
R - Red
G - Green
B - Black
Y - Yellow

Size 22

Flush Push Button. Manual Push "In". Spring Return.

Part No.	Description
PS-P2F-R	Red
PS-P2F-G	Green
PS-P2F-B	Black
PS-P2F-Y	Yellow

Extended Push Button. Manual Push "In". Spring Return.

Part No.	Description
PS-P2E-R	Red
PS-P2E-G	Green
PS-P2E-B	Black
PS-P2E-Y	Yellow

Manual Push Mushroom. Manual Push "In". Spring Return.

Part No.	Description
PS-P2M-R	Red
PS-P2M-G	Green
PS-P2M-B	Black

Automatic Push/Turn Mushroom. Manual push "In" Latches "In". Turn clockwise to unlatch. Spring return.

Part No.	Description
PS-L3M-R	Red
PS-L3M-G	Green
PS-L3M-B	Black

Push Key Push Button. Manual push "In". Spring return. Turn key counter-clock-wise to lock "Out"; clock-wise to unlock. Key withdraw-able locked or unlocked. Black only.

Part No.	Description
PS-P4K-B	Black

Push Key Mushroom. Manual push "In". Automatic latches "In". Turn key clock-wise to release. Spring return. Key withdrawable "Out" position only. Red only.

Part No.	Description
PS-L4M-R	Red

Spring Return Twist 45°. Turn clockwise and hold for "In". Release for spring return. Black only.

Part No.	Description
PS-T2T-B	Black

Maintained Twist 90°. Turn clockwise to latch "In". Turn counterclock-wise to release. Black only.

Part No.	Description
PS-T3T-B	Black

Key Twist 90° Maintained. (PS-T3K-B) Turn key clockwise to latch "In". Turn key counter-clockwise to release. Key with-drawable in both positions. Black only.

(PS-K3K-B) Same as PS-T3K-B except key is withdrawable in "Out" position only.

Part No.	Description
PS-T3K-B	Black
PS-K3K-B	Black

Size 30

Flush Push Button. Manual push “In”. Spring return.

Part No.	Description
PL-P2F-R	Red
PL-P2F-G	Green
PL-P2F-B	Black
PL-P2F-Y	Yellow

Extended Push Button. Manual push “In”. Spring return.

Part No.	Description
PL-P2E-R	Red
PL-P2E-G	Green
PL-P2E-B	Black
PL-P2E-Y	Yellow

Key Twist 90° Maintained. (PL-T3K-B) Turn key clockwise to latch “In”. Turn key counterclockwise to release. Key with-drawable in both positions. Black only.

(PL-K3K-B) Same as PL-T3K-B except key is withdrawable in “Out” position only.

Part No.	Description
PL-T3K-B	Black
PL-K3K-B	Black

Automatic Push/Turn Mushroom. Manual push “In”. Latches “In”. Turn clockwise to unlatch. Spring return.

Part No.	Description
PL-L3M-R	Red
PL-L3M-G	Green
PL-L3M-B	Black

Push Key Push Button. Manual push “In”. Spring return. Turn key counter-clockwise to lock “Out”; clockwise to unlock. Key withdrawable locked or unlocked. Black only.

Part No.	Description
PL-P4K-B	Black

Push Key Mushroom. Manual push “In”. Automatic latches “In”. Turn key clock-wise to release. Spring return. Key with-drawable “Out” position only. Red only.

Part No.	Description
PL-L4M-R	Red

Spring Return Twist 45°. Turn clockwise and hold for “In”. Release for spring return. Black only.

Part No.	Description
PL-T2T-B	Black

Maintained Twist 90°. Turn clockwise to latch “In”. Turn counterclock-wise to release. Black only.

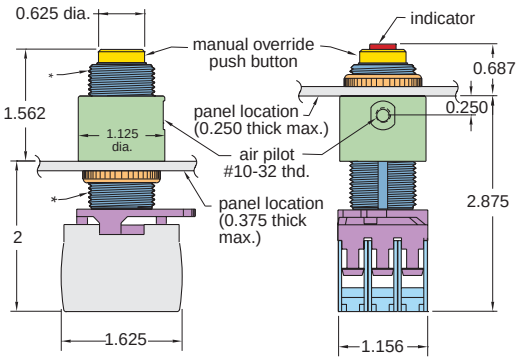
Part No.	Description
PL-T3T-B	Black

Manual Push Mushroom. Manual push “In”. Spring return.

Part No.	Description
PL-P2M-R	Red
PL-P2M-G	Green
PL-P2M-B	Black

Features

- Switch modules available normally open or normally closed
- Wide range of mounting configurations available
- Actuators with or without an air pressure indicator
- Standard manual override or Pneumatic Actuation Only (Manual Override Blocked)
- Interfaces pneumatic signals with manual signals via the same devices, saving space and cost, adding safety and convenience
- 4 bright colors for visibility and operator recognition
- Can actuate as many as 12 switches



* M22 x 1.5 thread (7/8" dia. panel mount hole)

Medium: Air

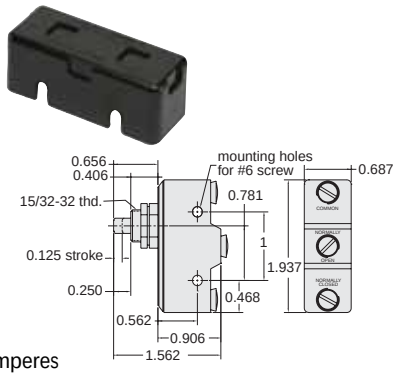
Operating Pressure: Approx. 10 psig plus 1.5 psig per switch

Max. Operating Pressure: 150 psig

Construction:
Activator Housing - Nickel-plated brass, Anodized aluminum, Nylon
Internal Parts - Delrin ®
Seals - Buna-N rubber
Mounting - M22 x 1.5 male thread for panel mount through 7/8" dia. hole

Part No.	Description	
Push Buttons		***Push Button Color***
AS-BN	Manual Override	Black
AS-GN	Manual Override	Green
AS-RN	Manual Override	Red
AS-YN	Manual Override	Yellow
AS-BN-A	Air Actuation Only	Black
AS-GN-A	Air Actuation Only	Green
AS-RN-A	Air Actuation Only	Red
AS-YN-A	Air Actuation Only	Yellow
Push Buttons with Indicator		***Indicator Color***
AS-BG	Manual Override	Black
AS-BR	Manual Override	Green
AS-BY	Manual Override	Red
AS-BW	Manual Override	Yellow
AS-BG-A	Air Actuation Only	Green
AS-BR-A	Air Actuation Only	Red
AS-BY-A	Air Actuation Only	Yellow
AS-BW-A	Air Actuation Only	White

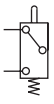
Single Pole Electrical Switch



Stem Travel: 1/8"

Rating A.C.: 120 volts - 15 amperes
240 volts - 15 amperes
480 volts - 15 amperes

Rating D.C.: 125 volts - 0.5 amperes
250 volts - 0.25 amperes

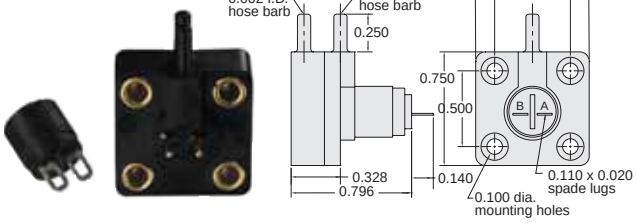


Mounting: 15/32-32 thread; nut and lockwashers furnished, also two 0.140" dia. mounting holes in body

Approvals: UL and CE

Part No.	Description
ES-1	Single Pole, Double Throw Snap-Action Electrical Switch
ES-1-GP	Single Pole, Double Throw Snap-Action Electrical Switch with Gold-Plated Contact
15601	Terminal Cover

Pneumatic Electric Switches

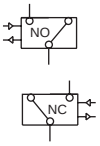


Electrical Rating: 60 ma. AC resistive 40 ma. DC resistive @ 120 volts

Switching Speed: 125 Hz, normally open

Actuating Pressure: 3" H_2O 10% pressure vacuum, or DP

Maximum Pressure: 8 psig (continuous)



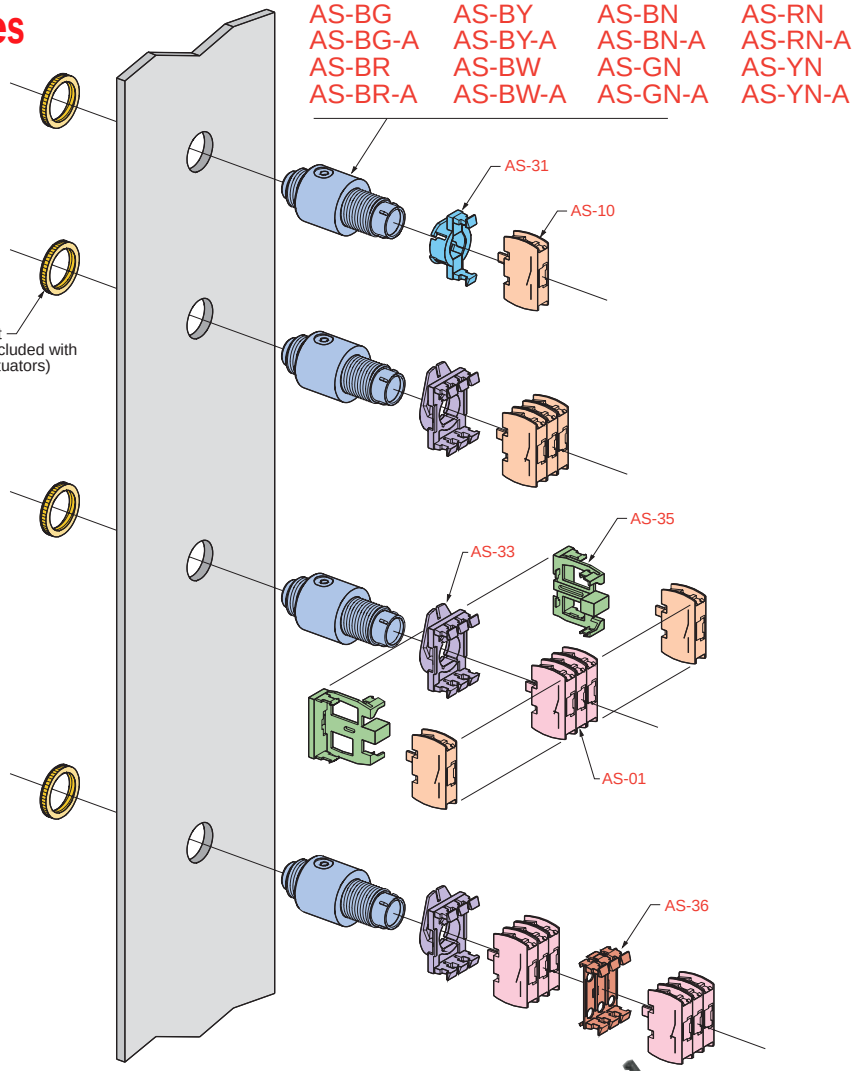
Construction: ABS plastic case gold plated contacts natural rubber diaphragm

Use: for interfacing fluidic or other low pressure air signals with electronic circuitry dual inputs operates on pressure, vacuum, or differential pressure signals

Part No.	Description
5100-3-NO	Pneumatic Electric Switch, Normally-Open Contacts
5100-3-NC	Pneumatic Electric Switch, Normally-Closed Contacts

Air-2-Electric® Air Switches and Mounting Clips

The Air-2-Electric system can handle multiple switches; using line voltage, as many as 12 switches can be actuated. Switch modules are available in normally open or normally closed models. Air-2-Electric actuators are available with a number of feature options such as a manual override and an air pressure indicator and in a variety of colors.



Air Switches

AS-01 - Normally Closed
AS-10 - Normally Open

Mounting Clips

The single clip mounts one switch to the pneumatic actuator. The front clip mounts up to three switches. Add side clips to mount up to five switches. For six to twelve switches, add a 2nd row clip to the front clip.

Note: The 2nd row clip will not mount where side clips are attached.

AS-31 - Single Clip

AS-33 - Front Clip

AS-35 - Side Clip

AS-36 - 2nd Row Clip

SWITCH MODULES AS-01 AND AS-10 Electrical and Mechanical Characteristics

Electrical Performance					Voltage		Motor Horsepower
AC	nominal Operating Voltage (VAC) (50-60 Hz)	110	220	440	110	Single phase	0.5
	nominal Operating Current (A)	8	6.5	3.5	220	Single phase	1.0
DC	nominal Operating Voltage (VDC)	12	24		220/240	3-phase	3.0
	nominal Operating Current (A)	4	1.5		440/480	3-phase	5.0

Electrical Life	220 V (50-60 Hz)	
Operating Current (A)	6	2
No. of Operations	1 x 10^6	3 x 10^6

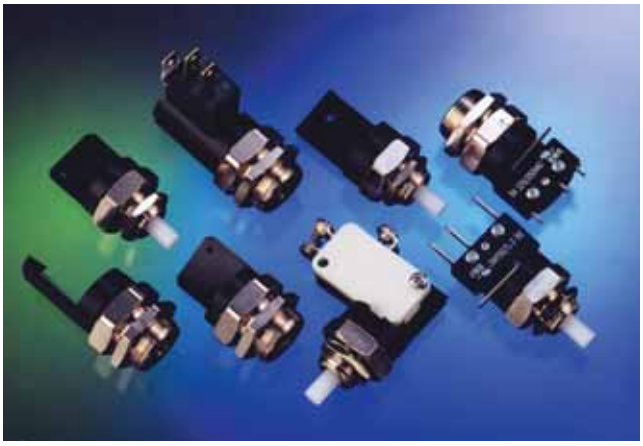
Approvals

Mechanical Life 3 x 10^6 cycles

Connection Screw terminals suitable for field wiring # 14-12 AWG

WARNING Caution should be taken to assure the conformation of all applicable standard codes and installation procedures. Proper design engineering procedures should be used to guard against the accidental actuation of the switches. Manual overrides or other precautionary measures should be considered.

Pressure Actuated Switches



Medium: Air

Inlet Pressure: 5 - 150 psig; 0.3 - 10.3 bar

Pilot Port: #10-32, 1/8" NPT, M5

Mounting: External thread and nut for panel, bracket, or bulkhead mounting,
5/8 - 32 pressure actuated
15/32-32 manually operated

Accuracy: Actuation and deactuation pressures listed are nominal values. Each has a tolerance of ±12% or 1 psig whichever is greater

❑ ❑ ❑ - 1 ❑ ❑ - ❑ ❑ - ❑

SAS Sub-Miniature Air Switch
MAS Miniature Air Switch

Design Series

Switch Current Rating:
SAS
A 5A @ 125/250 VAC
3A @ 30 VDC/.1A 60 VDC
X no switch
MAS
B 3A @ 125/250 VAC
3A @ 30 VDC
C 10A @ 125/250 VAC
5A @ 50 VDC
X no switch

Switch Terminals:
SAS: **0** no switch
1 110 series Q.C.
MAS: **0** no switch
2 187 series Q.C.
3 screw terminals

Actuation Pressure*
06 6 psig/0.4 bar
20 20 psig/1.4 bar
40 41 psig/ 2.8 bar
65 65 psig/4.5 bar
MN Manual

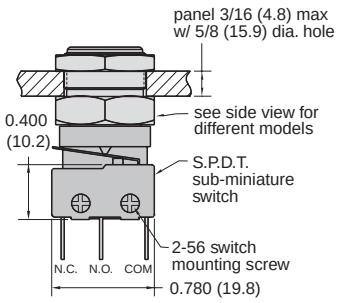
Deactuation Pressure*
06 5 psig/0.3 bar
20 18 psig/1.2 bar
40 36 psig/2.5 bar
65 58 psig/ 4.0 bar
MN Manual

Inlet Port:
Blank #10-32 thd
F 1/8" NPT female
P 1/8" NPT male
M5 M5 x 0.8 thd

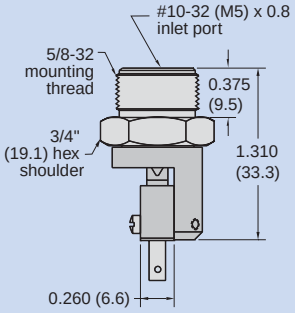
*Nominal value +/- 12% or 1psi, whichever is greater when used with Clippard switches

Pressure Actuated | Mechanically Actuated

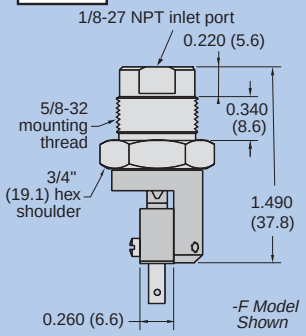
SAS Model



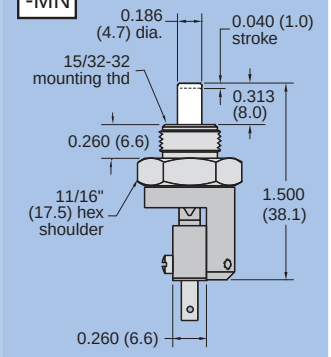
STD. & -M5



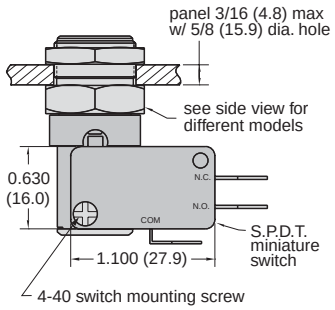
-F & -P

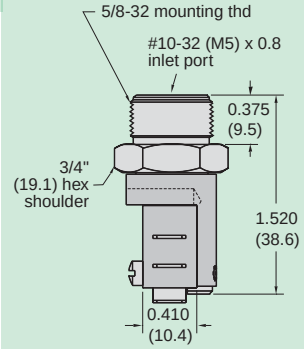


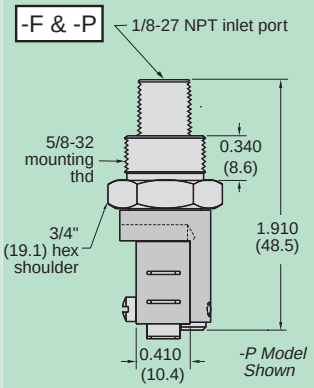
-MN

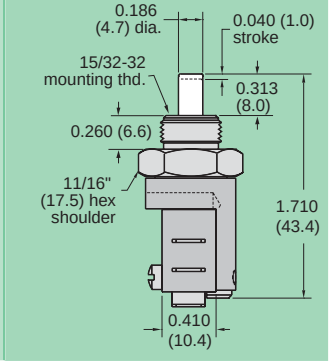


MAS Model

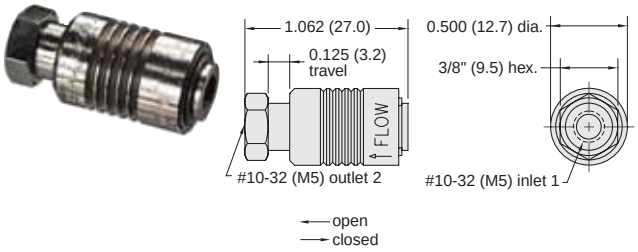








2 Position 2-Way or 3-Way Sleeve Valves



Medium: Air

Mounting: Inline or direct to fitting

Stem Travel: 1/8" (3.2)

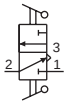
Material: Nickel plated brass

Input Pressure: 150 psig/I0 bar max.

Air Flow: 6.5 SCFM @ 50 psig; 11.8 SCFM @ 100 psig; 280 l/min @ 6 bar

Force to Actuate: Approx. 2.5 lbs

Part No.	Description
SLV-2	.2 Position 2-Way Sleeve Valve, #10-32
SLV-2-M5 . . .	.2 Position 2-Way Sleeve Valve, M5
SLV-3	.2 Position 3-Way Sleeve Valve, #10-32
SLV-3-M5 . . .	.2 Position 3-Way Sleeve Valve, M5



J-Series Sleeve Valves

Features

- Variety of inlet and outlet porting eliminates fittings
- No cross-over between inlet and exhaust ports
- Corrosion resistant electroless nickel plated brass body
- Anodized aluminum sleeve for corrosion resistance
- Smooth operation, low sliding friction
- Buna-N seals; (Fluorocarbon available)

Clippard J-Series sleeve valves with 1/8" NPT and 1/4" NPT ports offer large flow capability with a relatively short stroke in 2-way and 3-way valves, and no cross-over between inlet and exhaust on the 3-way models.

The JSLV-2 2-way valve and the JSLV-3 3-way valve combine high flow with small size. Unlike ball valves, sleeve valves require no space for a handle. They also provide flexibility in pipe connections and are available with either male or female threads or combinations of both.

The JSLV-2 and JSLV-3 valves feature a smooth opening stroke during which inlet air is directed to the outlet. During the closing stroke, in the opposite direction of travel, the outlet is closed from the inlet and in the JSLV-3 version, the outlet is then exhausted to atmosphere without the inlet ever being connected to exhaust.

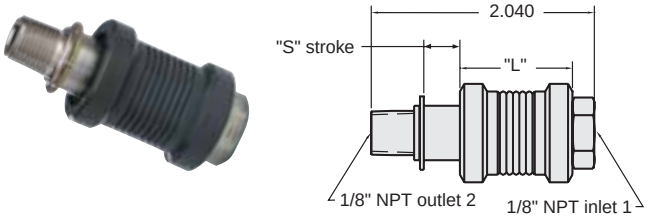
Medium: Air, Water or Oil

Force to Actuate: Approx. 8 lbs

Input Pressure: 150 psig max.

Mounting: Inline or direct to fitting

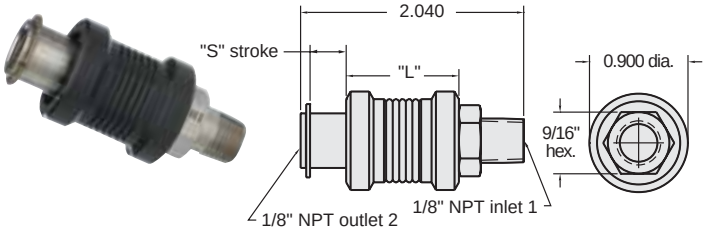
2-Way or 3-Way Sleeve Valves



Air Flow: 1/8" NPT: 43 SCFM @ 100 psig

Order No.	Type	Inlet	"L"	"S"
JSLV-2-F2M2	.2-Way	1/8 Female Pipe	.1.155"	.0.260"
JSLV-3-F2M2	.3-Way	1/8 Female Pipe	.1.030"	.0.385"

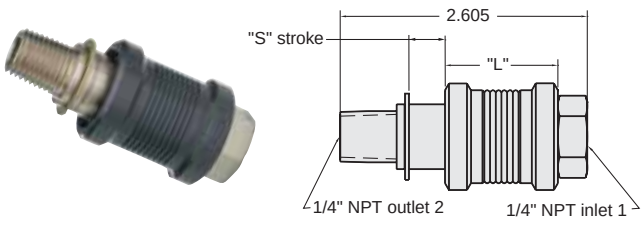
2-Way or 3-Way Sleeve Valves



Air Flow: 1/8" NPT: 43 SCFM @ 100 psig

Order No.	Type	Inlet	"L"	"S"
JSLV-2-M2F2	.2-Way	1/8 Male Pipe	.1.155"	.0.260"
JSLV-3-M2F2	.3-Way	1/8 Male Pipe	.1.030"	.0.385"

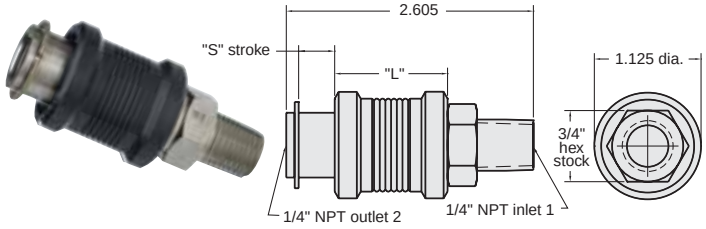
2-Way or 3-Way Sleeve Valves



Air Flow: 1/4" NPT: 70 SCFM @ 100 psig

Order No.	Type	Inlet	"L"	"S"
JSLV-2-F4M4	2-Way	.1/4 Female Pipe	.1.325"	.0.305"
JSLV-3-F4M4	3-Way	.1/4 Female Pipe	.1.190"	.0.460"

2-Way or 3-Way Sleeve Valves



Air Flow: 1/4" NPT: 70 SCFM @100 psig

Order No.	Type	Inlet	"L"	"S"
JSLV-2-M4F4	.2-Way	.1/4 Male Pipe	.1.325"	.0.305"
JSLV-3-M4F4	.3-Way	.1/4 Male Pipe	.1.190"	.0.460"

Miniature Pressure Regulators

Regulators are offered in either relieving or non-relieving versions. The relieving design maintains a constant pressure output even when downstream conditions change. As downstream pressure increases due to reduced flow, this increased pressure overcomes the regulator piston and the pressure is relieved to atmosphere to maintain a constant output pressure.

The non-relieving regulator does not automatically compensate for changes in downstream flow or pressure. There is no vent to atmosphere, as in a relieving type regulator, and the output pressure can increase due to a downstream flow.

- Panel mounting permits unit to be located with other controls on a control console or panel board for pilot operation of larger regulators or for remote control; mounting nuts and lockwashers furnished
- Small, compact - ideal for mounting on individual jigs and fixtures as well as in control circuits

Medium: Air

Materials: Brass body, Buna-N seals, stainless steel stem and spring

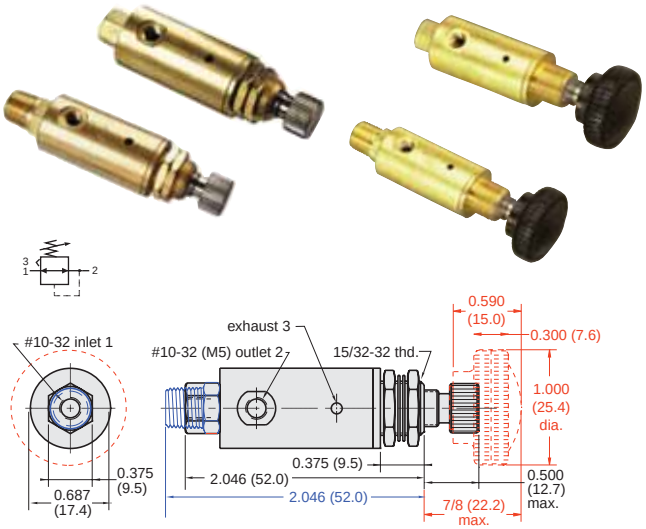
Air Flow: 3 SCFM @ 50 psig; 5 SCFM @ 100 psig; 120 l/min. @ 6 bar

Input Pressure: 300 psig/21 bar max.

Mounting: 15/32-32 thread. Nuts and lockwashers furnished

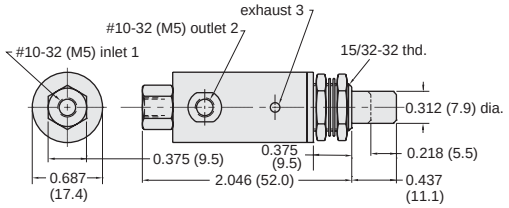
Adjustment: By means of a knob with micro-adjustment (40 pitch thd.)

Adjustable Pressure Regulators



Range (psig/bar)	#10-32	Knob	1/8" NPT	Non-Relieving	M5
0-20/1.4	MAR-1-2	MAR-1K-2	MAR-1P-2	MAR-1NR-2	MAR-1-2-M5
0-30/2.1	MAR-1-3	MAR-1K-3	MAR-1P-3	MAR-1NR-3	MAR-1-3-M5
0-40/2.8	MAR-1-4	MAR-1K-4	MAR-1P-4	MAR-1NR-4	MAR-1-4-M5
0-50/3.4	MAR-1-5	MAR-1K-5	MAR-1P-5	MAR-1NR-5	MAR-1-5-M5
0-60/4.1	MAR-1-6	MAR-1K-6	MAR-1P-6	MAR-1NR-6	MAR-1-6-M5
0-70/4.8	MAR-1-7	MAR-1K-7	MAR-1P-7	MAR-1NR-7	MAR-1-7-M5
0-100/6.9	MAR-1	MAR-1K	MAR-1P	MAR-1NR	MAR-1-M5

Plunger-Type Pressure Regulators



Plunger Travel: 7/32"

Force For Full Stem Travel: 25 lb nominal

Operation: As plunger is depressed pressure increases proportionally to the travel; when plunger is released the input is closed and the output pressure is exhausted to atmosphere

Range (psig/bar)*	#10-32	1/8" NPT	M5
0-20/1.4	MAR-1C-2	MAR-1CP-2	MAR-1C-2-M5
0-30/2.1	MAR-1C-3	MAR-1CP-3	MAR-1C-3-M5
0-40/2.8	MAR-1C-4	MAR-1CP-4	MAR-1C-4-M5
0-50/3.4	MAR-1C-5	MAR-1CP-5	MAR-1C-5-M5
0-60/4.1	MAR-1C-6	MAR-1CP-6	MAR-1C-6-M5
0-70/4.8	MAR-1C-7	MAR-1CP-7	MAR-1C-7-M5
0-100/6.9	MAR-1C	MAR-1CP	MAR-1C-M5

* Outlet pressure is based on 7/32" stem travel. If stem is depressed further, the outlet pressure will increase.

Three varieties of check valves are offered by Clippard. Each permits flow in one direction only. All have bright-dipped brass bodies that provide in-line mounting, Buna-N seals and stainless steel springs as standard. The MCV-2 has #10-32 (M5) ports and a "duckbill" seal. The MCV-1 series has #10-32 (M5) ports and a brass poppet. The MJCV-1 series has 1/8" NPT (G1/8) ports and a Delrin® poppet.

Materials: Brass body, Buna-N seals, stainless steel stem and spring

Medium: Air or Hydraulic

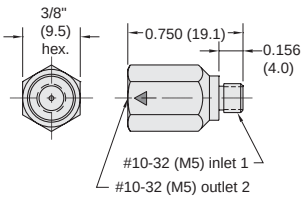
Input Pressure: 300 psig/21 bar max.

Pressure To Open: Cracks at approx. 1/2 psig

Mounting: Direct or inline

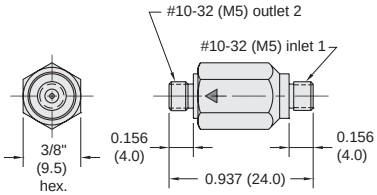
Flow Direction: Arrow on valve body indicates direction of flow

Note: Not intended for pressure relief



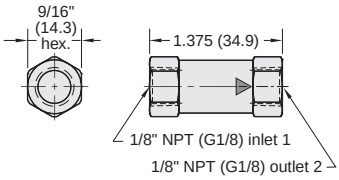
Part No.
MCV-1
MCV-1-M5

Air Flow: 6.5 SCFM @ 50 psig; 11.5 SCFM @ 100 psig; 280 l/min @ 6 bar



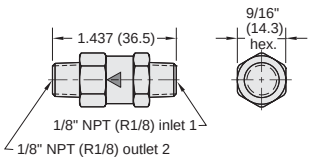
Part No.
MCV-1AA
MCV-1AA-M5

Air Flow: 6.5 SCFM @ 50 psig; 11.5 SCFM @ 100 psig; 280 l/min @ 6 bar



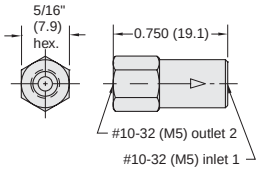
Part No.
MJCV-1
MJCV-1-MG

Air Flow: 20 SCFM @ 50 psig; 36 SCFM @ 100 psig; 580 l/min @ 6 bar



Part No.
MJCV-1AA
MJCV-1AA-MR

Air Flow: 20 SCFM @ 50 psig; 36 SCFM @ 100 psig; 580 l/min @ 6 bar



Medium: Air

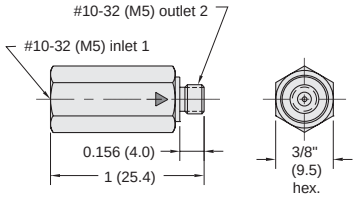
Input Pressure: 100 psig/21 bar max.

Air Flow: 1 SCFM @ 50 psig;
28 l/min @ 3.5 bar

Pressure To Crack: 1 psig

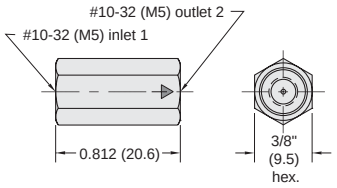
Pressure To Fully Open: 2.5

Part No.
MCV-2
MCV-2-M5



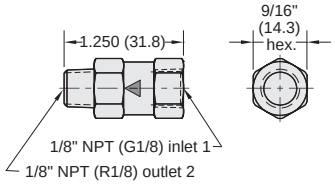
Part No.
MCV-1AB
MCV-1AB-M5

Air Flow: 6.5 SCFM @ 50 psig; 11.5 SCFM @ 100 psig; 280 l/min @ 6 bar



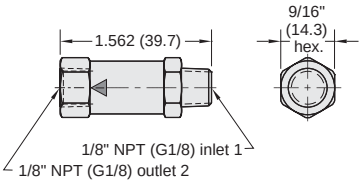
Part No.
MCV-1BB
MCV-1BB-M5

Air Flow: 6.5 SCFM @ 50 psig; 11.5 SCFM @ 100 psig; 280 l/min @ 6 bar



Part No.
MJCV-1AB
MJCV-1AB-MR

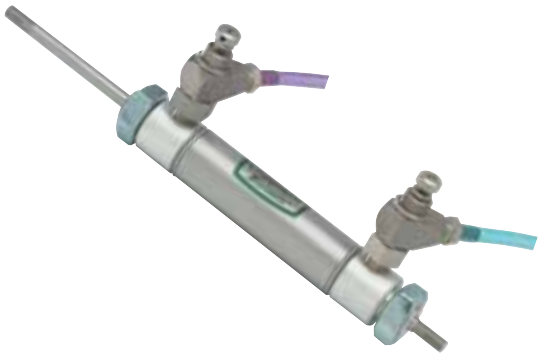
Air Flow: 20 SCFM @ 50 psig; 36 SCFM @ 100 psig; 580 l/min @ 6 bar

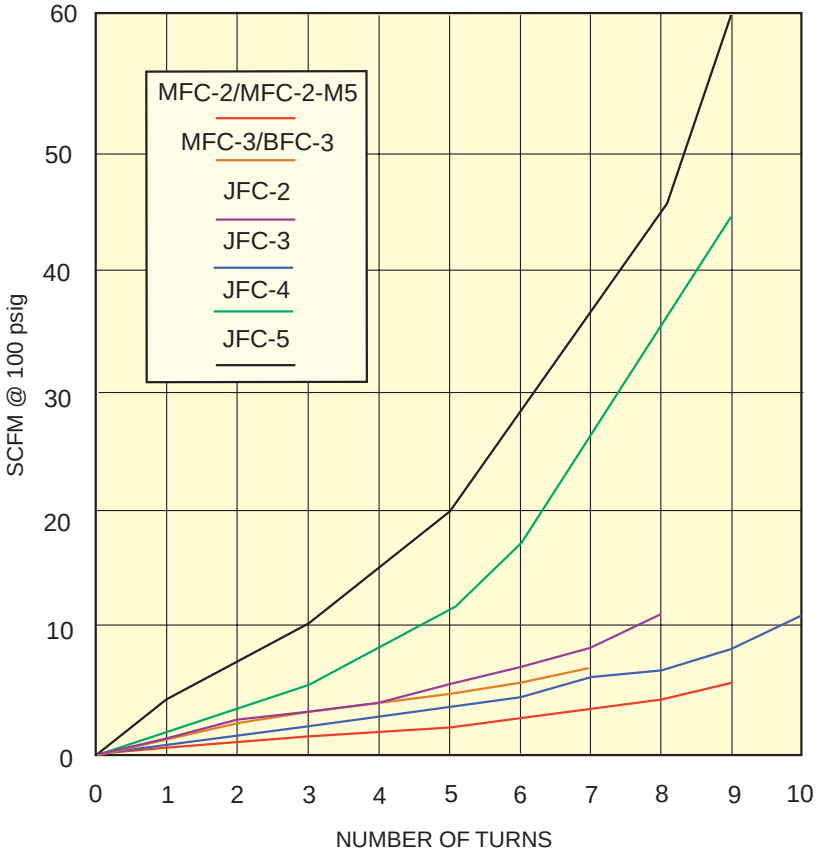


Part No.
MJCV-1BA
MJCV-1BA-MG

Air Flow: 20 SCFM @ 50 psig; 36 SCFM @ 100 psig; 580 l/min @ 6 bar

Flow Controls
Flow vs. Needle Turns



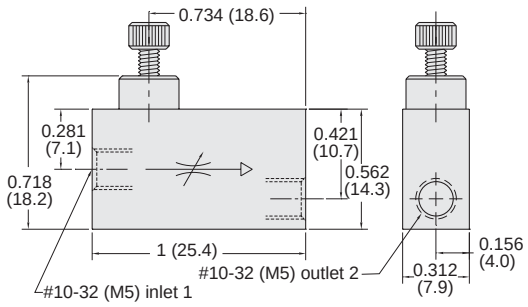


Clippard offers five models of adjustable flow controls with #10-32 through 3/8" NPT ports. They feature a combination needle and check valve that controls flow in one direction and allows free flow in the opposite direction.

They are an ideal valve for use with a cylinder, providing a slow extend stroke while allowing a fast retract stroke. The chart on this page illustrates the flow versus the number of needle adjustments turns for the MFC-2, MFC-2-M5, MFC-3, BFC-3, JFC-2, JFC-3, JFC-4 and JFC-5.

Medium: Air, Water or Oil

Adjustable Flow Control Valve



Materials: Brass body and stainless steel needle; Buna-N seals

Input Pressure: 300 psig max.

Air Flow: 4 SCFM max. @ 50 psig; 7 SCFM max. @ 100 psig

Pressure To Open: Cracks at approx. 2 psig

Mounting: Inline

Flow Direction: Arrow in valve body shows direction of controlled flow

Adjustment: Knurled knob on needle shaft

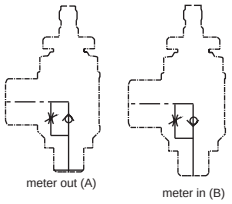
Part No.	Description
MFC-2	Adjustable Flow Control Valve, #10-32
MFC-2-M5	Adjustable Flow Control Valve, M5

Input Pressure: 150 psig max.

Air Flow: 5 SCFM @ 100 psig adjustable

Mounting: Directly into #10-32 port

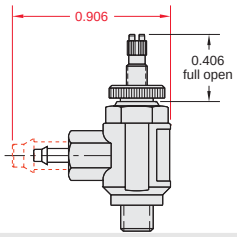
Ports: Rotating input port allows 360˚ positioning #10-32 port



Flow Direction: Arrow on valve body shows direction of controlled flow

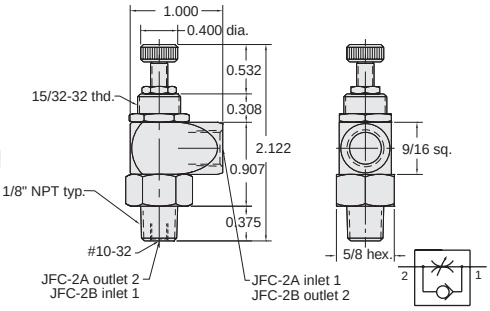
Adjustment: Screwdriver slot; slotted knurled knob with lock nut on #10-80 threaded needle shaft for fine adjustment; or recessed slotted needle

#10-32 Valves, Screwdriver Slot



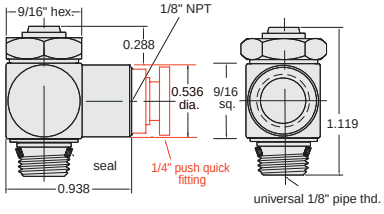
Part No.	Description
MFC-3A	Meter Out Control Valve, #10-32 Female Side Port
MFC-3A1	Meter Out Control Valve, 1/16” Barb Side Port
MFC-3A2	Meter Out Control Valve, 1/8” Barb Side Port
MFC-3B	Meter In Control Valve, #10-32 Female Side Port
MFC-3B1	Meter In Control Valve, 1/16” Barb Side Port
MFC-3B2	Meter In Control Valve, 1/8” Barb Side Port

1/8” NPT Control Valves, Knurled Knob



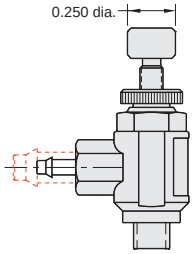
Part No.	Description
JFC-2A	Meter Out Control Valve, 1/8” NPT
JFC-2B	Meter In Control Valve, 1/8” NPT

1/8” NPT Valves, Recessed Needle



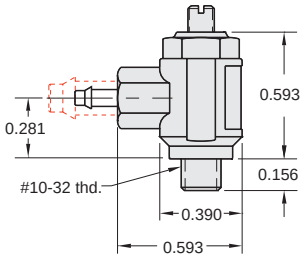
Part No.	Description
JFC-3AR	Meter Out Control Valve, 1/8” NPT
JFC-3BR	Meter In Control Valve, 1/8” NPT
JFC-3AP08	Meter Out Control Valve, 1/4” Push-Quick Fitting
JFC-3BP08	Meter In Control Valve, 1/4” Push-Quick Fitting

#10-32 Valves, Knurled Knob



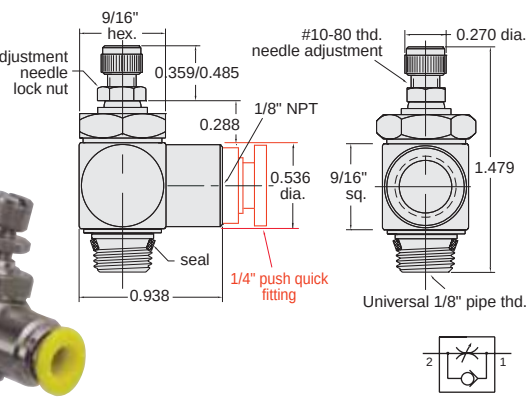
Part No.	Description
MFC-3AK	Meter Out Control Valve, #10-32 Female Side Port
MFC-3AK1	Meter Out Control Valve, 1/16” Barb Side Port
MFC-3AK2	Meter Out Control Valve, 1/8” Barb Side Port
MFC-3BK	Meter In Control Valve, #10-32 Female Side Port
MFC-3BK1	Meter In Control Valve, 1/16” Barb Side Port
MFC-3BK2	Meter In Control Valve, 1/8” Barb Side Port

#10-32 Valves, Recessed Needle



Part No.	Description
MFC-3AR	Meter Out Control Valve, #10-32 Female Side Port
MFC-3AR1	Meter Out Control Valve, 1/16” Barb Side Port
MFC-3AR2	Meter Out Control Valve, 1/8” Barb Side Port
MFC-3BR	Meter In Control Valve, #10-32 Female Side Port
MFC-3BR1	Meter In Control Valve, 1/16” Barb Side Port
MFC-3BR2	Meter In Control Valve, 1/8” Barb Side Port

1/8” NPT Valves, Knurled Knob



Part No.	Description
JFC-3A	Meter Out Control Valve, 1/8” NPT
JFC-3B	Meter In Control Valve, 1/8” NPT
JFC-3AP08	Meter Out Control Valve, 1/4” Push-Quick Fitting
JFC-3BP08	Meter In Control Valve, 1/4” Push-Quick Fitting

Flow Control Valves

These combination needle and check valve flow controls are typically used to control air flow from air cylinders, thereby controlling the speed at which the piston strokes, either while extending or retracting, depending on their location in the circuit.

J-Series Flow Control Valves allow free flow in one direction. In the opposite direction the flow is metered by the needle valve.

Models listed in the chart have either a 1/4" NPT (JFC-4) or 3/8" NPT (JFC-5) male threaded outlets, recessed screwdriver slot (R) or knurled knob (K) flow adjustment needles and female NPT or push-to-connect tubing (Push-Quick) inlets. The P08 models features a 1/4" Push-Quick fitting, and the P12 versions have a 3/8" Push-Quick fitting.

Medium: Air, Water or Oil

Material: Electroless nickel plated brass needle and stem, anodized aluminum body, Buna-N seals

Input Pressure: 150 psig max.

Air Flow: JFC-4 - 45 SCFM @ 100 psig adjustable
JFC-5 - 60 SCFM @ 100 psig adjustable

Mounting: Directly into cylinder. Panel or inline.

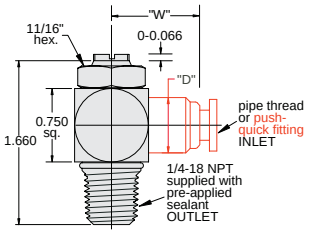
Ports: Rotating input port allows 360° positioning 1/8" NPT

Adjustment: Recessed slotted needle or knurled knob

Part #	"D"	"W"
JFC-4K & JFC-4R	0.710"	0.890"
JFC-4K-P08 & JFC-4R-P08	0.562"	0.890"
JFC-4K-P12 & JFC-4R-P12	0.710"	1.062"
JFC-5K & JFC-5R	0.827"	1.125"
JFC-5K-P12 & JFC-5R-P12	0.750"	1.124"

1/4" NPT Valves, Recessed Needle

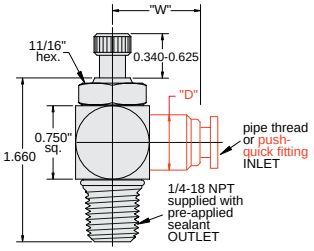
(JFC-4R shown)



Part No.	Description
JFC-4R	Meter Out Control Valve, 1/4" NPT
JFC-4R-P08	Meter Out Control Valve, 1/4" Push-Quick Fitting
JFC-4R-P12	Meter Out Control Valve, 3/8" Push-Quick Fitting

1/4" NPT Valves, Adjusting Knob

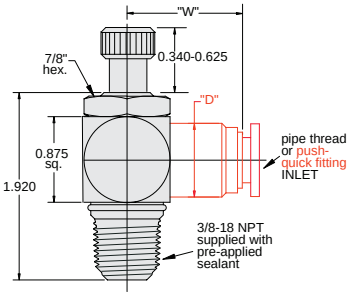
(JFC-4K shown)



Part No.	Description
JFC-4K	Meter Out Control Valve, 1/4" NPT
JFC-4K-P08	Meter Out Control Valve, 1/4" Push-Quick Fitting
JFC-4K-P12	Meter Out Control Valve, 3/8" Push-Quick Fitting

3/8" NPT Valves, Adjusting Knob

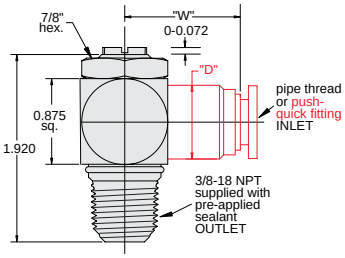
(JFC-5K-P12 shown)



Part No.	Description
JFC-5K	Meter Out Control Valve, 3/8" NPT
JFC-5K-P12	Meter Out Control Valve, 3/8" Push-Quick Fitting

3/8" NPT Valves, Recessed Needle

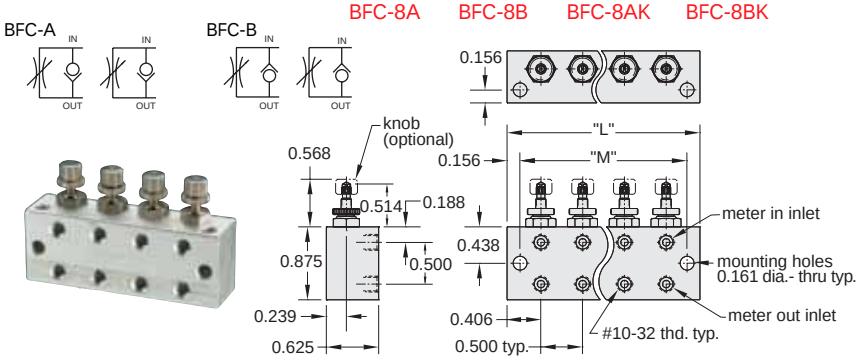
(JFC-5R-P12 shown)



Part No.	Description
JFC-5R	Meter Out Control Valve, 3/8" NPT
JFC-5R-P12	Meter Out Control Valve, 3/8" Push-Quick Fitting

Block Flow Controls

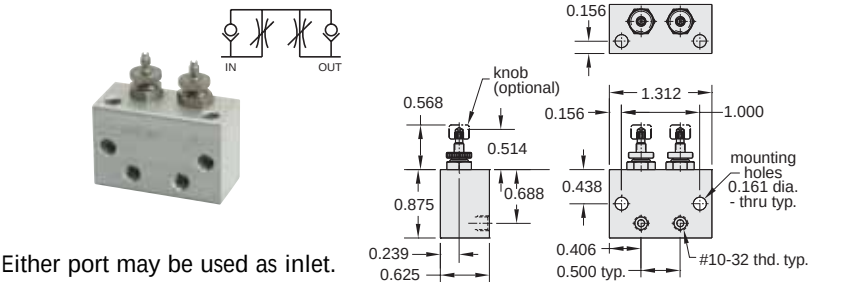
BFC-2A BFC-2B BFC-2AK BFC-2BK
BFC-4A BFC-4B BFC-4AK BFC-4BK
BFC-6A BFC-6B BFC-6AK BFC-6BK
BFC-8A BFC-8B BFC-8AK BFC-8BK



Block Flow Controls

BFC-2C BFC-2CK

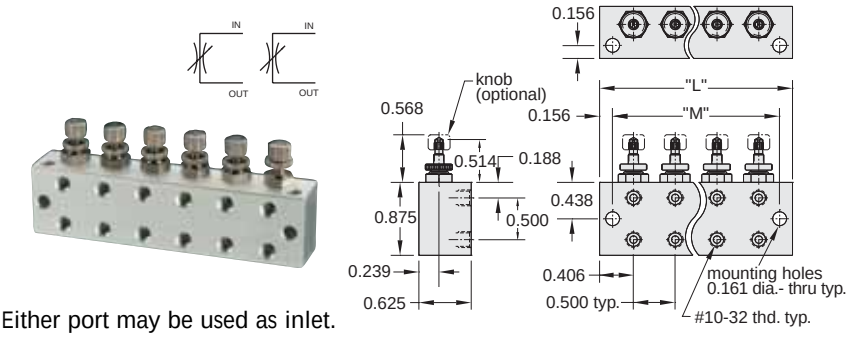
(2) Valves common meter in and meter out.



Either port may be used as inlet.

Block Needle Valves

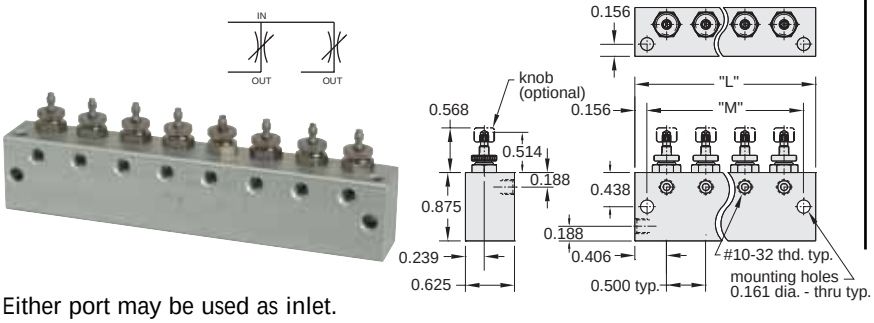
BNV-2N BNV-4N BNV-6N BNV-8N
BNV-2NK BNV-4NK BNV-6NK BNV-8NK



Either port may be used as inlet.

Block Needle Manifolds

BNM-2N BNM-4N BNM-6N BNM-8N
BNM-2NK BNM-4NK BNM-6NK BNM-8NK



Either port may be used as inlet.

Precision flow controls and needle valves available in blocks for rigid mounting.

Specification same as MFC-3

Clippard's block flow control and needle valves have a variety of features that offer extra versatility for unique applications. These precision made valves offer high performance, low cost, reliability and ease of installation. Each valve is independent of the other (except the BFC-2C), sharing only a common body. This allows separate pressures and/or gases to be used while simplifying mounting. Each needle adjustment is smooth, exact, and includes a locking ring to prevent tampering. The valve body is machined and anodized aluminum; the compound angle needle stems are machined from 303 stainless steel; the valve sleeve is electroless nickel plated brass; and the seals are Buna-N rubber. Block flow controls and needle valves are ideal for controlling double acting cylinders.

FC - Flow Control
NV - Needle Valve
NM - Needle Manifold

B ❑ - ❑ ❑ ❑

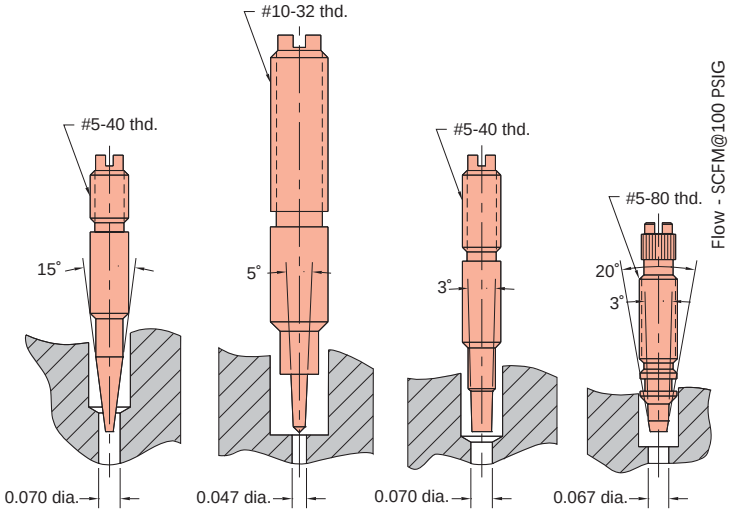
Block

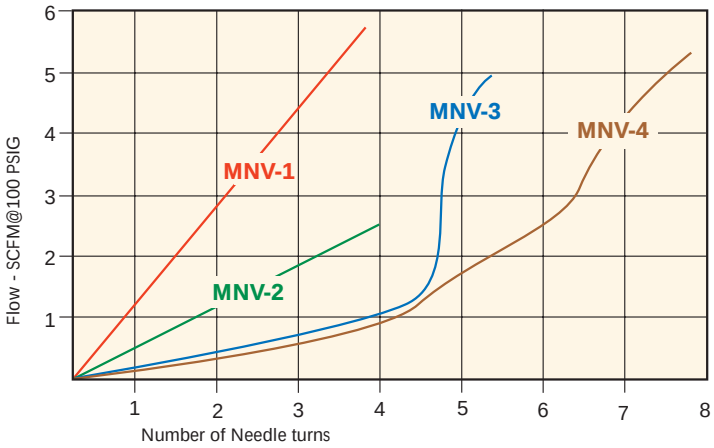
Number of stations
2 - 2 stations
4 - 4 stations
6 - 6 stations
8 - 8 stations

A - meter out flow
B - meter in flow
C - 2 valves common meter in and meter out
N - needle valve

Adjustment type
Blank - screwdriver slot
K - adjustment knob

Number of Stations "X"	"L"	"M"
2	1.312	1.000
4	2.312	2.000
6	3.312	3.000
8	4.312	4.000





Adjustable control needle valves restrict flow in both directions. There are (4) four models offered by Clippard, all with #10-32 ports, but with various needle configurations to provide coarse or fine flow adjustment. The diagram of needle shapes and the chart on this page show the difference between these models.

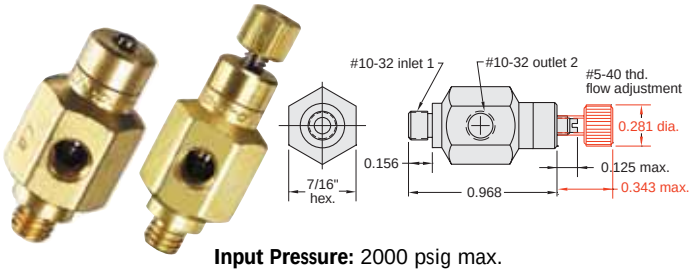
Medium: Air, Water or Oil

Materials: Brass body; stainless steel needle; Buna-N seal

Mounting: Direct, inline or #15/32-32 thread nut and lockwashers furnished as illustrated

Adjustment: Knurled knob (clockwise adjustment provides less flow), or Screwdriver slot (clockwise adjustment provides less flow.

15° Needle Valves, #10-32

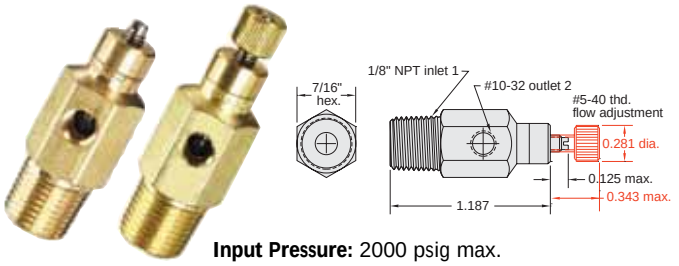


Input Pressure: 2000 psig max.

Air Flow: 3 SCFM @ 50 psig; 6 SCFM @ 100 psig

Part No.	Description
MNV-1	Needle Valve, #10-32, Screwdriver Slot
MNV-1K	Needle Valve, #10-32, Knurled Knob

15° Needle Valves, 1/8" NPT

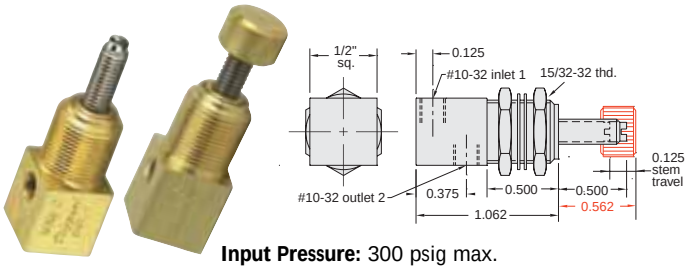


Input Pressure: 2000 psig max.

Air Flow: 3 SCFM @ 50 psig; 6 SCFM @ 100 psig

Part No.	Description
MNV-1P	Needle Valve, 1/8" NPT, Screwdriver Slot
MNV-1KP	Needle Valve, 1/8" NPT, Knurled Knob

5° Needle Valves, #10-32

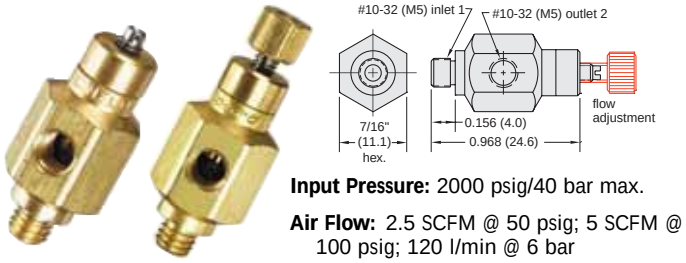


Input Pressure: 300 psig max.

Air Flow: 1 SCFM @ 50 psig; 2.5 SCFM @ 100 psig

Part No.	Description
MNV-2	Needle Valve, #10-32, Screwdriver Slot
MNV-2K	Needle Valve, #10-32, Knurled Knob

3° Needle Valves, #10-32

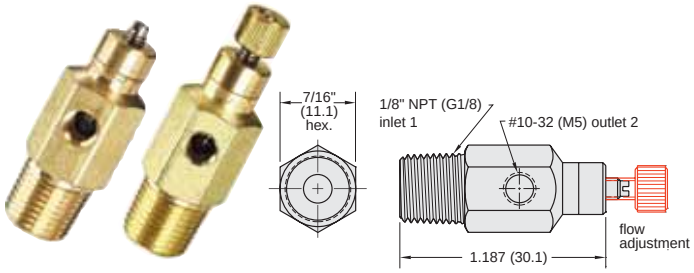


Input Pressure: 2000 psig/40 bar max.

Air Flow: 2.5 SCFM @ 50 psig; 5 SCFM @ 100 psig; 120 l/min @ 6 bar

Part No.	Description
MNV-3	Needle Valve, #10-32, Screwdriver Slot
MNV-3-M5	Needle Valve, M5, Screwdriver Slot
MNV-3K	Needle Valve, #10-32, Knurled Knob
MNV-3K-M5	Needle Valve, M5, Knurled Knob

3° Needle Valves, 1/8" NPT

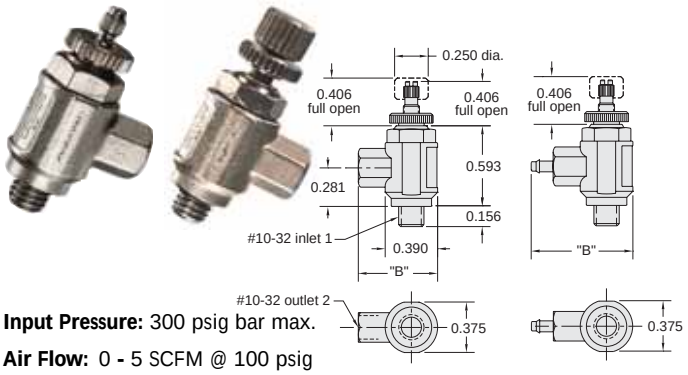


Input Pressure: 2000 psig/40 bar max.

Air Flow: 2.5 SCFM @ 50 psig; 5 SCFM @ 100 psig; 120 l/min @ 6 bar

Part No.	Description
MNV-3P	Needle Valve, #10-32, Screwdriver Slot
MNV-3P-M5	Needle Valve, M5, Screwdriver Slot
MNV-3KP	Needle Valve, #10-32, Knurled Knob
MNV-3KP-M5	Needle Valve, M5, Knurled Knob

3° Needle Valves, #10-32



Input Pressure: 300 psig bar max.

Air Flow: 0 - 5 SCFM @ 100 psig

Part No.	Female Part	"B"	Adjustment
MNV-4	#10-32	0.593	Knurled locking nut standard; screwdriver slot; knurled locking nut standard; clockwise adjustment of either provides less flow
MNV-41	1/16 Barb	0.750	
MNV-42	1/8 Barb	0.906	
MNV-4K	#10-32	0.593	Knurled knob; clockwise adjustment of either provides less flow
MNV-4K1	1/16 Barb	0.750	
MNV-4K2	1/8 Barb	0.906	

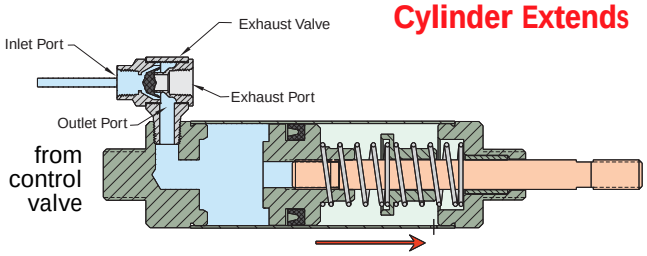
QUICK EXHAUST VALVE APPLICATION

In a typical application the exhaust valve is installed in the inlet of a spring return or double acting pneumatic cylinder.

Supply air from a control valve is directed into the inlet port of the exhaust valve. The Buna-N poppet seals the exhaust port and allows air to flow from the outlet port of the valve into the cylinder.

The pressurized air pushes against the piston and extends the rod, compressing the spring, until full rod extension is achieved.

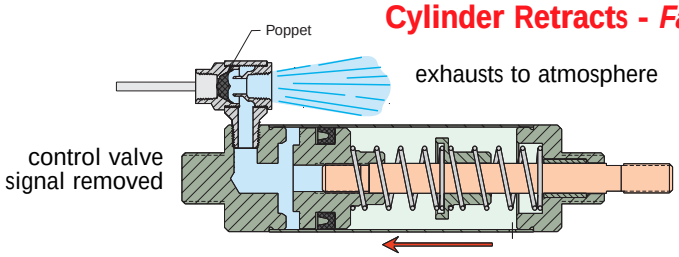
Cylinder Extends



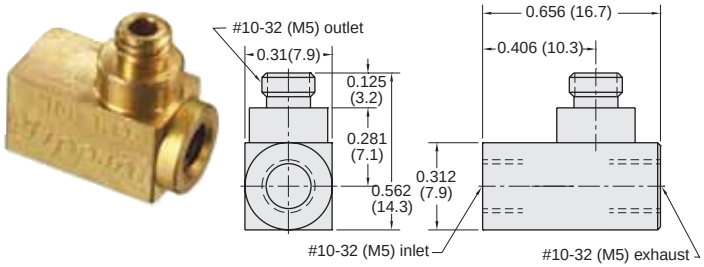
When the control valve exhausts air from the exhaust valve inlet port, the Buna-N poppet shifts to seal the inlet port and open the exhaust port to the cylinder. The pressurized air is allowed to exhaust directly through the exhaust valve to atmosphere.

Normally the air must travel back through the long air line to the control valve to exhaust. By mounting the exhaust valve directly on the cylinder, the piston retracts quickly since the distance to atmosphere is very short and unrestricted.

Cylinder Retracts - *Fast!*



Poppet Quick Exhaust Valve



Part No.	Description
MEV-2	Poppet Type Quick Exhaust Valve, #10-32
MEV-2-M5	Poppet Type Quick Exhaust Valve, M5

Medium: Air

Material: Brass body, Buna-N poppet

Working Range: 15-150 psig/35-10 bar max.

Air Flow: 5 SCFM @ 50 psig; 9 SCFM @ 100 psig (exhaust rate); 220 l/min @ 6 bar

Mounting: Direct to cylinder

Pressure to Shift: @ 50 psig - opens after approx. 5 psig drop; @ 3.5 bar - opens after approx. 0.350 bar drop

Note: Not for use with cylinders larger than 7/8" dia.; moderate strokes up to 10"

J-Series Exhaust Valves

Clippard's J-Series Exhaust Valve offers a variety of design features and provides fast response times and high flow with 1/8" and 1/4" NPT ports. This compact poppet type valve is constructed of brass and is 100% tested to assure the highest quality. The JEV's primary function is to increase cylinder speed. However, it also enables the use of smaller directional valves, longer control lines and can be used as a shuttle valve. 32 versions available.

❑ ❑ ❑ ❑ - ❑ ❑ ❑ ❑

J-Series Exhaust Valve
JEV - Inlet-to-Outlet 90° Orientation
JLEV - Inlet-to-Outlet Inline Orientation

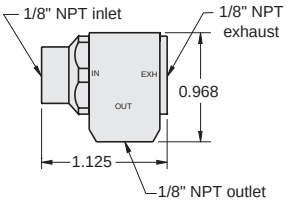
Inlet Thread Type
M - Male Thread
F- Female Thread

Inlet Thread Size
2 - 1/8" NPT
4 - 1/4" NPT

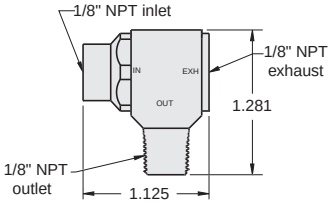
Outlet Thread Type
M - Male Thread
F- Female Thread

Outlet Thread Size
2 - 1/8" NPT
4 - 1/4" NPT

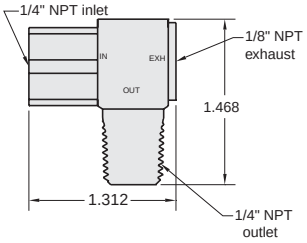
Part No.
JEV-F2F2



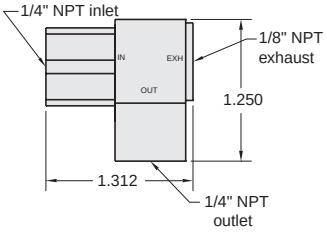
Part No.
JEV-F2M2



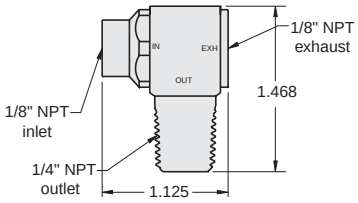
Part No.
JEV-F4M4



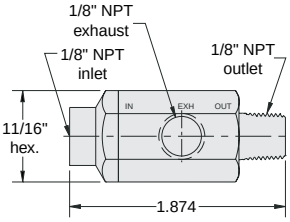
Order Information
JEV-F4F4



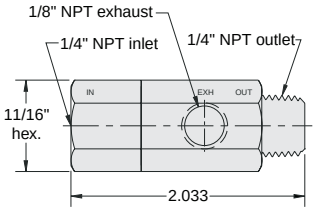
Part No.
JEV-F2M4



Part No.
JLEV-F2M2



Part No.
JLEV-F4M4



Features

- Enables use of smaller control valves
- 15 to 150 psig maximum
- Male outlet offers direct connection to cylinder
- 36 SCFM @ 50 psig and 58 SCFM @ 100 psig
- Low shift ratio
- 7 standard configurations
- Custom configurations also available
- Brass construction with molded Buna-N seal

Shuttle Valves

There are three models of shuttle valves offered by Clippard. These valves feature a shuttle that allows flow from one inlet to the outlet while blocking the other inlet. They may be mounted directly to valves and cylinders or inline using the hose barbs on the MSV models.

Poppet type shuttle (double check) valve. Brass body, and poppet, Buna-N seal

Medium: Air, Water or Oil

Input Pressure: 250 psig/17.5 bar max.

Air Flow: 5.0 SCFM @ 50 psig; 9.5 SCFM @ 100 psig; 230 l/min @ 6 bar

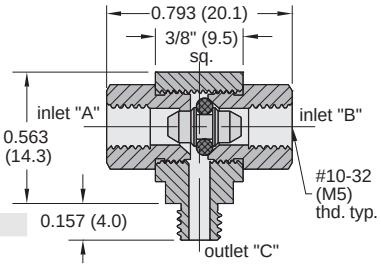
Mounting: Direct or inline

Operation: Flow from "A" to "C" or "B" to "C"

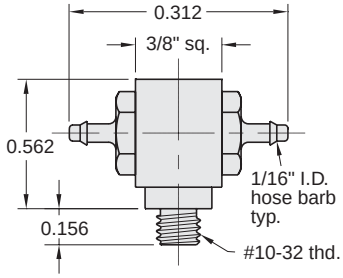
Pressure to Shift: 1/2 psig approx.

Exhaust: Through port where pressure was last applied

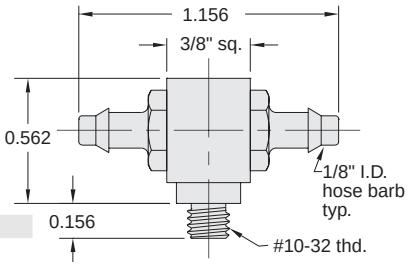
Note: Shuttle valves should not be used as a pressure selector



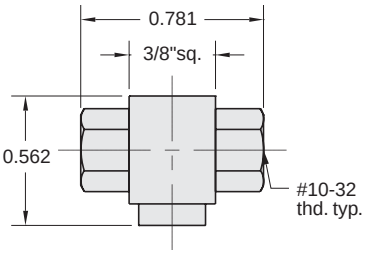
Part No.
MSV-1
MSV-1-M5



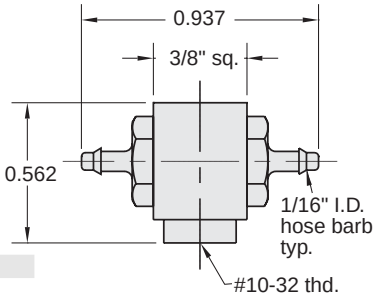
Part No.
MSV-1M22



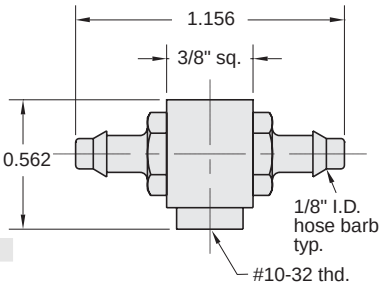
Part No.
MSV-1M44



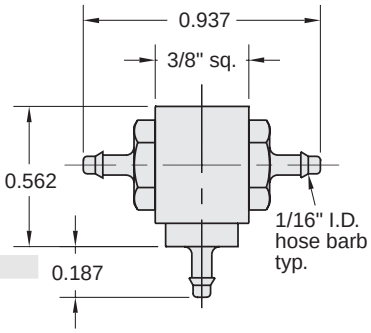
Part No.
MSV-1FFF



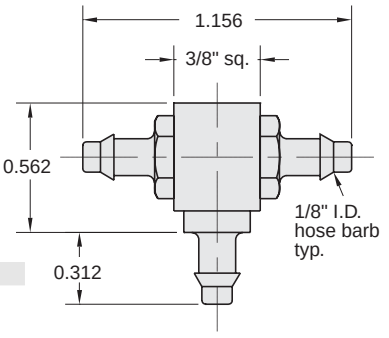
Part No.
MSV-1F22



Part No.
MSV-1F44



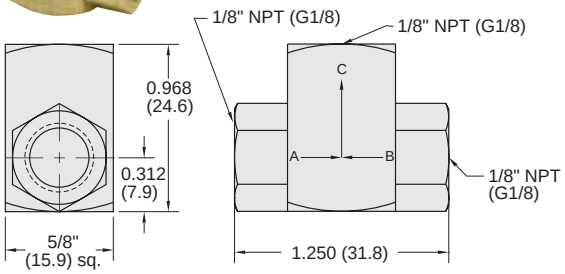
Part No.
MSV-1222



Part No.
MSV-1444

Poppet Type Shuttle Valves

Brass body, Delrin Poppet, Buna-N seal



Medium: Air, Water or Oil

Input Pressure: 300 psig/21 bar - air; 1000 psig/70 bar - hydraulic

Air Flow: 14 SCFM @ 50 psig; 26 SCFM @ 100 psig; 630 l/min @ 6 bar

Mounting: Direct or inline

Operation: Flow from "A" to "C" or "B" to "C"

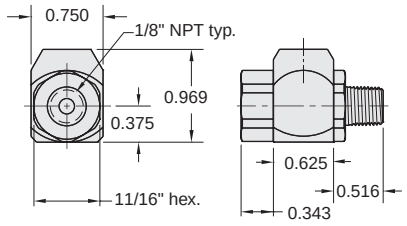
Pressure to Shift: 1/2 psig approx.

Note: Shuttle valves should not be used as a pressure selector

Part No.	Description
MJSV-1	.Poppet Shuttle Valve, 1/8" NPT
MJSV-1-MG	.Poppet Shuttle Valve, G1/8

J-Series Shuttle Valves

Part No.
JSV-2FPF



Poppet type shuttle (double check) valve. Brass body, stainless steel shuttle, Buna-N seal

Medium: Air, Water or Oil

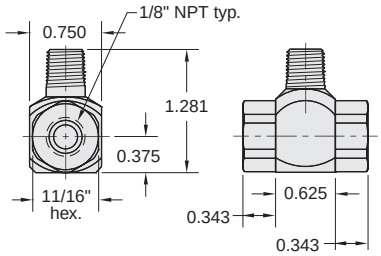
Input Pressure: 300 psig max.

Air Flow: 30 SCFM @ 50 psig
50 SCFM @ 100 psig

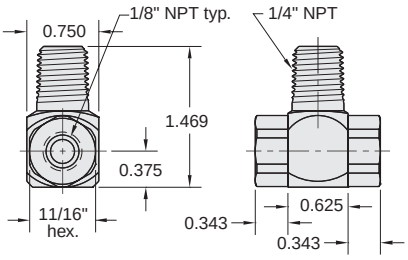
Mounting: Direct or inline

Pressure to Shift: 1 psig approx.

Part No.
JSV-2PFF



Part No.
JSV-2WFF



Part No.
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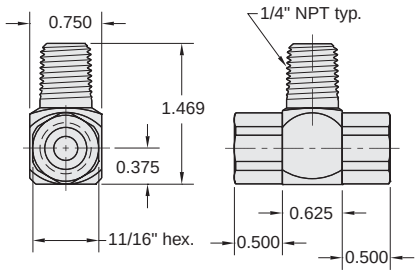
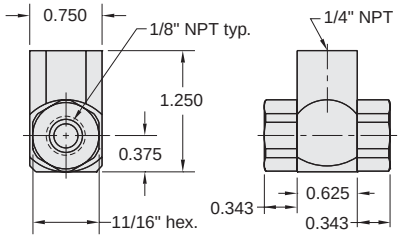


Part No.
JSV-2YFF



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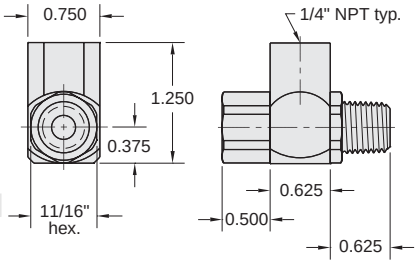
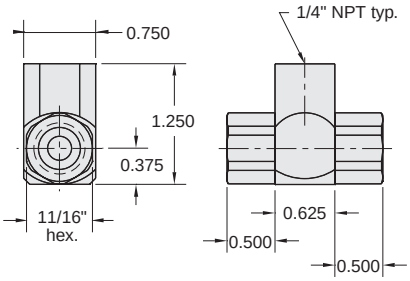


Part No.
JSV-2YYY



Miniature Pulse Valves

A normally open 3-way valve that closes shortly after being pressurized and remains closed until supply pressure is exhausted and repressurized. Widely used in control circuits.

Medium: Air

Input Pressure: 40-150 psig/20 bar max.

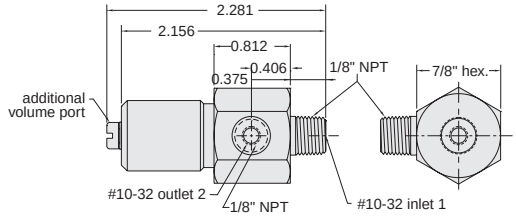
Mounting: 1/8" NPT (G1/8) thread; nut furnished

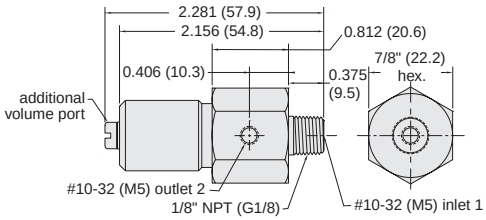
Volume Chamber: #10-32 (M5)

Operation: Converts a continuous supply of inlet air into a pulse of approximately100 milliseconds

Response: 300 cycles per minute; time delay may be increased by adding standard Clippard volume chambers not to exceed 3 cu. in.

Construction: Body - brass, Seals - Buna-N rubber, Spring - stainless steel, Poppet - Delrin®

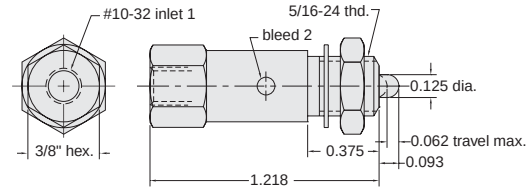


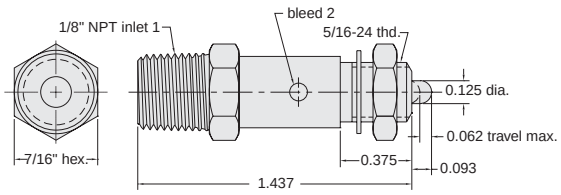


Part No.	Description
PV-1	Pulse Valve, #10-32
PV-1-M5	Pulse Valve, M5 Metric
PV-1P	Pulse Valve, 1/8" NPT

Normally Closed 2-Way Pilot Sensor

For use with pressure piloted control circuits, can repeatedly detect a position within 0.005" properly mounted. In jigs or fixtures it will signal correct position and start-ok to control circuit.





Medium: Air

Stem Travel: 1/16" max. (will open and close in as little as 0.005")

Input Pressure: 300 psig max.

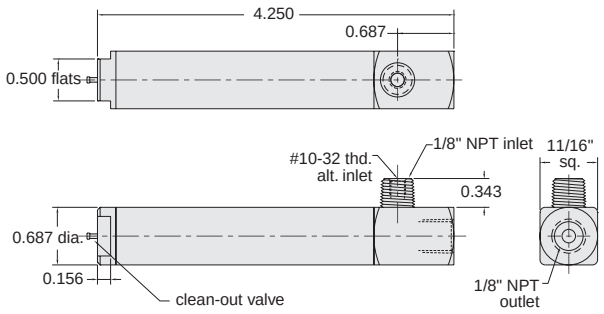
Air Flow: 3 SCFM @ 50 psig; 6 SCFM @ 100 psig

Force For Full Stem Travel: 7 oz. nominal

Mounting: #15/16-24 thread. Nut and lockwashers furnished

Part No.	Description
MPS-2	Poppet Valve with Pilot Sensor, #10-32
MPS-2-P	Poppet Valve with Pilot Sensor, 1/8" NPT

Replaceable Air Filter with Element



Medium: Air Only

Filtration: 35 micron

Input Pressure: 0-250 psig max.

Air Flow: 5.0 SCFM @ 50 psig; 9.0 SCFM @ 100 psig

Material: Brass

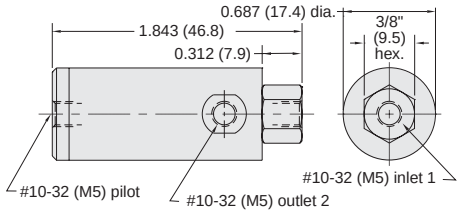
Mounting: Direct or inline

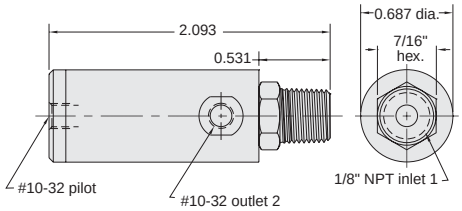
Cleanout: Press clean-out valve stem periodically to remove accumulated water. For complete cleaning, filter body unscrews at point "A" without disturbing piping. DO NOT DISASSEMBLE UNDER PRESSURE. Remove screw and filter element to clean or replace

Part No.	Description
MAF-1	Replaceable Air Filter with Element
12382	Low Pressure Drop, Concentric, Chemically-Inert 35-micron Filter Elements

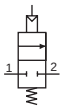
Piloted Actuated Water Drawback Valves

When this normally-closed valve closes a spring biased internal piston draws back a small volume on outlet side (approx. 6-7" in 1/8" I.D. tube) thus preventing overflow or dribbles. Ideal for use in quenching or water spray applications.





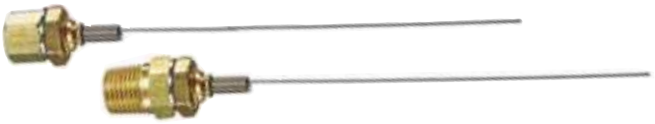
Medium: Water or Other Light Liquids
Input Pressure: 100 psig/10 bar max.
Pilot Pressure: 25 psig min.
Flow: 74 cu. in. H_2O per min. @ 80 psig
Drawback: 0.07 cu. in. (1.2 ml)
Mounting: Mounts inline

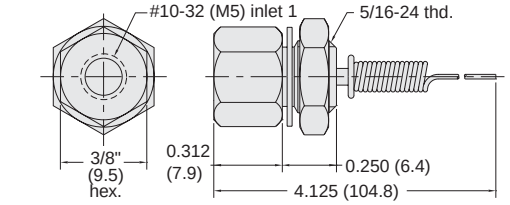


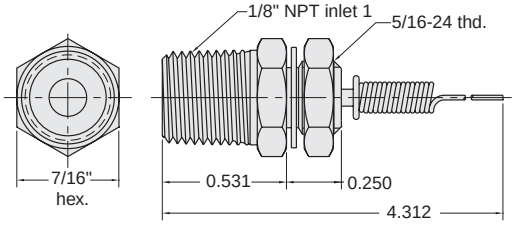
Part No.	Description
WDV-2	Poppet Valve with Air Pilot, #10-32
WDV-2-M5	Poppet Valve with Air Pilot, M5
WDV-2P	Poppet Valve with Air Pilot, 1/8" NPT

2-Way Normally Closed Whisker Valve

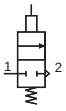
For use with bleed pressure piloted control circuits. Coil spring stainless steel whisker is easily replaceable and can be formed to different shapes.







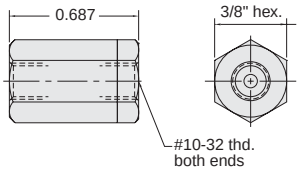
Medium: Air
Input Pressure: 150 psig/10 bar max.
Air Flow: 1.0 SCFM @ 50 psig; 1.5 SCFM @ 100 psig
Force For Full Stem Travel: 1/4 oz. approx.
Mounting: 5/16-24 male thread. Nut and lockwashers furnished
Bleed: To atmosphere around whisker stem
Whisker: Stainless steel, approx. 3" (76.2) length. Replaceable (Part Number 12375)



Part No.	Description
MWV-1	Normally-Closed Whisker Valve, #10-32
MWV-1-M5	Normally-Closed Whisker Valve, M5
MWV-1P	Normally-Closed Whisker Valve, 1/8" NPT

In-Line Fixed Orifice Air Chokes

Each choke is calibrated for precise flow



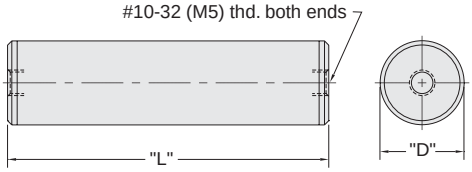
Medium: Air
Material: Brass
Working Range: 0-300 psig max.

Part No.	Description
MAC-A	Air Choke, 0.0135" Hole, Yellow Disk
MAC-B	Air Choke, 0.010" Hole, Green Disk
MAC-C	Air Choke, 0.0075" Hole, Blue Disk
MAC-D	Air Choke, 0.006" Hole, Red Disk

Quality remains a primary feature of every product Clippard produces. This is achieved through the excellence in manufacturing practices and craftsmanship that has continued throughout the years. The company motto—Quality People, Quality Products—emphasizes the important role every employee plays in maintaining the company's reputation.

In-Line Volume Chamber

Used for providing a time delay in pneumatic circuits



Volume CU. IN.	Volume Chamber
0.1	MAT-.1
0.25	MAT-.25
0.50	MAT-.50
1.0	MAT-1.0
1.2	R-821
2.0	MAT-2.0
2.4	R-821 (2)
3.6	R-821 (3)
4.0	MAT-4.0

The time delay of the PV-1, PV-1P and R-711 may be increased by adding standard Clippard volume chambers. The charts show total TIME versus VOLUME for these combinations.

Suffix	Bore	"L"	"D"	Cu.In
0.1	3/8"	1.265"	0.437"	0.1
0.25	3/8"	2.640"	0.437"	0.25
0.5	9/16"	2.390"	0.625"	0.5
1.0	9/16"	4.390"	0.625"	1.0
2.0	15/16"	3.328"	1"	2.0
4.0	15/16"	6.234"	1"	4.0

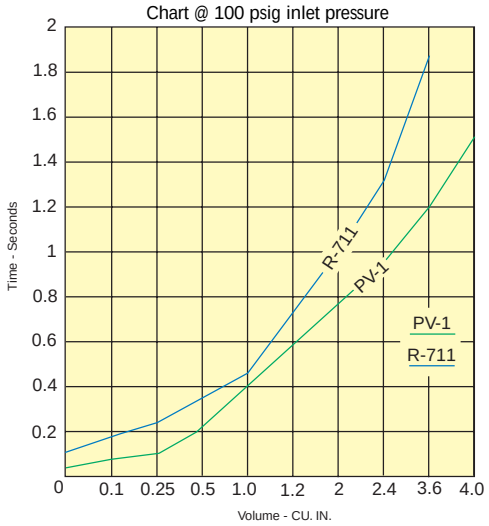
Time in Seconds Volume	PV-1	R-711
0	0.042	0.117
0.1	0.074	0.180
0.25	0.124	0.245
0.5	0.210	0.350
1.0	0.390	0.450
1.2	0.580	0.700
2.0	0.760	1.000
2.4	0.950	1.300
3.6	1.200	1.900
4.0	1.500	N.R.

R-821 volume charts are shown in the Modular Section of this catalog.

Medium: Air only **Material:** Brass

Input Pressure: 150 psig/10 bar max.

Mounting: Direct or inline; Mounting clamp with MAT-20 and MAT-4.0

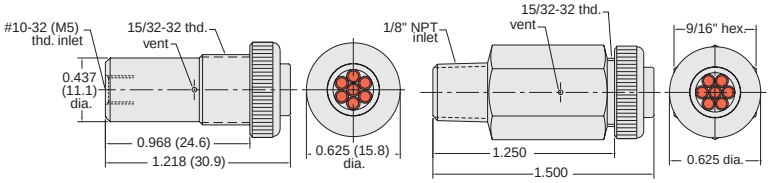


Part No.	Description
MAT-(size)	.In-Line Volume Chamber, #10-32
MAT-(size)-M5	.In-Line Volume Chamber, M5

Specify Size per Chart

Multi-Pin Air Indicator

Plunger type (when extended 7-pin color display signals "on")



Medium: Air Only

Input Pressure: 150 psig/1-10 bar max.

Minimum Actuation Pressure: 15 psig (approx)

Response: Approx. 10 ms @ 50 psig

Filtration: 40 micron recommended

Mounting: IND-3: Panel mount in hole. #15/32-32 nut and lockwasher provided; IND-3P: Direct mount into 1/8" NPT hole

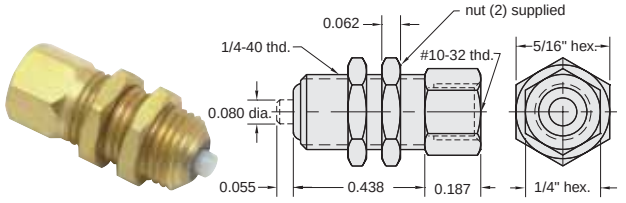
Maximum Panel Thickness: 3/16" (4.8)

Part No.	Description
IND-3-(color)	.Multi-Pin Air Indicator, #10-32
IND-3-M5-(color)	.Multi-Pin Air Indicator, M5
IND-3P-(color)	.Multi-Pin Air Indicator, 1/8" NPT

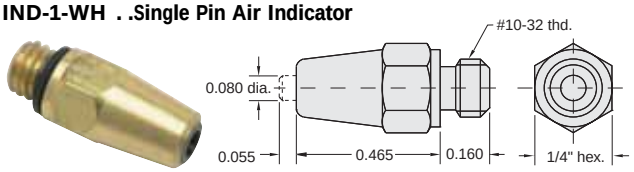
GN-Green, WH-White, RD-Red, YL-Yellow

Single Pin Air Indicator

Plunger type (when extended white pin display signals "on")



Part No.	Description
IND-1-WH	.Single Pin Air Indicator



Part No.	Description
IND-1M-WH	Single Pin Air Indicator

Medium: Air Only

Input Pressure: 150 psig max.

Minimum Actuation Pressure: 12 psig (approx)

Response: Approx. 10 ms @ 50 psig

Filtration: 40 micron recommended

Mounting: IND-1-WH: Panel mount 1/4 dia. hole. 1/4-40 thd. nuts provided. IND-1M-WH: Direct mount into 1/8" NPT hole

Maximum Panel Thickness: 3/16"

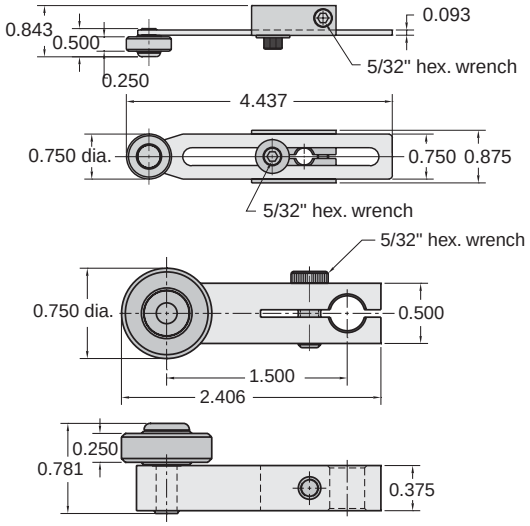
Heavy-Duty Limit Valves

These valves feature rugged construction to withstand heavy use. A zinc alloy die cast actuator head with a hard-ened steel shaft in a bronze bearing is mated to a solid aluminum valve body. Inside is a Clippard series cartridge valve (MJV-2C or 3C, MJVO 2C or 3C) made of brass and stainless steel with Buna-N seals. Valve cartridge is easily replaced in minutes. Three different style actuator arms are available as shown below.

Part No.	Description
LVA-2	**2-Way Poppet Normally-Closed Limit Valve**
LVA-3	**3-Way Poppet Normally-Closed Limit Valve**
LVAO-2	**2-Way Normally-Open Limit Valve**
LVAO-3	**3-Way Normally-Open Limit Valve**

Roller Actuator Arms

Roller Actuator Arms are ideal for Clippard heavy duty air limit valves.



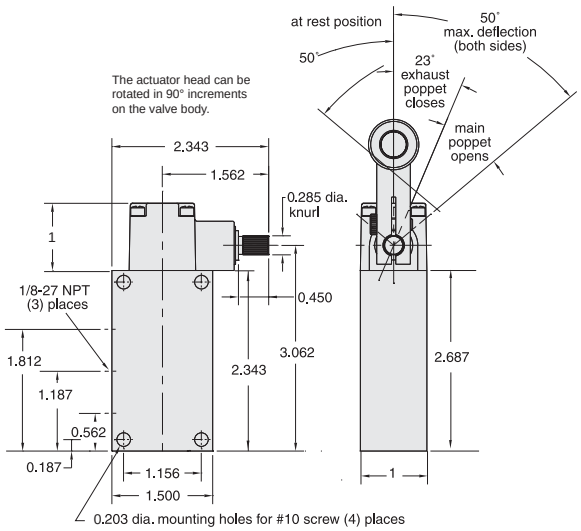
Arm: Aluminum base with steel extendable arm (AR-L only)

Roller: Hardened steel

Adjustment: AR-L only - 1.0 to 3.5 in.

Mounting: Slotted mounting clamp tightens onto limit valve with 5/32" hex. wrench; may be positioned on limit valve shaft in any direction within a 360˚ circle.

Part No.	Description
AR-K	**Roller Actuator Arm**
AR-L	**Roller Actuator Arm, Adjustable**



Medium: Air

Stem Travel: Actuator arm may move 50˚ in either direction

Input Pressure: 300 psig max.

Air Flow: 10 SCFM @ 50 psig; 19 SCFM @ 100 psig

Torque to Actuate: 3 in./lbs.

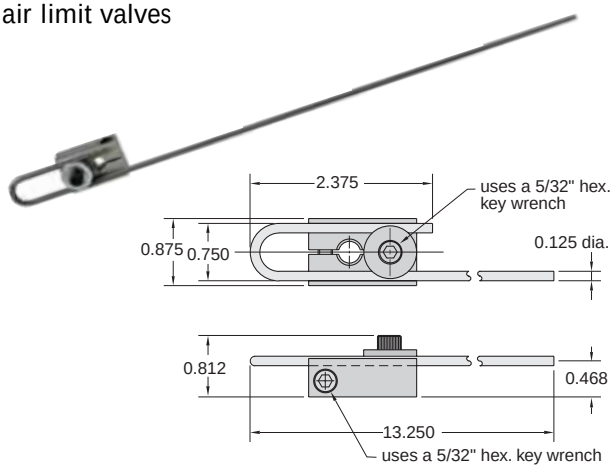
Actuation Range: 0-23˚ Off, 23-50˚ On, Maximum travel 50˚

Mounting: Four 13/64" dia. mounting holes provided in valve body for use with #10 screw, or for tapping 1/4-20 by customer

Ports: Inlet - 1/8-27" NPT, Outlet - 1/8-27" NPT, Exhaust - 1/8-27" NPT for convenience in porting away exhaust air or attaching muffler; it should not be restricted; exhaust port is not used on 2-ways

Adjustable Rod Actuator Arm

Adjustable Rod Actuator Arm for Clippard heavy duty air limit valves



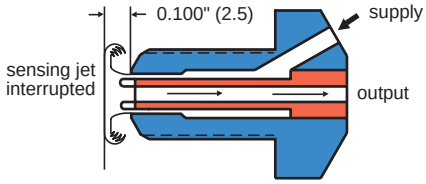
Arm: Steel 1/8" rod 13 inches long retained by screw clamp; the rod may be shortened and/or bent to desired shape

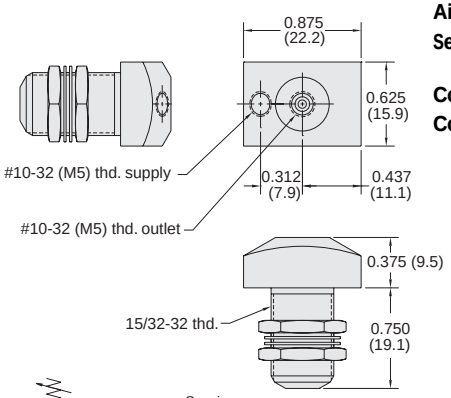
Mounting: Slotted aluminum mounting clamp may be positioned on limit valve shaft in any direction within a 360˚ circle

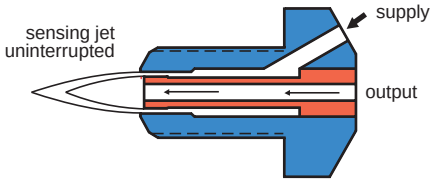
Part No.	Description
AR-M	**Rod Actuator Arm**

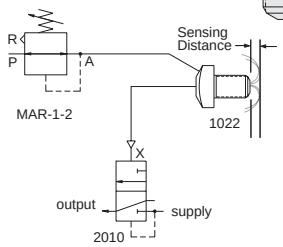
Non-Contact Air Proximity Switch

Non-Contact Air Proximity Switch with no moving parts; will sense any flat or curved object which presents a sensing surface of 1/4" or more to the sensing nozzle









Part No.	Description
1022	**Non-Contact Air Limit Switch, #10-32**
1022-M5 . . .	**Non-Contact Air Limit Switch, M5**

Medium: Air

Input Pressure: 4-10 psig/0.3-0.7 bar

Nominal Proximity Distance: 0.100"

Output Signal at 4 psig supply: Normal: 2" H_2O actuated: 7 1/2" H_2O

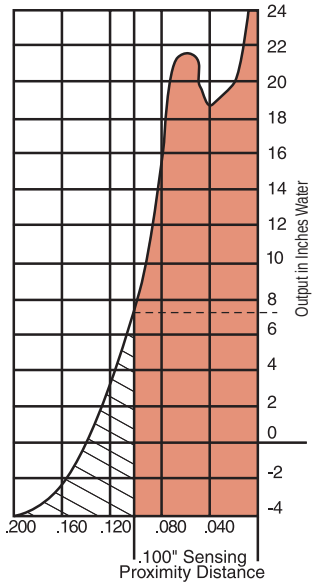
Frequency Response: 500 CPM

Air Consumption: 0.3 SCFM

Sensing Capability: Flat or curved surfaces with 1/8" minimum radius

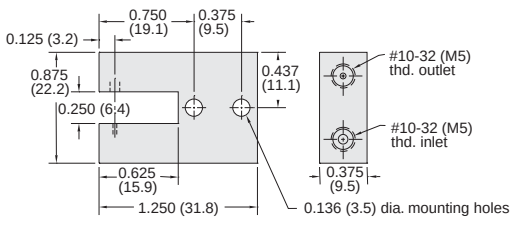
Connections: #10-32 (M5) female

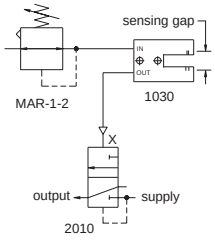
Construction: Solid brass bright dipped

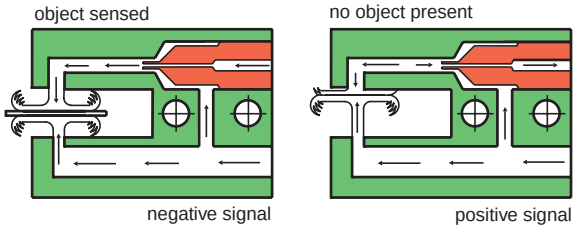


Non-Contact Gap Sensor

Non-Contact Gap Sensor will sense any flat or round object with a 1/32" minimum radius. Produces a positive signal when no object is present and a negative signal when an object interrupts its sensing system







Part No.	Description
1030	**Non-Contact Positive Pressure Sensor, #10-32**
1030-M5 . . .	**Non-Contact Positive Pressure Sensor, M5**

Medium: Air

Input Pressure: 0.5-5 psig

Output: -3" to 26" H_2O @ 4 psig

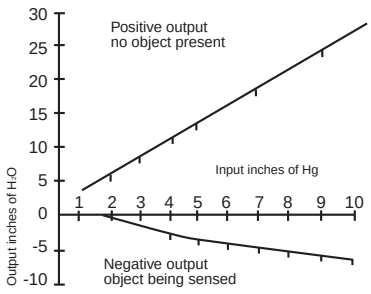
Frequency Response: 1000 cpm

Air Consumption: 1/4 SCFM @ 4 psig

Sensing Capability: Flat or curved surfaces with 1/32" minimum radius. May be used for up to 4" gap with an additional auxiliary jet

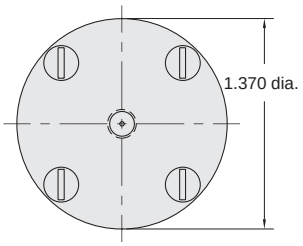
Connections: #10-32 (M5) female

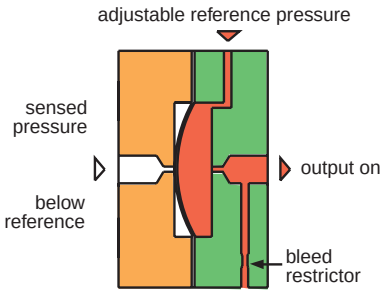
Construction: Solid brass bright dipped

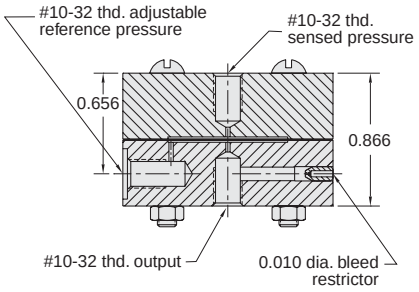


Normally-On Single Stage Pressure Repeater

Normally on Single Stage Pressure Repeater for off-on control of an adjustable reference pressure when a sensed pressure moves above or below the reference pressure level







Medium: Reference pressure - air sensed pressure - Air, gas, or liquid

Input Pressure: 1-150 psig max.

Air Flow: 0.029" orifice

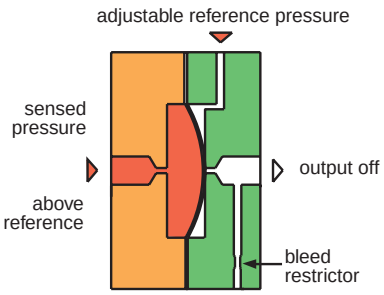
Response Time: 5 ms.

Differential Sensitivity: 2%

Frequency Response: 60 Hz

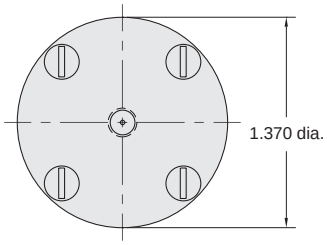
Materials: Anodized aluminum body, Buna-N diaphragms

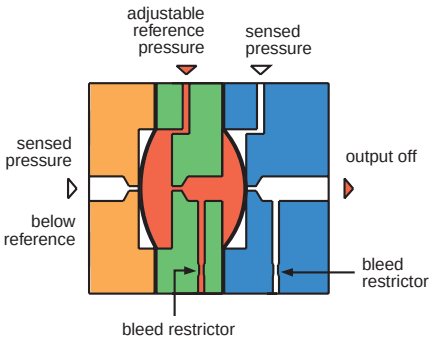
Part No.	Description
1043	**Single Stage Pressure Repeater**

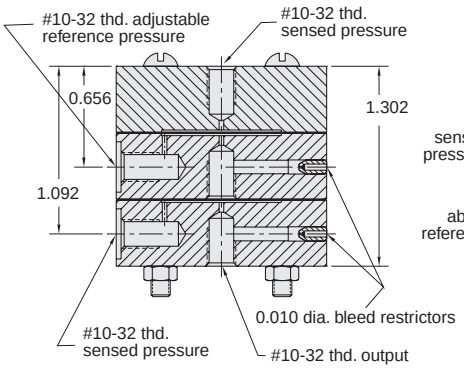


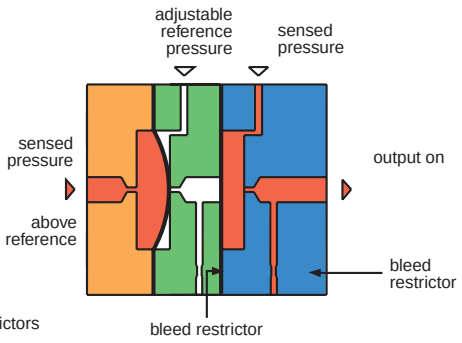
Normally-Off Two Stage Pressure Repeater

Normally Off Two Stage Pressure Repeater for off-on control of an adjustable reference pressure when a sensed pressure moves above or below the reference pressure level









Medium: Reference pressure - air sensed pressure - Air, gas, or liquid

Input Pressure: 1-150 psig max.

Air Flow: 0.029" orifice

Response Time: 5 ms.

Differential Sensitivity: 2%

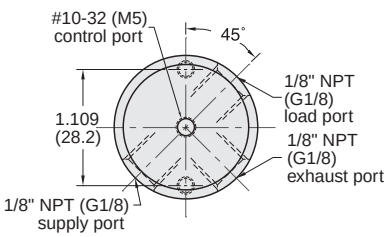
Frequency Response: 60 Hz

Materials: Anodized aluminum body, Buna-N diaphragms

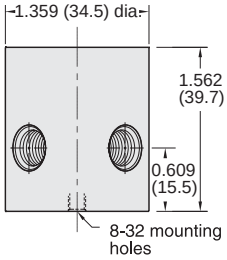
Part No.	Description
1044	**Two Stage Pressure Repeater**

3-Way Normally-Closed Amplifier Valves

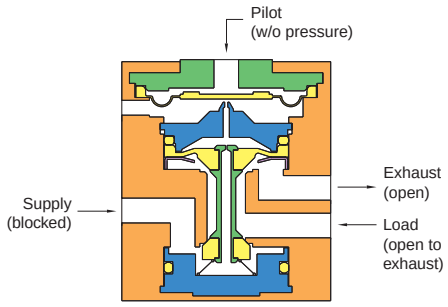
3-Way Valve Normally Closed Interface amplifies very low pressure air-jet sensing signals to working power levels



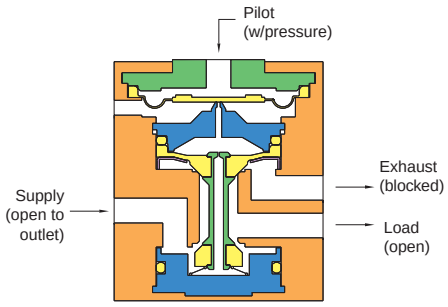
Top View



Side View



Valve Closed



Valve Open

Medium: Air

Material: Anodized aluminum body, Buna-N diaphragms

Input Pressure: 30-100 psig/2-7 bar max.

Air Flow: 22 SCFM @ 100 psig; 530 l/min @ 6 bar

Pilot Pressure: 4" H_2O @ 100 psig

Maximum Allowable Pilot Pressure: 5 psig

Response Time: 10 ms. dead headed

Operating Speed: 50 Hz

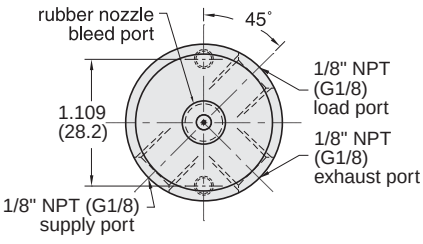
Bleed: 0.1 SCFM @ 100 psig

Ports: Load - 1/8" NPT (G1/8) female
Supply - 1/8" NPT (G1/8) female
Exhaust - 1/8" NPT (G1/8) female
Control - #10-32 (M5) female

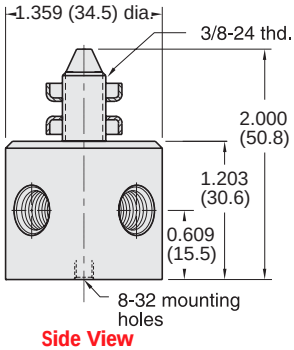
Part No.	Description
2010	**Normally-Closed Interface, 1/8" NPT**
2010-MG . . .	**Normally-Closed Interface, G1/8**

3-Way Bleed Pressure Piloted Limit Valves

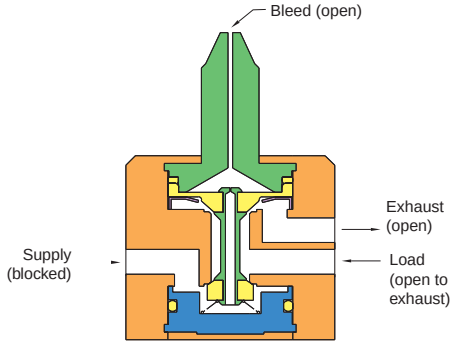
3-Way Bleed Pressure Piloted Limit Valve; blocking of the sensing port causes rapid valve opening



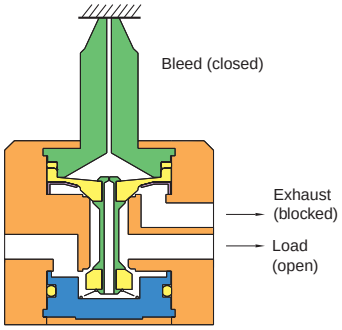
Top View



Side View



Valve Closed



Valve Open

Medium: Air

Material: Anodized aluminum body, Buna-N diaphragms

Input Pressure: 30-100 psig/2-7 bar max.

Air Flow: 22 SCFM @ 100 psig; 530 l/min@ 6 bar

Bleed: 0.1 SCFM @ 100 psig

Response Time: 15 ms.

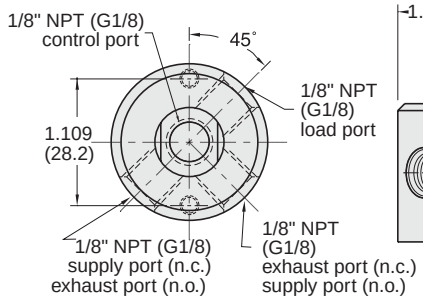
Ports: 1/8" NPT (G1/8)

Note: Supplied with threaded bulkhead mount and integral rubber nozzle for direct actuation by mechanical closure. By removing rubber nozzle and inserting a #10-32 fitting and length of hose, 2011-1 can be converted to a remote sensing valve.

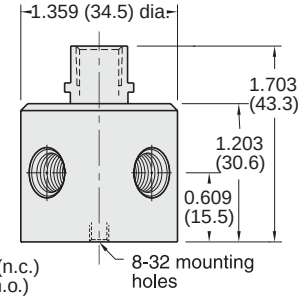
Part No.	Description
2011-1	**Piloted Limit Valve, 1/8" NPT**
2011-1-MG . .	**Piloted Limit Valve, G1/8**

Special Piloted 3-Way Valves

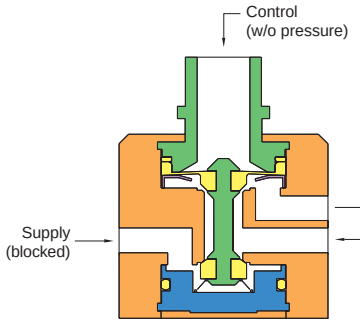
3-Way N.O. or N.C. Air-Piloted Valves



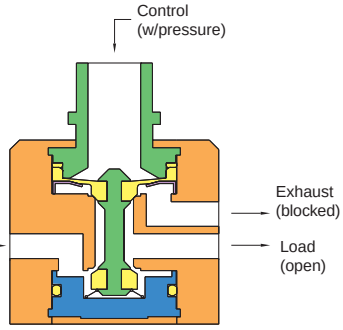
Top View



Side View



Valve Closed



Valve Open

Medium: Air

Material: Anodized aluminum body, Buna-N diaphragms

Input Pressure: 1-100 psig/7 bar max.

Air Flow: 22 SCFM @ 100 psig; 530 l/min @ 6 bar

Bleed: 0.1 SCFM @ 100 psig

Minimum Pilot Pressure:
N.O. - 90% of supply pressure
N.C. - 60% of supply pressure

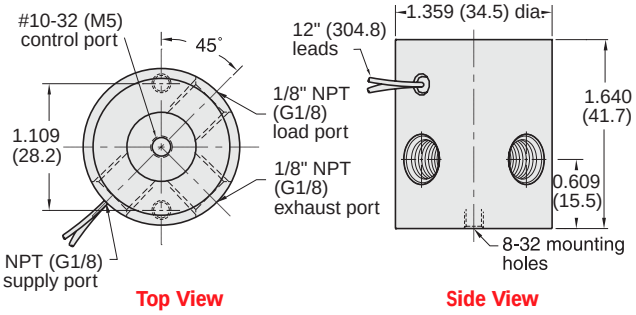
Response Time: 15 ms. after pilot pressure reaches switch point

Operating Speed: 1100 CPM

Part No.	Description
2012	Piloted Valve, 1/8" NPT
2012-MG . . .	Piloted Valve, G1/8
2012-VAC . . .	Valve for Vacuum Operation (requires positive pressure pilot signal)
2012-G	Valve for Liquid Adhesives (silicone diaphragm and seals), 1/8" NPT
2012-G-MG .	Valve for Liquid Adhesives (silicone diaphragm and seals), G1/8

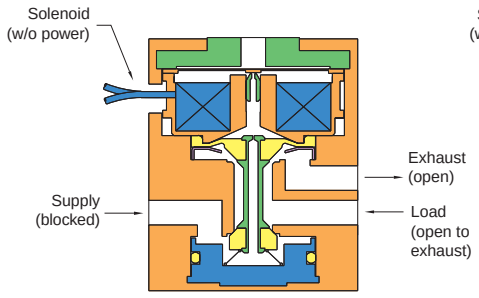
3-Way N.O. or N.C. Electronically Piloted Valves

3-Way Normally Closed Electronic Valve with low-power DC solenoid can be directly converted to high pressure pneumatic power without electronic amplification.

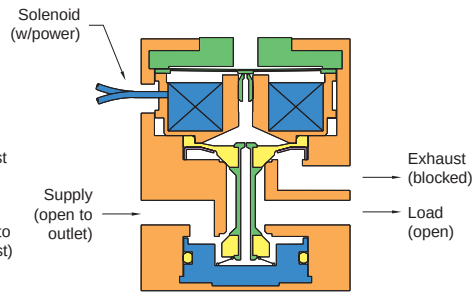


Top View

Side View



Valve Closed



Valve Open

Medium: Air

Material: Anodized aluminum body, Buna-N diaphragms

Input Pressure: 30-100 psig/2-7 bar max.

Air Flow: 22 SCFM @ 100 psig
530 l/min @ 6 bar

Bleed: 0.1 SCFM @ 100 psig

Filtration: 10 micron

Frequency Response: 50 Hz @ 100 psig
70 Hz @ 30 psig

Switching Speed: 10 ms.

Leads: 28 gauge stranded P.V.C. insulated

Continuous Overload: 350% @ 25° C ambient; 250% @ 50° C ambient

Power Consumption: less than 0.50 watts at rated voltage 80 ma. @ 6V
40 ma. @ 12V
20 ma. @ 24V

Part No.	Description
2013-6	Valve, 6 Volts DC, 1/8" NPT
2013-12	Valve, 12 Volts DC, 1/8" NPT
2013-24	Valve, 24 Volts DC, 1/8" NPT
2013-6-MG .	Valve, 6 Volts DC, G1/8
2013-12-MG	Valve, 12 Volts DC, G1/8
2013-24-MG	Valve, 24 Volts DC, G1/8

3-Way Normally-Closed Pressure Piloted Valve

Designed to be piloted by a Clippard EV or ET manifold mount electronic valve. Output from the EV/ET actuates the valve to produce outputs up to 22 SCFM at 100 psig. Combines low wattage, long life and cool running of the EV/ET valves with quick response and high flow of Clippard booster type valves.

The 2020 and 2021 are identical in all respects except one. The 2020 has an external #10-32 (M5) port for the pressure supply to the EV/ET electronic pilot valve. The 2021 has an internal pressure supply to the EV/ET.

Medium: Air

Input Pressure: 30-100 psig/2.7-7 bar max.

Air Flow: 22 SCFM @ 100 psig; 620 l/min @ 6 bar

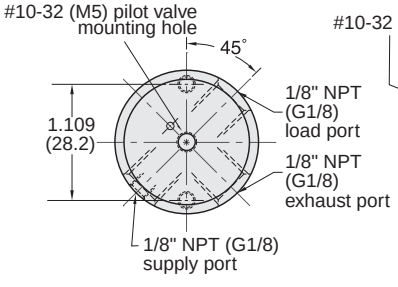
Pilot Pressure: 60% of supply pressure, min.

Response Time: Approx. 20 ms.

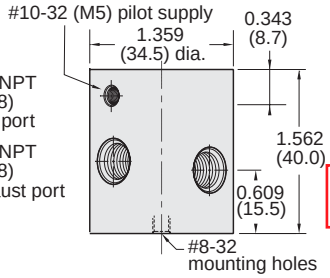
Mounting: Mounting holes provided

Materials: Anodized aluminum, stainless steel

Part No.	Description
2020	**Piloted Valve, 1/8" NPT**
2020-MG	**Piloted Valve, G1/8**
2021	**Piloted Valve, 1/8" NPT**
2021-MG	**Piloted Valve, G1/8**



Top View

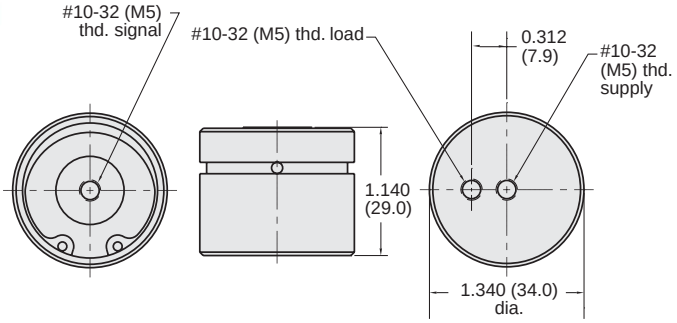


Side View

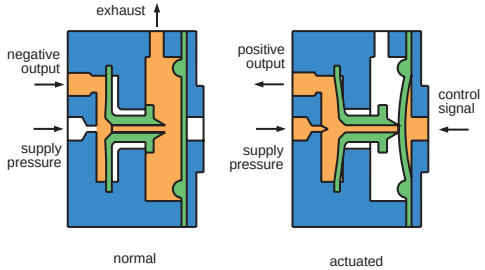
2020 shown with ET Pilot Valve and external pilot supply

Pressure Piloted Snap Action Amplifying Valve

Provides a sharp, clean output signal, even with slow-changing pressure input signals; output is stabilized without chatter or oscillation



Top View | Side View | Bottom View



normal | actuated

Medium: Air

Input Pressure: 3-100 psig/0.2-7 bar max.

Minimum Pilot Pressure: 1.5" H_2O psig

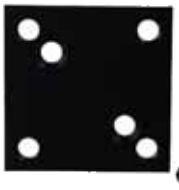
Maximum Pilot Pressure: 1 psig (28" H_2O")

Air Flow: 0.18 SCFM @ 100 psig; 5 l/min @ 6 bar

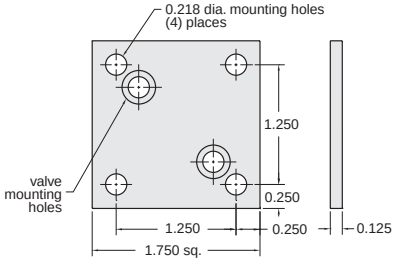
Bleed Orifice Diameter: 0.010"

Part No.	Description
3200-A	**Amplifying Valve, #10-32**
3200-A-M5	**Amplifying Valve, M5**

Flat Bracket



Flat bracket designed to mount 2010, 2011-1, 2012 and 2013 valves

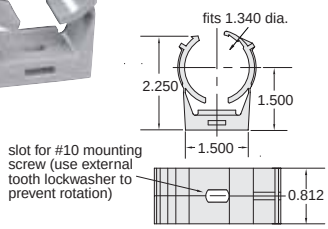


Construction: Black oxide finish, two mounting screws furnished.

Part No.	Description
2010-050	. . .Flat Bracket

Bracket for Action Relays

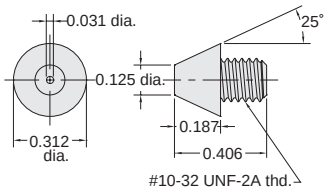
Mounting bracket for 3200-A snap action relays.



Part No.	Description
3200-006	. . .Snap Action Relay Bracket

Rubber Nozzles

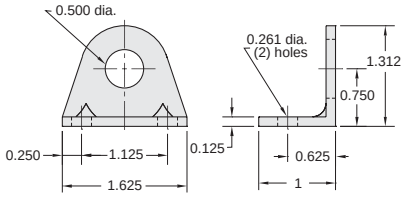
#10-32 rubber nozzles for replacement 2011-1 limit valves. #10-32 thread, five to a package



Part No.	Description
2011-012	. . .Rubber Nozzles

Mounting Bracket, 90°

90˚ angle, heavy duty Mounting Bracket for Clippard miniature valves



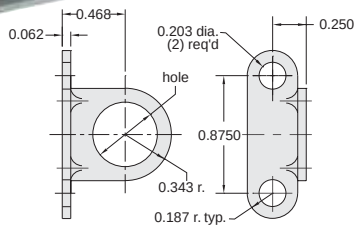
Mounting: 1/2" dia. hole for valve; two 0.261" dia. holes for attaching bracket

Construction: Stamped from 1/8" thick steel zinc plated

Part No.	Description
15018-2	. . . .Mounting Bracket, 90°

Foot Mounting Bracket

90˚ angle, Foot Metal Mounting Bracket for Clippard miniature valves



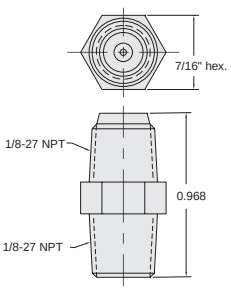
Mounting: 31/64" dia. mounting hole for valve; two 13/64" dia. mounting holes for attaching bracket

Construction: Stamped from 1/16" thick steel, zinc plated

Part No.	Description
11918-1	. . . .Mounting Bracket, 0.484 Hole
11918-2	. . . .Mounting Bracket, 0.328 Hole

1/8" NPT Filter

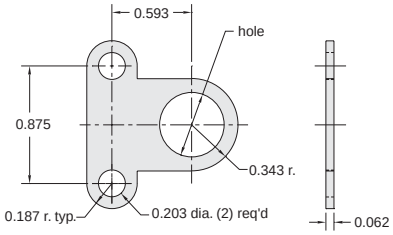
1/8" NPT hex nipple with 40 micron filter / strainer, can be used as a muffler



Part No.	Description
9002-01	. . . .1/8" NPT Filter

Flat Metal Bracket

Flat metal Bracket, for mounting Clippard miniature valves



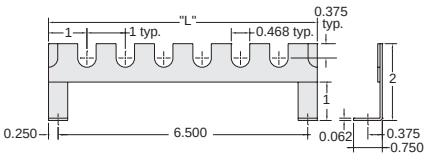
Mounting: two 31/64" dia. mounting hole for valve; two 13/64" dia. mounting holes for attaching bracket

Construction: Stamped from 1/16" thick steel, zinc plated

Part No.	Description
11917-1	. . . .Metal Bracket, 0.484 Hole
11917-2	. . . .Metal Bracket, 0.328 Hole

Slotted Mounting Bracket

Quick mounting, slotted drop-in type metal Mounting Bracket for Clippard miniature valves, regulators, controls, cylinders and switches. Open tops make them ideal for quick, easy assembly of compact pneumatic logic control systems inside small spaces.



Mounting: 31/64" wide slots, with bottom radius. Mounted legs have 0.119" dia. mounting holes in feet

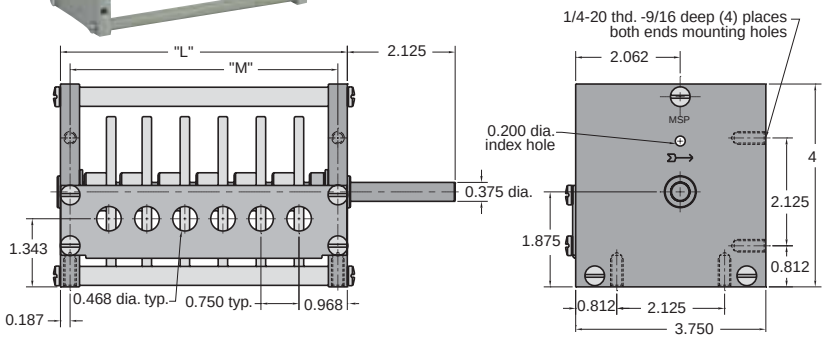
Construction: Machined from 16 gauge steel; spot welded legs; zinc plated.

Piping Path: 1" high open area below bracket horizontal member provides space for tubing or piping paths

Part #	# of Slots	"L"
MB-4	4	.....5"
MB-6	6	.....7"
MB-8	8	.....9"
MB-10	10	.....11"

Miniature Sequence Programmer

Center Shaft Replaceable Cam Miniature Sequence Programmer



Use:** Power may be by machine controlled or by any small geared-down motor. Cams mounted on shaft operate up to 14 Clippard standard 2-, 3-, or 4-way valves (using Cam Follower 11925), and snap action switches such as Clippard ES-1. Valves on unit may control large pilot operated valves, or may be connected directly to cylinders, air limits, or circuitry, eliminating costly switches and solenoid valves.
**** Cams not included**

Furnished with valve mounting bracket and Allen wrench. May be used with standard, adjustable or special cut cams at extra charge. Please specify desired cams when ordering. Use Clippard wrench #11751 for valve mounting.

Recommended Torque: Approx. 2 in. lbs. per cam.

Timing: Cams aligned originally using rod through holes in end blocks and cams. Once locked to shaft, timing is permanently established, rotation of cams actuates valves according to lobes provided. (see cam data)

Construction Features:

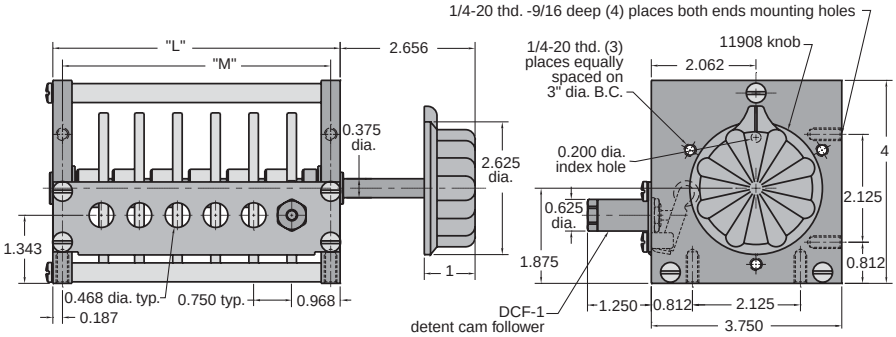
- Self-lubricating bronze bearings
- 1/8" black oxided steel shaft-extendible either end
- One-piece phenolic cams - extendible either end
- Easy cam adjustment - one set screw
- End plates tapped for mounting bottom or rear
- Positive cam indexing
- Heavy aluminum end blocks
- Rigid channel steel mounting bracket for valves, switches

Part No.	# of Cams	"L"	"M"
MSP-4	4	4.156	3.781
MSP-6	6	5.656	5.281
MSP-8	8	7.156	6.781
MSP-10	10	8.656	8.281
MSP-12	12	10.156	9.781
MSP-14	14	11.656	11.281

Miniature Sequence Programmer

Center Shaft Replaceable Cam Detent Sequence Programmer.

Specify desired standard Clippard programmer cams plus one detent cam.



Construction: Basically the same as the MSP programmers with the addition of a spring plunger detent mechanism, an extended shaft with hand knob, and tapped mounting holes for panel mounting

No. Of Cams*: 3 to 13, depending upon model; six standard models (3, 5, 7, 9, 11 and 13 valve stations respectively

Mounting: Mount on panel, or by bottom or rear, as required; three (3) 1/4-20 tapped holes provided on front plate for flush mount to panel; additional holes provided on front plate for flush mount to panel; additional holes at bottom and sides of end plates

***Cams not included**

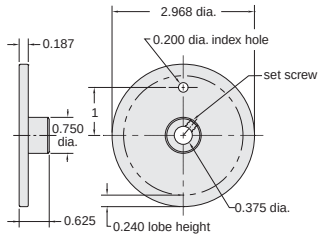
Use: Manually to set a predetermined sequence; or as a stepping switch

Part No.	# of Cams	"L"	"M"
DSP-3	3	4 5/32	3 25/32
DSP-5	5	5 21/32	5 9/32
DSP-7	8	7 5/32	6 25/32
DSP-9	9	8 21/32	8 9/32
DSP-11	11	10 5/32	9 25/32
DSP-13	13	11 21/32	11 9/32

Mechanical Sequencer Cams & Gauges

Minimatic® Cams

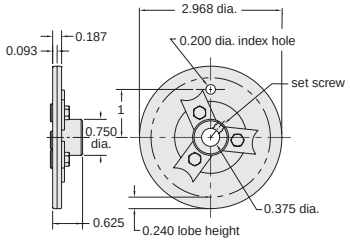
Minimatic Sequence Programmer Cams. Use with Clippard MSP or DSP sequence programmers. Available in 8 models pre-cut with lobes from 15˚ to 340˚, also blank 360˚ cam for custom machining.



Order No.	Lobe	Order No.	Lobe
C-33-15	....15˚	C-33-180	...180˚
C-33-30	....30˚	C-33-270	...270˚
C-33-60	....60˚	C-33-340	...340˚
C-33-90	....90˚	C-33-360	..uncut*
C-33-120	...120˚		

Adjustable Cams

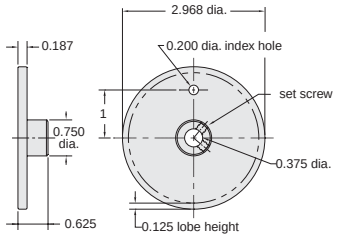
Use with Clippard MSP or DSP sequence programmers. Available in five models with adjustable lobes covering from 30˚ to 360˚, also as a blank for custom machining.



Lobe Adjustment		
Order No.	From	To
A-33-30	.....30˚	.....50˚
A-33-45	.....45˚	.....80˚
A-33-70	.....70˚	.....130˚
A-33-120	120	.....230˚
A-33-210	.....210˚	.....360˚
A-33-360	.....uncut	

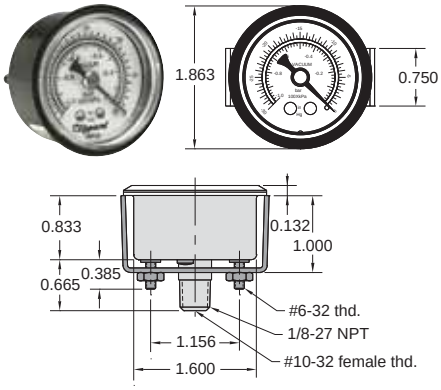
Detent Cams

One standard phenolic detent cam with 4, 6, 8, 10 or 12 evenly spaced cuts is required with each DSP. Special cut detent cams are available at nominal cost.



Order No.	Number of Positions
DC-4	4
DC-6	6
DC-8	8
DC-10	10
DC-12	12

Vacuum Gauge



Gauge measures pneumatic vacuum pressure. Mounting bracket included.

Range: Scale reading from 0 to 30 in.Hg. and 0 to -1 bar

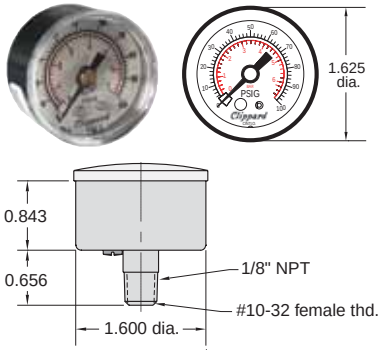
Construction: Nickel-plated steel case. Plastic face. Dial shows two ranges; Hg in black. bars in red. Built-in pressure snubber.

Ports: Connection located at rear is double threaded O.D. - male thread 1/8" NPT
I.D. - tapped for #10-32 fitting

Mounting: Stud mount using 1/8" NPT center stud or panel mount using the zinc plated steel bracket supplied.

Part No.	Description
VG-30	.....Vacuum Gauge

Pressure Gauge



Gauge measures pneumatic system pressure. Stud mounted.

Range: Scale reading from 0 to 100 psig and 0 to 6.9 bar

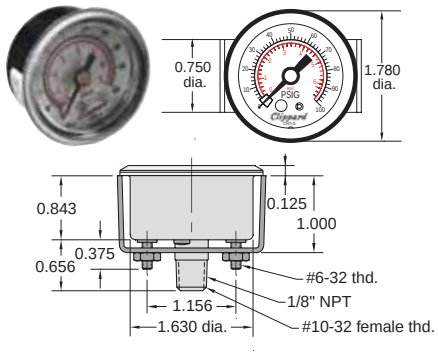
Construction: Steel case. Plastic face. Dial shows two ranges; psig in black. Bars in red. Built-in pressure snubber.

Ports: Connection located at rear is double threaded O.D. - male thread 1/8" NPT
I.D. - tapped for #10-32 fitting

Mounting: Direct with 1/8" NPT

Part No.	Description
PG-101-BK	..Pressure Gauge, Black Case
PG-101-NP	..Pressure Gauge, Nickel-Plated

Pressure Gauge



Gauge measures pneumatic system pressure. Mounting bracket included.

Input Pressure: Scale reading from 0 to 100 psig and 0 to 6.9 bar

Construction: Nickel-plated steel case. Plastic face. Dial shows two ranges; psig in black. Bars in red. Built-in pressure snubber.

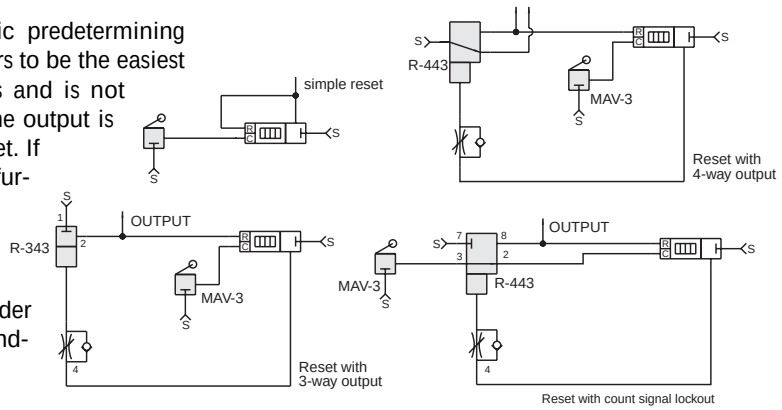
Ports: Connection located at rear is double threaded O.D. - male thread 1/8" NPT
I.D. - tapped for #10-32 fitting

Mounting: With zinc plated steel bracket supplied

Part No.	Description
PG-100	....Pressure Gauge

Here are some suggested means for resetting pneumatic predetermining counters. While the simple reset shown in Figure 1 appears to be the easiest means of resetting a counter, it has serious drawbacks and is not recommended. As soon as the counter begins to reset, the output is cut off and the counter may or may not be completely reset. If an output is taken from the reset loop (Figure 1), this further jeopardizes the completion of the reset conditions or, in fact, any reset at all.

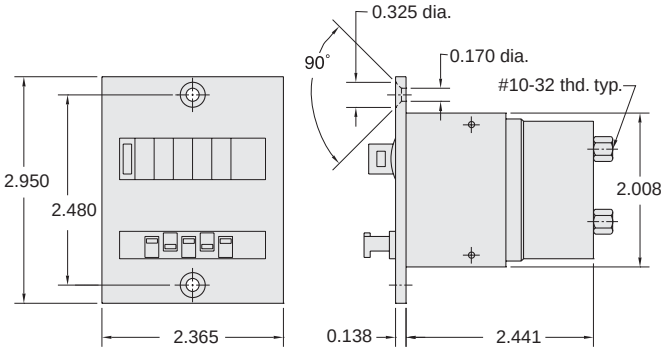
The following circuits are suggested as means to reset the Clippard PC-3PM. All air logic circuits should be tested under actual conditions to determine their suitability for the intended application.



Pneumatic Predetermining Counter

This unit is a highly versatile Pneumatic Predetermining Counter. It counts down from a preselected number and gives a pneumatic signal output when zero is reached. The output can then be used to actuate or initiate machine functions. The PC-3PM can be used in combination with pneumatic logic controls, limit switches, proximity switches, and similar controls.

The counter is preset by depressing the reset button, and at the same time entering the desired preset figure by depressing the preset keys. It can be used to count products being packaged, count machine operations and cause a change in operation after the preset value has been reached.



Display: 5 figures, numerals 0.100" to 0.160"

Medium: filtered compressed air containing no oil

Connections: Z (1) Counter impulse input; Y (2) Reset impulse; P (3) Air input; A (4) Air output signal

Reset: Manual push button and pneumatic spring return

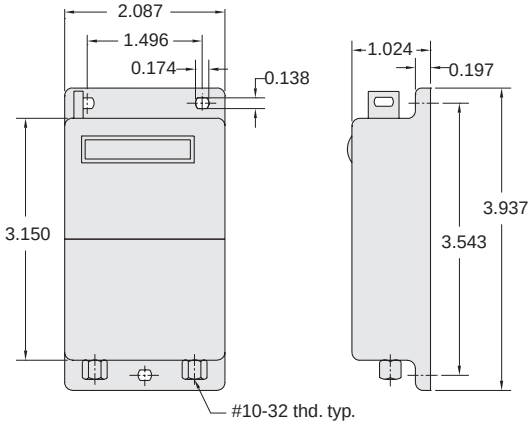
Input Pressure: 30-120 psig

Mounting: Panel mount

Part No.	Description
PC-3PM	**. . . .Pneumatic Predetermining Counter**

6-Digit Pneumatic Totalizing Counter

This model is a 6-digit pneumatic totalizing counter. A pneumatic signal or impulse adds the value of 1 to the display. When the indicator reaches its maximum value, the counter starts again at zero The counter my be reset manually be depressing the reset push button, or by an air impulse. The counter is useful for event recording, piece or part counting, for indicating program steps, cycle counting, machine time logging, and for many other purposes. The PT-1SM is designed for surface mounting.



Display: 6 figures, numerals 0.080" to 0.160"

Medium: filtered compressed air containing no oil

Reset: Manual push button and pneumatic spring return

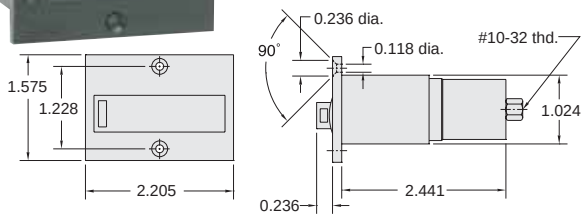
Input Pressure: 30-120 psig

Mounting: Surface mount

Part No.	Description
PT-1SM	**. . . . .6-Digit Pneumatic Totalizing Counter**

Pneumatic Totalizing Counter

This unit is a 6-digit pneumatic totalizing counter, designed for panel mounting. Its operation is identical to that of the PT-1SM, but in a different physical arrangement. Both units may be reset manually or by a pneumatic impulse. Operating pressure range is extremely wide (30 to 120 psig).



Display: 6 figures, numerals 0.080" to 0.160"

Medium: filtered compressed air containing no oil

Reset: Manual push button and pneumatic spring return

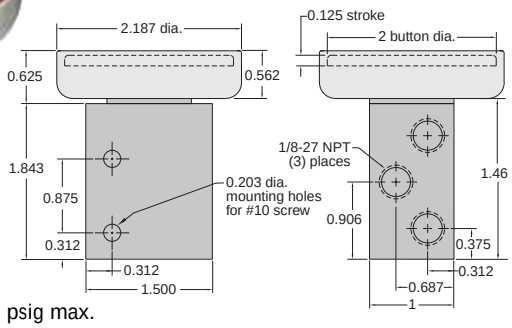
Input Pressure: 30-120 psig

Mounting: Panel mount

Part No.	Description
PT-2PM	Pneumatic Totalizing Counter, 6-Digit

3-Way Poppet Palm Button Valves

3-Way Poppet (MAV-3C) Normally Closed - Bubble Tight Cartridge Valve (- replaceable)



Medium: Air

Stem Travel: 1/8"

Input Pressure: 100 psig max.

Air Flow: 3.5 SCFM @150 psig; 6.0 SCFM @100 psig

Bleed: 0.1 SCFM @ 100 psig

Force to Actuate: 1.75 lb. manual

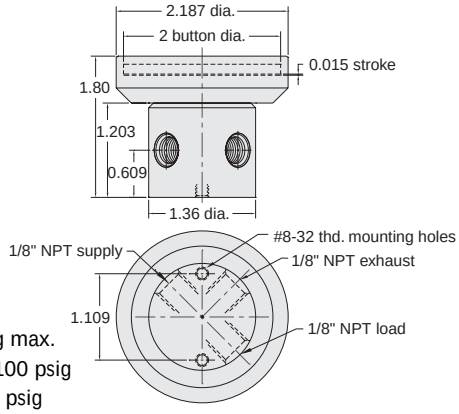
Ports: 1/8" NPT - exhaust may be muffled or piped away but NOT restricted

Mounting: Mounting holes provided; optional Bracket Kit #12959 provides additional mounting versatility; valve available with anodized color buttons

Part No.	Description
PB-1-RD	3-Way Poppet Bubble Valve, Red
PB-1-GN	3-Way Poppet Bubble Valve, Green
PB-1-BK	3-Way Poppet Bubble Valve, Black
12959	90° Mounting Bracket Kit (shown below)

Low Force 3-Way Palm Button Valves

3-way low force poppet valve; Normally closed; depressing button blocks the sensing port causing rapid value opening



Medium: Air

Input Pressure: 100 psig max.

Air Flow: 22 SCFM - @100 psig

Bleed: 0.8 SCFM @ 100 psig

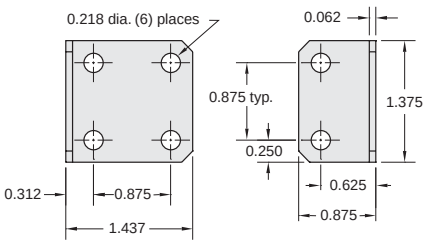
Force to Actuate: 1 oz. manual

Mounting: Mounting holes provided; optional Bracket Kit #2010-50 provides additional mounting versatility; valve available with anodized color buttons

Part No.	Description
PB-2-RD	Low Force 3-Way Poppet Valve, Red
PB-2-GN	Low Force 3-Way Poppet Valve, Green
PB-2-BK	Low Force 3-Way Poppet Valve, Black
2010-050 . . .	Mounting Bracket Kit (shown below)

90° Mounting Bracket

90° angle, heavy duty versatile Mounting Bracket for Clippard palm button valves

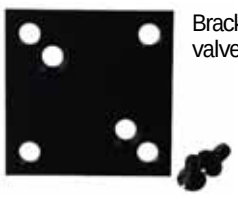


Mounting: Six 7/32" dia. holes on 1/8" centers for attaching valves to bracket

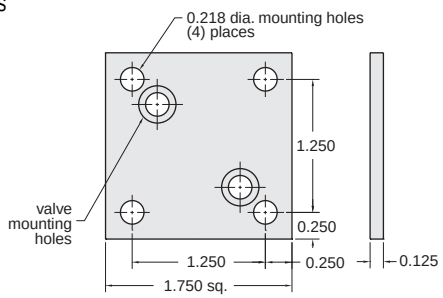
Construction: Stamped from 1/8" thick steel, zinc plated

Part No.	Description
12959	90° Mounting Bracket Kit

Mounting Bracket

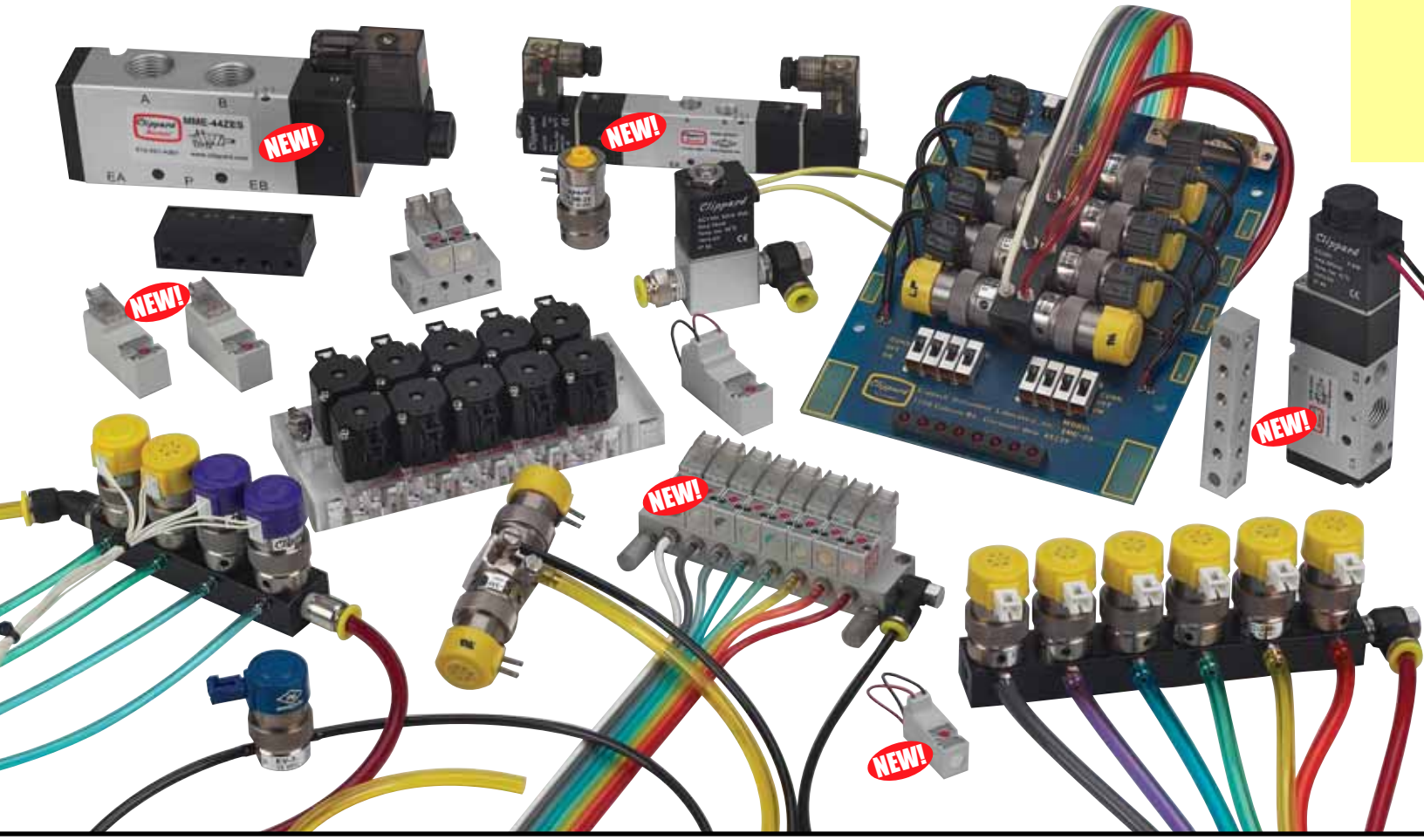


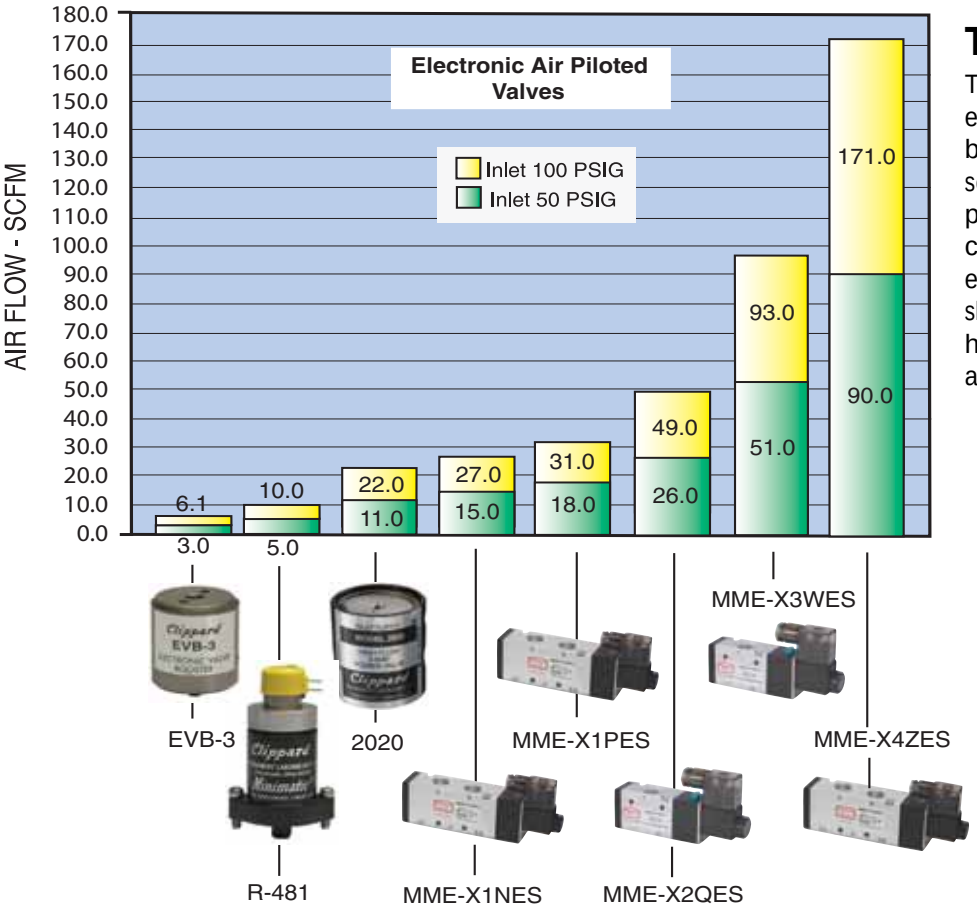
Bracket to mount 2010, 2011-1, 2012 and 2013 valves

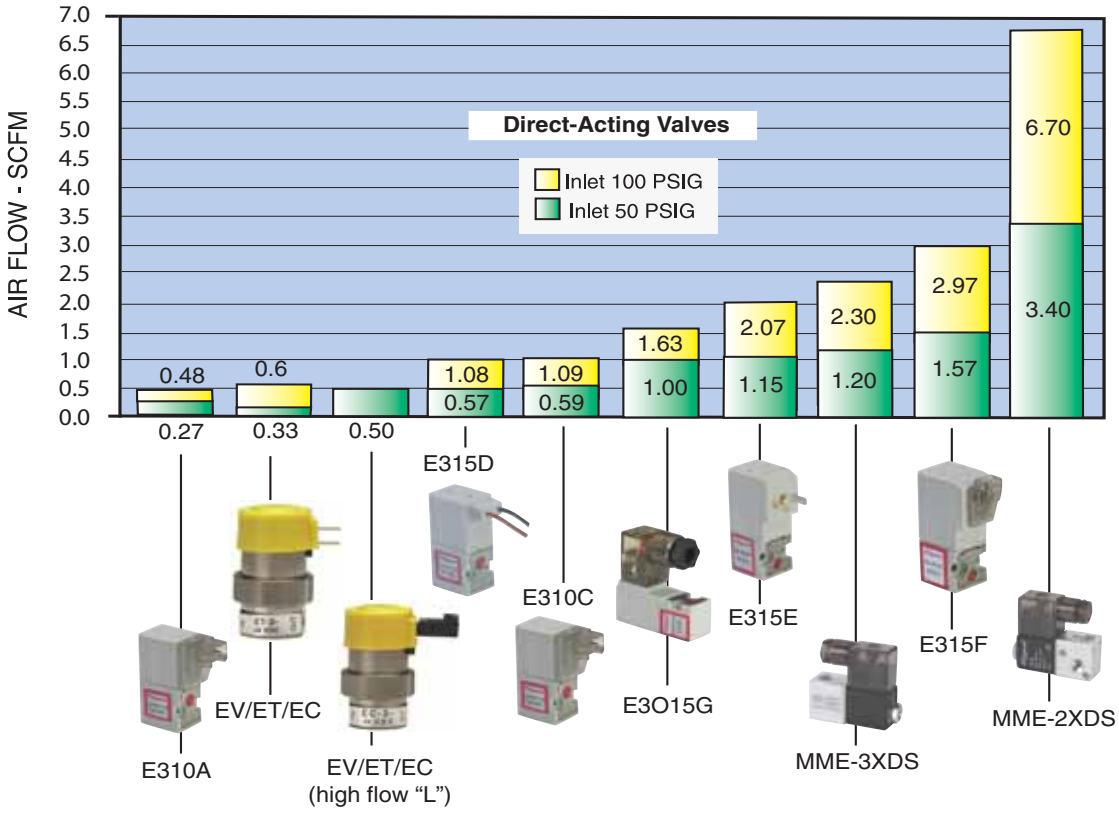


Black oxide finish, two mounting screws furnished

Part No.	Description
2010-050 . . .	Mounting Bracket Kit







Typical Air Flow

The EV, ET, EC, ES, EI, E3, MME, etc. are electronic valves offered by Clippard. Combined with a series of Clippard manifolds, they provide a complete system for efficient interface with electric and electronic circuits. The charts show typical air flow values to help select the right valve for the application.

The Mouse Valve Series
EV, ET, EC Series Valves

Like a mouse, this valve is quiet, quick, eats very little (0.67 watts) and is cute. Valves accept low voltage, low current signals, convert them into high pressure (100 psig) pneumatic outputs. Optional low pressure/medium flow and low pressure/high flow are available. (The air supply should be reasonably clean and dry for optimum performance. Recommended filtration is 40 micron.)

Valve caps are of molded Hytrel®. Depending upon valve type, cap is:

- plain top on 2-way models
- with exhaust holes in cap on certain 3-way models
- with fitting, as shown, for 3-way N.O. styles for N.C. exhaust (inlet when N.O.)

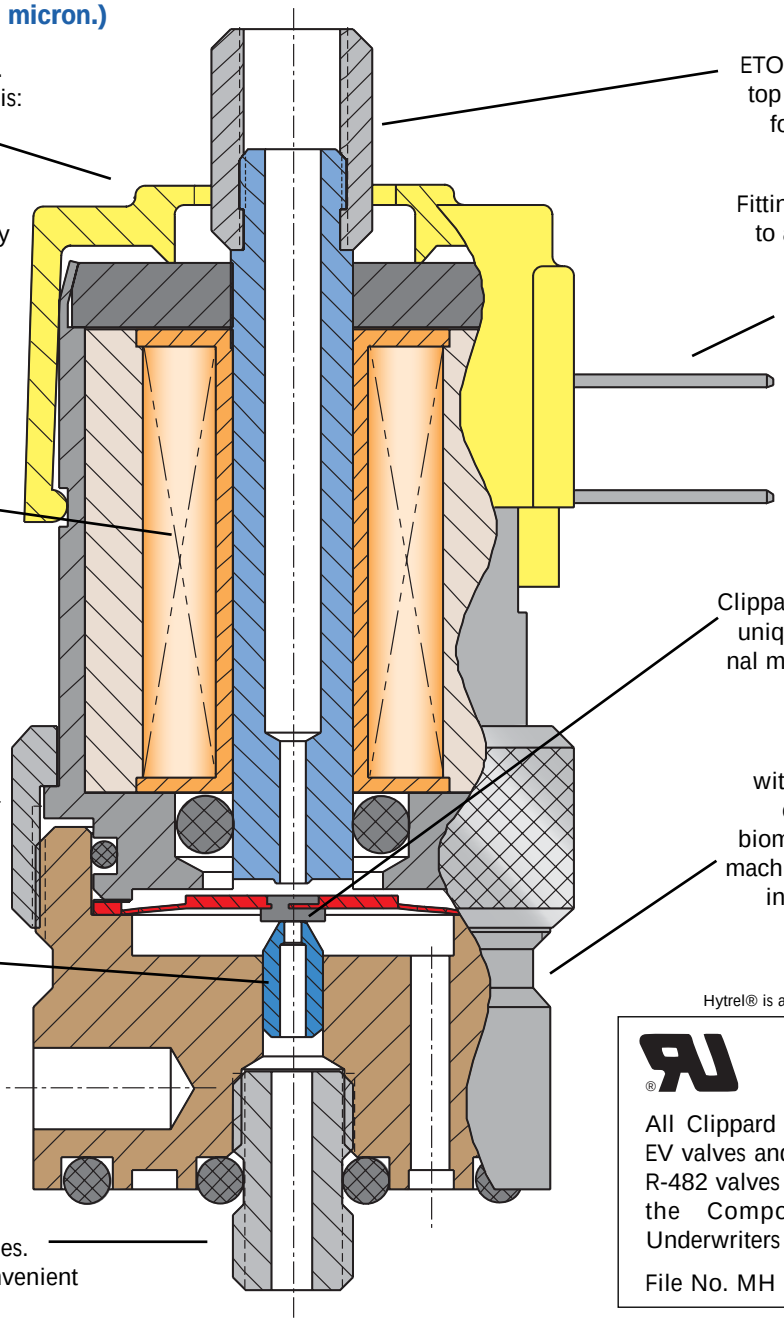
Low power coil uses only 0.67 watts at the rated voltage. Standard voltages include 6, 12 and 24. Other voltages are available.

Adjusting ring may be loosened for positioning to orient connections.

DO NOT REMOVE. Parts orientation will be lost and warranty voided.

Standard orifice is .025. Also available are:
L - 0.040 orifice
H - 0.060 orifice

Manifold mount base shown permits fast, secure mounting of electronic valves to manifolds for grouping in compact assemblies. Alternate standard model has convenient mounting holes.



ETO and similar styles have top #10-32 threaded fitting for N.C. exhaust or N.O. inlet.

Fittings should be tightened to a maximum of 9 in.-lb.

Quick-connect spade lugs are of tinned brass and furnished on all ET models. EV models are available with 18" wire leads for popular voltages. EC models are furnished with 0.025" square pin connector.

Clippard Electronic Valves are unique, with only one internal moving part that travels a mere 0.007 inches.

Valves are small in size with a variety of mounting options. Ideal for use in biomedical, test equipment, machines, computer-directed industrial systems, and in portable devices.

Hytrel® is a registered trademark of DuPont

All Clippard standard ET, EC and EV valves and Clippard R-481 and R-482 valves are recognized under the Component Program of Underwriters Laboratories, Inc.

File No. MH 13573

Clippard Minimatic electronic valves are precision-built 2-way or 3-way control valves, utilizing a unique, patented, valving principle. There are no sliding parts. Complete poppet travel is a mere 0.007". As a result, low power consumption and exceptionally long life are major benefits of this design.

The valves are very quiet in operation and also very cool. No flow is needed for cooling. The valves' small size makes them well suited to a wide range of applications in biomedical, EDP, environmental test equipment, textile machines, packaging machinery, computerized industrial automation, and portable systems.

FEATURES

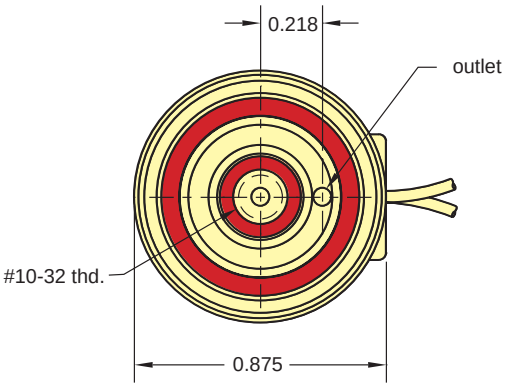
Clippard Functional Simplicity

- The design of Clippard electronic valves is a deceptively simple arrangement with a minimum of operating parts, and remarkably straight forward low power operation.
- The Clippard “spider” is the only moving part and its motion to operate the valve is a mere 0.007” travel.
- Low voltage D.C. inputs, signals from simple manual switching up to computer directed systems, move the spider in extremely fast response time... 5-10 milliseconds.
- The unit uses extremely low power (0.67 watts at the rated voltage) and is cool running. The valves are light in weight, compact in physical size and mount easily in space-saving packages.

Quick Connect

Clippard ET valves feature spade lugs for simple, quick secure low voltage connections. Wire crimp-on spade lug connectors are available separately to adapt electronic wiring where necessary. Clippard original EV type valves are available in popular voltages with 18” wire leads. The EC model utilizes a 0.025” square pin connector.

Easy Mount



The complete line of EC, EV, and ET electronic valves are available with two mounting options. Standard base models have two 6-32 threaded, 7/32” deep mounting holes. Manifold models are equipped with a bottom stud, 5/32” long with #10-32 thread, which fits Clippard standard and special manifolds, accessory valves and subplates. Spanner holes in the valve body permit tightening.

NOMINAL			Power (watts)	Working Range (cont. duty)
Voltage	Current (amps)	Resistance (ohms)		
6	0.11	54	0.67	90% - 150% of rated voltage
12	0.055	218	0.67	
24	0.028	864	0.67	

ACCESSORIES

EVB-2 & EVB-3 Booster

Clippard EVB-2 & EVB-3 booster valves mate with manifold mount EC, EV, and ET valves and manifolds to provide increased flow. Direct piloting from a Clippard EC, EV and ET valve provides a flow of up to 6.1 SCFM at 100 psig.

2020/2021 High Flow Valves

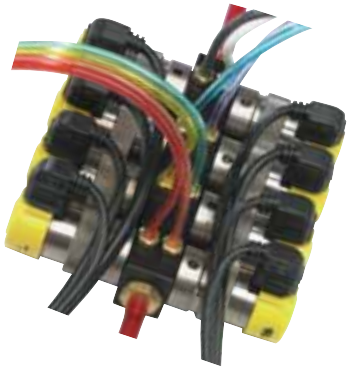
Model 2020 and 2021 high flow valves are piloted 3-way valves that work with the Clippard EC, EV, and ET 3-way manifold valves. Output from the EC, EV, or ET will actuate the valve and produce output up to 22 SCFM at 100 psig. Piloted 4-way valves are also available as R-481 and R-482.

Dual Supply Manifold

Shown is the 15490-3 Clippard Dual Supply Manifold with two ET-3M electronic/pneumatic interface valves. 1/8" NPT inlet is seen at the left of the manifold with the dual #10-32 port outlets at the right.

Multi-Valve Manifolds

Multi-valve manifolds are available in two lengths with either single or double (top or top and bottom) rows of outputs for versatility in application. Input to all valves mounted on this manifold is through the manifold end. Outputs are individual #10-32 ports for hose barb fittings and vinyl or urethane hose.

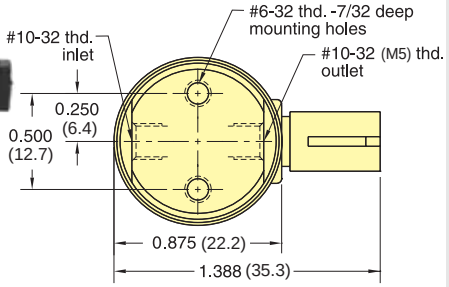


Pilot Manifold

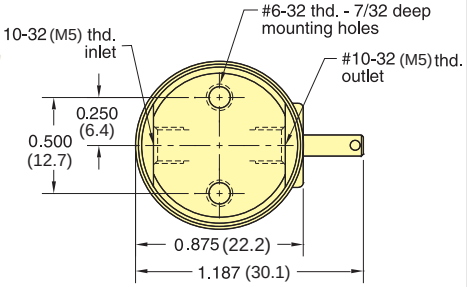
Here a Clippard ET valve is mounted to the 15491-1 Clippard Pilot manifold, making it possible for the ET-3M valve controlled by an electronic signal to actuate a larger air-piloted valve or an air cylinder.

EV, ET, EC Series 2- & 3-Way Normally Closed Valves
In-line Mount

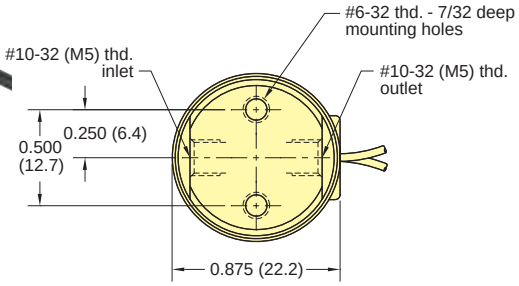
EC - ❑ - ❑ - ❑



ET - ❑ - ❑ - ❑



EV - ❑ - ❑ - ❑



Type: Normally Closed 2- or 3-Way

Medium: Air (40 micron filtration)

Temperature Range: 30˚ to 180˚F

Power Consumption: 0.67 watt

Response: 5 - 10 milliseconds

Mounting: In-line

Ports: #10-32 (M5)

Operating Range: 90% to 150% of rated voltage

Air Flow: 0.6 scfm @ 100 psig;
17 l/min @ 7 bar
"L" option - 0.5 scfm @ 50 psig;
14 l/min @ 3.5 bar
"H" option - 0.45 scfm @ 25 psig;
13 l/min @ 1.8 bar

Pressure Range:
28" Hg Vac. to 105 psig;
0-7 bar max
"L" option:
28" Hg Vac. to 50 psig;
0-3.5 bar max
"H" option:
28" Hg Vac. to 25 psig;
0-1.8 bar max

For Cable and Connectors, see Page 187.

NUMBERING SYSTEM

E ❑ - ❑ - ❑ - ❑ - ❑ — **M5** - Metric

- **C** - Connector
- **T** - Terminal Spades
- **V** - Wire Leads

- **3** - 2-Way
- **2** - 3-Way

Voltages: *
- **6** - 6 Volts
- **12** - 12 Volts
- **24** - 24 Volts

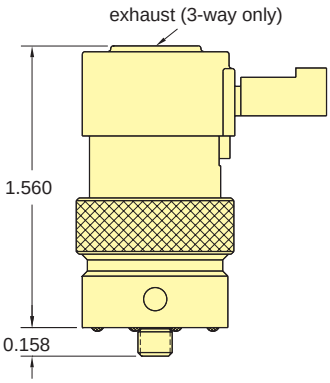
Standard Options:
- **Blank** - Standard orifice 0.025
- **L** - 0.040 orifice
- **H** - 0.060 orifice
- **V** - Fluorocarbon seals

Non-Standard Options:
- **E** - EPR seals
- **S** - Silicon seals
- **D** - Diode

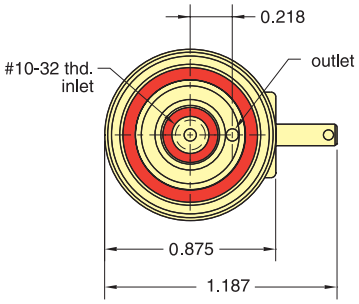
* Consult factory for availability of non-standard voltages and other options

EV, ET, EC Series 2- & 3-Way Normally Closed Valves
Manifold Mount

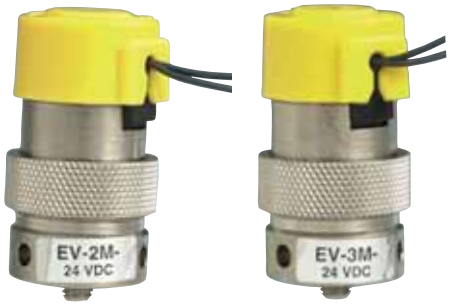
EC - ❑ M - ❑ - ❑

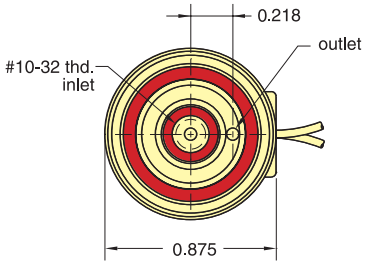


ET - ❑ M - ❑ - ❑



EV - ❑ M - ❑ - ❑





Type: Normally Closed 2- or 3-Way

Medium: Air (40 micron filtration)

Temperature Range: 30˚ to 180˚F

Power Consumption: 0.67 watt

Response: 5 - 10 milliseconds

Mounting: Manifold

Ports: Manifold mounted with #10-32 stud

Operating Range: 90% to 150% of rated voltage

Air Flow: 0.6 scfm @ 100 psig; 17 l/min @ 7 bar
"L" option - 0.5 scfm @ 50 psig; 14 l/min @ 3.5 bar
"H" option - 0.45 scfm @ 25 psig; 13 l/min @ 1.8 bar

Pressure Range:
28" Hg Vac. to 105 psig
"L" option:
28" Hg Vac. to 50 psig
"H" option:
28" Hg Vac. to 25 psig

For Cable and Connectors, see Page 187.

NUMBERING SYSTEM

E ❑ - ❑ M - ❑ - ❑

- **C** - Connector
- **T** - Terminal Spades
- **V** - Wire Leads

- **2** - 2-Way
- **3** - 3-Way

Voltages: *
- **6** - 6 Volts
- **12** - 12 Volts
- **24** - 24 Volts

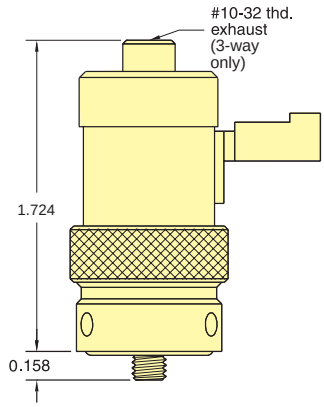
Standard Options:
- **Blank** - Standard orifice 0.025
- **L** - 0.040 orifice (50 psig max)
- **H** - 0.060 orifice (25 psig max)
- **V** - Fluorocarbon seals

Non-Standard Options:
- **E** - EPR seals
- **S** - Silicon seals
- **D** - Diode

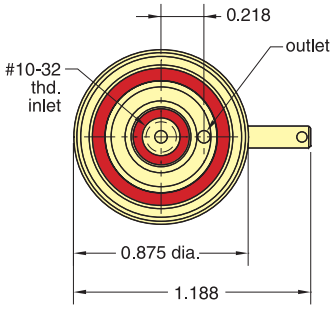
* Consult factory for availability of non-standard voltages and other options

EV, ET, EC Series 2- & 3-Way Normally Open Valves
Manifold Mount

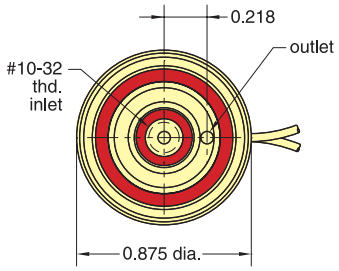
ECN - ❑ M - ❑ - ❑



ETN - ❑ M - ❑ - ❑



EVN - ❑ M - ❑ - ❑



Type: Normally Open 2- or 3-Way

Medium: Air (40 micron filtration)

Temperature Range: 30˚ to 180˚F

Power Consumption: 0.67 watt

Response: <15 milliseconds

Mounting: Manifold

Ports: Manifold mounted with #10-32 stud

Operating Range: 90% to 150% of rated voltage

Air Flow: 0.9 scfm @ 100 psig; 25 lpm @ 7 bar

Pressure Range: 28" Hg Vac. to 105 psig; 7 bar max

ECN, ETN & EVN series valves are 2- & 3-way N.O. solenoid valves. The normally open inlet is through the center mounting stud, so the valves can be supplied directly from the manifold without external tubing.

For Cable and Connectors, see Page 187.

NUMBERING SYSTEM

E ❑ N - ❑ M - ❑ - ❑

- **C** - Connector
- **T** - Terminal Spades
- **V** - Wire Leads

- **2** - 2-Way
- **3** - 3-Way

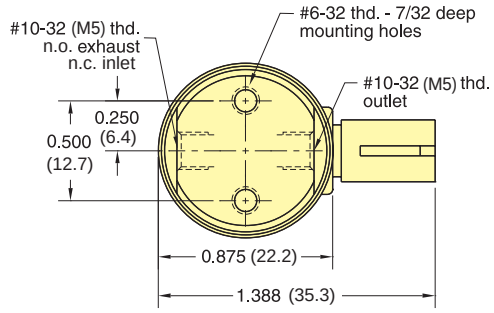
Voltages: *
- **6** - 6 Volts
- **12** - 12 Volts
- **24** - 24 Volts

Standard Options:
- **Blank** - Buna-N seals
- **V** - Fluorocarbon seals

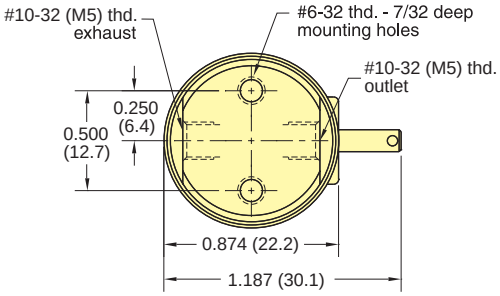
Non-Standard Options:
- **E** - EPR seals
- **D** - Diode

* Consult factory for availability of non-standard voltages and other options

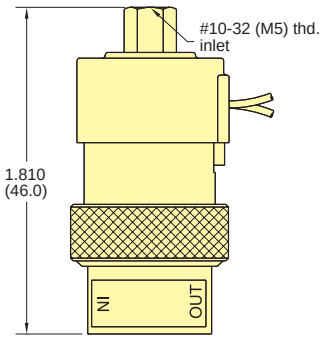
ECO - 3 - ❑ - ❑



ETO - 3 - ❑ - ❑



EVO - 3 - ❑ - ❑



Type: Fully Ported 3-Way

Medium: Air (40 micron filtration)

Temperature Range: 30˚ to 180˚F

Power Consumption: 0.67 watt

Response: 5 - 10 milliseconds

Mounting: In-line or Manifold

Ports: #10-32 (M5) or

Operating Range: 90% to 150% of rated voltage

Air Flow: 0.6 scfm @ 100 psig*; 17 l/min @ 7 bar
"L" option - 0.5 scfm @ 50 psig; 14 l/min @ 3.5 bar
"H" option - 0.45 scfm @ 25 psig; 13 l/min @ 3.8 bar

* When air supply is connected to the top port to operate valve normally open, main flow is 0.8 scfm and exhaust flow is 0.6 scfm at 100 psig.

Pressure Range:
28" Hg Vac. to 105 psig; 7 bar max
"L" option:
28" Hg Vac. to 50 psig; 3.5 bar max
"H" option:
28" Hg Vac. to 25 psig; 1.8 bar max

For Cable and Connectors, see Page 187.

NUMBERING SYSTEM

E ❑ O - 3 - ❑ - ❑ - ❑

- **C** - Connector
- **T** - Terminal Spades
- **V** - Wire Leads

Voltages: *
- **6** - 6 Volts
- **12** - 12 Volts
- **24** - 24 Volts

Standard Options:
- **Blank** - Standard orifice 0.025
- **L** - 0.040 orifice
- **H** - 0.060 orifice
- **V** - Fluorocarbon seals

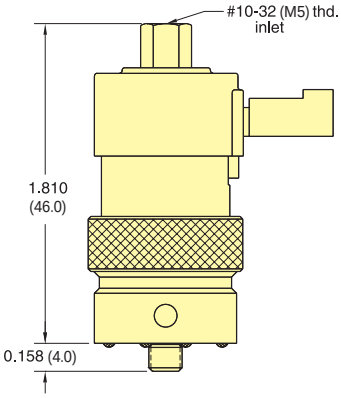
Non-Standard Options:
- **E** - EPR seals
- **S** - Silicon seals
- **D** - Diode

- **M5** - Metric

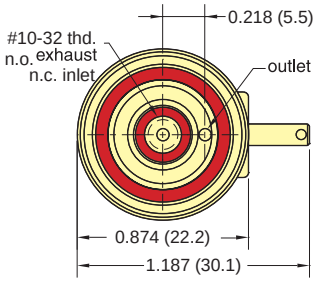
* Consult factory for availability of non-standard voltages and other options

EV, ET, EC Series 3-Way Fully Ported Valves
Manifold Mount

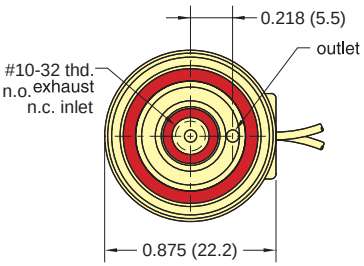
ECO - 3M - ❑ - ❑



ETO - 3M - ❑ - ❑



EVO - 3M - ❑ - ❑



Type: Fully Ported 3-Way

Medium: Air

Temperature Range: 30˚ to 180˚F

Power Consumption: 0.67 watt

Response: 5 - 10 milliseconds

Mounting: Manifold

Ports: Manifold mounted with #10-32 (M5) stud

Operating Range: 90% to 150% of rated voltage

Air Flow: 0.6 scfm @ 100 psig*;
17 l/min @ 7 bar
"L" option - 0.5 scfm @ 50 psig;
14 l/min @ 3.5 bar;
"H" option - 0.45 scfm @ 25 psig;
13 l/min @ 1.8 bar;

* When air supply is connected to the top port to operate valve normally open, main flow is 0.8 scfm and exhaust flow is 0.6 scfm at 100 psig.

Pressure Range:
28" Hg Vac. to 105 psig;
7 bar max
"L" option:
28" Hg Vac. to 50 psig;
3.5 bar max
"H" option:
28" Hg Vac. to 25 psig;
1.8 bar max

For Cable and Connectors, see Page 187.

NUMBERING SYSTEM

E ❑ O - 3 M - ❑ - ❑ - ❑

- **C** - Connector
- **T** - Terminal Spades
- **V** - Wire Leads

Voltages: *
- **6** - 6 Volts
- **12** - 12 Volts
- **24** - 24 Volts

Standard Options:
- **Blank** - Standard orifice 0.025
- **L** - 0.040 orifice
- **H** - 0.060 orifice
- **V** - Fluorocarbon seals

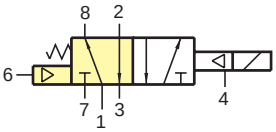
Non-Standard Options:
- **E** - EPR seals
- **S** - Silicon seals
- **D** - Diode

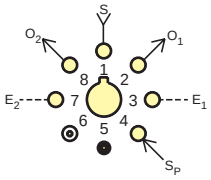
M5 - Metric

* Consult factory for availability of non-standard voltages and other options

R-481-❑

For more information please see page 260 in the Modular Valve section of this catalog.





Note: Supply pressure must be applied to both ports 1 & 4. Minimum pressure on port 4 should be 40 psig.

Type: 4-way combination electronic and modular spool type interface valve. Fully ported ET-3 & R401 hybrid

Medium: Air, water, or oil; pilot - air only

Input Pressure: Pilot - 40 psig minimum
Working - 0-150 psig

Air Flow: Valve - 9 scfm @ 100 psig

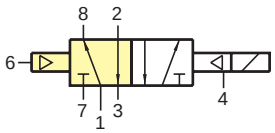
Voltages: R-481-6 6 VDC
R-481-12 12 VDC
R-481-24 24 VDC

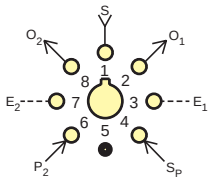
Mounting: Uses Octoport base and two captivated screws

Ports: Valve has patented Octoport system

R-482-❑

For more information please see page 260 in the Modular Valve section of this catalog.





Note: Supply pressure must be applied to both ports 1 & 4. Minimum pressure on port 4 should be 40 psig.

Type: 4-way combination electronic and modular spool type interface valve. Fully ported ET-3 & R402 hybrid

Medium: Air, water, or oil; pilot - air only

Input Pressure: Pilot - 40 psig minimum
Working - 0 to 150 psig

Air Flow: Valve - 9 scfm @ 100 psig

Voltages: R-482-6 6 VDC
R-482-12 12 VDC
R-482-24 24 VDC

Mounting: Uses Octoport base and two captivated screws

Ports: Valve has patented Octoport system

ET-C48
ET-C120

Black molded lug connectors are available for easy push on connection ET-C48 is 48" in length, ET-C120 is 120" in length

ET Valve Connectors

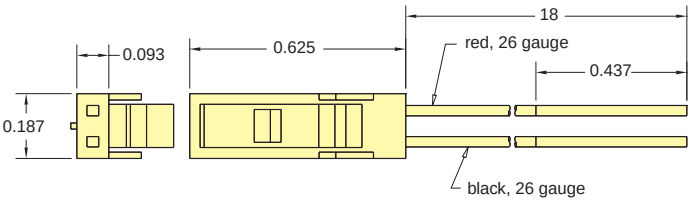
3831

Insulated crimp-on spade lug connectors are available for wiring up leads to connect electronic circuit to ET style valves. Accepts #22, #24, or #26 wire

C2-RB18
C2-RB120

AMP connector #103959-1 with 18" or 120" wire leads for EC/ECO and EI/EIO valves

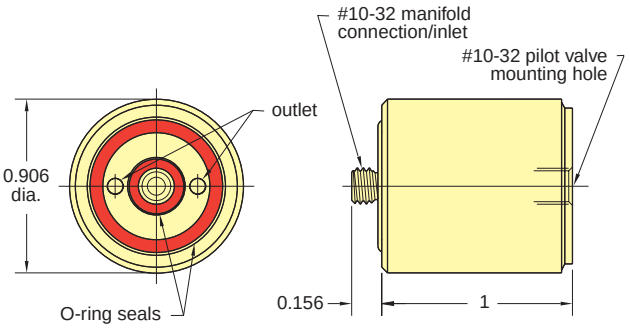
EC & EI Valve Connectors



EVB-2

EC, EV and ET Piloted 2-Way Valve, Manifold Mount

Electronic Valve Booster Amplifies the flow capacity of EC, EV and ET type valves by over twelve times. Manifold style electronic valves mount onto booster body, which, in turn, mounts on Clippard manifolds.



Type: 2-Way Normally Closed, Pressure Piloted Valve

Medium: Air

Input Pressure: 20 to 150 psig

Air Flow: 6.1 scfm @ 100 psig

Response: 20 milliseconds at 20 psig
13 milliseconds at 100 psig

Mounting: Mounts to manifold

Ports: Inlet and outlet through manifold

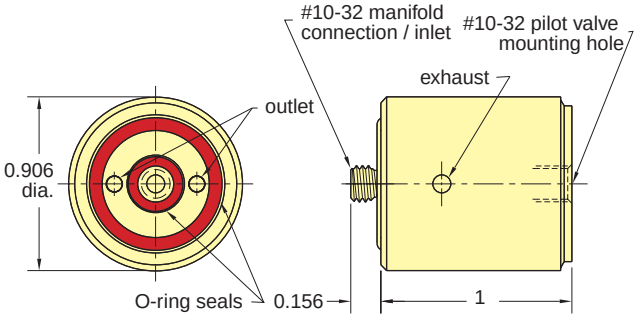
Materials: Nickel plated brass, acetyl, stainless steel and Buna-N

Additional Note Use only normally closed 3-way pilot valves in conjunction with EVB-2

EVB-3

EC, EV and ET Piloted 3-Way Valve, Manifold Mount

Electronic Valve Booster Amplifies the flow capacity of EC, EV and ET type valves by over twelve times. Manifold style electronic valves mount onto booster body, which, in turn, mounts on Clippard manifolds.



Type: 3-Way Normally Closed, Pressure Piloted Valve

Medium: Air

Input Pressure: 20 to 150 psig

Air Flow: 6.1 scfm @ 100 psig

Response: 20 milliseconds at 20 psig
13 milliseconds at 100 psig

Mounting: Mounts to manifold

Ports: Inlet and outlet through manifold

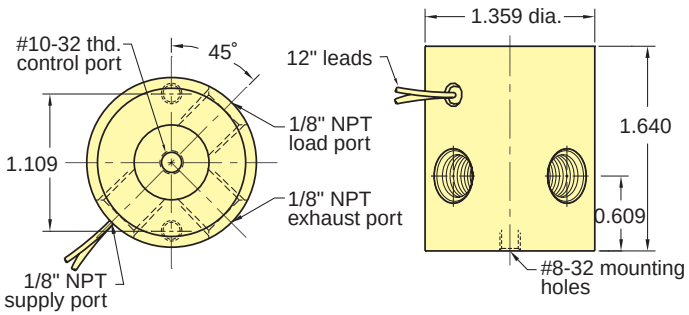
Materials: Nickel plated brass, acetyl, stainless steel and Buna-N

Additional Note Use only normally closed 3-way pilot valves in conjunction with EVB-3

2013 - ❑

Electronic Fluidamp

Low-power DC solenoid solid state output signals can be directly converted to high pressure pneumatic power without amplification



Type: 3-Way Normally Closed, Electronic Valve

Medium: Air

Input Pressure: 30 to 100 psig

Air Flow: 22 scfm @ 100 psig

Bleed Flow: 0.10 scfm @ 100 psig

Filtration: 10 micron

Frequency Response: 50 Hz @ 100 psig
70 Hz @ 30 psig

Ports: 1/8" NPT female

Switching Speed: 10 milliseconds

Electrical Data

Continuous Overload: 350% @ 25˚C ambient
250% @ 50˚C ambient

Power Consumption: Less than .50 watts at rated voltage (80 ma. @ 6V, 40 ma. @ 12 V, 20 ma. @ 24V)

Leads: 28 gauge stranded P.V.C. insulated

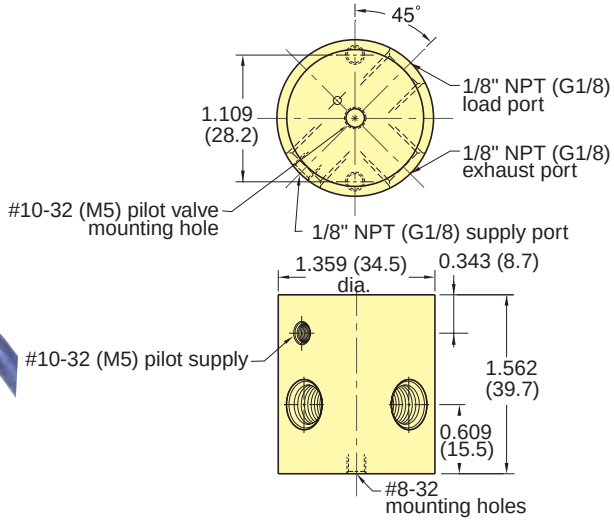
Standard Options:

2013-6	6 volts DC
2013-12	12 volts DC
2013-24	24 volts DC

2020/2021

High Flow EC, EV and ET Piloted 3-Way Valves

Designed to be piloted by a Clippard EC, EV and ET manifold mount electronic valve. Output from the EC, EV and ET actuates the valve to produce outputs up to 22 scfm at 100 psig. Combines low wattage, long life and cool running of the EC, EV and ET valves with quick response and high flow of Clippard "Fluidamp" type valves. The 2020 and 2021 are identical in all respects except one. The 2020 has an external #10-32 port for the pressure supply to the EC, EV, and ET electronic pilot valve.



Type: 3-Way Normally Closed, Pressure Piloted Valve

Medium: Air

Input Pressure: 30 to 100 psig; 2.1 to 6.9 bar

Pilot Pressure: (2020) 60% of supply pressure, minimum

Air Flow: 22 scfm at 100 psig/620 l/min @ 6 bar

Response: Approximately 20 milliseconds

Mounting: Mounting holes provided

Ports: Inlet and outlet, exhaust 1/8" NPT Pilot supply on 2020 is #10-32 female

Materials: Anodized Aluminum, Stainless Steel and Buna-N

Additional Note Use only normally closed 3-way pilot valves in conjunction with 2020/2021

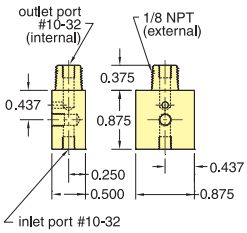
Option: Add -MG for Metric Version

Specialized Manifolds

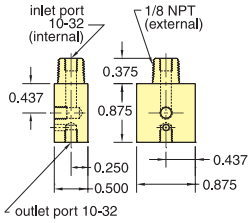
Material: Nickel plated brass

Use: Mount EC, EV and ET valves to any 1/8" NPT supply port

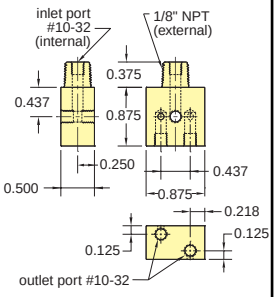
15490-1 and 15490-1-MR (metric).
#10-32 (M5) Inlet
1/8" NPT (R1/8) Outlet



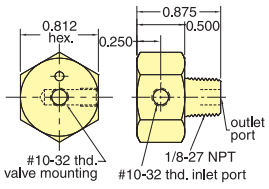
15490-2 and 15490-2-MR (metric).
1/8" NPT (R1/8) Inlet
#10-32 (M5) Outlet



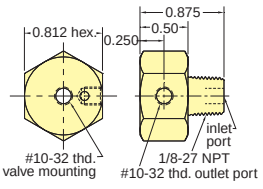
15490-3 and 15490-3-MR (metric) Dual Supply.
1/8" NPT (R1/8) Inlet
#10-32 (M5) Outlet



15491-1 and 15491-1-MR (metric).
#10-32 (M5) Inlet
1/8" NPT (R1/8) Outlet



15491-2 and 15491-1-MR (metric).
1/8" NPT (R1/8) Inlet
#10-32 (M5) Outlet

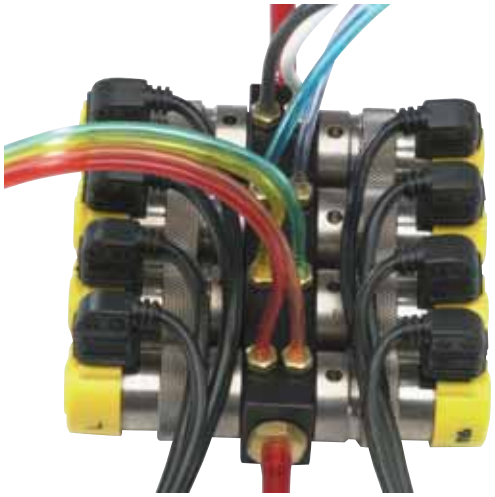


1548 ❑ - ❑

Multi-Valve Manifolds

Construction: Black anodized aluminum

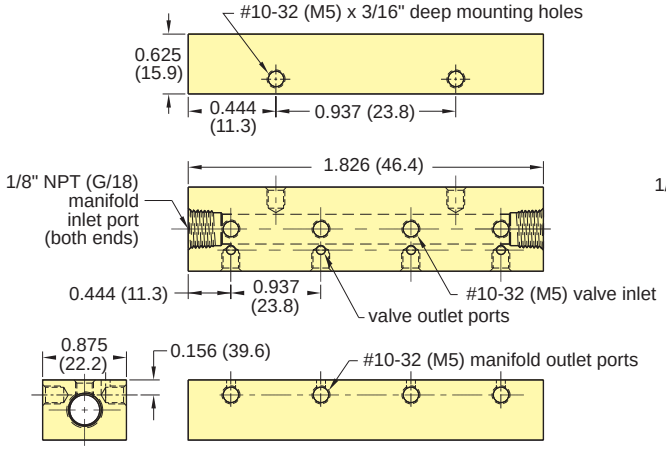
Order No.	# of Valves	"A"	"B"
15481-4	4	1.875"	3.750"
15481-4-M5	4	42.6 mm	95.3 mm
15481-6	6	3.750"	5.625"
15481-6-M5	6	95.3 mm	142.9 mm



Eight ET valves mounted on a 15482-8

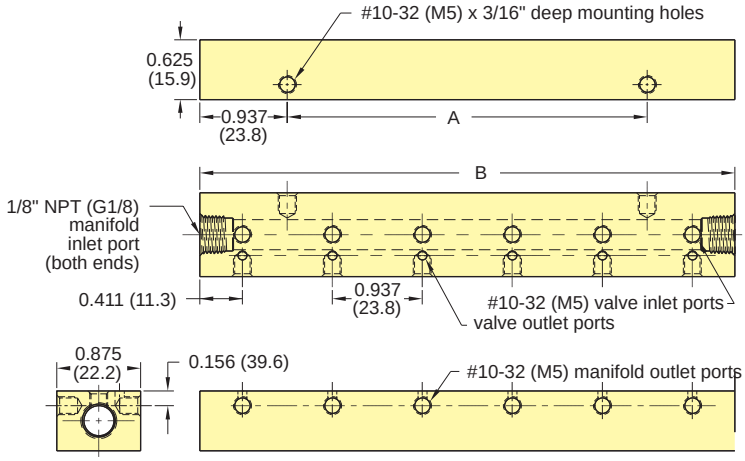
15481-2 & 15481-2-M5 (Metric)

Mounts two valves on one side only



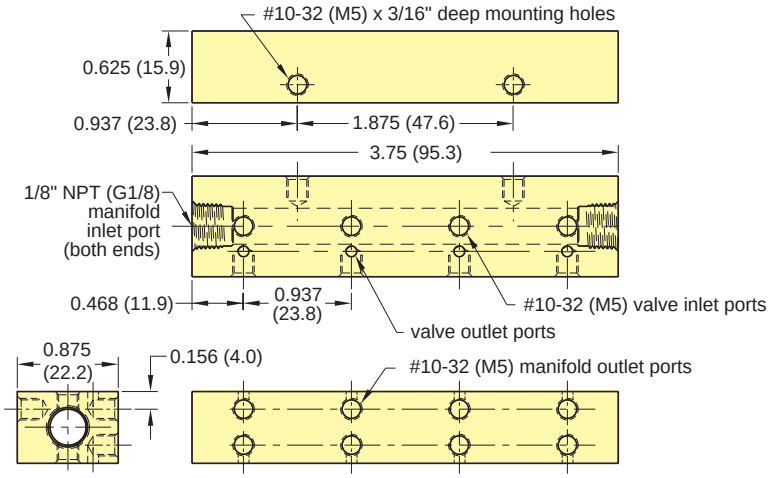
15481-4 & 15481-4-M5 (Metric)
15481-6 & 15481-6-M5 (Metric)

Mounts six valves on one side only



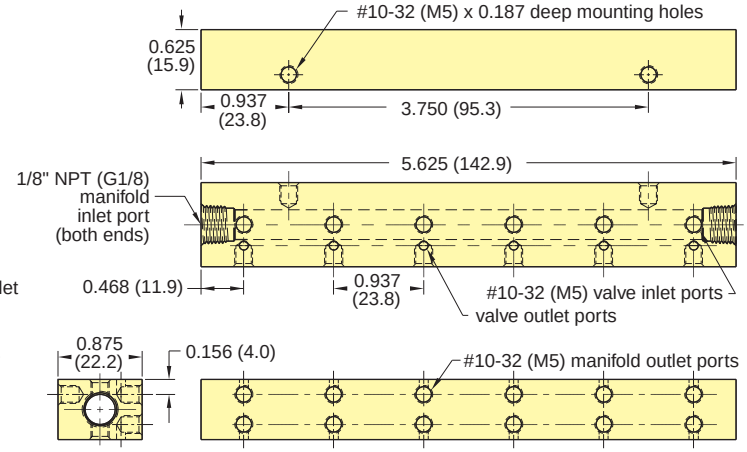
15482-8 & 15482-8-M5 (Metric)

Mounts eight valves, four each on opposite sides



15482-12 & 15482-12-M5 (Metric)

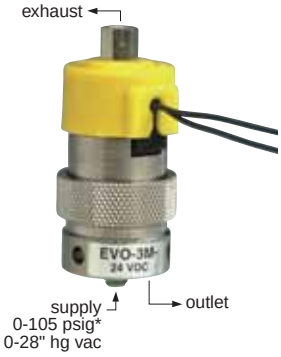
Mounts twelve valves, six each on opposite sides



Models Offered

EV-2M
Normally Closed

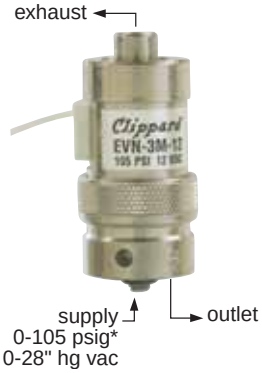
EV-3M
Normally Closed



EVO-3M
Normally Closed

EVO-3M
Normally Open

EVN-2M
Normally Open



EVN-3M
Normally Open

EV-2
Normally Closed

EV-3
Normally Closed

EVO-3
Normally Closed

EVO-3
Normally Open

EVO-3
as Diverter

For Cable and Connectors, see Page 187.

EVP Series Proportional Control Valves

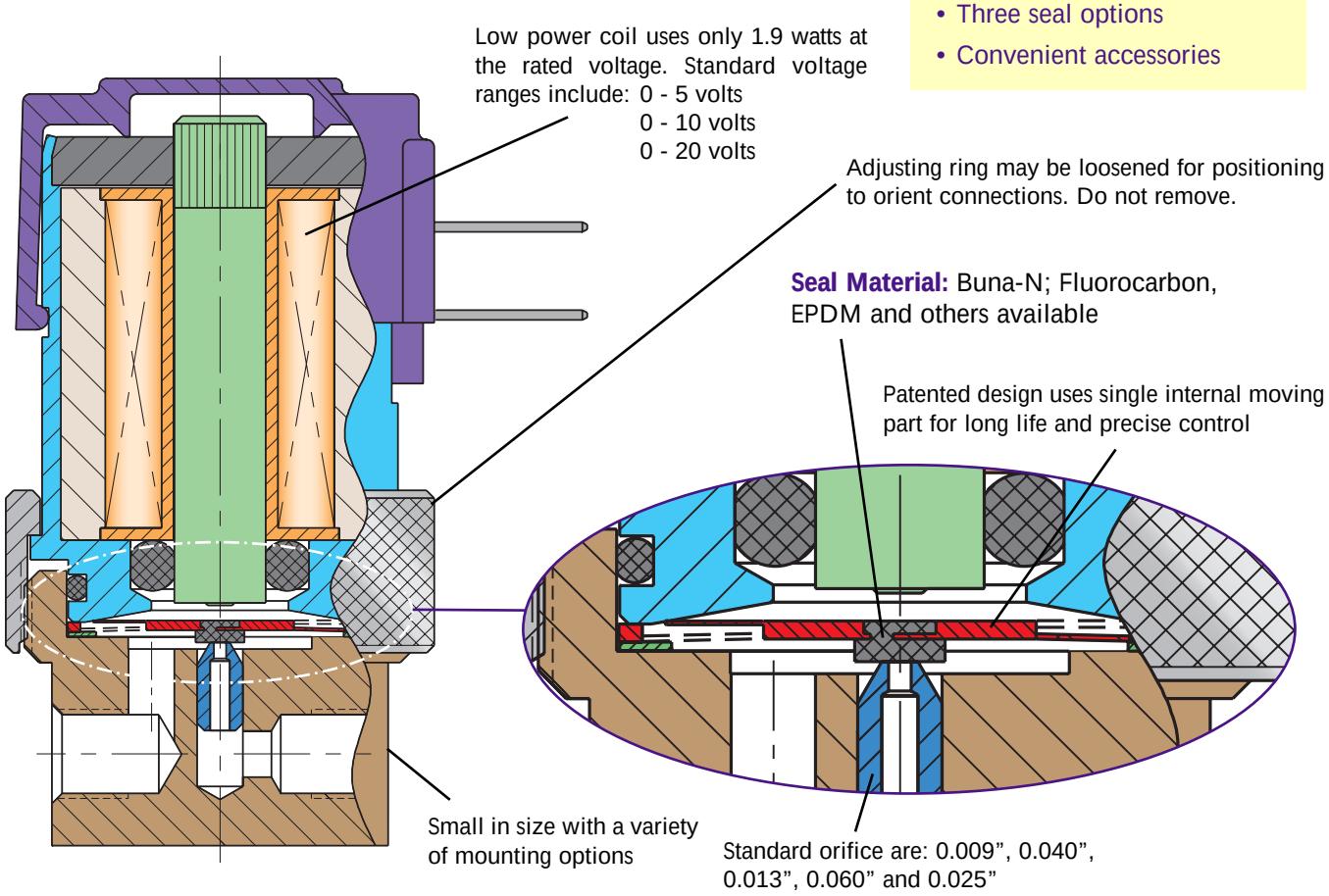
The EVP series Proportional Control Valves combine the features of the existing EV series valve - long life, low power, and Clippard's reputation for high quality components - with the additional capability for proportional control.

The EVP series valve provides air or gas flow control, and varies the output flow based on the current input to the solenoid. The consistent gain (see chart) of this valve provides a high degree of control for many applications.

Controllability and overall value are the main features of the EVP Proportional Valve series. The valve may be controlled using DC current, open or closed-loop control, and even PWM (pulse width modulation) to cover a broad range of applications.

Features

- Fast response
- Long life
- Small package
- Single moving part - low friction and wear
- Five orifice sizes
- Three voltage ranges
- Three connection styles
- Two mounting types
- Three seal options
- Convenient accessories



Designed For:

- Analytical Instruments
- Blood pressure monitoring
- Precise pressure control
- Dialysis
- Automotive
- Gas Controllers
- Mass Flow Control
- Patient Simulators
- Gas Chromatography
- Respirators / Ventilators
- Semiconductor - CMP

and many more...

EVP Series Proportional Control Valves

Based on Clippard's original spider design from 1973, the EVP's armature is the heart of the valve which provides precise flow control.

An introductory CD is available which highlights the features and specifications of the award-winning EVP Proportional Control Valves. Call and request one today!

Type: 2-Way, Proportional

Medium: Air, Inert Gases

Temperature Range: 32˚ to 120˚ F (0˚ to 50˚ C)

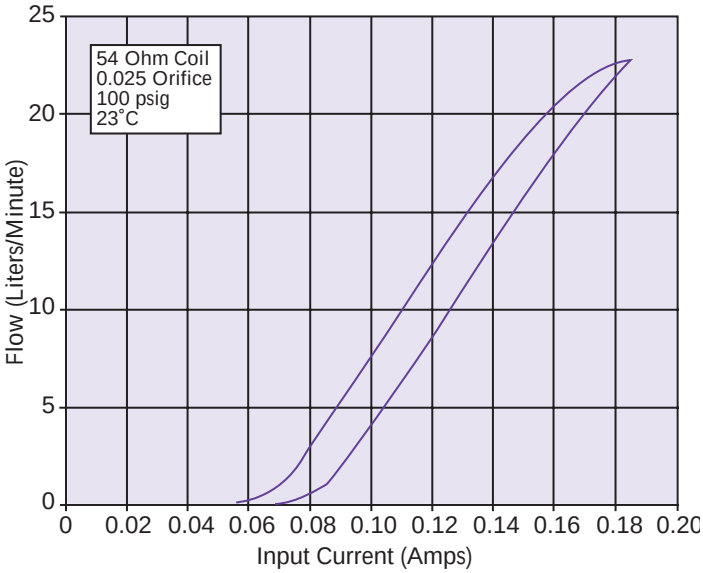
Power Consumption: 1.9 watts at 23˚C 2.3 watts max.

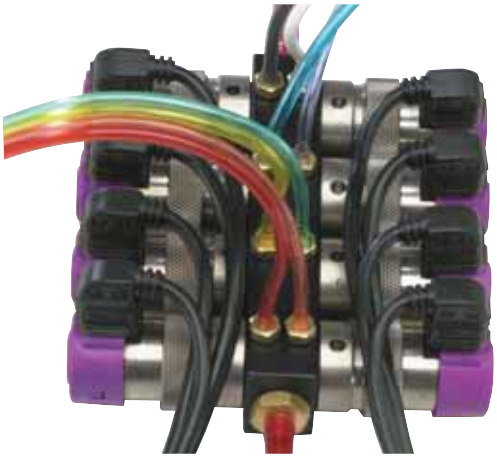
Mounting: In-line or Manifold

Ports: #10-32 Female (In-line)
#10-32 Male Stud (Manifold)

Seal Material: Buna-N; Fluorocarbon and EPDM. 186

Typical Performance

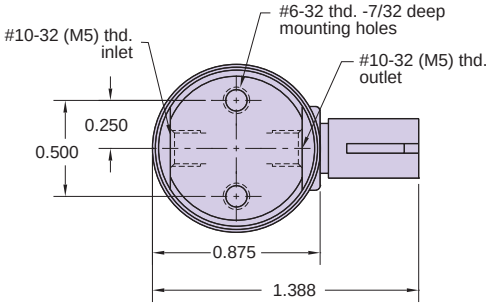




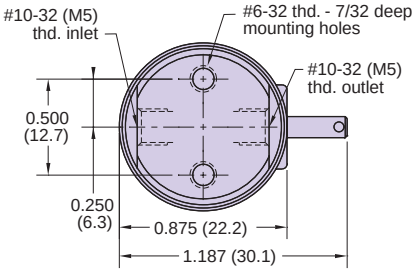
Orifice Diameter	Rated Pressure	Flow at Max. Current (±10%)
0.009"	100 psig	2.7 slpm / 5.7 scfh
0.013"	100 psig	6.7 slpm / 14.2 scfh
0.025"	100 psig	23.5 slpm / 50.0 scfh
0.040"	50 psig	19.0 slpm / 40.0 scfh
0.060"	25 psig	14.0 slpm / 30.0 scfh

EVP Series Proportional Control Valves
In-line Mount

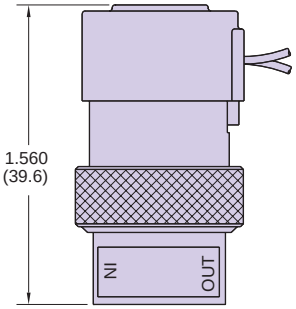
EC - P - ❑ - ❑ ❑ - ❑



ET - P - ❑ - ❑ ❑ - ❑



EV - P - ❑ - ❑ ❑ - ❑



Type: 2-Way, Proportional

Medium: Air, Inert Gases

Temperature Range: 32˚ to 120˚ F

Power Consumption: 1.9 watts at 23˚C 2.3 watts max.

Mounting: In-line

Ports: #10-32 (M5) Female

Orifice Diameter (in.)	Rated Pressure (psig)	Flow at Max. Current (scfh)
0.009	100	5.7±10%
0.013	100	14.2±10%
0.025	100	50.0±10%
0.040	50	40.0±10%
0.060	25	30.0±10%

Nominal Voltage Range at 23˚C (vdc)	Input Current Range (amps)	Coil Resistance at 23˚C (ohms)	Max. Voltage Required (vdc)
0 - 5	0 - 0.370	13.5	6.2
0 - 10	0 - 0.185	54	12.4
0 - 20	0 - 0.092	218	24.8

The EVP Proportional Valve can be calibrated for pressures less than the maximum shown here. Lower pressures may be substituted, and will be used for calibration. The pressures shown above are standard options. For pressures less than 10 psig, please consult factory.

NUMBERING SYSTEM

E ❑ - **P** - ❑ - ❑ ❑ - ❑ - ❑

- ❑ (Connector): **C** - Connector; **T** - Terminal Spades; **V** - Wire Leads
- **Voltages:** * — **05** - 0-5 VDC; **10** - 0-10 VDC; **20** - 0-20 VDC
- **Orifice Options:** § — **09** - 0.009 dia.; **13** - 0.013 dia.; **25** - 0.025 dia.; **40** - 0.040 dia.; **60** - 0.060 dia.
- **Maximum Pressure:** § — **25** - 25 psig; **50** - 50 psig; **A0** - 100 psig
- ❑ (Options): **Blank** - none; **E** - EPDM; **V** - FKM seals
- ❑ (Ports): **Blank** - #10-32; **M5** - Metric

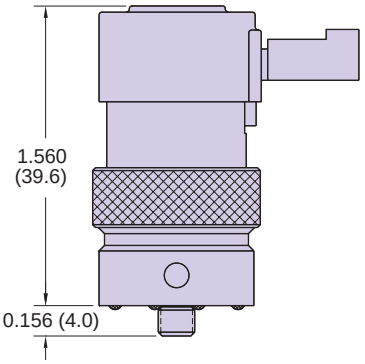
* Consult factory for availability of non-standard voltages and other options

§ Standard Orifice Configurations
09A0 13A0 25A0
4050 6025

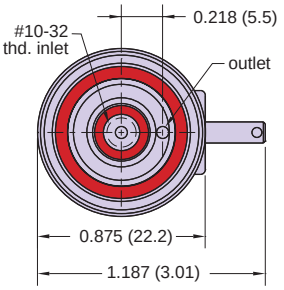
Sample part number:
EC-P-10-25A0

For Cable and Connectors, see Page 187.

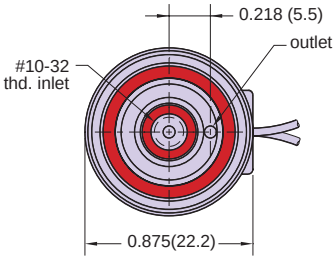
EC - PM - ❑ - ❑ ❑ - ❑



ET - PM - ❑ - ❑ ❑ - ❑



EV - PM - ❑ - ❑ ❑ - ❑



Type: 2-Way, Proportional

Medium: Air, Inert Gases

Temperature Range: 32˚ to 120˚F

Power Consumption: 1.9 watts at 23˚C 2.3 watts max.

Mounting: Manifold

Ports: #10-32 male stud

Orifice Diameter (in.)	Rated Pressure (psig)	Flow at Max. Current (scfh)
0.009	100	5.7±10%
0.013	100	14.2±10%
0.025	100	50.0±10%
0.040	50	40.0±10%
0.060	25	30.0±10%

Nominal Voltage Range at 23˚C (vdc)	Input Current Range (amps)	Coil Resistance at 23˚C (ohms)	Max. Voltage Required (vdc)
0 - 5	0 - 0.370	13.5	6.2
0 - 10	0 - 0.185	54	12.4
0 - 20	0 - 0.092	218	24.8

The EVP Proportional Valve can be calibrated for pressures less than the maximum shown here. Lower pressures may be substituted, and will be used for calibration. The pressures shown above are standard options. For pressures less than 10 psig, please consult factory.

NUMBERING SYSTEM

E ❑ - P M - ❑ - ❑ ❑ ❑ - ❑ - ❑

- **C** - Connector
- **T** - Terminal Spades
- **V** - Wire Leads

Voltages: *
- **05** - 0-5 VDC
- **10** - 0-10 VDC
- **20** - 0-20 VDC

Orifice Options: §
- **09** - 0.009 dia.
- **13** - 0.013 dia.
- **25** - 0.025 dia.
- **40** - 0.040 dia.
- **60** - 0.060 dia.

Maximum Pressure: §
- **25** - 25 psig
- **50** - 50 psig
- **A0** - 100 psig

Options:
- **Blank** - none
- **E** - EPDM
- **V** - FKM seals

Ports:
- **Blank** - #10-32
- **M5** - Metric

* Consult factory for availability of non-standard voltages and other options

§ Standard Orifice Configurations
09A0 13A0 25A0
4050 6025

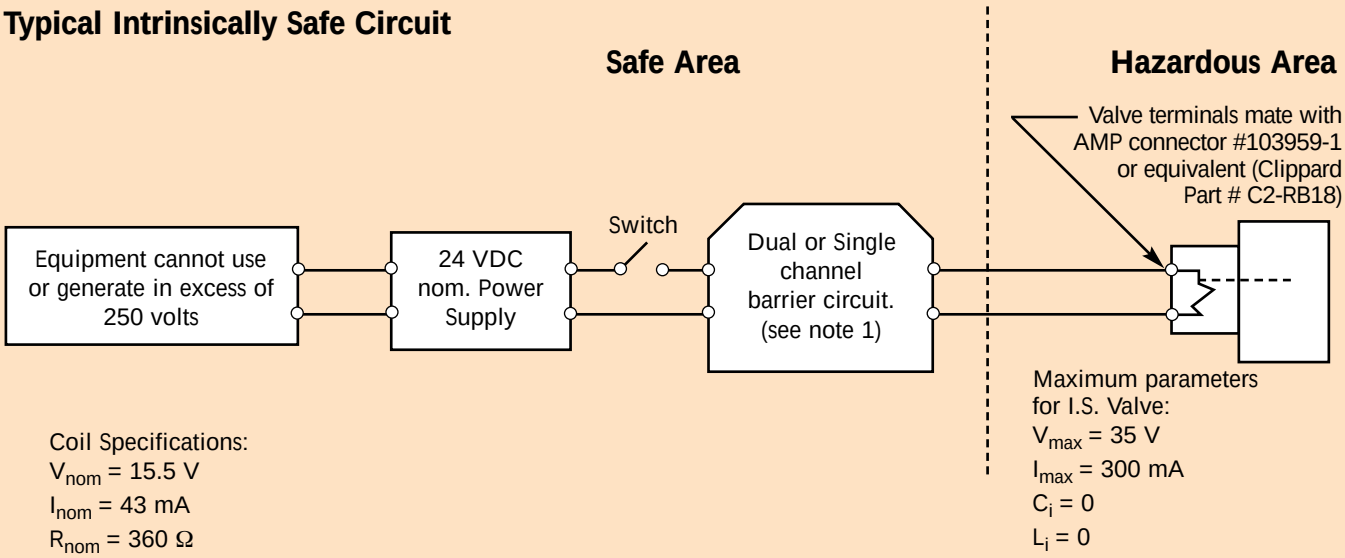
Sample part number:
EC-PM-10-25A0

For Cable and Connectors, see Page 187.

Definitions

C_a : Maximum Allowed Capacitance
C_i : Maximum Internal Capacitance
I_{max} : Maximum Input Current
I_{sc} : Maximum Output Current
L_a : Maximum Allowed Inductance
L_i : Maximum Internal Inductance
V_{oc} : Maximum Output Voltage
V_{max} : Maximum Input Voltage
V_t : Voltage Total

FM APPROVAL
Typical Intrinsically Safe Circuit



Coil Specifications:
V_{nom} = 15.5 V
I_{nom} = 43 mA
R_{nom} = 360 Ω

Maximum parameters for I.S. Valve:
V_{max} = 35 V
I_{max} = 300 mA
C_i = 0
L_i = 0

1. For barrier interconnection refer to maximum barrier output parameters as referenced on the specific barrier installation drawing. Connect as follows:
   a. $V_{max} > V_{oc}$ of single channel barrier or V_t of dual channel barrier
   b. $I_{max} > I_{sc}$ of single channel barrier or I_t of dual channel barrier
   c. C_i + field wiring < C_a of single or dual channel barrier
   d. L_i = field wiring < L_a of single or dual channel barrier
2. Installation of intrinsically safe system is to be done in accordance with ANSI / ISA-RP12.6

NUMBERING SYSTEMS

Porting — Valve Type — Mounting Style — Voltage (DC) — Orifice Options — Coil Connections

EI❑ - ❑ ❑ - 15.5 - ❑ ❑ - ❑

- Porting: **Blank** - Normally CLOSED; **O** - Normally Open or Captivated Exhaust
- Valve Type: **2** - 2-Way; **3** - 3-Way
- Mounting Style: **Blank** - Standard Mount; **M** - Manifold Mount
- Voltage (DC): 15.5
- Orifice Options: **Blank** - 0.025 Dia. Orifice; **L** - 0.040 Dia Orifice; **H** - 0.060 Dia. Orifice
- Coil Connections: **Blank** - Amp Conn.; **C** - 18 gage leads; **CP** - 18 gage leads with pipe connection
- **Blank** - #10-32; **M5** - Metric

Increase Flow

High Flow Valves Models 2020 and 2021 high flow valves are piloted 3-way valves that work with EI/EIO intrinsically safe valves as well as EV/ET 3-way valves. They are designed to be mounted on EI/EIO manifold valves. Outputs from the EI/EIO will actuate the valve and produce outputs up to 22 scfm at 100 psig. Piloted 3-way valves are also available as R-481 and R-482.

Solenoid/Modular Valve: (Electrical Parameters)
U_{max} = 28 V
I_{max} = 93.3 mA
P_{max} = 0.653 W
C_{eq} = 1.0 pF (opened circuit)
L_{eq} = 157 H/Ω

EVB Booster Valve Clippard EVB-3 booster valve mates with manifold mounted EI/EIO valves and manifolds to provide increased flow. Direct piloting from Clippard EI/EIO valves provides a flow of up to 6.1 scfm at 100 psig.

What is Intrinsic Safety?

An intrinsically safe system is one in which all electrical devices and their associated circuits are designed such that they can neither arc nor spark with sufficient energy to ignite the hazardous substances around which they are being used. Put another way, the energy stored from the inductance of the circuit components must be unable to generate a spark or arc at the circuits open point during current circulation that is capable of igniting the hazardous materials present when they are in a fuel/air mixture that is most favorable for ignition.

What is Entity approval?

According to INTRINSIC SAFETY standards, there is no requirement for authorized laboratory certification of system-wide intrinsic safety if the designer can determine, with certainty, that the physical and electrical parameters of every system component has been met sufficient to ensure that system-wide intrinsic safety has been maintained.
An “Entity Approval” is documentation stating that a device is intrinsically safe in specified hazardous atmospheres if the stated physical and electrical conditions contained in the approval are met. By meeting the requirements of “Entity Approvals” on all components of a system, the designer can more easily document that system-wide intrinsic safety has been maintained.

The Clippard EI-EIO series valves hold the Entity Approvals listed and supporting documentation is available to our customers.

EI Intrinsically Safe Normally Closed Valves

EI-❑❑-15.5-❑

Standard Mount

Manifold Mount

EI-❑❑-15.5-❑C

Standard Mount

Manifold Mount

EI-❑❑-15.5-❑CP

Standard Mount

Manifold Mount

For Cable and Connectors, see Page 187.

Type: 2-Way or 3-Way Poppet, Normally Closed

Medium: Air (40 micron filtration)

Temperature Range: 30˚ - 180˚F

Input Pressure: 28 Hg. Vac to 105 psig; 0-7 bar
28 Hg. Vac to 50 psig (L); 0-3.5 bar
28 Hg. Vac to 25 psig (H); 0-1.8 bar

Air Flow: 0.6 scfm @ 100 psig; 17 l/min @ 7 bar
0.5 scfm @ 50 psig (L); 14 l/min @ 3.5 bar
0.45 scfm @ 25 psig (H); 13 l/min @ 1.8 bar

Voltages: 15.5 VDC

Power Consumption: 0.67 watt at rated voltage (0.66 watt on top three products)

Response: 5 - 10 milliseconds @ 100 psig

Ports: Inlet - #10-32 (M5), Outlet - #10-32 (M5) - on std.

Metric: Add -M5 to Part Number (standard mount only)

EIO-❑❑-15.5-❑

Standard Mount

Manifold Mount

EIO-❑❑-15.5-❑C

Standard Mount

Manifold Mount

Type: 2-Way or 3-Way Poppet, Fully Ported

Medium: Air (40 micron filtration)

Temperature Range: 30˚ - 180˚F

Input Pressure: 28 Hg. Vac to 105 psig; 0-7 bar
28 Hg. Vac to 50 psig (L); 0-3.5 bar
28 Hg. Vac to 25 psig (H); 0-1.8 bar

Air Flow: 0.6 scfm @ 100 psig; 15 l/min @ 7 bar
0.5 scfm @ 50 psig (L); 15 l/min @ 3.5 bar
0.45 scfm @ 25 psig (H); 14 l/min @ 1.8 bar

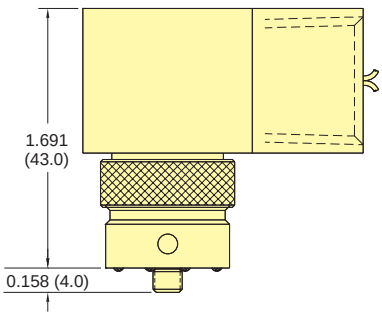
Voltages: 15.5 VDC

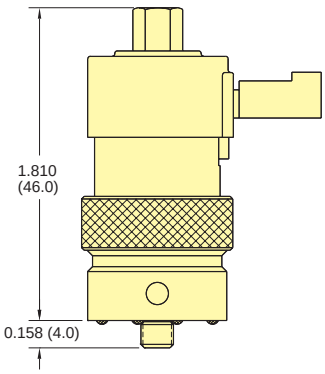
Power Consumption: 0.67 watt at rated voltage

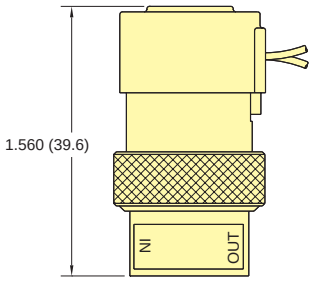
Response: 5 - 10 milliseconds @ 100 psig

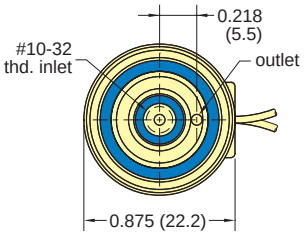
Ports: Inlet - #10-32 (M5), Outlet - #10-32 (M5) - on std.

Metric: Add -M5 to Part Number









For Cable and Connectors, see Page 187.

Maximatic®

MAXIMATIC SOLENOID VALVES

Clippard's all-new Solenoid valves are available in 2-way, 3-way and 4-way configurations in port sizes from #10-32 to 1/2" NPT. Select either a direct-acting poppet or solenoid-controlled pilot operated balanced spool design. Spool valves are body ported but can be bolted to a parallel circuit manifold.

These electronic valves offer high flow in a small package, and are constructed of aluminum, stainless steel and thermoplastic materials. The 4-way valves are also available in 3 position versions with either pressure center, closed center or exhaust center spool options.

Materials: Aluminum, Stainless Steel, Thermoplastic
Maximum Pressure: Vacuum to 150 psig (direct-acting only); 30 to 125 on MME-41 Series, 20 to 125 psig on all others (spool valves)
Response Time: Less than 20 ms
Mounting: Manifold standard. Actuator (1/4" only) or NAMUR (3/8" NPT only) available on Page 201.
Manual Override: Locking or non-locking
Electrical Connection: DIN terminal with LED indicator, or 18" Wire Leads
DIN Connector: Plug-in electrical connector with LED. MME-31/41 models are DIN 43650 Form "C" 3 mm screw. All others are DIN 43650 Form "B" 3 mm screw. LED will not "light" if polarity is reversed.
Wire Leads: Not polarity sensitive
Temperature Range: 32° to 150°F (0 to 65°C)
Seals: Buna-N

Conforms to ISO 19973-2 test standards.

3- & 4-Way Valves

Port	Cv	Flow Rate @ 50 psig	Flow Rate @ 100 psig
#10-32	0.58	16 scfm	27 scfm
1/8" NPT	0.67	18 scfm	31 scfm
1/4" NPT	0.89	26 scfm	49 scfm
3/8" NPT	1.68	51 scfm	93 scfm
1/2" NPT	2.79	91 scfm	171 scfm

Maximum Value. Maximum Performance.

For side ported manifold mount, the Maximatic line of valves offers both 1/4" actuator mount and 3/8" NAMUR mount

2-, 3- & 4-Way Designs

Choose either DIN connector with LED indicator or 18" Wire Lead connection. Both are rotatable and interchangeable.

Easily accessible locking or non-locking manual override switch

Port sizes from #10-32 to 1/2" NPT

Small size makes valves ideal for use in compact applications

Buna-N Seals

Sturdy aluminum body withstands rough environments

Operating ranges to 125 psig

Closed Center, Pressure Center and Exhaust Center Models Available

Maximatic® Valves are available as body ported, manifold mount, NAMUR (3/8" NPT only), and Actuator (1/4" NPT only) mounting. Standard models include a base that permits fast, secure mounting of electronic valves to a manifold for grouping in compact assemblies.

A wide variety of voltage options are available including 12-volt DC, 24-volt DC, 24-volt AC, 110-volt AC and 220-volt AC. Consult factory for other voltages.

All Maximatic® Solenoid Valves are IP 65 CE Rating

NEW! MAXIMATIC® SOLENOID VALVES

Valve Series	Enter
Electronic	E
Air Pilot	A

Valve Type	Enter
2-Way (Direct-Acting only)	2
3-Way	3
4-Way	4

Body/Port Size	Enter
Direct-Acting	
1/8" NPT	P
1/8" NPT Stacking	S
1/4" NPT	Q
Spool Type	
#10-32	1N
1/8" NPT	1P
1/4" NPT (0.89 Cv)	2Q
1/4" NPT (1.68 Cv)	3Q
3/8" NPT	3W
1/2" NPT	4Z

Primary/Secondary Actuator	Enter
Air/Air	AA
Air/Spring	AS
Electronic Pilot/Elec. Pilot	EE
Electronic Pilot/Spring	ES
Direct Acting/Spring	DS (2- or 3-Way, #10-32, 1/8", 1/4" only)

Mounting	Enter
Standard Manifold	(blank)
Actuator/NAMUR*	B

* Only available on 3- or 4-Way Electronic Valves. 1/4" NPT Actuator or 3/8" NPT NAMUR Mount.

Spool Type	Enter
2-Position, Spool	(blank)
3-Position, Closed Center	C
3-Position, Exhaust Center	E
3-Position, Pressure Center	P

Only available on 4-Way Valves with "AA" or "EE" Actuator. Standard Manifold Mount only.

Electrical Connector	Enter
DIN Connector	D
Wire Leads (18")	W

Only required on Electronic Valves.

Voltage	Enter
12-Volt DC	012
24-Volt DC	024
24-Volt AC	24A
110-Volt AC	110
220-Volt AC	220

Only required on Electronic Valves.

MM [ ] - [ ] [ ] [ ] [ ] [ ] - [ ] [ ]

Example: MM E - 4 2Q ES - D 110

Single Solenoid Electronic Valves Mounted on 8-Station Manifold

This numbering schematic is shown for illustration purposes only. All possible configurations are not available. For standard models, see the products illustrated in this catalog.

2-Way Valves

Series No.	Style	Ports Inlet	Ports Outlet	Exhaust	Function	Cv	Flow @ 100 psig
MME-2PDS	Poppet	1/8" NPT	1/8" NPT	1/8" NPT	2/2	0.12	6.7 scfm
MME-2QDS	Poppet	1/4" NPT	1/4" NPT	1/4" NPT	2/2	0.12	6.7 scfm
MME-2SDS	Poppet	1/8" NPT	1/8" NPT	1/8" NPT	2/2	0.05	2.3 scfm

3-Way Valves

Series No.	Style	Ports Inlet	Ports Outlet	Exhaust	Function	Cv	Flow @ 100 psig
MME-3PDS	Poppet	1/8" NPT	1/8" NPT	1/8" NPT	3/2	0.12	6.7 scfm
MME-3QDS	Poppet	1/4" NPT	1/4" NPT	1/4" NPT	3/2	0.12	6.7 scfm
MME-3SDS	Poppet	1/8" NPT	1/8" NPT	1/8" NPT	3/2	0.05	2.3 scfm
MME-31NES	Spool	#10-32	#10-32	#10-32	3/2 NC	0.58	2.3 scfm
MME-31PES	Spool	1/8" NPT	1/8" NPT	1/8" NPT	3/2 NC	0.67	31 scfm
MME-32QES	Spool	1/4" NPT	1/4" NPT	1/8" NPT	3/2 NC	0.89	49 scfm
MME-33WES	Spool	3/8" NPT	3/8" NPT	1/4" NPT	3/2 NC	1.68	93 scfm
MME-34ZES	Spool	1/2" NPT	1/2" NPT	1/2" NPT	3/2 NC	2.79	171 scfm
MME-31NEE	Spool	#10-32	#10-32	#10-32	3/2	0.58	27 scfm
MME-31PEE	Spool	1/8" NPT	1/8" NPT	1/8" NPT	3/2	0.67	31 scfm
MME-32QEE	Spool	1/4" NPT	1/4" NPT	1/8" NPT	3/2	0.89	49 scfm
MME-33WEE	Spool	3/8" NPT	3/8" NPT	1/4" NPT	3/2	1.68	93 scfm
MME-34ZEE	Spool	1/2" NPT	1/2" NPT	1/2" NPT	3/2	2.79	171 scfm

4-Way Valves

Series No.	Style	Ports Inlet	Ports Outlet	Exhaust	Function	Cv	Flow @ 100 psig	Spool Configuration: Closed Center	Exhaust Center	Pressure Center
MME-41NES	Spool	#10-32	#10-32	#10-32	5/2	0.58	27 scfm			
MME-41PES	Spool	1/8" NPT	1/8" NPT	1/8" NPT	5/2	0.67	31 scfm			
MME-42QES	Spool	1/4" NPT	1/4" NPT	1/8" NPT	5/2	0.89	49 scfm			
MME-43WES	Spool	3/8" NPT	3/8" NPT	1/4" NPT	5/2	1.68	93 scfm			
MME-44ZES	Spool	1/2" NPT	1/2" NPT	1/2" NPT	5/2	2.79	171 scfm			
MME-41NEE	Spool	#10-32	#10-32	#10-32	5/2	0.58	27 scfm			
MME-41PEE	Spool	1/8" NPT	1/8" NPT	1/8" NPT	5/2	0.67	31 scfm			
MME-42QEE	Spool	1/4" NPT	1/4" NPT	1/8" NPT	5/2	0.89	49 scfm			
MME-43WEE	Spool	3/8" NPT	3/8" NPT	1/4" NPT	5/2	1.68	93 scfm			
MME-44ZEE	Spool	1/2" NPT	1/2" NPT	1/2" NPT	5/2	2.79	171 scfm			
MME-41NEEC	Spool	#10-32	#10-32	#10-32	5/3	0.50	23 scfm	•		
MME-41PEEC	Spool	1/8" NPT	1/8" NPT	1/8" NPT	5/3	0.50	23 scfm	•		
MME-42QEEC	Spool	1/4" NPT	1/4" NPT	1/8" NPT	5/3	0.67	49 scfm	•		
MME-43WEEC	Spool	3/8" NPT	3/8" NPT	1/4" NPT	5/3	1.00	72 scfm	•		
MME-44ZEEC	Spool	1/2" NPT	1/2" NPT	1/2" NPT	5/3	1.68	93 scfm	•		
MME-41NEEP	Spool	#10-32	#10-32	#10-32	5/3	0.50	23 scfm			•
MME-41PEEP	Spool	1/8" NPT	1/8" NPT	1/8" NPT	5/3	0.50	23 scfm			•
MME-42QEEP	Spool	1/4" NPT	1/4" NPT	1/8" NPT	5/3	0.89	49 scfm			•
MME-43WEEP	Spool	3/8" NPT	3/8" NPT	1/4" NPT	5/3	1.00	72 scfm			•
MME-44ZEEP	Spool	1/2" NPT	1/2" NPT	1/2" NPT	5/3	1.68	93 scfm			•
MME-41NEEE	Spool	#10-32	#10-32	#10-32	5/3	0.50	23 scfm		•	
MME-41PEEE	Spool	1/8" NPT	1/8" NPT	1/8" NPT	5/3	0.50	23 scfm		•	
MME-42QEEE	Spool	1/4" NPT	1/4" NPT	1/8" NPT	5/3	0.89	49 scfm		•	
MME-43WEEE	Spool	3/8" NPT	3/8" NPT	1/4" NPT	5/3	1.00	72 scfm		•	
MME-44ZEEE	Spool	1/2" NPT	1/2" NPT	1/2" NPT	5/3	1.68	93 scfm		•	

Direct-Acting 2-Position Solenoid Valves

MME-2SDS-D024

MME-3PDS-D110

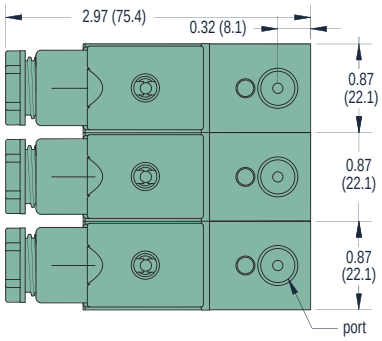
Maximatic® Direct-Acting Valves are single solenoid spring return poppet type valves available as either 2-way or 3-way configurations in ports sizes 1/8" NPT and 1/4" NPT. Hardware to stack multiple valves included with each stacking valve (MME-3SDS and MME-2SDS). Includes one long screw, one short screw, one gasket, and one nut.

Medium: Air (40 micron filtration), Inert Gas or Liquid
Operating Range: Vacuum to 150 psig

Flow: 2.3 scfm @ 100 psig
Electrical Connection: DIN connector with LED indicator ("-D"), or 18" Wire Lead ("-W")
Voltage: 12-volt DC ("-012"), 24-volt DC ("-024"), 24-volt AC ("-24A"), 110-volt AC ("-110"), or 220-volt AC ("-220")
Power Consumption: 6.5 Watt
Number of Ports: 2 or 3
Mounting: Body Ported or Stacking

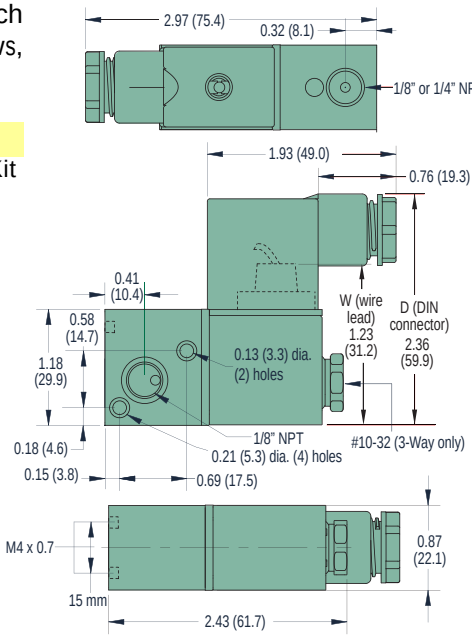
Replacement Stacking Kit
Replacement Stacking Kits are available which include two long screws, two short screws, one gasket and two nuts.

Part No.	
27048	Replacement Stacking Kit

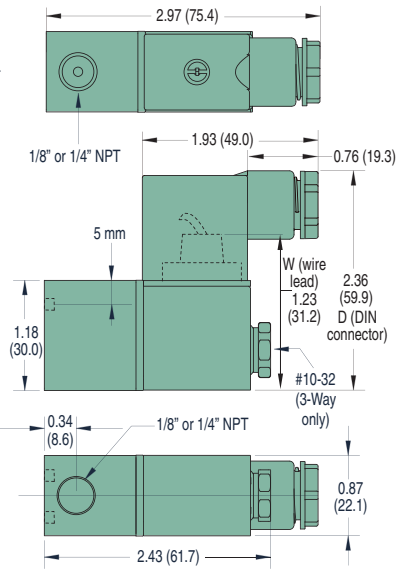


3-Station Configuration

2-Way & 3-Way Valves (Stacking)



2-Way & 3-Way Valves (non-Stacking)



2-Way Valves		Cv/scfm*	3-Way Valves		Inlet	Outlet	Exhaust	Cv/scfm*
MME-2PDS-	A P	0.12/6.7	MME-3PDS-	A P E	1/8" NPT	1/8" NPT	#10-32	0.05/2.3
MME-2SDS-**		0.12/6.7	MME-3SDS-**		1/8" NPT	1/8" NPT	#10-32	0.05/2.3
MME-2QDS-		0.12/6.7	MME-3QDS-		1/4" NPT	1/4" NPT	#10-32	0.05/2.3

*** Stacking Valve*
** scfm based on flow @ 100 psig*

*Add Electrical Connection and Voltage Choices to the end of each Base Part Number - Example: **MME-2QDS-W220***

2-Position Single & Double Solenoid Valves

MME-33WES-D110

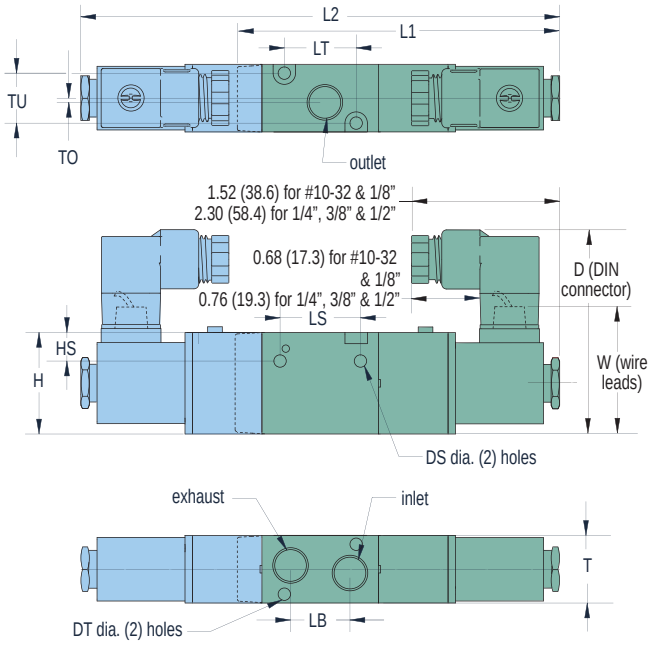
MME-32QEE-D110

Maximatic® 3-way electronic valves are either N.C. single solenoid spring return or double solenoid spool valves in #10-32 to 1/2" NPT port sizes.

Medium: Air (40 micron filtration) or Inert Gas
Operating Range: 20 to 125 psig
Electrical Connection: DIN connector with LED indicator ("-D"), or 18" Wire Lead ("-W")
Voltage: 12-volt DC ("-012"), 24-volt DC ("-024"), 24-volt AC ("-24A"), 110-volt AC ("-110"), or 220-volt AC ("-220")
Number of Ports: 3
Mounting: Body Ported, Manifold Mount, Actuator (1/4" NPT only) or NAMUR (3/8" NPT only) available. See Page 207.
Manual Override: Non-locking on MME-31 series. Locking on all other models.
Power Consumption: 2.5 Watts on MME-31 series; 3 Watts for all others.

MAXIMUM Value. Performance.

Dim.	MME-31	MME-32	MME-33	MME-34
D	2.14 (54.4)	2.65 (67.3)	2.71 (68.8)	2.94 (74.7)
DS	0.13 (3.3)	0.17 (4.3)	0.17 (4.3)	0.22 (5.6)
DT	0.13 (3.3)	0.13 (3.3)	0.17 (4.3)	0.17 (4.3)
H	1.07 (27.2)	1.38 (35.1)	1.58 (40.1)	1.97 (50.0)
HS	0.30 (7.6)	0.31 (7.9)	0.41 (10.4)	0.53 (13.5)
L1	3.38 (85.9)	4.39 (111.5)	4.70 (119.4)	5.39 (136.9)
L2	5.02 (127.5)	6.49 (164.8)	6.76 (171.7)	7.55 (191.8)
LB	0.63 (16.0)	0.71 (18.0)	0.94 (23.9)	1.42 (36.1)
LS	0.83 (21.1)	0.98 (24.9)	1.18 (30.0)	2.01 (51.1)
LT	0.75 (19.1)	1.30 (33.0)	1.38 (35.1)	1.73 (43.9)
T	0.71 (18.0)	0.87 (22.1)	1.06 (26.9)	1.34 (34.0)
TO	0.06 (1.5)	0.06 (1.5)	0.16 (4.1)	0.16 (4.1)
TU	0.71 (18.0)	0.87 (22.1)	1.06 (26.9)	1.34 (34.0)
W	1.32 (33.5)	1.51 (38.4)	1.54 (39.1)	1.73 (43.9)



Single Solenoid Valves	Double Solenoid Valves	Inlet	Outlet	Exhaust	Cv/scfm*
MME-31NES-	**MME-31NEE-**	#10-32	#10-32	#10-32	0.58/27
MME-31PES-	**MME-31PEE-**	1/8" NPT	1/8" NPT	1/8" NPT	0.67/31
MME-32QES-	**MME-32QEE-**	1/4" NPT	1/4" NPT	1/8" NPT	0.89/49
MME-33WES-	**MME-33WEE-**	3/8" NPT	3/8" NPT	1/4" NPT	1.68/93
MME-34ZES-	**MME-34ZEE-**	1/2" NPT	1/2" NPT	1/2" NPT	2.79/171

** scfm based on flow @ 100 psig*

Add Electrical Connection and Voltage Choices to the end of each Base Part Number - Example: ***MME-34ZEE-W024***

2-Position Single & Double Solenoid Valves

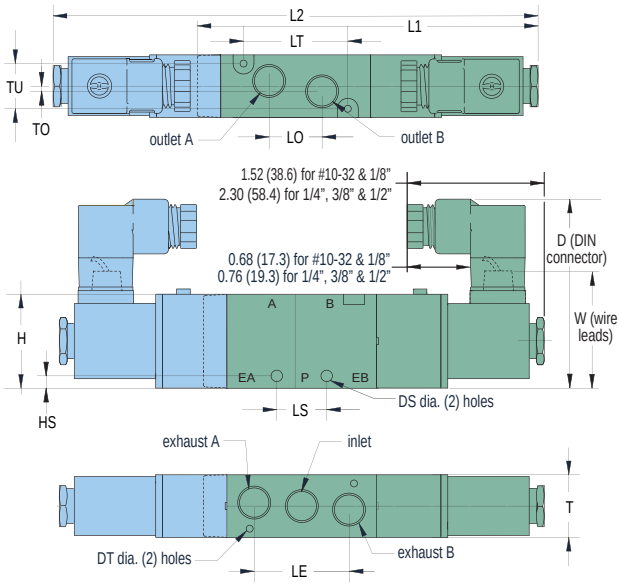
MME-44ZEE-D110

MME-44ZES-D012

Maximatic® 4-way solenoid controlled pilot operated valves are either single solenoid spring return or double solenoid spool valves in #10-32 thread to 1/2" NPT port sizes.

Medium: Air (40 micron filtration) and Inert Gas
Operating Range: 20 to 125 psig
Electrical Connection: DIN connector with LED indicator ("-D"), or 18" Wire Lead ("-W")
Voltage: 12-volt DC ("-012"), 24-volt DC ("-024"), 24-volt AC ("-24A"), 110-volt AC ("-110"), or 220-volt AC ("-220")
Number of Ports: 5
Mounting: Body Ported, Manifold Mount
Manual Override: Non-locking on MME-41 models. Locking on all other models.
Power Consumption: 2.5 Watts on MME-41 models; 3 Watts for all others.

Dim.	MME-41	MME-42	MME-43	MME-44
D	2.14 (54.4)	2.65 (67.3)	2.71 (68.8)	2.94 (74.7)
DS	0.13 (3.3)	0.17 (4.3)	0.17 (4.3)	0.21 (5.3)
DT	0.13 (3.3)	0.13 (3.3)	0.17 (4.3)	0.17 (4.3)
H	1.07 (27.2)	1.38 (35.1)	1.58 (40.1)	1.97 (50.0)
HS	0.16 (4.1)	0.28 (7.1)	0.26 (6.6)	0.29 (7.4)
L1	3.81 (96.8)	4.49 (114.0)	5.19 (131.8)	6.39 (162.3)
L2	5.54 (140.7)	6.49 (164.8)	7.24 (183.9)	8.48 (215.4)
LE	1.09 (27.7)	1.42 (36.1)	1.77 (45.0)	2.48 (63.0)
LO	0.63 (16.0)	0.74 (13.9)	0.96 (24.4)	1.42 (36.1)
LS	0.56 (14.2)	0.98 (24.9)	0.95 (24.1)	1.11 (28.2)
LT	1.18 (30.0)	1.40 (35.6)	1.97 (50.0)	2.82 (71.6)
T	0.71 (18.0)	0.86 (21.8)	1.06 (26.1)	1.34 (34.0)
TO	0.11 (2.8)	0.13 (3.3)	0.16 (4.1)	0.19 (4.8)
TU	0.50 (12.7)	0.65 (16.5)	0.80 (20.3)	1.07 (27.2)
W	1.32 (33.5)	1.51 (38.4)	1.54 (39.1)	1.73 (43.9)



Single Solenoid Valves	Double Solenoid Valves	Inlet	Outlet	Exhaust	Cv/scfm*
MME-41NES-	MME-41NEE-	#10-32	#10-32	#10-32	0.58/27
MME-41PES-	MME-41PEE-	1/8" NPT	1/8" NPT	1/8" NPT	0.67/31
MME-42QES-	MME-42QEE-	1/4" NPT	1/4" NPT	1/8" NPT	0.89/49
MME-43WES-	MME-43WEE-	3/8" NPT	3/8" NPT	1/4" NPT	1.68/93
MME-44ZES-	MME-44ZEE-	1/2" NPT	1/2" NPT	1/2" NPT	2.79/171

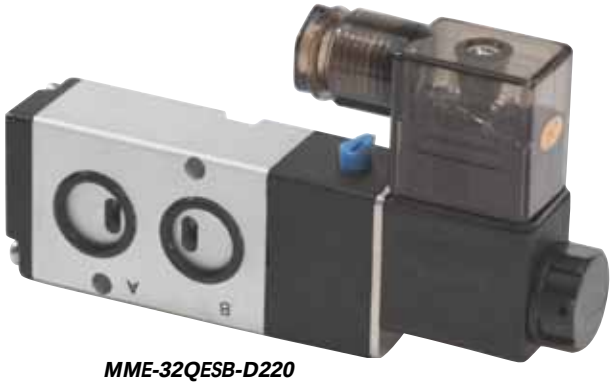
** scfm based on flow @ 100 psig*

Add Electrical Connection and Voltage Choices to the end of each Base Part Number - Example: ***MME-43WEE-D110***

2-Position Single Solenoid Valves

1/4" & 3/8" NAMUR Style

MME-33WESB-D012



MME-32QESB-D220

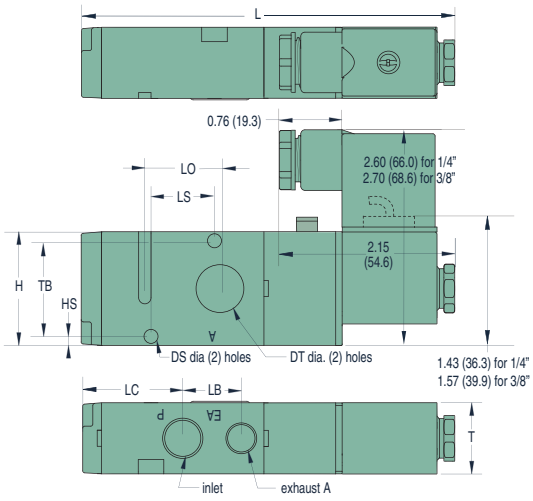
Maximatic® 3-way and 4-way single solenoid spring return spool valves are also available in 1/4" NPT actuator mount or 3/8" NAMUR mount.

Medium: Air (40 micron filtration) or Inert Gas
Operating Range: 20 to 125 psig
Electrical Connection: DIN terminal with LED indicator ("-D"), or Grommet with 18" Wire Lead ("-W")
Voltage: 12-volt DC ("-012"), 24-volt DC ("-024"), 24-volt AC ("-24A"), 110-volt AC ("-110"), or 220-volt AC ("-220")

Number of Ports: 3 or 5
Mounting: Actuator (1/4" NPT only) or NAMUR (3/8" NPT only).
Manual Override: Locking
Power Consumption: 3 Watts

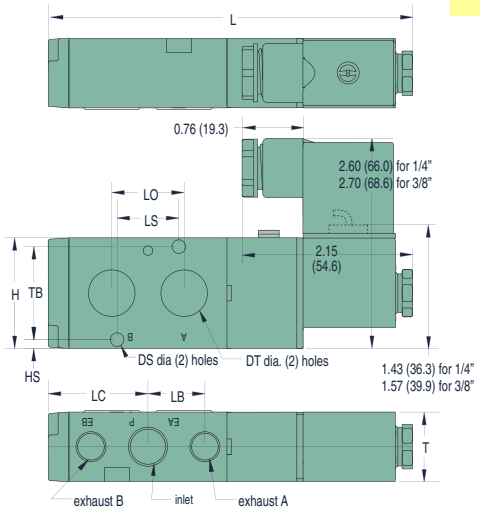
NAMUR/Actuator mount available on other 3- and 4-way Electronic and Air Pilot valves—Call for specifications.

3-Way Solenoid Valves



Dim.	1/4" NPT	3/8" NPT
DS	0.17 (4.3)	0.22 (5.6)
DT	0.72 (18.3)	0.78 (19.8)
H	1.38 (35.1)	1.58 (40.1)
HS	0.09 (2.3)	0.15 (3.8)
L	4.49 (114.0)	5.19 (131.8)
LC	1.21 (30.7)	1.57 (39.9)
LB	0.71 (18.0)	0.94 (23.9)
LO	0.91 (23.1)	0.94 (23.9)
LS	0.79 (20.1)	0.94 (23.9)
T	0.86 (21.8)	1.06 (26.9)
TB	1.14 (29.0)	1.26 (32.0)

4-Way Solenoid Valves



3-Way Single Solenoid Valves		Supply Port	Outlet	Exhaust	Cv/scfm*
MME-32QESB-	A T T P E	1/4" NPT	0.72"	1/4" NPT	0.89/49
MME-33WESB-		3/8" NPT	0.78"	1/4" NPT	1.68/93

4-Way Single Solenoid Valves		Supply Port	Outlet	Exhaust	Cv/scfm*
MME-42QESB-	A B T T EA P EB	1/4" NPT	0.72"	1/4" NPT	0.89/49
MME-43WESB-		3/8" NPT	0.78"	1/4" NPT	1.68/93

** scfm based on flow @ 100 psig*

Add Electrical Connection and Voltage Choices to the end of each Base Part Number - Example: ***MME-42QESB-D110***

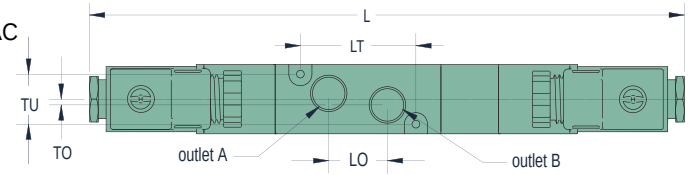
3-Position Spring Centered Double Solenoid Valves

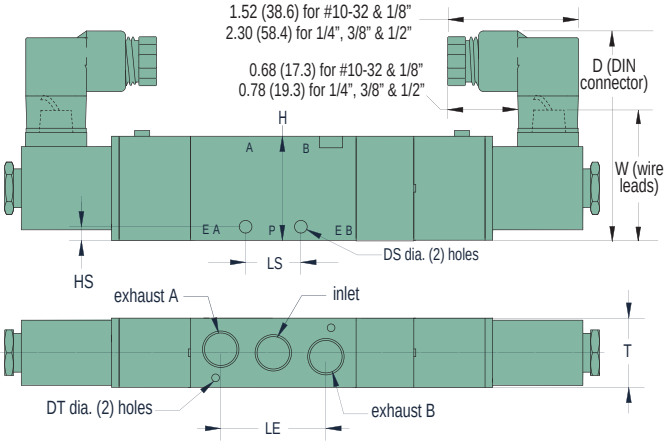
MME-44ZEEC-D024

Maximatic® 4-way double solenoid spring centered valves with closed center, pressure center or exhaust center spools are available from #10-32 thread to 1/2" NPT port sizes.

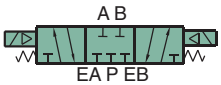
Medium: Air (40 micron filtration) or Inert Gas
Operating Range: 30 to 125 psig on MME-41 series, 20 to 125 psig on all others
Electrical Connection: DIN terminal with LED indicator ("-D"), or 18" Wire Lead ("-W")
Voltage: 12-volt DC ("-012"), 24-volt DC ("-024"), 24-volt AC ("-24A"), 110-volt AC ("-110"), or 220-volt AC ("-220")

Number of Ports: 5
Mounting: Body Ported, Manifold Mount
Manual Override: Non-locking on MME-41 Series. Locking on all other models.
Power Consumption: 2.5 Watts on MME-41 models; 3 Watts for all others.





Dim.	MME-41	MME-42	MME-43	MME-44
D	2.14 (54.4)	2.65 (67.3)	2.71 (68.8)	2.94 (74.7)
DS	0.13 (3.3)	0.17 (4.3)	0.17 (4.3)	0.21 (5.3)
DT	0.13 (3.3)	0.13 (3.3)	0.17 (4.3)	0.17 (4.3)
H	1.07 (27.2)	1.38 (35.1)	1.58 (40.1)	1.97 (50.0)
HS	0.16 (4.1)	0.28 (7.1)	0.26 (6.6)	0.29 (7.4)
L	6.13 (155.7)	7.24 (183.9)	7.98 (202.7)	8.48 (215.4)
LE	1.09 (27.7)	1.42 (36.1)	1.77 (45.0)	2.48 (63.0)
LO	0.63 (16.0)	0.74 (18.8)	0.96 (24.4)	1.42 (36.1)
LS	0.56 (14.2)	0.98 (24.9)	0.95 (24.1)	1.11 (28.2)
LT	1.18 (30.0)	1.40 (35.6)	1.97 (50.0)	2.82 (71.6)
T	0.71 (18.0)	0.86 (21.8)	1.06 (26.9)	1.34 (34.0)
TO	0.11 (2.8)	0.13 (3.3)	0.16 (4.1)	0.19 (4.8)
TU	0.50 (12.7)	0.65 (16.5)	0.80 (20.3)	1.07 (27.2)
W	1.32 (33.5)	1.51 (38.4)	1.54 (39.1)	1.73 (43.9)



Closed Center	Pressure Center	Exhaust Center	Inlet	Outlet	Exhaust	Cv/scfm*
MME-41NEEC-	**MME-41NEEP-**	**MME-41NEEE-**	#10-32	#10-32	#10-32	0.50/23
MME-41PEEC-	**MME-41PEEP-**	**MME-41PEEE-**	1/8" NPT	1/8" NPT	1/8" NPT	0.50/23
MME-42QEEC-	**MME-42QEEP-**	**MME-42QEEE-**	1/4" NPT	1/4" NPT	1/8" NPT	0.89/49
MME-43WEEC-	**MME-43WEEP-**	**MME-43WEEE-**	3/8" NPT	3/8" NPT	1/4" NPT	1.00/72
MME-44ZEEC-	**MME-44ZEEP-**	**MME-44ZEEE-**	1/2" NPT	1/2" NPT	1/2" NPT	1.68/93

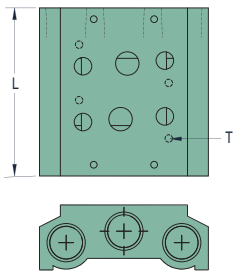
** scfm based on flow @ 100 psig*

Add Electrical Connection and Voltage Choices to the end of each Base Part Number - Example: ***MME-41PEEP-W024***

Rebuild Kits. Convenient rebuild kits are available which contain common maintenance items that may be needed during the life of the valve. Each contains a spool, diamond seal, two pilot seals, two pistons with seals, and spring. Consult factory for 3-position kits.

Part No.	
27040-31	3-Way Kit, MME-31
27040-32	3-Way Kit, MME-32
27040-33	3-Way Kit, MME-33
27040-34	3-Way Kit, MME-34
27040-41	4-Way 2 Pos. Kit, MME-41
27040-42	4-Way 2 Pos. Kit, MME-42
27040-43	4-Way 2 Pos. Kit, MME-43
27040-44	4-Way 2 Pos. Kit, MME-44

Parallel Bar Manifolds



4-Way Manifold *3-Way Manifold*

Valve Series	"L" Dimension 2-Station	4-Station	6-Station	8-Station	16-Station	"T" Mtg. Thd.
MME-31/41	2.24 (56.9)	3.73 (94.7)	5.25 (133.4)	6.75 (171.5)	12.69 (322.3)	M4
MME-32/42	2.71 (68.8)	4.50 (114.3)	6.33 (160.8)	8.13 (206.5)	15.38 (390.7)	M4
MME-33/43	3.22 (81.8)	5.42 (137.7)	7.62 (193.5)	9.82 (249.4)	18.63 (473.2)	M5
MME-34/44	3.85 (97.8)	6.56 (166.6)	9.38 (238.3)	12.10 (307.3)	23.11 (587.0)	M5

Parallel circuit manifold bars are available for all sizes of MME 3- and 4-way valves. Manifolds are made in increments of two stations from two to 16, and are supplied with mounting screws and gaskets. Spare kits are also available which include two screws and a gasket. Blank plate supplied with one gasket, two screws and metal plate.

Valve Series	Manifold Inlet/ Exhaust	Blank Plate	2-Station	4-Station	6-Station	8-Station	16-Station
3-Way Valve Manifolds							
MME-31	1/8"	MMM-31-B	MMM-31-02	MMM-31-04	MMM-31-06	MMM-31-08	MMM-31-16
MME-32	1/4"	MMM-32-B	MMM-32-02	MMM-32-04	MMM-32-06	MMM-32-08	MMM-32-16
MME-33	3/8"	MMM-33-B	MMM-33-02	MMM-33-04	MMM-33-06	MMM-33-08	MMM-33-16
MME-34	1/2"	MMM-34-B	MMM-34-02	MMM-34-04	MMM-34-06	MMM-34-08	MMM-34-16

3-Way Spare Mounting Kit Hardware

27041-31 . . . . . Hardware Kit for MME-31 Series Valves
27041-32 . . . . . Hardware Kit for MME-32 Series Valves
27041-33 . . . . . .Hardware Kit for MME-33 Series Valves
27041-34 . . . . . .Hardware Kit for MME-34 Series Valves

Valve Series	Manifold Inlet/ Exhaust	Blank Plate	2-Station	4-Station	6-Station	8-Station	16-Station
4-Way Valve Manifolds							
MME-41	1/4"	MMM-41-B	MMM-41-02	MMM-41-04	MMM-41-06	MMM-41-08	MMM-41-16
MME-42	1/4"	MMM-42-B	MMM-42-02	MMM-42-04	MMM-42-06	MMM-42-08	MMM-42-16
MME-43	3/8"	MMM-43-B	MMM-43-02	MMM-43-04	MMM-43-06	MMM-43-08	MMM-43-16
MME-44	1/2"	MMM-44-B	MMM-44-02	MMM-44-04	MMM-44-06	MMM-44-08	MMM-44-16

4-Way Spare Mounting Kit Hardware

27041-41 . . . . .Hardware Kit for MME-41 Series Valves
27041-42 . . . . .Hardware Kit for MME-42 Series Valves
27041-43 . . . . . .Hardware Kit for MME-43 Series Valves
27041-44 . . . . . .Hardware Kit for MME-44 Series Valves

Replacement Coils

2.5 Watt #10-32 & 1/8"

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

6.5 Watt Direct-Acting

Replacement coils for solenoid valves are available in voltages from 12 VDC to 220 VAC with either DIN connector or 18" wire leads.

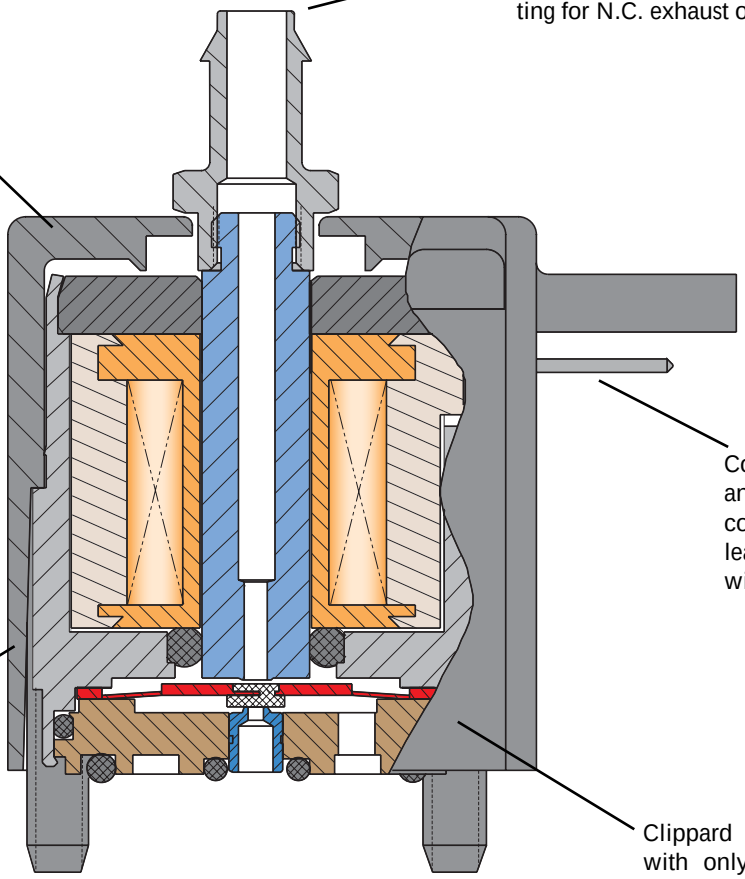
Description	2.5 Watt #10-32 & 1/8"	3.0 Watt 1/4", 3/8" & 1/2"	6.5 Watt Direct-Acting
DIN Connectors			
12-Volt DC	27001-D012	27065-D012	27002-D012
24-Volt DC	27001-D024	27065-D024	27002-D024
110-Volt AC	27001-D110	27065-D110	27002-D110
220-Volt AC	27001-D220	27065-D220	27002-D220
24-Volt AC	27001-D24A	27065-D24A	27002-D24A
Wire Leads			
12-Volt DC	27001-W012	27065-W012	27002-W012
24-Volt DC	27001-W024	27065-W024	27002-W024
110-Volt AC	27001-W110	27065-W110	27002-W110
220-Volt AC	27001-W220	27065-W220	27002-W220
24-Volt AC	27001-W24A	27065-W24A	27002-W24A

ES, ESO Series Compact Valves

Valves are small in size with a variety of coil voltages and flow options. Mounting is as close as 7/8" on center.

ESO and similar styles have top hose barb or #10-32 threaded fitting for N.C. exhaust or N.O. inlet.

Housing is molded Zytel ST 801 for toughness and rigidity.



Coils are available with an AMP# 103959-2 pin connection or 18" wire leads which utilize #26 wire.

Valves feature low power, cool running, quiet operation and fast response time. They convert low voltage, low current signals into high pressure pneumatic outputs.

Clippard ES valves are unique, with only one internal moving part that travels a mere 0.007 inches.

NUMBERING SYSTEMS

Valve Type
2 - 2-Way
3 - 3-Way

Options (ESO only)
Blank - #10-32 Female
1 - 1/16" I.D. Hose Barb
2 - 1/8" I.D. Hose Barb

E S ❑ - ❑ ❑ - ❑ - ❑ ❑

Porting
Blank - Normally Closed
O - Normally Open or Captivated Exhaust

Coil Connections
S - Side Pin
T - Top Pin
W - Wires
B - Board Mount

Voltage
6 - Volts
12 - Volts
24 - Volts

Orifice Options
Blank - 0.025 Dia. Orifice (105 psig)
L - 0.040 Dia Orifice (50 psig)
H - 0.060 Dia Orifice (25 psig)

Quality Design

The compact ES valve, like Clippard EV and ET valves, converts low voltage, low current signals into high pressure (0-105 psig) pneumatic outputs, utilizing a unique, patented, valving principle. Since there are no sliding parts, and complete poppet travel is only 0.007", low power consumption and exceptionally long life are assured with this design. No flow is required for cooling because the compact ES is cool, as well as quiet, in operation.

The compact nature of design makes this valve well suited to a wide range of applications in biomedical, environmental test equipment, textile machines, packaging machinery, computerized industrial automation, and portable systems.

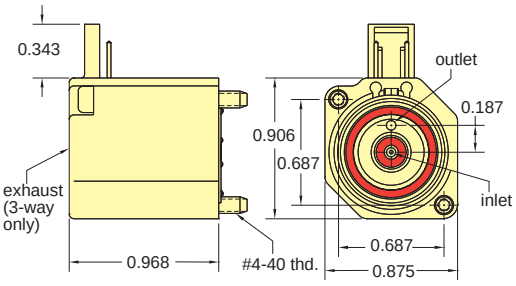
Features

- Temperature Range: 30˚ - 180˚ F
- Medium: Air (40 micron filtration)
- Low power consumption - 1 watt at rated voltage
- Close mounting - 7/8" on center
- Voltage Options: 6, 12 or 24 VDC
- Overall height less than 1 inch
- Easy to mount on manifold with two #4-40 screws
- Response: 5-10 ms at max rated pressure
- Geometric design
- Polymer housing - Zytel ST 801® super tough
- Pin connectors - AMP # 103959-2 or 18" wire leads: #26 wire
- Flow up to 0.6 scfm/15 l/min

Zytel ST 801® super tough is a registered trademark of DuPont

NOMINAL			Power (watts)	Working Range (cont. duty)
Voltage	Current (amps)	Resistance (ohms)		
6	0.17	36	1.0	90% - 150% of rated voltage
12	0.083	144	1.0	
24	0.042	576	1.0	

Normally Closed 2 & 3-Way Electronic Poppet Valves with Side Pin Connector



Input Pressure: 28" Hg Vac. to 105 psig
28" Hg Vac. to 50 psig (L)
25" Hg Vac. to 50 psig (H)

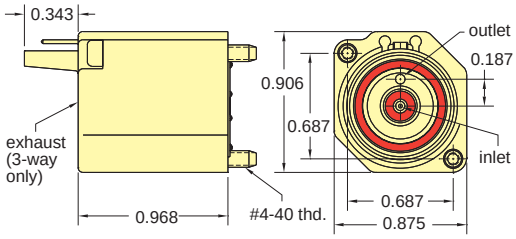
Air Flow: 0.6 scfm @ 100 psig
0.5 scfm @ 50 psig (L)
0.45 scfm @ 25 psig (H)

Ports: Inlet and outlet through manifold; 3-way exhaust through top of valve (3-way only)

Order No.

ES-2S-❑ 2-Way Electronic Poppet Valve
ES-3S-❑ 3-Way Electronic Poppet Valve

Normally Closed 2- & 3-Way Electronic Poppet Valves with Top Pin Connector



Input Pressure: 28" Hg Vac. to 105 psig
28" Hg Vac. to 50 psig (L)
25" Hg Vac. to 50 psig (H)

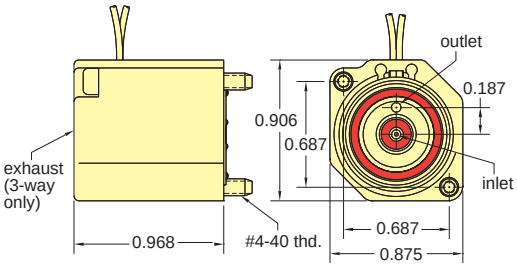
Air Flow: 0.6 scfm @ 100 psig
0.5 scfm @ 50 psig (L)
0.45 scfm @ 25 psig (H)

Ports: Inlet and outlet through manifold; 3-way exhaust through top of valve (3-way only)

Order No.

ES-2T-❑ 2-Way Electronic Poppet Valve
ES-3T-❑ 3-Way Electronic Poppet Valve

Normally Closed 2- & 3-Way Electronic Poppet Valves with Wire Leads



Input Pressure: 28" Hg Vac. to 105 psig
28" Hg Vac. to 50 psig (L)
25" Hg Vac. to 50 psig (H)

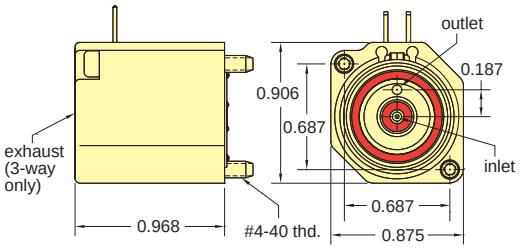
Air Flow: 0.6 scfm @ 100 psig
0.5 scfm @ 50 psig (L)
0.45 scfm @ 25 psig (H)

Ports: Inlet and outlet through manifold; 3-way exhaust through top of valve (3-way only)

Order No.

ES-2W-❑ 2-Way Electronic Poppet Valve
ES-3W-❑ 3-Way Electronic Poppet Valve

Normally Closed 2- & 3-Way Electronic Poppet Valves with Board Mount



Input Pressure: 28" Hg Vac. to 105 psig
28" Hg Vac. to 50 psig (L)
25" Hg Vac. to 50 psig (H)

Air Flow: 0.6 scfm @ 100 psig
0.5 scfm @ 50 psig (L)
0.45 scfm @ 25 psig (H)

Ports: Inlet and outlet through manifold; 3-way exhaust through top of valve (3-way only)

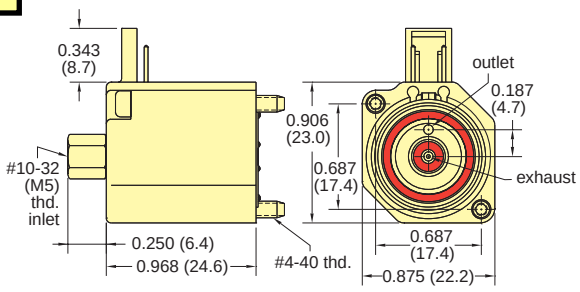
Order No.

ES-2B-❑ 2-Way Electronic Poppet Valve
ES-3B-❑ 3-Way Electronic Poppet Valve

For Cable and Connectors, see Page 215.

ESO-3S- ❑

Fully Ported 3-Way Electronic Poppet Valve with Side Pin Connector



Input Pressure: 28" Hg Vac. to 105 psig;
0-7 bar
28" Hg Vac. to 50 psig (L);
0-3.5 bar
25" Hg Vac. to 50 psig (H);
0-1.8 bar

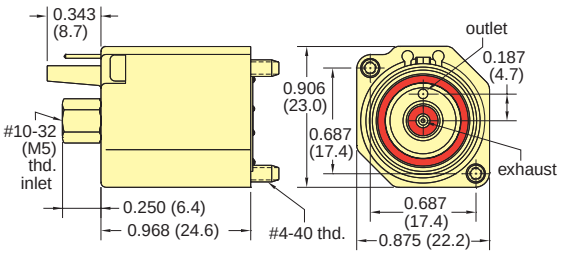
Air Flow: 0.6 scfm @ 100 psig;
15 l/min @ 7 bar
0.5 scfm @ 50 psig (L);
15 l/min @ 3.5 bar
0.45 scfm @ 25 psig (H);
14 l/min @ 1.8 bar

Ports: Exhaust and outlet through manifold;
3-way supply (#10-32/M5) through top of valve

Metric: Add -M5 to Part Number

ESO-3T- ❑

Fully Ported 3-Way Electronic Poppet Valve with Top Pin Connector



Input Pressure: 28" Hg Vac. to 105 psig;
0-7 bar
28" Hg Vac. to 50 psig (L);
0-3.5 bar
25" Hg Vac. to 50 psig (H);
0-1.8 bar

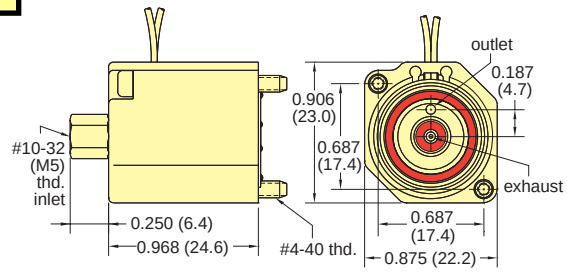
Air Flow: 0.6 scfm @ 100 psig;
15 l/min @ 7 bar
0.5 scfm @ 50 psig (L);
15 l/min @ 3.5 bar
0.45 scfm @ 25 psig (H);
14 l/min @ 1.8 bar

Ports: Exhaust and outlet through manifold;
3-way supply (#10-32/M5) through top of valve

Metric: Add -M5 to Part Number

ESO-3W- ❑

Fully Ported 3-Way Electronic Poppet Valve with Wire Leads



Input Pressure: 28" Hg Vac. to 105 psig;
0-7 bar
28" Hg Vac. to 50 psig (L);
0-3.5 bar
25" Hg Vac. to 50 psig (H);
0-1.8 bar

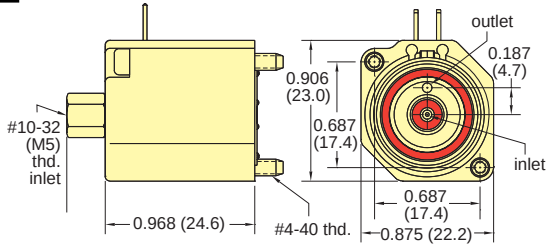
Air Flow: 0.6 scfm @ 100 psig;
15 l/min @ 7 bar
0.5 scfm @ 50 psig (L);
15 l/min @ 3.5 bar
0.45 scfm @ 25 psig (H);
14 l/min @ 1.8 bar

Ports: Exhaust and outlet through manifold;
3-way supply (#10-32/M5) through top of valve

Metric: Add -M5 to Part Number

ESO-3B- ❑

Normally Open 3-Way Electronic Poppet Valve with Board Mount



Input Pressure: 28" Hg Vac. to 105 psig;
0-7 bar
28" Hg Vac. to 50 psig (L);
0-3.5 bar
25" Hg Vac. to 50 psig (H);
0-1.8 bar

Air Flow: 0.6 scfm @ 100 psig;
15 l/min @ 7 bar
0.5 scfm @ 50 psig (L);
15 l/min @ 3.5 bar
0.45 scfm @ 25 psig (H);
14 l/min @ 1.8 bar

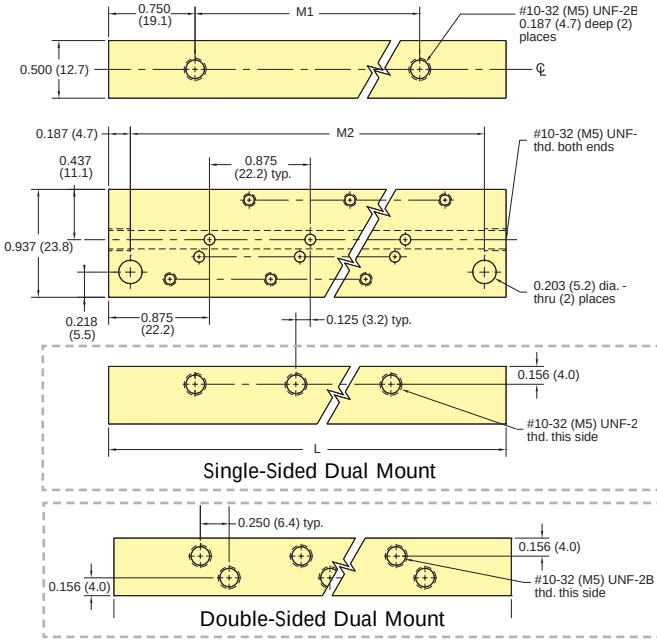
Ports: Exhaust and outlet through manifold;
3-way supply (#10-32/M5) through top of valve

Metric: Add -M5 to Part Number

For Cable and Connectors, see Page 215.

26081-❑ Single-Sided Dual Mount

Suffix	Valves	L	M1	M2
-4	4	4.375”	2.875”	4.000”
-4-M5	4	111.1 mm	73.0 mm	101.6 mm
-6	6	6.125”	4.625”	5.750”
-6-M5	6	155.6 mm	117.5 mm	146.1 mm
-8	8	7.875”	6.375”	7.500”
-8-M5	8	200.0 mm	161.9 mm	190.5 mm



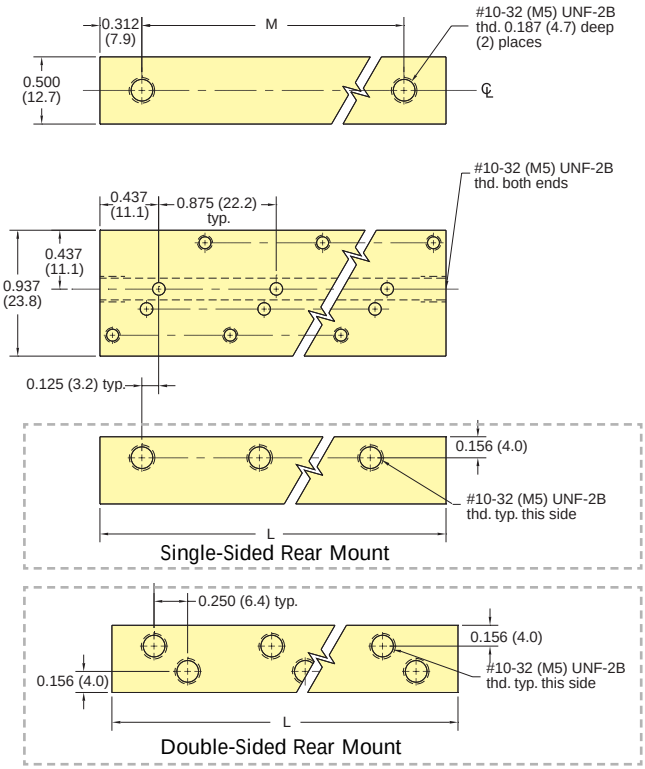
26082-❑ Double-Sided Dual Mount

Suffix	Valves	L	M1	M2
-8	8	4.375”	2.875”	4.000”
-8-M5	8	111.1 mm	73.0 mm	101.6 mm
-12	12	6.125”	4.625”	5.750”
-12-M5	12	155.6 mm	117.5 mm	146.1 mm
-16	16	7.875”	6.375”	7.500”
-16-M5	16	200.0 mm	161.9 mm	190.5 mm

* ESM-CP plate is to cover individual unused manifold station.

26083-❑ Single-Sided Rear Mount

Suffix	Valves	L	M
-4	4	3.500”	2.875”
		88.9 mm	73.0 mm
-6	6	5.250”	4.625”
		133.4 mm	117.5 mm
-8	8	7.000”	6.375”
		177.8 mm	161.9 mm



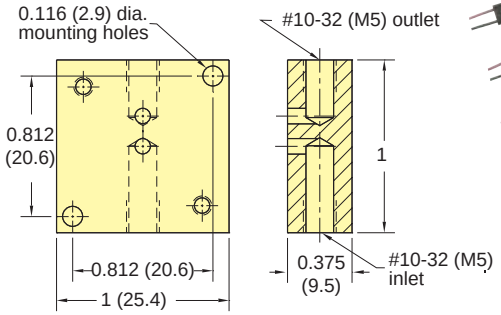
26084-❑ Double-Sided Rear Mount

Suffix	Valves	L	M
-8	8	3.500”	2.875”
-8-M5	8	88.9 mm	73.0 mm
-12	12	5.250”	4.625”
-12-M5	12	133.4 mm	117.5 mm
-16	16	7.000”	6.375”
-16-M5	16	177.8 mm	161.9 mm

* ESM-CP cover plate is available for one manifold station.

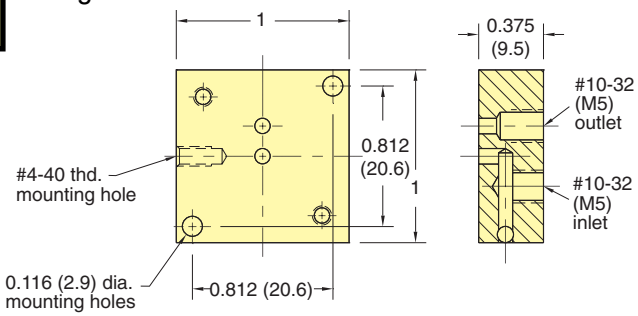
26090-1

Single Station Side Port Manifold



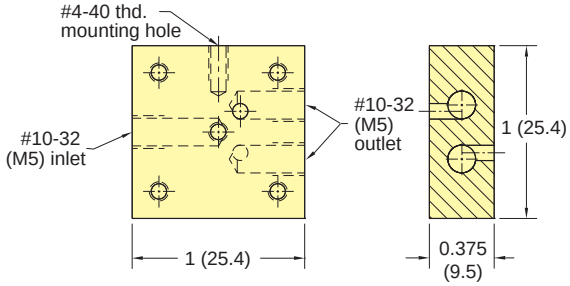
26090-2

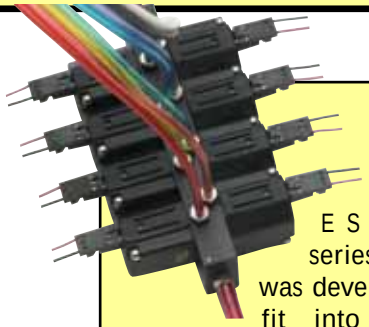
Single Station Bottom Port Manifold



26090-3

Dual Station Manifold





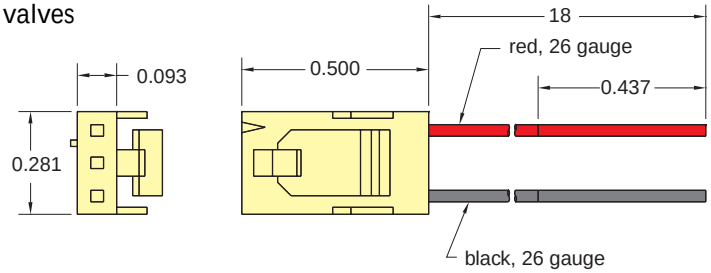
The ES/ESO series valve was developed to fit into tighter physical envelopes. By reducing the size of the base as well as the size of the coil, a considerable volume savings was achieved.

As in the case of the EV/EVO product, the ES/ESO uses the single moving part design proven many times in the EV/ET/EC series valves. Of course, given the reduced size of the coil the power to operate increases to 1 watt.

Because of its reliability, the ES/ESO series valve is found in many of the same applications and industries as its predecessor, the EV/ET/EC. However, the smaller size finds it used more commonly in portable or mobile equipment. This makes the valve particularly applicable in home healthcare applications.

C3-RXB18

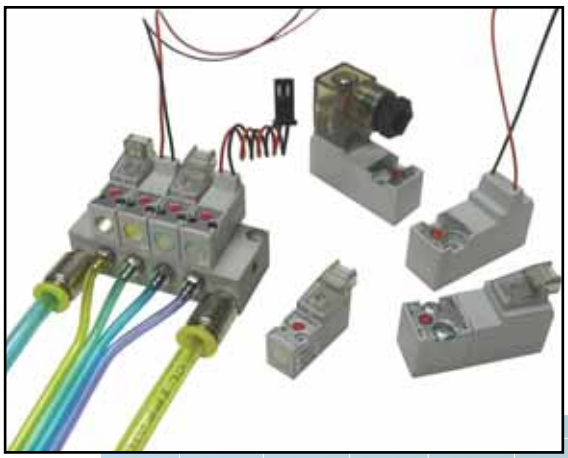
AMP Connector #103960-2 with 18" wire leads for ES/ESO valves



Lead Set Chart For ES Valve						
Part No.	Used On	Wire Colors			Lead Length	Wire Gage
		pin 1	pin 2	pin 3		
C3-RXB18	ES	red	~	black	18"	#26

NEW! 10 mm & 15 mm Miniature Valves

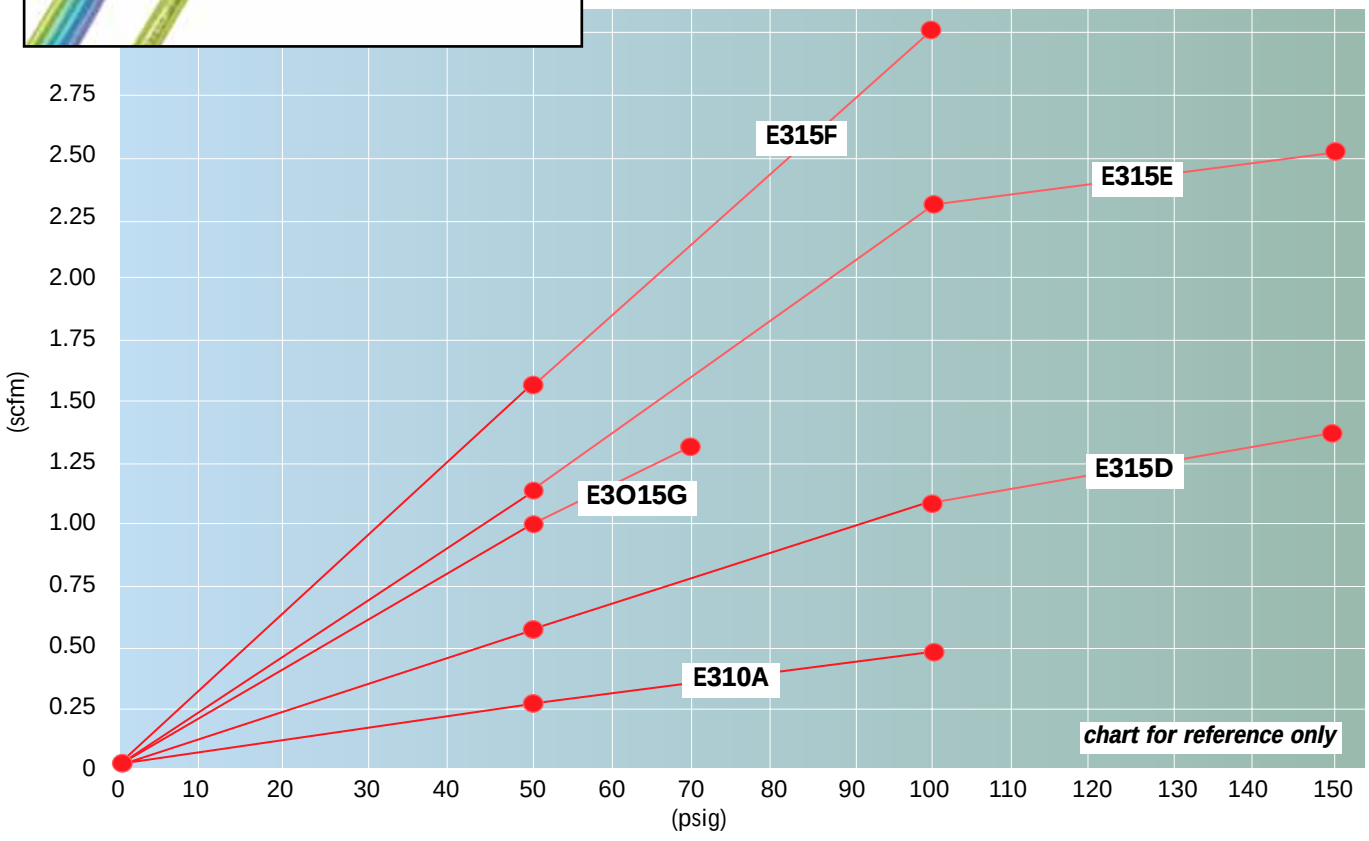
All of the benefits of Clippard quality and reliability are now available in these 10 mm and 15 mm valves. Offered in both Normally Open or Normally Closed models, these 2-way and 3-way valves are perfect for small and compact areas where pneumatic controls are needed.



This series has a high strength, lightweight engineered glass filled nylon body, along with stainless steel, copper and Buna-N, making it suitable for a broad range of applications. With exceptional life and reliability this is the perfect sub-miniature valve for tomorrow's needs in a wide variety of industries.

All 10 mm and 15 mm valves are RoHS compliant.

Typical Air Flow



Valve Material: Glass filled Nylon, Stainless Steel, Buna-N or Fluorocarbon Elastomer

Electrical: The coil is constructed of copper wire and is isolated according to the class "F" standard. All circuitry and connections are protected from corrosion.

Weight: Weighing in at a mere 0.4 ounces is the 10 mm valve, and in the other corner the 15 mm checks in at 1.3 ounces!

PART NUMBERING SYSTEM

Valve Type	Choose
2-Way Normally Closed	E210
3-Way Normally Closed	E310
3-Way Normally Open	E3O10

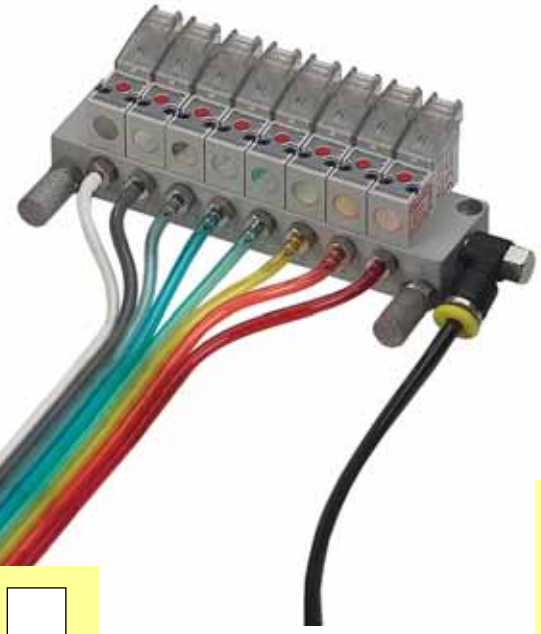
Orifice Size	Choose
0.020" (0.5 mm)	A
0.030" (0.75 mm)	C

Power	Choose
0.6 Watts	1
1.3 Watts	2

Electrical Connector	Choose
In-Line Connector	F
In-Line Connector with LED	C
90° Connector	E
90° Connector with LED	L
Wire Leads, 11.8" (300 mm)	W

Voltage	Choose
12-Volt DC	012
24-Volt DC	024

Seal Option	Choose
Buna-N	(blank)
Fluorocarbon	V



This numbering schematic is shown for illustration purposes only. All possible configurations are not available. For standard models, see the products illustrated in this catalog.

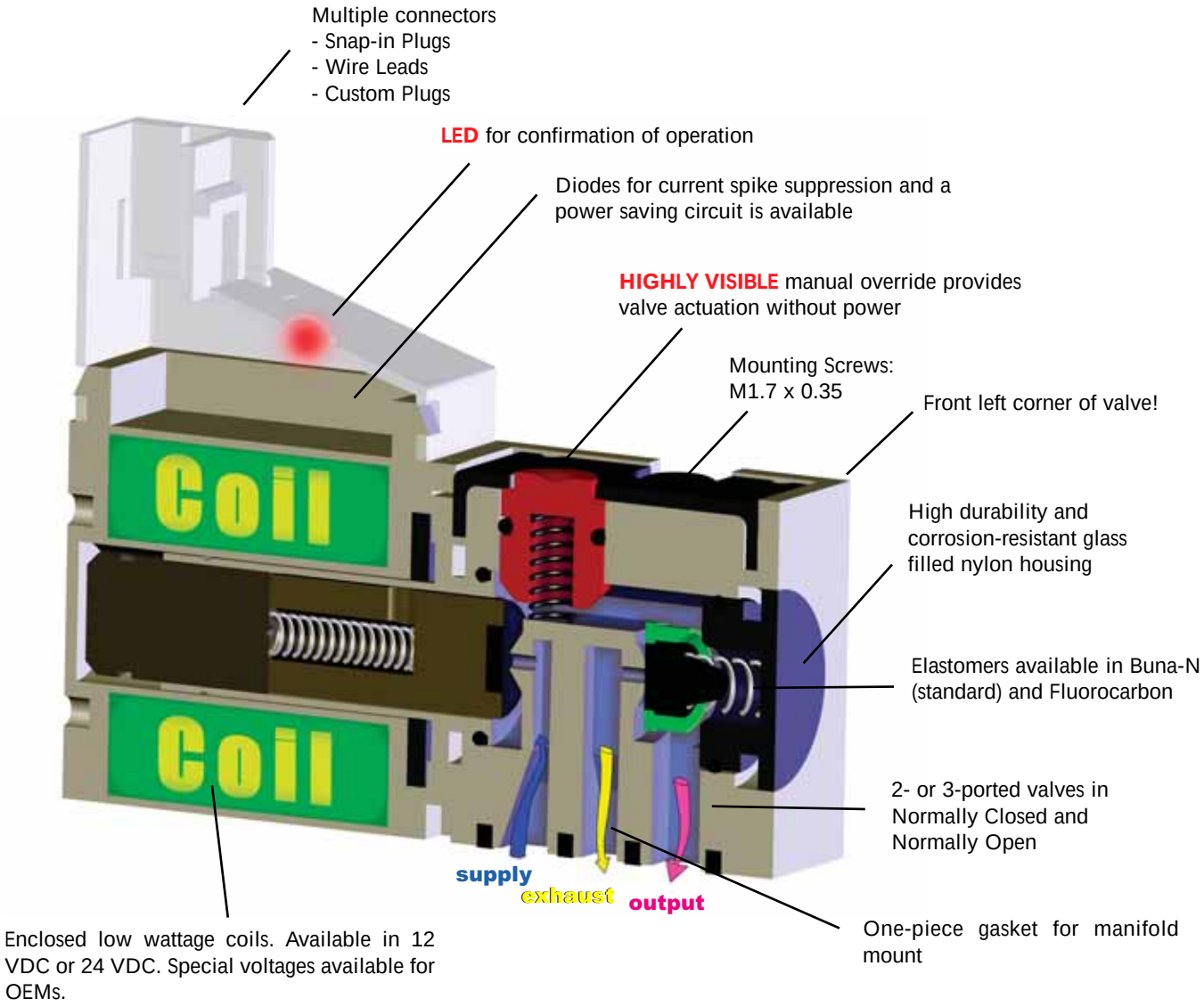
□□□-□□□-□□□

Example: E310A - 2L012 - V

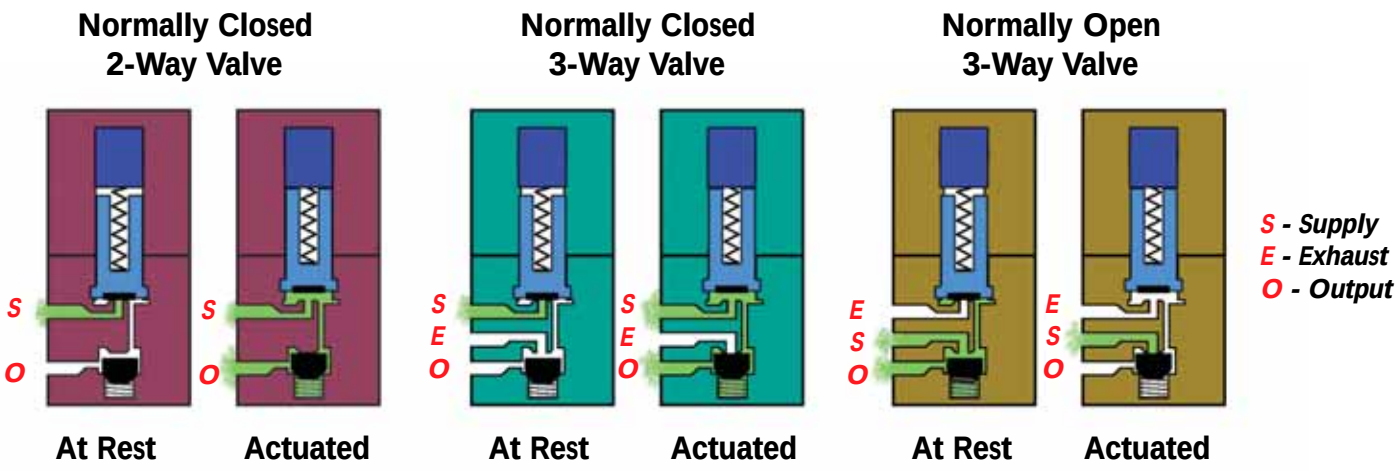
Another feature of the Clippard 10 mm valve is the ability to detach the coil and connector from the valve body. This can be useful for the purpose of orientating the coil by 180°, or exchanging connector types or voltages.

Normally Closed	**Silver**
Normally Open	**Black**

Clippard also helps you identify the valve you have by color coding the top plate. If it is silver, the valve is a Normally Closed version—if it is black, the valve is Normally Open.



Functional Schematics



SPECIFICATIONS

Medium: Air, Gas and other Compatible Fluids

Working Pressure: Vacuum to 110 psig/7.6 bar max. See Chart below

Max. Flow Rate: Standard: 0.5 scfm (14 l/min); High Flow: 0.8 scfm (24 l/min)

Exhaust Flow: 0.8 scfm (22 l/min)

Response Time: 8 ms when energized; 10 ms when de-energized

Electrical: 12 VDC or 24 VDC

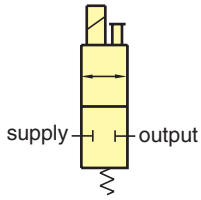
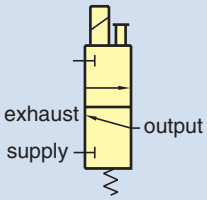
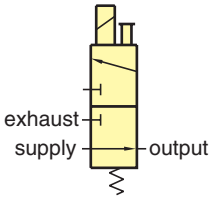
Power Consumption: 0.6 or 1.3 watts dependent on orifice size and pressure

Material: Stainless steel core and springs, springs, nylon body and Buna-N seals

Temperature Range: 23 to 122°F (-5 to 50°C)

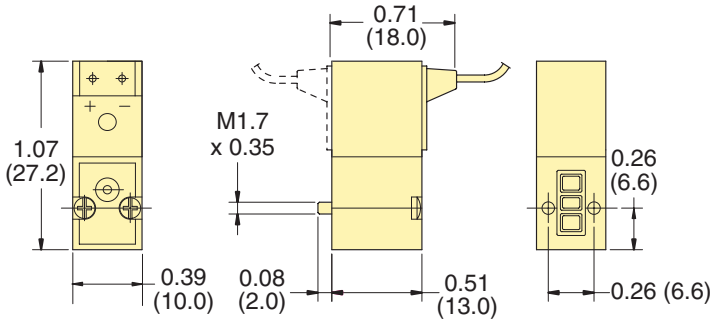
tested to over 100 million cycles!

ORDER INFORMATION

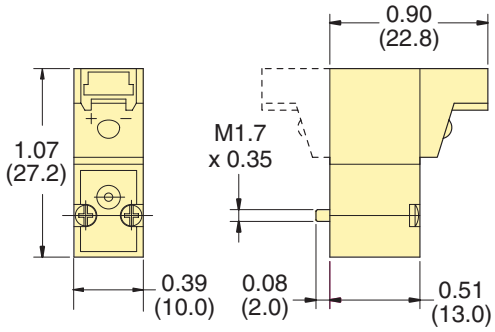
Type	Base No.	Connector	Orifice	Wattage	Working Pressure
2/2 Normally Closed 	E210A-1E*	90° Connector	0.020”	0.6	Vac - 110 psig/7.6 bar
	E210C-2E*	90° Connector	0.030”	1.3	Vac - 110 psig/7.6 bar
	E210A-1L*	90° Connector with LED	0.020”	0.6	Vac - 110 psig/7.6 bar
	E210C-2L*	90° Connector with LED	0.030”	1.3	Vac - 110 psig/7.6 bar
	E210A-1F*	In-Line Connector	0.020”	0.6	Vac - 110 psig/7.6 bar
	E210C-2F*	In-Line Connector	0.030”	1.3	Vac - 110 psig/7.6 bar
	E210A-1C*	In-Line Connector with LED	0.020”	0.6	Vac - 110 psig/7.6 bar
	E210C-2C*	In-Line Connector with LED	0.030”	1.3	Vac - 110 psig/7.6 bar
	E210A-1W*	Wire Leads, 11.8” (300 mm)	0.020”	0.6	Vac - 110 psig/7.6 bar
	E210C-2W*	Wire Leads, 11.8” (300 mm)	0.030”	1.3	Vac - 110 psig/7.6 bar
3/2 Normally Closed 	E310A-1E*	90° Connector	0.020”	0.6	Vac - 110 psig/7.6 bar
	E310C-2E*	90° Connector	0.030”	1.3	Vac - 110 psig/7.6 bar
	E310A-1L*	90° Connector with LED	0.020”	0.6	Vac - 110 psig/7.6 bar
	E310C-2L*	90° Connector with LED	0.030”	1.3	Vac - 110 psig/7.6 bar
	E310A-1F*	In-Line Connector	0.020”	0.6	Vac - 110 psig/7.6 bar
	E310C-2F*	In-Line Connector	0.030”	1.3	Vac - 110 psig/7.6 bar
	E310A-1C*	In-Line Connector with LED	0.020”	0.6	Vac - 110 psig/7.6 bar
	E310C-2C*	In-Line Connector with LED	0.030”	1.3	Vac - 110 psig/7.6 bar
	E310A-1W*	Wire Leads, 11.8” (300 mm)	0.020”	0.6	Vac - 110 psig/7.6 bar
	E310C-2W*	Wire Leads, 11.8” (300 mm)	0.030”	1.3	Vac - 110 psig/7.6 bar
3/2 Normally Open 	E3O10A-1E*	90° Connector	0.020”	0.6	Vac - 110 psig/7.6 bar
	E3O10C-2E*	90° Connector	0.030”	1.3	Vac - 110 psig/7.6 bar
	E3O10A-1L*	90° Connector with LED	0.020”	0.6	Vac - 110 psig/7.6 bar
	E3O10C-2L*	90° Connector with LED	0.030”	1.3	Vac - 110 psig/7.6 bar
	E3O10A-1F*	In-Line Connector	0.020”	0.6	Vac - 110 psig/7.6 bar
	E3O10C-2F*	In-Line Connector	0.030”	1.3	Vac - 110 psig/7.6 bar
	E3O10A-1C*	In-Line Connector with LED	0.020”	0.6	Vac - 110 psig/7.6 bar
	E3O10C-2C*	In-Line Connector with LED	0.030”	1.3	Vac - 110 psig/7.6 bar
	E3O10A-1W*	Wire Leads, 11.8” (300 mm)	0.020”	0.6	Vac - 110 psig/7.6 bar
	E3O10C-2W*	Wire Leads, 11.8” (300 mm)	0.030”	1.3	Vac - 110 psig/7.6 bar

Add Voltage Choice to the end of each Base Part Number. Example:* ***E210A-1C012*

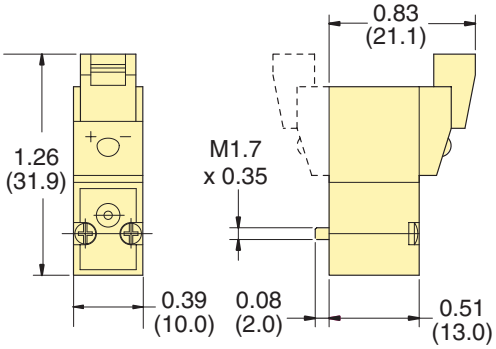
Wire Leads



90° Connector



In-Line Connector



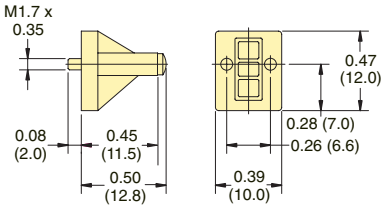
ELECTRICAL SPECIFICATIONS

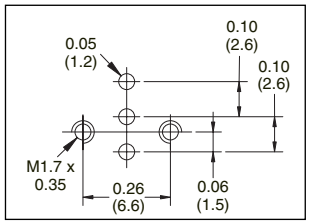
Power (Wattage)	Voltage	Voltage Tolerance	Response Time (Energized)	Response Time (De-Energized)	Copper Wire Insulation Class
0.5	12 VDC 24 VDC	-10% to 10%	8 ms	10 ms	F 311°F (155°C)
1.3	12 VDC 24 VDC	-10% to 10%	8 ms	10 ms	F 311°F (155°C)

Cover Plate

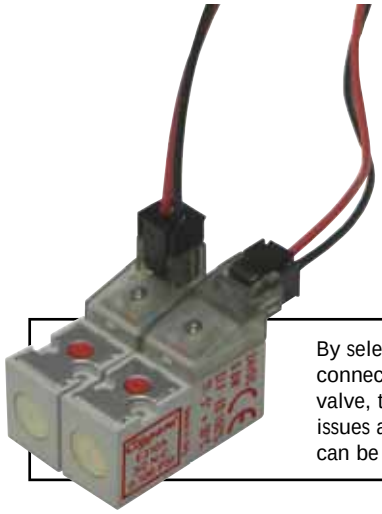
Manifold Cover Plate includes plate, gasket and two screws.

Order No.	
E10M-CP	10 mm Cover Plate





Mounting Interface



By selecting the appropriate connector type for your 10 mm valve, tight spaces, orientation issues and electrical requirements can be accommodated easily.

Connectors

Wire Connector must be ordered separately.

Order No.	
C2A-RB300	Connector with Cable, 11.8" (300 mm)
C2A-RB600	Connector with Cable, 23.62" (600 mm)
C2A-RB1000	Connector with Cable, 39.37" (1,000 mm)

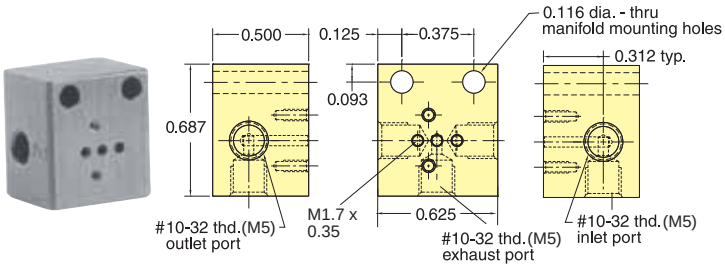
Molex connector #050013-80000.

Custom plugs, wire lengths, connectors and flavors are available for your specific requirements. Call for details.

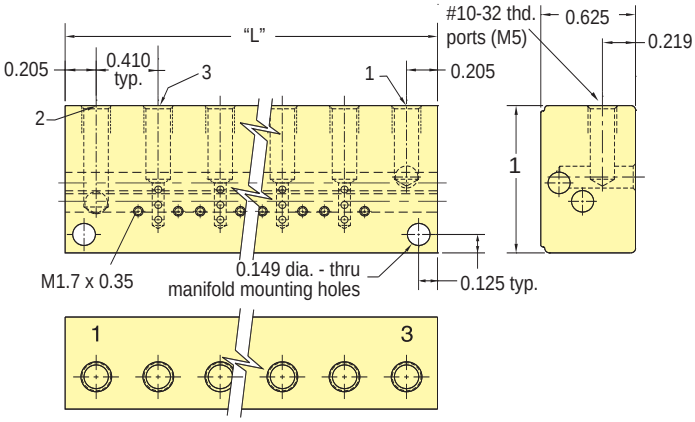
Manifolds

Manifolds are available for one to 12 valves, and are supplied with mounting screws and gaskets. Spare hardware and closing plates also available. Add -M5 for Metric ports.

Order No.	
E10M-01	Single Station Manifold



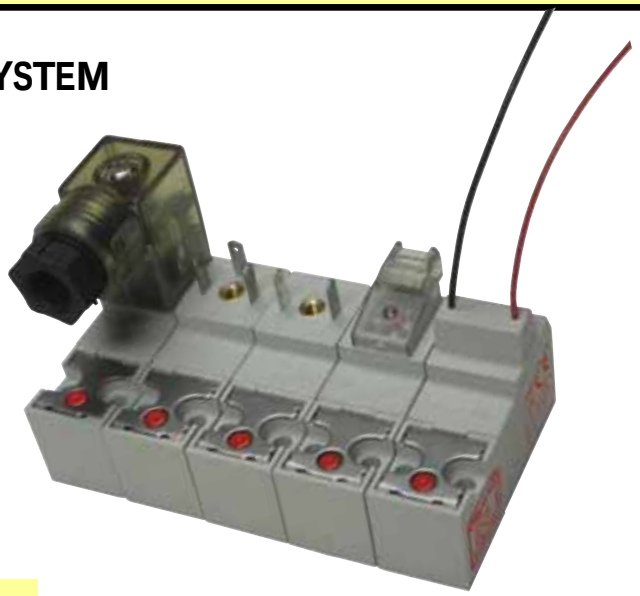
Multi-Station Manifolds



Stations	Order No.	"L" Dimension
2	E10M-02	1.64 (41.7)
4	E10M-04	2.46 (62.5)
6	E10M-06	3.28 (83.3)
8	E10M-08	4.10 (104.1)
10	E10M-10	4.92 (125.0)
12	E10M-12	5.74 (145.8)

Consult factory for custom manifolds

PART NUMBERING SYSTEM



Valve Type	Choose
2-Way N.C.	E215
3-Way N.C	E315
3-Way N.O.	E3O15

Orifice Size	Choose
0.8 mm (0.032”), 1.1 N.C.	D
1.1 mm (0.043”), 1.1	E
1.6 mm (0.063”), 1.6	F
1.6 mm (0.063”), 1.1 N.O.	G

Power	Choose
1.0 Watts	1
2.3 Watts	2

Electrical Connector	Choose
Terminal Connector	T
DIN Connector	D
90° Connector with LED	L
In-Line Connector with LED	C
Wire Leads, 11.8” (300 mm)	W

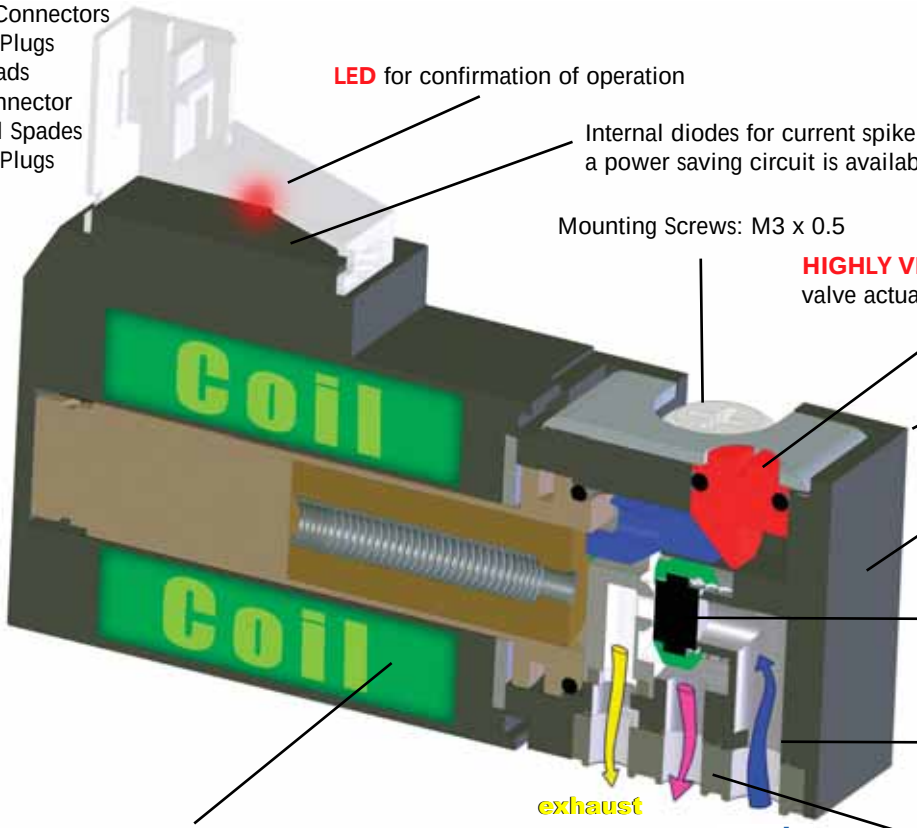
Voltage	Choose
12-Volt DC	012
24-Volt DC	024
24-Volt AC	24A
110-Volt AC	110
220-Volt AC	220

This numbering schematic is shown for illustration purposes only. All possible configurations are not available. For standard models, see the products illustrated in this catalog.

Example: E315F - 1C24A

ELECTRICAL SPECIFICATIONS

Power (Wattage)	Voltage	Voltage Tolerance	Response Time (Energized)	Response Time (De-Energized)	Copper Wire Insulation Class
1.0	12 VDC 24 VDC 24 VAC 110 VAC 220 VAC	-10% to 10%	10 ms	12 ms	F 311°F (155°C)
2.3	12 VDC 24 VDC 24 VAC 110 VAC 220 VAC	-10 to 10%	10 ms	12 ms	F 311°F (155°C)



Multiple Connectors
- Snap-in Plugs
- Wire Leads
- DIN Connector
- Terminal Spades
- Custom Plugs

LED for confirmation of operation

Internal diodes for current spike suppression and a power saving circuit is available

Mounting Screws: M3 x 0.5

HIGHLY VISIBLE manual override provides valve actuation without power

Front left corner of valve!

High durability and corrosion-resistant glass filled nylon housing

Elastomers available in Buna-N (standard) and Fluorocarbon

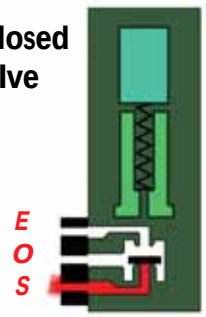
2- or 3-ported valves in Normally Closed and Normally Open

One-piece gasket for manifold mount

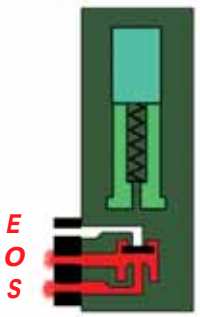
Enclosed low wattage coils. Available in:
12 VDC, 24 VDC, 24 VAC, 110 VAC or 220 VAC.
Special voltages available for OEMs.

FUNCTIONAL SCHEMATICS

Normally Closed 3-Way Valve

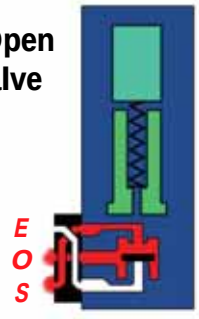


At Rest

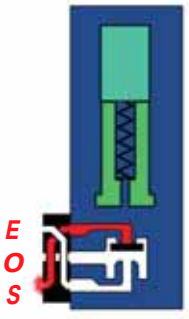


Actuated

Normally Open 3-Way Valve



At Rest



Actuated

Porting
The Normally Open and Normally Closed configurations allow both models to be mounted on the same manifold.

NEW! 15 mm Miniature Valves

Specifications

Medium: Air, Gas, and other Compatible Fluids

Working Pressure: Vacuum to 150 psig/ 10.3 bar max. See Chart below.

Maximum Flow Rate:
0.03" Orifice/E315D 1.6 scfm (45 l/min)
0.04" Orifice/E315E 2.1 scfm (59 l/min)
0.06" Orifice/E315F 3.0 scfm (84 l/min)

Response Time: 10 ms when energized; 12 ms when de-energized

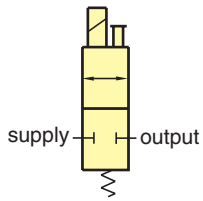
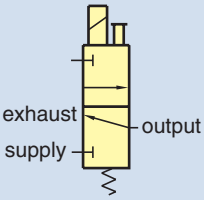
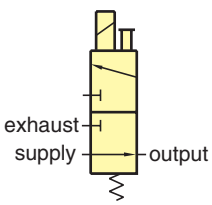
Material: Stainless steel core and springs, nylon body and Buna-N seals

Voltage: 12-volt DC, 24-volt DC or 24-volt AC. 110-volt AC and 220-volt AC only available with DIN Connectors.

Power Consumption: 1.0 or 2.3 watts dependent on orifice size and pressure

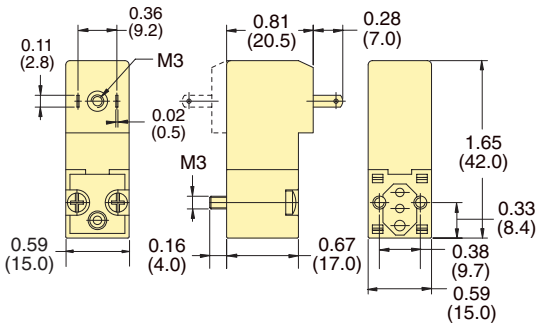
Temperature Range: 23 to 122°F (-5 to 50°C)

Order Information

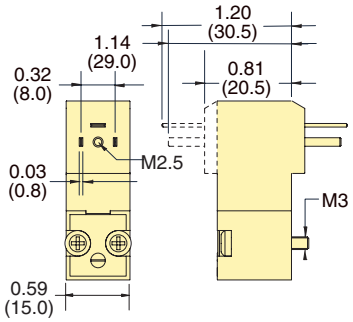
Type	Base No.	Connector	Orifice	Wattage	Working Pressure
2/2 Normally Closed 	E215D-2T*	Terminal	0.032"	1.0	Vac - 150 psig/10.3 bar
	E215E-2T*	Terminal	0.043"	2.3	Vac - 150 psig/10.3 bar
	E215F-2T*	Terminal	0.063"	2.3	Vac - 110 psig/7.6 bar
	E215D-2D*	DIN Connector	0.032"	1.0	Vac - 150 psig/10.3 bar
	E215E-2D*	DIN Connector	0.043"	2.3	Vac - 150 psig/10.3 bar
	E215F-2D*	DIN Connector	0.063"	2.3	Vac - 110 psig/7.6 bar
	E215D-2W*	Wire Leads, 11.8" (300 mm)	0.032"	1.0	Vac - 150 psig/10.3 bar
	E215E-2W*	Wire Leads, 11.8" (300 mm)	0.043"	2.3	Vac - 150 psig/10.3 bar
	E215F-2W*	Wire Leads, 11.8" (300 mm)	0.063"	2.3	Vac - 110 psig/7.6 bar
	E215D-2L*	90° Connector with LED	0.032"	1.0	Vac - 150 psig/10.3 bar
	E215E-2L*	90° Connector with LED	0.043"	2.3	Vac - 150 psig/10.3 bar
	E215F-2L*	90° Connector with LED	0.063"	2.3	Vac - 110 psig/7.6 bar
	E215D-2C*	In-Line Connector with LED	0.032"	1.0	Vac - 150 psig/10.3 bar
	E215E-2C*	In-Line Connector with LED	0.043"	2.3	Vac - 150 psig/10.3 bar
	E215F-2C*	In-Line Connector with LED	0.063"	2.3	Vac - 110 psig/7.6 bar
3/2 Normally Closed 	E315D-1T*	Terminal	0.032"	1.0	Vac - 150 psig/10.3 bar
	E315E-2T*	Terminal	0.043"	2.3	Vac - 150 psig/10.3 bar
	E315F-2T*	Terminal	0.063"	2.3	Vac - 110 psig/7.6 bar
	E315D-1D*	DIN Connector	0.032"	1.0	Vac - 150 psig/10.3 bar
	E315E-2D*	DIN Connector	0.043"	2.3	Vac - 150 psig/10.3 bar
	E315F-2D*	DIN Connector	0.063"	2.3	Vac - 110 psig/7.6 bar
	E315D-1W*	Wire Leads, 11.8" (300 mm)	0.032"	1.0	Vac - 150 psig/10.3 bar
	E315E-2W*	Wire Leads, 11.8" (300 mm)	0.043"	2.3	Vac - 150 psig/10.3 bar
	E315F-2W*	Wire Leads, 11.8" (300 mm)	0.063"	2.3	Vac - 110 psig/7.6 bar
	E315D-1L*	90° Connector	0.032"	1.0	Vac - 150 psig/10.3 bar
	E315E-2L*	90° Connector	0.043"	2.3	Vac - 150 psig/10.3 bar
	E315F-2L*	90° Connector	0.063"	2.3	Vac - 110 psig/7.6 bar
	E315D-1C*	In-Line Connector	0.032"	1.0	Vac - 150 psig/10.3 bar
	E315E-2C*	In-Line Connector	0.063"	2.3	Vac - 150 psig/10.3 bar
	E315F-2C*	In-Line Connector	0.063"	2.3	Vac - 110 psig/7.6 bar
3/2 Normally Open (110 psig max.) 	E3O15D-1T*	Terminal	0.032"	1.0	Vac - 110 psig/7.6 bar
	E3O15E-2T*	Terminal	0.043"	2.3	Vac - 110 psig/7.6 bar
	E3O15G-2T*	Terminal	0.063"	2.3	Vac - 75 psig/5.2 bar
	E3O15D-1D*	DIN Connector	0.032"	1.0	Vac - 110 psig/7.6 bar
	E3O15E-2D*	DIN Connector	0.043"	2.3	Vac - 110 psig/7.6 bar
	E3O15G-2D*	DIN Connector	0.063"	2.3	Vac - 75 psig/5.2 bar
	E3O15D-1W*	Wire Leads, 11.8" (300 mm)	0.032"	1.0	Vac - 110 psig/7.6 bar
	E3O15E-2W*	Wire Leads, 11.8" (300 mm)	0.043"	2.3	Vac - 110 psig/7.6 bar
	E3O15G-2W*	Wire Leads, 11.8" (300 mm)	0.063"	2.3	Vac - 75 psig/5.2 bar
	E3O15D-1L*	90° Connector	0.032"	1.0	Vac - 110 psig/7.6 bar
	E3O15E-2L*	90° Connector	0.043"	2.3	Vac - 110 psig/7.6 bar
	E3O15G-2L*	90° Connector	0.063"	2.3	Vac - 75 psig/5.2 bar
	E3O15D-1C*	In-Line Connector	0.032"	1.0	Vac - 110 psig/7.6 bar
	E3O15E-2C*	In-Line Connector	0.063"	2.3	Vac - 110 psig/7.6 bar
	E3O15G-2C*	In-Line Connector	0.063"	2.3	Vac - 75 psig/5.2 bar

*Add Voltage Choice to the end of each Base Part Number. Example: E210A-1C012

Terminal Connector

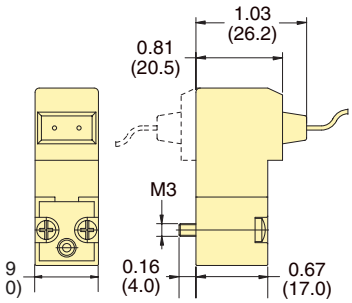


DIN Connector

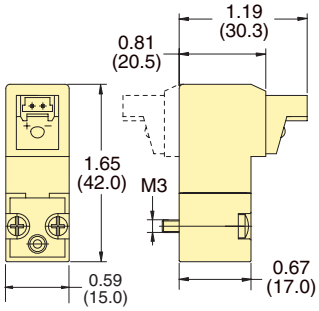


DIN Connector ordered separately on page 226.

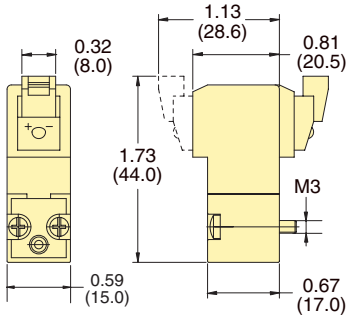
Wire Leads



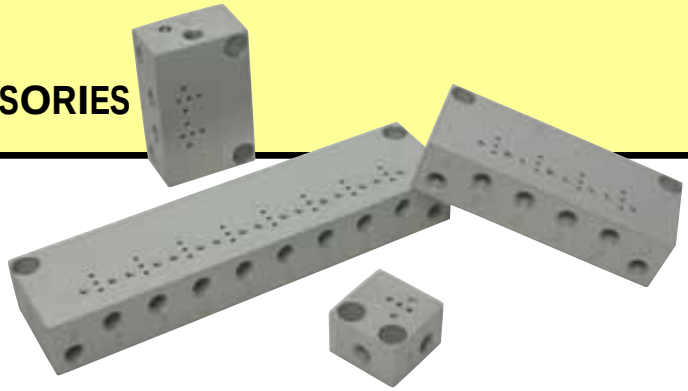
90° Connector with LED



In-Line Connector with LED



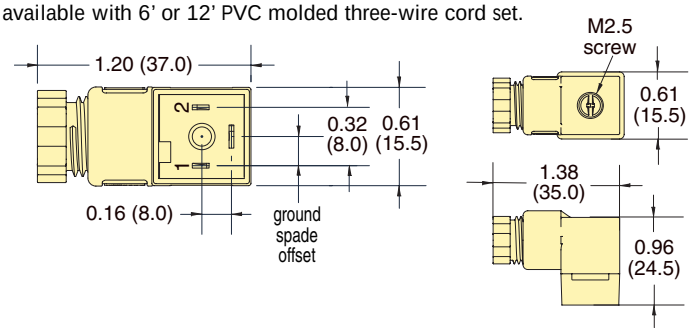
NEW! 15 mm Valve Accessories



DIN Connectors

For Use with 15 mm Valves Only

DIN 43650 Form "C" connector with 8.0 mm spade center spacing is designed to connect to 15 mm DIN coils. This standard connector format allows for interchangeability across the industry. Also available with 6' or 12' PVC molded three-wire cord set.



Order No.	LED	Voltage	Cord
CC-C012		12 VDC	
CC-C012-P6		12 VDC	6'
CC-C012-P12		12 VDC	12'
CC-C024	✔	24 VDC	
CC-C024-P6	✔	24 VDC	6'
CC-C024-P12	✔	24 VDC	12'
CC-C24A	✔	24A VAC	
CC-C24A-P6	✔	24A VAC	6'
CC-C24A-P12	✔	24A VAC	12'
CC-C110	✔	110 VAC	
CC-C110-P6	✔	110 VAC	6'
CC-C110-P12	✔	110 VAC	12'
CC-C220	✔	220 VAC	
CC-C220-P6	✔	220 VAC	6'
CC-C220-P12	✔	220 VAC	12'

Connectors

Wire Connector must be ordered separately. Wire gauge AWG 24. Stranding 7/32.

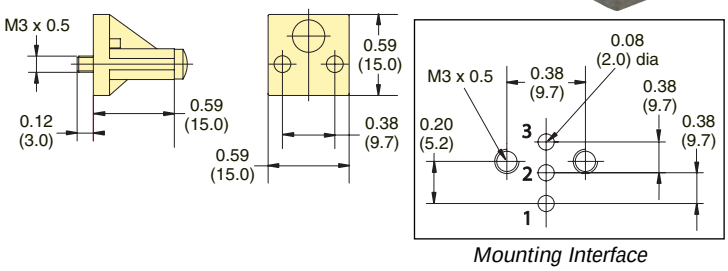
Order No.	
C2A-RB300	Connector with Cable, 11.8" (300 mm)
C2A-RB600	Connector with Cable, 23.62" (600 mm)
C2A-RB1000	Connector with Cable, 39.37" (1,000 mm)

Molex connector #050013-80000.

Cover Plate

Manifold Cover Plate includes plate, gasket and two screws.

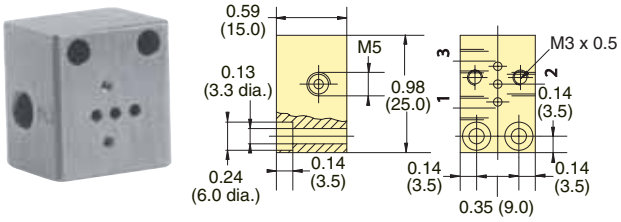
Order No.	
E15M-CP	15 mm Cover Plate (red)



Mounting Interface

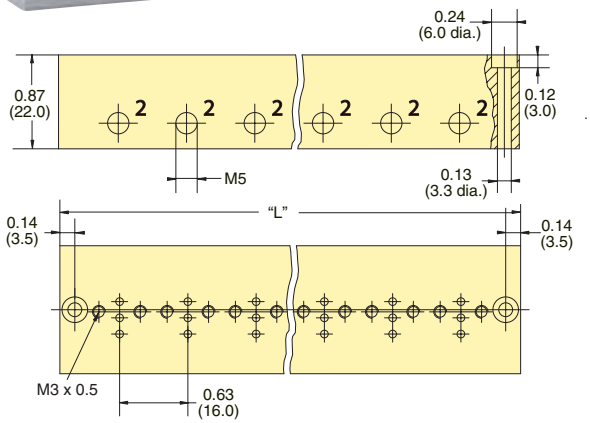
Manifolds

Manifolds are available for one to 12 valves, and are supplied with mounting screws and gaskets. Spare hardware and closing plates also available. Add -M5 for Metric ports.



Order No.	
E15M-01	Single Station Manifold

Multi-Station Manifolds



Stations	Order No.	"L" Dimension
2	E15M-02	1.73 (44.0)
4	E15M-04	2.99 (76.0)
6	E15M-06	4.25 (108.0)
8	E15M-08	5.51 (140.0)
10	E15M-10	6.77 (172.0)
12	E15M-12	8.03 (204.0)

Space Lug Connectors

Insulated crimp-on spade lug connectors are available for wiring up leads to connect electronic circuits to 15 mm terminal connectors. Accepts #22, #24, or #26 wire.

Order No.	
3831	Space Lug Connector

MANIFOLD NUMBERING SYSTEM

E M C - ❑ ❑ - ❑ ❑ - ❑ ❑

Electronic Manifold Card with ET or ETO valves

Number of Valves on Card
08 - 8 Valves
12 - 12 Valves

Voltage of Valves
00 - w/o valves
06 - 6 VDC
12 - 12 VDC
24 - 24 VDC

Type of Valve
01 - w/o valves
20 - ET-2M-XX
22 - ET-2M-XX-H
25 - ET-2M-XX-L
30 - ET-3M-XX
32 - ET-3M-XX-H
35 - ET-3M-XX-L
40 - ETO-3M-XX
42 - ETO-3M-XX-H
45 - ETO-3M-XX-L

EMC-08-00-01 and EMC-12-00-01 are part numbers for cards without any valves, and without manifold. Manifold mounting hardware is included. Manifolds may be ordered separately, if desired.

Part numbers are: 15482-8 and 15482-12

Convenience in interfacing electronics and pneumatics... fast mounting, completely assembled, manifolded valve cards.

Clippard Electronic Manifold Cards

Now you can direct low-voltage DC signals from controllers, systems, computers or other sources to operate powerful pneumatic valves with a minimum of piping and hook-up.

Self-contained card includes:

- 8 or 12 Clippard ET interface valves
- Manifold mount for single air supply
- Circuit board fully wired
- Instant plug-in with 25-pin connector
- Resistor, diode, LED and switch for each valve
- Auxiliary power supply connection

Ready to operate quickly. Just mount the card and make external connection.

And each valve may be individually removed and replaced without any need for desoldering!

Features

- Fast, easy to mount
- Pre-assembled; all valves mounted
- 8 or 12 valve sizes
- 6, 12 or 24 volts DC
- Low power requirements (0.67 watt per valve)
- Choice of valve types
- Each valve switchable
- Shut-off spike protection
- 25-pin connector
- No expensive card rack required

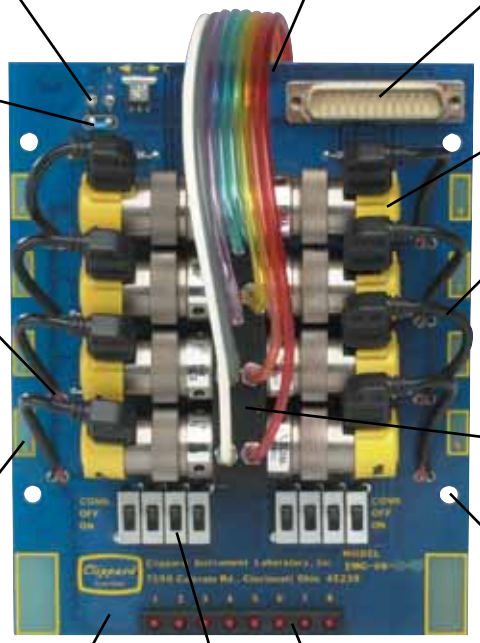
Auxiliary Power Input
Power to operate the valves may be provided through two sources: ONE, through the 25-pin connector if your signal source also has sufficient power to operate the bank of valves, or TWO, through a separate auxiliary power input connection built into the board. To isolate power from the 25-pin connector, use the power source selector switch.
NOTE: In applying power on a temporary basis, use care to observe proper circuit polarity.

Power Selector Switch
Two-position selector switch enables choice of power input source (25-pin connector or auxiliary).

25-Pin Connector

Clippard Electronic Valves

Reverse Polarity Protection
Circuit using diodes and capacitor provides input voltage protection against reverse polarity.



Valve Connection Cords
Cord and plug leads are terminated with solder connections on the board, and connect by molded plug to the valves. All connections are completed at the factory.

Resistor-Diode-LED Circuit
Individual circuit to each valve provides protection against shut-off spikes. LED is illuminated when valve is actuated.

Clippard Valve Manifold
Compact, efficient mounting of the valves is by Clippard multi-valve manifolds.

Valve Identification
Valve numbers are silk-screened on each panel.

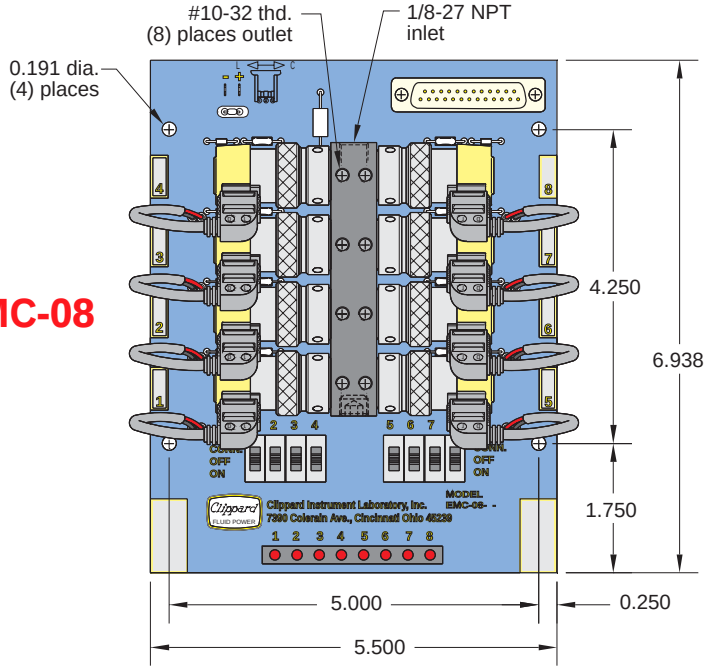
Mounting Holes
Four (EMC-08) and six (EMC-12) mounting holes 0.191" dia. are built into each board.

LED Bank
Illuminated LED signals that the valve is actuated.

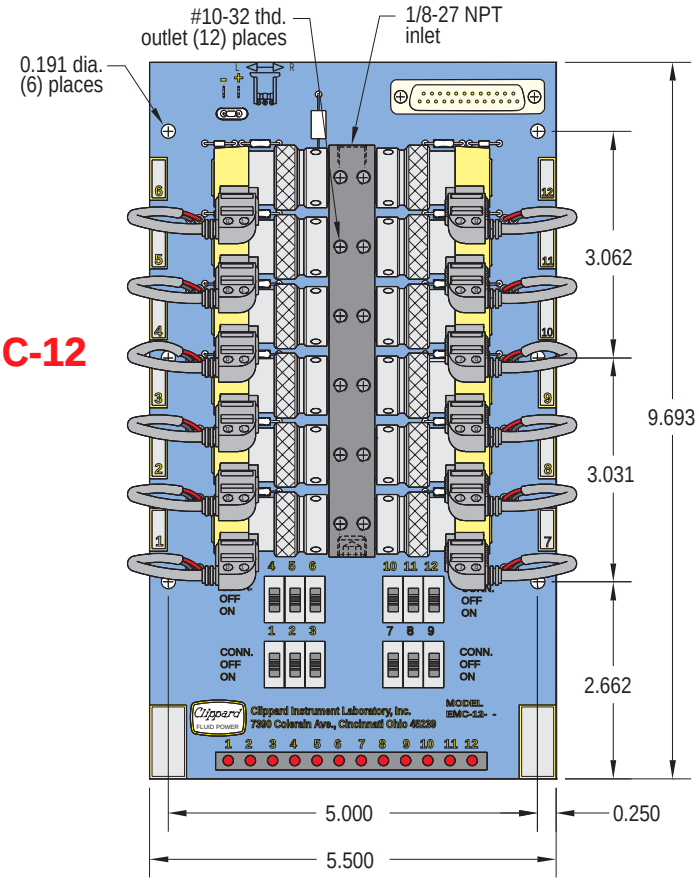
Printed Circuit Board
Durable laminated fiberglass

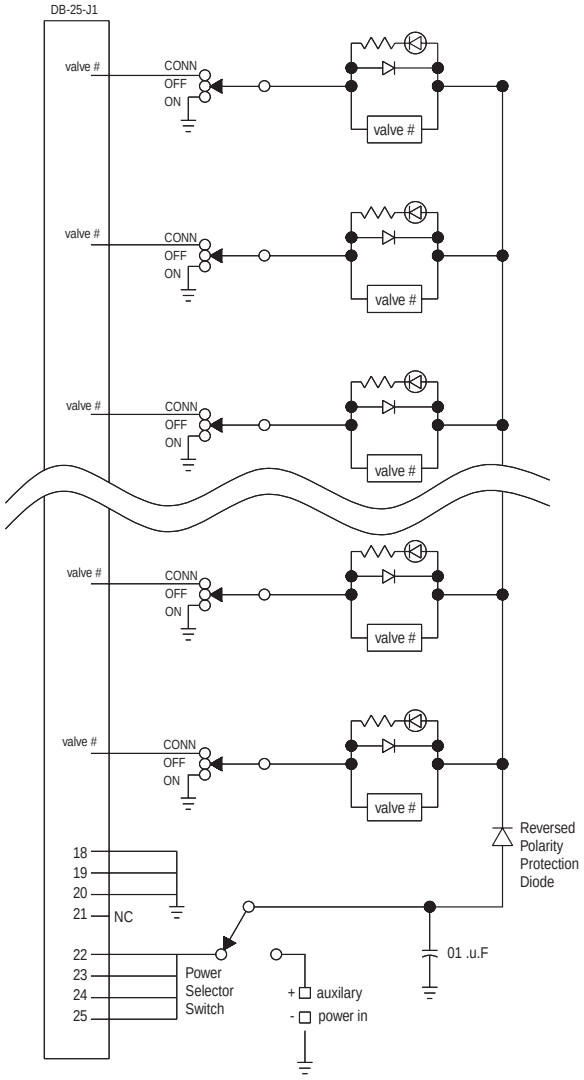
3-Position Detented Switches
Three position slide switch provides for:
ON - Power "ON"; valve is activated
OFF - Power "OFF"; valve not connected
CONN - Valve connected to 25-pin connector, and will be controlled through it.

EMC-08



EMC-12

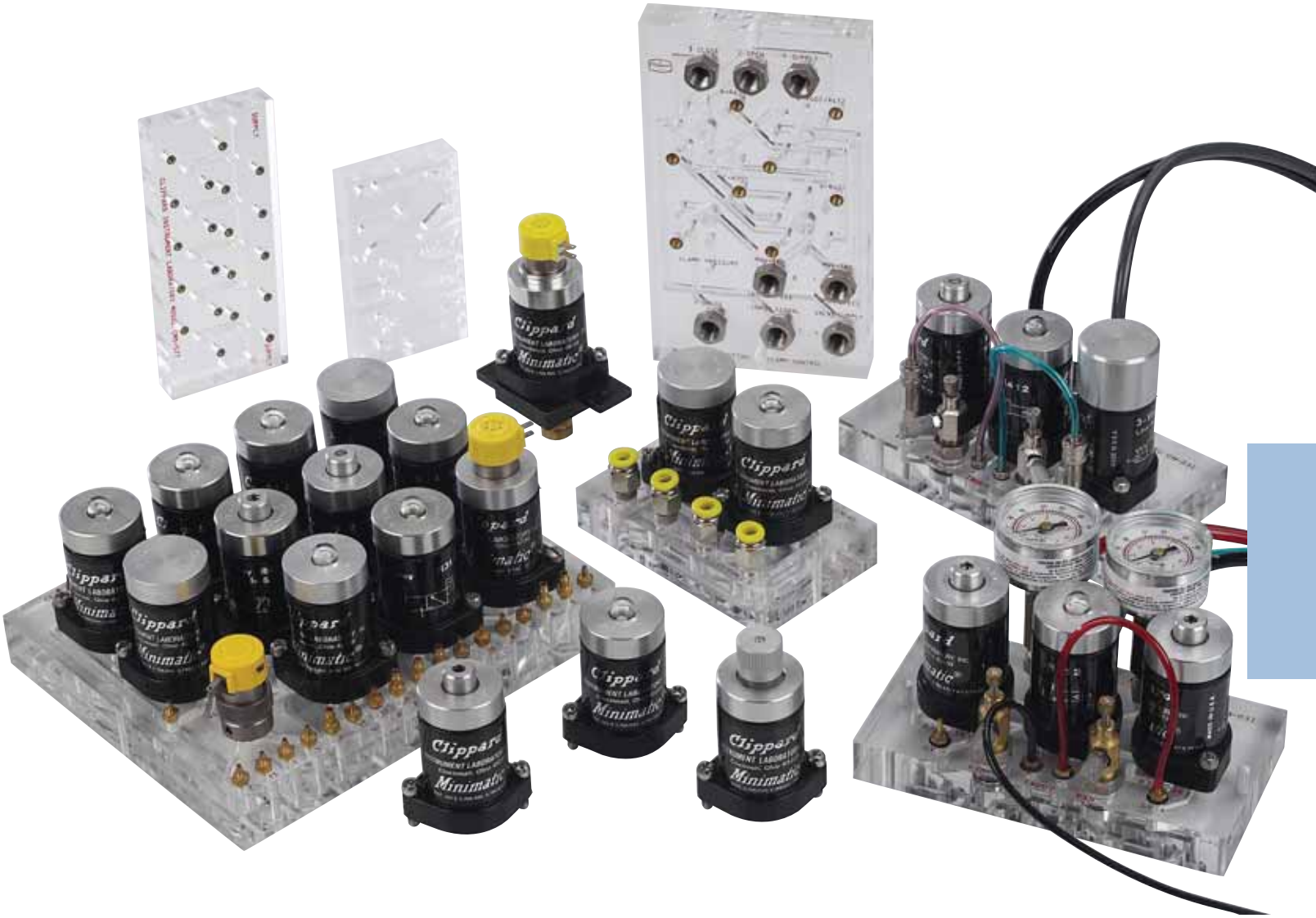




Wiring Diagram

Note: Manifold mounted valves are normally closed. Use ETO models if exhaust must be ported. ETO models cannot be used "Normally Open" without special piping.

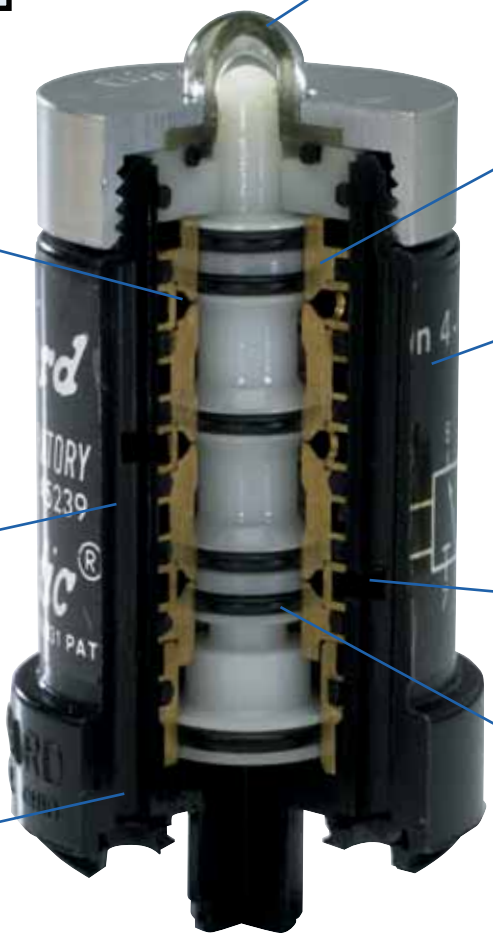
NOTES



One of the major elements of Clippard's award winning design concept is the manifold body. It encircles a central valve cavity with air passages that can be used at any point along the axis of the valve. These passages terminate at the base of the body in a circular octoport pattern. The body mates with a manifold subplate which mounts the complete module and provides #10-32 tapped holes for standard hose fittings. A single molded Octoport gasket, held in place by the two mounting screws, insures a positive seal. Because of the easy availability of an air connection wherever it is required, the manifold body permits valve elements to be designed for maximum performance without the restrictive limitations of rigid port configurations. It also allows multiple porting... using two or more ports as an inlet, outlet, supply, etc. This reduces the amount of external piping needed to complete the circuit. Furthermore the manifold body enables the internal interconnection of ports. This is especially valuable in a number of modules that contain more than one valve.

The separate elements are interconnected in the same module to provide complete subcircuits such as three input "OR", three input "AND", or a two input "NOR". These functions further reduce external piping.

MANIFOLD BODY



Visual indicator shows valve position

Valves are of brass, nickel plated brass, stainless steel, and acetal copolymer.

Exclusive microgap construction for full air flow, no blow by, long life and fast response

Manifold body is molded of high density acetal copolymer; high dimensional stability, outstanding impact resistance, and excellent moisture, ultraviolet, and temperature characteristics

Eight air passages extend longitudinally through the body surrounding the valve cavity

Milled slots in valve cavity connect the valve through longitudinal passages to octoport outlets

All valves are fully ported for maximum versatility

Nickel plated internal parts reduce breakaway friction

Patent no.'s 3,766,935 and 3,786,831

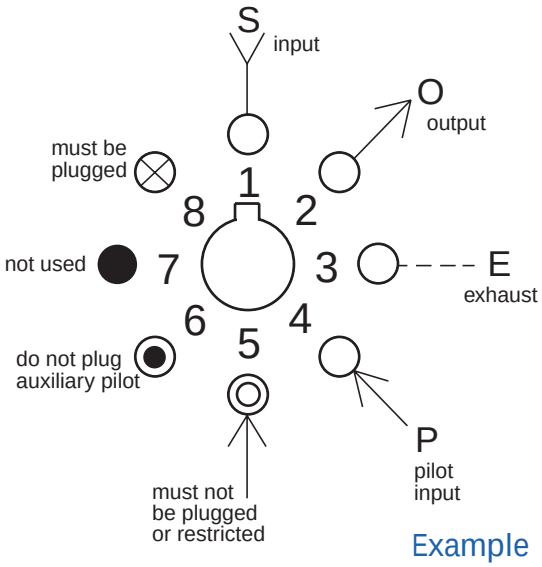
Octoport Port Coding

The coding method shown here is used on the individual product catalog sheets. You will find a port usage diagram furnished for each variation of each model shown. Letters are used to identify port usage:

S - Supply or Signal
O - Output
E - Exhaust
P - Pilot Input

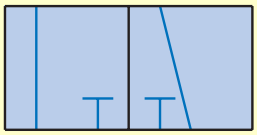
Where more than one supply, output, exhaust, etc. are involved in one module, subscript numerals are provided: S_1, S_2, etc.
Where an auxiliary output is provided it may be identified by the letter O in parentheses: (O).

NOTE: Many of the Octoport valves have multiple ported supplies, outputs, or exhausts, etc. The port usage symbols will usually show one or the other of these ports with an "X" (must be plugged) in it. Both or either of the multiple ports may be used. Unused multiple ports must be plugged. The ANSI symbol will always show which valves have multiple ports.

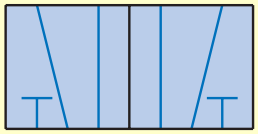


Example

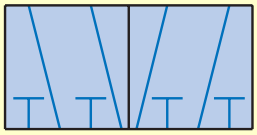
Base Valve



Can be used as a:
- 2-way normally closed valve
- 2-way normally open valve
- 3-way normally closed valve
- 3-way normally open valve
- 3-way diverter valve
- 3-way selector valve



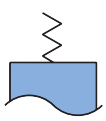
Can be used as a:
- 4-way fully ported valve
- Dual 2-way valves (one N.O. & one N.C.)
- Dual 3-way valves with common exhaust (one N.O. & one N.C.)

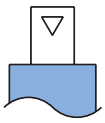


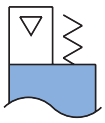
Can be used as a:
- 6-way fully ported valve
- Dual 2-way normally closed valve
- Dual 2-way normally open valve
- Dual 3-way normally closed valve
- Dual 3-way normally open valve
- Dual selector valve

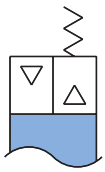
Versatility is the key when it comes to Clippard's Minimatic® Modular Valves. Available in an unlimited variety of directional, flow, pressure and special control valves - each in a valve body designed to mount and link together with a simple piping system. The piping system eases assembly and plumbing, resulting in reduced labor costs, errors in installation, and the potential for plumbing leakage. In addition, multiple valve elements can be contained in a single body; providing incredible flexibility and variety to accomplish a myriad of control challenges. The Minimatic modular valves are the supreme "Plug and Play" devices for pneumatic applications.

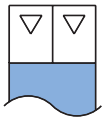
Actuation Methods

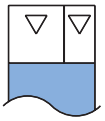

Spring Return

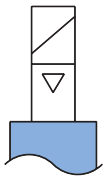

Air Pilot

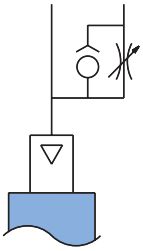

Spring & Auxilary Pilot

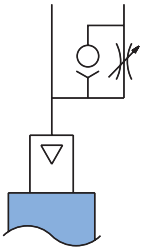

Removable Spring & Auxilary Pilot

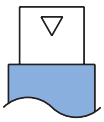

2 Air Pilots "OR"

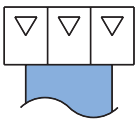

Differential Air Pilots

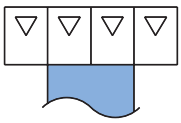

Solenoid Piloted

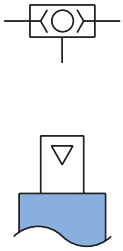

Delay Out From Air Pilot

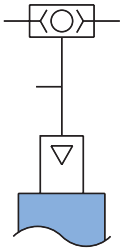

Delay In To Air Pilot

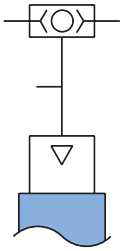

Low Pressure Air Pilot

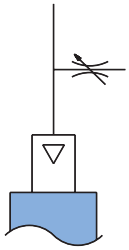

3 Air Pilots "OR"

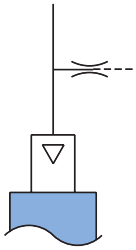

4 Air Pilots "OR"

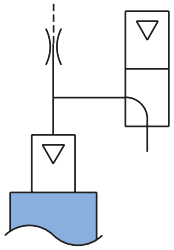

Independant Shuttle Valve & Air Pilot


Shuttle Valve To Air Pilot


Shuttle Valve To Low Pressure


Delay To Air Pilot


Bleed Pressure Pilot


Fluidic Interface Pilot

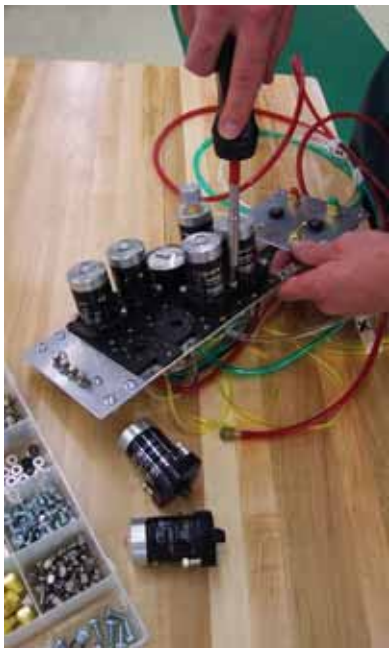
SIMPLIFIED ASSEMBLY

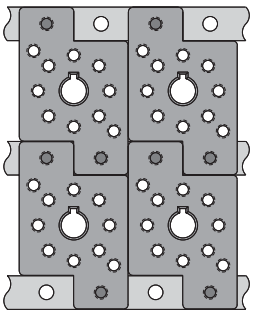
Screws and lockwashers (replacement part R-105) plated steel, binder head, #10-32 thread.

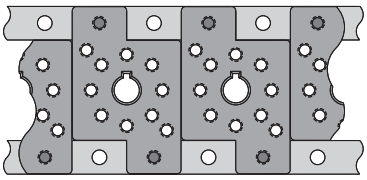
Molded gasket (replacement part R-104) furnished with each module.

Custom plastic manifold subplates of clear plastic have most interconnections inside; speed assembly, assure integrity of circuit. Valves plug in easily.

Standard mounting strips attach to interlocked subplates with #10-32 screws. Resulting circuit plate is rigid and strong.
Modules plug in to circuit plate and are held by two fully captivated screws. Molded gasket provides seal between each module and subplate.







See page 236 for further details.

Auxiliary Pilots

One of the bonus features of the Clippard Minimatic® modular components system is the availability and use of auxiliary pilots. These auxiliary pilots are included as standard on the following valves:

R-301	R-311	R-321	R-323	R-331	R-333
R-341	R-343	R-401	R-431	R-443	R-445
R-453	R-461	R-471	R-481		

All of these valves are air piloted with a spring return, with the added advantage of an auxiliary air pilot on the spring side of the valve. The auxiliary pilot consists of an air pilot in addition to the standard spring pilot. This feature greatly increases the versatility of the valve.

The auxiliary pilot may be used to cancel the force of the opposite pilot, thus enabling the spring to shift the valve, even though there is still air pressure on the opposite pilot (except R-431).

The majority of these valves will be used without the auxiliary pilot, but the ANSI symbols and port usage drawings show the auxiliary pilot.

Octoport Stamp

Part number R-108
Complete pneumatic circuit drawings in minimum time with this small, self inked octoport stamp.

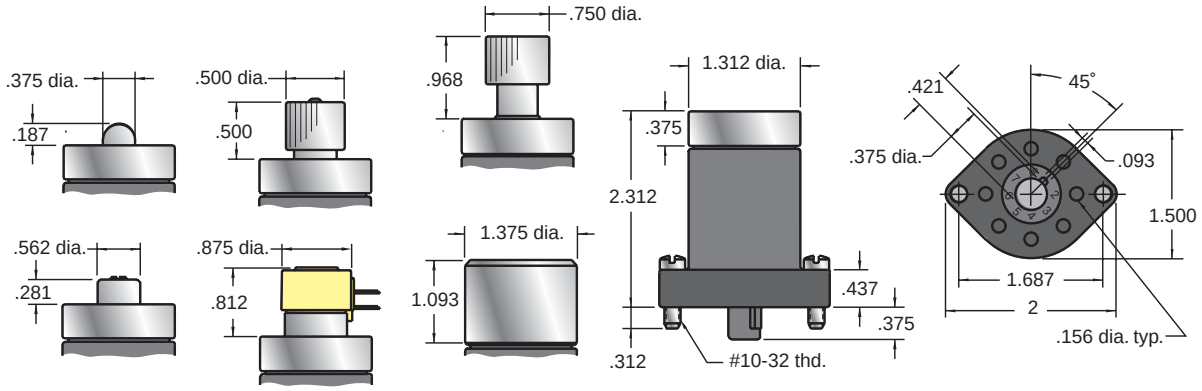
System Requirements

The Clippard Minimatic® modular components system is designed to operate on standard shop air. The air supply should be reasonably clean and dry for optimum performance. The system operating range is 0 to 150 psig. Recommended filtration is 40 micron. Many units have pilot pressure requirements of 20 to 40 psig, therefore, system pressure should be sufficient to assure 40 psig as the absolute minimum pilot pressure at all times. A normal system operating pressure from 60 to 100 psig should adequately provide this. The system operates in a temperature range of 32 to 230˚F.

NOTE: Constant operation at temperature range extremes may affect system performance.

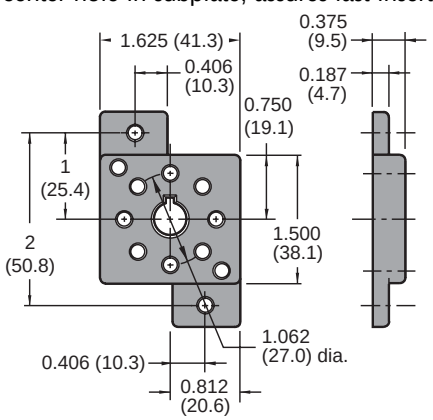
Manifold Module Dimensions

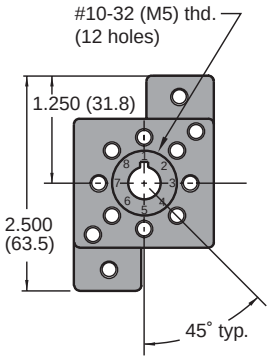
Module manifold body is injection molded high density acetal copolymer for high dimensional stability, outstanding impact resistance, and excellent moisture, ultraviolet, and temperature characteristics.



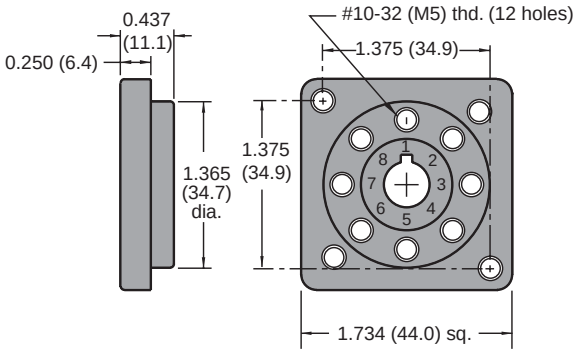
Subplate Dimensions

R-101/R-101-M5 subplate mounts to mounting strips with #10-32 screws and lockwashers provided. Ports on module base are numbered in the same pattern as on the subplate, making piping easy to identify. Module stem is keyed to fit center hole in subplate; assures fast insertion and proper positioning.





R-101 & R-101-M5 (metric)

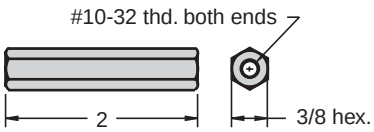


R-111 & R-111-M5 (metric)

R-111/R-111-M5 subplate mounts in 1 3/8" (34.9) hole in electrical box, control panel. Mounting screws and gasket provided seal subplate to mounting plate.

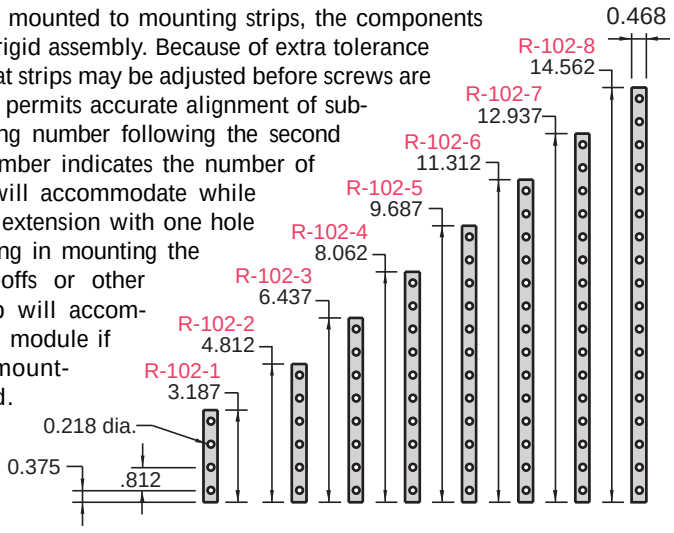
Mounting Strips & Stand-Off Dimensions

R-107-20



For providing space beneath assembled group of modules, use R-106 (order R-107-20, packet of four with hardware). Provides 2" clearance from enclosure wall for piping with Clippard fittings and tubing. Keeps piping and installation neat.

When subplates are mounted to mounting strips, the components build into a strong, rigid assembly. Because of extra tolerance in the holes, note that strips may be adjusted before screws are fully tightened. This permits accurate alignment of subplates. The identifying number following the second dash in the part number indicates the number of modules the strip will accommodate while still proving a short extension with one hole at both ends for using in mounting the assembly to stand-offs or other structures. The strip will accommodate 1 additional module if no extensions for mounting are needed. (Every two holes will accept a subplate.)

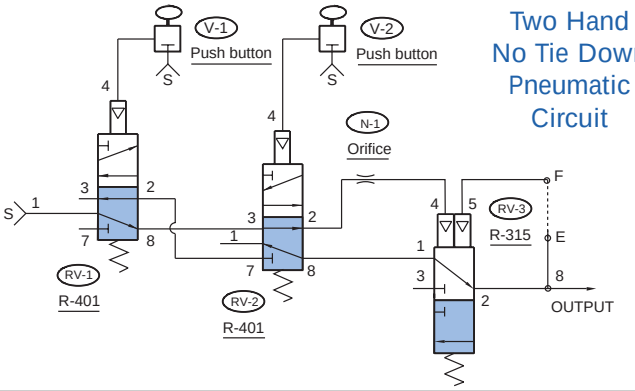


STEP ONE

Pneumatic Circuit

The first step in building a modular circuit is designing the pneumatic circuit using ANSI symbols.

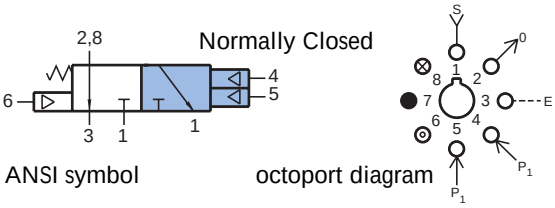
Starting on page 265 we have a number of circuits utilizing Clippard Minimatic Modular Components. We have chosen the Two Hand No Tie Down Circuit for this demonstration.



Two Hand No Tie Down Pneumatic Circuit

STEP TWO

Specifications for the R-315 modular valve



Octoport Diagrams

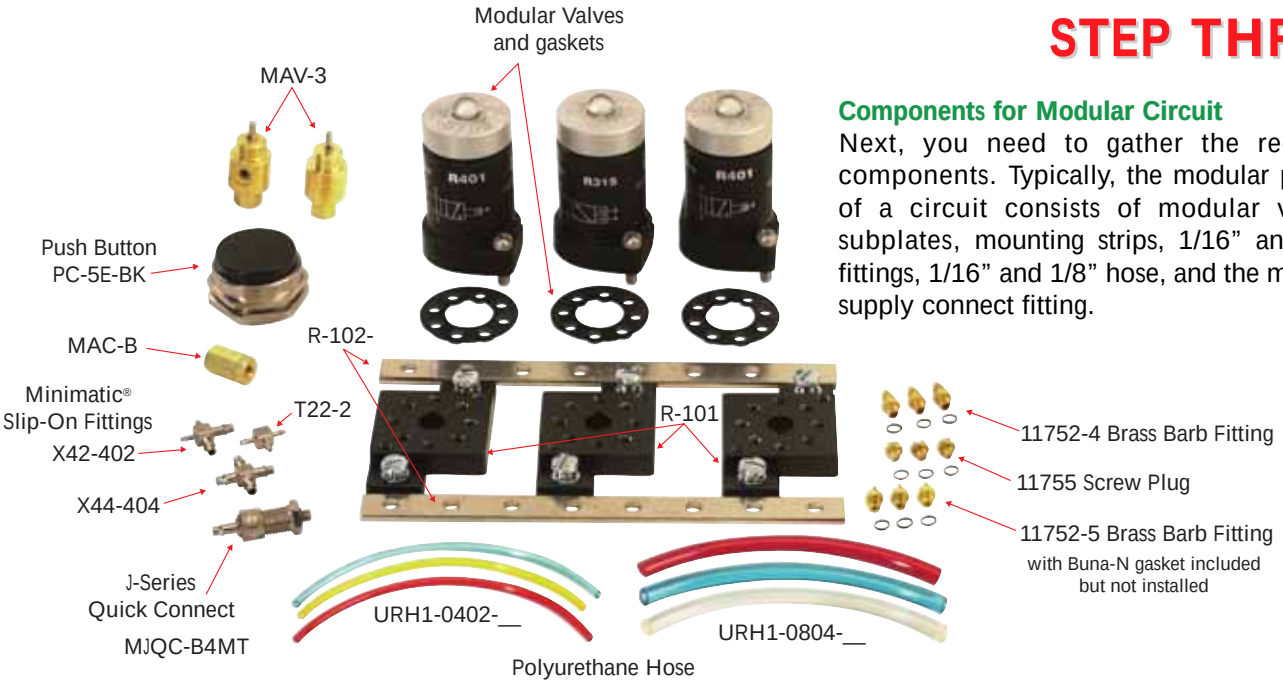
The next step is selecting the octoport diagram for each modular valve. Each Clippard modular valve (R-series) has its own unique octoport diagram which is shown to the right of the ANSI symbol.

See page 232 for clues for deciphering the Octoport port coding.

STEP THREE

Components for Modular Circuit

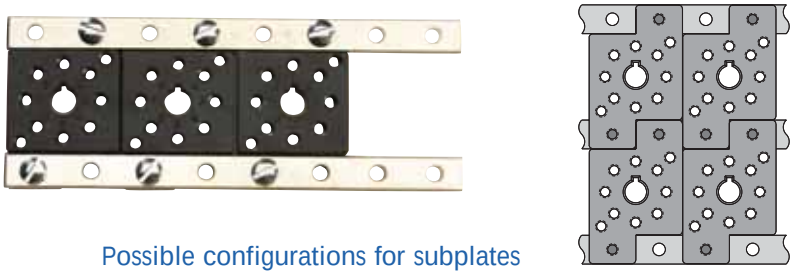
Next, you need to gather the required components. Typically, the modular portion of a circuit consists of modular valves, subplates, mounting strips, 1/16" and 1/8" fittings, 1/16" and 1/8" hose, and the main air supply connect fitting.



STEP FOUR

Mounting Strip and Subplate Assembly

The next step is assembling the mounting strips (R-102-) and subplates (R-101/R-101-M5).



Possible configurations for subplates

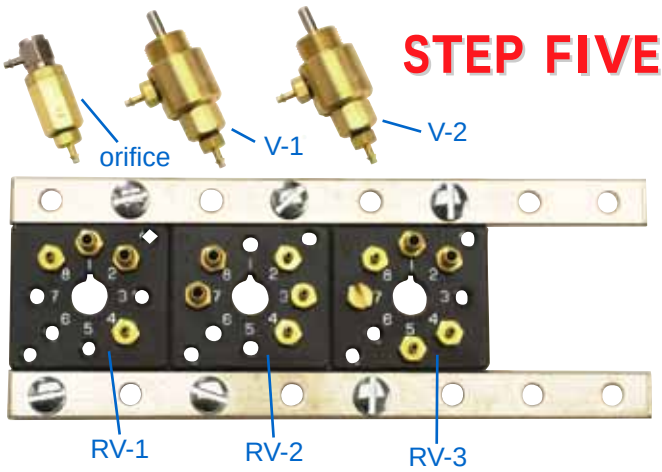
Subplate and Fitting Installation

The next step is to install the fittings into the R-101/R-101-M5 subplates using the octoport, octoport port coding, and pneumatic circuit diagrams. Generally, 1/16" hose is used for pilot ports and their adjoining lines and 1/8" hose are for supply lines and cylinders.

Looking at the two hand no tie down circuit:

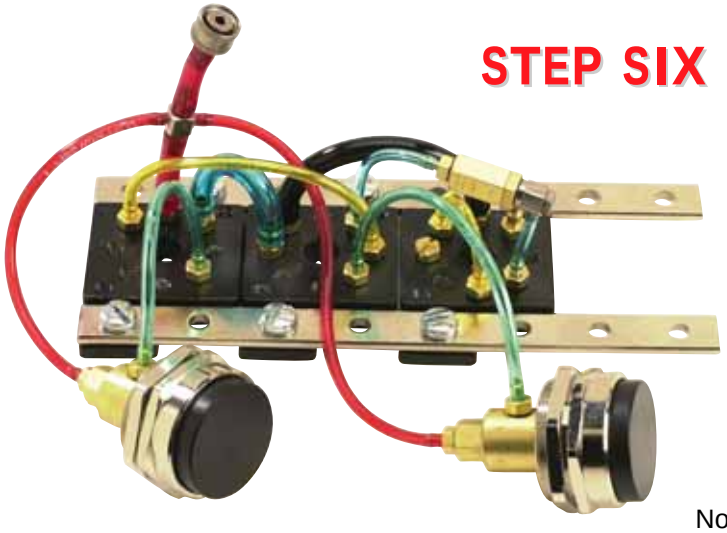
1. Valve RV-1 has fitting 11752-5 (#10-32 to 1/16" ID hose fitting) installed in ports 4 and 8
2. Fitting 1752-4 (#10-32 thd. to 1/8" ID hose fitting) installed in ports 1 and 2 because port 1 is the main air supply for the circuit and port 2 is the outlet.
3. On valves V-1 and V-2, fitting 11752-5 was installed in both the inlet and outlet of each valve because both valves are used for pilot actuation of valves RV-1 and RV-2.

STEP FIVE



4. Being in a pilot line, the inline fixed orifice air choke N-1 was fitted with an 11752-5 on one end and a UTO-2 universal "L" fitting on the other.

STEP SIX



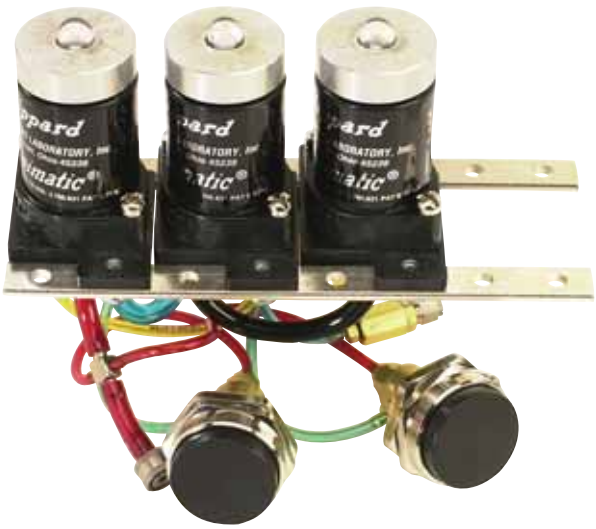
Connecting Hose

With the fittings installed, the circuit is ready for hose. The color coding we use at Clippard is quite simple. Red hose is used for all supply lines. For all other hose as many different colors as possible are used in order to facilitate circuit trouble shooting.

1. Supply lines - Red hose
2. The 1/16" ID fittings require URH1-0402 hose
3. The 1/8" ID fittings require URH1-0804 hose
4. The main supply line was fitted with a MJQC-CB4 which can be attached to any of the MJQC valve bodies.

Note: The MJQC series is not compatible with the MQC series.

STEP SEVEN



Modular Valve Hook-Up

The final assembly step is installing the modular valves and mounting gasket to the subplates.

Hose and barb sizes were picked with this particular application in mind. Both may vary to meet your needs. Feel free to contact our facility for technical support.

R-301

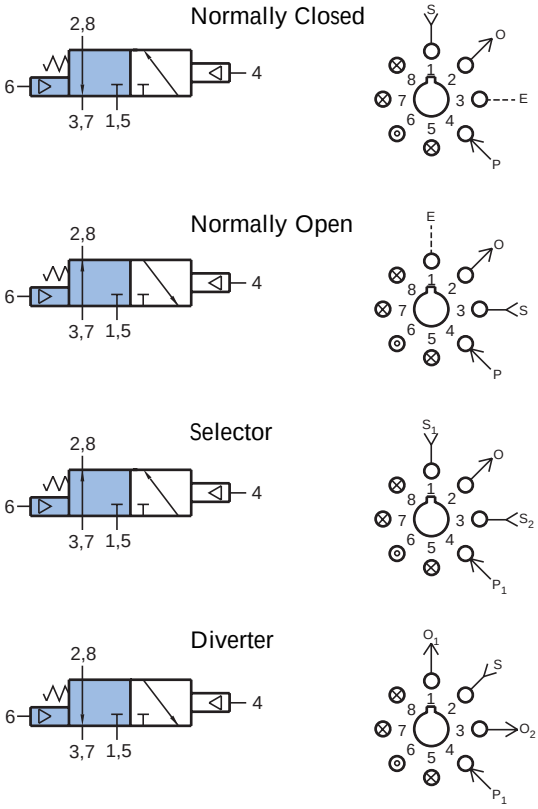
3-Way Valve

Features:

- Indicator shows valve in shaded position
- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: Vacuum to 150 psig; 10.3 bars



Description:

R-301 is a 3-way, spring return, fully ported, piloted valve. It can be used normally-OPEN, normally-CLOSED, as a diverter or as a selector. It can also be used as a 2-way valve by plugging the exhaust ports.

R-302

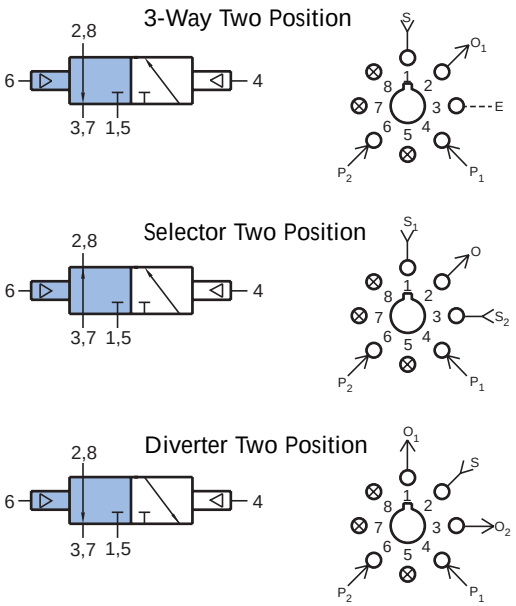
3-Way Valve

Features:

- Indicator shows valve in shaded position
- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Description:

R-302 is a 2-position, 3-way, double-piloted, fully-ported valve. It can be used normally-OPEN, normally-CLOSED, as a 2-position diverter, as a 2-position selector, or as a 2-way valve by plugging the exhaust ports.

R-305

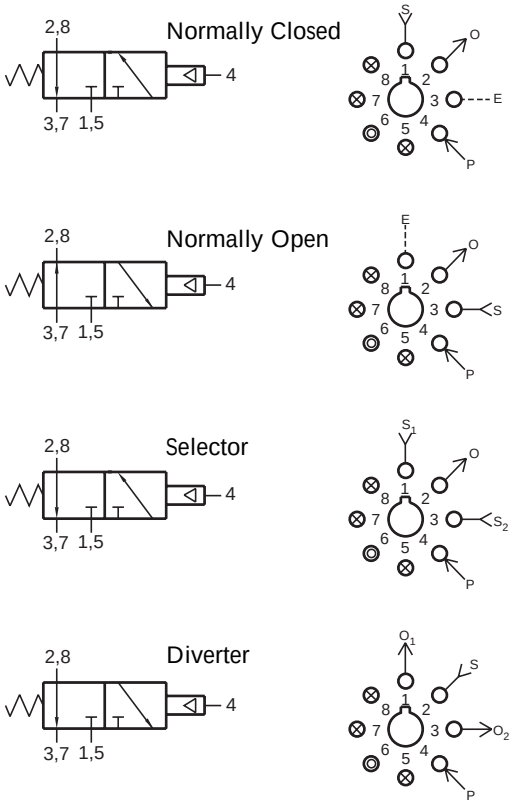
3-Way Low Pressure Pilot Valve

Features:

- Pilot actuates valve with low pressure signal
- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 15 psig; 1.0 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Description:

R-305 is a 3-way, spring-return, fully ported valve with a low pressure pilot. Pilot pressure signals as low as 15 psig will actuate the valve. The valve can be used normally-OPEN, normally-CLOSED, as a selector or as a diverter. The R-305 may be used in place of an R-301 valve where a lower pilot actuation pressure is desired. It can also be used as a 2-way valve by plugging the exhaust ports.

R-310

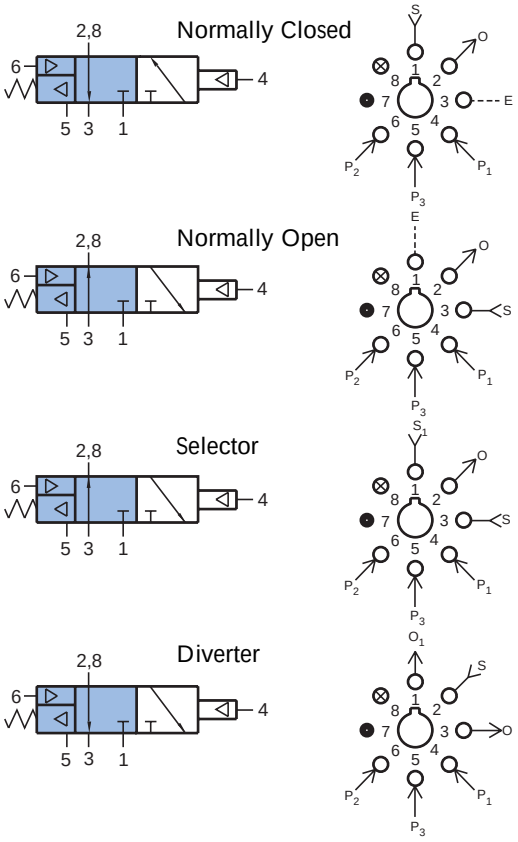
3-Way Reset Valve

Features:

- Indicator shows valve in shaded position
- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts
- Unique piloted spring reset

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum (against spring): 40 psig; 2.8 bars
Pilot Pressure Minimum (spring retracted): 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Description:

R-310 is a 3-way, fully ported valve with a special air retracted spring return that will return the valve to a definite position when there is no signal at ports 5 and 4. This “reset” feature may be used in circuits in the event of loss of air pressure or to change the operating characteristics of the valve in the circuit in response to an independent input at port 5. When port 5 is not piloted, the R-310 acts as an R-301 3-way spring return, fully ported valve. When port 5 is actuated, the R-310 acts as an R-302 3-way, two position valve. With no signal at port 5, a signal at port 6 acts as an auxiliary pilot type valve and will override a signal at port 4.

R-311

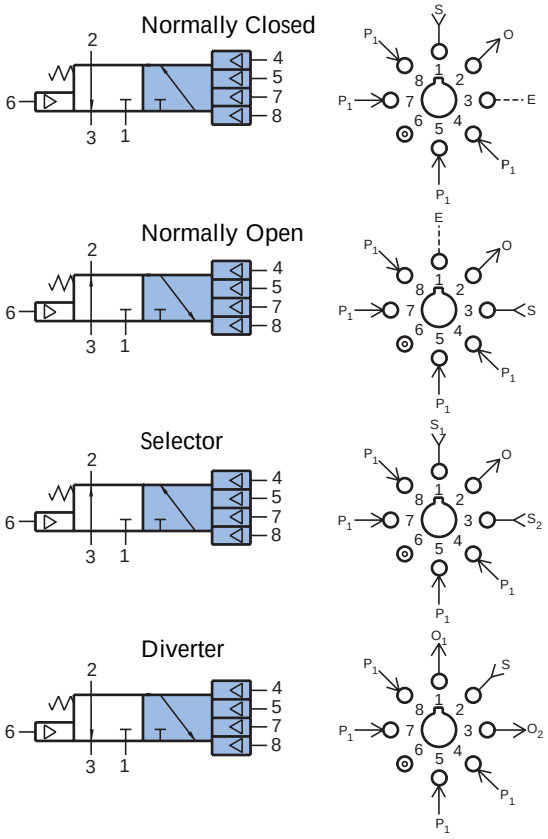
3-Way Multiple Pilot Valve

Features:

- Indicator shows valve in shaded position
- Multiple pilots reduces number of valves - reduces piping and space required
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhaust

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Description:

R-311 is a 3-way, spring return, fully ported valve with four pilots. Any one of the four pilots will actuate the valve. Actuating more than one pilot has no additional effect. Pilot signals must be absent at all four pilots to release the valve. The valve can be used normally - OPEN, normally - CLOSED, as a selector or as a diverter, all with four pilot inputs. It can also be used as a 2-way valve by plugging the exhaust ports. The R-311 may be used to replace an R-301 or R-321 valve in a circuit when additional pilot inputs are required. The R-311 also features an auxiliary pilot on the spring side of the valve. The auxiliary pilot will overcome any one or all of the four input pilots.

R-312

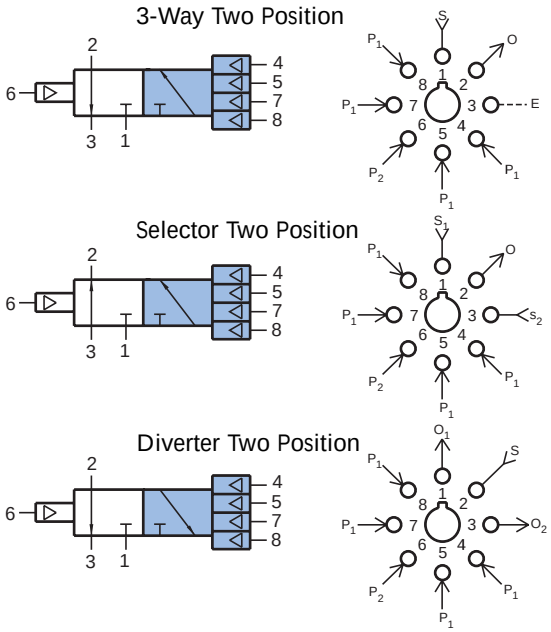
3-Way Multiple Pilot Valve

Features:

- Indicator shows valve in shaded position
- Multiple pilots reduces number of valves - reduces piping and space required
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhaust

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Description:

R-312 is a 3-way, two position, fully ported valve with four pilots on one position. Any one of the four pilots on one position will actuate the valve. Actuating more than one pilot has no additional effect. Pilot signals must be absent at all four pilots before the opposite pilot can shift the valve. The valve can be used normally-OPEN, normally-CLOSED, as a selector, or as a diverter, all with four pilot inputs. It can also be used as a 2-way valve by plugging the exhaust ports. The R-312 may be used to replace an R-302 or R-322 valve in a circuit when additional pilot inputs are required.

R-314

3-Way Multiple Pilot Valve

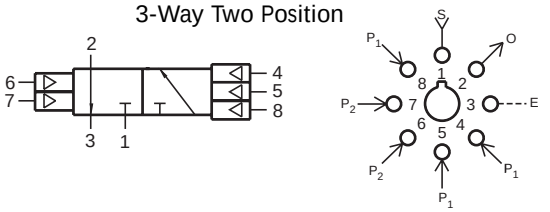
Features:

- Multiple pilots reduces number of valves - reduces piping and space required
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

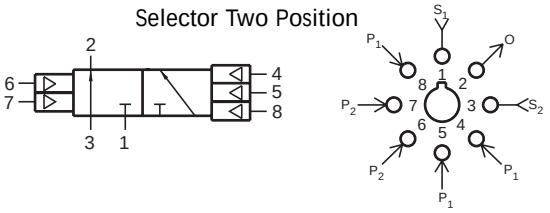
Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

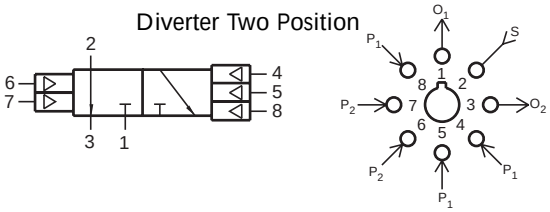
3-Way Two Position



Selector Two Position



Diverter Two Position



Description:

R-314 is a 3-way, air piloted, two position valve. It has three pilots on one side and two pilots on the other side. (see symbol) Actuating more than one pilot on the same side has no additional effect. Pilot signals must be absent from all pilots (on the same side) before an opposite pilot will shift the valve. The valve can be used normally-OPEN, normally-CLOSED; as a selector, or as a diverter. It may be used as a 2-way valve by plugging the exhaust ports.

R-315

3-Way Multiple Pilot Valve

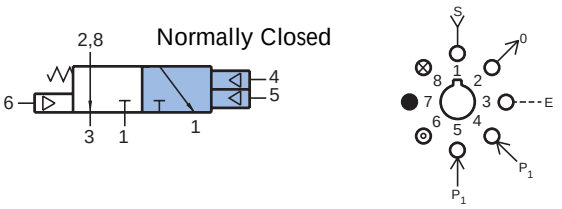
Features:

- Indicator shows valve in shaded position
- Multiple pilots reduces number of valves - reduces piping and space required
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhaust

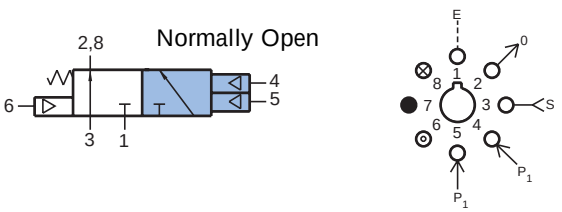
Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

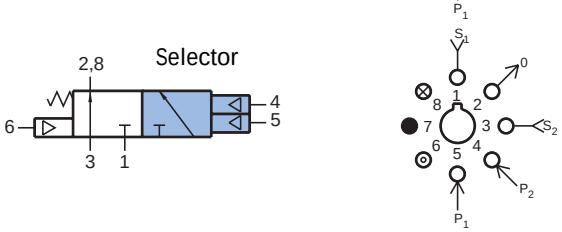
Normally Closed



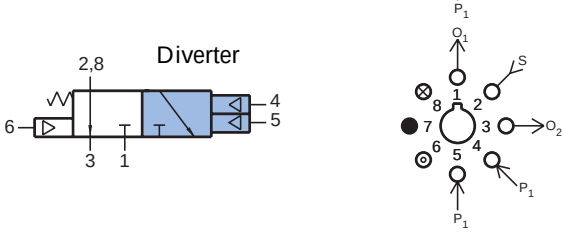
Normally Open



Selector



Diverter



Description:

R-315 is a 3-way, spring return, fully ported valve with two independent pilots that make it ideal for “latch” circuits. Either of the two pilots will actuate the valve. Actuating more than one pilot has no additional effect. Pilot signals must be absent at both pilots to release the valve. The valve can be used normally-OPEN, normally-CLOSED, as a selector or as a diverter. It can also be used as a 2-way valve by plugging the exhaust ports. The R-315 may be used to replace an R-301 valve in a circuit when additional pilot inputs are required. The R-315 also features an auxiliary pilot on the spring side of the valve. The auxiliary pilot will overcome any one or all of the four input pilots.

R-321

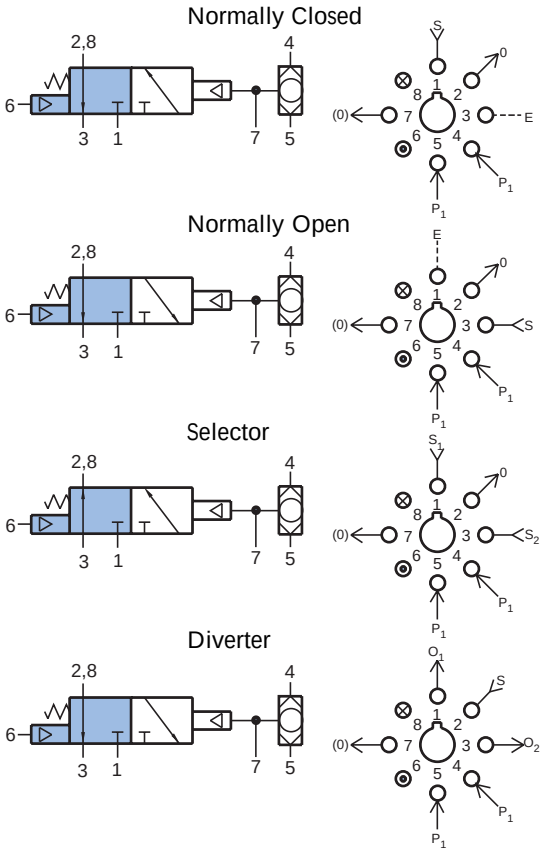
3-Way Combination Valve

Features:

- Indicator shows valve in shaded position
- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Description:

R-321 is a 3-way, spring return, fully ported valve with an interconnected shuttle valve in one pilot line to provide two inputs to the pilot. It can be used normally - OPEN, normally - CLOSED, as a diverter, or as a selector. Auxiliary outlet is provided through port 7, which should be plugged if not used.

R-322

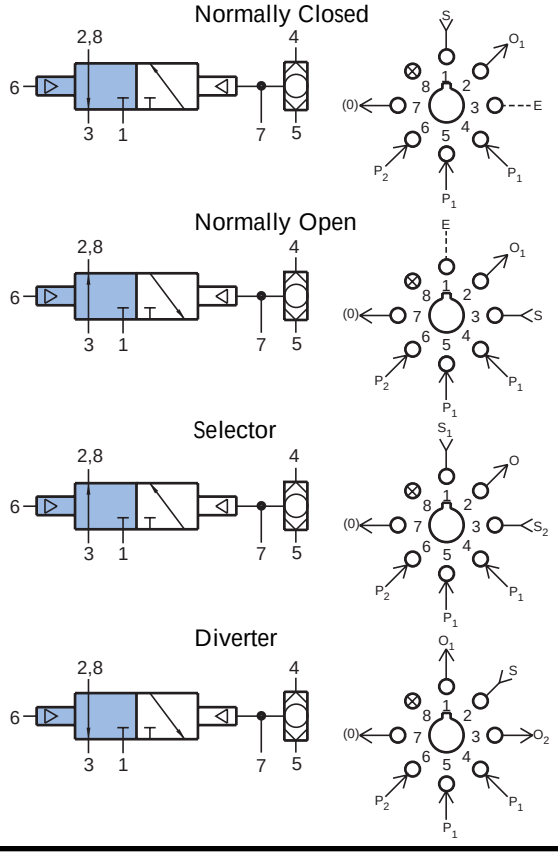
3-Way Combination Valve

Features:

- Indicator shows valve in shaded position
- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Description:

R-322 is a 3-way valve, 2-position, fully ported, with an interconnected shuttle valve in one pilot line to provide two inputs to the pilot. It can be normally-OPEN, normally-CLOSED, as a 2-position selector, or as a 2-position diverter. Auxiliary outlet is provided through port 7, which should be plugged if not used.

R-323

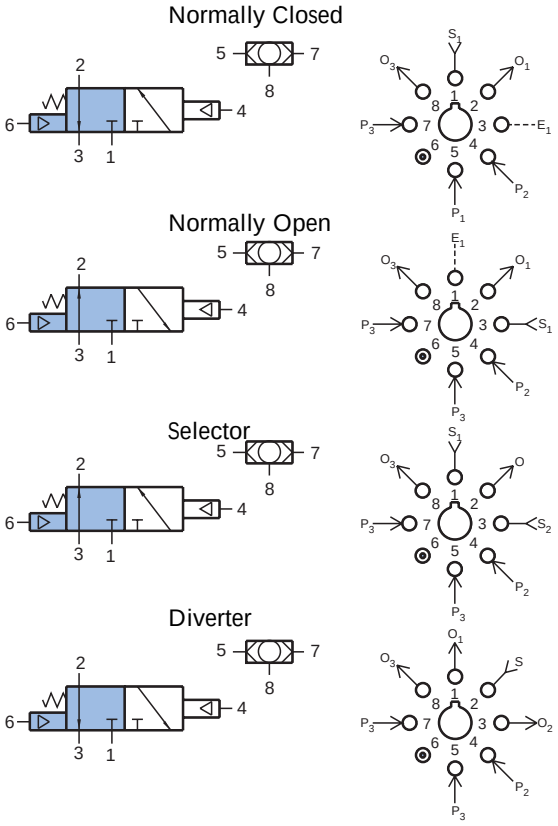
3-Way Combination Valve

Features:

- Indicator shows valve in shaded position
- Multiple valves save space
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Description:

R-323 is a 3-way, spring return, fully ported valve with an independent shuttle valve in the same body. Both valves may be used independently in a circuit. The 3-way can be used normally-OPEN, normally-CLOSED; as a diverter, or as a selector. The R-323 also features an auxiliary pilot on the spring side of the valve.

R-324

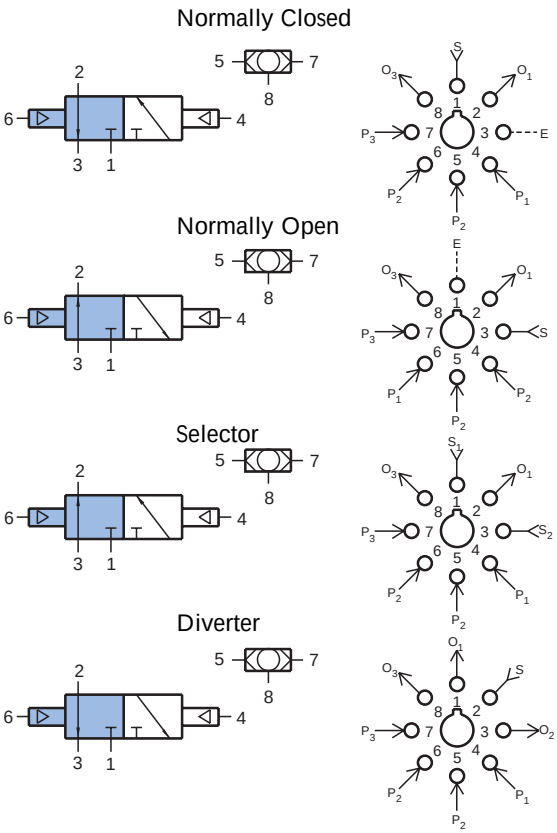
3-Way Combination Valve

Features:

- Indicator shows valve in shaded position
- Multiple valves save space
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Description:

R-324 is a 3-way, two position, fully ported valve with an independent shuttle valve in the same body. Both valves may be used independently in a circuit. The 3-way can be used normally-OPEN, normally-CLOSED; as a diverter, or as a selector.

R-325

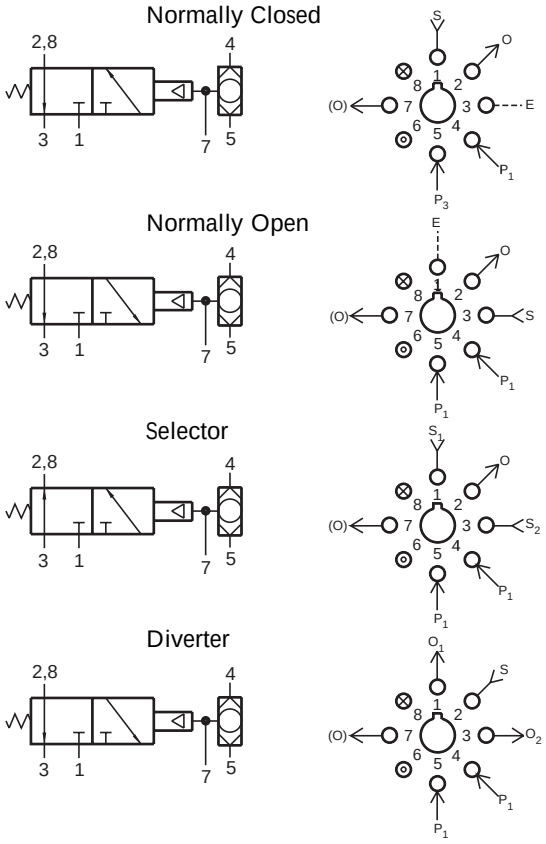
3-Way Low Pressure Combination Valve

Features:

- Pilot actuates valve with low pressure signal
- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 15 psig; 1.0 bar
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Description:

R-325 is a 3-way, spring return, fully ported valve with a low pressure pilot and an interconnected shuttle valve to provide two inputs to the low pressure pilot. It can be used normally - CLOSED, normally - OPEN, as a 2-position diverter, or as a 2-position selector. The R-325 may be used in place of an R-321 valve where a lower pilot pressure is desired. Auxiliary outlet is provided through port 7, which should be plugged if not used.

R-331
R-333

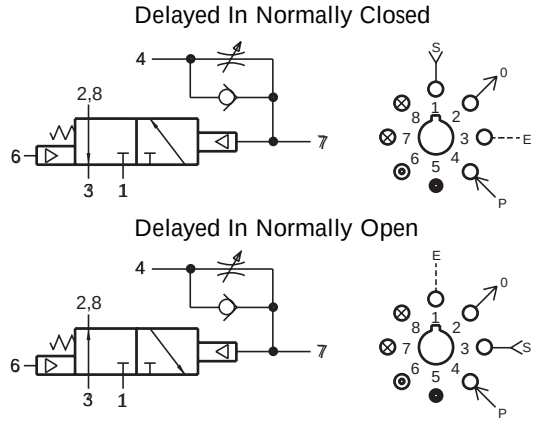
3-Way Delay Valve

Features:

- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Screwdriver slot needle adjustment deters tampering (R-333)
- Knurled knob for fast accurate adjustments - no tools needed (R-331)
- 0-5 seconds range

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Description:

R-331 and R-333 are dual element combinations consisting of a fully ported, spring return, 3-way valve, and an adjustable flow control to provide a delay “IN” function. Input signal at port 4 will be delayed through adjustable flow control and will delay the actuation of the valve. The 3-way valve is fully ported and can be used normally-OPEN, normally-CLOSED, or as a selector or diverter. Port 7 is an auxiliary for adding volume for longer time delays. If not used, port 7 should be plugged.

R-332
R-334

3-Way Delay Valve

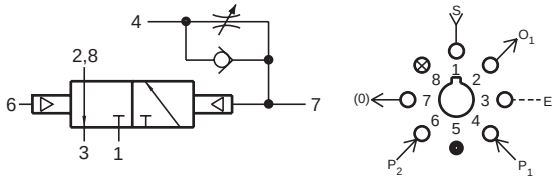
Features:

- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Screwdriver slot needle adjustment deters tampering (R-334)
- Knurled knob for fast accurate adjustments - no tools needed (R-332)
- 0-3 seconds range

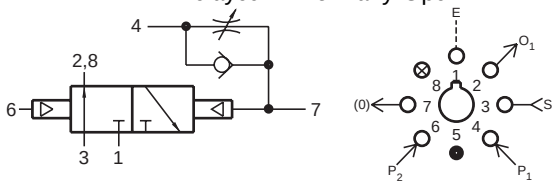
Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Delayed In Normally Closed



Delayed In Normally Open



Description:

R-332 and R-334 are dual element combinations consisting of a 2-position, 3-way valve, fully ported, and an adjustable flow control to provide a delay “IN” function. Input signal at port 4 will be delayed through adjustable flow control and will delay the actuation of the valve. The 3-way valve can be used normally-OPEN, normally-CLOSED, as a 2-position selector or 2-position diverter. Port 7 is an auxiliary for adding volume for longer time delays. If not used, port 7 should be plugged.

R-341
R-343

3-Way Delay Valve

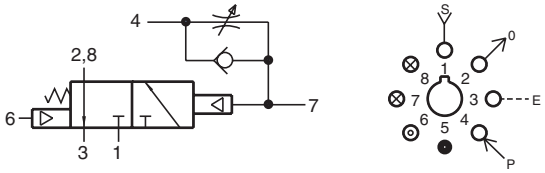
Features:

- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Screwdriver slot needle adjustment deters tampering (R-343)
- Knurled knob for fast accurate adjustments - no tools needed (R-341)
- 0-7 seconds range

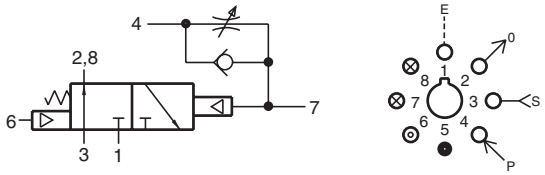
Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

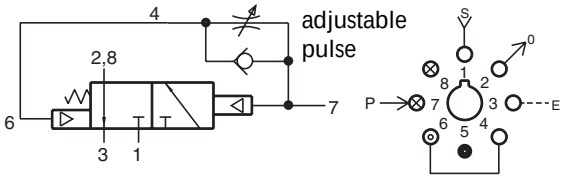
Delayed Out Normally Closed



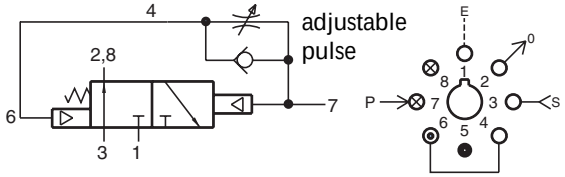
Delayed Out Normally Open



Normally Closed



Normally Open



Description:

R-341 and R-343 are dual element combinations consisting of a fully ported spring return, 3-way valve and an adjustable flow control to provide a delay “out” function.

Input signal at port 4 actuates the valve immediately; and upon loss of pressure signal at port 4, the valve remains in position until pilot pressure decays through the flow control. The valve can be used as normally - OPEN or normally-CLOSED, and as a diverter or selector. Port 7 is an auxiliary for adding volume for longer time delays. If not used, port 7 should be plugged.

R-351

Dual Normally Closed 3-Way Valve

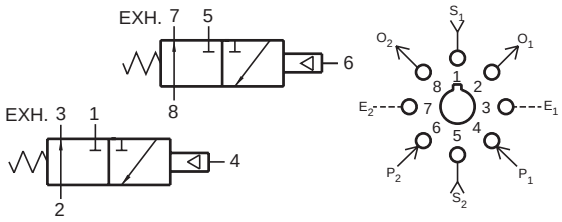
Features:

- Micro gap construction - snap action and no blow by
- Two independent valves in one module
- Saves space

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32 to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Dual 3-Way Normally Closed



Description:

R-351 is a dual element combination of 2 independent, spring return, 3-way valves in a single manifold, set-up for normally-CLOSED usage only. Ports 3 and 7 are exhausts to atmosphere and cannot be restricted.

R-352

Dual 3-Way Valve

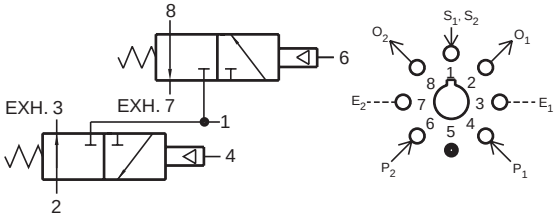
Features:

- Micro gap construction - snap action and no blow by
- Two independent units in one module
- Common supply eliminates extra piping

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Dual 3-Way



Description:

R-352 is a dual element combination consisting of 2 independent, spring return, 3-way normally-CLOSED valves with a common inlet. Ports 3 and 7 are exhausts to atmosphere, and can not be restricted.

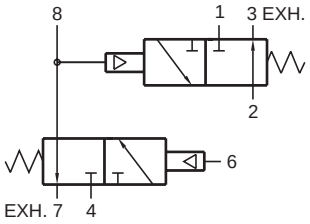
R-353

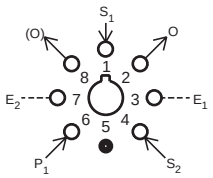
Dual 3-Way Valve

Features:

- Micro gap construction - snap action and no blow by
- Complete function in one module
- Auxiliary outputs save fittings and time

Dual 3-Way





Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Description:

R-353 is a dual element combination consisting of 2 normally-CLOSED, spring return, 3-way valves interconnected to form a 3-input "AND" subcircuit. Ports 3 and 7 are exhausted to atmosphere, and should not be restricted. Ports 1, 4, and 6 are inputs. Output will occur at Port 2 only when all three of these ports are actuated. Port 8 is an auxiliary output and should be plugged if not used.

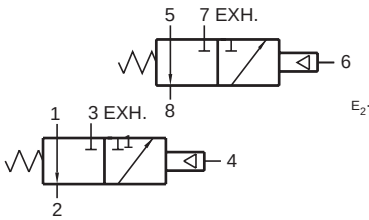
R-355

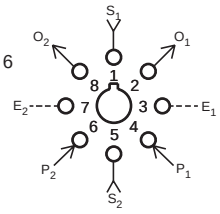
Dual Normally Open 3-Way Valve

Features:

- Micro gap construction - snap action and no blow by
- Two independent units in one module
- Saves space

Dual 3-Way Normally Open





Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Description:

R-355 is a dual element combination of 2 independent, spring-return, 3-way valves in a single manifold, set-up for normally-OPEN usage only. Ports 3 and 7 are exhausts to atmosphere and can not be restricted.

R-401

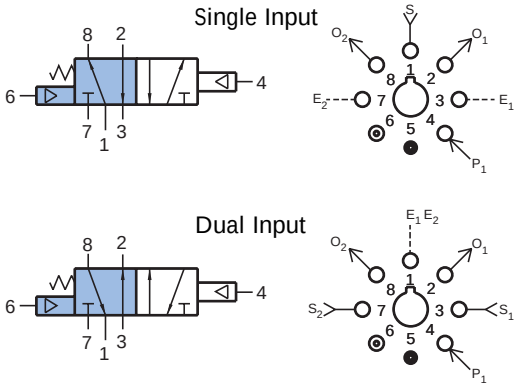
4-Way Valve

Features:

- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Description:

R-401 is a 4-way, spring return, pilot operated, fully ported 5-ported 4-way valve. R-401 is a versatile component in basic logic circuits, and can perform all 2, 3, and 4-way functions. Operates double acting cylinders, and allows speed control by restricting exhaust ports. It can be used with one input, two independent outputs and two independent exhausts, or with two independent inputs, two independent outputs and a common exhaust. Auxiliary pilot feature.

R-402

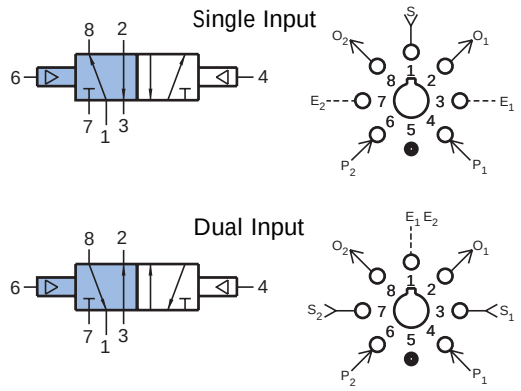
4-Way Valve

Features:

- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

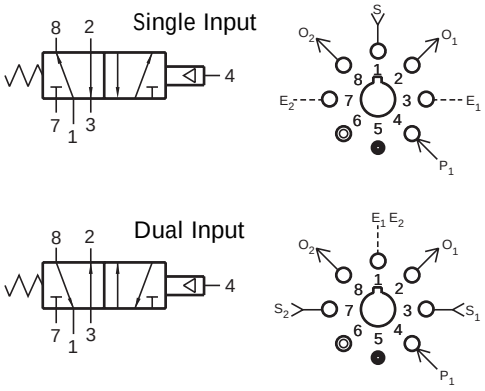


Description:

R-402 is a 4-way, double piloted, fully ported, 2-position valve. R-402 is a versatile component in basic logic circuits, and can perform all 2-, 3-, and 4-way functions. Operates double acting cylinders, and allows speed control by restricting exhaust ports.

R-405

L.P. Pilot Valve



Features:

- Pilot actuates valve with low pressure signal
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

Performance:

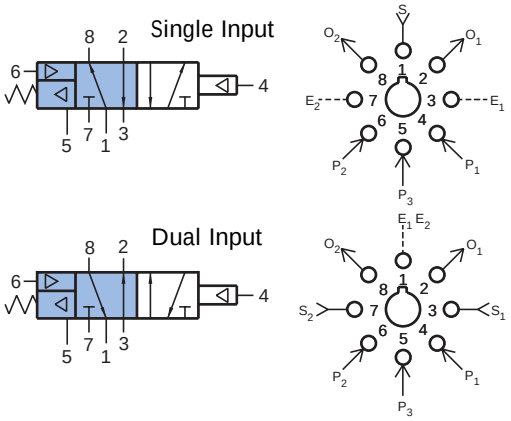
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 15 psig; 1.0 bar
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Description:

R-405 is a 4-way, spring-return, fully ported 5-port valve with a low pressure pilot. Pilot pressures as low as 15 psig will actuate the valve. It can perform all 2, 3, and 4-way functions. Operates double acting cylinders, allows speed control by restricting exhaust ports. It can be used with 1 input, 2 independent outputs and two independent exhausts, or with 2 independent inputs, 2 independent outputs and a common exhaust. The R-405 may be used in place of an R-401 where lower pilot actuation pressure is desired.

R-410

4-Way Reset Valve



Features:

- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts
- Unique piloted spring reset

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum (against spring): 40 psig; 2.8 bars
Pilot Pressure Minimum (spring retracted): 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

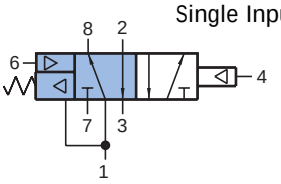
Description:

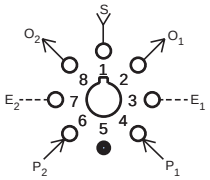
R-410 is a 4-way, fully ported valve with a special air retracted spring return that will return the valve to a definite position when there is no signal at ports 5 and 4. This “reset” feature may be used in circuits in the event of loss of air pressure or to change the operating characteristics of the valve in the circuit in response to an independent input at port 5. When port 5 is not piloted, the R-410 acts as a R-401 4-way spring return, fully ported valve. When port 5 is actuated, the R-410 acts as an R-402 4-way, two position valve. With no signal at port 5, a signal at port 6 acts as an auxiliary pilot type valve and will override a signal at port 4.

R-412

4-Way Reset Valve

Single Input





Features:

- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts
- Reset feature allows for fail safe circuit design

Performance:

Flow: 9 scfm @ 100 psig; 254 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

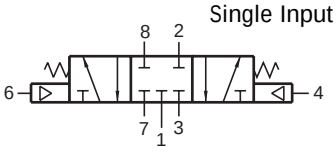
Description:

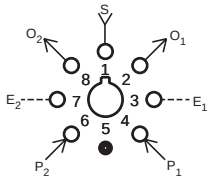
R-412 is a 5 ported 4-way double piloted, fully ported, 2-position valve with a special air-retracted spring that returns the valve to a definite position when the input air is off. This “memory” feature is ideal for circuitry where a definite starting position is required should the air supply fail and come on again unexpectedly. When there is pressure at port one, the spring pilot compresses the spring and holds it out of the way: valve functions normally as a double piloted 4-way valve identical to the R-402.

R-421

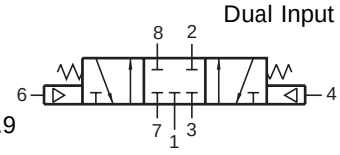
3-Position, 4-Way Valve

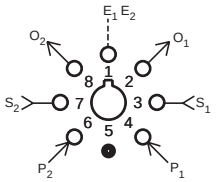
Single Input





Dual Input





Features:

- Micro gap construction - snap action and no blow by
- Three positions
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Description:

R-421 is a 4-way, 3-position, spring centered, fully ported valve. In the center position, all ports are blocked. It is ideal for approximate positioning and holding of pneumatic cylinders.

R-431

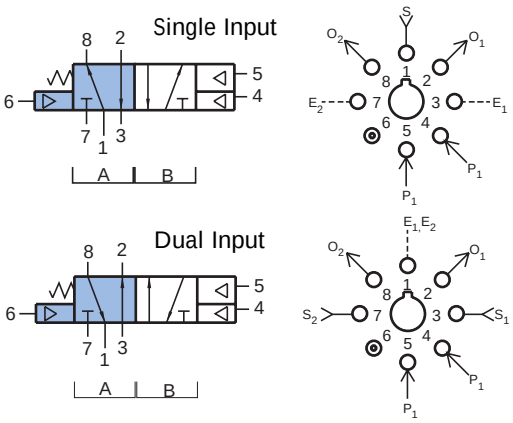
Twin Pilot 4-Way Valve

Features:

- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Dual pilots eliminate shuttle valve
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Description:

R-431 is a 5 ported, 4-way valve, with spring return and dual pilots. When ports 5 and 2 are connected, a momentary pilot signal at port 4 will shift the valve to the "latched" position. It will remain in this position until the supply (port 1) is removed, or connection between ports 5 and 2 is interrupted.

Special Note: R-431 uses differential pilots and, as a result, the auxiliary pilot with the spring is not sufficiently large to cancel out the force of pilot 5. The auxiliary pilot will overcome pilot 4. The valve is actuated by pilot signals per the following chart:

Pilot			Position
6	5	4	
off	off	off	A
off	off	on	B
off	on	on	B
off	on	off	B
on	off	off	A
on	off	on	A
on	on	off	B*

*Dependent on pressure relation of port 5 and 6

R-432

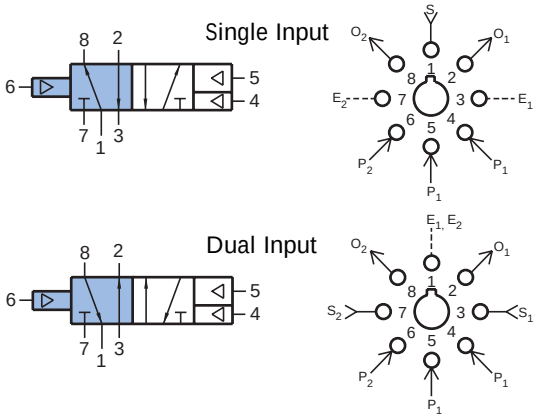
Twin Pilot 4-Way Valve

Features:

- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Dual pilots eliminate shuttle valve
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Description:

R-432 is a 5 ported, 4-way, two position, double piloted valve.

R-433

Twin Pilot 4-Way Valve

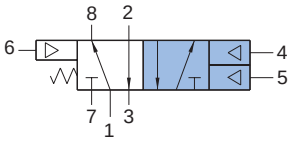
Features:

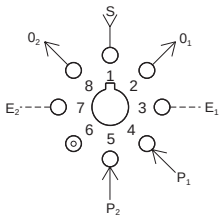
- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Dual pilots eliminate shuttle valve
- Balanced design allows speed control at exhausts

Performance:

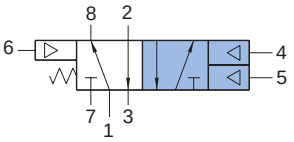
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

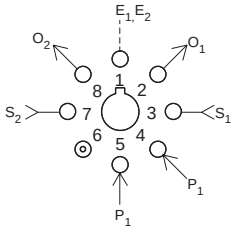
Single Input





Dual Input





Description:

R-433 is a 5 ported, 4-way valve, with spring return and dual pilots.

R-434

Twin Pilot 4-Way Valve

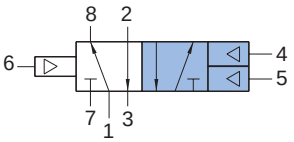
Features:

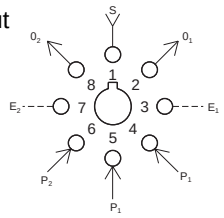
- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Dual pilots eliminate shuttle valve
- Balanced design allows speed control at exhausts

Performance:

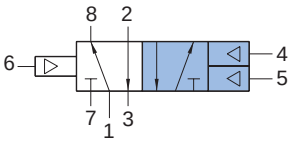
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

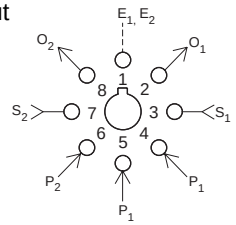
Single Input





Dual Input



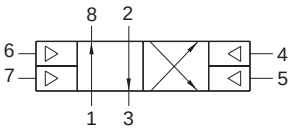


Description:

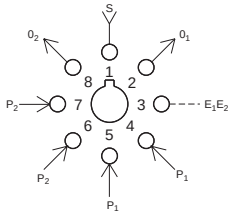
R-434 is a 5 ported, 4-way, two position, double piloted valve.

R-436

Dual Twin Pilot 4-Way Valve



Single Input



Features:

- Micro gap construction - snap action and no blow by
- Dual pilots eliminate shuttle valve
- Balanced design allows speed control at exhausts

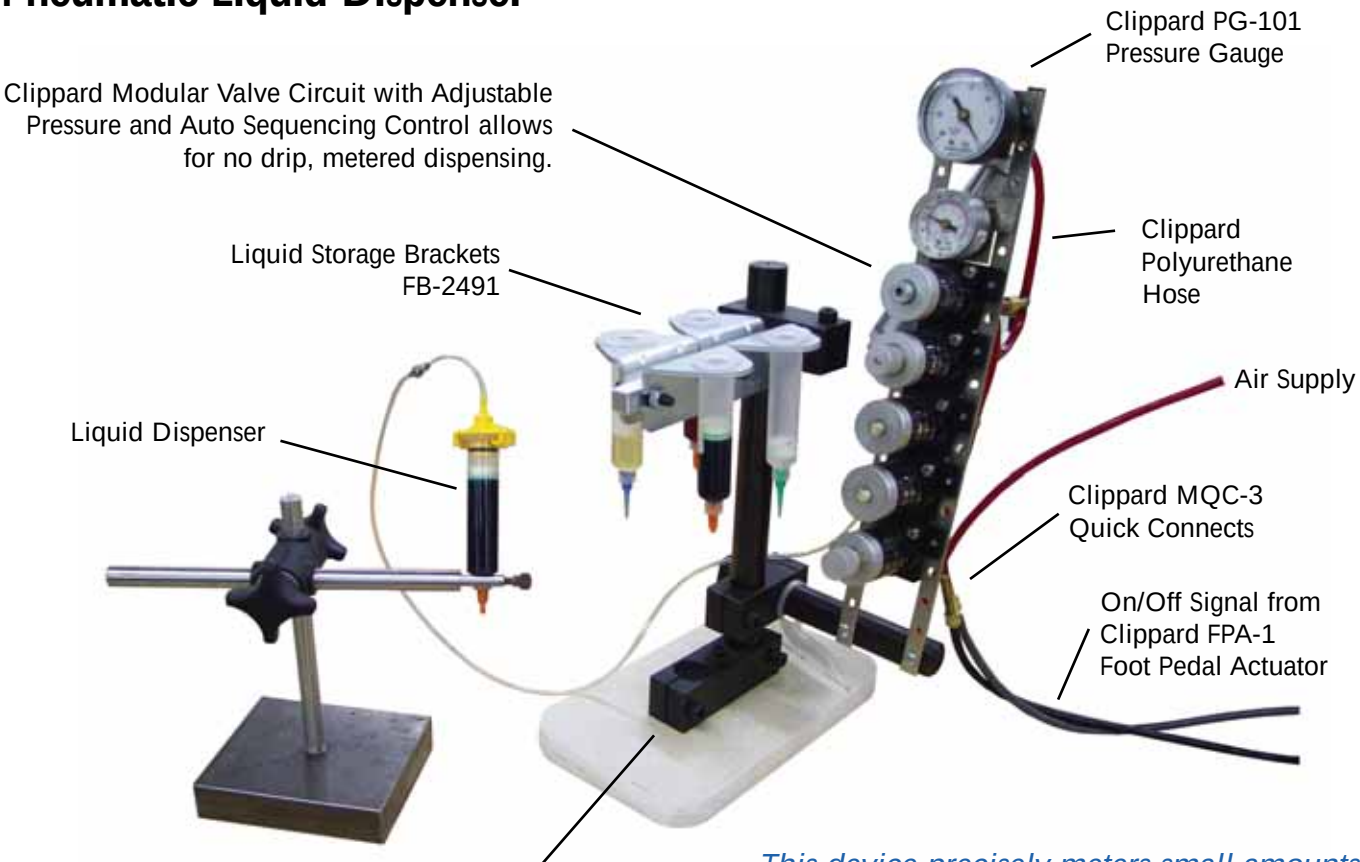
Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Description:

R-436 is a 4-way, two position valve with two pilots on each side. Actuating more than one pilot on the same side has no additional effect. Pilot signals must be absent from all pilots on one side before an opposite pilot will shift the valve. Port 3 is used as a common exhaust path.

Pneumatic Liquid Dispenser



This device precisely meters small amounts of liquids to parts with no drip or mess. It is made entirely of Clippard components.

R-441

4-Way Valve

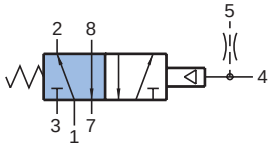
Features:

- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

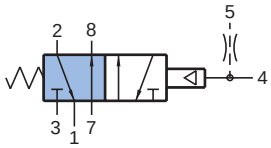
Performance:

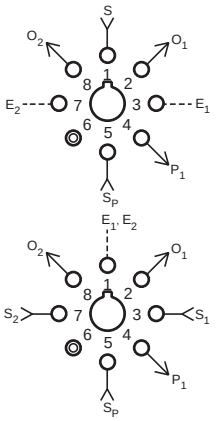
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Single Input



Dual Input





Description:

R-441 is a 4-way, spring return, bleed piloted valve for use with simple low force sensors. The vent supply pressure is independent of the inlet pressure to the valve. This pilot supply passes through a built-in restriction and shifts the valve compressing the spring. Venting (exhausting) the pressure in the pilot chamber (faster than the restricted supply can recover) shifts the valve.

R-442

4-Way Valve

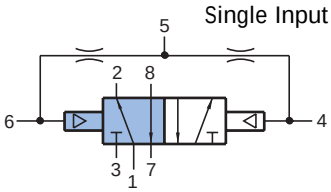
Features:

- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

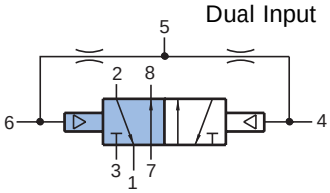
Performance:

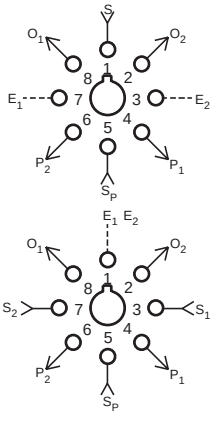
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Single Input



Dual Input





Description:

R-442 is a 4-way, double bleed pilot valve. The vent supply pressure is independent of the inlet pressure to the valve. Pilot supply passes through built-in restrictions and pressurizes both pilots. Venting (exhausting) the pressure in one pilot chamber (faster than the restricted supply can recover) causes the valve to be shifted by the opposite pilot.

R-443

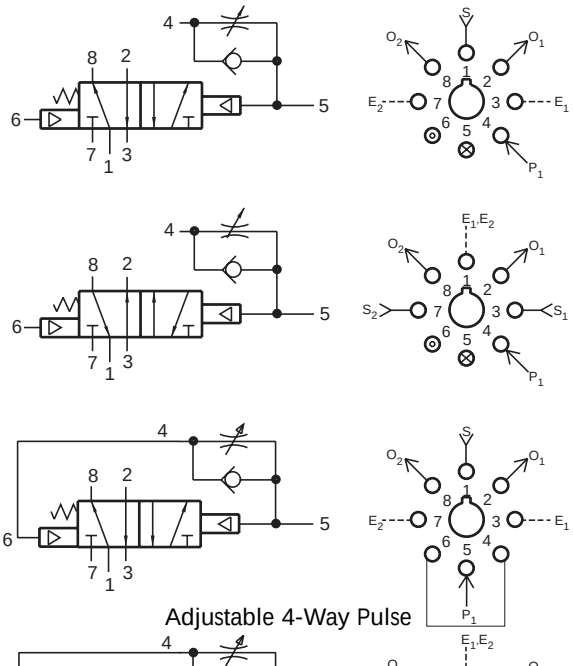
4-Way Delay Valve

Features:

- Micro gap construction - snap action and no blow by
- Screwdriver slot needle adjustment deters tampering
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars



Adjustable 4-Way Pulse

Description:

R-443 is a 4-way, spring return, fully ported 5-port valve with an adjustable flow control valve interconnected to the pilot. A pilot input signal in port 4 actuates the valve. When the pilot signal is exhausted it is delayed, out keeping the valve actuated until the pilot pressure has decayed. The R-443 can perform all 2, 3, and 4-way functions. The R-443 also features an auxiliary pilot on the spring side of the valve. Port 5 is an auxiliary for adding volume for longer time delays, if not used, port 5 should be plugged.

R-445

4-Way Delay Valve

Features:

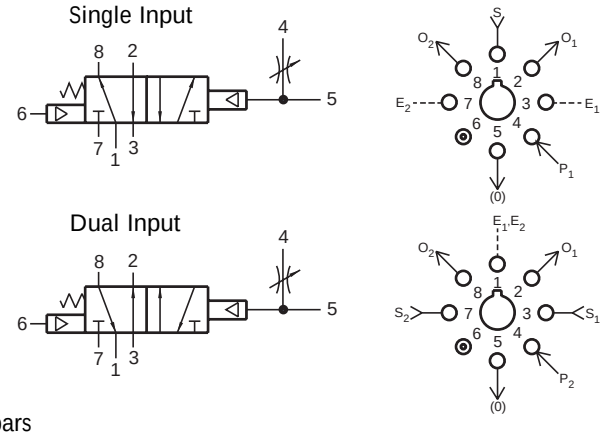
- Micro gap construction - snap action and no blow by
- Screwdriver slot needle adjustment deters tampering
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Single Input

Dual Input

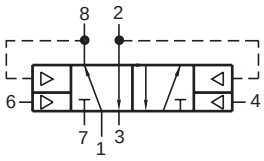


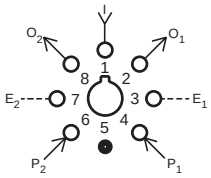
Description:

R-445 is a 4-way, spring return, fully ported, 5-port valve with an adjustable needle valve connected in parallel to the pilot. A pilot signal input in port 4 will be delayed in before actuating the valve. When the pilot signal is exhausted it is delayed out keeping the valve actuated until the pilot pressure has decayed. The R-445 can perform all 2-, 3-, and 4-way functions. The R-445 also features an auxiliary pilot on the spring side of the valve. It can also be used as a bleed pilot by a constant supply to 4 and connecting port 5 to a bleed valve.

R-451

Binary Trigger Valve





Features:

- Micro gap construction - snap action and no blow by
- Dual pilots eliminate shuttle valve
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

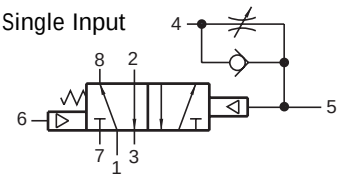
Description:

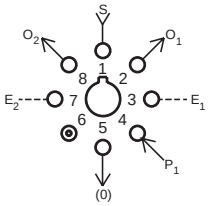
R-451 is a special purpose valve designed to work in conjunction with the R-402/R412 valve to provide a single input flip-flop (binary sub-circuit).

R-453

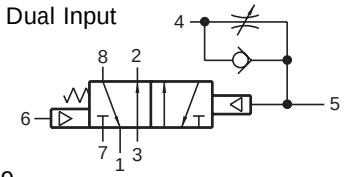
4-Way Delay Valve

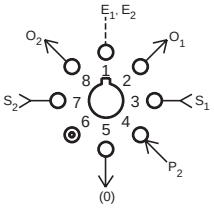
Single Input





Dual Input





Features:

- Micro gap construction - snap action and no blow by
- Screwdriver slot needle adjustment deters tampering
- Balanced design allows speed control at exhausts

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Description:

R-453 is a 4-way, spring return, fully ported 5 port valve with an adjustable flow control valve interconnected to the pilot. A pilot signal input in port 4 will be delayed in before actuating the valve. When the pilot signal is exhausted, the spring shifts the valve. The R-453 can perform all 2-, 3-, and 4-way functions. The R-453 also features an auxiliary pilot on the spring side of the valve.

R-454

4-Way Delay Valve

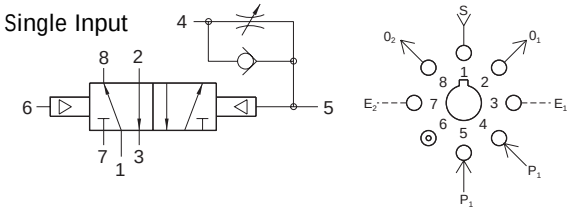
Features:

- Micro gap construction - snap action and no blow by
- Screwdriver slot needle adjustment deters tampering
- Balanced design allows speed control at exhausts

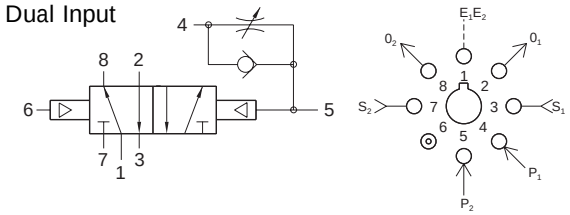
Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Single Input



Dual Input



Description:

R-454 is a 4-way, double pilot, fully ported 5 port valve with an adjustable flow control valve interconnected to one pilot. A pilot signal input in port 4 will be delayed in before actuating the valve. The R-454 can perform all 2-, 3- and 4-way functions.

R-461

4-Way Valve, 6-Ported

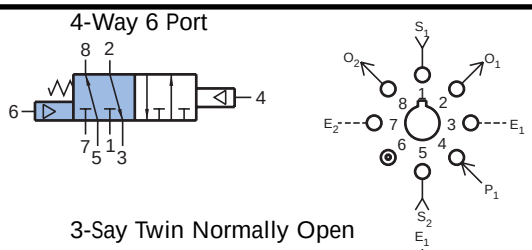
Features:

- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

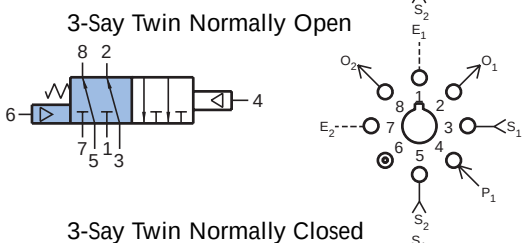
Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

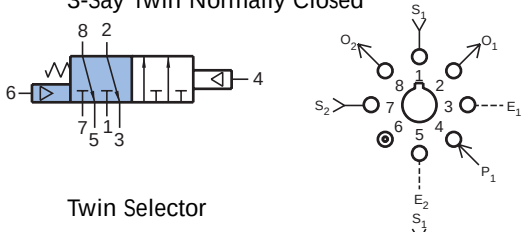
4-Way 6 Port



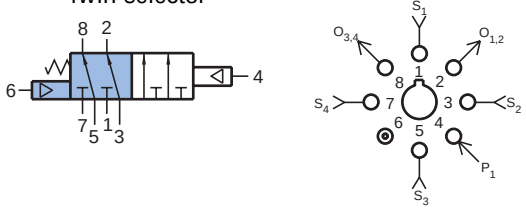
3-Say Twin Normally Open



3-Say Twin Normally Closed



Twin Selector



Description:

R-461 is a 6-ported, 4-way, spring return, fully ported, pilot operated valve. It is basically two fully ported 3-way valves with a common pilot. It can be used in a variety of applications including dual pressure operations with two independent inlets, outlets, and exhausts.

R-462

4-Way Valve, 6-Ported

Features:

- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

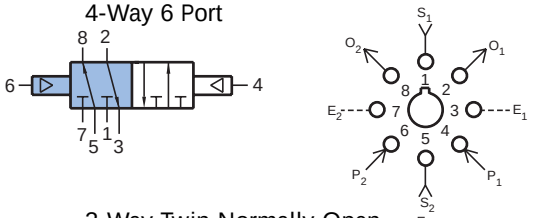
Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

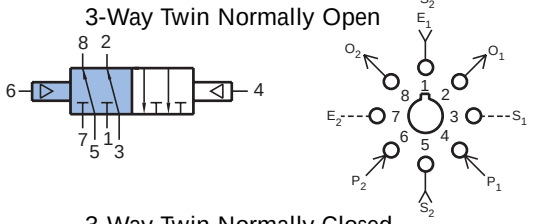
Description:

R-462 is a 6-ported, 4-way, double piloted, fully ported, two position valve. It is basically two fully ported 3-way valves with a common pilot. It can be used in a variety of applications including dual pressure operations with two independent inlets, outlets and exhausts.

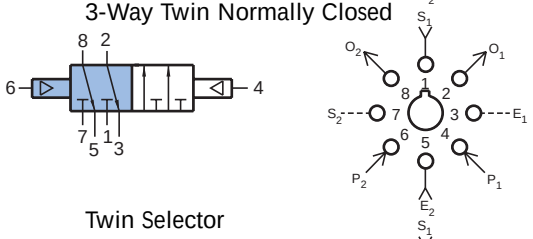
4-Way 6 Port



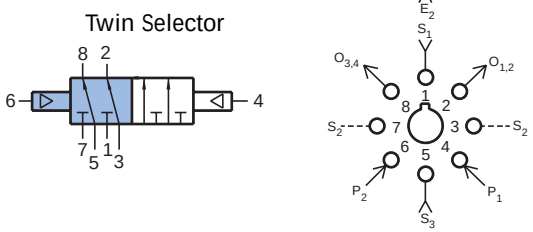
3-Way Twin Normally Open



3-Way Twin Normally Closed



Twin Selector



R-465

Low Pressure 4-Way Valve, 6-Ported

Features:

- Pilot actuates valve with low pressure signal
- Multiple porting speeds piping
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts

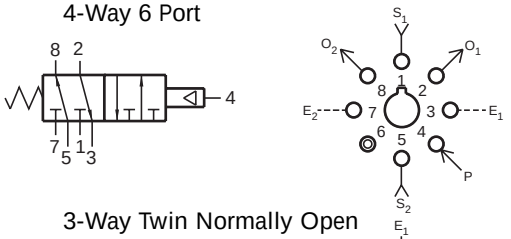
Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 15 psig; 1.0 bar
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

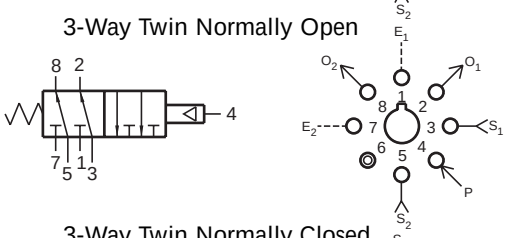
Description:

R-465 is a 6-ported, 4-way, spring-return, fully ported valve with a low pressure pilot. Pilot pressures as low as 15 psig will actuate the valve. It is basically two fully ported 3-way valves with a common low pressure pilot. It can be used in a variety of applications including dual pressure operation, with two independent inlets, outlets and exhausts. The R-465 may be used in place of an R-461 where a lower pilot actuation pressure is desired.

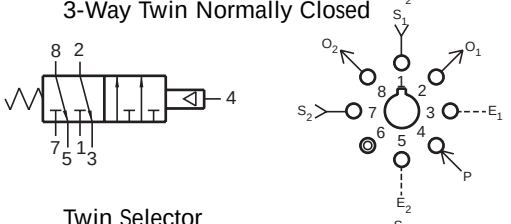
4-Way 6 Port



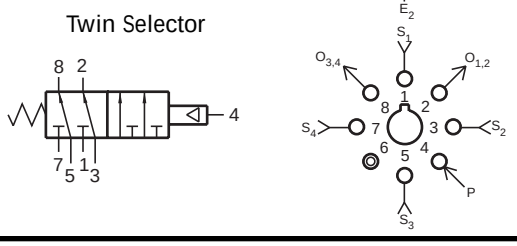
3-Way Twin Normally Open



3-Way Twin Normally Closed

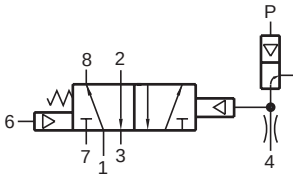


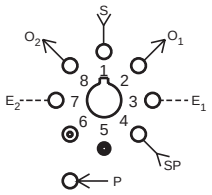
Twin Selector



R-471

4-Way Amplified Pilot Valve





Features:

- Micro gap construction - snap action and no blow by
- Clippard 3200 bleed type amplifier section assures long life and repeatability
- Standard octoport plug-in design

Performance:

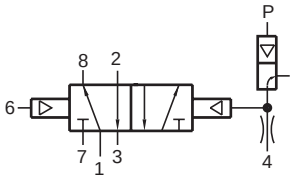
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure (psig) Minimum: 8" H_2O on 1" H_2O off
Pilot Supply Pressure: 45 to 100 psig; 3.1 to 6.9 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars
Bleed Flow (amplifier orifice): 0.010" (0.25)

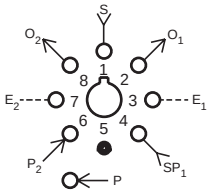
Description:

R-471 is a 4-way, fully ported, spring return, amplified pilot valve. The R-471 is a hybrid combination of the R-401 and model 3200 snap action valve.

R-472

4-Way Interface Valve





Features:

- Micro gap construction - snap action and no blow by
- Clippard 3200 bleed type amplifier section assures long life and repeatability
- Standard octoport plug-in design

Performance:

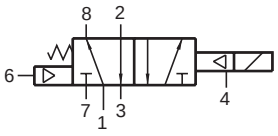
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot pressure (psig) Minimum: 8" H_2O on 1" H_2O off
Pilot Supply Pressure: 45 to 100 psig; 3.1 to 6.9 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars
Bleed Flow (amplifier orifice): 0.010" (0.25)

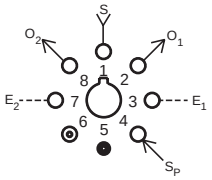
Description:

R-472 is a 4-way, fully ported, two position, amplified pilot valve. R-472 is a hybrid combination of the R-402 and model 3200 snap action valve.

R-481-❑

Electronic Valve





Features:

- Extremely low power consumption
- Micro gap construction - snap action and no blow by
- Standard octoport plug-in design
- Provides interface between electronics and pneumatics

Performance:

Working Range: 0 to 150 psig; 0 to 10.3 bars
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure (on port 4): 40 to 105 psig; 2.8 to 7.2 bars
Temperature: 32˚ to 180˚ F
Power Consumption: 0.65 watt at rated voltage

Voltage.....

R-481-6	6 VDC
R-481-12	12 VDC
R-481-24	24 VDC

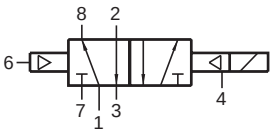
Duty: Continuous duty at 150% of rated voltage (50% overload) permissible

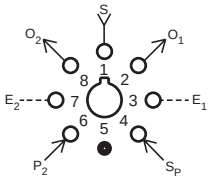
Description:

R-481 is a fully ported (5-ported), 4-way valve. It is essentially a hybrid valve consisting of the R-401 valve and the Clippard model ET-3 electronic/pneumatic valve. The ET-3 responds to low current, low voltage signals and pneumatically actuates the R-401 4-way valve to which it is attached. A 40 psig pilot pressure must be present at port 4.

R-482-❑

Electronic Valve





Features:

- Extremely low power consumption
- Micro gap construction - snap action and no blow by
- Standard octoport plug-in design
- Provides interface between electronics and pneumatics

Performance:

Working Range: 0 to 150 psig; 0 to 10.3 bars
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure: 20 to 105 psig; 1.4 to 7.2 bars
At Port 6 (min): 20
Temperature: 32˚ to 180˚ F
Power Consumption: 0.65 watt at rated voltage

Voltage:.....

R-482-6	6VDC
R-482-12	12VDC
R-482-24	24VDC

Duty: Continuous duty at 150% of rated voltage (50% overload) permissible

Description:

R-482 is a fully ported (5-ported), 4-way valve. It is essentially a hybrid valve consisting of the R-402 valve and the Clippard model ET-3 electronic/pneumatic valve. The ET-3 responds to low current, low voltage signals and pneumatically actuates the R-402 4-way valve to which it is attached. A 20 psig pilot pressure must be present at port 4.

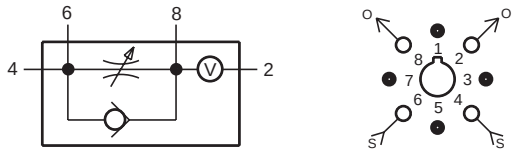
R-501
R-502

Flow Control Valve

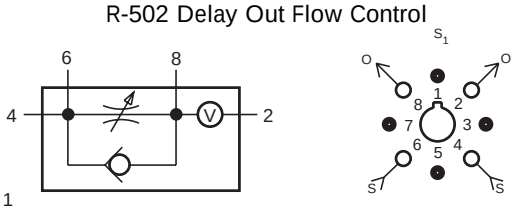
Features:
- Multiple porting speeds piping
- Knurled knob for fast, accurate adjustments - no tools needed
- Fine adjustment for pneumatic timing

Performance:
Flow: 0 to 1 scfm @ 100 psig; 0 to 28.3 l/min
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

R-501 Delay In Flow Control



R-502 Delay Out Flow Control



Description:
R-501 is an adjustable flow control designed to meter "IN" to an integral volume chamber to delay pressure build-up in one direction. Dual ports are provided to add extra volume or for multiple input-output connections.

R-502 is an adjustable flow control designed to meter "OUT" from an integral volume chamber to delay pressure decay in one direction.

R-602
R-603

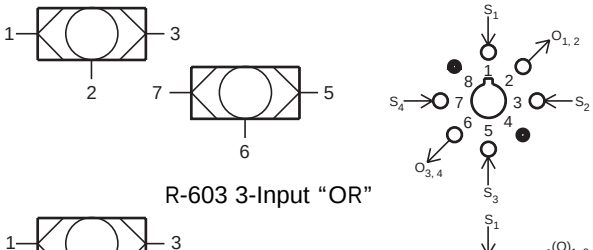
Dual Shuttle Valves

Features:
R-602
- Bubble tight operation
- Two independent units in one module
- Saves space

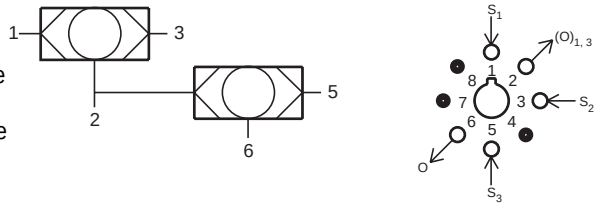
R-603
- Complete three input subcircuit in one module
- Auxiliary outputs save fittings and time

Performance:
Flow: 10 scfm @ 100 psig; 283 l/min @ 6.9 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 5 to 150 psig; 0.3 to 10.3 bars

R-602 Dual Shuttle Valve



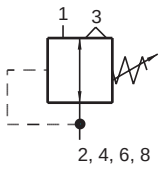
R-603 3-Input "OR"

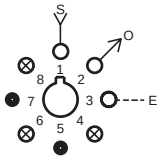


Description:
R-602 is a dual element combination consisting of two completely independent shuttle valves in a single body.
R-603 is a dual element combination consisting of two shuttle valves which are interconnected into a subcircuit. It provides a 3-input "or" with port 2 available as an auxiliary. If not used, port 2 should be plugged.

R-701

Pressure Regulator





Features:

- Multiple porting speeds piping
- Knurled knob for fast, accurate adjustments - no tools needed
- Self-relieving

Performance:

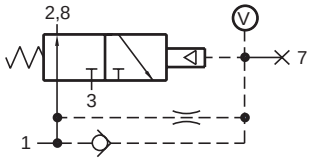
Flow: 12 scfm @ 100 psig; 340 l/min @ 6.9 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

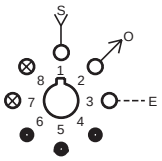
Description:

R-701 is a self-relieving, adjustable pressure regulator with multiple output ports. Pressure can be piped directly from ports 2, 4, 6 and 8. Eliminates need for additional fittings. Unused output ports should be plugged.

R-711

Pulse Valve



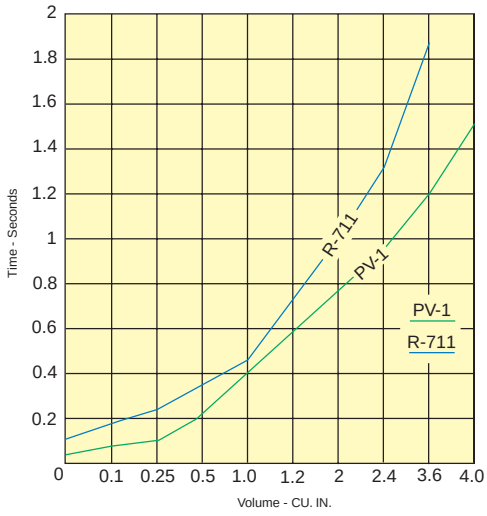


Features:

- Multiple porting speeds piping
- Micro Gap Construction - snap action and no blow by
- Complete function in one module

Performance:

Flow: 10 scfm @ 100 psig; 283 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 40 to 150 psig; 2.8 to 10.3 bars



Time in Seconds			Time in Seconds		
Volume	PV-1	R-711	Volume	PV-1	R-711
0	0.042	0.117	1.2	0.580	0.700
0.1	0.074	0.180	2.0	0.760	1.000
0.25	0.124	0.245	2.4	0.950	1.300
0.5	0.210	0.350	3.6	1.200	1.900
1.0	0.390	0.450	4.0	1.500	N.R.

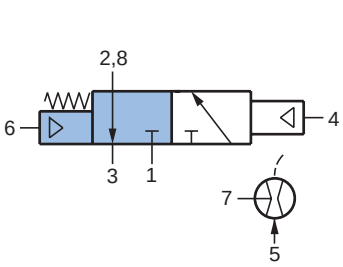
Description:

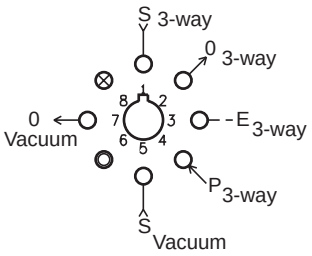
R-711 is a 3-way, normally-OPEN, self-piloted valve that closes shortly after being pressurized and remains closed until signal pressure is exhausted. It converts a continuous input signal into a single pulse of approximately 50 milliseconds. Port 7 is provided for additional volume for extending pulse duration and should be plugged if not used.

R-731

Modular Vacuum Generator

Turn pressure to vacuum generator on/off





Features:

- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by

Performance:

3-Way Valve

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Vacuum Generator

Vacuum (in. Hg @ 60 psig): 25
Vacuum Flow: 0.6 scfm @ 60 psig; 17 l/min @ 4.1 bars
Air Consumption: 1.7 scfm @ 60 psig; 48 l/min @ 4.1 bars
Temperature: 32˚ to 180˚ F

Description:

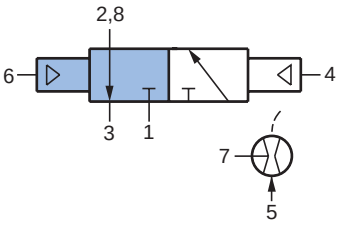
The R-731 is a combination venturi vacuum generator and an independent pilot actuated, spring return, fully ported 3-way valve. Applying pressure at port 5 creates a vacuum at port 7. The 3-way valve can be used to turn the vacuum generator on or off or it can be used to switch the vacuum on or off. 40 psig is required to pilot the 3-way valve.

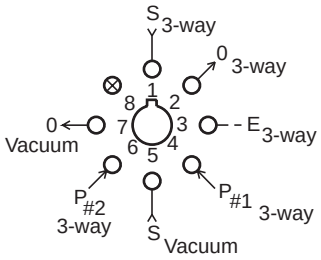
For mounting and muffler information see page 265.

R-732

Modular Vacuum Generator

Select Pressure or Vacuum Output





Features:

- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by

Performance:

3-Way Valve

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Vacuum Generator

Vacuum (in. Hg @ 60 psig): 25
Vacuum Flow: 0.6 scfm @ 60 psig; 17 l/min @ 4.1 bars
Air Consumption: 17 scfm @ 60 psig; 481 l/min @ 4.1 bars
Temperature: 32˚ to 180˚ F

Description:

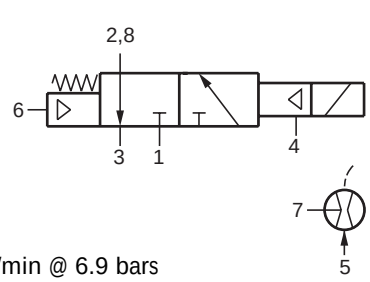
The R-732 is a combination venturi vacuum generator and an independent double pilot actuated, fully ported 3-way valve. Applying pressure at port 5 creates a vacuum at port 7. The 3-way valve can be used to turn the vacuum generator on or off or it can be used to switch the vacuum on or off. 20 psig is required to pilot the 3-way valve.

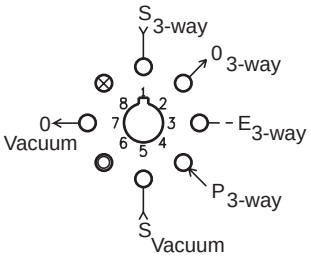
For mounting and muffler information see page 265.

R-781-❑

Modular Vacuum Generator

Turn Vacuum on/off





Features:

- Micro gap construction - snap action and no blow by

Performance:

3-Way Valve

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Vacuum Generator

Vacuum (in. Hg @ 60 psig): 25
Vacuum Flow (scfm @ 60 psig): 0.6
Air Consumption (scfm @ 60 psig): 1.7
Temperature: 32˚ to 180˚ F
Available Voltage: 6, 12, 24 VDC

Voltage.....	R-781-6	6 VDC
	R-781-12	12 VDC
	R-781-24	24 VDC

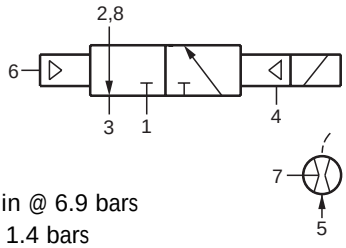
Power Consumption: 0.65 W @ rated voltage
Duty: Continuous duty to 150% of rated voltage

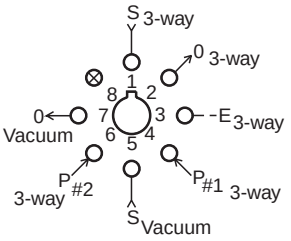
Description:

R-781 is a combination venturi vacuum generator and an independent pilot actuated electronically controlled, spring return, fully ported 3-way valve. Applying pressure at port 5 creates a vacuum at port 7. The 3-way valve cn be used to turn the vacuum generator on or off or it can be used to switch the vacuum on or off. To shift the 3-way valve 40 psig is required at port 4 along with the appropriate DC voltage being applied to the solenoid.

R-782-❑

Modular Vacuum Generator





Features:

- Micro gap construction - snap action and no blow by

Performance:

3-Way Valve

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Vacuum Generator

Vacuum (in. Hg@ 60 psig): 25
Vacuum Flow: 0.6 scfm @ 60 psig
Air Consumption: 1.7 scfm @ 60 psig
Temperature: 32˚ to 180˚ F
Available Voltage: 6, 12, 24 VDC

Voltage.....	R-782-6	6 VDC
	R-782-12	12 VDC
	R-782-24	24 VDC

Power Consumption: 0.65 W @ rated voltage
Duty: Continuous duty to 150% of rated voltage

Description:

The R-782 is a combination venturi vacuum generator and an independent pilot actuated electronically controlled, air pilot return, fully ported 3-way valve. Applying pressure at port 5 creates a vacuum at port 7. The 3-way valve can be used to turn the vacuum generator on or off or it can be used to switch the vacuum on or off. To shift the 3-way valve 20 psig is required at port 4 along with the appropriate DC voltage being applied to the solenoid. To return the valve a pilot pressure of 20 psig is required at port 6.

The Modular Vacuum Generator

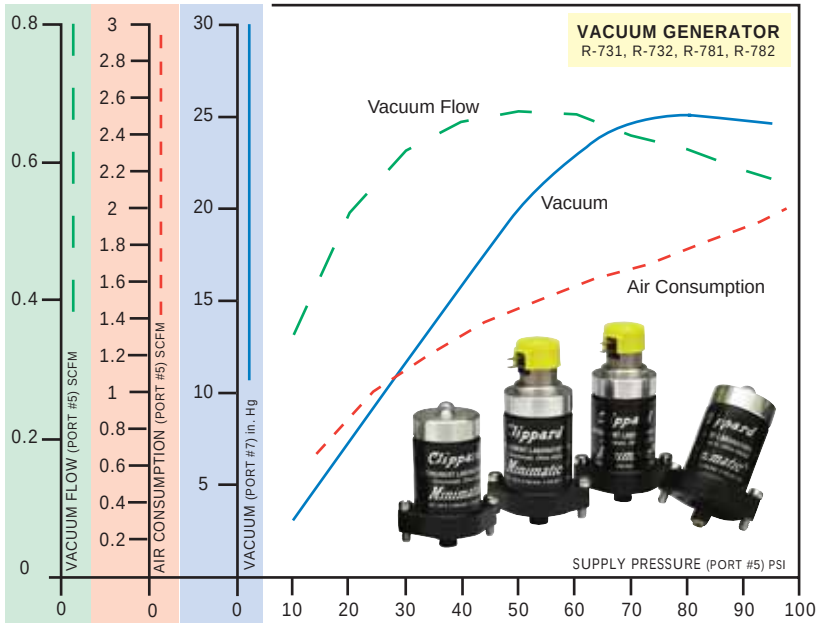
is a combination venturi vacuum generator and 3-way valve, contained in a modular body for simplicity and ease of installation. This combination allows the user to control the pressure to the vacuum generator, vacuum from the generator, and other circuit functions as required.

With 60 psig air to the modular generator, a vacuum of 25 in. Hg and 0.6 scfm is generated from the outlet. This vacuum may be used for pick, place, and hold applications, or liquid drawback circuits and is an energy efficient alternative to both electric and multi-stage air powered pumps.

The venturi vacuum generator provides a low cost vacuum source with no required maintenance. It contains a large flow path in a design that is self-cleaning, eliminating the need for a filtered air supply.

The 3-way valve is a proven Clippard modular valve design utilizing micro gap construction for a very short stroke of the balanced spool.

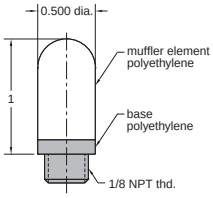
The Clippard modular vacuum generator uses a Delrin® body with a central valve cavity surrounded by (8) independent air passages that terminate at the base of the body in a circular, octoport pattern. The body mates with a manifold subplate (sold separately) that mounts the complete module and provides #10-32 tapped holes for standard hose fittings. A single octoport gasket (included with the module), held in place by two mounting screws, insures a positive seal.



Performance: Clippard modular vacuum generators provide high vacuum flow with high vacuum levels and are field adjustable. The adjustment screw at the base of the modular allows setting to the optimum performance needed to perform the task.

Muffler 3849-1

The 3849-1 muffler is constructed of durable polyethylene with a 1/8" NPT male thread which installs in the extension of either the R-101-10 or R-11-10 subplate.



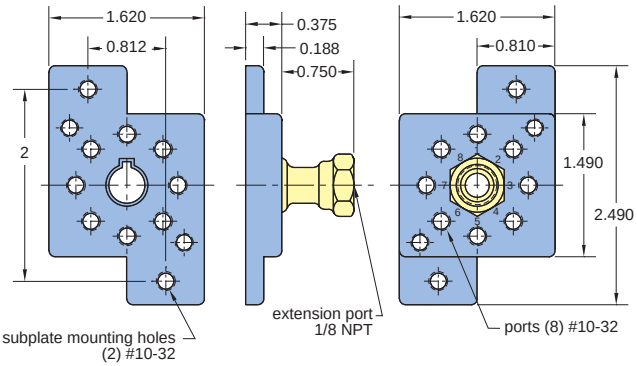
Gauge VG-30

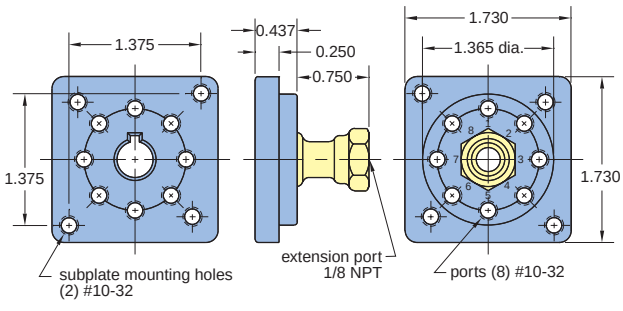
Inlet Vacuum: scale reading from 0 to -30 in. Hg. & 0 to -1 bar

Construction: black case, plastic face, dial shows two ranges; in. Hg in black, bars in red; built-in pressure snubber

Ports: connection located at rear is threaded both
O.D. - male thread 1/8" NPT
I.D. - tapped for #10-32 fitting

Mounting: Stud mount using 1/8" NPT center stud or panel mount using the zinc plated steel bracket supplied.





Subplate Dimensions

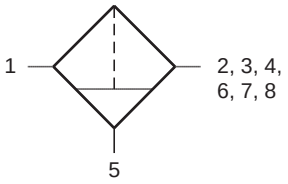
The **R-101-10** subplate mounts to mounting strips with #10-32 screws and lockwashers provided. Ports on module base are numbered in the same pattern as on the subplate, making piping easy to identify. Module stem is keyed to fit center hole in subplate; assures fast insertion and proper positioning.

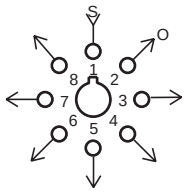
R-111-10 subplate mounts in 1 3/8" hole in electrical box, control panel. Mounting screws and gasket provided seal subplate to mounting plate.

R-801

Filter

Features:
- Multiple porting speeds piping
- Clean out port for easy maintenance
- Protects system - assures proper functioning
- Replaceable filter element (Part no. R-801-14)





Performance:
Flow: 12 scfm @ 100 psig; 339 l/min @ 6.9 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

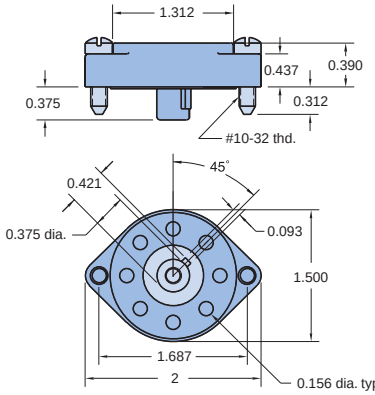
Description:
R-801 is a 25 micron filter with multiple outlets at ports 2, 3, 4, 6, 7 and 8 to minimize need for fittings. Port 5 is a drain and should be plugged; however, when the valve is mounted vertically port 5 can be tubed to a drain. Unused ports should be plugged.

R-811

Connector

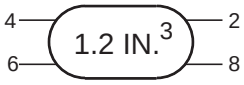
Connects to subplate R-101/R101-M5, R-111/R-111-M5 and manifolds

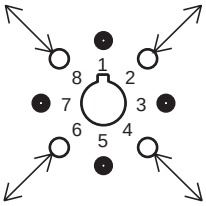
Description:
R-811 is an octoport connector that provides rapid and accurate connection of up to eight hoses. Truly a convenience connection; saves time; eliminates mistakes.



R-821

Volume Chamber



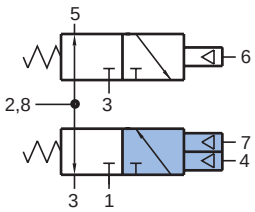


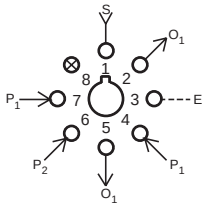
Description:
Volume chamber provided in standard, plug-in Clippard Minimatic® module body, using standardized octoport. May be used for providing time delay in pneumatic circuits. This model has 1.2 cubic inch volume chamber.

R-901

Sequence Valve

Features:
- Indicator shows valve position
- Micro gap construction - snap action and no blow by
- Balanced design allows speed control at exhausts



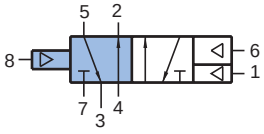


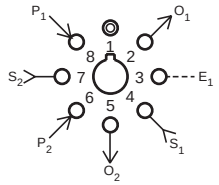
Performance:
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 40 psig; 2.8 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Description:
R-901 is a dual element combination consisting of a 3-way normally-closed, spring return air piloted valve and a 3-way normally-open, spring return, air piloted valve. One of the outputs of the N.C. valve is the input to the N.O. valve. A valve position indicator is provided for the N.C. valve. The R-901 is intended for use in sequential stepping control circuits.

R-932

Sequence Valve





Features:

- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by

Performance:

Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

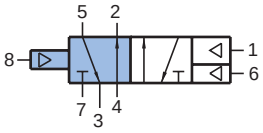
Uses:
The R-932 Sequence Control Module is a compact, efficient component for creating a sequential system for control of a multi-step operation. It has many uses throughout industry.

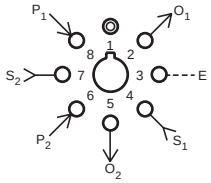
Description:

R-932 is a 4-way, 5 ported, double piloted, two position valve designed for sequence control application. Availability of two supply and two output ports enables the module to perform the sequential function. One output controls the operation assigned to that step in the cycle. The other output maintains the next step in a hold mode until ready for release. Likewise, the R-932 uses differential pilots. This enables the signal at port 6 to cancel out the force of the opposite pilot at port 8. Shifting of the valve is not possible until the signal at port 6 is removed. When a step is completed, a limit feedback signal actuates the next step. At the end of the sequence the last step resets all the sequence valves, resetting the operation for the next cycle. For each step in the cycle, a separated R-932 module must be used.

R-934

Sequence Valve





Features:

- Indicator shows valve in shaded position
- Micro gap construction - snap action and no blow by

Performance:

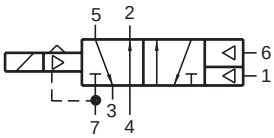
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

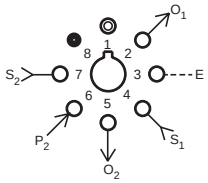
Description:

The R-934 sequence valve is the same as the R-932 sequence valve with the exception of ports 1 and 6. The R-934 port 6 pilot is the same size as the port 8 pilot. This provides a built in safety that if a limit valve is held actuated, the reset signal at port 6 will not reset the sequence, therefore stopping the system with the indicator being in the down position for trouble shooting. The R-934 sequence valve can only be used on the steps that do not have the input signal held normally open.

R-982-❑

Electronic Piloted Sequence Valve





Features:

- Extremely low power consumption
- Patented micro gap valving for quick action, no blow by
- Standard octoport plug-in design
- Provides interface between electronics and pneumatics

Performance:

Working Range: 20 -105 psig;
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Power Consumption: 0.65

Voltage.....	R-982-6	6 VDC
	R-982-12	12 VDC
	R-982-24	24 VDC

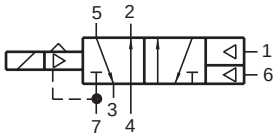
Duty: Continuous duty at 150% of rated voltage

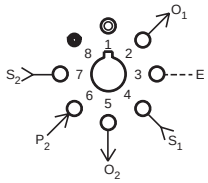
Description:

R-982 electronic sequence valve is essentially a hybrid valve consisting of the R-932 valve and the Clippard model ET-3 electronic/pneumatic valve. The ET-3 responds to low current, low voltage signals and pneumatically actuates the R-932 sequence valve to which it is attached.

R-984-❑

Electronic Piloted Sequence Valve





Features:

- Extremely low power consumption
- Micro gap construction - snap action and no blow by
- Standard octoport plug-in design
- Provides interface between electronics and pneumatics

Performance:

Working Range: 20-105 psig; 1.4-7.2 bars
Flow: 9 scfm @ 100 psig; 255 l/min @ 6.9 bars
Pilot Pressure Minimum: 20 psig; 1.4 bars
Temperature: 32˚ to 180˚ F
Power Consumption: 0.65

Voltage.....	R-984-6	6 VDC
	R-984-12	12 VDC
	R-984-24	24 VDC

Duty: Continuous duty at 150% of rated voltage

Description:

The R-984 electronic sequence valve is essentially a hybrid valve consisting of the R-934 valve and the Clippard model ET-3 electronic/pneumatic valve. The ET-3 responds to low current, low voltage signals and pneumatically actuates the R-934 sequence valve to which it is attached.

APPLICATION

ap·pli·ca·tion \ap-lə-'kâ-shən\ n 1 : the act of applying 2 : assiduous attention 3 : REQUEST; also : a form used in making a request 4 : something placed or spread on a surface 5 : capacity for use

The following circuits show a few of the many useful ways to use Clippard Minimatic® modular components in practical pneumatic circuitry. The drawings presented here are combinations of ANSI and pictorial symbols and Octoport piping diagrams. For more information and application assistance contact your nearest Clippard distributor.

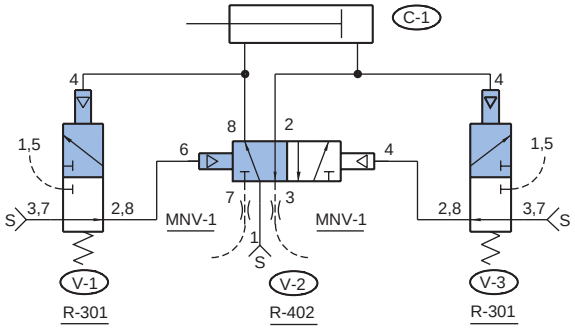
Initial Approach to Designing a Pneumatic Control

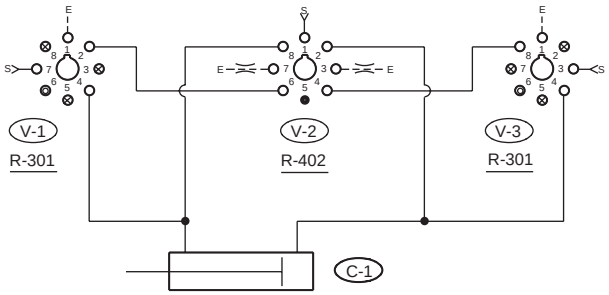
1. Have a clear verbal understanding of the sequence of operations desired.
2. Put down on paper:
   - **A.** Manual controls necessary or required and what their function is to be.
   - **B.** Other available input signals from:
     1. Limit valves
     2. Sensors
     3. Other controls or control media
   - **C.** All output devices (cylinders, piloted valves, electrical motors, etc.) that are to be controlled.
3. Determine all mechanical interlocks that exist.
4. Determine all the safety interlocks that must exist.
5. Work out the logic portion of the control utilizing the inputs and outputs at hand. Employ the functional circuit concept. Remember even the most complicated control circuits are composites of smaller functional circuits.
6. Check the final circuit for proper actuation during:
   - **A.** Start up
   - **B.** Shut down
   - **C.** Loss of air
   - **D.** Panic stops in the middle of cycle
   - **E.** Restarts in the middle of the cycle
   - **F.** Control during other events that are likely to occur

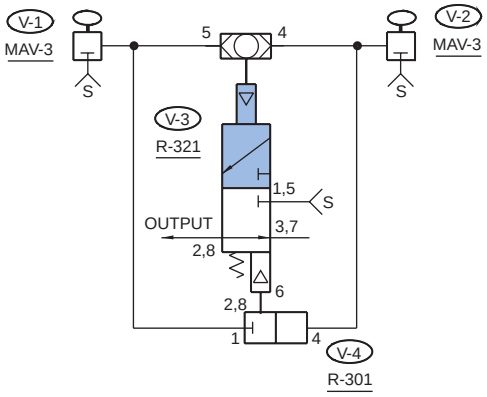
Cycling Without Limit Valves

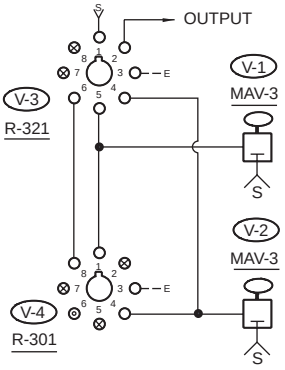
This circuit enables a double acting cylinder to reciprocate without the use of limit valves and to control its speed in each direction. As C-1 retracts, it creates a back-pressure behind the piston which is further increased by restricting the exhaust air at port 3, V-2, to slow the return of the cylinder rod. This back pressure holds the pilot closed on V-3. When C-1 has fully returned, the back pressure diminishes. When there is insufficient pressure to hold the pilot down on V-3, the spring shifts the valve, which sends pressure to the right hand pilot, port 4, of V-2. This causes V-2 to shift, which starts C-1 to extend and pilots V-3 exhausting the pressure on the right hand pilot of V-2.

As C-1 extends, an identical sequence occurs between V-1 and V-2, causing the 4-way valve to shift when C-1 has fully extended.









Exclusive "OR" Circuit

The exclusive "OR" circuit operates as follows: When V-1 is depressed, the signal goes to both V-3 and V-4. The signal at V-4 is blocked. The signal at V-3 actuates the valve and provides an output signal. If V-2 is actuated independently, the same sequence occurs.

If both V-1 and V-2 are actuated, the output at V-4 energizes the bottom pilot which, together with the spring, overrides the opposite pilot of V-3, nullifying both signals, V-3 thus remains off.

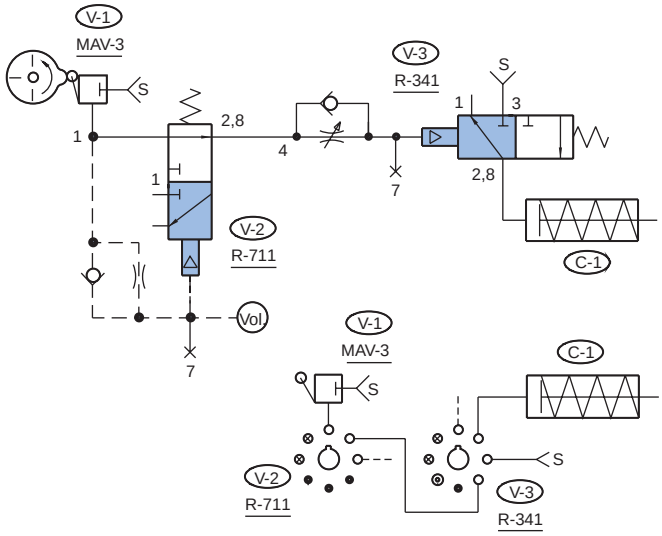
Circuit Function

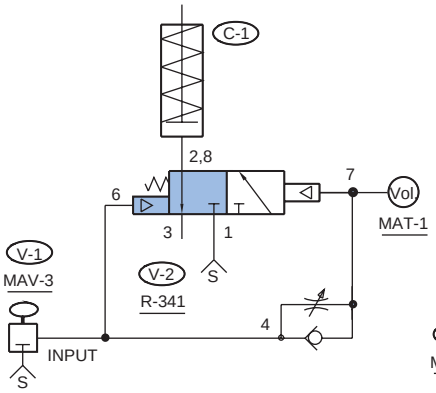
INPUTS	V-1	off	off	on	on
	V-2	off	on	off	on
OUTPUT	V-3	off	on	on	off

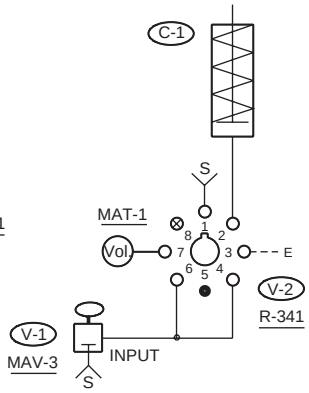
Motion Sensing Circuit

V-1 is actuated by rotary or linear cam. Pressure from V-1 goes to a pulse valve (V-2) where it is converted to a uniform pulse each time V-1 is actuated. Each pulse goes through the check valve of V-3 and holds the pilot down on the valve. C-1 is retracted. The pressure holding the pilot of V-3 is constantly trying to exhaust through the adjustable needle valve V-3 and out to atmosphere through the exhaust port of the pulse valve V-2.

When motion stops (or falls below a pre-determined C.P.M.) the pressure on the pilot of V-3 exhausts and the spring shifts the valve, which causes C-1 to extend. The R-341 is shown as normally closed. It can also be used as normally open, a selector, or a diverter.





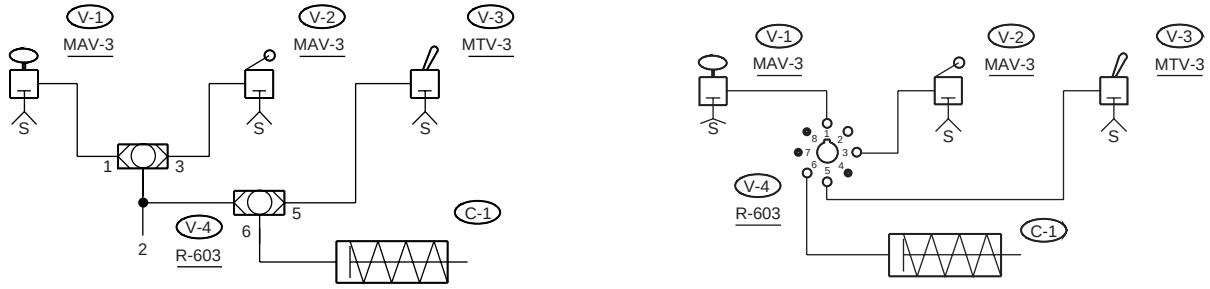


Signal Release Pulse Circuit

This circuit gives a single pulse output of adjustable duration when its input signal is released (exhausted). Upon actuation of the input 3-way valve, V-1, air is supplied to both valve pilots simultaneously so the valve, V-2, remains in the closed position. Upon release of the input signal the pilot on the spring side of the valve is exhausted immediately. This allows the "trapped" air in the volume tank to actuate the valve causing the output to come on. The valve remains actuated until the trapped air bleeds off through the adjustable needle valve.

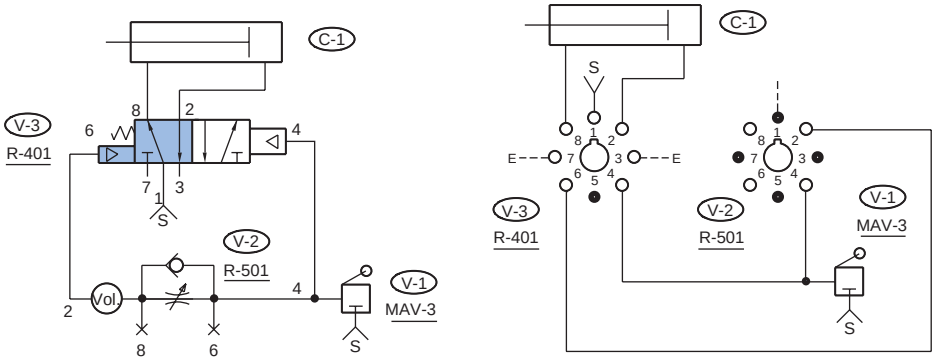
Use of Shuttle Valves

The R-603 is a three input shuttle valve sometimes called a three input “OR”. Actuation of V-1 or V-2 or V-3 will give an output at port 6, of V-4, and extend C-1.



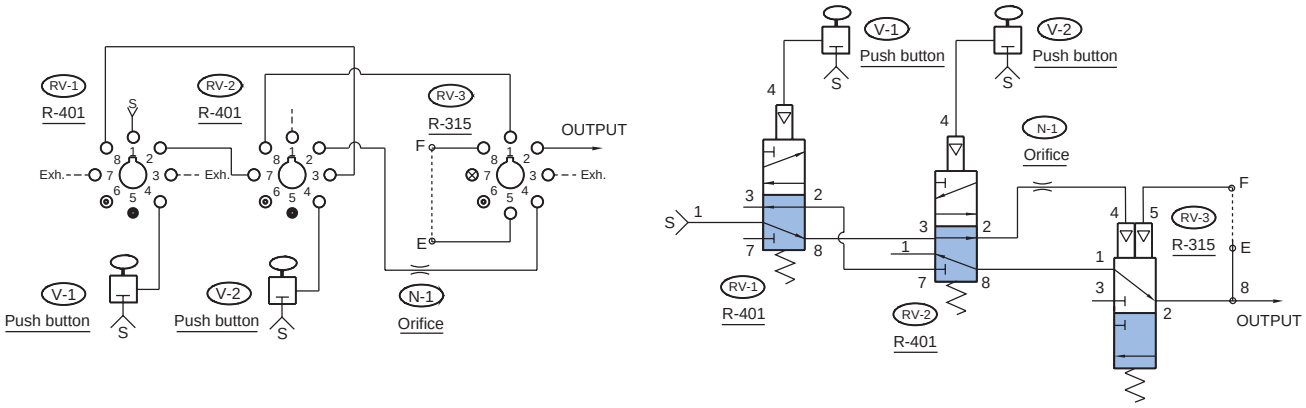
Adjustable 4-Way Pulse

When V-1 is actuated a signal pilots port 4, V-3, extending C-1. The signal is also going to the auxiliary pilot but is delayed by the flow control V-2. When pressure builds up on the pilot, port 6, V-3, it, together with the spring, overcomes the opposite pilot and shifts the valve. C-1 then retracts. V-3 will not cycle again until V-1 is released.



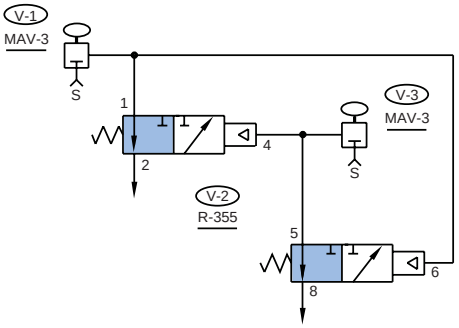
Two Hand No Tie Down

This circuit provides an output signal to power or pilot a piece of machinery when two push buttons are manually pressed simultaneously. Neither button can be tied down. The output will cease if either button is released. See CM-023 in the Pneumatic Circuit Board section for more details.



Pilot Signal Priority Lockout

Application of a pilot signal from either push button will pneumatically lock out the output of the other push button to eliminate the possibility of a dual output.



932 Sequence Control Circuit

A typical sequence circuit is shown below. It includes five R-932 sequence modules, two R-402 4-way modular valves, (power valves) and two cylinders, each equipped with two limit valves. This typical circuit is designed for Cylinder A to extend and return, then Cylinder B to extend and return.

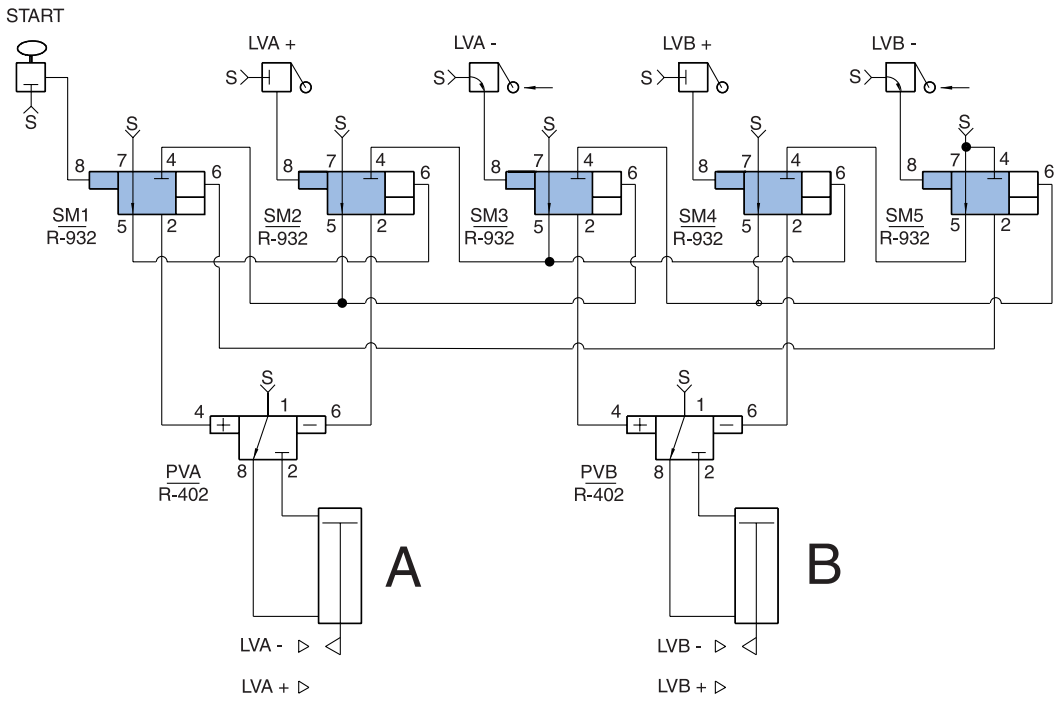
In inactive mode, LVA- and LVB- are held passing, supplying pressure to port 8 of both SM3 and SM5. The valves will not actuate because there is air already to port 6 which connects to a larger pilot.

When the start button is actuated, pilot pressure is applied to SM1, shifting the valve which pressurizes port 4 of power valve “A” (PVA) pressure at its port 4. This shifts PVA, extending the cylinder. When SM1 shifts, it also removes pressure from SM2 at port 6 preparing it for step 2.

Extension of cylinder A actuated LVA+. This shifts SM2, providing pressure to port 6 of PVA which shifts and powers the retraction of Cylinder A. The shifting of SM2 also removes supply from port 4 of step 1 allowing the cylinder retraction, and removes supply from port 6 of SM3, preparing it for step 3.

As a result, when LVA- attains passing position this time, there is no pressure on the larger pilot of SM3. It shifts, providing supply to port 4 of PVB. The power module shifts, with resultant flow extending Cylinder B. The sequence cycle continues through retraction and stops unless the start button remains actuated. Continuous cycling can be accomplished by using a toggle or selector valve for the start button.

Retraction of cylinder B actuates LVB- causing a chain reaction for resetting the sequence valves for the next cycle.



NOTE: The SEQUENCE IS FOLLOWED by the indicator in the valve. The last indicator down is the last step actuated. This is helpful when trouble shooting a circuit.

The circuit described above is an example of a typical sequence circuit. Most applications will require additional functions. Therefore, the number of sequence valves will increase, but the procedure for connections and applications of the R-932 remain.

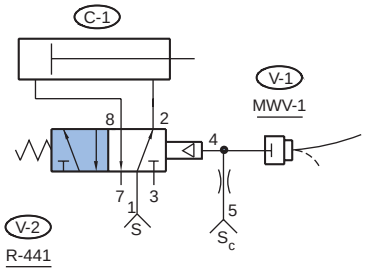
It is important to remember the input signals can come from other types of input devices such as:
proximity sensors, gap sensors, back pressure sensors, pressure sensors, limit valves, electronic Hall Effect sensing, liquid level sensing, part sensing, etc.

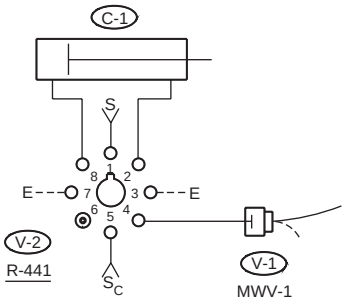
By using modular components found in this catalog, additional functions such as “Delay IN (R-333) “AND” (R-301) can be added to the sequence circuits.

The sequence circuit can also be used with larger air power valves or air piloted hydraulic valves.

Bleed Piloted 4-Way Valve

Pressure in line 4 pilots valve V2 so that the cylinder is retracted on the valve V-2 and C-1 retracted. When V-1 is actuated, the pressure is exhausted from 4 faster than the restricted supply at 5 can make it up. The spring then shifts the valve and C-1 extends.

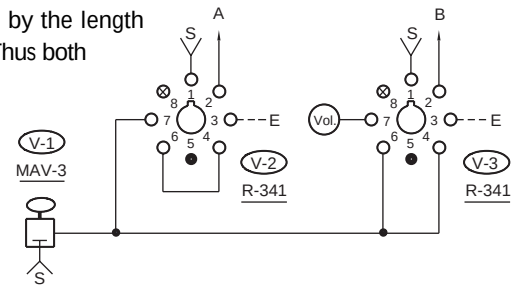


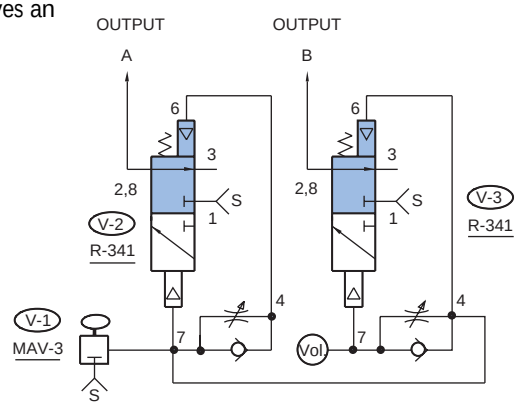


Unique OPEN-CLOSE Pulse Circuit

This pulse circuit can be adapted to a wide variety of uses. It consists of an MAV-3 3-way valve and two standard R-341 modular valves, and is being used to open and close a collet vice on a milling fixture. Circuit operation: when V-1 is depressed, V-2 gives an output pulse at "A". The length of the pulse is predetermined by the needle valve adjustment on V-2.

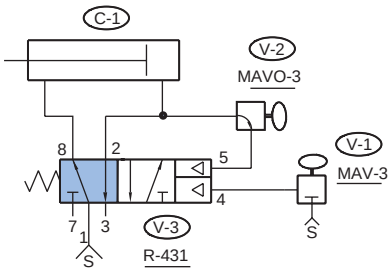
When V-1 is released, a pulse occurs at "B". This pulse is also determined by the length of the needle valve on V-3. Thus both pulses are independently adjustable. Note that the R-341 allows supply to be segregated from the pilot signal which allows for different pressures or gases to be controlled.

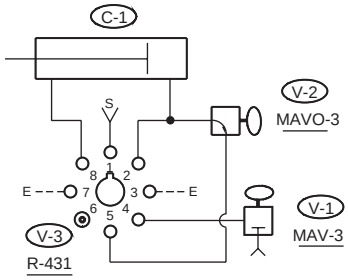




"Latch" Circuit

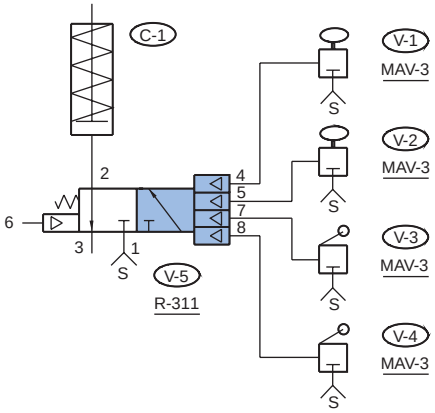
Actuation of V-1 pilots V-3 and extends C-1. The same pressure that extends C-1 also passes through V-2 and holds the twin pilot down locking C-1 in the out position even though V-1 is released. When V-2 is actuated, breaking the line between port 2 & 5, V-3, and exhausting the pilot, the spring will shift the valve V-3, causing C-1 to retract.

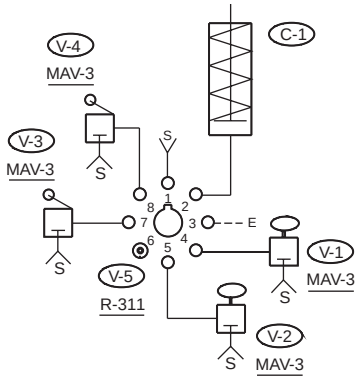




"Active Or" Circuit

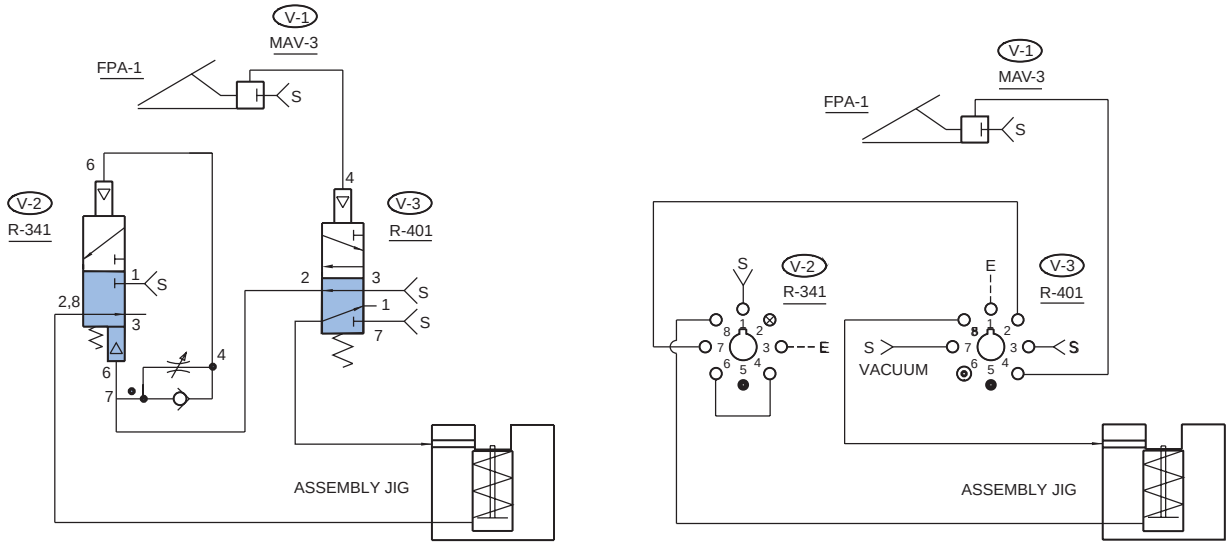
Actuation of any one or all of the input signal valves, V-1, V-2, V-3, V-4, will cause an active output (an output from a separate air supply source).





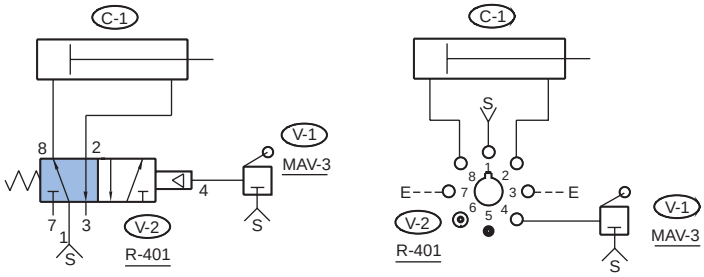
Assembly Jig Control

This circuit is used with an assembly jig that draws a vacuum on a part inserted into it. When the operator has finished working on the part, a spring return knock out cylinder pushes the part out of the jig. Depressing V-1 pilots V-3 which draws a vacuum on the jig. Releasing V-1 allows the spring in V-3 to shift the valve, connecting air to V-2, an adjustable pulse valve, which gives a controlled pulse of air to the knock out cylinder in the jig.



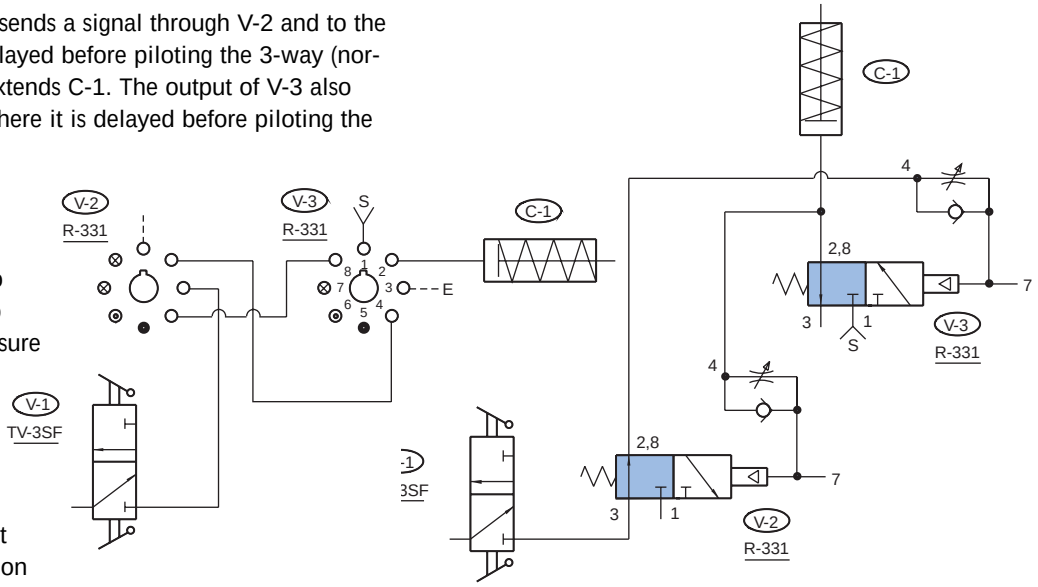
Piloted 4-Way Valve

When V-1 is actuated, pressure forces the pilot to overcome the spring and shift the valve V-2, causing C-1 to retract. Releasing V-1 exhausts the pressure on the pilot and allows the spring to shift the valve extending C-1.



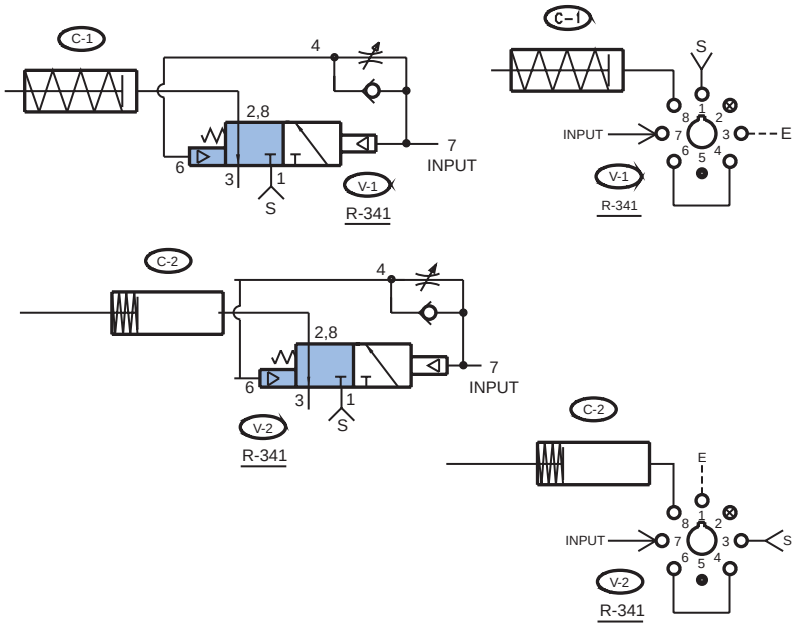
Automatic Cycler

Turning on the toggle switch V-1 sends a signal through V-2 and to the flow control of V-3 where it is delayed before piloting the 3-way (normally closed) valve V-3, which extends C-1. The output of V-3 also goes to the flow control of V-2 where it is delayed before piloting the 3-way (normally open) valve V-2. When V-2 shifts, it shuts off the original signal from V-1 and exhausts the pressure that has piloted V-3, allowing the spring to shift the valve. This causes C-1 to retract and also exhausts the pressure that has piloted V-2, allowing the spring to shift the valve. This allows the signal from V-1 to start the cycle over again. The adjustment on V-3 controls the "IN" duration, and the adjustment on V-2 controls the "OUT" duration at C-1.



Adjustable Pulse Valve

The R-341 delay valve may be used to provide an adjustable pulse (N.C.) or adjustable off (N.O.) signal. When an input occurs at port 7 it immediately pilots the valve and gives a signal at ports 2 & 8, which extends C-1. The same input is also being delayed through the flow control (between 7 & 4) until enough pressure builds up to actuate the auxiliary pilot which, together with the spring, overcomes the opposite pilot and shifts the valve shutting off the output. C-1 then retracts. The input must be removed before the valve will reset and cycle again. Since the input is separate from the supply and output valving, separate pressures or fluids can be used in the valve. Pulse times can range from 25 MS to 5 seconds. The second drawing shows the R-341 piped normally open. The same sequence applies as above, only the valve is going off for a period instead of on.

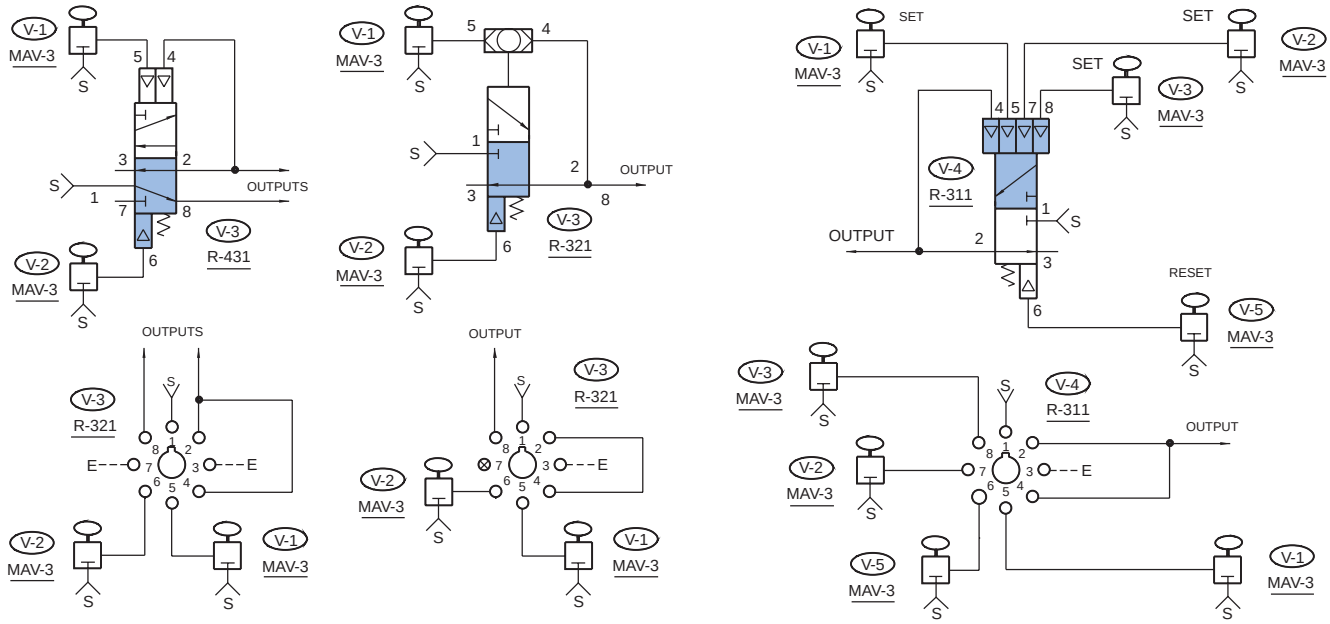


Set-Reset Circuits

Shown are three examples of set-reset circuits, also called “latch” circuits. There are many ways to set or reset a valve or group valves. These examples make use of the unique auxiliary pilots available on many of the modular valves.

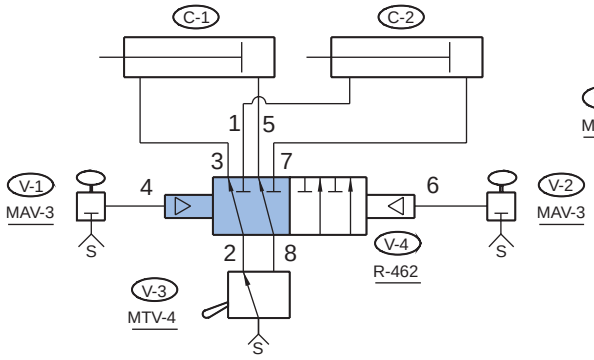
A set occurs when a valve is actuated and part of the output is used to hold the valve in the actuated position, even though the original pilot signal may be gone.

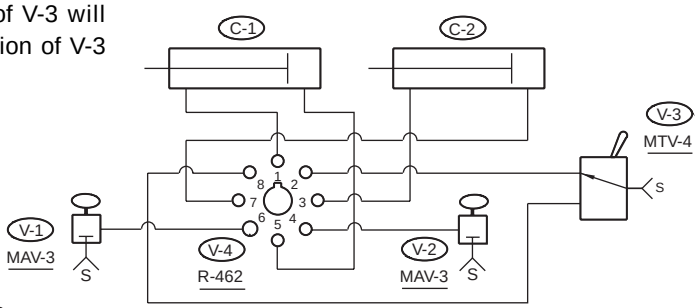
Generally a circuit is reset by interrupting the “set” pilot line or air supply to the valve when an opposite pilot is present to shift the valve. The modular auxiliary pilot, in combination with the valve spring, will overcome any or all opposite pilot(s) to reset the circuit.



Six Ported 4-Way

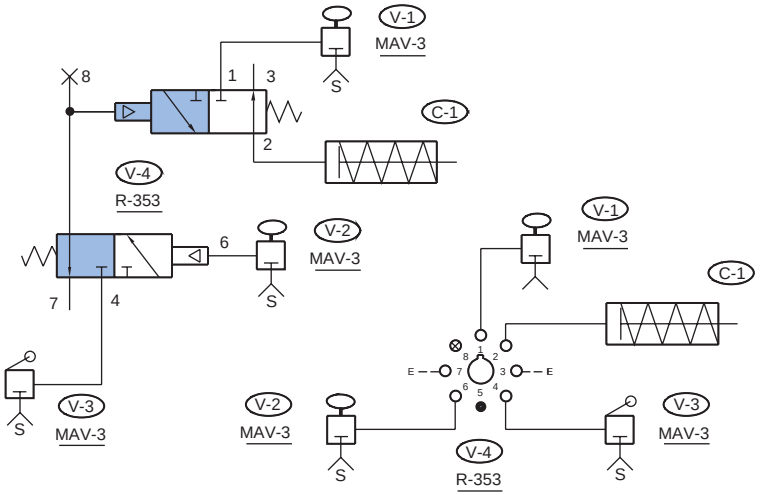
This circuit controls two double acting cylinders with a single 4-way (6 ported) valve. When V-1 has been depressed, actuation of V-3 will extend or retract C-1. When V-2 has been depressed, actuation of V-3 will extend or retract C-2.





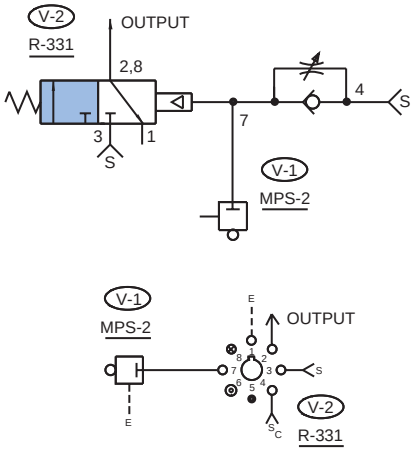
Three Input "And"

The R-353 valve will give an output at C-1 only when V-1, V-2, and V-3 are depressed. Remove any of the three inputs and the output ceases.



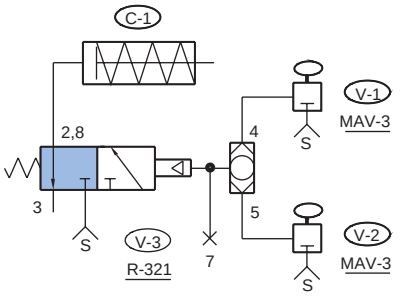
Exhaust Piloted 3-Way Valve

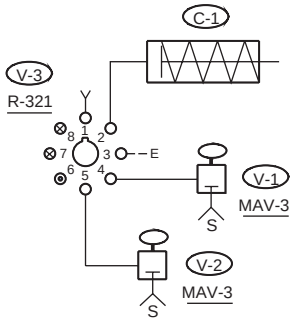
Pressure in line 7 holds pilot down on the valve V-2 which has no output signal. When V-1 is actuated, pressure is exhausted from line 7 faster than the adjusted supply can make it up. The spring then shifts the valve giving an output at ports 2 & 8. (Port 8 is shown as blocked.)



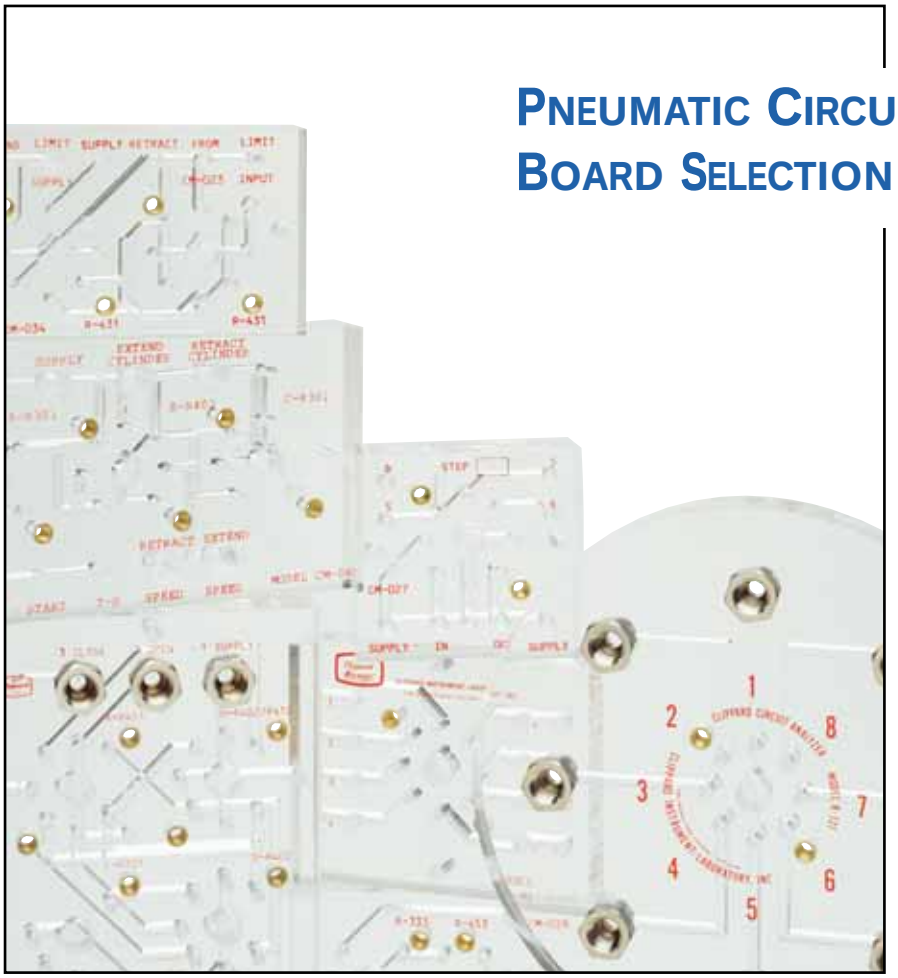
Piloting From Two Inputs

Actuating of either V-1 or V-2 will pilot V-3 causing C-1 to extend. The R-321 is shown normally closed. It may also be used normally open, as a selector, or as a diverter. An R-315 provides the same function by having two separate pilots.





PNEUMATIC CIRCUIT BOARD SELECTION GUIDE



CM-01	Circuit Analyzer
CM-02	Adapter Manifold, 1/8” NPT
CM-03	Binary Circuit
CM-04	Adapter Manifold, #10-32 Single
CM-05	Adapter Manifold, #10-32 Dual Ports
CM-06	Auto Cycling
CM-07	R-471 / R-481 Manifold, Single
CM-08	Binary Clamp Control
CM-010	Double Electronically Piloted Valve
CM-011	Oscillator, Single Output
CM-016	4 Valve Manifold, 4-Way
CM-018	Double Electronically Piloted Valve, Closed Center
CM-019	R-471 / R-481 Manifold, 4 Valves
CM-020	R-471 / R-481 Manifold, 6 Valves
CM-023	Two Hand No Tie Down
CM-024	Sequencing Circuit, 5 step
CM-025	Sequencing Circuit, 2 step
CM-026	Sequencing Circuit, 3 step
CM-027	Sequencing Circuit, 1 step
CM-028	Oscillator, Double Acting
CM-030	Auto Cycling, Input / Output Flexibility
CM-031	Auto Cycling, Enhanced Flexibility
CM-033	Auto Cycling Control for External Power Valve
CM-034	Latching Circuit For Two Hand No Tie Down
CM-035	Sequencing Circuit, 4 step
CM-036	Adapter Manifold, 2 Valves
CM-037	Adapter Manifold, 3 Valves
CM-038	Two Hand No Tie Down with Latch Circuit

Features & Benefits

Circuit Boards and Clippard Modular Components

Clippard clear acrylic pneumatic circuit boards are designed to provide a compact and highly efficient pneumatic control system, with the use of Clippard modular components and other Clippard products.

Many valving systems require a considerable amount of piping, tubing and fittings to create the necessary circuitry. The piping originates beneath the valve and often needs extra space and clearance to complete. The acrylic circuit board provides a place to mount the components and easy methods to hook-up the circuit, generally on the top side of the circuit board. For a single circuit the original assembly method can be the best direction to take... but where a number of identical circuits are prepared, the acrylic circuit board technology offers a series of distinct advantages.

In addition to the Clippard modular line of products, the circuit boards also accommodate Clippard EV/ET manifold mount valves, and many other valves, gauges, mufflers, as well as hose barb fittings. The combination of Clippard pneumatic circuit boards, valves, fittings, and accessory items can provide a complete pneumatic circuit system with the knowledge of dependability and success.

FEATURES

- Custom-made pneumatic circuit boards hold all components
- Simplifies assembly
- Reduces piping
- Helps assure accuracy of connections
- Component I.D. silk-screened on subplate surface
- Inputs and outputs clearly marked
- Threaded brass inserts hold components securely
- Change valves quickly without affecting connections
- Use any number of components
- Makes sophisticated circuitry manageable
- Circuit boards also accept Clippard electronic interface valves
- Saves assembly costs

Pneumatic Circuit Boards

This section provides detailed information about a series of circuit boards for popular uses. These range from the very simple single-module circuit, to more complex multi-step sequencing circuits using pneumatic control to automate machine or process cycles. The descriptive materials include photographs, dimensional drawings, circuit diagrams where applicable, lists of products required, and descriptions of the function of the circuit.

The circuit boards included in our price list are maintained in stock with our distributors and/or in our finished goods inventory at our factory. They are available for fast delivery.

For assistance in selecting a circuit board to suit your use, ask your local Clippard distributor to discuss your application.

Custom Pneumatic Circuit Boards

You can have a faster, more dependable way to produce multiples of the same pneumatic circuit . . . a system that enables you to speed circuit assembly while assuring accurate hookups.

Using Clippard modular components, valves and controls mounted on a custom circuit board, you get the same circuit time after time.

Assembly time and effort are reduced. A large number of parts, fittings, and lengths of tubing are no longer needed. The resulting circuit is compact, neat in appearance, and can be easily mounted for permanent installation. No more “haywire” plumbing. Piping errors are eliminated, and an efficient, dependable, and attractive control results.

Each custom circuit board is individually produced with the same high quality standards associated with the Clippard name. By utilizing Clippard’s unique manufacturing process, these clear acrylic units provide sealed internal passageways between valves without the need for gaskets, clamps, or piping.

Sizes and dimensions will vary according to your application. By adapting your control requirements to the versatility of Clippard Modular Valves, your Clippard distributor can provide you with detailed application information.

To complete your pneumatic control, just plug in the modular valves and tighten the two captivated screws on each valve. Connect inputs and outputs to the circuit board and the circuit is ready to run. It’s the fastest most efficient circuit system available.

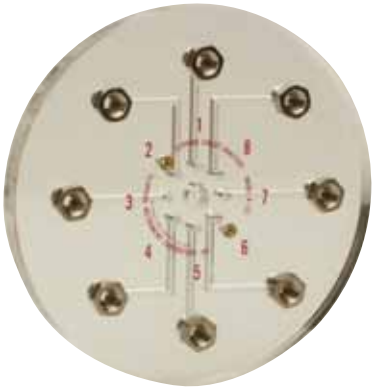
CM-01

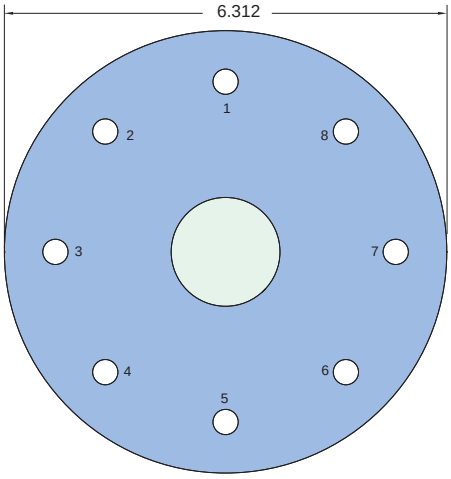
Circuit Board for Octoport Circuit Analyzer

Size: 6 5/16" dia. by 3/4" thick. Holds one module - plus 8 Clippard pressure gauges

Use: For testing and to analyze Clippard modular valve circuits. To order circuit board only: specify part #CM-01

To order analyzer complete with pressure gauges, hose and connections, specify Part # R-121.



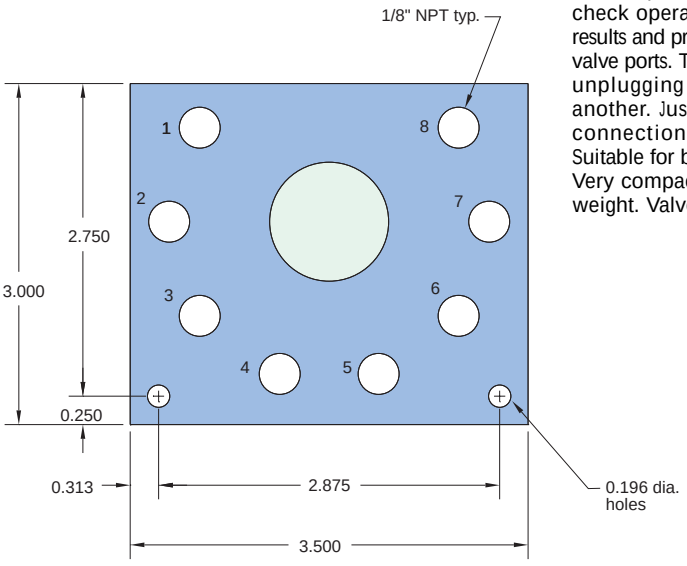


CM-02

Adapter Circuit Board Single Module

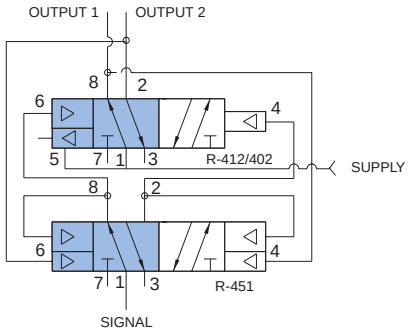
Size: 3 1/2" x 3" x 9/16" - 1 module

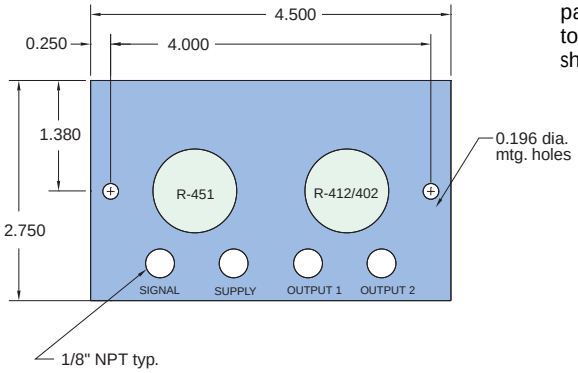
Use: Provides mounting for a single modular valve, with 8 individual 1/8" NPT ports furnished on the top side of the circuit board. Beneficial in experimenting or bread boarding a new circuit or one operation of a circuit. You can quickly connect input and outputs on a temporary basis, and check operation of the module through results and pressures resulting at the various valve ports. Test several modules by merely unplugging one, and replacing it with another. Just two screws to loosen. All connections are automatically made. Suitable for building a one module circuit. Very compact size. Easy to mount. Light weight. Valves are easily replaced.



CM-03

Binary Redirect Circuit Boards





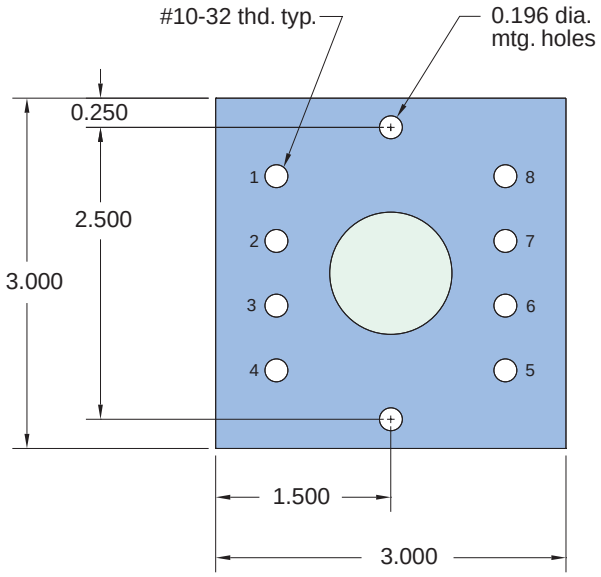
Size: 4 1/2” x 2 3/4” x 13/16” thick - 2 modules

Use: Combines the R-451 and R-402 or R-412 in a binary redirect or flip-flop circuit. Provides 1/8” NPT ports for all connections.

Operation: Use of the R-412 provides a “memory” function to return the output to a known position (port 8) whenever air is first turned on to the circuit. This output pilots port 4 of the R-451 positioning it for the next signal. A signal input passes through the R-451, ports 1 to 2, and pilots port 4 of the R-412. The output of the R-412 shifts to port 2 and also pilots port 6 of the R-451. When the next signal input is received, it passes through the R-451, ports 1 to 8, and pilots port 6 of the R-412, shifting its output back to port 8.

CM-04

Universal #10-32 Circuit Board



Size: 3” x 3” x 5/8” thick - 1 module

Use: Provides mounting for a single modular valve, and provides #10-32 ports on the top side of subplate. Similar to CM-02, but ports are #10-32 threaded instead of 1/8” NPT.

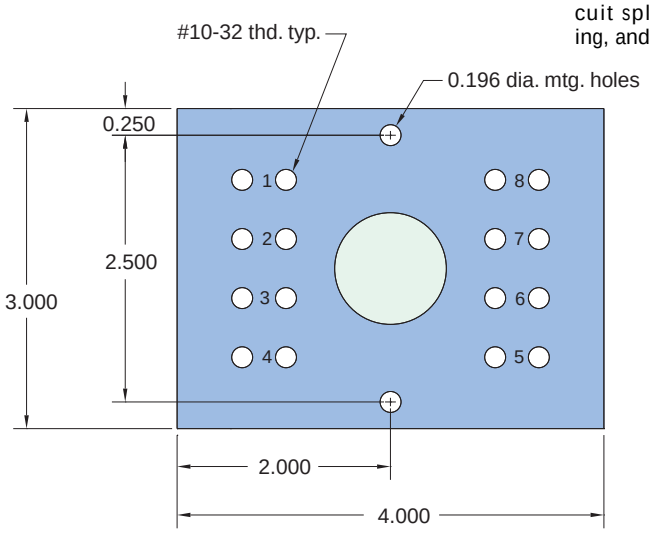
Handy for circuit development and single module circuits

CM-05

Adapter Circuit Board with Dual #10-32 Ports

Size: 4" x 3" x 5/8" thick - 1 module

Use: Provides mounting for a single modular valve, and provides TWO #10-32 ports for each valve outlet. Ports are on the top side of the circuit board. Dual port arrangement is helpful where outputs need to be directed to more than one circuit location. Also helps work on alternate circuit uses, cir cuit splits, experimental design, test ing, and circuit design verification.



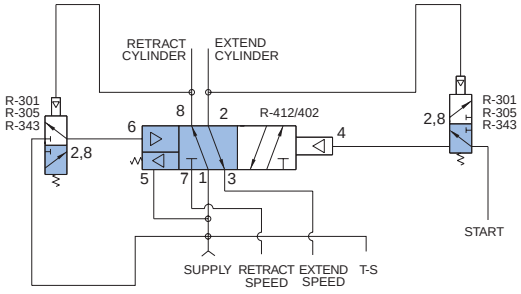
CM-06

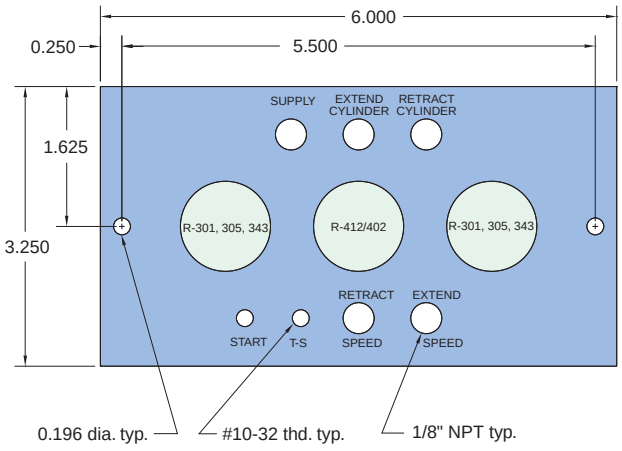
Automatic Cycler Without Limits

Size: 6" x 3 1/4" x 13/16" thick - 3 modules

Use: Circuit board has 1/8" NPT cylinder outlet ports, #10-32 ports for "on-off" toggle valve, for the cycling of a double acting cylinder without the use of limit valves.

Operation: This circuit enables a double acting cylinder to reciprocate without the use of limit valves and to control its speed in each direction. As C-1 retracts, it creates a back pressure behind the piston. It is further increased by restricting the exhaust air at port 3 of V-2 to slow the return of the cylinder rod. This back-pressure holds the pilot down on V-3. When C-1 has fully returned, the back pressure diminishes. When there is insufficient pressure to hold the pilot down on V-3, the spring shifts the valve, which sends pressure to the right hand pilot (port 4) of V-2. This causes V-2 to shift, which starts C-1 to extend and pilots V-3 exhausting the pressure on the right hand pilot of V-2. As C-1 extends, an identical sequence occurs between V-1 and V-2 causing the 4-way valve to shift when C-1 has fully extended.



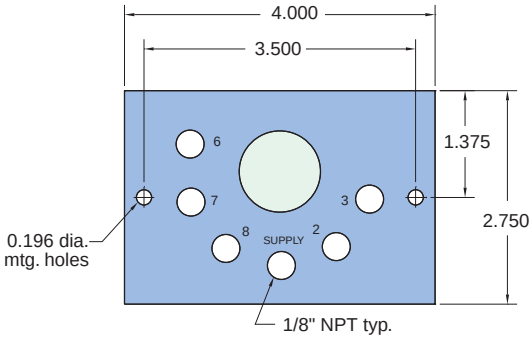


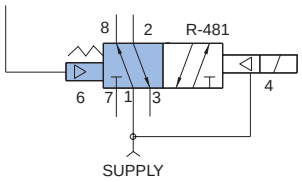
CM-07

Circuit Board for R-471/472/481/482 with 1/8" NPT Ports

Size: 4" x 2 3/4" x 5/8" thick - 1 module

Use: Port #4, the supply to the pilot valve, is connected to the main supply port #1. Provides 1/8" NPT ports in the top of the circuit board.



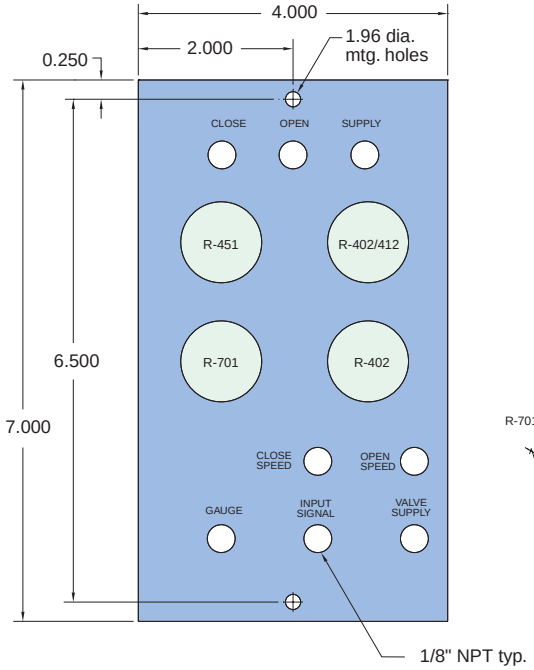


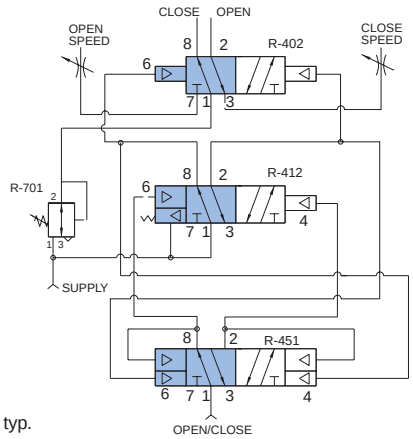
CM-08

Circuit Board for Binary Clamp Control with Adjustable Clamp Pressure

Size: 4" x 7" x 1" thick - 4 modules plus controls and fittings
Just PUSH for "On"
Just PUSH for "Off"

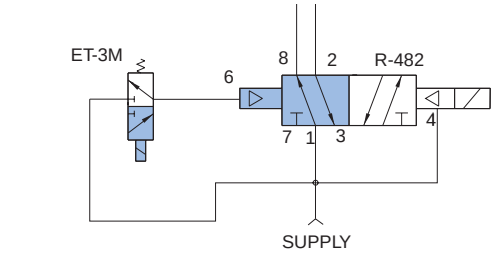
The Clippard CM-08 circuit board and the control valves that mount on it form a single push button pneumatic "OPEN/CLOSE". Binary clamp control with pressure and speed controls. The components are sold separately and can be assembled in a few minutes by the user. The use of this CM-08 package offers special user benefits: saves time; reduces cost and labor of piping; automates product tasks with easy to apply unit; binary push button operation; speed control built-in; pressure regulation included; may be operated remotely; equipped with "Auto-Reset" feature.

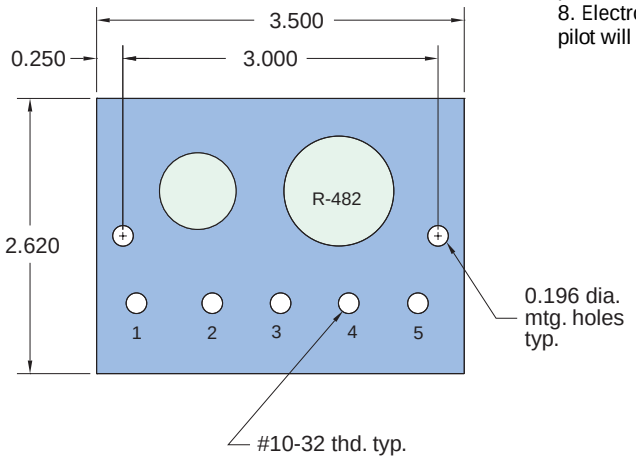




CM-010

Circuit Board for Double Electronic Piloted Valve





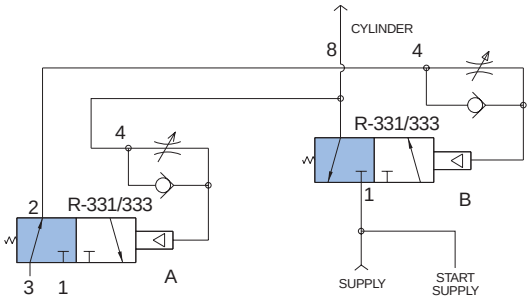
Size: 3 1/2" x 2 5/8" x 5/8" thick - 1 module and one ET-3M-xx valve

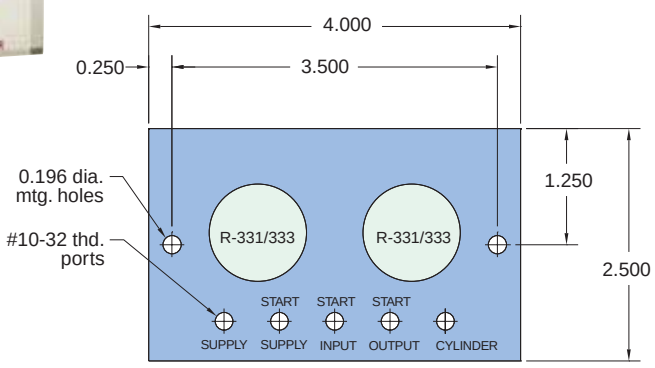
Use: Provides mounting for one R-482 solenoid operated valve and one ET-3M valve for a double electronic piloted control circuit.

Operation: Supply air passes to ports 1 and 4 of the R-482 and to the supply port of the ET-3M valve. Starting position of R-482 may vary. Electronic signal to ET-3M will pilot port 6 of R-482 giving output at port 8. Electronic signal to the R-482 ET pilot will shift valve to output at port 2.

CM-011

Circuit Board for Autocycling of Single Acting Cylinder





Size: 4" x 2 1/2" x 9/16" thick - 2 modules

Use: Provides mounting for two R-331 or R-333 modular valves. Circuit provides for automatic cycling of the two modular valves. The needle valve adjustments in the modular valves allow for controlled on/off delay signal providing variable cycle speed.

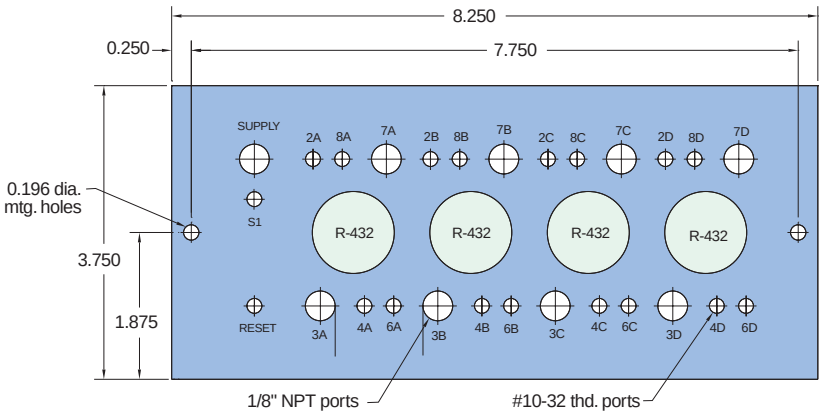
Operation: With no start input, cylinder will remain in retracted position. Turning on the start input signal causes valve "A " to output from port 2 to port 4 of "B". This signal is restricted in and pilots "B" to shift. When "B" has shifted, air flows through "B" from port 1 to 2 extending the cylinder. This output also goes to port 4 of valve "A" and is restricted in. When sufficient pressure builds to shift "A", the output of "A" drops out exhausting the port 4 pilot of "B" which allows the cylinder to retract to the starting position. Adjustment of the respective flow controls allows individual frequency controls of the extend and retract strokes.

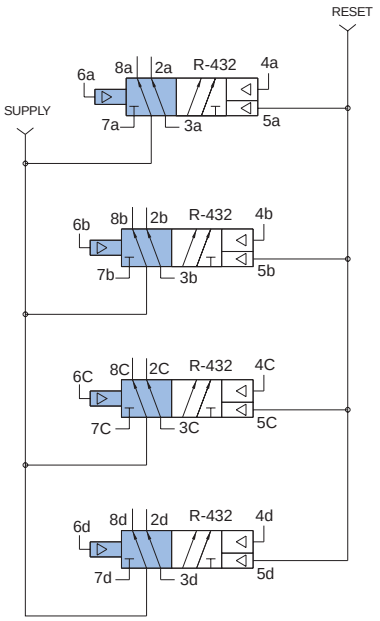
CM-016

4-Way Valve Circuit Board (Common Supply)

Size: 3 3/4" x 8 3/16" x 9/16" thick - 4 modules

Use: Provides mounting for four 4-way modular valves operating from a common supply. May utilize Clippard R-401, R-402, R-405, R-410, R-412, R-421, R-431, R-432, R-441, or R-442 valves. Supply and exhaust are tapped 1/8" NPT. Outputs are #10-32 tapped ports in the circuit board.





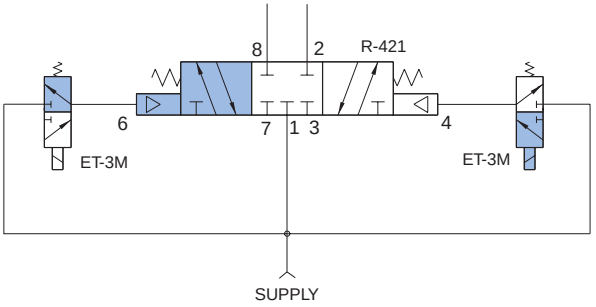
CM-018

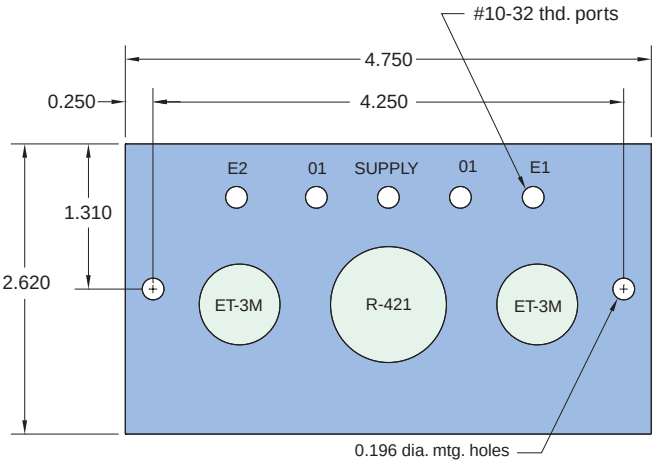
Circuit Board for Double Electronically Piloted 4-Way Valves

Size: 2 5/8" x 4 3/4" x 9/16" thick - 1 module; 2 ET-3M-xx valves

Use: Provides mounting platform for one R-402, R-412 or R-421 pneumatically operated valve and two ET-3M valves for a double electronic piloted control circuit

Operation: Supply air passes to port 1 of the R-421 and to supply ports of the ET-3M valves. R-421 is a three position, center closed valve, spring centered. Electronic signal to either ET-3M will pilot R-421 giving corresponding output as long as that ET valve remains energized. Energizing both ET valves simultaneously will cancel out opposing pilots. Springs will return R-421 to center-closed position.



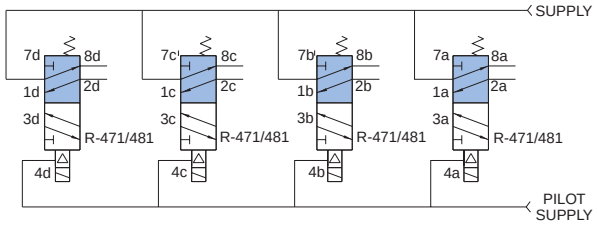


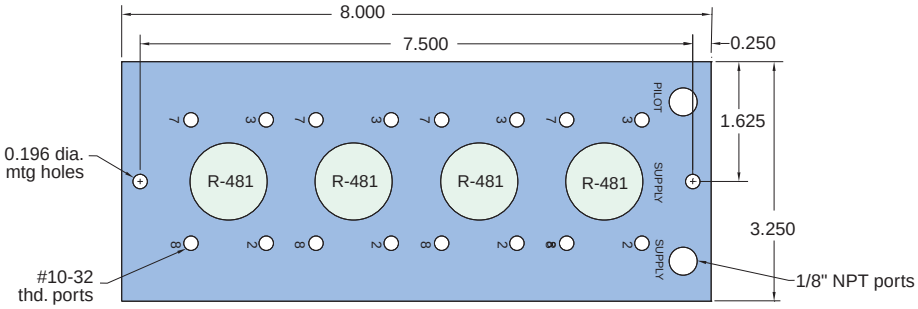
CM-019

Circuit Board for 4 R-471/481 4-Way Valves

Size: 3 1/4" x 8" x 9/16" thick - 4 modules

Use: Convenient and compact mounting for a group of four electronically piloted or low pressure piloted 4-way modular valves. Separate main valve supply and pilot supply #10-32 ports provided for access to exhaust for speed control.



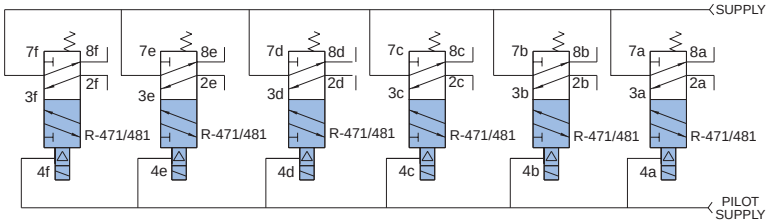


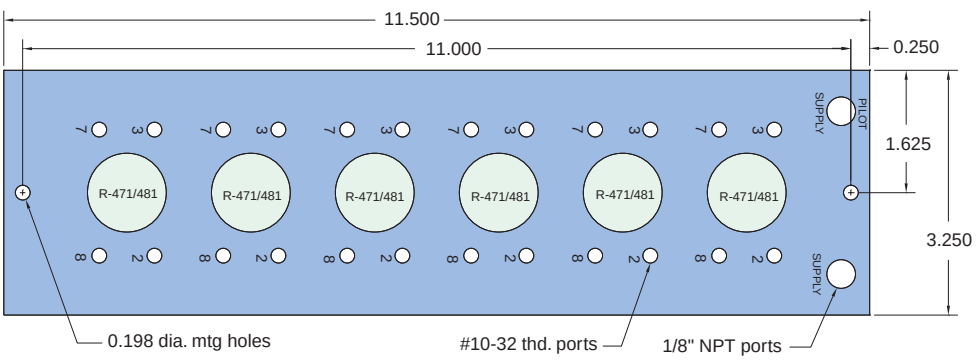
CM-020

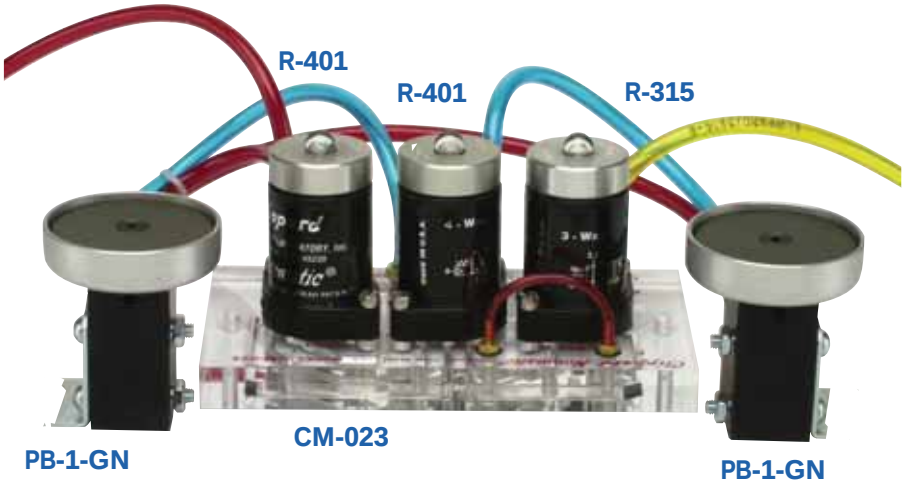
Circuit Board for 6 R-471/481 4-Way Valves

Size: 3 1/4" x 11 1/2" x 9/16" thick - 6 modules

Use: Convenient and compact mounting for a group of six electronically piloted or low pressure piloted 4-way modular valves. Separate main valve supply and pilot supply for solenoids. #10-32 ports provided for access to exhaust for speed control.







The Clippard Minimatic® CM-023 pneumatic circuit board is a self-contained modular circuit board with all interconnections needed to provide a two hand no tie down (THNTD) pneumatic circuit. The board is designed to be used with three Clippard modular plug-in control valves and to eliminate the piping time and materials normally associated with circuitry. Use of the CM-023 will assure simple and rapid installation of your two hand no tie down circuit.

The CM-023 THNTD control circuit requires two separate input signals that must be received approximately at the same instant before an output signal is obtained. Both input signals must be spontaneous and neither can be "tied down" or made constant. The main function of this control is to require a machine operator to use both hands to actuate the machinery, helping to insure that the operators hands are not in a position to be injured by the machine as it is actuated. When used with the Clippard PB guarded palm button valves which have been properly positioned and mounted, the CM-023 THNTD control will provide an output to actuate machinery only when the operator pushes each button simultaneously.

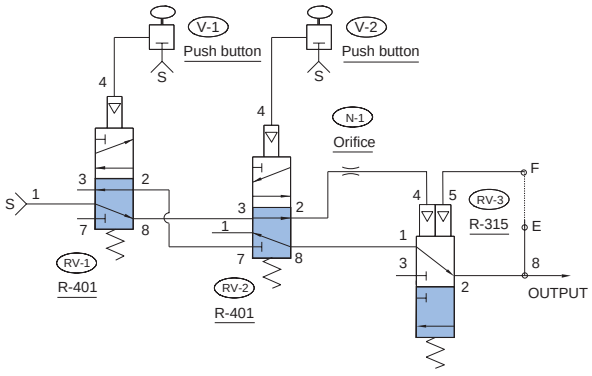
The growing emphasis on employee safety and governmental regulations requiring safe work conditions have encouraged the widespread use of two hand no tie down controls to protect workers from injury. Numerous types of THNTD controls have been introduced to the market. Many are cumbersome, bulky and expensive. The Clippard Minimatic THNTD package offers ease of installation and maintenance in a compact size.

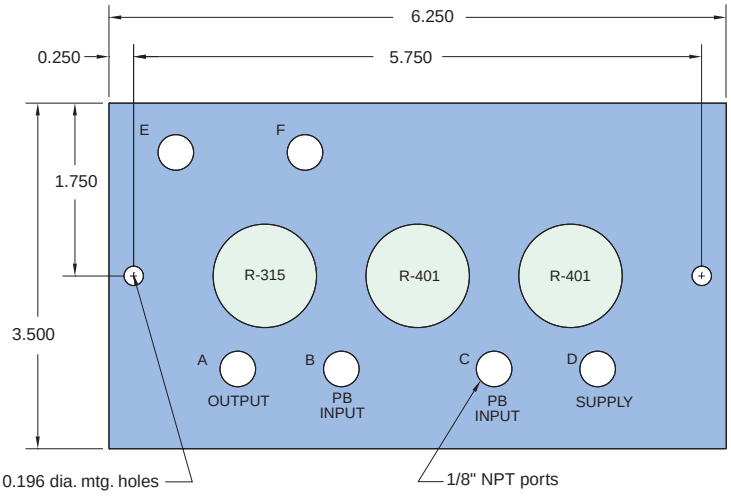
CM-023

Circuit Board for 2 R-401 and 1 R-315 Valve
Warning: See instructions shipped with product

Size: 6 1/4" x 3 1/2" x 9/16" thick - 3 modules

Use: The Clippard Minimatic® CM-023 circuit board is a self-contained modular circuit board with all interconnections needed to provide a Two Hand No Tie Down (THNTD) pneumatic circuit. Use of the CM-023 will assure simple and rapid installation of your two hand no tie down circuit.

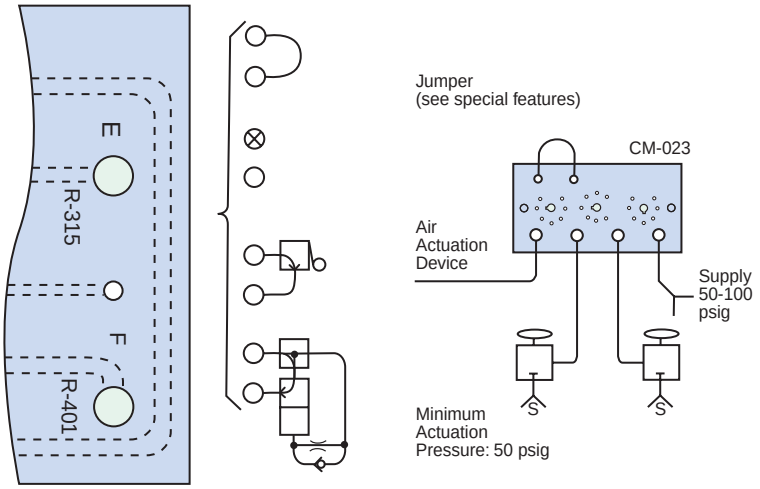




Circuit Operation

RV-3 is held open by supply air that passes through RV-1, RV-2 and N-1. When RV-1 is actuated alone, the pilot air for RV-3 flows back through the N-1 and RV-2 to atmosphere at RV-1 and RV-3 is closed by the spring. When RV-2 is actuated alone, the same sequence occurs except the pilot air from RV-3 exhausts to atmosphere via RV-2. Restriction N-1, which determines the time span during which both signals must be received in order to obtain and output.

When RV-1 and RV-2, are actuated together, supply air is directed through RV-1, RV-2 and RV-3 to the output providing a momentary output signal that is determined by N-1. If a maintained signal is required, a jumper between "E" + "F" maintains an output as long as the operator is depressing both palm buttons.



The indicator on RV-3 (R-315) must be down for an output to be obtained. If either RV-1 or RV-2 is actuated separately, their respective indicator will go up, but after approximately one second the indicator on RV-3 (R-315) will go down showing that the valve has shifted and an output cannot be obtained. Circuit performance and sequence should be periodically observed to verify proper function. Absolutely no alterations or modifications should be made to this circuit or its component parts.

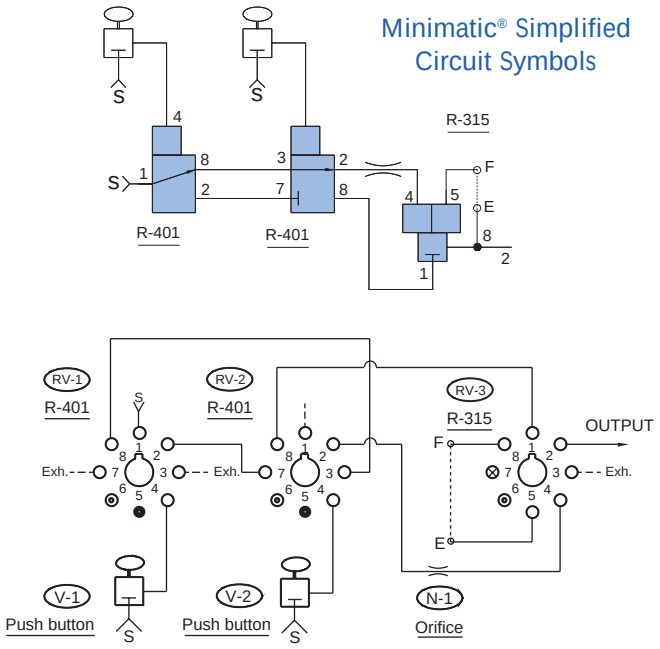
Maintained Output occurs as long as both pushbuttons are held. Release of either button terminates the output. (Connect E to F)

Momentary Output gives a single output pulse that is about 50 MS in duration. (Plug E with 11755 screw plug; F is open)

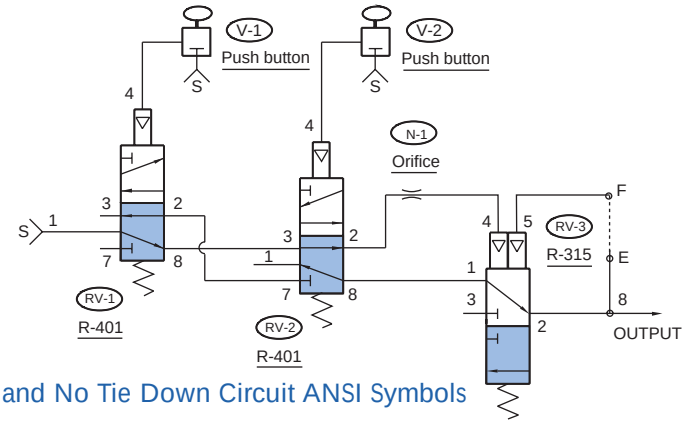
Cancelable Output terminates the output after a normally open 3-way limit valve has been tripped, even if both pushbuttons are still held. (Interpose normally open 3-way valve)

Cancel Output after Time Delay is a variation of cancelable output (above) where pneumatic delay valve such as Clippard Model R-331 is set to cancel the output after a designated time interval has elapsed. (Interpose normally open 3-way delay valve)

It is the *user's responsibility* to determine which special feature can be safely used in his particular application.



Octoport Piping Diagram



Two Hand No Tie Down Circuit ANSI Symbols

Shown below is a schematic for connecting additional R-932/R-934 stages. This technique would apply if connecting two CM-024's, CM-024 to a CM-026 or a CM-027, or a CM-024 to a CM-025 as shown.

1 The supply into the "supply port" on the CM-024 through the jumper line provides supply to the additional R-932 stage board.

Port 5 on the first CM-024 board and the last additional R-932 must be plugged, (Use Clippard P/N 11755 screw plug.) **2**

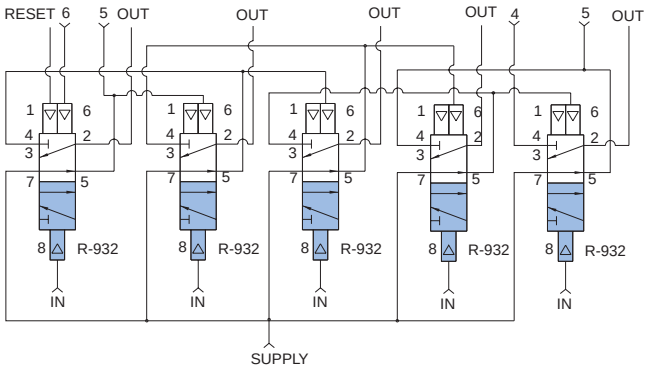
3 The output of valve 7 on the CM-025 is connected to port 6 on the CM-024. The purpose is to establish the next cycle. The connection from the end port on the additional stage R-932 / R-934 connects to port 4 of that board. This provides pressure to port 6 of CM-024 when valve 7 of CM-025 shifts to the "output" mode. (This is the last step in the cycle.)

Modification of circuits can be easily accomplished by changing the input/output sequence. Refer to the Clippard Designer's Guide for additional information on this unusual and easy to use pneumatic control circuit sequence system. **4**

CM-024

5-Valve Sequence Circuit Board used as the Starter Subplate

Size: 9 1/2" x 2 1/2" x 13/16" thick - 5 modules

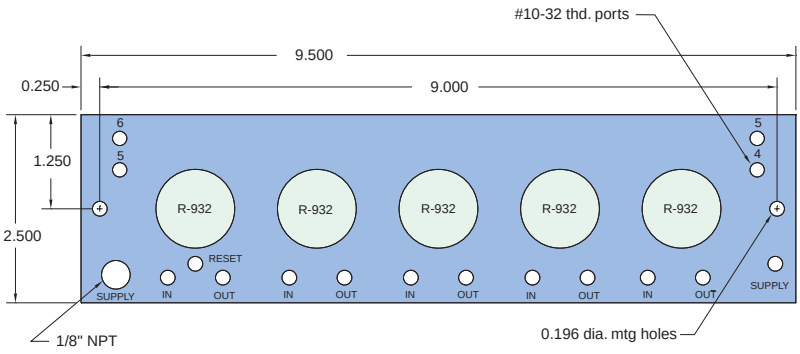


Use: The R-932 sequence control circuit board is a compact efficient system for integrating sequential control of a multi-step operation. It has many uses throughout industry. For example:

- Metalworking: multiple drilling, tapping, etc. Operation where workpiece must be clamped, worked, released, and transferred in a precise order with no overlapping steps.
- Production: where a unit is sized, wrapped, and cut in proper sequence.
- Assembly: insertion of product in package, closure, and delivery to a conveyor. The CM-024 may be linked to CM-025, -026, -027, or -035 as required to provide additional sequence steps.

Note: Output of last step must be connected to port 6.

Operation: This five valve sequence circuit board is used as the starter; #10-32 port connections provided for signal inputs, step outputs, reset input, and jumper connections for linking multiple boards together. May be linked to CM-024, -025, -026, -027, or -035 or any combination thereof to achieve sequential steps. 1/8" NPT port provided for incoming supply with #10-32 port provided for linking supply to downstream expander units. In addition, step-by-step input requirements make integration of this manifold, with various others shown in the catalog, quick and easy for development of complex control circuitry.

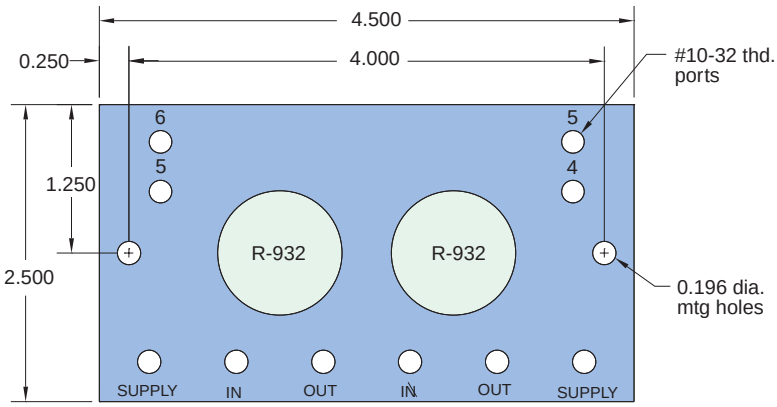


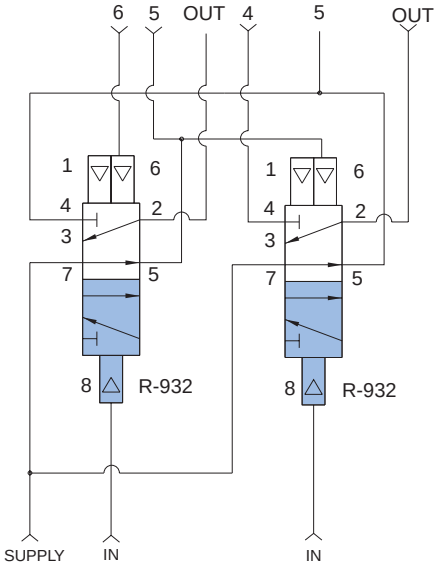
CM-025

Circuit Board for R-932 Sequencing System Using 2 Modular Valves

Size: 4 1/2" x 2 1/2" x 13/16" thick - 2 modules

Use: 2-valve sequence circuit board used as an expansion unit. #10-32 port connections provided for signal inputs, step outputs, supply, and jumper connections for linking multi ple boards together. May serve as a final segment of circuit or be inserted between two other sequencing circuit board.



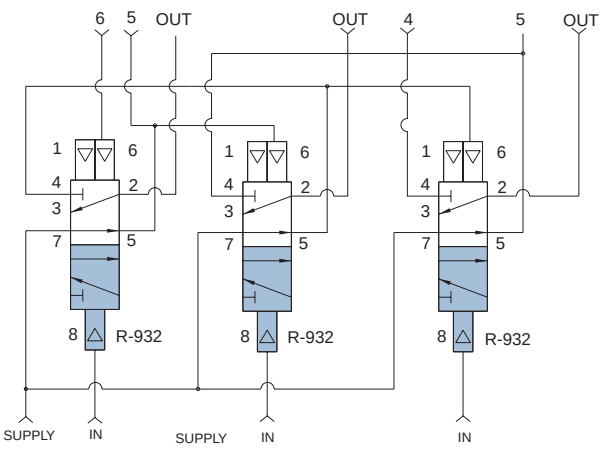


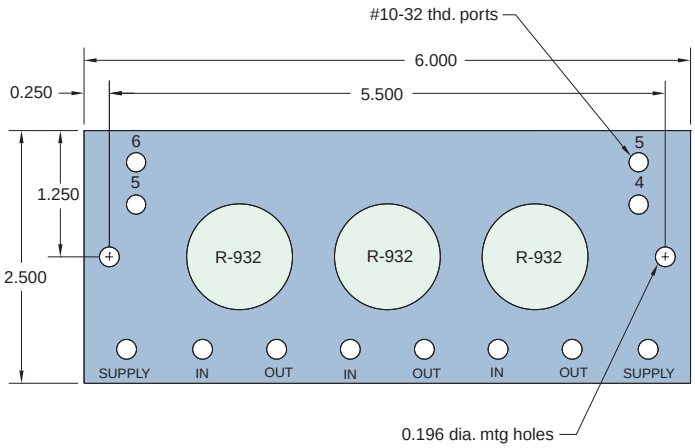
CM-026

Circuit Board for R-932 Sequencing System Using 3 Modular Valves

Size: 6" x 2 1/2" 13/16" thick - 3 modules

Use: 3-valve sequence circuit board used as an expansion unit. #10-32 port connections provided for signal inputs, step outputs, supply and jumper connections for linking multiple boards together. May serve as final segment of circuit or be inserted between two other sequencing subplates.



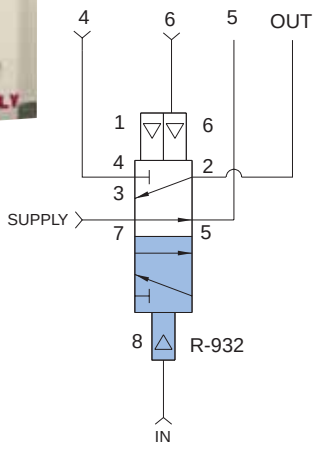


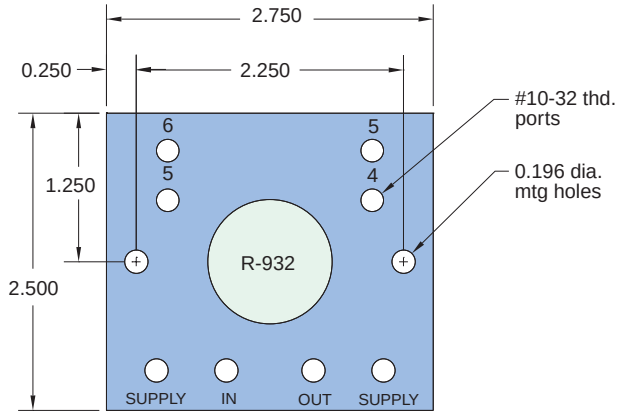
CM-027

Circuit Board for R-932 Sequencing System Using 1 Modular Valve

Size: 2 3/4" x 2 1/2" x 9/16" thick - 1 module

Use: Single valve sequence circuit board used as an expansion unit. #10-32 port connections provided for signal inputs, step outputs, supply and jumper connections for linking multiple boards together. May serve as final segment of circuit or be inserted between two other sequencing subplates.





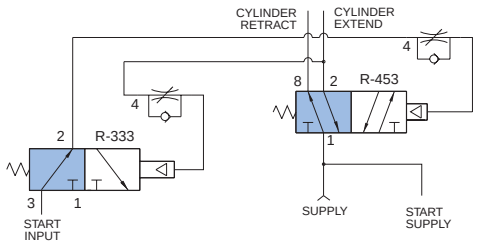
CM-028

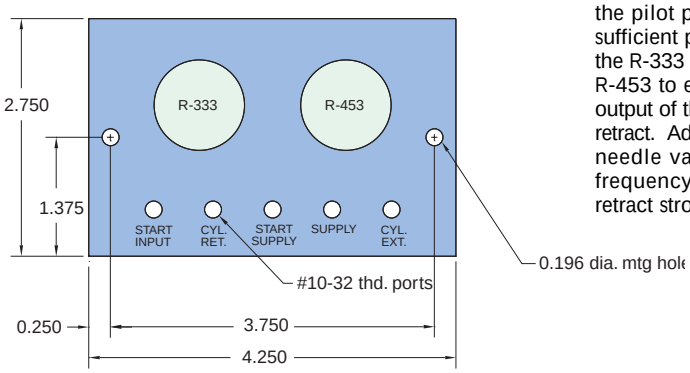
Circuit Board For Autocycling of Double Acting Cylinder

Size: 4 1/4" x 2 3/4" x 9/16" thick - 2 modules

Use: For automatic cycling of double acting cylinders without the use of limit valves or magnetic sensors.

Operation: With no start input, turning supply air on will produce output from cylinder retract (port 8) of R-453. Sending signal to start input passes through normally open R-333, ports 3 to 2, and is metered through flow control circuit of R-453 shifts output to cylinder extend (port 2). This also sends air to the flow control circuit of the R-333 which meters air into the pilot port of the R-333. When sufficient pilot pressure is reached, the R-333 closes allowing port 4 of R-453 to exhaust, thereby shifting output of the valve back to cylinder retract. Adjustment of the respective needle valves allows individual frequency control of extend and retract strokes.





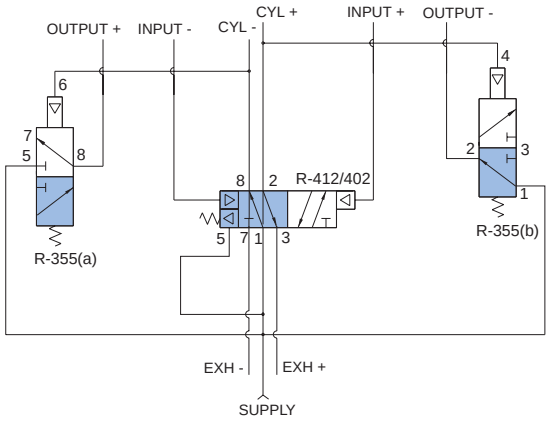
CM-030

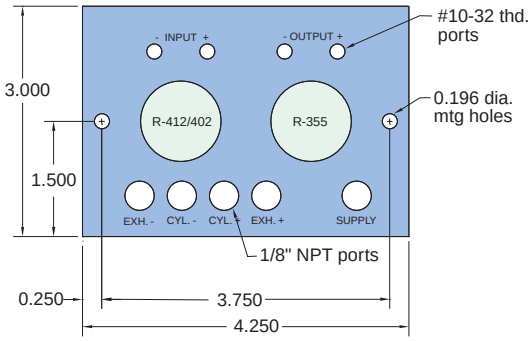
Back Pressure Sensing for Double Acting Cylinders

Size: 4 1/4" x 3" x 13/16" thick - 2 modules

Use: Highly versatile autocycler manifold for use as an accessory to an R-932 sequencer manifold to accomplish a cycling subroutine.

Operation: When supply air is first turned on, the "memory" feature of R-412 shifts output to port 8 for known starting point. When port 4 of R-355 allows air to flow from port 1 to 2 providing a signal at output (-) port. This output may be used to signal an R-932 sequencer that a step has been completed or the signal may be looped directly back into the input (+) port. This will pilot port 4 of the R-412 shifting the valve output to port 2 giving cylinder + output. As the cylinder reaches full extension, back pressure to port 6 of the R-355 decays allowing output from port 8 of that valve. This output may be used to signal an R-932 sequencer that a step has been completed or may be looped directly back into the input (-) port to repeat the cycle. Cylinder exhaust ports are provided in the manifold in 1/8" NPT to facilitate use of needle valves for speed control.





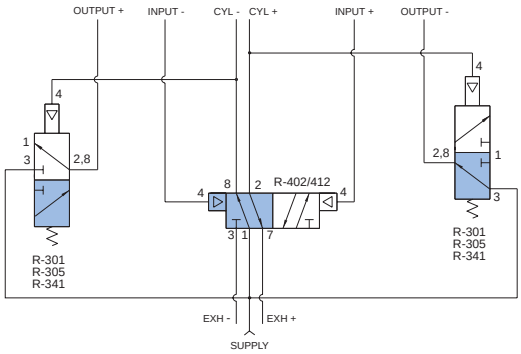
CM-031

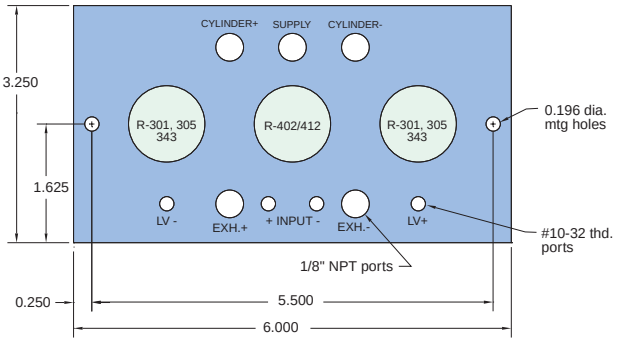
Back Pressure Sensing for Double Acting Cylinder

Size: 6" x 3 1/4" x 13/16" thick -3 modules

Use: This is a new version of cycling without limits. The system interfaces with the sequencing system using R-932 modular valves. From this operation, you can go back to input the next sequencing function. This is cycling with back pressure, which also has a sensing option, and delay.

Operation: The CM-030 and CM-031 are back pressure sensing circuits similar to the CM-017 and CM-06. The circuits are identical in that they both use a power valve for directional control and two normally open 3-way valves in one body (R-355) while the CM-031 provides additional control options because it uses three valves. The output signal and pilot input signals are externally available. This allows for additional control options and interfaces without 932 sequence control system. With the cylinder at rest in the retracted position air pressure from port 8 of the power valve (R-402 or R-412) is directed to the rod end of the cylinder. It is also referenced to the pilot port of a normally open 3-way (b) maintaining that valve closed. At this time there is an output at the - output port which comes from the working port of the other normally open 3-way valve (a). Connecting this output to the + input will shift the power valve, sending pressure to the cap end of the cylinder and allowing air to exhaust from the rod end. The air going to the cap end also pilots the 3-way valve (a), which cancels the pilot signal to the power valve. While the cylinder is extending, a back pressure decays allowing that valve (b) to open, producing a signal at the + output port. Connecting this port to the - input will pilot port 6 of the power valve and cause the cylinder to retract. This pressure will turn off valve (b) and the back pressure at the cap end of the cylinder keeps valve (a) closed. The CM-031 requires a separate valve at (a) and (b) but offers additional versatility because a time delay can be incorporated by using our R-341 module and using module R-305 maximizes the pressure differential across the piston. Access to the power valve pilot ports (+ and - inputs) and the + and - outputs enables these circuit boards to be used with the 932 sequence control in applications where it is not convenient to mount limit valves. These controls can also be used to sequence several operations by adding 1 or 2 more valves.





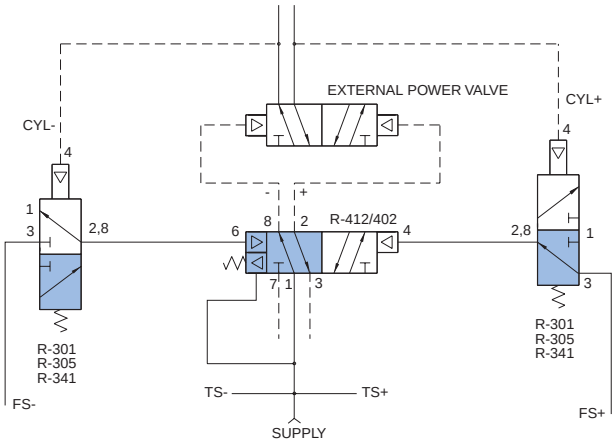
CM-033

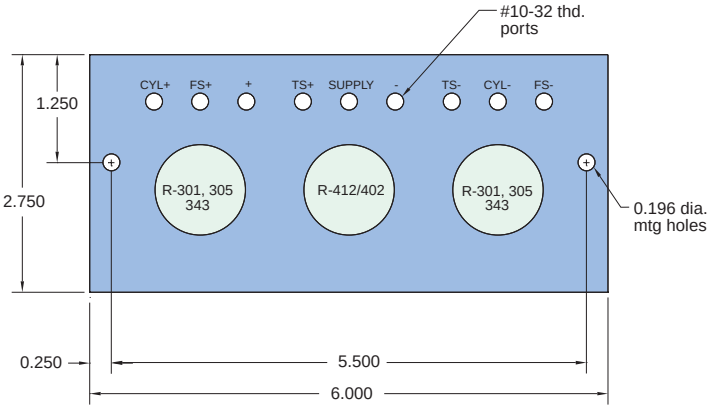
Cycling Without Limits with External Power Valve

Size: 6" x 2 3/4" x 9/16" thick - 3 modules

Use: When cycling without limits function is desired from cylinder with bore or stroke requiring very high flow rates to achieve desired cycle speed.

Operation: Similar to CM-06 except output of R-402 is used to pilot a larger pneumatically piloted power valve. Operates as either a straight back pressure sensing system or the use of an R-341 will provide time delay after pressure decay.



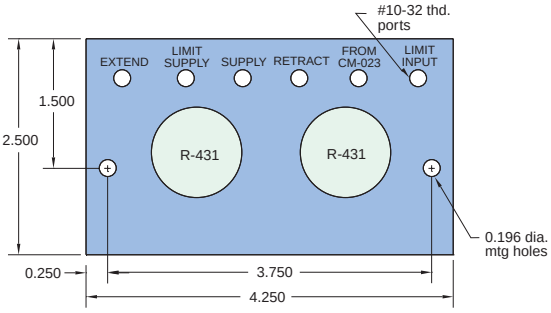


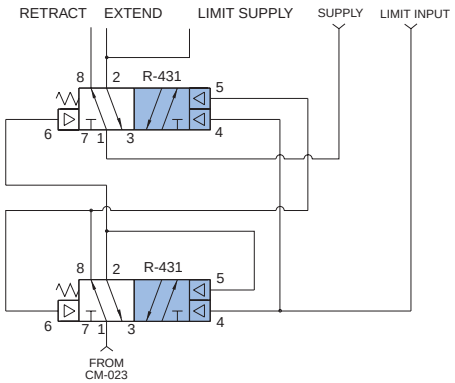
CM-034

Subplate for Back Pressure Latched with Clamp Operated with CM-023

Size: 4 1/4" x 2 1/2" x 13/16" thick - 2 modules

Use: For operation of a clamp or collet system where two hand no tie down input is required to be held continuously until clamp is fully engaged. Two hand not tie down circuit is reengaged to release the clamp mechanism.



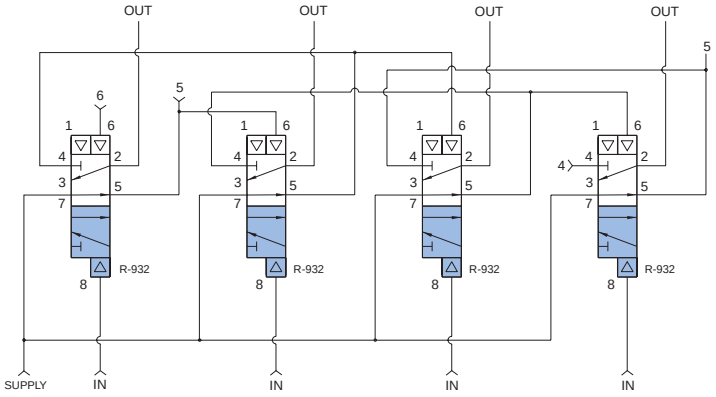


Operation: Output of the CM-023 goes to port 1 or R-431 (a). This provides output at port 8 which latches in port 6 and port 5 of R-431 (b). R-431 (b) output shifts to port 2 giving clamp close output and also gives output to LV supply The CM-023 must remain actuated until the valve is actuated or the spring on the R-431 will return both valves to the clamp open position. When the clamp has fully closed the limit valve is actuated and its output enters at limit input piloting ports 4 of both R-431 (a) and (b). This now latches both valves in the clamp closed position. A new input from the CM-023 now sends a signal from port 1 through port 2 of R-431 (a) which latches port 5 of R-431 (a) and pilots port 6 of R-431 (b). Power output from (b) now shifts to port 8 to unclamp. When the CM-023 palm buttons are released, both valves return to the starting position as shown and the circuit is ready for another operation.

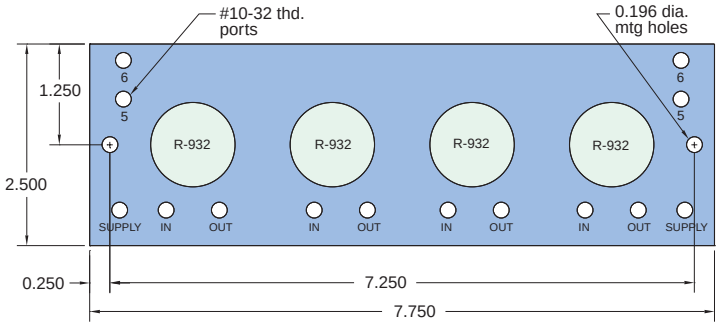
CM-035

Circuit Board for R-932 Sequencing System Using 4 Modular Valves

Size: 7 3/4" x 2 1/2" x 13/16" thick - 4 modules



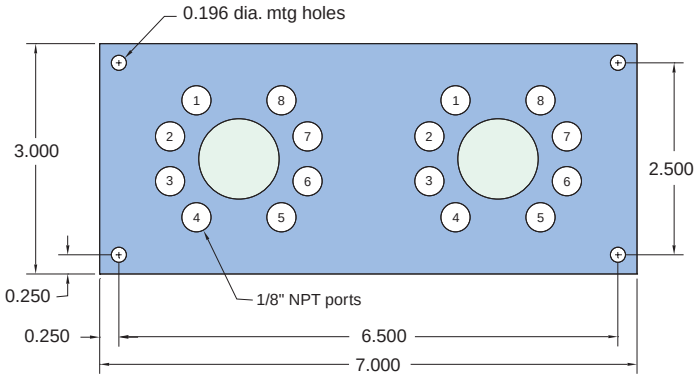
Use: 4-valve sequence circuit board used as an expansion unit. #10-32 port connections provided for signal inputs, step outputs, supply and jumper connections for linking multiple boards together. May serve as final segment of circuit or be inserted between other sequencing circuit board.



CM-036

2-Valve Mounting Subplate with 1/8" Ports

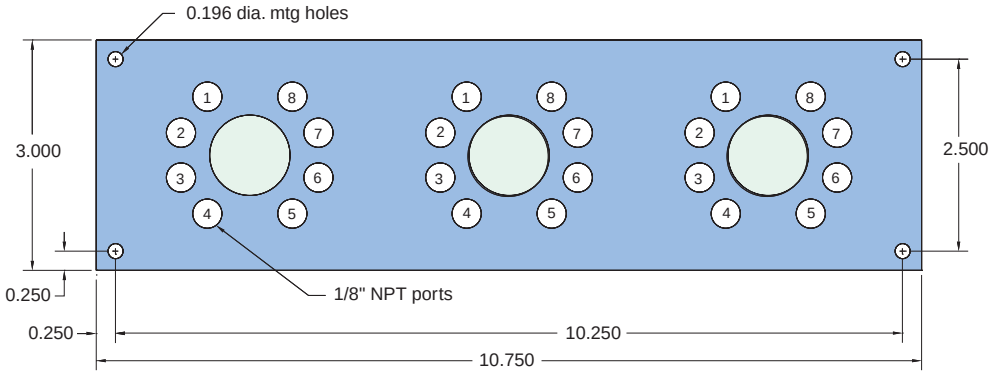
Size: 7" x 3" x 5/8" thick - 2 modules



CM-037

3-Valve Mounting Subplate with 1/8" Ports

Size: 10 3/4" x 3" x 5/8" thick - 3 modules



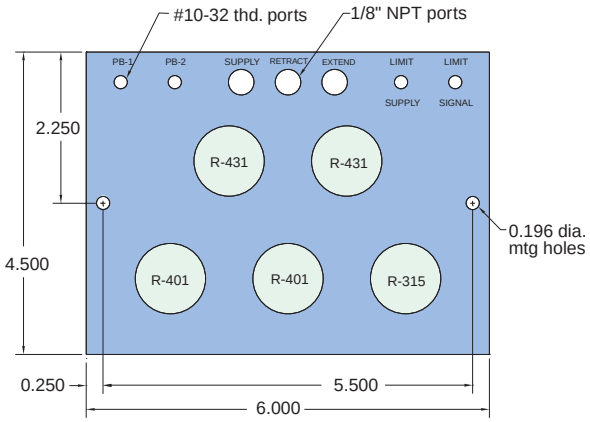
CM-038

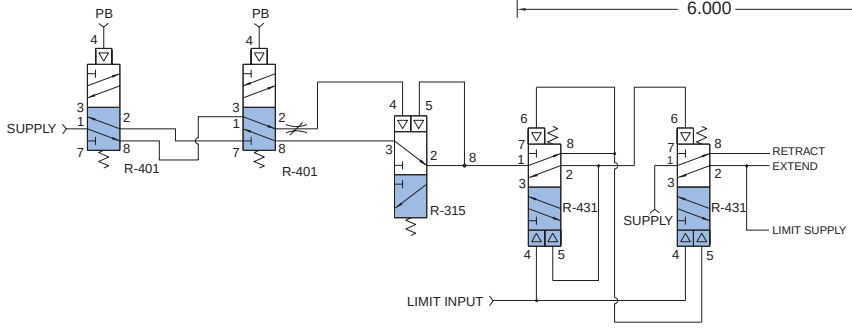
2 Hand No Tie Down Circuit with Latching Output

Size: 6" x 4 1/2" x 13/16" thick - 5 modules

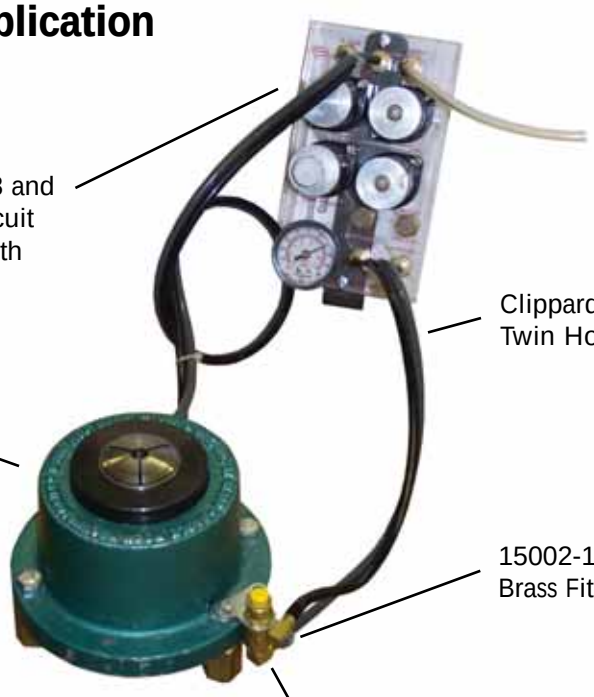
Operation: The CM-038 combines the functions of the CM-023 two hand no tie down with the CM-034 latching circuit. This control requires that the operator push both palm buttons simultaneously and maintain contact until the work member contacts a limit valve*. If the operator removes either hand prior to the limit valve being contacted, the cylinder will return to the home position. Once the limit valve is contacted, the cylinder will remain in place with out the need for operator contact. In order to return to the home position, the operator must depress both buttons simultaneously.

*A back pressure sensing circuit can be used in lieu of a limit valve in applications where it is not practical to mount a limit valve. For more details see CM-023 and CM-034 or consult factory.





Pneumatic Clamping Circuit Application



Acrylic Circuit Board CM-08 and Clippard Modular Valve Circuit for Binary Clamp Control with Adjustable Clamp Pressure

Clippard Polyurethane Twin Hose

Pneumatic Collet Closer

15002-1 Universal Brass Fitting

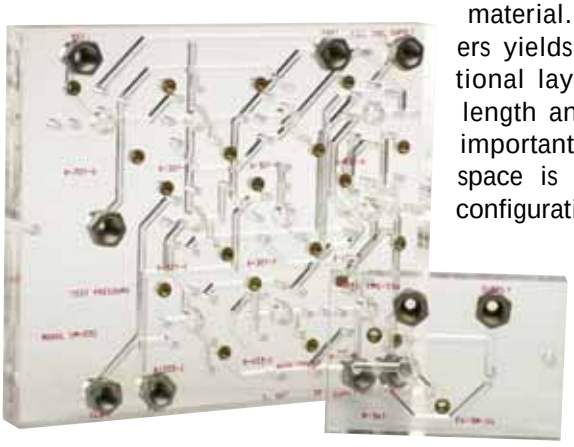
Clippard MAV-3 Limit Valve with PC-1Y Push Button

This CM-08 complete package uses an R-401, R-412, R-451, R-701 and a PG-100 to provide single button opening/closing of the collett vise allowing precise pressure adjustments.

Custom Pneumatic Circuit Boards Special Features

Clippard pneumatic circuit boards can be custom-made. Once established, you can depend on your circuit's interconnections to be identical every time.

Component identification is silk-screened on the acrylic board surface for convenience. Each input, output and modular valve is identified to assure proper assembly. Completed circuits may be visually inspected to confirm proper component placement.

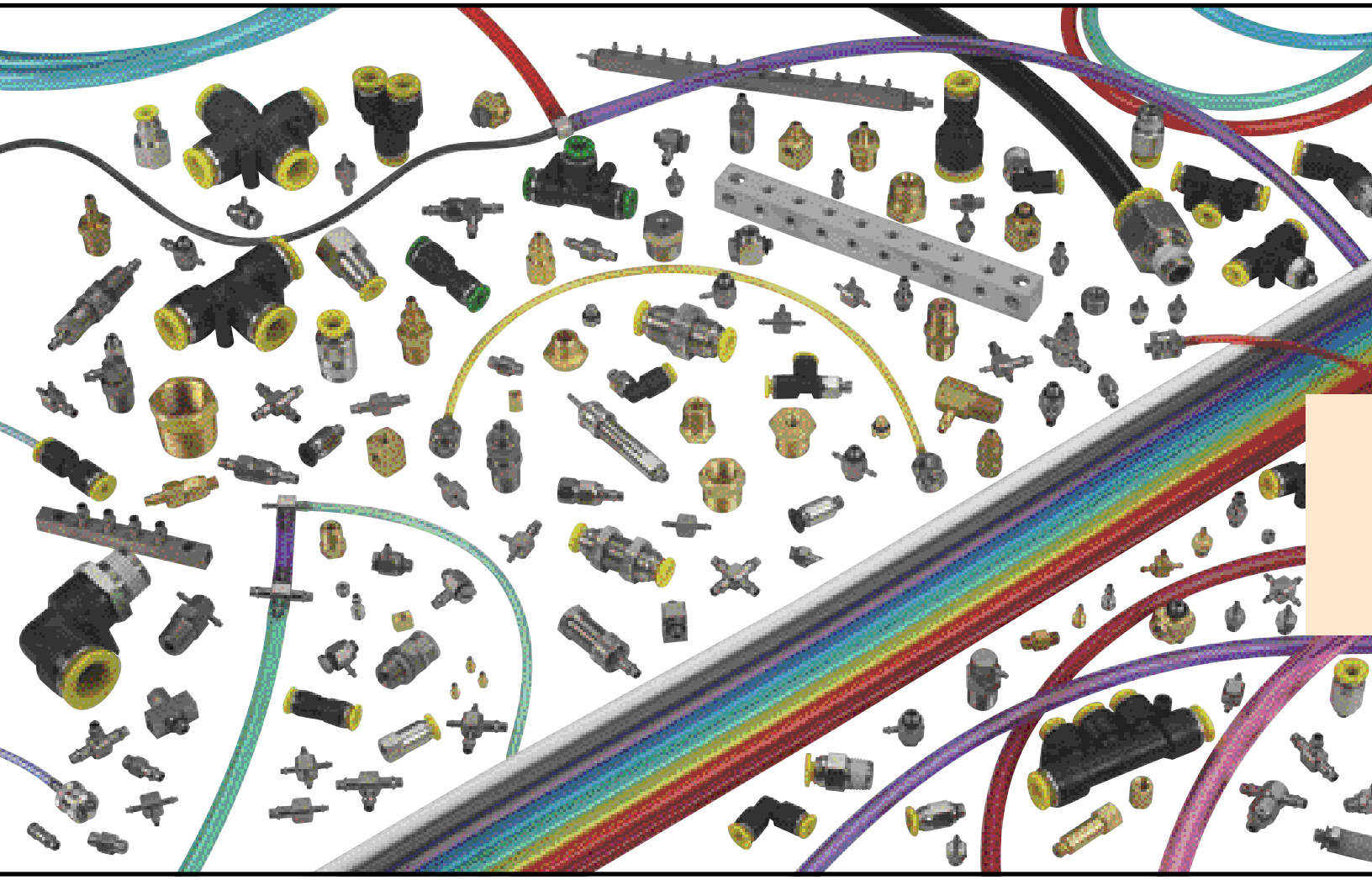


Every circuit board uses the exclusive (patented) Clippard "octoport" system to provide standard porting as pioneered throughout Clippard modular valves. Valves are held snugly to the circuit board by two captivated screws furnished with each modular valve. Valve module mounting screw holes are threaded brass inserts for extra strength. Changing valves takes less than a minute. Any valve module may be easily removed without disturbing the other modules, or affecting the circuit interconnections. Use any number of Clippard plug-in valves and controls.

Sophisticated pneumatic circuitry becomes simple to assemble and install using custom pneumatic circuit boards.

Thickness of the pneumatic circuit board subplate is determined by circuit complexity. Greater number of interconnection crossovers requires additional layers of material. The lowest number of plastic layers yields the lowest cost. However, additional layers may be utilized to minimize length and width of the circuit board, an important consideration where mounting space is restricted. Standard circuit board configuration is with all components and connections on the top of the circuit board.

In addition to Clippard modular control valves, the Clippard EV and ET series of electronic interface valves may be mounted on the circuit boards to function as a part of the control circuit. These electronic valves are actuated by 6, 12, & 24 VDC, drawing a low 0.67 watts. They are cool running and fast acting.



For ease in construction of pneumatic logic control and fluid power systems, you will find in the Clippard line an extensive choice of useful fittings. Clippard fittings are designed for the greatest flexibility, practical usefulness and for savings in time, cost and space.

Why Clippard Miniature Fluid Power Fittings?

While others were thinking about large fittings, Clippard was thinking big about smaller fittings. Smaller valves and cylinders created the need for smaller fittings. Clippard was the first to develop ports utilizing the #10-32 thread. This thread has become an industry standard in the marketplace. Because of their compact size, #10-32 fittings when properly gasketed and/or sealed with anaerobic sealant, can withstand pressures well beyond those required for pneumatic applications.

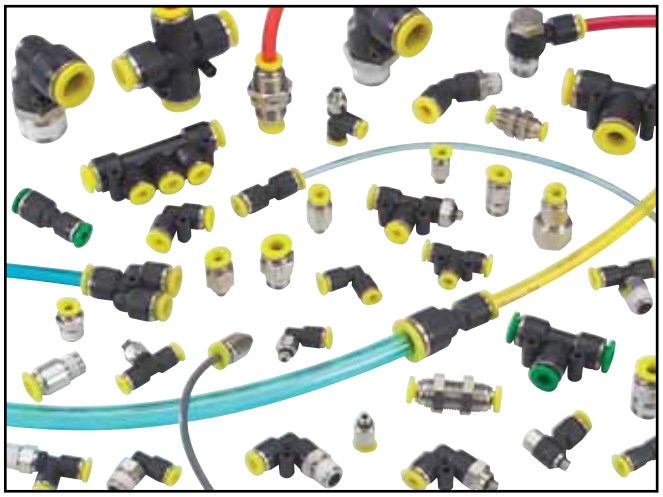
All Clippard fittings are made to the same high standards as our valves and cylinders. Precision machining and finishing processes insure that all fittings are held to the tightest tolerances. What does this mean to you? It means quality... quality that leads to ease in assembly, and consistent, trouble free performance.

Clippard precision fittings will save you time, space, and money when designing versatile, productive, trouble free, pneumatic circuits. Our endless variety of fittings insure that you find just the right "fit" when plumbing pneumatic circuits or assemblies. These fittings are small in size but large in performance, allowing for streamlining of pneumatic assemblies and eliminating the need for larger, more expensive, cumbersome fittings.

Options

Clippard brass fittings come standard with a bright chromate finish for added corrosion resistance. Most brass fittings are also available with nickel plating. Clippard slip-on fittings come standard with electroless nickel plating. Some fittings are also available with metric threads. Refer to each item in the catalog for available options.

To order a brass fitting with the nickel plating option, add a -NP following the catalog fitting number. To order a fitting with the M5 metric thread option, add a -M5 following the catalog fitting number.



Clippard Push-Quick Fittings provide a simple method of connecting pneumatic components to each other and system piping. They are designed for use with both flexible hose and stiff tubing made of nylon, urethane, polyethylene or polypropylene.

Pressure Range: 0 - 150 psig @ 130˚ F

Vacuum: 0 - 29.5 in Hg

Temperature Range: 32 - 140˚ F

Media: Air, Non-corrosive water

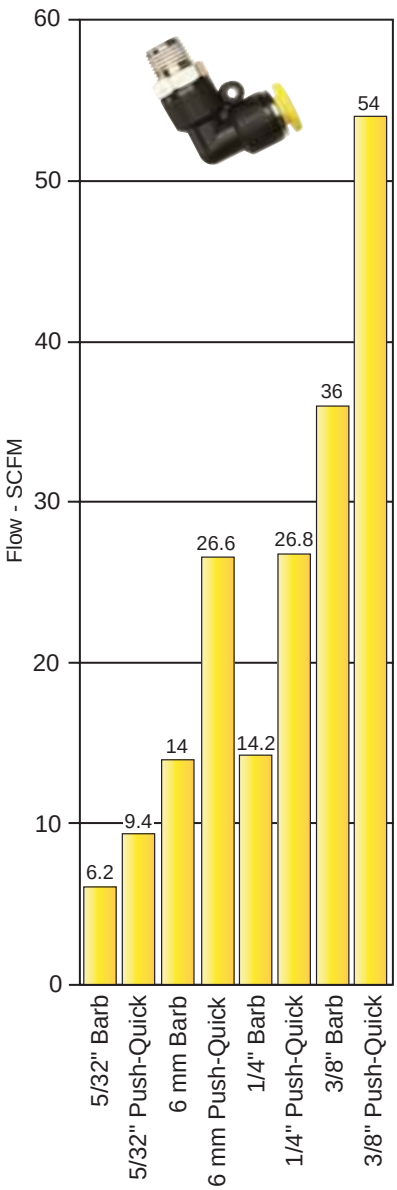
Tube Pull Out Force: >20 lb. @ 75˚ F (non-pressurized)

Burst Pressure: 350 psig @ 75˚ F

Materials: Body - Plastic Resin
Metal Stud - Nickel Plated Brass
Gripper Ring - Stainless Steel
Seals - Buna N

Push-Quick Fittings generally provide higher flows than barbed fittings. The Push-Quick fitting allows full flow through the hose/tubing I.D. with no smaller orifice required as in barb fittings. The chart shows the comparison between barb and push in fittings for various tubing/hose sizes. Push-Quick Fittings are available in five sizes for 1/8", 5/32", 6 mm, 1/4" and 3/8" O.D. tubing. The 5/32" fittings may also be used with 4 mm O.D. tubing.

Barb vs Push-Quick Fittings
Flow Comparison @ 100 psig



Installation of Tubing into fitting

1. Slowly push a clean and perpendicularly cut tubing into the fitting until it comes to a dead stop.
2. Pull the tubing back gently until the Gripper Ring of the fitting grips onto the tubing and has a good seal.

Removal of Tubing from fitting

1. Push in evenly on the two long oval sides of the Release Button.
2. Pull out the tubing while keeping the Release Button depressed.
3. To reuse the tubing; cut off the lodged portion of the previously used tubing evenly and perpendicularly.

Installation of Pipe Fittings with Pre-Applied sealant

1. Tighten fitting by hand, then turn it 2 or 3 turns with a wrench until it reaches the desired torque listed.
2. If the fitting is used and the sealant coating is not in good condition, apply Teflon® sealant tape to the threads.

* 6 mm size fittings have a green release button

Thread Size	#10-32	1/8" NPT, R1/8	1/4" NPT, R1/4	3/8" NPT	1/2" NPT
Torque lb. - ft.	1.0 - 1.5	5.0 - 6.5	8.5 - 10.0	16.0 - 17.5	20 - 21.5

Tubing Material	Polyurethane	Polyethylene	Polypropylene	Nylon
Specified Size	+/- 0.005"	+/- 0.004"	+/- 0.004"	+/- 0.004"
Hardness (Durometer)	Shore A85 or higher	Shore D 44 or higher	Shore D 44 or higher	Shore D 44

see pages 333 through 338 for hose and tubing

PUSH-QUICK FITTINGS

P Q - ❑ ❑ ❑ ❑ ❑ ❑

Push Quick

Fitting Type

- **BC** - Bulkhead Connector
- **BT** - Branch Tee
- **BU** - Bulkhead Union
- **CC** - Compact Male Conn.
- **CU** - Cross Union
- **EU** - Elbow Union
- **FC** - **NEW!** Female Conn.
- **MA** - Male Angle Conn.
- **MC** - Male Connector
- **ME** - Male Elbow
- **MU** - Manifold Union
- **PG** - **NEW!** Plug
- **RT** - Run Tee
- **RU** - Reduced Union
- **SU** - Straight Union
- **TU** - Tee Union
- **UE** - Universal Elbow
- **YU** - Y Union

Tubing Size (O.D.)

- **04** - 1/8" (0.125")
- **05** - 5/32 (4 mm) (0.156")
- **06M** - 6 mm (0.236")
- **08** - 1/4" (0.250")
- **10** - 5/16" (0.313")
- **12** - 3/8" (0.375")
- **16** - 1/2" (0.500")

Thread Size

- **N** - #10-32
- **5** - M5 thd.
- **P** - 1/8" NPT
- **R** - R1/8
- **Q** - 1/4" NPT
- **2** - R1/4
- **W** - 3/8" NPT
- **3** - R3/8
- **Z** - 1/2" NPT

Threaded Fittings

Tube	Thread	Female Connector FC	Male Compact Connector CC	Male Connector MC	Male Elbow ME	Run Tee RT	Branch Tee BT	Universal Elbow UE	Male Angle Connector MA	Bulkhead Connector BC
1/8"	#10-32		PQ-CC04N		PQ-ME04N				PQ-MA04N	
	1/8" NPT		PQ-CC04P		PQ-ME04P				PQ-MA04P	PQ-BC04P
	#10-32	PQ-FC05N	PQ-CC05N	PQ-MC05N	PQ-ME05N	PQ-RT05N	PQ-BT05N	PQ-UE05N	PQ-MA05N	
5/32"**	M5 thd.	PQ-FC005		PQ-MC055	PQ-ME055	PQ-RT055	PQ-BT055	PQ-UE055	PQ-MA055	
(4 mm)	1/8" NPT	PQ-FC05P	PQ-CC05P	PQ-MC05P	PQ-ME05P	PQ-RT05P	PQ-BT05P	PQ-UE05P	PQ-MA05P	PQ-BC05P
	R1/8	PQ-FC05R		PQ-MC05R	PQ-ME05R	PQ-RT05R	PQ-BT05R	PQ-UE05R	PQ-MA05R	PQ-BC05R
	1/4" NPT			PQ-MC05Q	PQ-ME05Q					
	M5 thd.			PQ-MC06M5	PQ-ME06M5	PQ-RT06M5	PQ-BT06M5	PQ-UE06M5	PQ-MA06M5	
6 mm*	R1/8	PQ-FC06MR		PQ-MC06MR	PQ-ME06MR	PQ-RT06MR	PQ-BT06MR	PQ-UE06MR	PQ-MA06MR	PQ-BC06MR
	R1/4	PQ-FC06M2		PQ-MC06M2	PQ-ME06M2	PQ-RT06M2	PQ-BT06M2	PQ-UE06M2	PQ-MA06M2	PQ-BC06M2
	#10-32		PQ-CC08N	PQ-MC08N	PQ-ME08N	PQ-RT08N	PQ-BT08N	PQ-UE08N	PQ-MA08N	
1/4"	1/8" NPT	PQ-FC08P	PQ-CC08P	PQ-MC08P	PQ-ME08P	PQ-RT08P	PQ-BT08P	PQ-UE08P	PQ-MA08P	PQ-BC08P
	1/4" NPT	PQ-FC08Q	PQ-CC08Q	PQ-MC08Q	PQ-ME08Q	PQ-RT08Q	PQ-BT08Q	PQ-UE08Q	PQ-MA08Q	PQ-BC08Q
	3/8" NPT			PQ-MC08W	PQ-ME08W				PQ-MA08W	
	M5 thd.			PQ-MC105						
	1/8" NPT	PQ-FC10P		PQ-MC10P	PQ-ME10P	PQ-RT10P	PQ-BT10P	PQ-UE10P	PQ-MA10P	PQ-BC10P
	R1/8	PQ-FC10R		PQ-MC10R	PQ-ME10R	PQ-RT10R	PQ-BT10R	PQ-UE10R		PQ-BC10R
5/16"	1/4" NPT	PQ-FC10Q		PQ-MC10Q	PQ-ME10Q	PQ-RT10Q	PQ-BT10Q	PQ-UE10Q	PQ-MA10Q	PQ-BC10Q
	R1/4	PQ-FC102		PQ-MC102	PQ-ME102	PQ-RT102	PQ-BT102	PQ-UE102		PQ-BC102
	3/8" NPT	PQ-FC10W		PQ-MC10W	PQ-ME10W	PQ-RT10W		PQ-UE10W		
	R3/8	PQ-FC103		PQ-MC103	PQ-ME103	PQ-RT103	PQ-BT103	PQ-UE103		
	1/8" NPT			PQ-MC12P	PQ-ME12P	PQ-RT12P	PQ-BT12P		PQ-MA12P	
3/8"	1/4" NPT	PQ-FC12Q	PQ-CC12Q	PQ-MC12Q	PQ-ME12Q	PQ-RT12Q	PQ-BT12Q	PQ-UE12Q	PQ-MA12Q	PQ-BC12Q
	3/8" NPT	PQ-FC12W	PQ-CC12W	PQ-MC12W	PQ-ME12W	PQ-RT12W	PQ-BT12W	PQ-UE12W	PQ-MA12W	PQ-BC12W
	1/2" NPT			PQ-MC12Z	PQ-ME12Z					
	1/4" NPT			PQ-MC16Q	PQ-ME16Q				PQ-MA16Q	
1/2"	3/8" NPT			PQ-MC16W	PQ-ME16W				PQ-MA16W	
	1/2" NPT			PQ-MC16Z	PQ-ME16Z				PQMA16Z	

* 6 mm size fittings have a green release button.

** 5/32" fittings may be used with 4 mm tubing

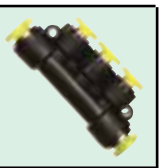
Note: Fittings with pipe thread (NPT), R1/8 and R1/4 are supplied with pre-applied sealant.

Non-Threaded Fittings





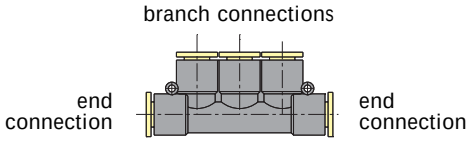


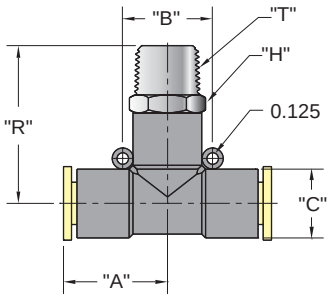



Tube Size	Straight Union SU	Reduced Union RU	Elbow Union EU	Tee Union TU	Y Union YU	Cross Union CU	Bulkhead Union BU	Manifold Union MU**
1/8”	PQ-SU04		PQ-EU04	PQ-TU04	PQ-YU04	PQ-CU04		
5/32” (4 mm)	PQ-SU05	PQ-RU0504	PQ-EU05	PQ-TU05	PQ-YU05	PQ-CU05	PQ-BU05	PQ-MU0504
6 mm*	PQ-SU06M	PQ-RU06M05	PQ-EU06M	PQ-TU06M	PQ-YU06M	PQ-CU06M	PQ-BU06M	PQ-MU06M05
1/4”	PQ-SU08	PQ-RU0804 PQ-RU0805	PQ-EU08	PQ-TU08	PQ-YU08	PQ-CU08	PQ-BU08	PQ-MU0805
5/16”	PQ-SU10	PQ-RU1008	PQ-EU10	PQ-TU10	PQ-YU10	PQ-CU10	PQ-BU10	PQ-MU1008
3/8”	PQ-SU12	PQ-RU1208	PQ-EU12	PQ-TU12	PQ-YU12	PQ-CU12	PQ-BU12	PQ-MU1208
1/2”	PQ-SU16	PQ-RU1612	PQ-EU16	PQ-TU16	PQ-YU16		PQ-BU16	

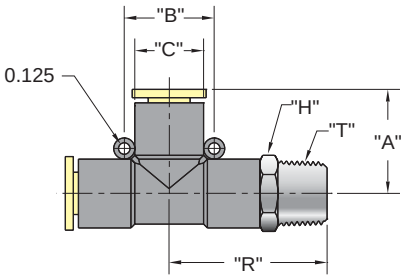
* 6 mm size fittings have a green release button.

** The first size listed in the part number are the end connections, the second size listed are the branch connections.





BT



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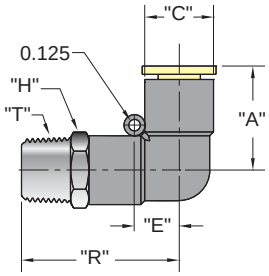
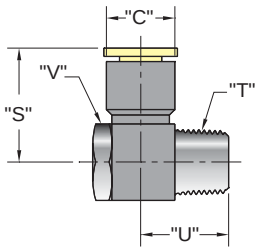
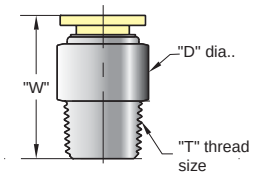


ME

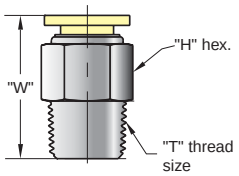


UE

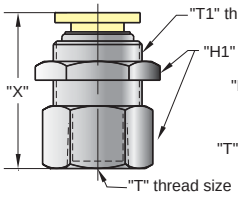
Tubing Size	Thread Size ”T”	“A”	“B”	“C”	“E”	“H”	“R”	“S”	“U”	“V”
1/8”	#10-32	0.722”		0.410”	0.328”	7/16”	0.900”			
1/8”	1/8” NPT	0.722”		0.410”	0.328”	7/16”	0.980”			
5/32” (4 mm)	#10-32	0.722”	0.656”	0.410”	0.328”	7/16”	0.900”	0.820”	0.440”	5/16”
5/32” (4 mm)	M5 x 0.8	0.722”	0.656”	0.410”	0.328”	10 mm	0.900”	0.831”	0.449”	8 mm
5/32” (4 mm)	1/8” NPT	0.722”	0.656”	0.410”	0.328”	7/16”	0.980”	0.920”	0.570”	7/16”
5/32” (4 mm)	R1/8	0.722”	0.656”	0.410”	0.328”	10 mm	0.980”	0.921”	0.563”	10 mm
5/32” (4 mm)	1/4” NPT	0.722”	0.656”	0.410”	0.328”	7/16”	1.130”			
6 mm	M5 x 0.8	0.830”	0.740”	0.524”	0.370”	12 mm	1.030”	0.953”	0.500”	12 mm
6 mm	R1/8	0.830”	0.740”	0.524”	0.370”	12 mm	1.100”	0.976”	0.587”	12 mm
6 mm	R1/4	0.830”	0.740”	0.524”	0.370”	14 mm	1.140”	1.059”	0.654”	14 mm
1/4”	#10-32	0.840”	0.740”	0.524”	0.370”	1/2”	1.030”	0.940”	0.480”	1/2”
1/4”	1/8” NPT	0.840”	0.740”	0.524”	0.370”	1/2”	1.100”	0.990”	0.600”	1/2”
1/4”	1/4” NPT	0.840”	0.740”	0.524”	0.370”	9/16”	1.230”	1.120”	0.740”	9/16”
1/4”	3/8” NPT	0.840”	0.740”	0.524”	0.370”	11/16”	1.290”			
3/8”	1/8” NPT	1.100”	0.944”	0.720”	0.472”	11/16”	1.350”			
3/8”	1/4” NPT	1.100”	0.944”	0.720”	0.472”	11/16”	1.470”	1.320”	0.800”	11/16”
3/8”	3/8” NPT	1.100”	0.944”	0.720”	0.472”	11/16”	1.160”	1.550”	0.900”	11/16”
1/2”	1/4” NPT	1.160”		0.850”	0.570”	7/8”	1.550”			
1/2”	3/8” NPT	1.160”		0.850”	0.570”	7/8”	1.580”			
1/2”	1/2” NPT	1.160”		0.850”	0.570”	7/8”	1.670”			



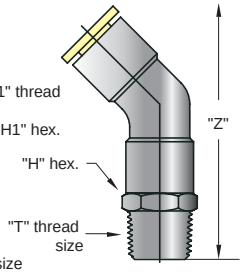
CC



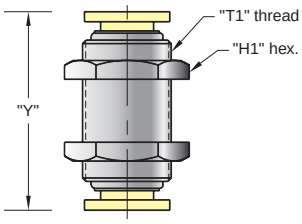
FC/MC



BC

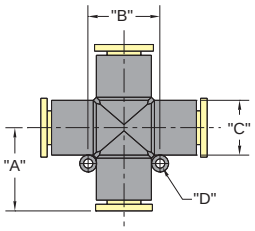


MA

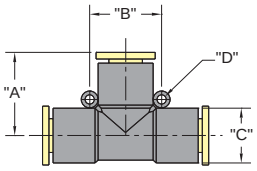


BU

Tubing Size	Thread Size "T"	"D"	"H"	"H1"	"T1"	"W"	"X"	"Y"	"Z"
1/8"	#10-32	0.410"			7/16"	0.880"			1.454
1/8"	1/8" NPT	0.410"			7/16"	0.860"			1.474
5/32" (4 mm)	#10-32	0.410"	7/16"		7/16"	0.890"	0.820"	0.440"	1.454"
5/32" (4 mm)	M5 x 0.8		10 mm		10 mm	0.900"	0.830"	0.450"	1.454
5/32" (4 mm)	1/8" NPT	0.410"	7/16"	5/8"	7/16"	0.840"	0.920"	0.570"	1.474
5/32" (4 mm)	R 1/8		10 mm	14 mm	10 mm	0.840"	0.920"	0.563"	1.474
5/32" (4 mm)	1/4" NPT		9/16"			0.920"			
6 mm	M5 X 0.8		12 mm		12 mm	0.950"	0.953"	0.500"	1.556
6 mm	R 1/8		10 mm	17 mm	12 mm	0880"	0.976"	0.587"	1.556
6 mm	R 1/4		14 mm	17 mm	14 mm	0.875"	1.059"	0.654"	1.616
1/4"	#10-32	0.470"	1/2"		1/2"	0.913"	0.940"	0.480"	1.620
1/4"	1/8" NPT	0.470"	1/2"	3/4"	1/2"	0.913"	0.990"	0.600"	1.620
1/4"	1/4" NPT	0.530"	9/16"	3/4"	9/16"	0.965"	1.120"	0.740"	1.682
1/4"	3/8" NPT		11/16"		11/16"	0.965"			1.722
3/8"	1/8" NPT		11/16"		11/16"	1.280"			1.823
3/8"	1/4" NPT	0.670"	11/16"	15/16"	11/16"	1.342"	1.320"	0.800"	1.923
3/8"	3/8" NPT	0.670"	11/16"	15/16"	11/16"	1.241"	1.320"	0.900"	1.943
1/2"	1/4" NPT		7/8"		7/8"	1.380"			1.965
1/2"	3/8" NPT		7/8"		7/8"	1.320"			2.125
1/2"	1/2" NPT		7/8"		7/8"	1.320"			2.195



CU



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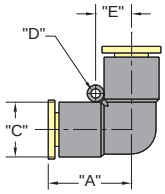
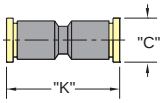
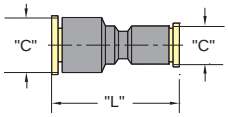


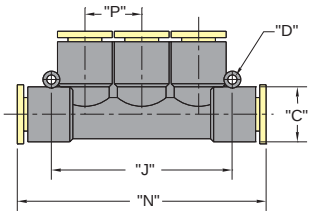
EU



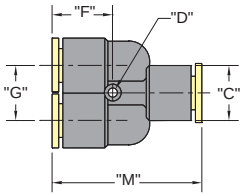
SU



RU



MU



YU

Tubing Size	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"J"	"K"	"L"	"M"	"N"	"P"
1/8"	0.710	0.560	0.420	0.080					1.240				
5/32 (4 mm)	0.722	0.656	0.410	0.125	0.328	0.512	0.517	1.608	1.239	1.230	1.318	2.312	0.531
6 mm	0.830	0.740	0.524	0.125	0.370	0.568	0.531	1.608	1.500	1.367	1.495	2.435	0.531
1/4"	0.840	0.740	0.524	0.125	0.370	0.604	0.531	1.608	1.500	1.666	1.495	2.435	0.531
3/8"	1.100	0.944	0.720	0.125	0.472	0.740	0.720	1.850	1.851	1.666	2.017	2.312	0.531
1/2"	1.130	1.120	0.850	0.100	0.570	0.780	0.840		1.810	1.810	2.070		

NEW! Miniature Push-Quick Fittings

P Q M - ❑ ❑ ❑ ❑ ❑ ❑

Push Quick Miniature

Fitting Type

- **BT** - Branch Tee
- **BU** - Bulkhead Union
- **CC** - Compact Male Conn.
- **EE** - Extended Elbow
- **EU** - Elbow Union
- **FC** - Female Connector
- **MC** - Male Connector
- **ME** - Male Elbow
- **RT** - Run Tee
- **SU** - Straight Union
- **TU** - Tee Union

Tubing Size (O.D.)

- **05** - 5/32 (0.156") (4 mm)
- **08** - 1/4" (0.250")

Thread Size

- **Blank**- No Thread
- **N** - #10-32
- **P** - 1/4" NPT

New, Much Smaller in Size!

Like Clippard's larger series Push-Quick Fittings available on the previous pages, the new Miniature Push-Quick Fittings speed tube insertion for assembling pneumatic circuits. The fittings provide a simple method to connect pneumatic components and accept both flexible hose and rigid tubing.

Available in 5/32" (4 mm) and 1/4" OD tubing, the fittings permit full flow through the ID and there is no small orifice as required with barb fittings. They are available in many configurations with preapplied thread sealant.

Pressure Range: 0 - 150 psig @ 130˚ F

Vacuum: 0 - 29.5 in Hg

Temperature Range: 32 - 140˚ F

Media: Air, Non-corrosive water

Tube Pull Out Force: >20 lb. @ 75˚ F (non-pressurized)

Burst Pressure: 350 psig @ 75˚ F

Materials: Body - Plastic Resin
Metal Stud - Nickel Plated Brass
Gripper Ring - Stainless Steel
Seals - Buna N

Threaded Fittings







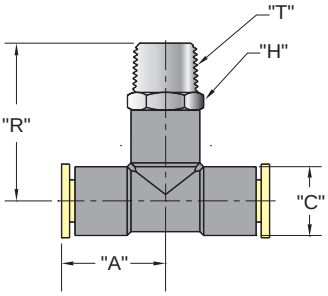
Tube	Thread	Male Compact Connector CC	Male Connector MC	Male Elbow ME	Run Tee RT	Branch Tee BT	Extended Elbow EE	Female Connector FC
5/32" (4 mm)	#10-32	PQM-CC05N	PQM-MC05N	PQM-ME05N	PQM-RT05N	PQM-BT05N	PQM-EE05N	PQM-FC05N
	1/8" NPT	PQM-CC05P	PQM-MC05P	PQM-ME05P	PQM-RT05P	PQM-BT05P	PQM-EE05P	PQM-FC05P
1/4"	#10-32	PQM-CC08N	PQM-MC08N	PQM-ME08N	PQM-RT08N	PQM-BT08N	PQM-EE08N	PQM-FC08N
	1/8" NPT	PQM-CC08P	PQM-MC08P	PQM-ME08P	PQM-RT08P	PQM-BT08P	PQM-EE08P	PQM-FC08P

Note: Fittings with pipe thread NPT are supplied with pre-applied sealant.

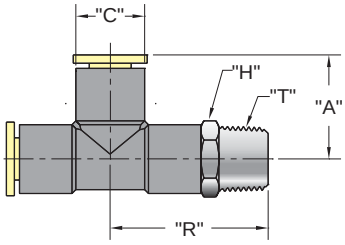
Non-Threaded Fittings




Tube Size	Straight Union SU	Elbow Union EU	Tee Union TU	Bulkhead Union BU
5/32" (4 mm)	PQM-SU05	PQM-EU05	PQM-TU05	PQM-BU05
1/4"	PQM-SU08	PQM-EU08	PQM-TU08	PQM-BU08



BT



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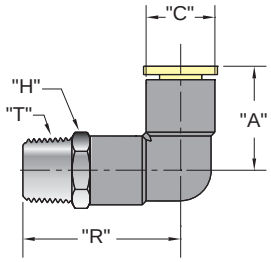
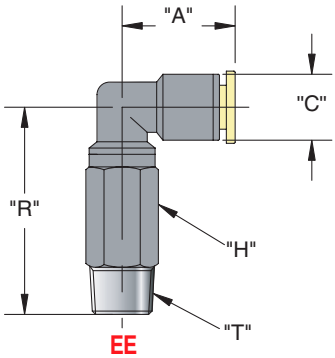
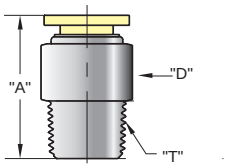


ME



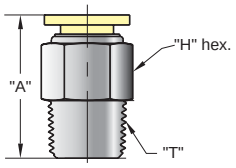
EE

Part Number	Tubing Size	"T" Thread	"A"	"C"	"H"	"R"	Part Number	Tubing Size	"T" Thread	"A"	"C"	"H"	"R"
PQM-BT05N	5/32"	#10-32	0.593"	0.335"	5/16"	0.645"	PQM-ME05N	5/32"	#10-32	0.618"	0.335"	5/16"	0.512"
PQM-BT05P	5/32"	1/8" NPT	0.593"	0.335"	13/32"	0.783"	PQM-ME05P	5/32"	1/8" NPT	0.618"	0.335"	13/32"	0.650"
PQM-BT08N	1/4"	#10-32	0.700"	0.413"	13/32"	0.787"	PQM-ME08N	1/4"	#10-32	0.700"	0.413"	13/32"	0.807"
PQM-BT08P	1/4"	1/8" NPT	0.700"	0.413"	13/32"	0.846"	PQM-ME08P	1/4"	1/8" NPT	0.700"	0.413"	13/32"	0.866"
PQM-RT05N	5/32"	#10-32	0.551"	0.335"	5/16"	0.622"	PQM-EE05N	5/32"	#10-32	0.618"	0.335"	5/16"	0.965"
PQM-RT05P	5/32"	1/8" NPT	0.551"	0.335"	13/32"	0.760"	PQM-EE05P	5/32"	1/8" NPT				
PQM-RT08N	1/4"	#10-32	0.669"	0.413"	13/32"	0.807"	PQM-EE08N	1/4"	#10-32	0.701"	0.413"	13/32"	1.240"
PQM-RT08P	1/4"	1/8" NPT	0.669"	0.413"	13/32"	0.866"	PQM-EE08P	1/4"	1/8" NPT	0.701"	0.413"	13/32"	1.319"



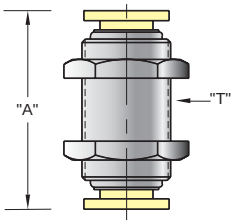
CC

Tubing Size	"T" Thread	"A"	"D"
5/32"	#10-32	0.708"	5/16"
5/32"	1/8" NPT		13/32"
1/4"	#10-32	0.780"	13/32"
1/4"	1/8" NPT	0.783"	13/32"



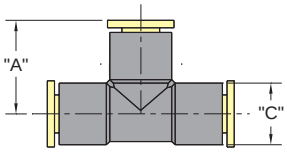
FC/MC

Tubing Size	"T" Thread	"A"	"H"
5/32"	#10-32	0.693"	5/16"
5/32"	1/8" NPT	0.712"	13/32"
1/4"	#10-32	0.748"	13/32"
5/32"	1/8" NPT	0.768"	13/32"



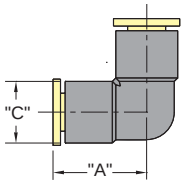
BU

Tubing Size	"T" Thread	"A"
5/32"		1.200"
1/4"		



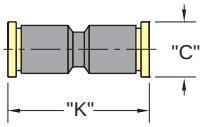
TU

Tubing Size	"A"	"C"
5/32"	0.539"	0.335"
1/4"	0.720"	0.413"



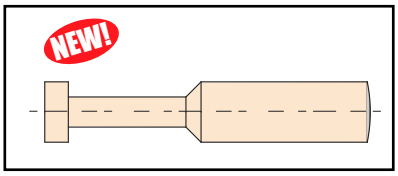
EU

Tubing Size	"A"	"C"
5/32"	0.618"	0.452"
1/4"	0.700"	0.539"



SU

Tubing Size	"C"	"K"
5/32"	0.335"	0.921"
1/4"		



Push-Quick Plugs

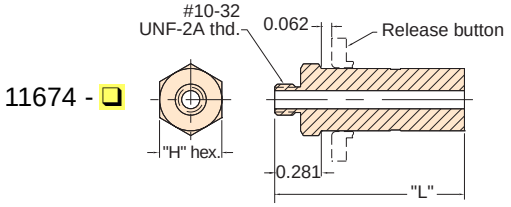
Clippard offers a variety of Push-Quick Plugs in sizes to fit 1/8” through 3/8” OD tubing. These plastic plugs may be used to plug the port of a Push-Quick Fitting for later use. Used as a temporary plug, they may later be removed and tubing inserted to connect to an additional line of a circuit.

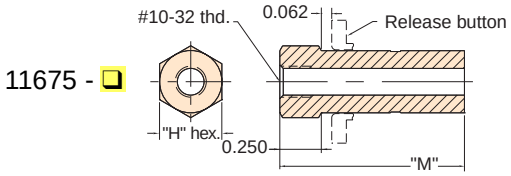
Part No.	Description	Part No.	Description
PQ-PG04	1/8” OD Tube	PQ-PG08	1/4” OD Tube
PQ-PG05	5/32” OD Tube	PQ-PG10	5/16” OD Tube
PQ-PG06M	6 mm OD Tube	PQ-PG12	3/8” OD Tube

Push-Quick Fitting Adapters

Clippard offers a variety of accessories that are designed for use with Push-Quick Fittings. These include special #10-32 threaded adapters in both male (p/n 11674) and female (p/n 11675) thread configurations and adapters that can be used to plug a Push-Quick fitting.

The threaded adapters insert into Push-Quick Fittings and provide either a male or female thread that can be used to mount any Clippard product with a #10-32 threaded inlet. This allows the direct attachment of the product to a Push-Quick Fitting without hoses or additional fittings.



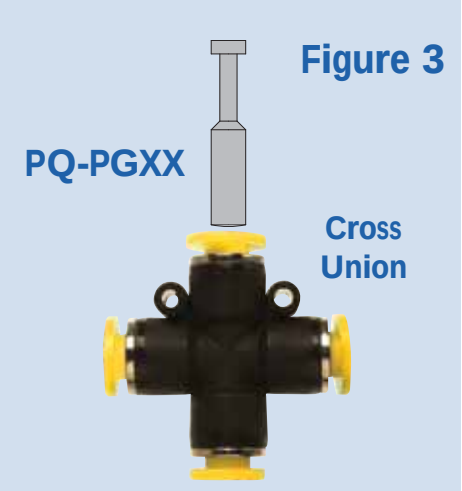


Part Dash #	Tubing Size	“D”	“H”	“L”	“M”	“N”
- 05	5/32”	0.312”	1/4”	0.993”	0.962”	1.212”
- 08	1/4”	0.312”	1/4”	1.003”	0.972”	1.222”
- 12	3/8”	0.437”	3/8”	1.143”	1.112”	1.362”

Figure 1 shows an MAV-3 3-Way Valve connected to a PQ-RT05P Run Tee using a 11674-05 Adapter. In this example, the Run Tee is connected to a 1/8” NPT supply pipe.

Figure 2 shows an IND-1M-WH Pressure Indicator connected to a PQ-TU08 Tee Union using a 11675-08 Adapter. If one of the branches of a Push-Quick Fitting is to be used as a temporary pressure gauge port, the PQ-PGXX series of Plugs can be used when the gauge is not in place. Plugs may also be used if Push-Quick Fitting branches are intended for future additions to the circuit, but have no current need.

Figure 3 shows a PQ-CU Cross Union with one branch plugged with a PQ-PG08 Plug.



MINIMATIC® SLIP-ON FITTINGS

Minimatic slip-on fittings provide a flexible, easy alternative to ferrule and push-to-connect design fittings.

Clippard Minimatic slip-on fittings are designed to be used with Clippard urethane hose. The flexibility and strength of urethane hose and the compact design of the fittings are ideal for pneumatic applications where convenience and size are considerations. The Minimatic slip-on fitting used with Clippard urethane hose will provide a leak free connection that will hold well beyond the working pressure of the hose without the need for additional clamps.

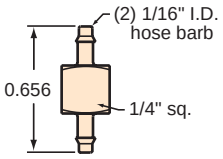
Minimatic slip-on fittings are available in a wide variety of configurations in a number of styles including tee, connectors, crosses, swivel, and universal. Barb sizes can be mixed on the same fitting for applications requiring multiple tubing sizes. The electroless nickel plating of Minimatic slip-on fittings provides corrosion resistance in applications involving high moisture, while enabling the fittings to retain their original, lustrous appearance. Buna-N gasket included with #10-32 threads except when ordered in bulk.

Features

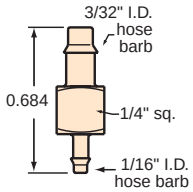
- Single barb design for quick and easy positive seal
- Miniature size provides low profile
- Multiple configurations for every need
- Brass Electroless nickel plating
- Available with 1/16", 3/32" or 1/8" hose barb
- Available with #10-32 thread and 1/8" NPT
- Holds to the burst pressure of polyurethane hose

CONNECTOR FITTINGS

C22



C32



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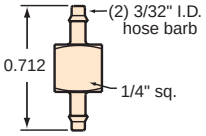
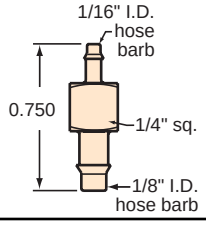
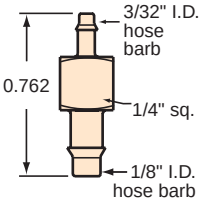


C42



C43



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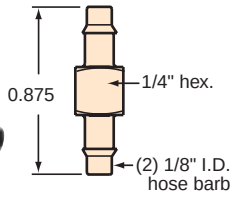
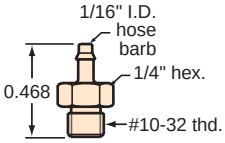


#10-32 to Hose Connectors

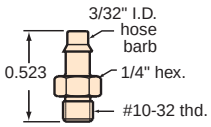
CT2

Gasket comes pre-installed



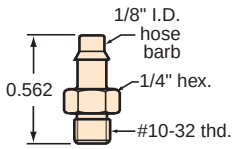
CT3

Gasket comes pre-installed



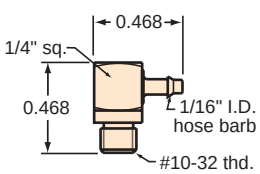
CT4

Gasket comes pre-installed



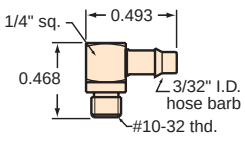
CT0-2

Gasket included. Not installed



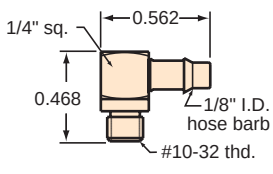
CT0-3

Gasket included. Not installed



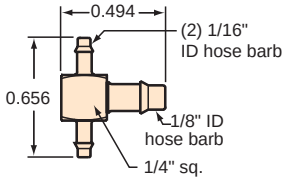
CT0-4

Gasket included. Not installed

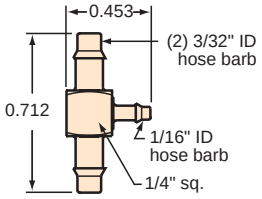


"T" FITTINGS

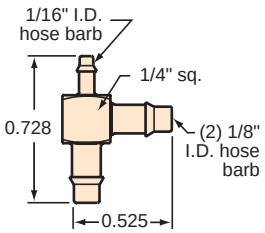
T22-3



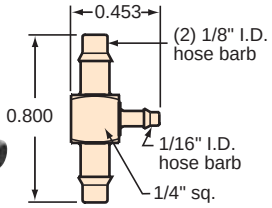
T33-2



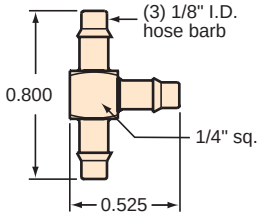
T42-4



T44-2



T44-4



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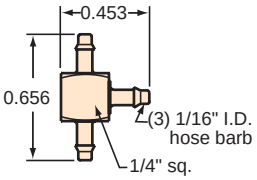
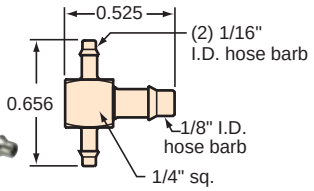


T22-4



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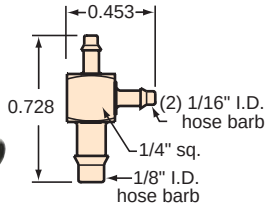
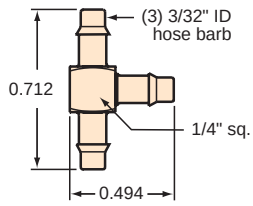


T33-3



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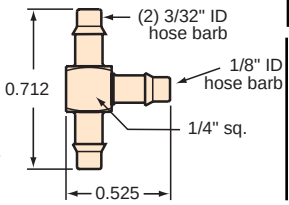
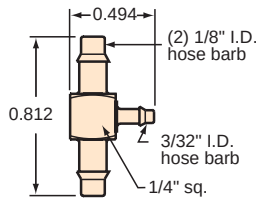


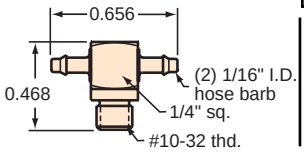
T44-3



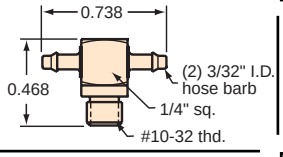
#10-32 to "T" Fittings

Gasket: Buna-N gasket included (not installed)

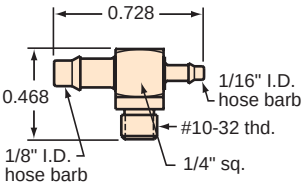
TT0-202



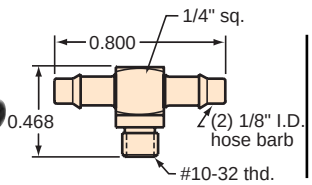
TT0-303



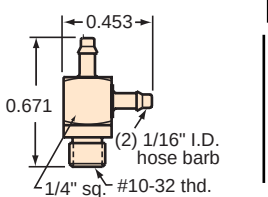
TT0-402



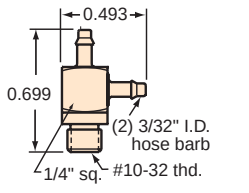
TT0-404



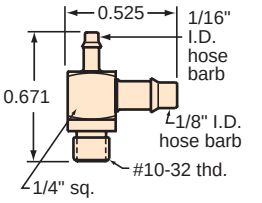
TT2-2



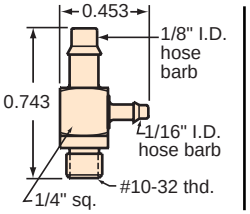
TT3-3



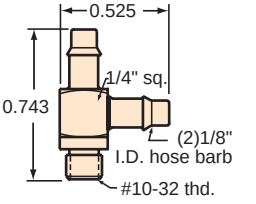
TT2-4



TT4-2

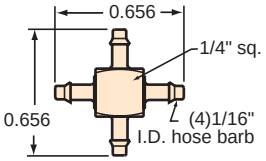


TT4-4

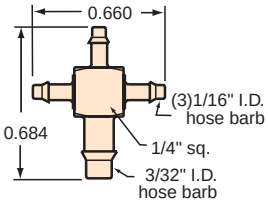


"X" FITTINGS

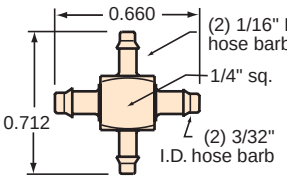
X22-202



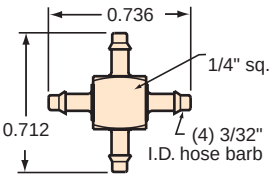
X32-202



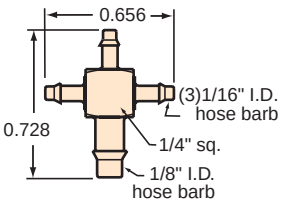
X33-202



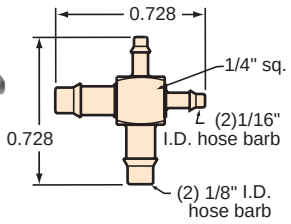
X33-303



X42-202



X42-402



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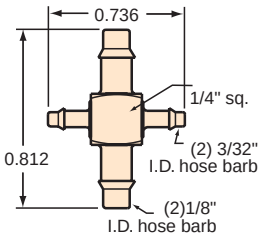
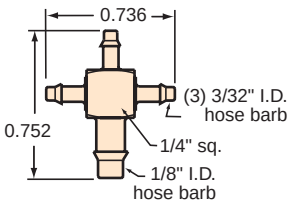
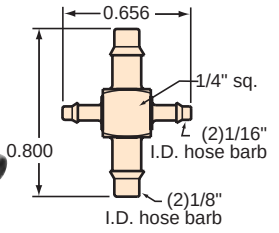


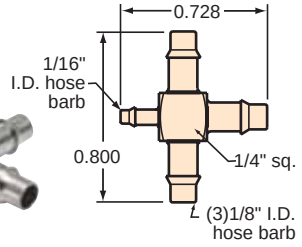
X43-303



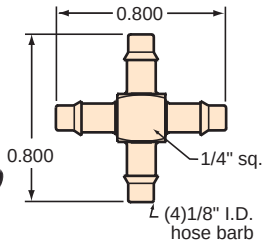
X44-202



X44-402



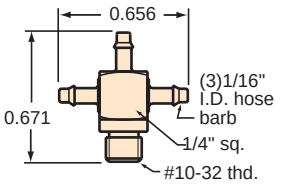
X44-404



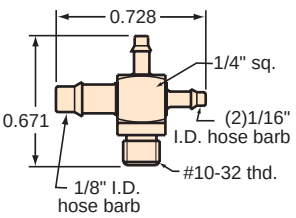
#10-32 to Hose "X" Fittings

Gasket: Buna-N gasket included (not installed)

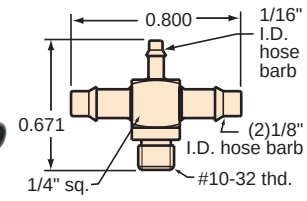
XT2-202



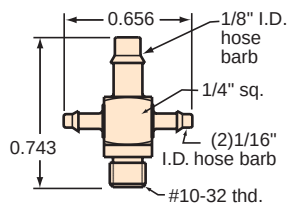
XT2-402



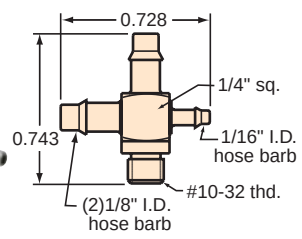
XT2-404



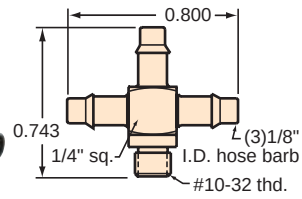
XT4-202



XT4-402



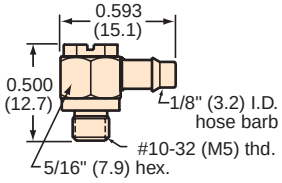
XT4-404



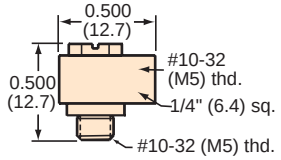
UNIVERSAL FITTINGS

Buna-N o-ring included with universal fittings

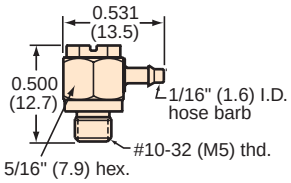
UT0-4
UT0-4-M5



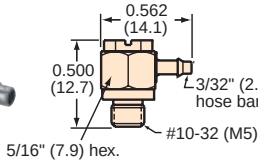
UT0-F
UT0-F-M5



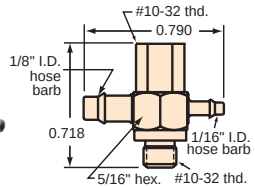
UT0-2
UT0-2-M5



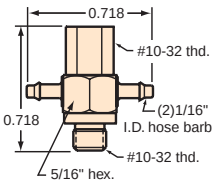
UT0-3



UTF-4002



UTF-2002



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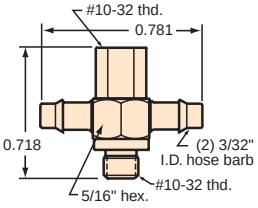
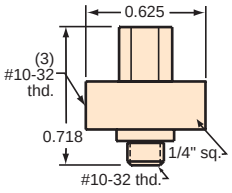
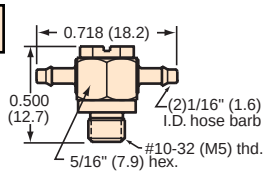


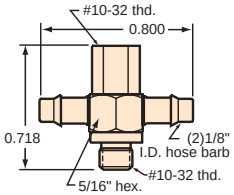
UTF-F0F



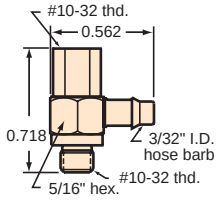
UT0-2002
UT0-2002-M5



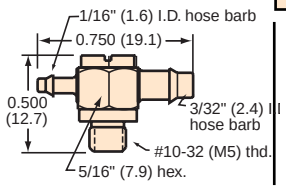
UTF-4004



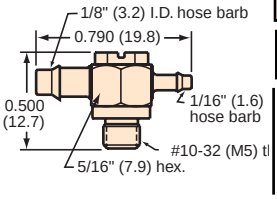
UTF-3



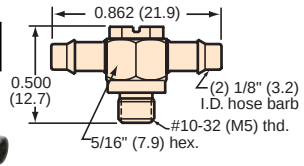
UT0-3002



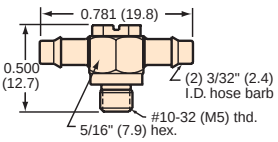
UT0-4002



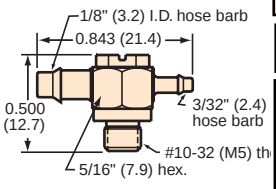
UT0-4004
UT0-4004-M5



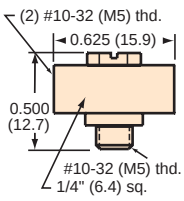
UT0-3003



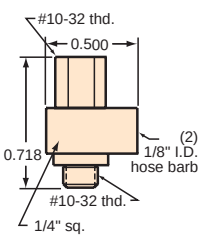
UT0-4003



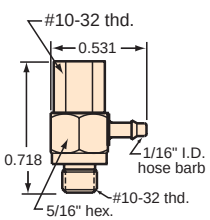
UT0-F0F
UT0-F0F-M5



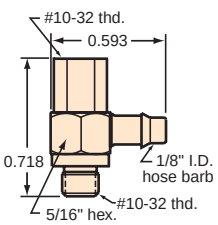
UTF-F



UTF-2

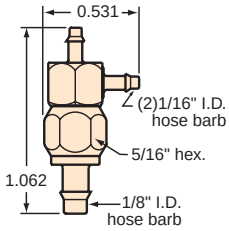


UTF-4

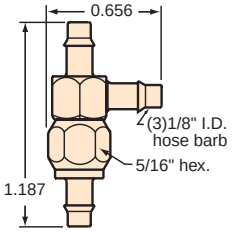


SWIVEL FITTINGS

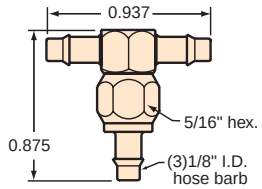
S42-2



S44-4

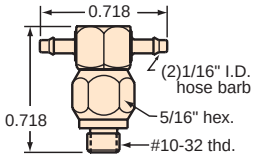


S40-4004

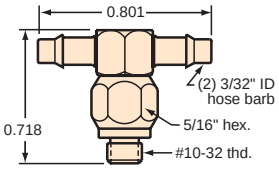


#10-32 to Hose Swivel "T" Fittings

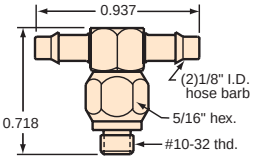
ST0-2002



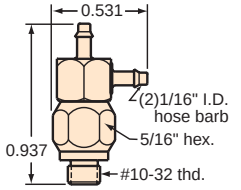
ST0-3003



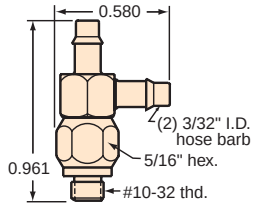
ST0-4004



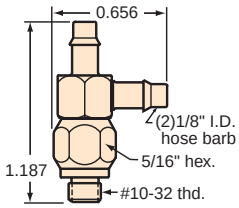
ST2-2



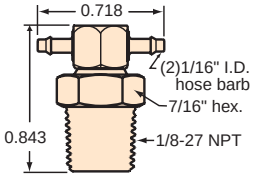
ST3-3



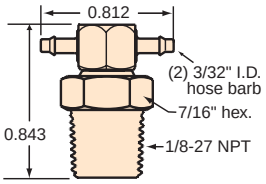
ST4-4



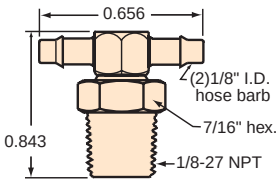
SP0-2002



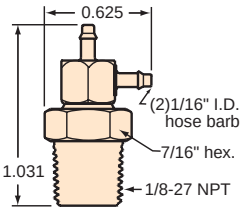
SP0-3003



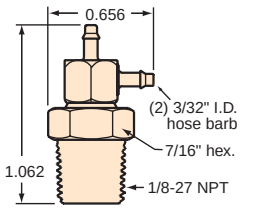
SP0-4004



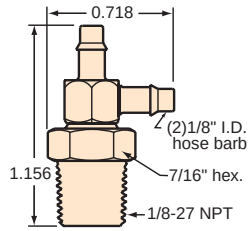
SP2-2



SP3-3



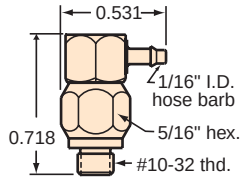
SP4-4



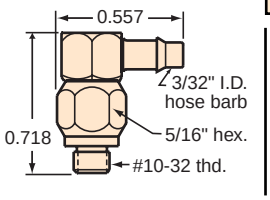
Tip Most Clippard #10-32 threaded fittings require no more than 9 inch pounds of torque to seal. We recommend that this force not be exceeded.

#10-32 to Hose Swivel "L" Fittings

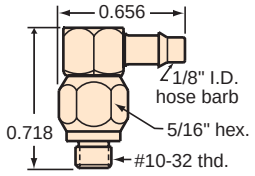
ST0-2



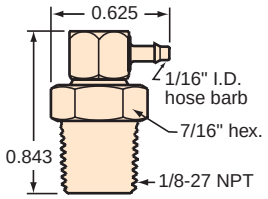
ST0-3



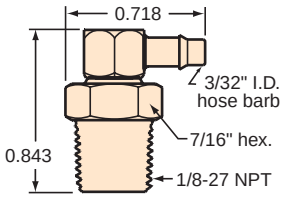
ST0-4



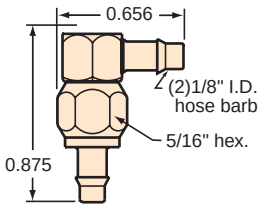
SP0-2



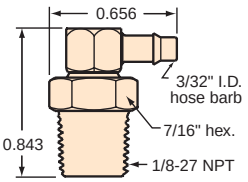
SP0-4



S40-4

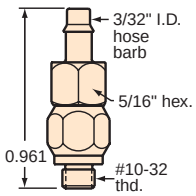


SP0-3

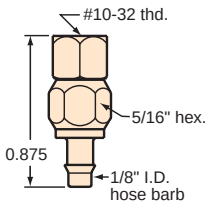


Connector Swivel Fittings

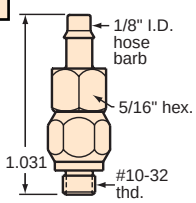
ST3



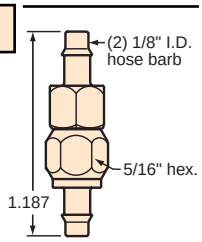
S4F



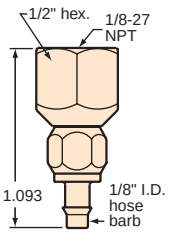
ST4



S44

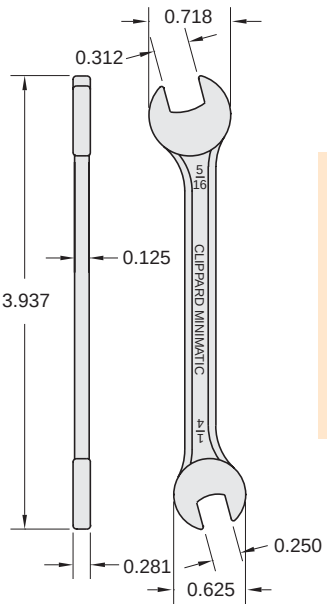


S4N



11770

Material: Chrome plated steel



Tips On Using Slip-On Fittings

Hose or Tubing Size

The use of different sizes of hose or tubing in your circuits deserves some care and consideration. In general, follow the manufacturer's guide for the size of hose or tubing you use. For air logic circuits, we recommend 1/16" I.D. for pilots and 1/8" I.D. for supplies and outputs.

Swivel Fittings

Minimatic® swivel connector fittings are very efficient in applications where joints need to be disconnected and reconnected frequently. Made with a threaded connection on one end and a swivel connection on the other, these fittings provide a true cost savings on pneumatic circuit designs. They are valuable also where short lengths of hose are being connected. Note: These are not rotating joints. They are for assembly benefits... not as a constant rotation connection.

Tightening #10-32 Fittings

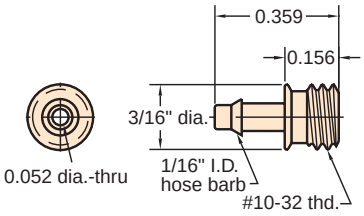
TIGHTEN WITH CARE. Often a "finger tight" connection between Clippard fittings with anaerobic sealant is all that is required. When using a gasket, most Clippard #10-32 threaded fittings require no more than 9 inch pounds of torque to seal. We recommend that this force not be exceeded. Use wrench #11770 with a 1/4" and 5/16" open-end.

Brass Barb to #10-32 Fittings

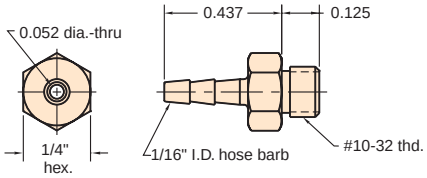
Material: Brass **Gasket:** Buna-N furnished in package only
Replacement 11761-2 **Options:** (-NP), (-M5 on 11752-2, 11752-3, 11752-4 and 11752-5)

Hose Barb

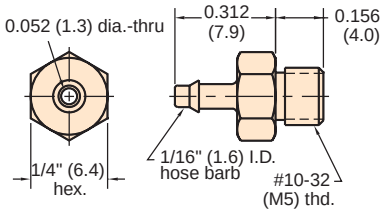
1/16" ID



12841*

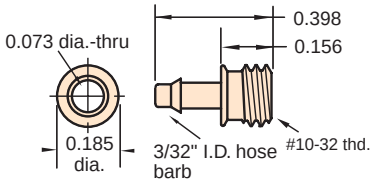


11752-2 & 11752-M5 (metric)

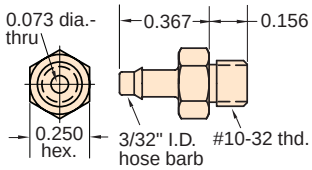


11752-5 & 11752-5-M5 (metric)

3/32" ID



12843*

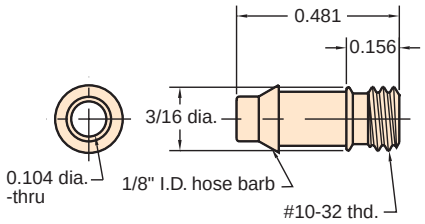


11752-8

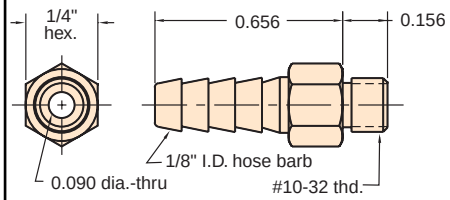
* Gasket not required; use thread sealant.

Tighten by hand for flush mounting in #10-32 threaded holes.

1/8" ID

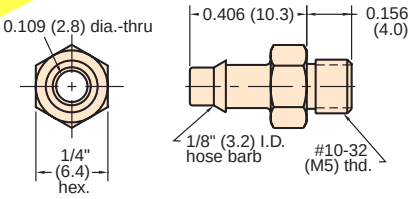


12842*

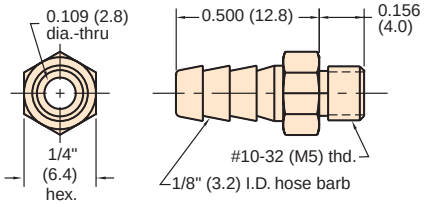


11752-1

#1 Recommended



11752-4 & 11752-4-M5 (metric)



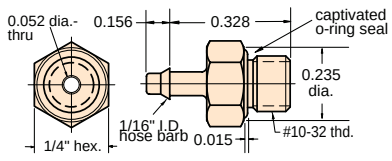
11752-3 & 11752-3-M5 (metric)

Brass Barb to #10-32 Fittings with Captivated O-Rings

Material: Brass **Seal:** Buna-N o-ring furnished installed **Options:** (-NP)

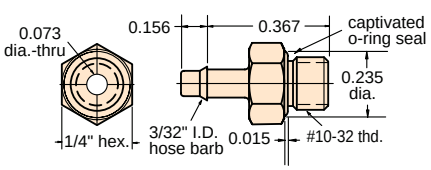
Hose Barb

1/16" ID



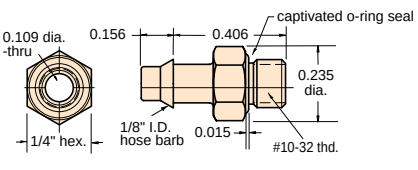
11792-5

3/32" ID



11792-8

1/8" ID



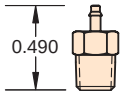
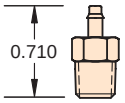
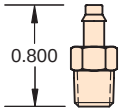
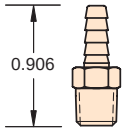
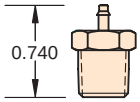
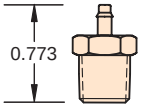
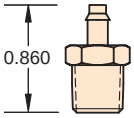
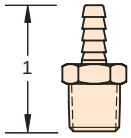
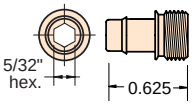
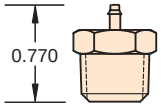
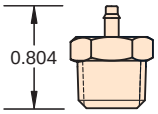
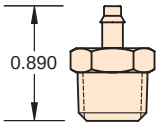
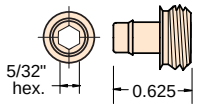
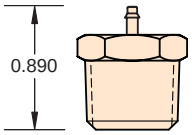
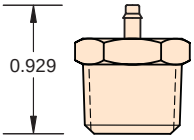
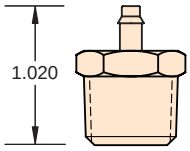
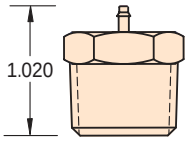
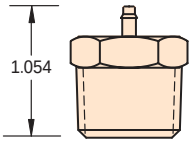
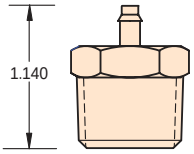
11792-4

Material: Brass

Thread: Standard Pipe Thread

Options: (-NP)



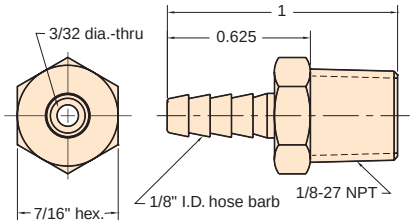

External Thread	Hose Barb(s)			
	1/16" ID	3/32" ID	1/8" ID	1/4" ID
1/16" NPT Thread (5/16" Hex.)			 	
Part No.	**1CJ2**	**1CJ3**	**1CJ4**	**11924-2**
1/8" NPT Thread (7/16" Hex.)			 	
Part No.	**2CP2**	**2CP3**	**2CP4**	**11924-1***	**12844**
1/4" NPT Thread (9/16" Hex.)				
Part No.	**4CQ2**	**4CQ3**	**4CQ4**	**12845**
3/8" NPT Thread (11/16" Hex.)				
Part No.	**6CW2**	**6CW3**	**6CW4**	
1/2" NPT Thread (13/16" Hex.)				
Part No.	**8CZ2**	**8CZ3**	**8CZ4**	

*Also available with G1/8 thread. Add -MG to the part number.

Brass Barb Fittings

11924-1

1/8" NPT to 1/8" I.D. Hose Fitting



Material: Brass

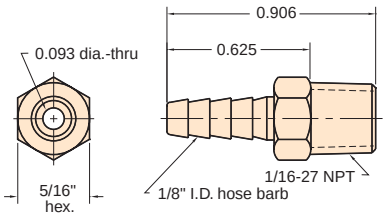
Thread: 1/8" NPT

Use: Joins standard pipe to 1/8" I.D. hose

Options: (-NP), (-MG)

11924-2

1/16" NPT to 1/8" I.D. Hose Fitting



Material: Brass

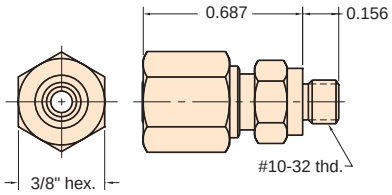
Thread: 1/16" NPT

Use: Joins standard pipe to 1/16" I.D. hose

Options: (-NP)

11923

#10-32 to 1/8" O.D.Tube Compression Fitting



Material: Brass

Thread: #10-32

For Tubing: 3811-1 copper
3814-2 nylon

Options: (-NP)

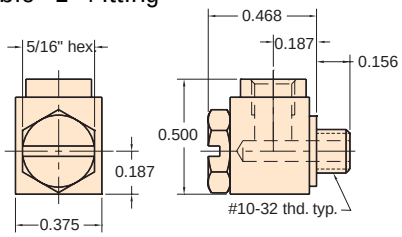
Features: One piece ferrule and nut for fast, easy insertion of tube

Replacement Ferrule & nut #15155

Clippard's reputation of building jigs, fixtures and machines as well as modifying existing machines to improve productivity is carried on in its well equipped machine shop. New product prototypes are crafted by experienced engineers and machinists.

15002-1

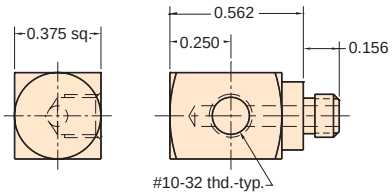
Adjustable "L" Fitting



Material: Brass body, stainless steel stud
Stud: Stainless steel hex head with screwdriver slot (12292)
Thread: #10-32
Seals: Buna-N o-ring furnished
Use: Permits port to be aimed 360˚ in one plane, then secured by tightening screw. Also useful in connecting and disconnecting hose in hard-to-reach locations.
Options: (-NP)

15002-2

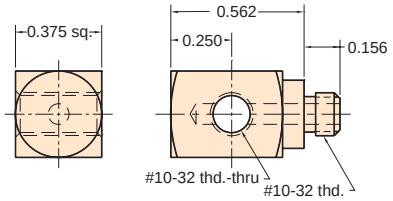
"L" Fitting



Material: Brass
Thread: #10-32
Gasket: Buna-N furnished in package only
Use: Allows ports to be brought out 90˚ to the side. For exact positioning use thread sealant
Options: (-NP)

15002-3

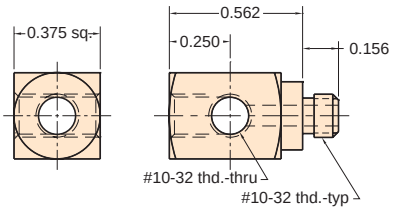
"T" Fitting



Material: Brass
Thread: #10-32
Gasket: Buna-N furnished in package only
Use: Like the "L" fitting, except ports out both sides. For precise positioning use thread sealant
Options: (-NP)

15002-4

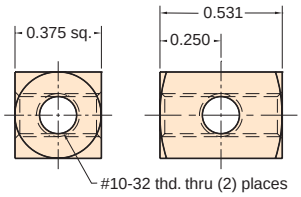
"X" Fitting



Material: Brass
Thread: #10-32
Gasket: Buna-N furnished in package only
Use: May be used as a miniature manifold, or "L" or "T" fitting by plugging unused ports with screw plug 11755. For precise positioning use thread sealant
Options: (-NP)

15002-5

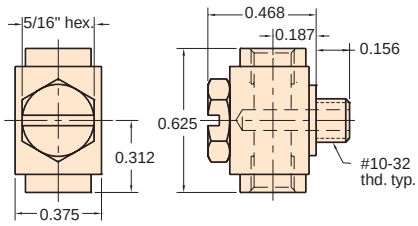
"X" Coupling



Material: Brass
Thread: #10-32
Use: Ideal as small manifold.
Options: (-NP)

15002-6

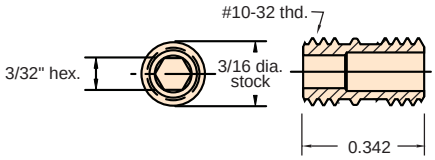
Adjustable "T" Fitting



Material: Brass
Thread: #10-32
Stud: Stainless steel hex head with screwdriver slot (12292)
Seals: Buna-N o-ring furnished
Use: Permits ports to be aimed in any direction 360˚ in one plane then secured by tightening screw. Also useful for connecting or disconnecting hose in tight spots.
Note: Same dimensions as 15002-1 "L" fitting, except length, which is 5/8"
Options: (-NP)

15453

Male #10-32 Coupling



Material: Stainless steel

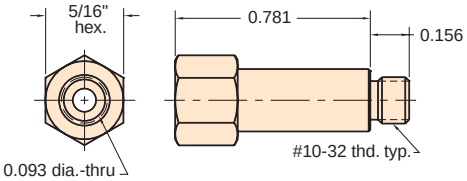
Thread: #10-32

Seals: Loctite necessary

Use: Excellent for a surface to surface connection of female #10-32 products

15010

#10-32 Extension Fitting



Material: Brass

Thread: #10-32

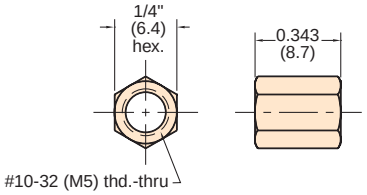
Gasket: Buna-N furnished

Use: To provide extension for convenience in assembling components

Options: (-NP)

15004

#10-32 Female Hex Coupling



Material: Brass

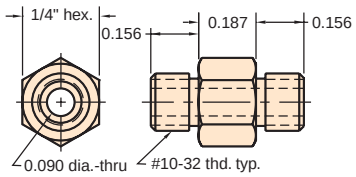
Thread: #10-32 tapped (M5)

Use: For coupling two #10-32 (M5) male fittings

Options: (-NP), (-M5)

11999

#10-32 Male Connector



Material: Brass

Thread: #10-32 both ends

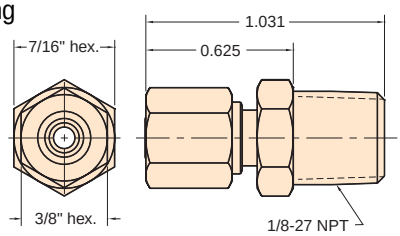
Gaskets: Buna-N 2 furnished

Use: For coupling cylinders directly to valves, and many other coupling arrangements

Options: (-NP)

3810-1

1/8" NPT to 1/8" O.D. Tube Compression Fitting



Material: Brass

Thread: 1/8" NPT

Use: Joins standard size pipe to 3811-1 copper or 3814-2 nylon tubing

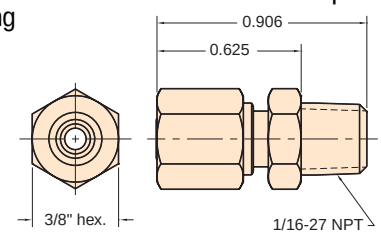
Replacement Ferrule & Nut: 15155

Options: (-NP)

Features: One piece ferrule and nut for fast, easy insertion of tube

3810-2

1/16" NPT to 1/8" O.D. Tube Compression Fitting



Material: Brass

Thread: 1/16" NPT

Use: Joins standard size pipe to 3811-1 copper or 3814-2 nylon tubing

Replacement Ferrule & Nut: #15155

Options: (-NP)

Features: One piece ferrule and nut for fast, easy insertion of tube

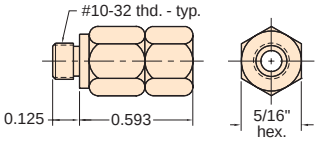
SWIVEL FITTINGS

Minimatic® swivel connector fittings are very efficient in applications where joints need to be disconnected and reconnected frequently. Made with a threaded connection on one end and a swivel connection on the other, these fittings provide a true cost savings on pneumatic circuit designs. They are valuable also where short lengths of hose are being connected.

Note: These are not rotating joints. They are assembly benefits . . . not to be used as a constant rotation junction.

15040

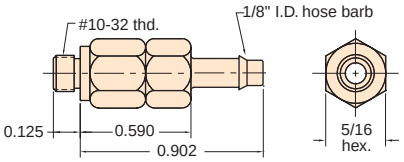
#10-32 Swivel Fitting



Material: Brass
Thread: #10-32
Seals: Buna-N o-ring (gasket furnished package only)
Use: Allows connection to rotate for tightening in confined spaces
Note: Used for positioning not for rotary connector
Options: (-NP)

15045

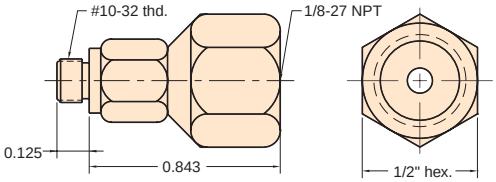
#10-32 to 1/8" I.D. Hose Swivel Fitting



Material: Brass
Thread: #10-32
Seals: Buna-N o-ring (gasket furnished package only)
Use: Allows connection to rotate for tightening in confined spaces
Hose Barb: 1/8" I.D. hose
Note: Used for positioning not for rotary connector
Options: (-NP)

15050

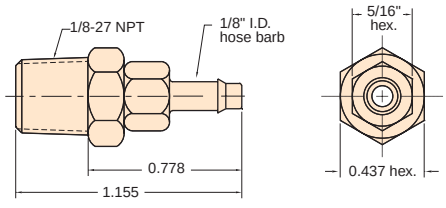
1/8" NPT to #10-32 Swivel Adapter



Material: Brass
Thread: #10-32 and tapped for 1/8-27 NPT
Seals: Buna-N o-ring (gasket furnished package only)
Use: Allow connection to rotate for tightening in confined spaces
Note: Used for positioning not for rotary connector
Options: (-NP)

15055

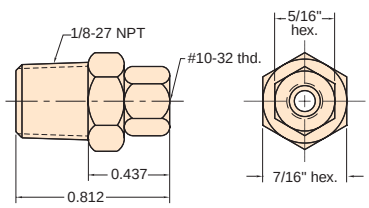
1/8" NPT to 1/8" I.D. Hose Swivel Fitting



Material: Brass
Thread: 1/8-27 NPT
Seals: Buna-N o-ring
Use: Allows connection to rotate for tightening in confined spaces
Hose Barb: 1/8" I.D. hose
Note: Used for positioning not for rotary connector
Options: (-NP)

15060

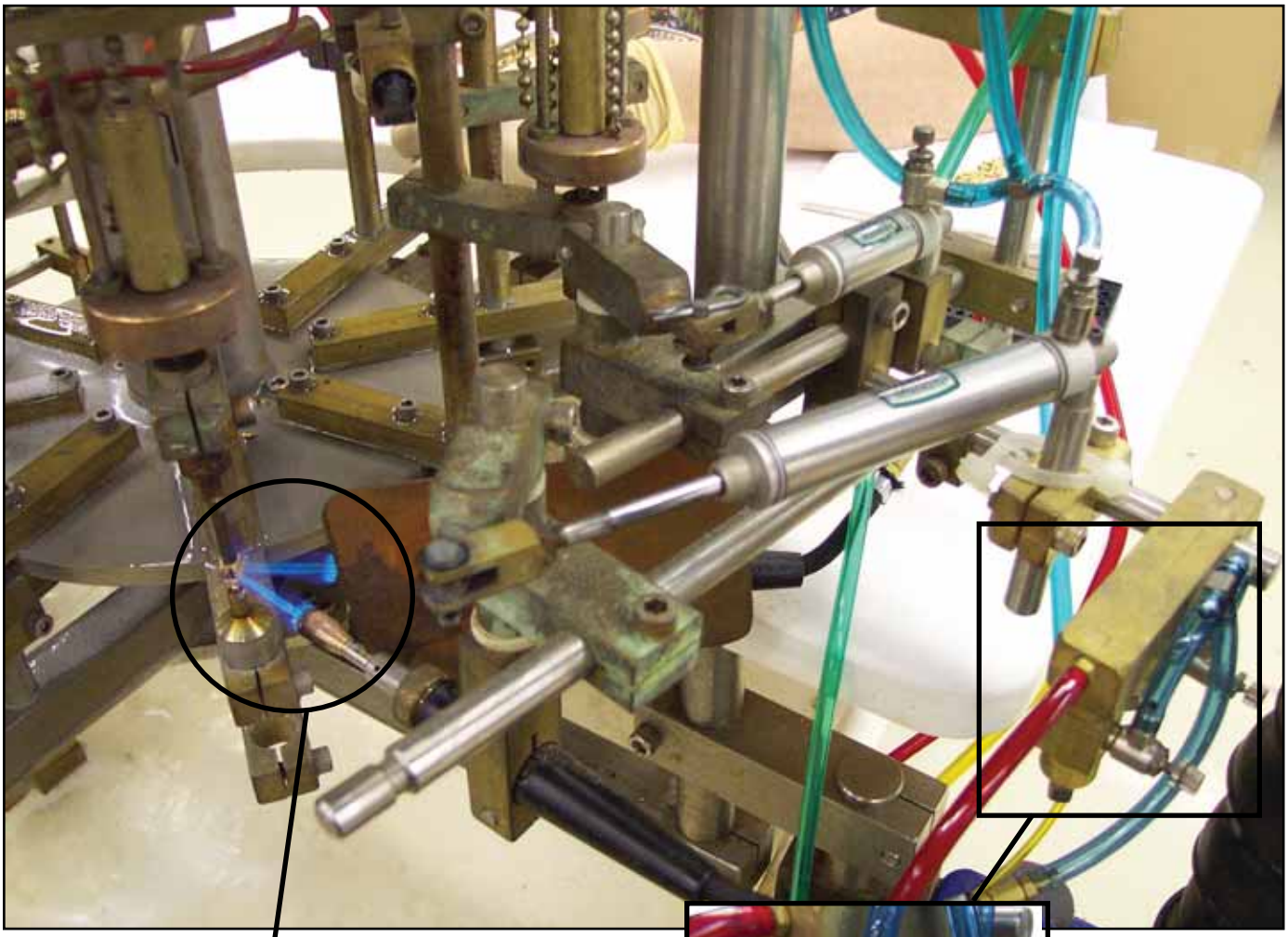
1/8" NPT to #10-32 Swivel Adapter



Material: Brass
Thread: 1/8-27 NPT male and #10-32 tapped
Seals: Buna-N o-ring
Use: Allows connection to rotate for tightening in confined spaces.
Note: Used for positioning not for rotary connector
Options: (-NP)

Clippard Slip-on Fitting Assembly

This semi-automatic rotary solder machine was designed and built in-house for the Clippard slip-on fitting product line. Incorporated into the design are Clippard modular valves, stainless steel cylinders, brass valves, flow controls, slip-on fittings, hose and super structure providing framework, control, indexing and parts handling.

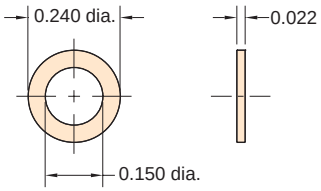


The machine consists of a rotating center carousel with eight stations. The individual components of each slip-on fitting are loaded into clamp fixtures mounted on the carousel. The carousel indexes to each of the process stations: load, heat, cool, quench, and unload. The control and timing of the machine is accomplished using Clippard modular valves and brass limit valves. Each clamp fixture has its own control circuit for manual and automatic control. Sensors are also incorporated at each clamp fixture to sense the presence of a part.

The heat station uses MFC-3AK2's to meter propane, while PAV-2's turn the propane on and off. In addition, the torches are connected to cylinders so they are able to rotate for the heat cycle.

11761-2

Buna-N Gasket



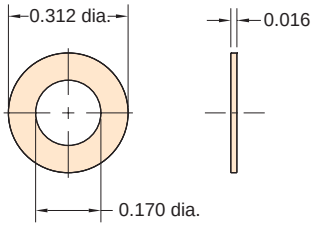
Material: Buna-N

Use: Buna-N gasket is designed for use with #10-32 threads; included with packaged Clippard fittings; replaces 11761-5

Temperature Range: -40 to +250˚ F

11761-3

Fiber Gasket



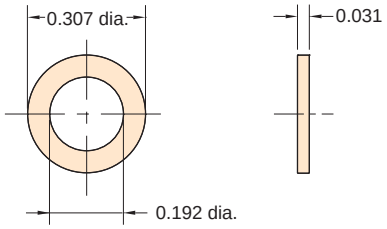
Material: Cellulose fiber & SBR latex

Use: Designed for use with #10-32 threads in high temperature applications

Temperature Range: -40 to +350˚ F

11761-4

Nylon Gasket



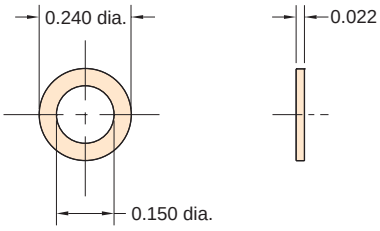
Material: Nylon

Use: Designed for use with #10-32 threads in applications that require nylon for chemical compatibility

Temperature Range: +40 to +200˚ F

11761-7

EPDM



Material: EPDM

Use: Designed for use with #10-32 threads in applications that require EPDM for low temperature or chemical compatibility; do not use with petroleum-based lubricants

Temperature Range: -60 to +300˚ F

Gasket Tips

Gaskets are recommended for use with Clippard fittings. They provide snug, dependable seals without extra effort or materials. The most popular gasket for static sealing of #10-32 threads is the 11761-2 Buna-N Gasket. This gasket is included with packaged fittings and comes installed on a variety of Minimatic® slip-on fittings. Overtightening fittings with gaskets may have a tendency to extrude the gasket. While this may be a concern, the actual sealing is being accomplished by a small piece of the gasket at the base of the threads.

Sealants

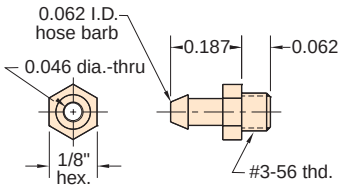
There are a number of brands of anaerobic sealants that may be used with Clippard fittings. Anaerobic sealants are applied wet and harden when no longer exposed to air. their proper use results in a very effective, low cost seal. There are several alternate sealing methods:

1. sealant alone
2. gasket alone
3. gasket and sealant combination

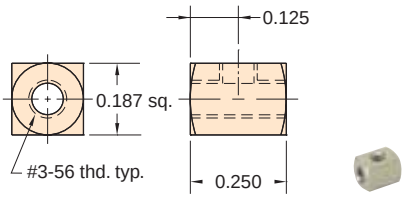
The first two methods will provide adequate sealing for normal air pressures. When extra resistance to vibration is necessary or a permanent orientation of the fitting is required, use of the combination of both gasket and sealant is recommended.

Material: Brass **Thread:** M2.5 - 0.45 (3-56 US equiv.) **Use:** Threads into Clippard subminiature cylinder; fits 1/16" I.D. hose

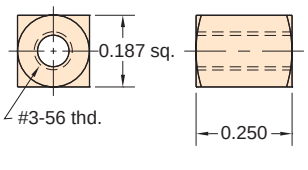
11750-2



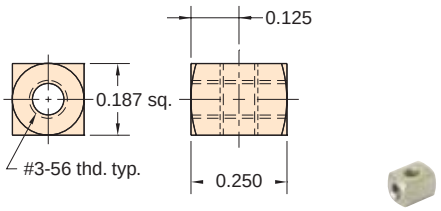
11749-2



11749-1

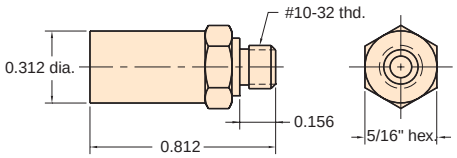


11749-3



15070

#10-32 Muffler



Material: Nickel plated brass body sintered stainless steel muffler (60 micron)

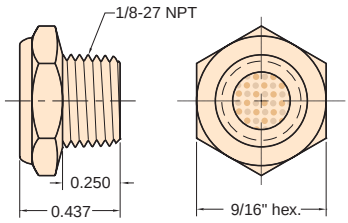
Thread: #10-32

Gasket: Buna-N furnished

Use: To muffle exhausts for quiet system operation

15080

1/8" NPT Muffler



Material: Solid brass body; sintered stainless steel insert (100 micron)

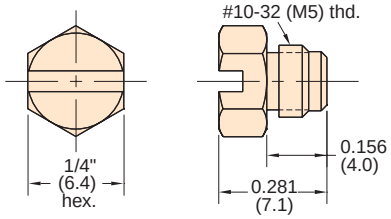
Thread: 1/8" NPT

Use: To muffle exhaust for quiet system operation

Options: (-NP)

11755

#10-32 Screw Plug



Material: Brass

Thread: #10-32 (M5)

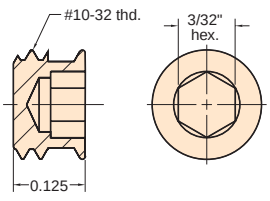
Gasket: Buna-N furnished package only

Use: For plugging unused ports in manifolds, air lines and other devices

Options: (-NP), (-M5)

0035-2

#10-32 Headless Screw Plug



Material: Stainless Steel screw plug

Thread: #10-32

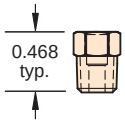
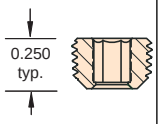
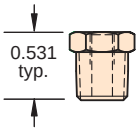
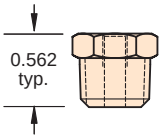
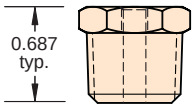
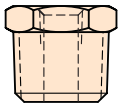
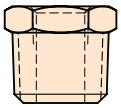
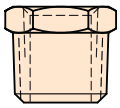
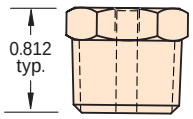
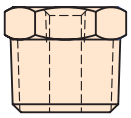
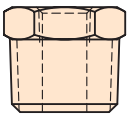
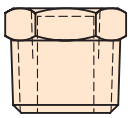
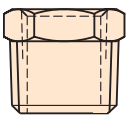
Use: For plugging unused ports in manifold, air lines and other devices that require a flush surface plug; use 3/32 Allen hex wrench to install

Note: Thread sealant recommended

Material: Brass

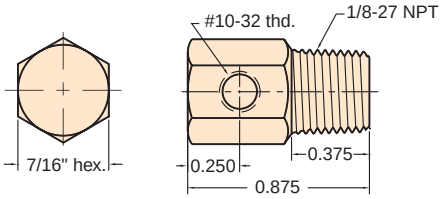
Use: Will adapt standard pipe to fittings and Clippard miniature components

Option: (-NP)

External Thread	Internal Thread					
	#10-32	#10-32	1/16" NPT	1/8" NPT	1/4" NPT	3/8" NPT
1/16" NPT Thread (5/16" Hex.)		 				
Part No.		1CJF				
1/8" NPT Thread (7/16" Hex.)						
Part No.	15036*	2CPF	2CPK			
1/4" NPT Thread (9/16" Hex.)						
Part No.		4CQF	4CQK	4CQN		
3/8" NPT Thread (11/16" Hex.)						
Part No.		6CWF	6CWK	6CWN	6CWY	
1/2" NPT Thread (13/16" Hex.)						
Part No.		8CZF	8CZK	8CZN	8CZY	8CZD

15090-1

1/8" NPT to #10-32 "L" Fitting



Material: Brass

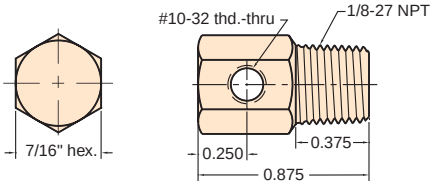
Thread: 1/8" NPT to #10-32

Use: To provide connections between the two thread sizes with mounting convenience

Options: (-NP)

15090-2

1/8" NPT to #10-32 "T" Fitting



Material: Brass

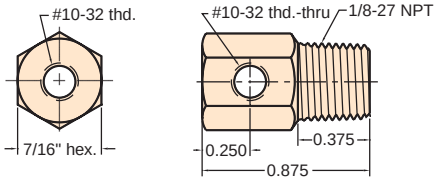
Thread: 1/8" NPT to #10-32

Use: To provide connections between the two thread sizes with extra mounting convenience

Options: (-NP)

15090-3

1/8" NPT to #10-32 "X" Cross Fitting



Material: Brass

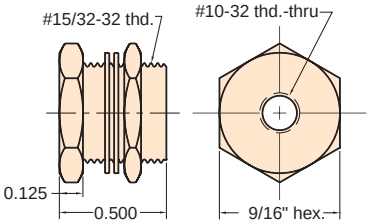
Thread: 1/8" NPT to #10-32

Use: To provide connections between the two thread sizes; can be used as a miniature manifold

Options: (-NP)

15027

#10-32 Bulkhead Fitting



Material: Brass

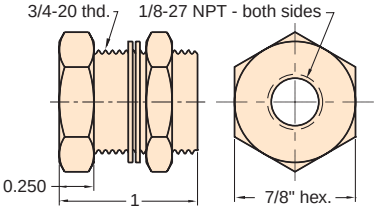
Thread: #10-32 tapped both ends

Locking Nut: 9/16" furnished with 2 steel lockwashers

Use: Provides rigid connection thru panels or bulkheads up to 1/4" thick; use with any Clippard #10-32 threaded fitting or connector

15029-1

1/8" NPT Bulkhead Fitting



Material: Brass

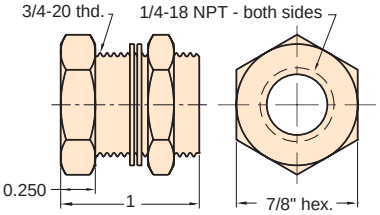
Thread: O.D. - 3/4 - 20, I.D. 1/8" NPT

Locking Nut: 7/8" hex furnished with 2 steel lockwashers

Use: Provides rigid connection thru panels or bulkheads up to 1/2" thick

15029-2

1/4" NPT Bulkhead Fitting



Material: Brass

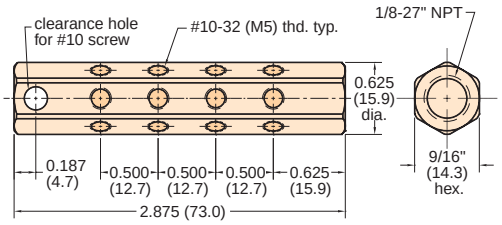
Thread: O.D. - 3/4 - 20, I.D. 1/4" NPT

Locking Nut: 7/8" hex furnished with 2 steel lockwashers

Use: Provides rigid connection thru panels or bulkheads up to 1/2" thick

MAN-12

12-Port Manifold



Material: Brass

Thread: Tapped ports: 1/8" standard pipe tapped inlet

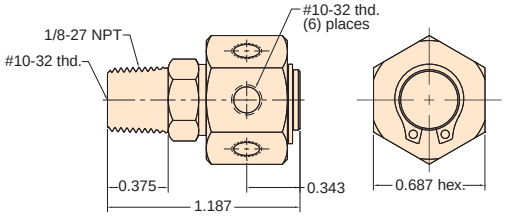
Mounting: 13/64" diameter mounting hole

Use: May be mounted on jigs, fixtures or machinery to provide up to 12 convenient #10-32 outlets from one standard 1/8" pipe connection; may be used with any Clippard #10-32 fittings, quick connects and many other devices; unused ports can be plugged with screw plug 11755

Options: (-NP)

MRM-6

6-Port Rotary Manifold



Material: Brass and stainless steel

Thread: 1/8" NPT for inlet is also tapped #10-32; outlet consists of 6 ports tapped #10-32

Seals: Buna-N o-ring furnished

Working Range: 250 psig max.

Air Flow: 5.9 scfm @ 50 psig

Use: May be used either as a rotary joint or as a stationary manifold; ideal for distributing air or liquid from center column onto a rotary index table; unused ports may be plugged with screw plug 11755 and gasket

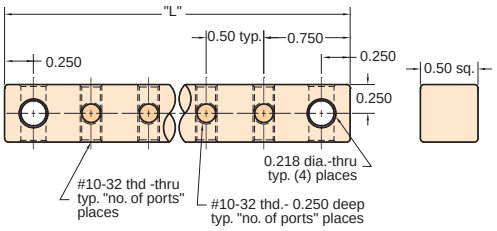
Low RPM applications

15028-❑

Miniature Terminal Blocks

X to be replaced with: 4, 6, 8, 10

15028-4 pictured above



Material: Anodized aluminum

Thread: #10-32 tapped ports

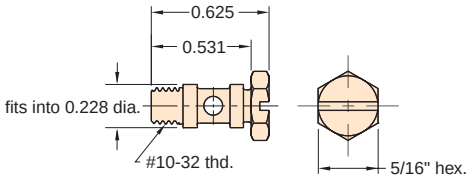
Mounting: With two 7/32: diameter mounting holes

Use: To help organize connections in circuit boxes, control panels and machine piping; cross drilled mounting holes permit mounting of "T" in any direction; use screw plug 11755 to plug unused ports

Model #	# of Ports	A	L
15028-4	4	2 1/2"	3"
15028-6	6	3 1/2"	4"
15028-8	8	4 1/2"	5"
15028-10	10	5 1/2"	6"

12292

Miniature Manifold Stud



Material: Stainless steel

Thread: #10-32

Seals: Buna-N o-ring and gasket furnished

Use: This hollow, cross-drilled stud is useful for connecting specially made manifolds to multiple ports of valves or cylinders, eliminating need for external fittings with hose

Tips On Using Minimatic® Fittings

Hose or Tubing Size

The use of different sizes of hose or tubing in your circuits deserves some care and consideration. In general, follow this guide for the size of hose or tubing you use.

For air logic circuits, we recommend:
1/16" I.D. for pilots
1/8" I.D. for supplies and outputs

B❑❑❑-❑❑

Block Manifold

B ❑ ❑ ❑ - ❑❑

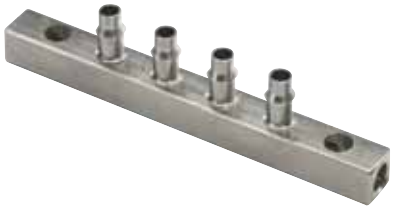
HH - Mounting Hole Both Ends
TT - #10-32 Thread Port Both Ends

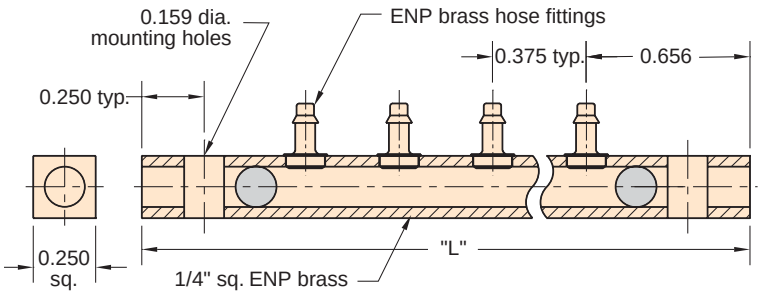
2 - 1/16" Barb
4 - 1/8" Barb

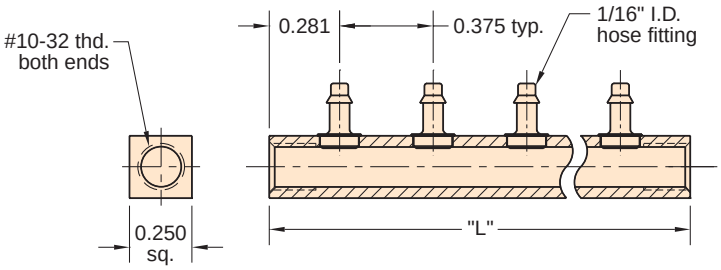
# of Barbs
04, 06, 08, 10, 12

Part #	# of Stations	Fitting Size
BHH2-04	4	1/16" I.D. Hose Barb
BHH2-06	6	
BHH2-08	8	
BHH2-10	10	
BHH2-12	12	
BHH4-04	4	1/8" I.D. Hose Barb
BHH4-06	6	
BHH4-08	8	
BHH4-10	10	
BHH4-12	12	

The BHH series has mounting holes for #6 screws at each end. One of the stations must be used as the air supply to the manifold.



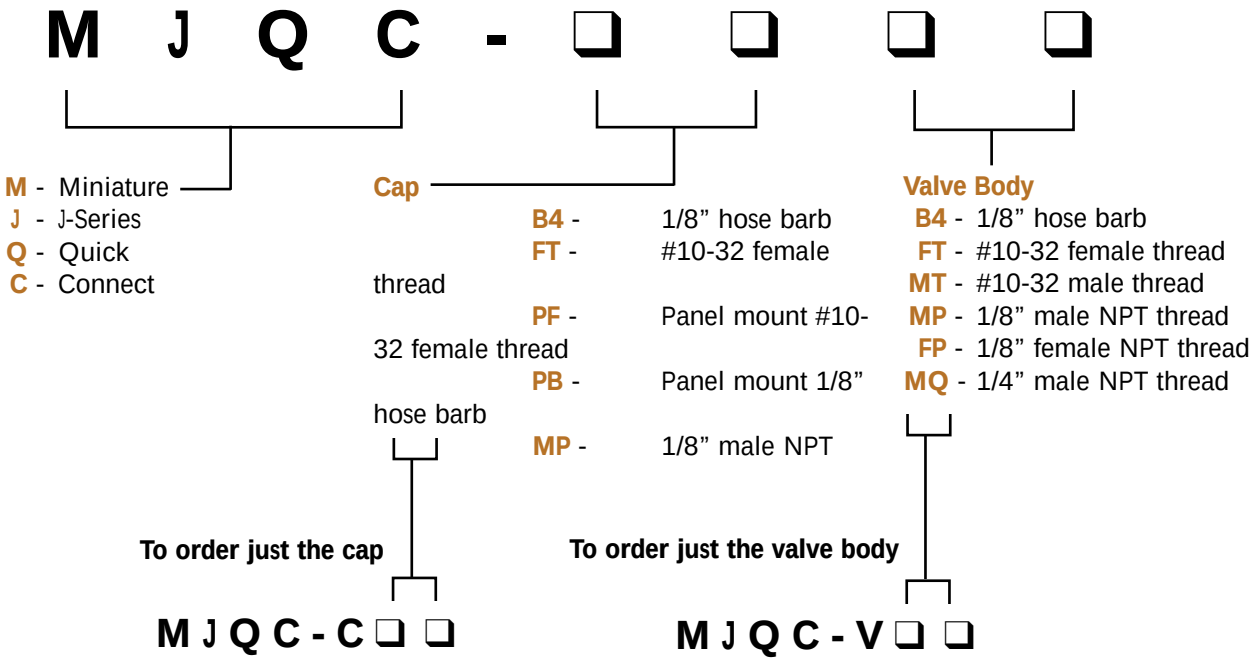




Part #	# of Stations	Fitting Size
BTT2-04	4	1/16" I.D. Hose Barb
BTT2-06	6	
BTT2-08	8	
BTT2-10	10	
BTT2-12	12	
BTT4-04	4	1/8" I.D. Hose Barb
BTT4-06	6	
BTT4-08	8	
BTT4-10	10	
BTT4-12	12	

The BTT series has #10-32 holes at each end for inline mounting. One end may be used as the air supply to the manifold and the other end plugged.

The Minimatic J-Series quick connect consists of two component parts that are joined to form the complete connector. The valve body contains a 2-way spring-loaded poppet valve that is generally connected to the main air supply. When the poppet is not depressed, the air supply is shut-off by this valve. The Cap contains a valve depressor that when assembled to the valve body, depresses the poppet allowing air to flow from the main supply to circuitry or equipment downstream. Valve body & cap assemblies contain both components.



STANDARD CATALOG PARTS		
Assembly	**Cap Only**	**Valve Body Only**
MJQC-B4B4	MJQC-CB4	MJQC-VB4
MJQC-B4MP	MJQC-CFT	MJQC-VFT
MJQC-MPB4	MJQC-CMP	MJQC-VFP
MJQC-PBB4	MJQC-CPB	MJQC-VMP
MJQC-PFB4	MJQC-CMQ	MJQC-VMQ

VALVE BODY & CAP ASSEMBLIES

*1/8 Barb - fits 1/8" I.D. hose. Ideal for use with Clippard 3814-6 polyurethane hose.

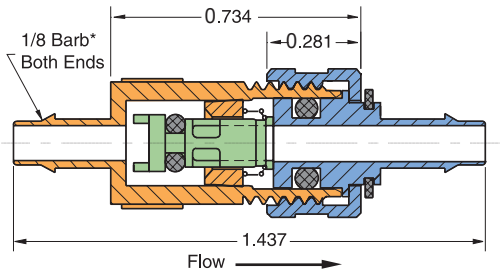
Minimatic® J-Series quick connect fittings are very compact yet provide a high flow of 14 scfm @ 100 psig. The electroless nickel plated brass body is available with #10-32 threads (M or F), 1/8" NPT threads (M or F), 1/4" NPT threads (M) or a 1/8" hose single barb configuration that is ideal for use with Clippard 3814-6 polyurethane hose.

FEATURES

- High flow of 14 scfm @ 100 psig
- Space saving attractive miniature design
- Wide variety of connectors
- Adds convenience to equipment and circuits
- Brass body, electroless nickel plated
- Non-corrosive - Delrin® poppet
- Fills the gap between clumsy, large quick connects and smaller quick connects with less flow
- Buna-N seals, positive shut off
- Positive threaded connection, stays connected
- Medium: air, oil, and water
- Working Pressure: 0-150 psig max.

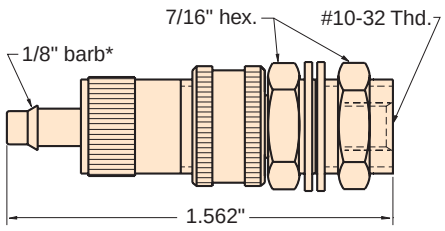
MJQC-B4B4

Combination of MJQC-VB4 & MJQC-CB4



MJQC-PFB4

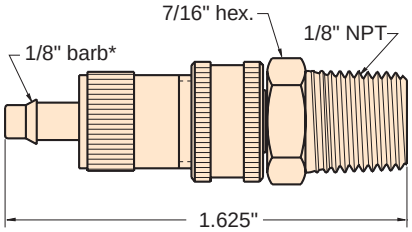
Combination of MJQC-VB4 & MJQC-CPF



(Supplied with mounting nut and two washers)

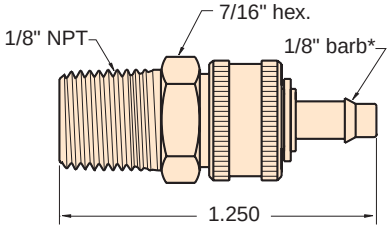
MJQC-MPB4

Combination of MJQC-VB4 & MJQC-CMP



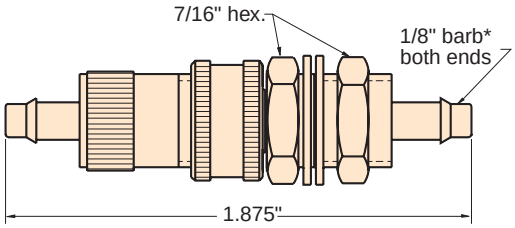
MJQC-B4MP

Combination of MJQC-VMP & MJQC-CB4



MJQC-PBB4

Combination of MJQC-VB4 & MJQC-CPB



(Supplied with mounting nut and two washers)

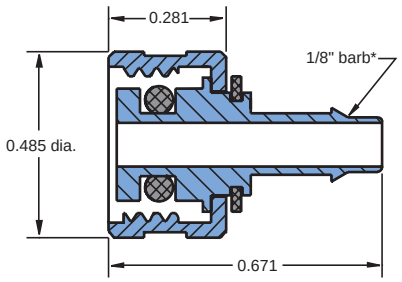
CAPS

Caps with open flow path

Minimatic J-Series quick connect fittings are ideal for use in jigs, fixtures, feeding devices, logic control circuitry and automatic or semi-automatic machinery. Assembly is simple, and the tightening of the knurled cap assures a positive, leakproof, high pressure connection that will stay connected.

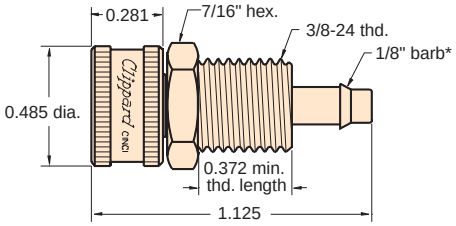
*1/8 barb - fits 1/8" I.D. hose. Ideal for use with Clippard 3814-6 polyurethane hose.

MJQC-CB4

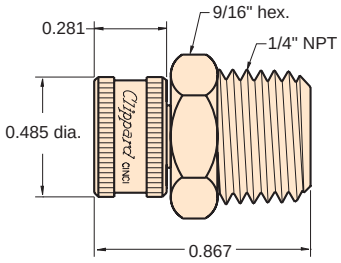


MJQC-CPB

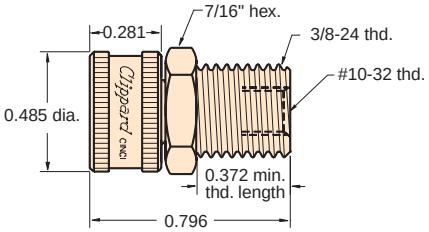
Supplied with mounting nut and two washers



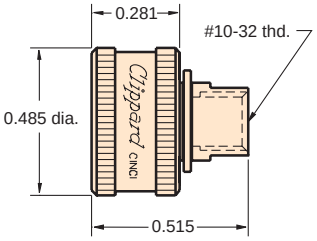
MJQC-CMQ



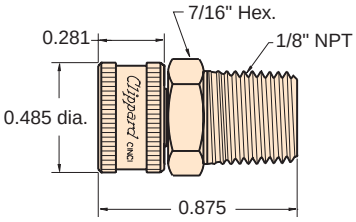
MJQC-CPF



MJQC-CFT



MJQC-CMP

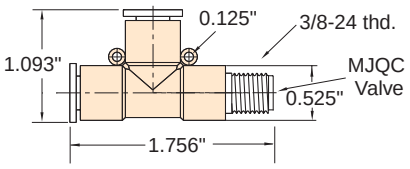


Push-Quick Fittings with MJQC Quick-Connect Port

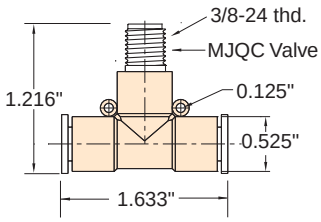
These 1/4" fittings combine the quick, easy Push-Quick functionality with the flexibility and security of the Quick-Connect series with no circuit interruption. MJQC Quick-Connect Caps (ordered separately above) attach to the threaded port allowing for a variety of uses.

Part No.	Description
PQ-RT08QC	Run T with 3/8-24 Thread
PQ-BT08QC	Branch T with 3/8-24 Thread

- Serves as an easy connection point for temporary functions/circuitry
- Quickly test for air flow
- Easy connection to valves, cylinders, hose, etc.
- Check air pressure via a gauge
- Use as a dump valve/vent



PQ-RT08QC



PQ-BT08QC

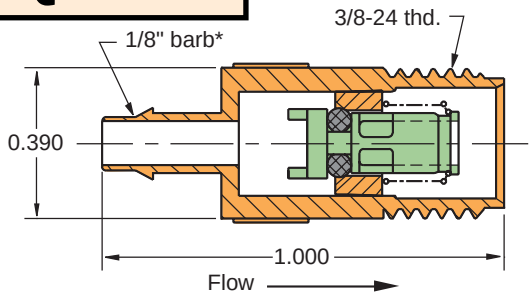
VALVE BODIES

Valve bodies with shut-off valve

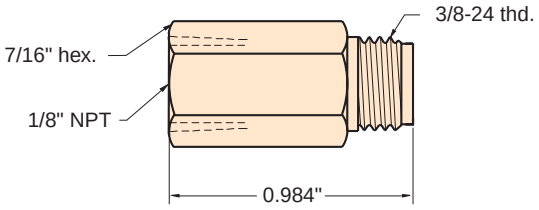
Minimatic J-Series quick connect fittings are very compact yet provide a high flow of 14 scfm @ 100 psig. The electroless nickel plated brass body is available with #10-32 threads (M or F), 1/8" NPT threads (M or F), 1/4" NPT threads (M) or a 1/8 hose single barb configuration that is ideal for use with Clippard 3814-6 polyurethane hose.

*1/8 Barb - fits 1/8" I.D. hose. Ideal for use with Clippard 3814-6 polyurethane hose.

MJQC-VB4

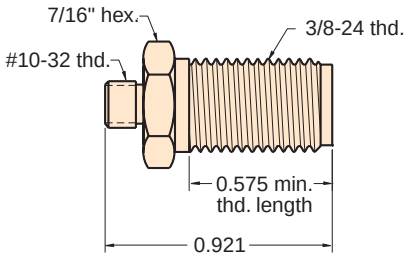


MJQC-VFP

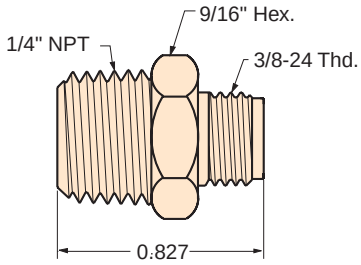


MJQC-VMT

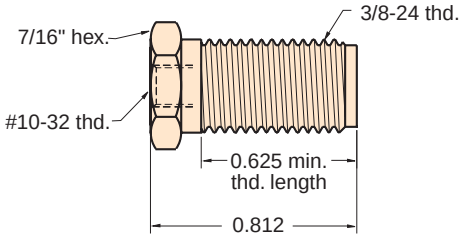
Supplied with mounting nut and two washers



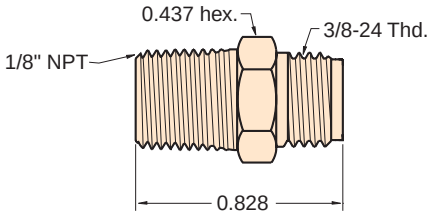
MJQC-VMQ



MJQC-VFT

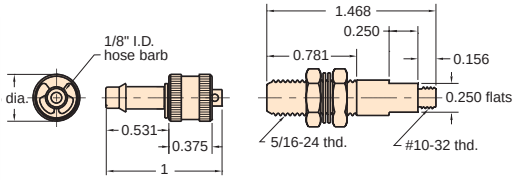


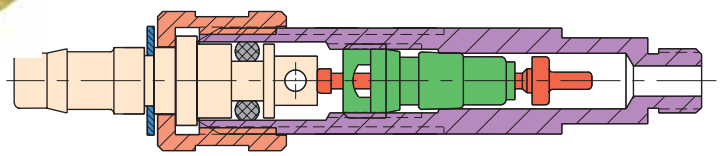
MJQC-VMP



MQC-2S

Quick Connect Assembly





Flow ←

Type: One way check quick connect assembly of valve body MQC-V2 and hose connector MQC-F

Material: Body- brass, Stem- brass

Seals: Buna-N

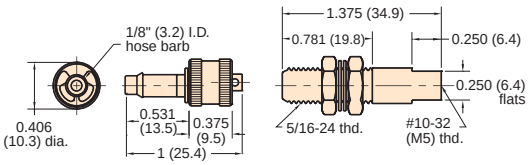
Working Pressure: 0 to 300 psig

Air Flow: 3.0 scfm @ 50 psig
5.8 scfm @ 100 psig

Triple Barb: Order #MQC-2

MQC-3S

Quick Connect Assembly



Type: One way check quick connect assembly of valve body MQC-V3 and hose connector MQC-F

Material: Body- brass, Stem- brass

Seals: Buna-N

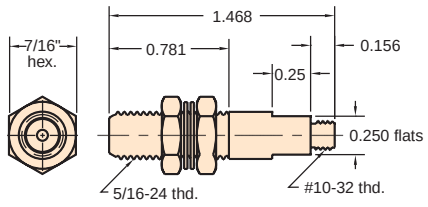
Working Pressure: 0 to 300 psig

Air Flow: 3.0 scfm @ 50 psig
5.8 scfm @ 100 psig

Triple Barb: Order #MQC-3 or MQC-3-M5 (metric)

MQC-V2

Valve Body



Material: Brass

Thread: #10-32 male

Mounting: In panel or bracket to 1/4" thick with two 7/16" mounting nuts and lockwashers furnished; also screws directly into operative unit or manifold

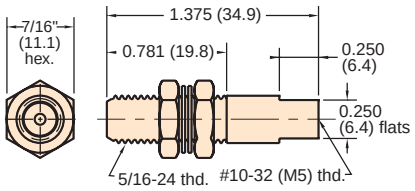
Seals: Buna-N

Use: For connection with external shut-off to external hose, use hose connectors: MQC-F, MQC-FT, MQC-F2

Options: (-NP)

MQC-V3

Valve Body



Material: Brass

Thread: Tapped #10-32

Mounting: In panel or bracket to 1/4" thick with two 7/16" mounting nuts and lockwashers furnished; like MQC-V2, but end is tapped #10-32 instead of threaded

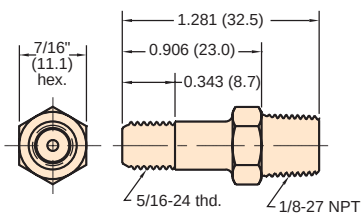
Seals: Buna-N

Use: For connection with external shut-off to external hose, use hose connectors: MQC-F, MQC-FT, MQC-F2

Options: (-NP), (-M5)

MQC-VP

Valve Body



Material: Brass

Thread: 1/8" NPT base; 5/16-24 body

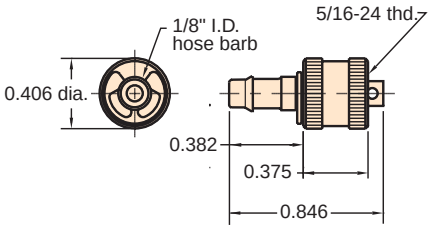
Use: For connection with external shut-off to external hose, use hose connectors: MQC-F, MQC-FT, MQC-F2

Seals: Buna-N

Options: (-NP), (-MR), (-MG)

MQC-FS

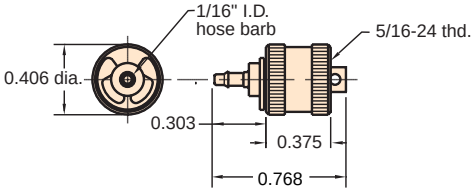
1/8” Hose Connector



Material: Brass
Thread: I.D. of knurled end screws onto male end of valve bodies
For Use With: 1/8” I.D. Vinyl, Buna-N or braided hose
Installation: Simply push hose onto barbed end and secure with hose clamp # 5000-1, 5000-2 or 5000-1A.
Seals: Buna-N
Options: (-NP)
Triple Barb: Order #MQC-F

MQC-F2S

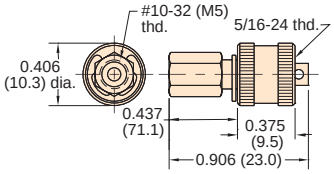
1/16” Hose Connector



Material: Brass
Thread: I.D. of knurled end screws onto male end of valve bodies
For Use With: Subminiature 3814-5 1/16” ID vinyl hose
Installation: Simply push hose onto barbed end and secure with slip-over hose clamp furnished
Seals: Buna-N
Options: (-NP)
Triple Barb: Order #MQC-F2

MQC-FT

#10-32 (M5) Tapped Connector



Material: Brass
Thread: Outlet is tapped #10-32 or M5 Metric. I.D. of knurled end screws onto male end of valve bodies: MQC-V2, MQC-V3, MQC-VP
Mounting: Outlet mounts with #10-32 (M5) short coupling #11999
Seals: Buna-N
Options: (-NP), (-M5)

Tip
When assembling #10-32 threaded fittings with gaskets, turn the fitting in until the gasket contacts the surface. Then give the fitting less than a 1/4 turn to achieve a good seal.

For the ultimate in convenience, have a selection of helpful fittings available for every need. Keeping a supply of fittings on hand can save money and time, allowing projects, prototypes, circuits, and repairs to be finished quickly and avoiding delays.

These Minimatic fittings kits contain a variety of the most commonly used fittings and quick connects. The kit saves time ordering and additional parts or replacements can be ordered at any time. Each kit comes in a sturdy plastic case.

17555-SF1

Minimatic Slip-on Fittings Kit

Contains:

- CTO-2 Connector L 1/16” I.D. Hose to M #10-32
- UTO-2 Universal L 1/16” I.D. Hose to M #10-32
- STO-2 Swivel L 1/16” I.D. Hose to M #10-32
- CTO-4 Connector L 1/8” I.D. Hose to M #10-32
- UTO-4 Universal L 1/8” I.D. Hose to M #10-32
- STO-4 Swivel L 1/8” I.D. Hose to M #10-32
- TTO-202 Connector 1/16” I.D. Hose T with M #10-32
- UTO-2002 Universal 1/16” I.D. Hose T with M #10-32
- STO-2002 Swivel 1/16” I.D. Hose T with M #10-32
- TTO-404 Connector 1/8” I.D. Hose T with M #10-32
- UTO-4004 Universal 1/8” I.D. Hose T with M #10-32
- STO-4004 Swivel 1/8” I.D. Hose T with M #10-32
- Clippard 1/4” & 5/16” Wrench 11770
- Gasket 11761-2
- Hose Samples
- UTO-FOF (T) Universal M #10-32 to F #10-32
- UTO-F (L) Universal M #10-32 to F #10-32
- UTF-F (T) Universal M #10-32 to F #10-32
- UTF-FOF (X) Universal M #10-32 to F #10-32
- Inline Connectors
  - C44 1/8” I.D. Hose to 1/8” I.D. Hose
  - C42 1/8” I.D. Hose to 1/16” I.D. Hose
  - C22 1/16” I.D. Hose to 1/16” I.D. Hose
- T22-4 1/8” I.D. Hose T to 1/16” I.D. Hoses
- T44-2 1/16” I.D. Hose T to 1/8” I.D. Hoses
- X44-404 1/8” I.D. Hose X
- X22-202 1/16” I.D. Hose X
- SPO-4 1/8” M NPT to L 1/8” I.D. Hose
- SPO-2 1/8” M NPT to L 1/16” I.D. Hose
- SPO-4004 1/8” M NPT to T 1/8” I.D. Hose
- SPO-2002 1/8” M NPT to T 1/16” I.D. Hose
- T22-2 1/16” I.D. Hose T
- T44-4 1/8” I.D. Hose T
- XT4-404 1/8” I.D. Hose X with M #10-32
- XT2-202 1/16” I.D. Hose X with M #10-32
- CT2 1/16” I.D. Hose to M #10-32
- CT4 1/8” I.D. Hose to M #10-32
- Inline Swivel Connectors
  - S44 1/8” I.D. Hose to 1/8” I.D. Hose
  - ST4 1/8” I.D. Hose to M #10-32
  - S4F 1/8” I.D. Hose to F #10-32

17555

Minimatic Fittings Kit

Contains:

- 1/8” NPT to #10-32 L 15090-1
- #10-32 L Fitting 15002-2
- #10-32 Screw Plug 11755
- #10-32 to 1/16” I.D. Hose Fitting 11752-2
- #10-32 Extension Fitting 15010
- 1/8” M NPT to 1/8” I.D. Hose Adapter 11924-1
- Adjustable #10-32 L Fitting 15002-1
- #10-32 X Fitting 15002-4
- Female #10-32 Hex Connector 15004
- #10-32 M to 1/8” I.D. Hose with Swivel 15045
- 1/4” M NPT to #10-32 F Adapter 15006-3
- 1/8” NPT to #10-32 T 15090-2
- #10-32 T Fitting 15002-3
- #10-32 M Short Coupling 11999
- #10-32 to 1/8” I.D. Hose Fitting 11752-3
- Gasket 11761-2
- 12 Port Manifold MAN-12
- Clippard 1/4” & 5/16” Wrench 11770
- 1/8” M NPT to #10-32 F Adapter 15006-1

17555-QC1

Minimatic Quick Connect Kit

Contains:

- 1/8” I.D. T Connector T44-4
- Panel Mount #10-32 F Cap MJQC-CPF
- Panel Mount 1/8” I.D. Hose Cap MJQC-CPB
- 3/8-24 Nuts 0107-48 Lockwasher 0302-43
- 1/8” F NPT Valve MJQC-VFP
- 1/4” M NPT Valve MJQC-VMQ
- 1/8” M NPT Valve MJQC-VMP
- 1/8” M NPT Cap MJQC-CMP
- 1/4” M NPT Cap MJQC-CMQ
- 1/8” I.D. Hose Valve MJQC-VB4
- Panel Mount #10-32 F Valve MJQC-VFT
- Panel Mount #10-32 M Valve MJQC-VMT
- #10-32 F Cap MJQC-CFT
- 1/8” I.D. Hose Cap MJQC-CB4
- Gasket 11761-2
- Hose Samples
- Clippard 1/4” & 5/16” Wrench 11770
- #10-32 M to 1/8” I.D. CT4
- UTO-4 UTO-4004

hose \ `hōz \ n : a flexible tube for conveying gases or fluids

tubing \ `t(y)u-bing \ n : a stiff material in the form of a tube used for conveying gases or fluids

Do you use a garden tube?

The answer to the question of whether to call it a tube or a hose rests on a fine line, one many people have gotten tangled up in. In both definitions it clearly states that a tube and a hose are used for conveying fluids, yet sometimes one word seems to fit the situation (and the application) better than the other.
So remember...

It's a hose when it's flexible and a tube when it's not.

Clippard offers a variety of miniature hose and tubing from copper and nylon tubing to flexible urethane, vinyl and Buna-N hose. The chart below lists these products and their available colors and lengths.

❑ - ❑ - ❑ - ❑

Hose or Tubing Type
- **NYT1** - Single Nylon Tubing
- **VYH1** - Single Vinyl Hose
- **VYH2** - Dual Vinyl Hose
- **URH1** - Single 85 Duro. Urethane Hose
- **URH2** - Dual 85 Duro. Urethane Hose
- **URH8** - Ribbon 85 Duro. Urethane Hose
- **URT1** - Single 95 Duro. Urethane Tubing
- **PET1** - Single Polyethylene Tubing

Size: O.D. x I.D.
- **0402** - 1/8" x 1/16"
- **0403** - 1/8" x 3/32"
- **0503** - 5/32" x 3/32"
- **0804** - 1/4" x 1/8"
- **0805** - 1/4" x 0.160"
- **1208** - 3/8" x 1/4"

Metric Sizes
- **0604M** - 6 mm x 4 mm

Colors: Solid
- **BLS** - blue
- **BKS** - black
- **BRS** - brown
- **GNS** - green
- **GYS** - gray
- **NAS** - natural
- **ORS** - orange
- **RDS** - red
- **WHS** - white
- **YLS** - yellow
- **01S** - gray/black (dual only)

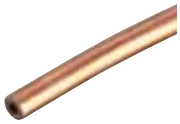
Translucent
- **BLT** - blue
- **CLT** - clear
- **GNT** - green
- **PUT** - purple
- **ORT** - orange
- **RDT** - red
- **YLT** - yellow
- **02T** - BLT/GNT/GYS/ORT/PUT/RDT/WHS/YLT (ribbon only)

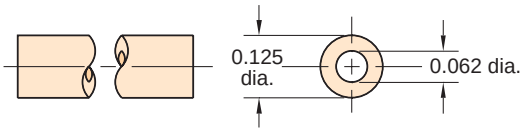
Available Lengths
- **050** - 50 ft roll
- **500** - 500 ft spool

This chart is to be used as an explanation of our ordering system. See individual listings following this page for sizes and colors available.

3811-1-RL

1/8" O.D. Copper Tubing

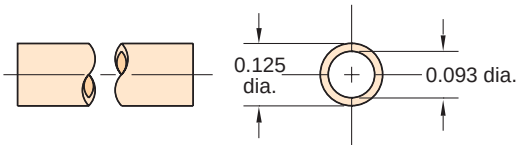




Material: High pressure copper
Working Pressures: to 2,500 psig
Static Burst Pressure: over 10,000 psig
Lengths Available: 50 feet
Use With: Ferrule tubing connectors #'s: 3810-1
3810-2
11923

NYT1-0403-CLT-❑

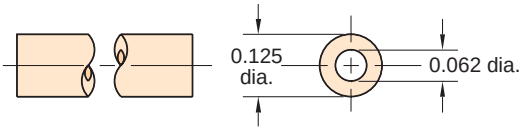
3/32" I.D. Nylon Tubing
(Former Part No. 3814-2)



Material: Semi-flexible nylon tubing
Color: Clear / Translucent
Working Range: to 250 psig
Static Burst Pressure: Approx. 1,000 psig
Use With: Ferrule tubing connectors: 11923
3810-1
3810-2
Forming: May be formed into sharp corners with heat
Lengths Available: 50 and 500 feet

VYH1-0402-CLT-❑

1/16" I.D. Vinyl Hose
(Former Part No. 3814-5)

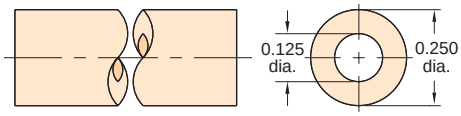


Note:
Consult factory for custom colors

Type: Flexible, durable vinyl plastic hose
Working Range: 0 to 105 psig at 70˚F maximum 60 psig at 80˚F or above (max. temp. 100˚F)
Use With: Hose fittings: 11752-2 and clamp 5000-4
Bend Radius: 3x hose dia.
Color: Translucent: Clear
Lengths Available: 50 and 500 feet

VYH1-0804-CLT-❑

1/8" I.D. Vinyl Hose
(Former Part No. 3814-1)

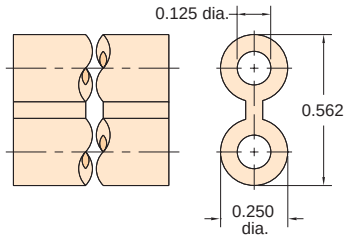


Note:
Consult factory for custom colors

Working Range: 0 to 105 psig at 70˚F maximum 60 psig at 80˚F or above (max. temp. 100˚F
Use With: Hose fittings: 11752-1, 11752-3 and 11924
Hose clamps: 5000-2
Bend Radius: 3x hose dia.
Color: Translucent: Clear
Lengths Available: 50 and 500 feet

VYH2-0804-GYS-❑

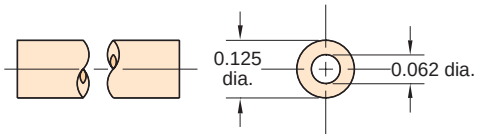
1/8" I.D. Twin Vinyl Hose
(Former Part No. 3814-3)



Type: Flexible, durable vinyl plastic hose, but two hoses molded together, one side has rib entire length for identification
Color: Solid: Gray/Gray
Use Clamp: 5000-1
Working Range: 0 to 150 psig at 70˚F maximum 60 psig at 80˚F or above (max. temp. 100˚F)
Use: Ideal for feeding supply in on one line and out on the other, reduces labor; makes neat assembly; may be parted with any sharp cutting edge
Lengths Available: 50 and 500 feet

URH1-0402-❑-❑

1/16" I.D. Polyurethane Hose
(Former Part No. 3814-7)

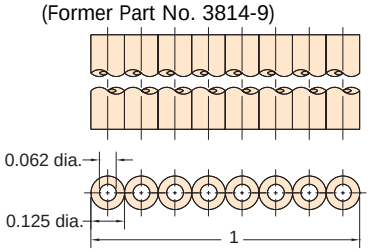


Working Range: 0 to 105 psig at 100˚F Maximum 120˚F
Static Burst Pressure: Over 500 psig at 70˚F
Color: Solid: Black, brown, white, gray, orange
Translucent: Clear, blue, green, red, yellow
Lengths Available: 50 and 500 feet
Note: In normal application hose clamps are not required with hose when used with Clippard hose barb fittings

Note:
Specify color on order, and use full product number (including code letters for color) as shown in Price List. If no color is specified, clear will be furnished.

URH8-0402-02T-050

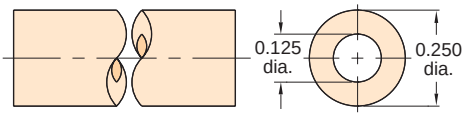
1/16" I.D. Polyurethane Ribbon Hose
(Former Part No. 3814-9)



Type: Flexible, durable urethane hose
Working Range: 0 to 105 psig at 100˚F maximum 120˚F
Static Burst Pressure: Over 500 psig at 70˚F
Color: Solid: Gray, white
Translucent: Blue, green, orange, purple, red, yellow
Lengths Available: 50 feet
Note: In normal application, hose clamps are not required with hose when used with Clippard hose barb fittings

URH1-0804-❑-❑

1/8" I.D. Polyurethane Hose
(Former Part No. 3814-6)

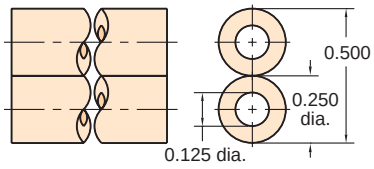


Working Range: 0 to 105 psig at 100˚F Maximum 120˚F
Static Burst Pressure: Approximately 425 psig at 70˚F
Color: Solid: Black, brown, white, gray, orange
Translucent: Clear, blue, green, red, yellow
Lengths Available: 50 and 500 feet
Bend Radius: 2x hose dia.
Note: In normal application hose clams are not required with hose when used with Clippard hose barb fittings

Note:
Specify color on order, and use full product number (including code letters for color) as shown in Price List. If no color is specified, clear will be furnished.

URH2-0804-01S-❑

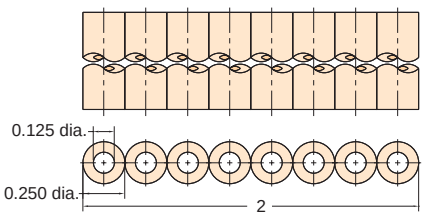
Twin 1/8" I.D. Polyurethane Hose
(Former Part No. 3814-13)



Working Range: 0 to 105 psig at 100˚F
Static Burst Pressure: Approximately 425 psig at 70˚F
Color: Solid: Gray and black combination
Lengths Available: 50 and 500 feet
Bend Radius: 2x hose dia.
Use: Ideal for feeding supply in on one line and out on the other; reduces labor; makes neat assembly; may be parted with any sharp cutting edge
Note: In normal application, hose clamps are not required with 3814-13 hose when used with Clippard hose barb fittings

URH8-0804-02T-050

1/8" I.D. Polyurethane Ribbon Hose
(Former Part No. 3814-12)

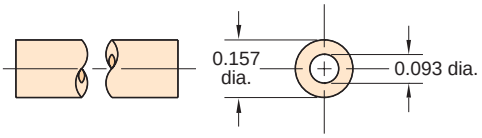


Type: Flexible, durable urethane hose
Working Range: 0 to 105 psig at 100˚F maximum 120˚F
Static Burst Pressure: Over 500 psig at 70˚F
Color: Solid: Gray, white
Translucent: Blue, green, orange, purple, red, yellow
Lengths Available: 50 feet
Note: In normal application, hose clamps are not required with hose when used with Clippard hose barb fittings

URT1-0503-❑-❑

5/32" O.D. 95D Urethane Tubing

Flexible, durable ether based tubing



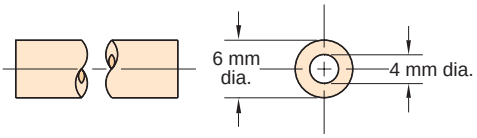
Working Range: 0 to 105 psig at 100˚F Maximum 120˚F
Static Burst Pressure: Over 500 psig at 70˚F
Color: Solid: Black, gray, orange, red, white
Translucent: Blue, clear, green, red, yellow
Lengths Available: 50 and 500 feet
Note: Designed for use with push-in fittings.

Note:
Specify color on order, and use full product number (including code letters for color) as shown in Price List. If no color is specified, clear will be furnished.

URT1-0604M-❑-❑

6 mm O.D. 95D Urethane Tubing

Flexible, durable ether based tubing



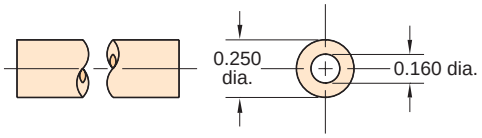
Working Range: 0 to 105 psig at 100˚F Maximum 120˚F
Static Burst Pressure: Over 450 psig at 70˚F
Color: Solid: Black
Translucent: Blue, clear, green, red
Lengths Available: 50 and 500 feet
Note: Designed for use with push-in fittings.

Note:
Specify color on order, and use full product number (including code letters for color) as shown in Price List. If no color is specified, clear will be furnished.

URT1-0805-❑-❑

1/4" O.D. 95D Urethane Tubing

Flexible, durable ether based tubing



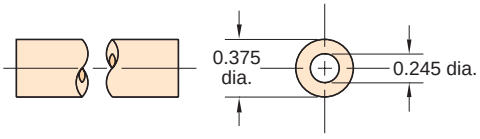
Working Range: 0 to 105 psig at 100˚F Maximum 120˚F
Static Burst Pressure: Over 450 psig at 70˚F
Color: Solid: Black, gray, orange, red, white
Translucent: Blue, clear, green, red, yellow
Lengths Available: 50 and 500 feet
Note: Designed for use with push-in fittings.

Note:
Specify color on order, and use full product number (including code letters for color) as shown in Price List. If no color is specified, clear will be furnished.

URT1-1208-❑-❑

3/8" O.D. 95D Urethane Tubing

Flexible, durable ether based tubing



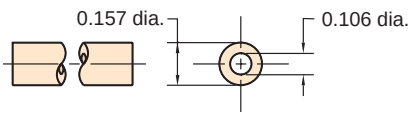
Working Range: 0 to 105 psig at 100˚F Maximum 120˚F
Static Burst Pressure: Over 440 psig at 75˚F
Color: Solid: Black
Translucent: Blue, clear, green, red
Lengths Available: 50 and 500 feet
Note: Designed for use with push-in fittings.

Note:
Specify color on order, and use full product number (including code letters for color) as shown in Price List. If no color is specified, clear will be furnished.

PET1-0503-❑-❑

5/32" O.D. Polyethylene Tubing

Linear low density tubing



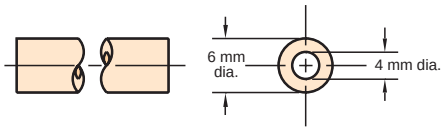
Working Range: 0 to 105 psig at 100˚F Maximum 120˚F
Static Burst Pressure: Over 540 psig at 75˚F
Colors: Solid: Black or Natural
Lengths Available: 50 and 500 feet
Bend Radius: 1/2"
Note: Designed for use with push-in fittings.

Note:
Specify color on order, and use full product number (including code letters for color) as shown in Price List. If no color is specified, natural will be furnished.

PET1-0604M-❑-❑

6 mm O.D. Polyethylene Tubing

Linear low density tubing



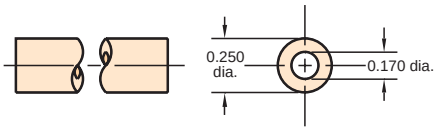
Working Range: 0 to 105 psig at 100˚F Maximum 120˚F
Static Burst Pressure: Approximately 560 psig at 75˚F
Colors: Solid: Black or Natural
Lengths Available: 50 and 500 feet
Bend Radius: 1 1/4”
Note: Designed for use with push-in fittings

Note:
Specify color on order, and use full product number (including code letters for color) as shown in Price List. If no color is specified, natural will be furnished.

PET1-0805-❑-❑

1/4” O.D. Polyethylene Tubing

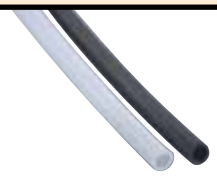
Linear low density tubing



Working Range: 0 to 105 psig at 100˚F Maximum 120˚F
Static Burst Pressure: Approximately 480 psig at 75˚F
Colors: Solid: Black or Natural
Lengths Available: 50 and 500 feet
Bend Radius: 1 1/4”
Note: Designed for use with push-in fittings

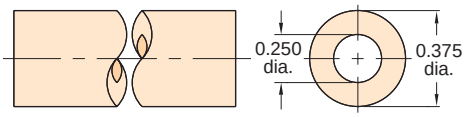
Note:
Specify color on order, and use full product number (including code letters for color) as shown in Price List. If no color is specified, natural will be furnished.

PET1-1208-❑-❑



3/8” O.D. Polyethylene Tubing

Linear low density tubing



Working Range: 0 to 105 psig at 100˚F Maximum 120˚F
Static Burst Pressure: Approximately 600 psig at 75˚F
Colors: Solid: Black or Natural
Lengths Available: 50 and 500 feet
Bend Radius: 2”
Note: Designed for use with push-in fittings

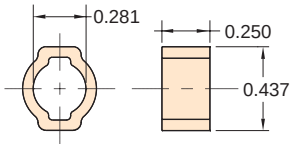
Note:
Specify color on order, and use full product number (including code letters for color) as shown in Price List. If no color is specified, natural will be furnished.

5000-1

Quick Set Hose Clamps

Type: Zinc plated steel

Use: 5000-1 with Buna N hose twin vinyl hose

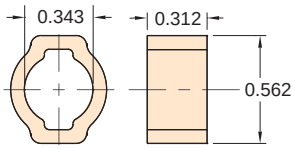


5000-1A

Quick Set Hose Clamps

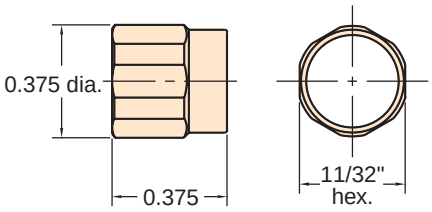
Type: Zinc plated steel

Use: 5000-1A with braided hose



5000-2

Reusable Hose Clamps



Material: Brass, self-threading, reusable

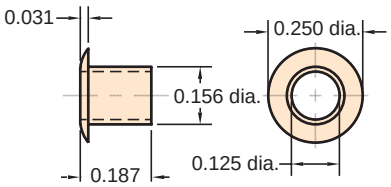
Use With: 11765 Buna-N hose VYH1-0804-CLT vinyl hose and Clippard hose fittings

Installation: Slip sleeve over hose, push onto fitting, then screw into place; tighten with wrench

Options: (-NP)

5000-4

Press-On Hose Clamp



Material: Brass, press-on hose clamp

Use: for VYH1-0402-CLT hose 1/16" I.D. vinyl

Installation: Simply place hose clamp over hose with flange end out; then press hose partially onto fitting, then slide clamp back toward fitting to secure

Options: (-NP)

Polyethylene vs Vinyl vs Polyurethane

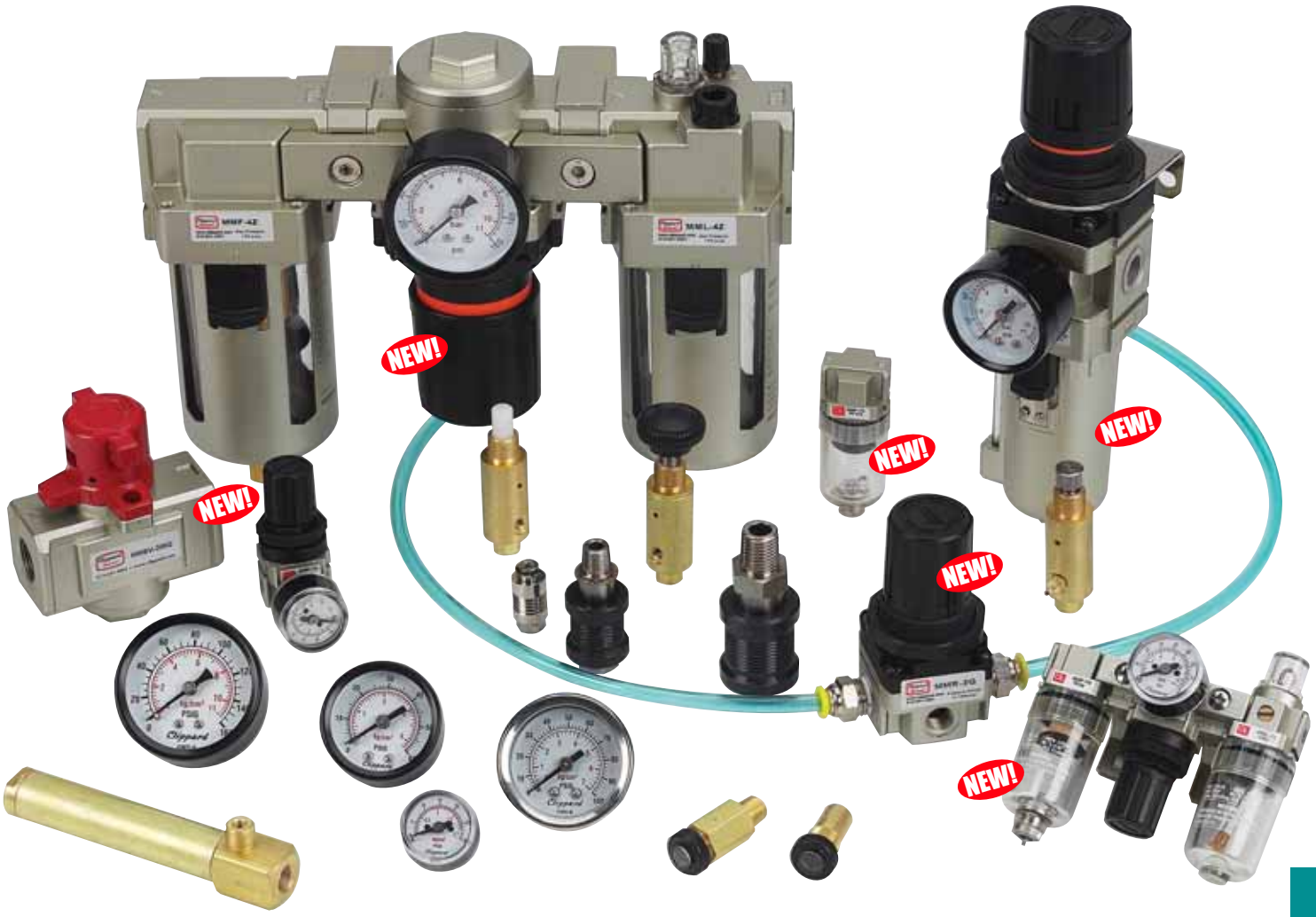
Polyurethane offers a wider range of chemical compatibility than Vinyl, it may be used at much higher temperatures and clamps are not needed when used with barb fittings. Linear low density polyethylene offers a lower cost alternative to polyurethane and superior environmental stress crack resistance over standard polyethylene. Both polyurethane and polyethylene are FDA approved.

Typical Hose & Tubing Bend Radii

When using hose or tubing, care should always be taken to avoid sharp bends to prevent compressing the inside diameter of the hose or tubing and restricting flow. For extremely close connections, allow a short loop of hose to avoid crimping.

Clippard Hose or Tubing		I.D.	O.D.	Min. Bend Radius
3811-1	Copper Tube	1/16"	1/8"	3 x dia.
NYT1-XXX	Nylon Tubing	3/32"	1/8"	3 x dia.
VYH1-XXX	Vinyl Hose	1/16"	1/8"	3 x dia.
VYH1-XXX	Vinyl Hose	1/8"	1/4"	2 x dia.
VYH2-XXX	Dual Vinyl Hose	1/8"	1/4"	2 x dia.
URH1-XXX	85 Duro. Urethane Hose	1/16"	1/8"	2 x dia.
URH8-XXX	Ribbon 85 Duro. Urethane	1/16"	1/8"	-
URH1-XXX	85 Duro. Urethane Hose	1/8"	1/4"	2 x dia.
URH2-XXX	Dual 85 Duro. Urethane	1/8"	1/4"	3 x dia.
URH8-0804-XXX	Ribbon 85 Duro. Urethane	1/8"	1/4"	-
URT1-0503-XXX	95 Duro. Urethane Tubing	3/32"	5/32"	3 x dia.
URT1-0604M-XXX	95 Duro. Urethane Tubing	4 mm	6 mm	2 x dia.
URT1-0805-XXX	95 Duro. Urethane Tubing	0.160"	1/4"	2 x dia.
URT1-1208-XXX	95 Duro. Urethane Tubing	0.245"	3/8"	3 x dia.
PET1-0503-XXX	Polyethylene Tubing	0.106"	5/32"	3 x dia.
PET1-0604M-XXX	Polyethylene Tubing	4 mm	6 mm	5 x dia.
PET1-0805-XXX	Polyethylene Tubing	0.170"	1/4"	5 x dia.
PET1-1208-XXX	Polyethylene Tubing	1/4"	3/8"	5 x dia.

NEW! Air Preparation Equipment



NEW! MAXIMATIC® FILTER-REGULATOR-LUBRICATORS

Maximatic Filters, Regulators & Lubricators

Maximatic FRLs condition and prepare compressed air for use in fluid power systems. Pneumatic applications with properly conditioned air will operate longer, cost less and improve system efficiency. Clippard offers five different sizes from #10-32 to 1" NPT of Filter, Regulators, Lubricators and combination units. Their modular design and interconnecting brackets provide flexibility and facilitates simple field installation and/or modification.

Filters. Filters capture solid particulate and remove water by "spinning" the air centrifugally. Water and larger particles are thrown against the side of the bowl where they condense and/or fall to the lower part of the bowl. Smaller particles are captured as the air flows through the filter element.

Regulators. Controlling pressure is an important requirement in all systems. Maximatic Regulators are adjustable from 7 to 125 psig. For applications requiring better resolution, 7 to 30 or 7 to 60 psig models with spring are available. The #10-32 size is a piston-style due to its small size, while the 1/8" to 1" are a diaphragm design. Both types feature a poppet-type inlet valve which enables free reverse flow when the inlet air is removed.

Lubricators. Pneumatic actuators and valves perform better and last longer when properly lubricated. The bowl serves as a reservoir for the oil and supplies oil through the pick-up tube when pressurized. The amount of oil dispersed is controlled by an adjustable needle valve as well as the flow rate through the lubricator.

Body Material: Die Cast Aluminum
Maximum Operating Pressure: 150 psig
Regulating Range: 125 psig standard, 30 psig and 60 psig optional
Regulator Type: Relieving
Filter Drain: Semi-Automatic Differential or Optional Automatic Drain. When the air supply is below 7 psig, the semi-automatic drain will open.
Bowl Material: Polycarbonate standard up to 4Z model/size. Metal bowl standard on 4A and 5B models/sizes. Aluminum Cast with sight glass available.
Bowl Guard: Steel on models indicated
Filtration: 25 micron sintered brass filter standard, 5 micron optional
Temperature Range: 32° to 130°F (-0 to 54°C)

Ordering Guide

Type	Enter		Enter
FRL	.FRL	Filter	.F
Stacking FRL	.FRLS	Regulator	.R
Stacking Filter-Regulator	.FRS	Lubricator	.L

Body/Port Size	Enter		Enter
#10-32	.1N	3/8" NPT (High Flow)	.4W
1/8" NPT	.2P	1/2" NPT	.4Z
1/4" NPT (Standard Flow)	.2Q	3/4" NPT	.4A
1/4" NPT (High Flow)	.3Q	1" NPT	.5B
3/8" NPT (Standard Flow)	.3W		

This numbering schematic is shown for illustration purposes only. All possible configurations are not available—For standard models, see the products illustrated in this catalog.

Options

Automatic Drain (D)	Metal Bowl (M)	30 psig (P30) 60 psig (P60)	5 Micron Filter (F5)

Example: MM F - 4Z - D M

MM [ ] - [ ] - [ ] [ ] [ ] [ ]

NEW! MAXIMATIC® FILTER-REGULATOR-LUBRICATORS

#10-32 through 1" NPT ports available

Large selection of convenient mounting hardware offered

All FRL components are a modular design which allow easy connection and disconnection of the components for simple installation and maintenance.

Pressure Gauge allows for easy viewing

Die Cast Aluminum Body

Easy-to-view sight glasses standard on all metal bowls

25 micron filters standard, 5 micron optional

Flow rates from 3 scfm to 280 scfm

Filters prevent moisture and solid particulates from getting into compressed air lines

Lubricators increase component life by dispensing oil into the airline supply

Semi-Automatic or Automatic Drain

Regulator ensures a constant downstream air line pressure

Bowl Shield

Polycarbonate bowls are standard on all filters and lubricators. Bowl shields are standard on MMF/MML 4A and 5B. An optional metal bowl is available for filters and lubricators.

Metal Bowl

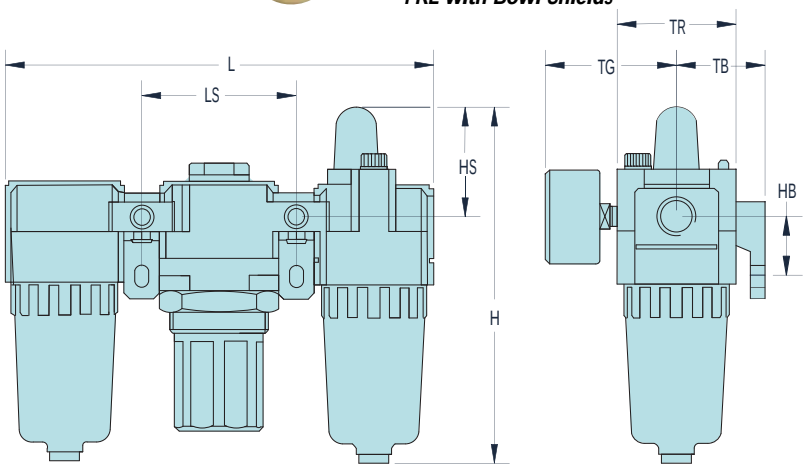
NEW! MAXIMATIC® FILTER-REGULATOR-LUBRICATORS

MMFRL-2P-D
FRL with Polycarbonate Bowls and Auto Drain

MMFRL-3W
FRL with Bowl Shields

Combination FRLs provide air filtration, regulation and lubrication in one unit for easy mounting and installation. Includes L brackets and gauge.

Bowl: Polycarbonate standard. Steel bowl shields provided on models indicated. Metal bowls with sight glasses also available, add "-M" to the Part Number.
Regulating Range: 7 to 100 psig on MMFRL-1N, 7 to 125 psig on all others. 30 and 60 psig ranges also available, add "-P30" or "-P60" to the end of the Part Number.
Drain: Semi-Automatic standard on MMFRLS-3 series. Manual standard on all others. Optional Automatic Drain available—add "-D" to the Part Number. Drains not available on Lubricators.
Filtration: 25 micron filter standard. Add "-F5" to the end of the Part Number for an optional 5 micron filter.



Drawing shown with Polycarbonate Bowl without Shield or Auto Drain

Dim.	MMFRL-1	MMFRL-2	MMFRL-3	MMFRL-4Z MMFRL-4W	MMFRL-4A	MMFRL-5B
H	3.33 (84.6)	4.92 (125.0)	6.16 (156.5)	7.54 (191.5)	7.60 (193.0)	10.69 (271.5)
HB	0.79 (20.1)	0.94 (23.9)	1.39 (35.3)	1.57 (40.0)	1.57 (39.9)	1.97 (50.0)
HS	1.00 (25.4)	1.50 (38.1)	1.50 (38.1)	1.61 (40.9)	1.61 (40.9)	1.89 (48.0)
L	3.58 (90.9)	5.51 (140.0)	7.13 (181.1)	9.37 (238.0)	9.96 (253.0)	11.81 (300.0)
LS	1.3 (33.0)	1.97 (50.0)	2.52 (64.0)	3.31 (84.1)	3.50 (88.9)	4.13 (104.9)
TB	0.98 (24.9)	1.18 (30.0)	1.61 (41.0)	1.97 (50.0)	1.97 (50.0)	2.75 (69.9)
TG	1.02 (25.9)	2.24 (57.0)	2.39 (60.7)	2.58 (65.5)	2.74 (69.6)	2.97 (75.4)
TR	0.98 (24.9)	1.57 (40.0)	2.09 (53.1)	2.76 (70.1)	2.76 (70.1)	3.54 (89.9)

Part No.	Port	Gauge Port	Flow Rate		Bowl Shield	Gauge
MMFRL-1N	#10-32	1/16" NPT	3 scfm	90 l/min	no	PG-10-160J
MMFRL-2P	1/8" NPT	1/8" NPT	18 scfm	500 l/min	no	PG-15-160P
MMFRL-2Q	1/4" NPT	1/8" NPT	18 scfm	500 l/min	no	PG-15-160P
MMFRL-3Q	1/4" NPT	1/8" NPT	70 scfm	2,000 l/min	yes	PG-15-160P
MMFRL-3W	3/8" NPT	1/8" NPT	70 scfm	2,000 l/min	yes	PG-15-160P
MMFRL-4W	3/8" NPT	1/4" NPT	140 scfm	4,000 l/min	yes	PG-15-160P
MMFRL-4Z	1/2" NPT	1/4" NPT	140 scfm	4,000 l/min	yes	PG-20-160Q
MMFRL-4A-M*	3/4" NPT	1/4" NPT	160 scfm	4,500 l/min	yes	PG-20-160Q
MMFRL-5B-M*	1" NPT	1/4" NPT	180 scfm	5,000 l/min	yes	PG-20-160Q

** Metal bowl standard*

NEW! MAXIMATIC® STACKING FRLS

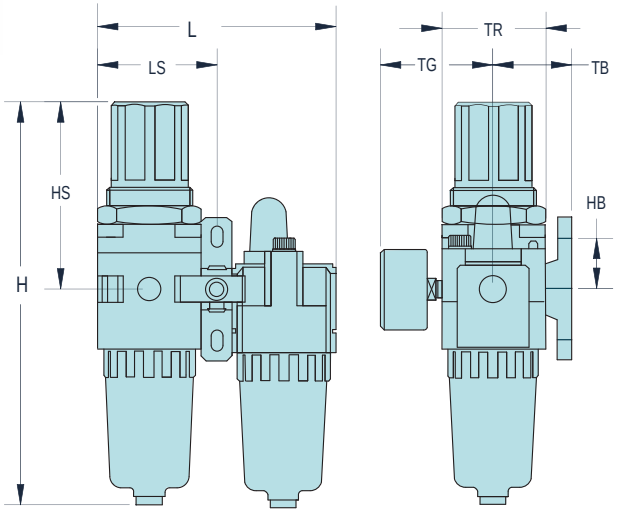
MMFRLS-2Q-D Stacking FRL with Polycarbonate Bowls and Auto Drain

MMFRLS-3Q-D Stacking FRL with Bowl Shields and Auto Drain

Stacking FRLs provide air filtration, regulation and lubrication in one unit for easy mounting and installation.

- Includes L bracket and gauge

Bowl: Polycarbonate standard. Steel shield provided on models indicated. Metal bowls with sight gauges also available, add "-M" to the end of the Part Number.
Regulating Range: 7 to 100 psig on MMFRLS-1N, 7 to 125 psig on all others. 30 and 60 psig ranges also available, add "-P30" or "-P60" to the end of the Part Number.
Drain: Semi-Automatic standard on MMFRLS-3/4/5 series. Manual standard on all others. Optional Automatic Drain available—add "-D" to Part Number.
Filtration: 25 micron filter standard. Add "-F5" to the end of the Part Number for an optional 5 micron filter.



Drawing shown without Shield or Auto Drain

Dim.	MMFRLS-1	MMFRLS-2	MMFRLS-3	MMFRLS-4Z MMFRLS-4W	MMFRLS-4A	MMFRLS-5B
H	4.31 (109.5)	6.48 (164.6)	8.31 (211.1)	10.31 (261.9)	10.51 (267.0)	13.31 (338.1)
HB	0.79 (20.1)	0.94 (23.9)	1.38 (35.1)	1.57 (39.9)	1.57 (39.9)	1.97 (50.0)
HS	1.99 (50.5)	3.07 (78.0)	3.64 (92.5)	4.41 (112.0)	4.49 (114.0)	4.57 (116.1)
L	2.28 (57.9)	3.54 (89.9)	4.61 (117.1)	6.06 (153.9)	6.46 (164.1)	7.68 (195.1)
LS	1.14 (29.0)	1.77 (45.0)	2.30 (58.4)	3.03 (77.0)	3.23 (82.0)	3.84 (97.5)
TB	0.98 (24.9)	1.18 (30.0)	1.61 (40.9)	1.97 (50.0)	1.97 (50.0)	2.75 (69.9)
TG	1.02 (25.9)	2.24 (56.9)	2.39 (60.7)	2.58 (65.5)	2.74 (69.6)	2.97 (75.4)
TR	0.98 (24.9)	1.57 (39.9)	2.09 (53.1)	2.76 (70.1)	2.76 (70.1)	3.54 (89.9)

Part No.	Port	Gauge Port	Flow Rate		Bowl Shield	Gauge
MMFRLS-1N	#10-32	1/8" NPT	3 scfm	90 l/min	no	PG-10-160J
MMFRLS-2P	1/8" NPT	1/8" NPT	18 scfm	500 l/min	no	PG-15-160P
MMFRLS-2Q	1/4" NPT	1/8" NPT	18 scfm	500 l/min	no	PG-15-160P
MMFRLS-3Q	1/4" NPT	1/8" NPT	60 scfm	1,700 l/min	yes	PG-15-160P
MMFRLS-3W	3/8" NPT	1/8" NPT	60 scfm	1,700 l/min	yes	PG-15-160P
MMFRLS-4W	3/8" NPT	1/4" NPT	105 scfm	3,000 l/min	yes	PG-20-160Q
MMFRLS-4Z	1/2" NPT	1/4" NPT	105 scfm	3,000 l/min	yes	PG-20-160Q
MMFRLS-4A-M*	3/4" NPT	1/4" NPT	140 scfm	4,000 l/min	yes	PG-20-160Q
MMFRLS-5B-M*	1" NPT	1/4" NPT	180 scfm	5,000 l/min	yes	PG-20-160Q

** Metal bowl standard*

NEW! MAXIMATIC® STACKING FILTER-REGULATORS

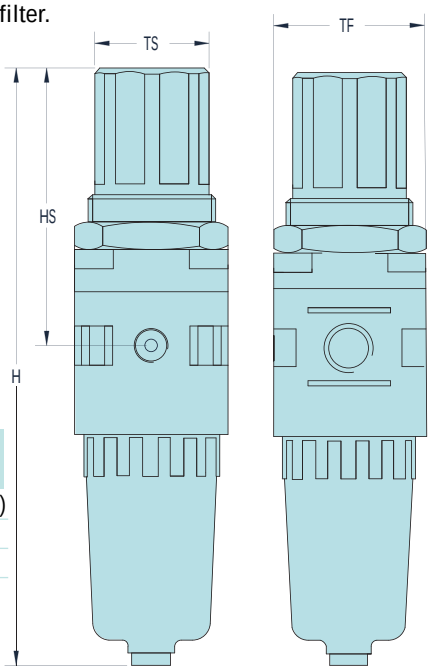
MMFRS-3Q
Stacking Filter-Regulator with Bowl Shield & Semi-Automatic Drain

MMFRS-2P
Stacking Filter-Regulator with Polycarbonate Bowl & Manual Drain

Stacking Filter-Regulator combinations provide air filtration and precise regulation in a single unit for easy mounting and installation where space is limited.

- Includes bracket and gauge (see Page 346 for dimensions).

Regulating Range: 7 to 100 psig on MMFRS-1N, 7 to 125 psig on all others. 30 and 60 psig ranges also available, add "-P30" or "-P60" to the end of the Part Number.
Bowl: Polycarbonate standard. Steel bowl shield provided on models indicated. Metal bowl with sight gauge also available, add "-M" to the Part Number.
Differential Drain: Semi-Automatic standard on MMFRS-3/4/5 series; Manual standard on all other models. When supply pressure is below 7 psig on all MMFRS-3 and MMFRS-4 models without metal bowls, the standard drain will open. An optional Automatic Drain available—add "-D" to Part Number.
Filtration: 25 micron filter standard. Add "-F5" to the end of the Part Number for an optional 5 micron filter.



Dim.	MMFRS-1N	MMFRS-2Q MMFRS-2P	MMFRS-3W MMFRS-3Q	MMFRS-4Z MMFRS-4W	MMFRS-4A	MMFRS-5B
H	4.31 (109.5)	6.48 (164.6)	8.31 (211.0)	10.31 (261.9)	10.51 (267.0)	13.31 (338.1)
HS	1.99 (50.5)	3.07 (78.0)	3.64 (92.5)	4.41 (112.0)	4.49 (114.0)	4.57 (116.1)
TF	0.98 (24.9)	1.57 (39.9)	2.09 (53.1)	2.76 (70.1)	2.76 (70.1)	3.54 (89.9)
TS	1.10 (27.9)	1.34 (34.0)	1.37 (40.0)	2.13 (54.1)	2.13 (54.1)	2.13 (54.1)

Part No.	Port	Gauge Port	Flow Rate		Bowl Shield	Gauge
MMFRS-1N	#10-32	1/16" NPT	3 scfm	90 l/min	no	PG-10-160J
MMFRS-2P	1/8" NPT	1/8" NPT	19 scfm	550 l/min	no	PG-15-160P
MMFRS-2Q	1/4" NPT	1/8" NPT	19 scfm	550 l/min	no	PG-15-160P
MMFRS-3Q	1/4" NPT	1/8" NPT	70 scfm	2,000 l/min	yes	PG-15-160P
MMFRS-3W	3/8" NPT	1/8" NPT	70 scfm	2,000 l/min	yes	PG-15-160P
MMFRS-4W	3/8" NPT	1/4" NPT	140 scfm	4,000 l/min	yes	PG-20-160Q
MMFRS-4Z	1/2" NPT	1/4" NPT	140 scfm	4,000 l/min	yes	PG-20-160Q
MMFRS-4A-M*	3/4" NPT	1/4" NPT	160 scfm	4,500 l/min	yes	PG-20-160Q
MMFRS-5B-M*	1" NPT	1/4" NPT	195 scfm	5,000 l/min	yes	PG-20-160Q

** Metal bowl standard*

NEW! MAXIMATIC® FILTERS

MMF-3Q-D Filter with Bowl Shield & Auto Drain

MMF-2Q Filter with Polycarbonate Bowl & Manual Drain

MMF-2Q-D Filter with Polycarbonate Bowl & Automatic Drain

MMF-2Q-MD Filter with Metal Bowl & Manual Drain

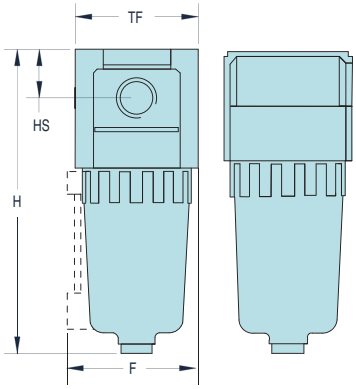
Maximatic® filters remove moisture and contaminants, and provide air filtration through a 25 micron filter. Replacement 25 micron and 5 micron filters are available.

- Semi-automatic drain standard on MMFRLS-3/4/5 series. Manual drain standard on all others. Optional Automatic Drain available—add "-D" to Part Number.

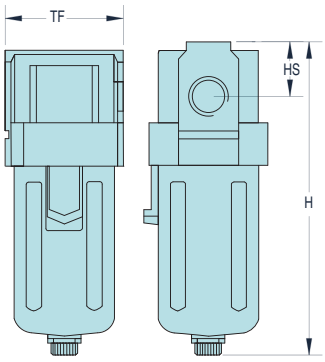
Bowl: Polycarbonate standard. Cast steel shield provided on models indicated. Metal bowl with sight gauge also available, add "-M" to the end of the Part Number.
Filtration: 25 micron filter standard. Add "-F5" to Part Number for optional 5 micron filter.

Filter	F	H	HS	TF
MMF-1	--	2.60 (66.0)	0.28 (7.1)	0.98 (24.9)
MMF-2	1.81 (50.0)	3.84 (97.5)	0.43 (10.9)	1.57 (39.9)
MMF-3	2.26 (57.4)	5.22 (132.6)	0.55 (14.0)	2.09 (53.1)
MMF-4W/4Z	3.00 (76.2)	6.63 (168.4)	0.71 (18.0)	2.76 (70.1)
MMF-4A-M	3.00 (76.2)	6.79 (172.5)	0.79 (19.8)	2.76 (70.1)
MMF-5B-M	3.00 (76.2)	9.74 (247.4)	0.94 (23.9)	3.54 (89.9)

MMF-1 & MMF-2 Series



MMF-3 & MMF-4 Series



MAXIMUM
Value. Performance.

Part No.	Port	Flow Rate		Bowl Shield
MMF-1N	#10-32	4 scfm	110 l/min	no
MMF-2P	1/8" NPT	26 scfm	750 l/min	no
MMF-2Q	1/4" NPT	26 scfm	750 l/min	no
MMF-3Q	1/4" NPT	70 scfm	2,000 l/min	yes
MMF-3W	3/8" NPT	70 scfm	2,000 l/min	yes
MMF-4W	3/8" NPT	140 scfm	4,000 l/min	yes
MMF-4Z	1/2" NPT	140 scfm	4,000 l/min	yes
MMF-4A-M*	3/4" NPT	210 scfm	6,000 l/min	n/a
MMF-5B-M*	1" NPT	245 scfm	7,000 l/min	n/a

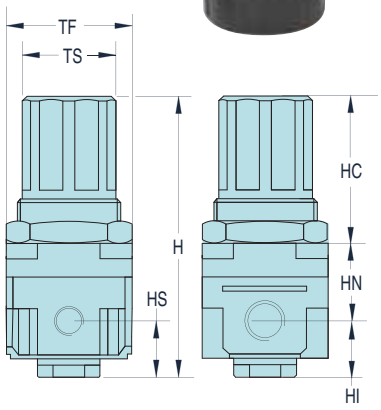
** Metal bowl standard*

NEW! MAXIMATIC® REGULATORS

Maximatic® Regulators provide precise air regulation from 7 to 125 psig. The adjustment knob must be pulled out to adjust the pressure, preventing accidental adjustment. Maximum inlet pressure is 150 psig. Includes bracket and gauge.

Regulating Range: 7 to 100 psig standard on MMR-1N, and 7 to 125 psig on all others. 30 and 60 psig ranges also available, add "-P30" or "-P60" to the end of the Part Number.

MMR-3Q



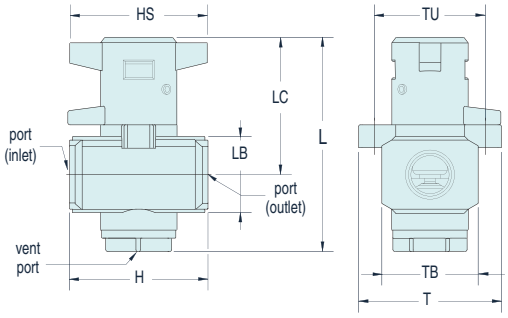
Dim.	MMR-1	MMR-2	MMR-3	MMR-4Z MMR-4W	MMR-4A	MMR-5
H	2.42 (61.5)	3.74 (95.0)	5.02 (127.5)	5.89 (149.6)	6.06 (153.9)	6.61 (168.0)
HS	0.43 (10.9)	0.67 (17.0)	1.38 (35.0)	1.48 (37.6)	1.59 (40.4)	1.89 (47.3)
HC	1.12 (28.4)	1.86 (47.2)	2.26 (57.4)	2.78 (70.6)	2.78 (70.6)	2.83 (71.9)
HN	0.75 (19.1)	1.00 (25.4)	1.25 (31.8)	1.44 (36.6)	1.44 (36.6)	1.87 (47.5)
HI	0.43 (10.9)	0.65 (16.5)	1.32 (33.5)	1.43 (36.3)	1.43 (36.3)	1.70 (43.2)
TF	0.98 (24.9)	1.57 (39.9)	2.09 (53.1)	2.76 (70.1)	2.76 (70.1)	3.54 (89.9)
TS	1.10 (27.4)	1.34 (34.0)	1.57 (39.9)	2.13 (54.1)	2.13 (54.1)	2.13 (54.1)

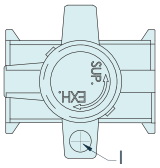
Part No.	Port	Gauge Port	Flow Rate		Gauge
MMR-1N	#10-32	1/16" NPT	4 scfm	100 l/min	PG-10-160J
MMR-2P	1/8" NPT	1/8" NPT	19 scfm	550 l/min	PG-15-160P
MMR-2Q	1/4" NPT	1/8" NPT	19 scfm	550 l/min	PG-15-160P
MMR-3Q	1/4" NPT	1/8" NPT	88 scfm	2,500 l/min	PG-15-160P
MMR-3W	3/8" NPT	1/4" NPT	88 scfm	2,500 l/min	PG-15-160P
MMR-4W	3/8" NPT	1/4" NPT	140 scfm	4,000 l/min	PG-20-160Q
MMR-4Z	1/2" NPT	1/4" NPT	140 scfm	4,000 l/min	PG-20-160Q
MMR-4A	3/4" NPT	1/4" NPT	210 scfm	6,000 l/min	PG-20-160Q
MMR-5A	3/4" NPT	1/4" NPT	280 scfm	8,000 l/min	PG-20-160Q
MMR-5B	1" NPT	1/4" NPT	280 scfm	8,000 l/min	PG-20-160Q

NEW! RELIEVING SHUT-OFF/LOCK OUT VALVES

Maximatic Shut-Off/Lock Out valves may be used in conjunction with Maximatic FRLs to provide a method of turning off the air supply. Cleaning or replacing filters, adding oil to the lubricator or other maintenance steps can be made without the air supply present. The valve can also be locked in the "off" position (lock not provided) to prevent accidental pressurizing.

Medium: Air
Input Pressure: 150 psig
Air Flow: See table below
Mounting: In-line
Material: Die Cast Aluminum





Dim.	MMSV-3QP MMSV-3PP	MMSV-3WQ MMSV-3QQ	MMSV-3ZW MMSV-3WW
L	2.44 (62.0)	3.07 (78.0)	3.32 (84.3)
H	1.58 (40.1)	2.09 (53.1)	2.76 (70.1)
TB	1.10 (27.9)	1.18 (30.0)	1.42 (36.1)
T	1.62 (41.1)	2.10 (53.3)	2.10 (53.3)
TU	1.26 (32.0)	1.63 (41.4)	1.63 (41.4)
LC	1.57 (39.9)	1.95 (49.5)	2.08 (52.8)
LB	0.87 (22.1)	1.10 (27.9)	1.42 (36.1)
HS	1.58 (40.1)	1.77 (45.0)	1.77 (45.0)
I	0.24 (10.2)	0.29 (7.4)	0.29 (7.4)

Part No.	Port	Vent Port	Air Flow (cfm) @ 100 psig	For Use with FRL, Filter-Regulator, Filter & Regulator Series:					
MMSV-3PP	1/8" NPT	1/8" NPT	18	MMFRL-2	MMFRLS-2	MMFR-2	MMFRS-2	MMF-2	MMR-2
MMSV-3QP	1/4" NPT	1/8" NPT	25	MMFRL-2	MMFRLS-2	MMFR-2	MMFRS-2	MMF-2	MMR-2
MMSV-3QQ	1/4" NPT	1/4" NPT	60	MMFRL-3	MMFRLS-3	MMFR-3	MMFRS-3	MMF-3	MMR-3
MMSV-3WQ	3/8" NPT	1/4" NPT	90	MMFRL-3	MMFRLS-3	MMFR-3	MMFRS-3	MMF-3	MMR-3
MMSV-3WW	3/8" NPT	3/8" NPT	120	MMFRL-4	MMFRLS-4	MMFR-4	MMFRS-4	MMF-4	MMR-4
MMSV-3ZW	1/2" NPT	3/8" NPT	180	MMFRL-4	MMFRLS-4	MMFR-4	MMFRS-4	MMF-4	MMR-4

MML-3W Lubricator with Bowl Shield

MML-2P Lubricator with Polycarbonate Bowl

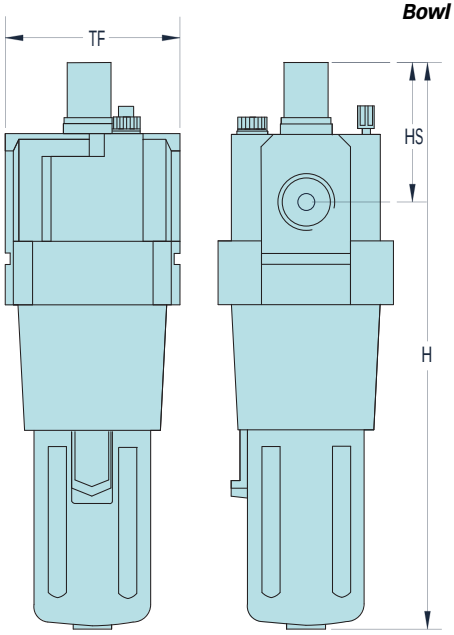
MML-2Q-M Lubricator with Metal Bowl

These inexpensive direct-flow lubricators provide lubrication to downstream valves and actuators

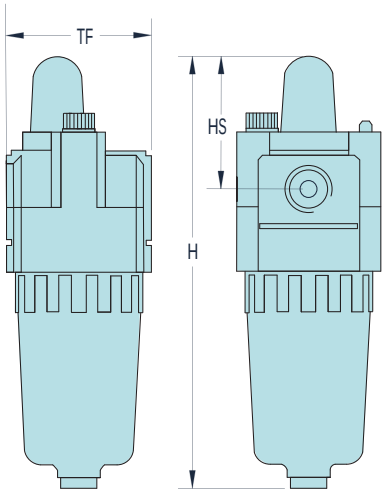
Bowl: Polycarbonate standard. Steel Shield provided on models as indicated. Metal bowl with sight glass also available, add "-M" to the Part Number.

Mounting Hardware

For a complete offering of mounting hardware, spacers, replacement bowls and other accessories, see pages 348 through 350.



MML-3, MML-4 & MML-5 Series



MML-1 & MML-2 Series

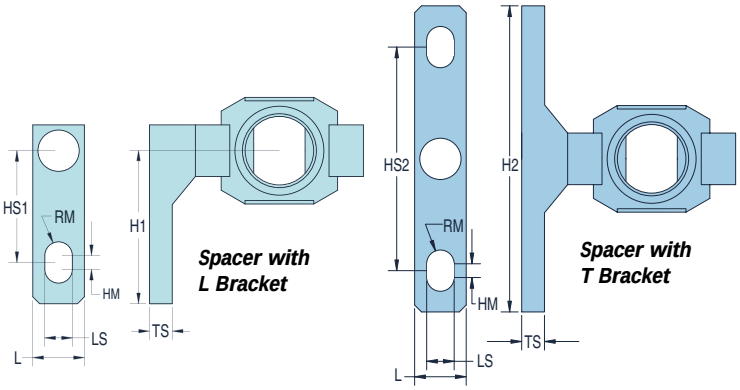
Lubricator Bowl Fluid Capacity

Model	Bowl #	Capacity
MML-2	27057-2	0.8 oz./24 ml (cc)
MML-3	27058-3	2.3 oz./68 ml (cc)
MML-4	27058-4	6.2 oz./183 ml (cc)

Part No.	Port	Flow Rate		Bowl Shield	Dimensions H	HS	TF
MML-1N	#10-32	3 scfm	90 l/min	no	3.21 (81.5)	1.00 (25.4)	0.98 (24.9)
MML-2P	1/8" NPT	28 scfm	800 l/min	no	4.80 (121.9)	1.50 (38.1)	1.57 (39.9)
MML-2Q	1/4" NPT	28 scfm	800 l/min	no	4.80 (121.9)	1.50 (38.1)	1.57 (39.9)
MML-3Q	1/4" NPT	60 scfm	1,700 l/min	yes	5.59 (142.0)	1.50 (38.1)	2.09 (53.1)
MML-3W	3/8" NPT	60 scfm	1,700 l/min	yes	5.59 (142.0)	1.50 (38.1)	2.09 (53.1)
MML-4W	3/8" NPT	180 scfm	5,000 l/min	yes	6.97 (177.0)	1.61 (40.9)	2.76 (70.1)
MML-4Z	1/2" NPT	180 scfm	5,000 l/min	yes	6.97 (177.0)	1.61 (40.9)	2.76 (70.1)
MML-4A	3/4" NPT	220 scfm	6,300 l/min	yes	6.97 (177.0)	1.54 (39.1)	2.76 (70.1)
MML-5B	1" NPT	245 scfm	7,000 l/min	yes	10.00 (254.0)	1.77 (45.0)	3.54 (89.9)

MMH-Y20L

MMH-Y20T



Mounting Hardware for Combination Units

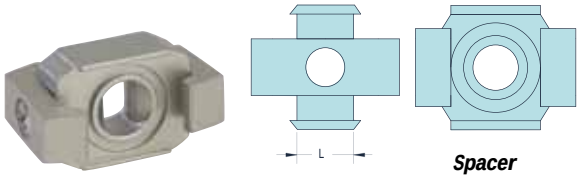
To convert individual Filter, Regulator and Lubricators into combination units. Seals included.

FRL Series	Spacer with L Bracket	Spacer with T Bracket
FRL-1	MMH-Y10L	MMH-Y10T
FRL-2	MMH-Y20L	MMH-Y20T
FRL-3	MMH-Y30L	MMH-Y30T
FRL-4W/4Z	MMH-Y40L	MMH-Y40T
FRL-4A	MMH-Y50L	MMH-Y50T
FRL-5	MMH-Y60L	MMH-Y60T

Dim.	MMH-Y10L MMH-Y10T	MMH-Y20L MMH-Y20T	MMH-Y30L MMH-Y30T	MMH-Y40L MMH-Y40T	MMH-Y50L MMH-Y50T	MMH-Y60L MMH-Y60T
L	0.47 (12.0)	0.59 (15.0)	0.63 (16.0)	0.87 (22.0)	0.87 (22.0)	0.91 (23.0)
LS	0.18 (4.5)	0.22 (5.5)	0.28 (7.0)	0.35 (9.0)	0.35 (9.0)	0.47 (12.0)
HM	0.12 (3.0)	0.12 (3.0)	0.16 (4.0)	0.16 (4.0)	0.16 (4.0)	0.16 (4.0)
TS	0.20 (5.0)	0.20 (5.0)	0.28 (7.0)	0.28 (7.0)	0.28 (7.0)	0.41 (10.5)
RM	0.09 (2.3)	0.11 (2.8)	0.14 (3.5)	0.18 (4.5)	0.18 (4.5)	0.24 (6.0)
H1	1.06 (27.0)	1.30 (33.0)	1.77 (45.0)	1.97 (50.0)	1.97 (50.0)	2.48 (63.0)
HS1	0.79 (20.0)	0.94 (24.0)	1.38 (35.0)	1.57 (40.0)	1.57 (40.0)	1.97 (50.0)
H2	2.13 (54.0)	2.60 (66.0)	3.54 (90.0)	3.94 (100.0)	3.94 (100.0)	4.96 (26.0)
HS2	1.57 (40.0)	1.89 (48.0)	2.76 (70.0)	3.15 (80.0)	3.15 (80.0)	3.94 (100.0)

Spacers

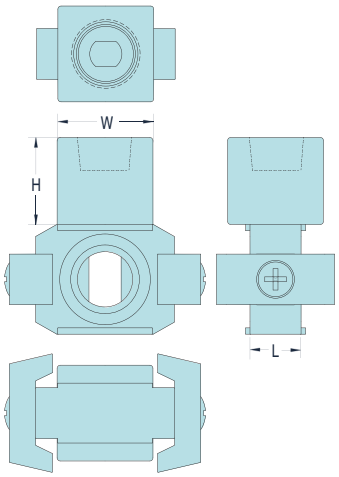
To convert individual Filter, Regulator and Lubricators into combination units without mounting brackets. Seals included.



Spacer

Series	Part No.	"L" Dimension
FRL-1	MMH-Y10	0.32 (8.1)
FRL-2	MMH-Y20	0.41 (10.4)
FRL-3	MMH-Y30	0.44 (11.2)
FRL-4W/4Z	MMH-Y40	0.55 (14.0)
FRL-4A	MMH-Y50	0.57 (14.5)
FRL-5	MMH-Y60	0.61 (15.5)

MAXIMUM Value. Performance.

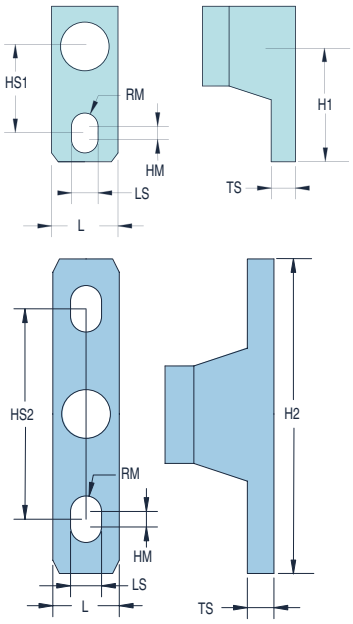


Spacers with Auxiliary Port

Provides parallel port between components.

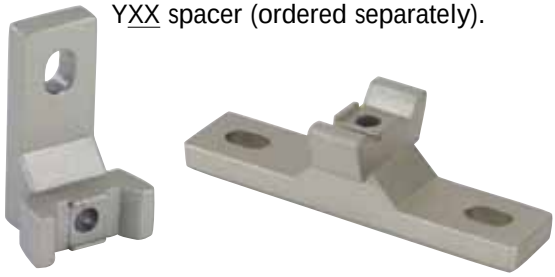
MMH-Y21-N01

FRL Series	Spacer with Port	Spacer with L Bracket & Port	Spacer with T Bracket & Port	Dimension L	H	W
FRL-2	MMH-Y21-N01 (1/8")	MMH-Y21L-N01 (1/8")	MMH-Y21T-N01 (1/8")	0.41 (10.4)	0.69 (17.5)	0.76 (19.3)
	MMH-Y21-N02 (1/4")	MMH-Y21L-N02 (1/4")	MMH-Y21T-N02 (1/4")	0.41 (10.4)	0.69 (17.5)	0.76 (19.3)
FRL-3	MMH-Y31-N01 (1/8")	MMH-Y31L-N01 (1/8")	MMH-Y31T-N01 (1/8")	0.44 (11.2)	0.64 (16.3)	0.75 (19.1)
	MMH-Y31-N02 (1/4")	MMH-Y31L-N02 (1/4")	MMH-Y31T-N02 (1/4")	0.44 (11.2)	0.64 (16.3)	0.75 (19.1)
FRL-4W/4Z	MMH-Y41-N02 (1/4")	MMH-Y41L-N02 (1/4")	MMH-Y41T-N02 (1/4")	0.55 (14.0)	0.71 (18.0)	0.94 (23.9)
	MMH-Y41-N03 (3/8")	MMH-Y41L-N03 (3/8")	MMH-Y41T-N03 (3/8")	0.55 (14.0	0.71 (18.0)	0.94 (23.9)
FRL-5	MMH-Y61-N03 (3/8")	MMH-Y61L-N03 (3/8")	MMH-Y61T-N03 (3/8")	0.61 (15.5)	0.79 (20.1)	1.18 (30.0)
	MMH-Y61-N04 (1/2")	MMH-Y61L-N04 (1/2")	MMH-Y61T-N04 (1/2")	0.61 (15.5)	0.79 (20.1)	1.18 (30.0)



T & L Brackets

L brackets are included with the purchase of combination FRLs, to convert to T, use T bracket only. If no bracket is furnished, use T or L bracket with MMH-YXX spacer (ordered separately).



FRL Series	L Bracket Part No.	T Bracket Part No.
1	MMH-B110L	MMH-B110T
2	MMH-B210L	MMH-B210T
3	MMH-B310L	MMH-B310T
4W/4Z	MMH-B410L	MMH-B410T
4A	MMH-B510L	MMH-B510T
5	MMH-B610L	MMH-B610T

Dim.	MMH-B110T MMH-B110L	MMH-B210T MMH-B210L	MMH-B310T MMH-B310L	MMH-B410T MMH-B410L	MMH-B510T MMH-B510L	MMH-B610T MMH-B610L
HS1	0.79 (20.1)	1.89 (48.0)	2.76 (70.0)	3.15 (80.0)	3.15 (80.0)	3.94 (100.0)
HS2	1.58 (40.1)	0.94 (24.0)	1.38 (35.0)	1.57 (40.0)	1.57 (40.0)	1.97 (50.0)
L	0.48 (12.2)	0.59 (15.0)	0.63 (16.0)	0.87 (22.0)	0.87 (22.0)	0.91 (23.0)
LS	0.18 (4.6)	0.22 (5.5)	0.28 (7.0)	0.35 (9.0)	0.35 (9.0)	0.47 (12.0)
HM	0.20 (5.1)	0.12 (3.0)	0.16 (4.0)	0.16 (4.0)	0.16 (4.0)	0.16 (4.0)
TS	0.20 (5.1)	0.20 (5.0)	0.28 (7.0)	0.28 (7.0)	0.28 (7.0)	0.41 (10.5)
RM	0.90 (22.9)	0.11 (2.8)	0.14 (3.5)	0.18 (4.5)	0.18 (4.5)	2.36 (6.0)
H1	0.61 (15.5)	0.65 (16.5)	0.89 (22.6)	0.99 (25.1)	0.99 (25.1)	1.24 (31.5)
H2	1.21 (30.7)	1.30 (33.0)	1.77 (45.0)	1.97 (50.0)	1.97 (50.0)	2.48 (63.0)

Replacement Bowls

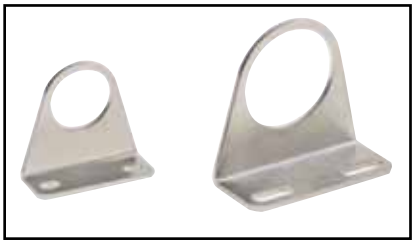
All metal bowls come complete with a sight glass.

Filter	Poly. Bowl with Manual Drain	Poly. Bowl with Auto Drain	Metal Bowl with Manual Drain	Metal Bowl with Auto Drain
MMF-1 Series	27055-1	---	---	---
MMF-2 Series	27055-2	27055-2-A	27059-2	27059-2-A
MMF-3 Series	27056-3*	27056-3-A*	27059-3	27059-3-A
MMF-4 Series	27056-4*	27056-4-A*	27059-4	27059-4-A
MMF-5 Series	27056-5*	27056-5-A*	27059-5	27059-5-A

Lubricator	Poly. Bowl	Metal Bowl
MML-1 Series	27057-1	---
MML-2 Series	27057-2	27060-2
MML-3 Series	27058-3*	27060-3
MML-4 Series	27058-4*	27060-4
MML-5 Series	27058-5*	27060-5

** Comes standard with metal shield.*

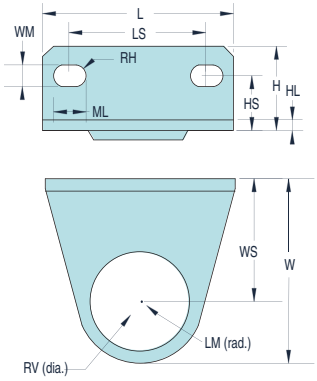
MAXIMUM
• Value.
• Performance.



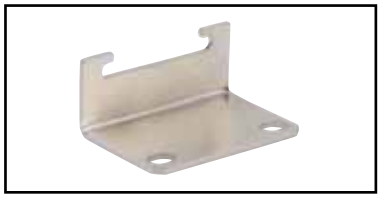
Replacement Mounting Hardware for Regulators & Stacked Filter-Regulators

Brackets are included with the purchase of these components.

Regulator	Bracket Part No.
MMR-1N/MMFRS-1N	MMH-B120
MMR-2P/2Q	MMH-B220
MMFRS-2P/2Q	MMH-B220
MMR-3Q/3W	MMH-B320
MMFRS-3Q/3W	MMH-B320
MMR-4W/4Z/4A	MMH-B420
MMFRS-4W/4Z/4A	MMH-B420
MMR-5B	MMH-B420
MMFRS-5B	MMH-B420



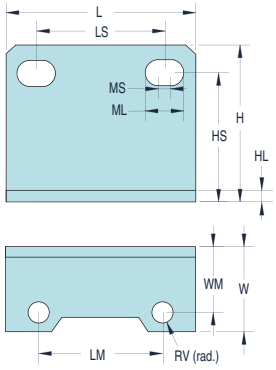
Dim.	MMH-B120	MMH-B220	MMH-B320	MMH-B420
L	1.57 (40.0)	2.17 (55.0)	2.09 (53.0)	2.76 (70.0)
LS	1.10 (28.0)	1.34 (34.0)	1.57 (40.0)	2.13 (54.0)
H	0.67 (17.0)	1.38 (35.0)	0.85 (21.5)	1.06 (27.0)
HS	0.43 (11.0)	0.75 (19.0)	0.55 (14.0)	0.71 (18.0)
W	1.49 (37.8)	1.97 (50.0)	2.52 (64.0)	3.12 (79.2)
WS	0.98 (25.0)	1.18 (30.0)	1.55 (39.0)	1.94 (49.2)
RV	0.81 (20.5)	1.32 (33.5)	1.67 (42.5)	2.07 (52.5)
LM	0.48 (12.3)	0.79 (20.0)	0.98 (25.0)	1.18 (30.0)
ML	0.26 (6.5)	0.21 (5.4)	0.26 (6.5)	0.33 (8.5)
WM	0.18 (4.5)	0.21 (5.4)	0.26 (6.5)	0.33 (8.5)
RH	0.09 (2.3)	0.11 (2.7)	0.13 (3.3)	0.17 (4.3)
HL	0.08 (2.0)	0.09 (2.3)	0.09 (2.3)	0.09 (2.3)



Mounting Hardware for Lubricators & Filters

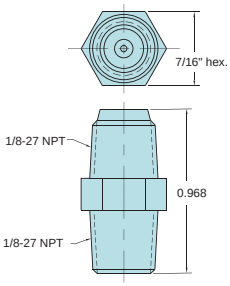
No brackets are furnished with these components. Comes with hardware to mount bracket to MMF/MML.

Filter/ Lubricator	Bkt. Mtg. Thread	Bracket Part No.
MMF-2P	M4	MMH-B240
MML-2P	M4	MMH-B240
MMF-3	M4	MMH-B340
MML-3	M4	MMH-B340
MMF-4Z/4W	M5	MMH-B440
MML-4Z/4W	M5	MMH-B440
MMF-4A	M5	MMH-B540
MML-4A	M5	MMH-B540
MMF-5	M6	MMH-B640
MML-5	M6	MMH-B640



Dim.	MMH-B240	MMH-B340	MMH-B440	MMH-B540	MMH-B640
L	1.57 (40.0)	2.09 (53.0)	2.76 (70.0)	2.76 (70.0)	3.54 (90.0)
LS	1.06 (27.0)	1.57 (40.0)	2.13 (54.0)	2.13 (54.0)	2.60 (66.0)
H	1.30 (33.0)	1.53 (39.0)	1.85 (47.0)	1.85 (47.0)	2.52 (64.0)
HS	1.06 (27.0)	1.26 (32.0)	1.50 (38.0)	1.50 (38.0)	2.05 (52.0)
W	0.71 (18.0)	0.89 (22.5)	1.24 (31.5)	1.24 (31.5)	1.69 (43.0)
RV	0.18 (4.5)	0.18 (4.5)	0.22 (5.5)	0.22 (5.5)	0.26 (6.5)
LM	1.02 (26.0)	1.38 (35.0)	1.85 (47.0)	1.85 (47.0)	2.36 (60.0)
MS	0.12 (3.0)	0.06 (1.5)	0.08 (2.0)	0.08 (2.0)	0.08 (2.0)
ML	0.33 (8.4)	0.32 (8.0)	5.12 (13.0)	5.12 (13.0)	5.12 (13.0)
WM	0.21 (5.4)	0.26 (6.5)	0.43 (11.0)	0.43 (11.0)	0.43 (11.0)
HL	0.09 (2.3)	0.09 (2.3)	0.09 (2.3)	0.09 (2.3)	0.13 (3.2)

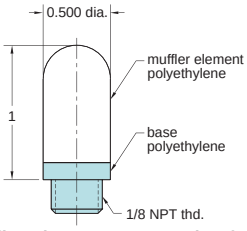
1/8” NPT Filter



1/8” NPT hex nipple with 40 micron filter / strainer, can be used as a muffler.

Part No.	Description
9002-01	1/8” NPT Filter

Muffler



The 3849-1 muffler is constructed of durable polyethylene with a 1/8” NPT male thread.

Part No.	Description
3849-1	Muffler

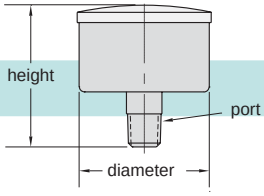
Filter Elements

All Maximatic filters come standard with a 25 micron sintered brass filter element and baffle, however 5 micron filters are also available. Add “-F5” to the end of the filter Part Number for 5 micron. Replacement filters with baffles are also offered below.

Filter Series	5 micron	25 micron
MMF-1	27021	27050
MMF-2	27022	27051
MMF-3	27023	27052
MMF-4	27024	27053
MMF-5	27025	27054

Pressure Gauges

Gauge measures pneumatic system pressure. Stud mounted.



Range: Scale reading up to 160 psig/11 bar. See See chart.

Construction: Steel case (nickel-plated on PG-101-NP). Plastic face. Dial shows two ranges; psig in black, bars in red. Built-in pressure snubber.

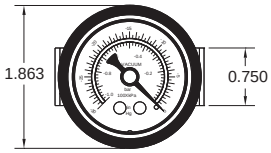
Ports: Connection located at rear is double threaded
O.D. - male thread 1/8" NPT

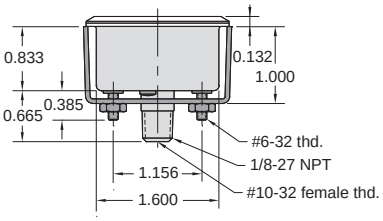
Mounting: Stud mount using 1/8" NPT center stud

Part No.	Diameter	Height	Port	Range psig	Range Bar
PG-10-30J*	1"	1.003"	1/16" NPT	0 to 30	0 to 2
PG-10-60J*	1"	1.003"	1/16" NPT	0 to 60	0 to 4
PG-10-160J*	1"	1.003"	1/16" NPT	0 to 160	0 to 11
PG-15-30P	1.5"	1.540"	1/8" NPT	0 to 30	0 to 2
PG-15-60P	1.5"	1.540"	1/8" NPT	0 to 60	0 to 4
PG-101-BK*	1.625"	1.670"	1/8" NPT	0 to 100	0 to 6.9
PG-101-NP*	1.625"	1.670"	1/8" NPT	0 to 100	0 to 6.9
PG-15-160P	1.5"	1.540"	1/8" NPT	0 to 160	0 to 11
PG-20-30Q	2"	1.680"	1/4" NPT	0 to 30	0 to 2
PG-20-60Q	2"	1.680"	1/4" NPT	0 to 60	0 to 4
PG-20-160Q	2"	1.680"	1/4" NPT	0 to 160	0 to 11

* I.D. - tapped for #10-32 fitting

Vacuum Gauge





Gauge measures pneumatic vacuum pressure. Mounting bracket included.

Range: Scale reading from 0 to 30 in.Hg. and 0 to -1 bar

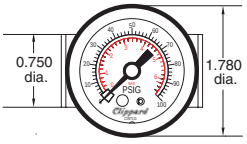
Construction: Nickel-plated steel case. Plastic face. Dial shows two ranges; Hg in black, bars in red. Built-in pressure snubber.

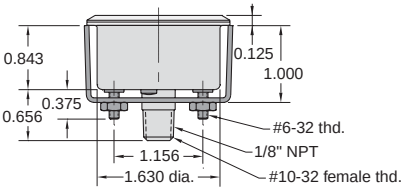
Ports: Connection located at rear is double threaded
O.D. - male thread 1/8" NPT
I.D. - tapped for #10-32 fitting

Mounting: Stud mount using 1/8" NPT center stud or panel mount using the zinc plated steel bracket supplied.

Part No.	Description
VG-30	Vacuum Gauge

Pressure Gauge





Gauge measures pneumatic system pressure. Mounting bracket included.

Input Pressure: Scale reading from 0 to 100 psig and 0 to 6.9 bar

Construction: Nickel-plated steel case. Plastic face. Dial shows two ranges; psig in black, bars in red. Built-in pressure snubber.

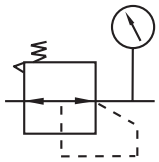
Ports: Connection located at rear is double threaded
O.D. - male thread 1/8" NPT
I.D. - tapped for #10-32 fitting

Mounting: With zinc plated steel bracket supplied

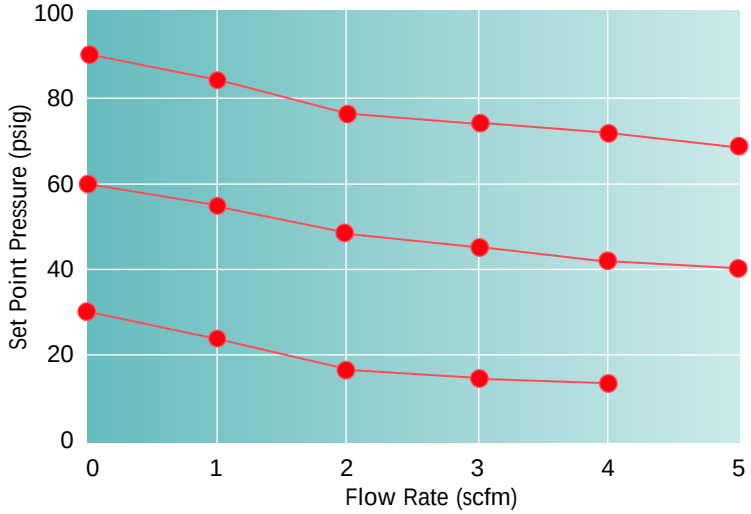
Part No.	Description
PG-100	Pressure Gauge

Flow Rate vs. Set Point Pressure @ 100 psig Supply Pressure

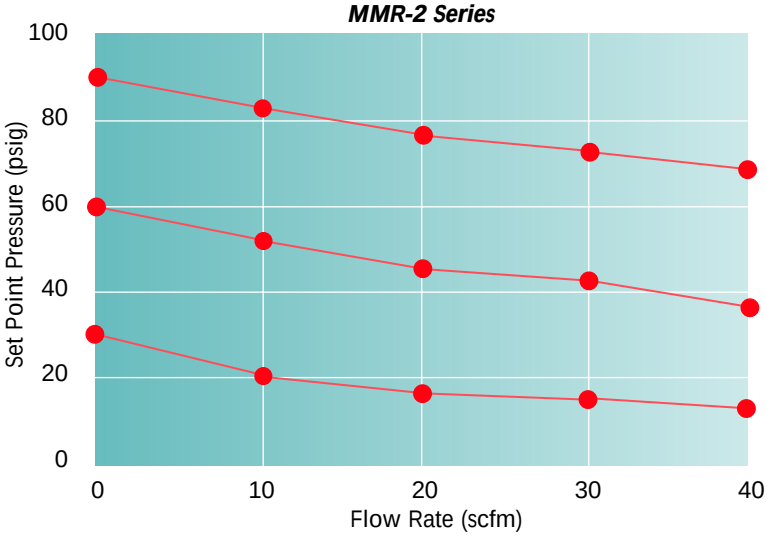
- *Find the required flow rate in the graphs below.*
- *Determine the desired set point pressure.*
- *With a suggested pressure drop of <15 psig, determine which Regulator size provides the required flow rate.*



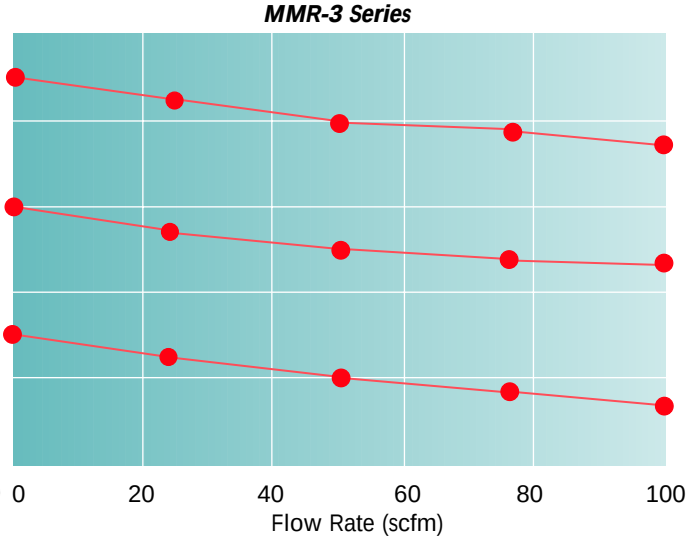
MMR-1 Series



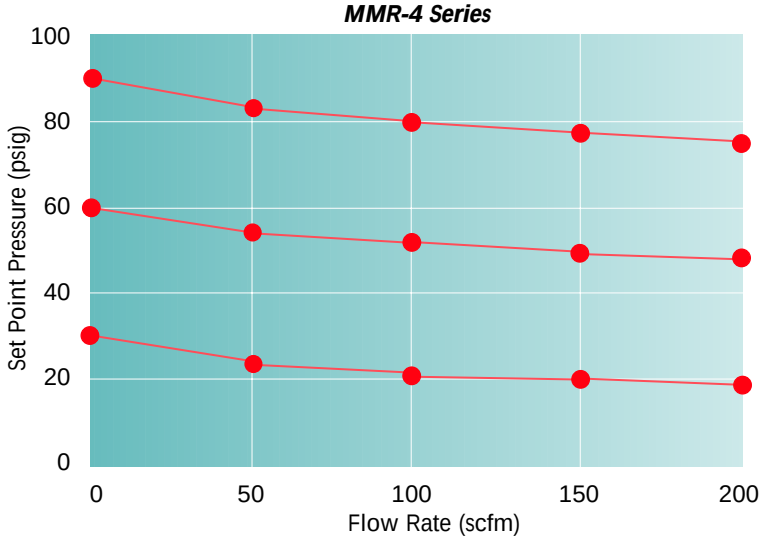
MMR-2 Series



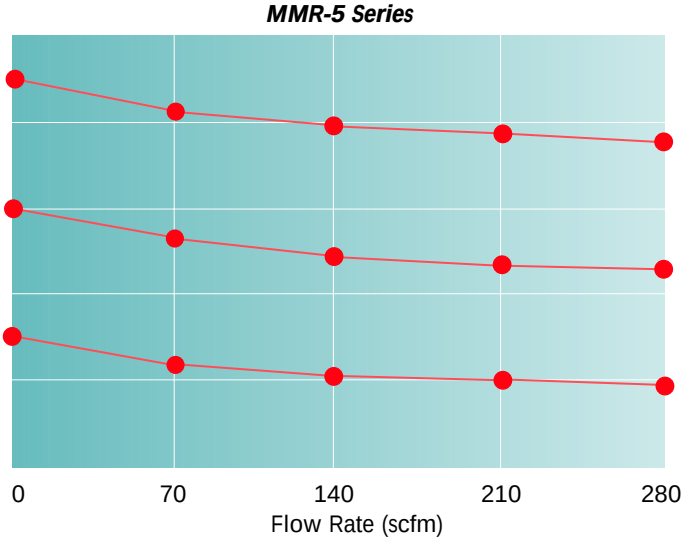
MMR-3 Series



MMR-4 Series

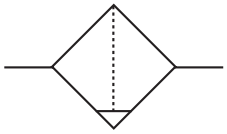


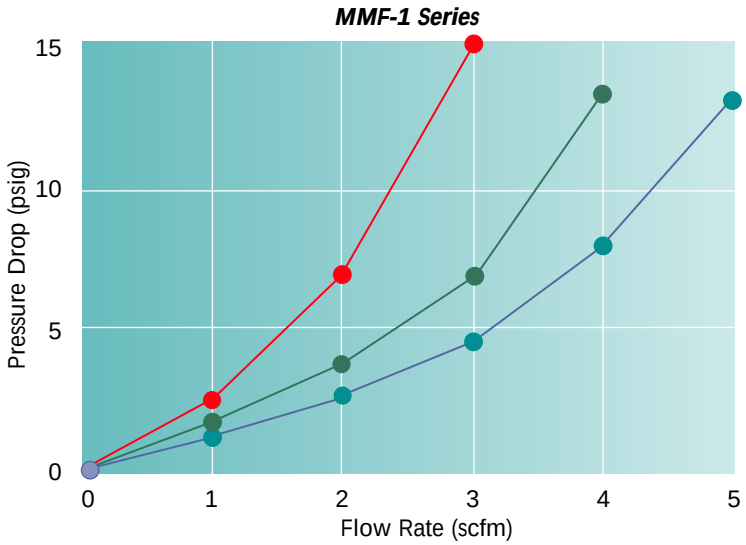
MMR-5 Series

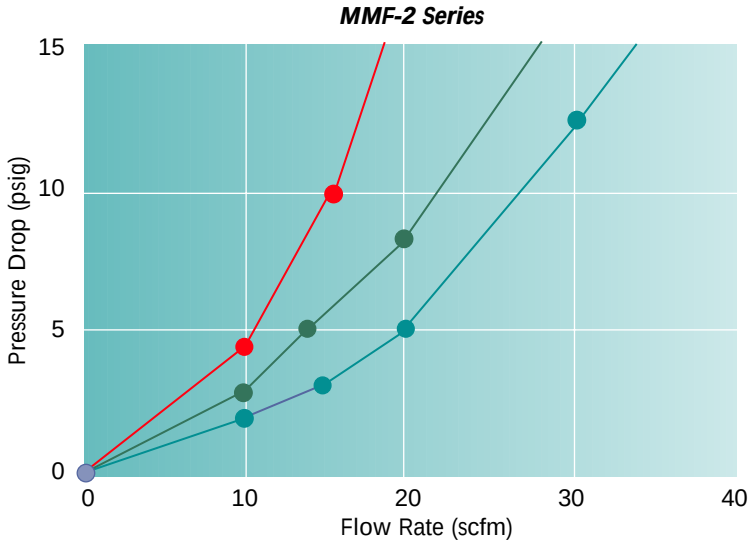


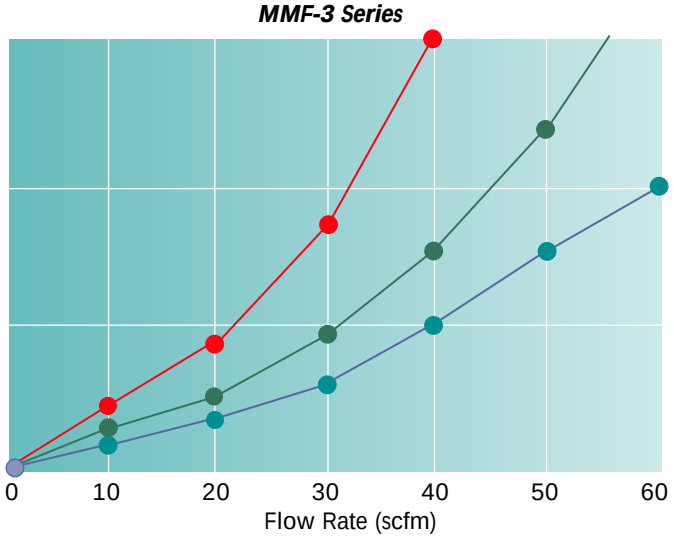
Flow Rate vs. Set Pressure Drop @ 30 ●—●, 60 ●—● & 90 ●—● psig Supply Pressure

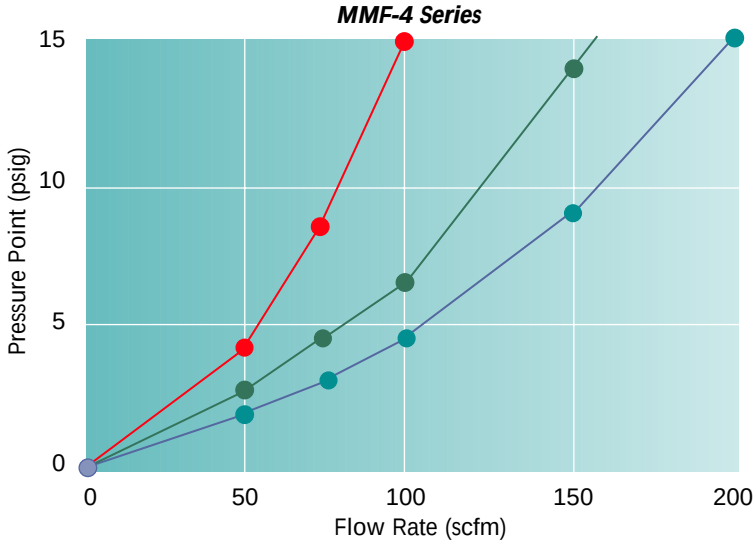
- *Find the required flow rate in the graphs below.*
- *Determine the desired set point pressure.*
- *With a suggested pressure drop of <15 psig, determine which Filter size provides the required flow rate.*

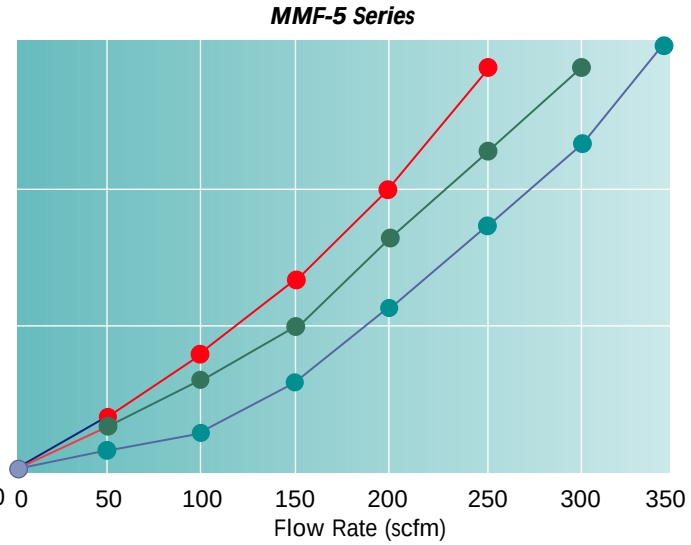






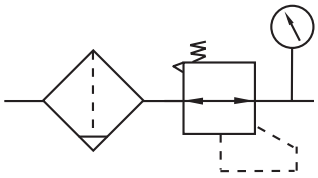




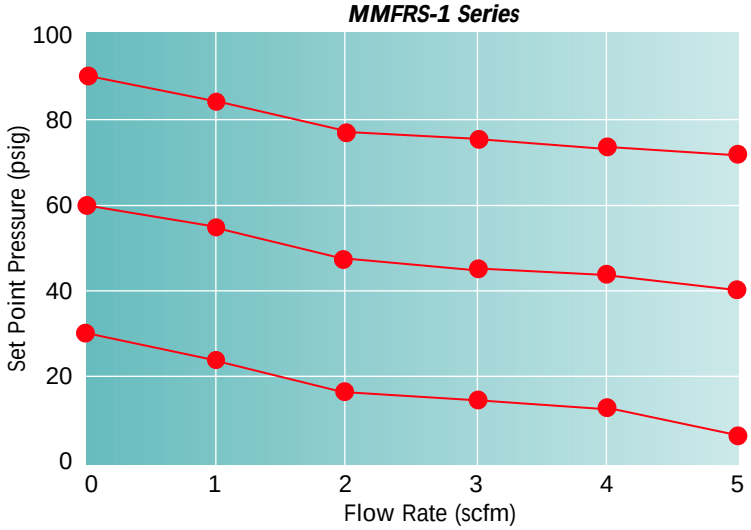


Flow Rate vs. Set Point Pressure @ 100 psig Supply Pressure

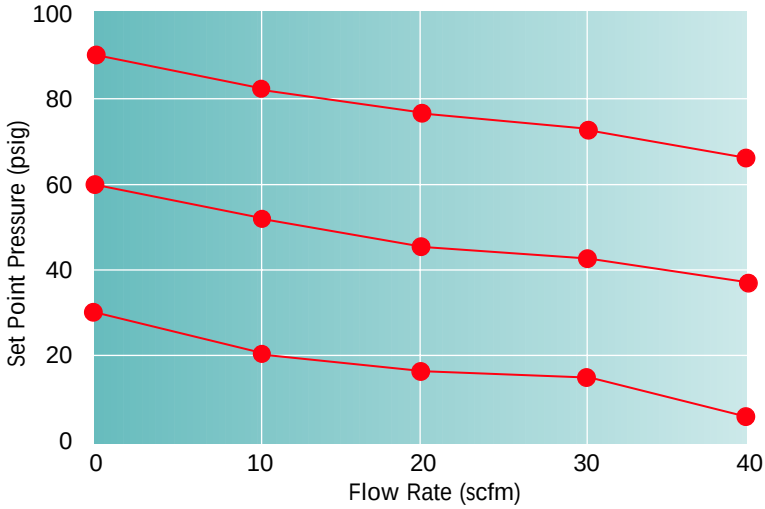
- *Find the required flow rate in the graphs below.*
- *Determine the desired set point pressure.*
- *With a suggested pressure drop of <15 psig, determine which Filter-Regulator size provides the required flow rate.*



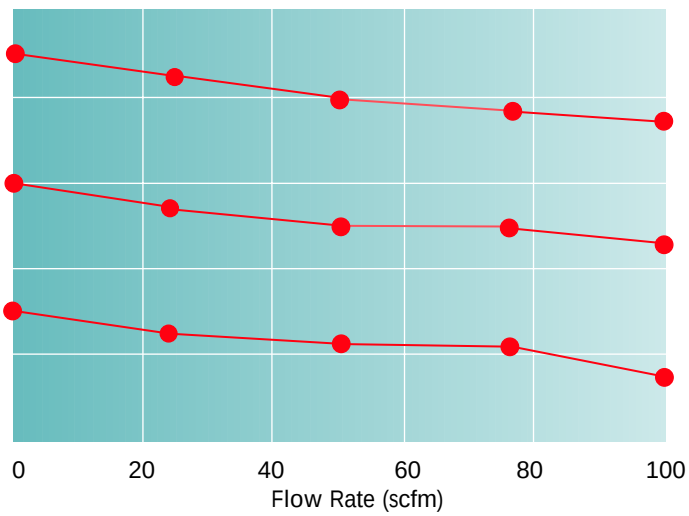
MMFRS-1 Series



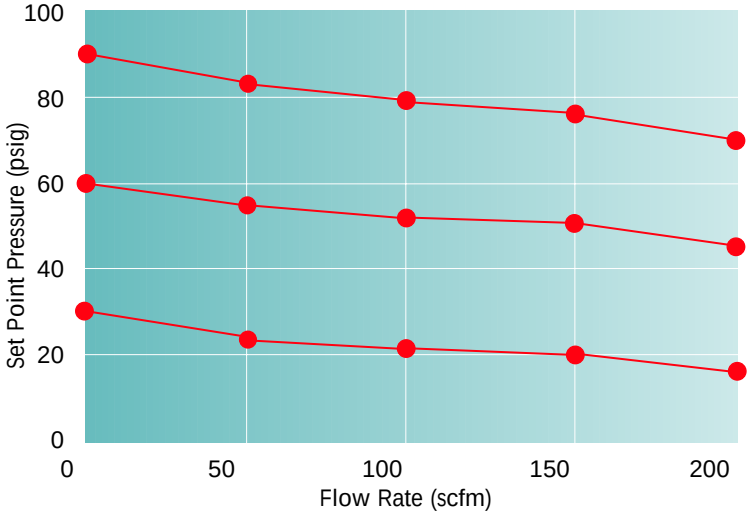
MMFRS-2 Series



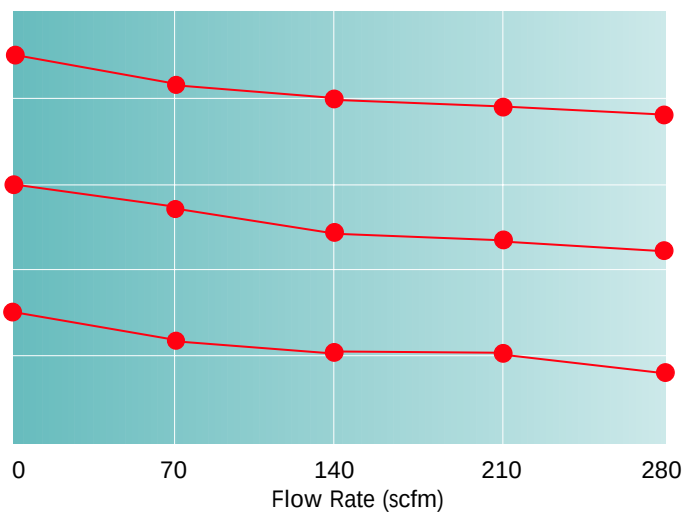
MMFRS-3 Series



MMFRS-4 Series

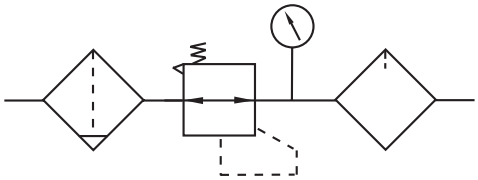


MMFRS-5 Series

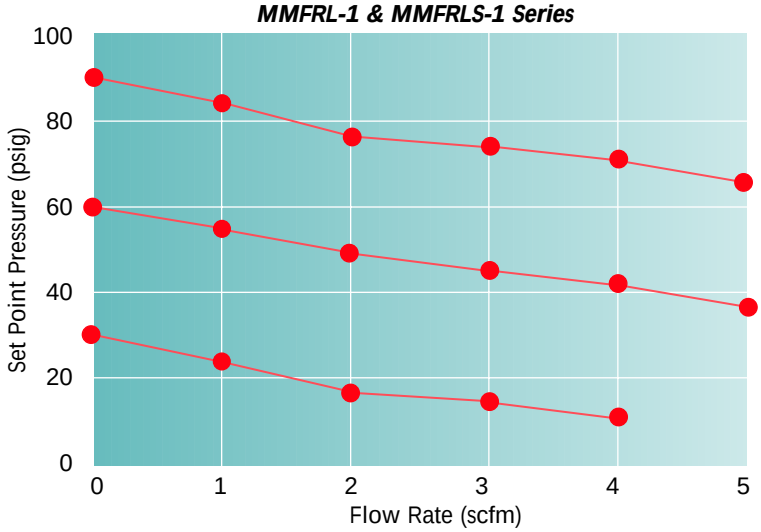


Flow Rate vs. Set Point Pressure @ 100 psig Supply Pressure

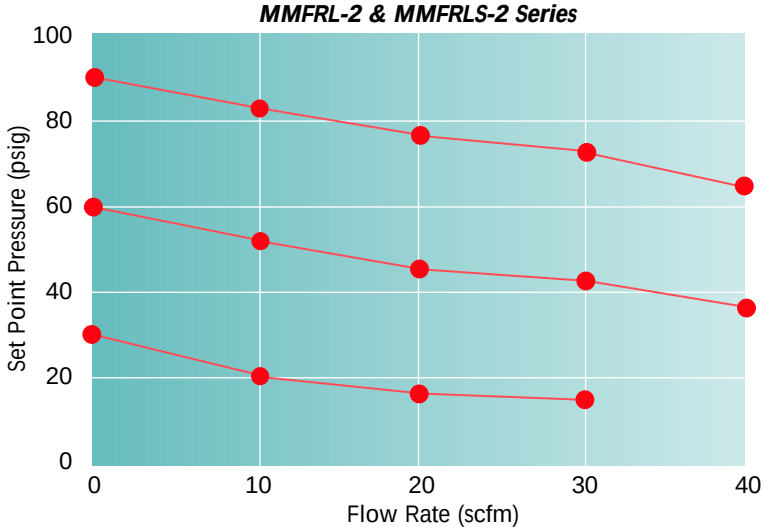
- *Find the required flow rate in the graphs below.*
- *Determine the desired set point pressure.*
- *With a suggested pressure drop of <15 psig, determine which FRL size provides the required flow rate.*



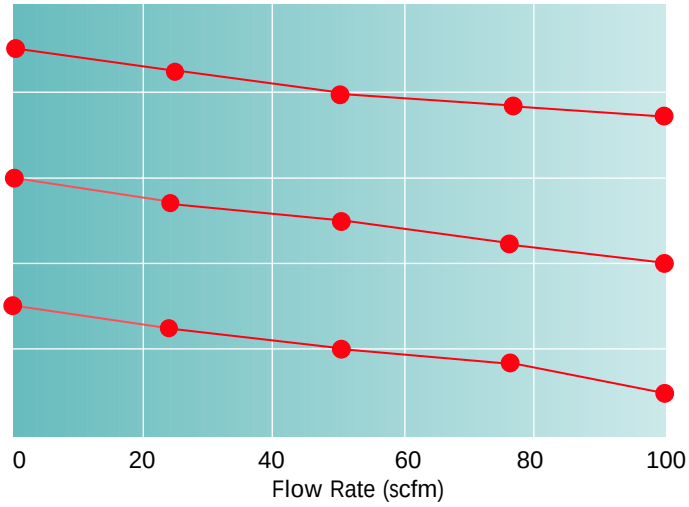
MMFRL-1 & MMFRLS-1 Series



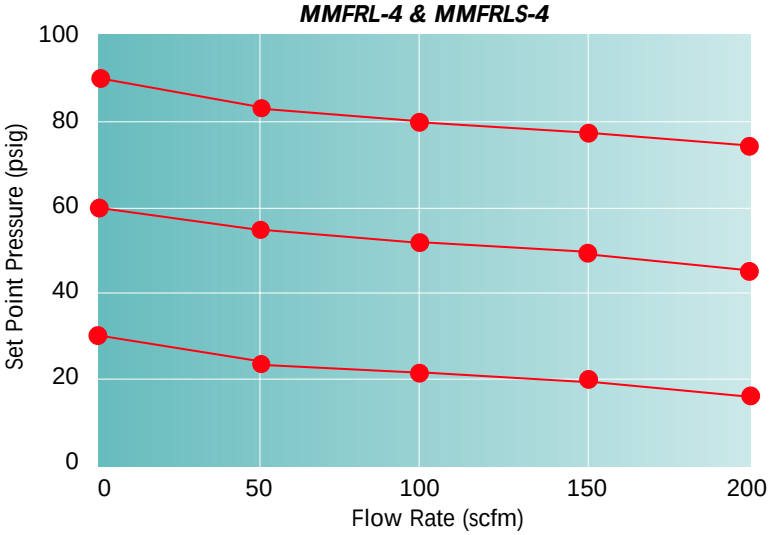
MMFRL-2 & MMFRLS-2 Series



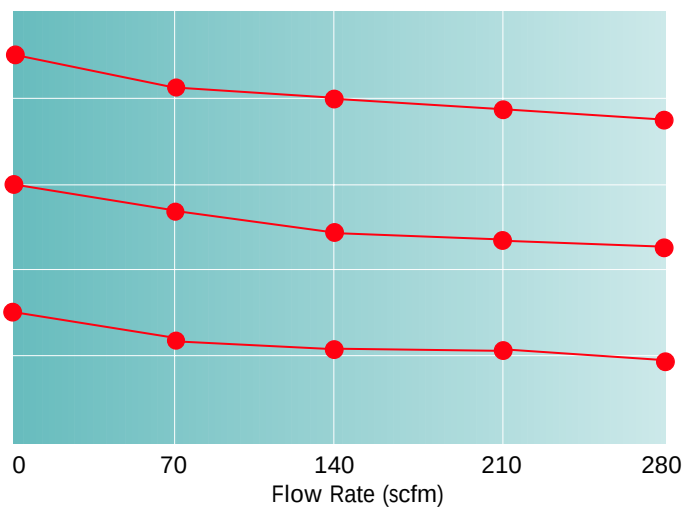
MMFRL-3 & MMFRLS-3 Series



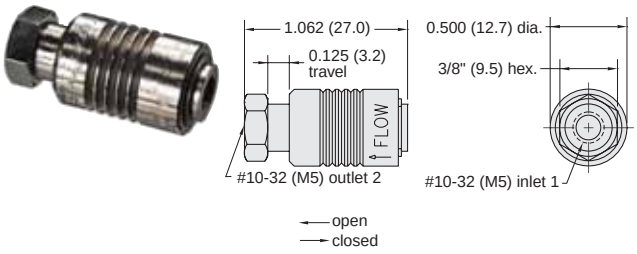
MMFRL-4 & MMFRLS-4



MMFRL-5 & MMFRLS-5 Series



2 Position 2-Way or 3-Way Sleeve Valves



Medium: Air

Mounting: Inline or direct to fitting

Stem Travel: 1/8" (3.2)

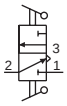
Material: Nickel plated brass

Input Pressure: 150 psig/l0 bar max.

Air Flow: 6.5 SCFM @ 50 psig; 11.8 SCFM @ 100 psig; 280 l/min @ 6 bar

Force to Actuate: Approx. 2.5 lbs

Part No.	Description
SLV-2	2 Position 2-Way Sleeve Valve, #10-32
SLV-2-M5	2 Position 2-Way Sleeve Valve, M5
SLV-3	2 Position 3-Way Sleeve Valve, #10-32
SLV-3-M5	2 Position 3-Way Sleeve Valve, M5



J-Series Sleeve Valves

Features

- Variety of inlet and outlet porting eliminates fittings
- No cross-over between inlet and exhaust ports
- Corrosion resistant electroless nickel plated brass body
- Anodized aluminum sleeve for corrosion resistance
- Smooth operation, low sliding friction
- Buna-N seals; (Fluorocarbon available)

Clippard J-Series sleeve valves with 1/8" NPT and 1/4" NPT ports offer large flow capability with a relatively short stroke in 2-way and 3-way valves, and no cross-over between inlet and exhaust on the 3-way models.

The JSLV-2 2-way valve and the JSLV-3 3-way valve combine high flow with small size. Unlike ball valves, sleeve valves require no space for a handle. They also provide flexibility in pipe connections and are available with either male or female threads or combinations of both.

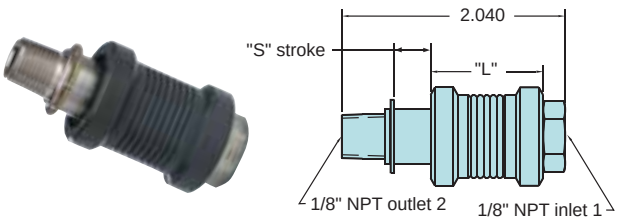
The JSLV-2 and JSLV-3 valves feature a smooth opening stroke during which inlet air is directed to the outlet. During the closing stroke, in the opposite direction of travel, the outlet is closed from the inlet and in the JSLV-3 version, the outlet is then exhausted to atmosphere without the inlet ever being connected to exhaust.

Medium: Air, Water or Oil

Force to Actuate: Approx. 8 lbs

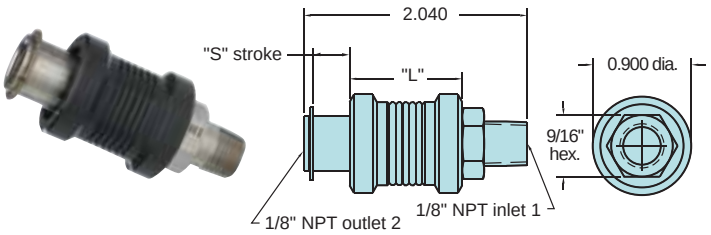
Input Pressure: 150 psig max.

Mounting: Inline or direct to fitting



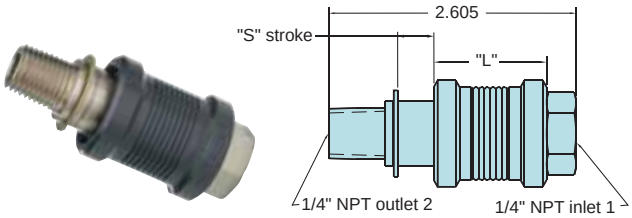
Air Flow: 1/8" NPT: 43 SCFM @ 100 psig

Order No.	Type	Inlet	"L"	"S"
JSLV-2-F2M2	2-Way	1/8 Female Pipe	1.155"	0.260"
JSLV-3-F2M2	3-Way	1/8 Female Pipe	1.030"	0.385"



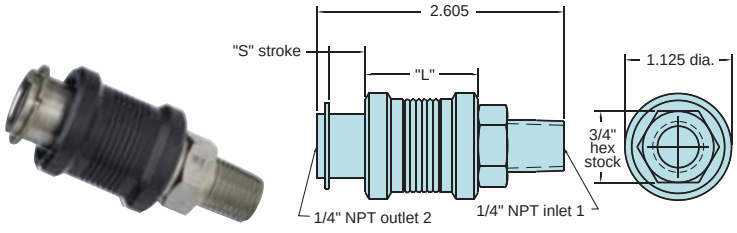
Air Flow: 1/8" NPT: 43 SCFM @ 100 psig

Order No.	Type	Inlet	"L"	"S"
JSLV-2-M2F2	2-Way	1/8 Male Pipe	1.155"	0.260"
JSLV-3-M2F2	3-Way	1/8 Male Pipe	1.030"	0.385"



Air Flow: 1/4" NPT: 70 SCFM @ 100 psig

Order No.	Type	Inlet	"L"	"S"
JSLV-2-F4M4	2-Way	1/4 Female Pipe	1.325"	0.305"
JSLV-3-F4M4	3-Way	1/4 Female Pipe	1.190"	0.460"



Air Flow: 1/4" NPT: 70 SCFM @100 psig

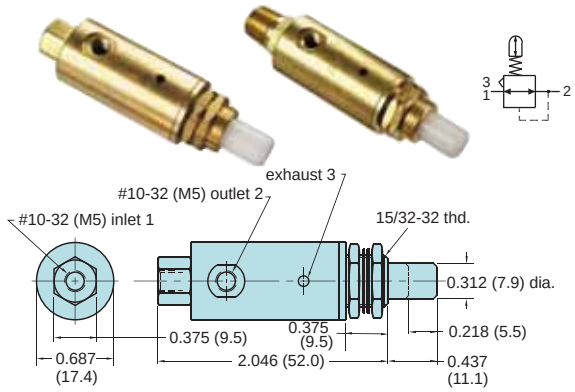
Order No.	Type	Inlet	"L"	"S"
JSLV-2-M4F4	2-Way	1/4 Male Pipe	1.325"	0.305"
JSLV-3-M4F4	3-Way	1/4 Male Pipe	1.190"	0.460"

Miniature Pressure Regulators

Regulators are offered in either relieving or non-relieving versions. The relieving design maintains a constant pressure output even when downstream conditions change. As downstream pressure increases due to reduced flow, this increased pressure overcomes the regulator piston and the pressure is relieved to atmosphere to maintain a constant output pressure.

The non-relieving regulator does not automatically compensate for changes in downstream flow or pressure. There is no vent to atmosphere, as in a relieving type regulator, and the output pressure can increase due to a downstream flow.

Plunger-Type Pressure Regulators



Plunger Travel: 7/32" **Force For Full Stem Travel:** 25 lb nominal

Operation: As plunger is depressed pressure increases proportionally to the travel; when plunger is released the input is closed and the output pressure is exhausted to atmosphere

Range (psig/bar)*	#10-32	1/8" NPT	M5
0-20/1.4	MAR-1C-2	MAR-1CP-2	MAR-1C-2-M5
0-30/2.1	MAR-1C-3	MAR-1CP-3	MAR-1C-3-M5
0-40/2.8	MAR-1C-4	MAR-1CP-4	MAR-1C-4-M5
0-50/3.4	MAR-1C-5	MAR-1CP-5	MAR-1C-5-M5
0-60/4.1	MAR-1C-6	MAR-1CP-6	MAR-1C-6-M5
0-70/4.8	MAR-1C-7	MAR-1CP-7	MAR-1C-7-M5
0-100/6.9	MAR-1C	MAR-1CP	MAR-1C-M5

* Outlet pressure is based on 7/32" stem travel. If stem is depressed further, the outlet pressure will increase.

Replacement Air Filter with Element

Medium: Air Only **Filtration:** 35 micron

Input Pressure: 0-250 psig max. **Material:** Brass

Air Flow: 5.0 SCFM @ 50 psig; 9.0 SCFM @ 100 psig

Mounting: Direct or inline

Cleanout: Press clean-out valve stem periodically to remove accumulated water. For complete cleaning, filter body unscrews at point "A" without disturbing piping. DO NOT DISASSEMBLE UNDER PRESSURE. Remove screw and filter element to clean or replace

- Panel mounting permits unit to be located with other controls on a control console or panel board for pilot operation of larger regulators or for remote control; mounting nuts and lockwashers furnished
- Small, compact - ideal for mounting on individual jigs and fixtures as well as in control circuits

Medium: Air

Materials: Brass body, Buna-N seals, stainless steel stem and spring

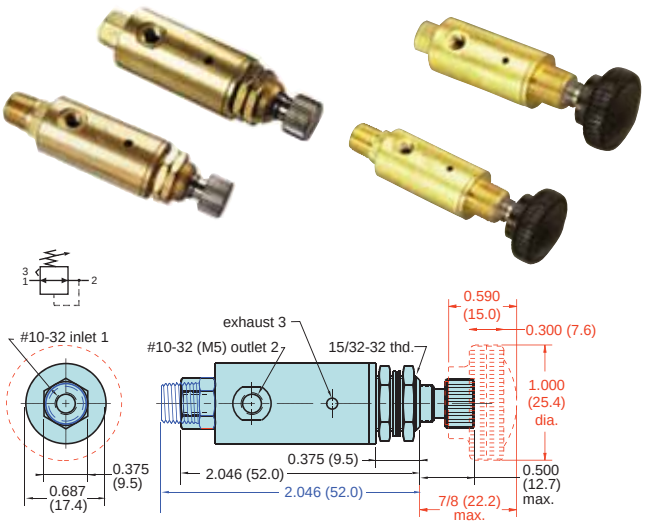
Air Flow: 3 SCFM @ 50 psig; 5 SCFM @ 100 psig; 120 l/min. @ 6 bar

Input Pressure: 300 psig/21 bar max.

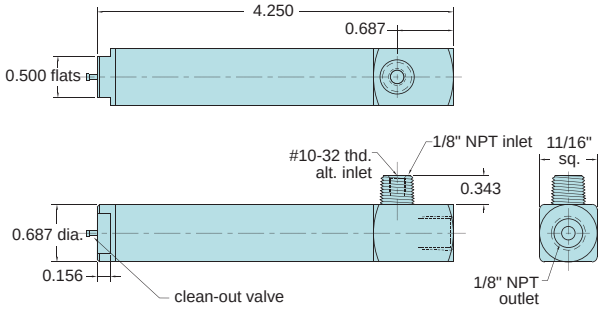
Mounting: 15/32-32 thread. Nuts and lockwashers furnished

Adjustment: By means of a knob with micro-adjustment (40 pitch thd.)

Adjustable Pressure Regulators



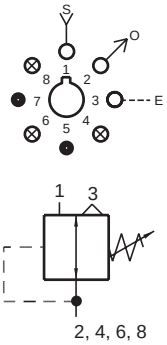
Range (psig/bar)	#10-32	Knob	1/8" NPT	Non-Relieving	M5
0-20/1.4	MAR-1-2	MAR-1K-2	MAR-1P-2	MAR-1NR-2	MAR-1-2-M5
0-30/2.1	MAR-1-3	MAR-1K-3	MAR-1P-3	MAR-1NR-3	MAR-1-3-M5
0-40/2.8	MAR-1-4	MAR-1K-4	MAR-1P-4	MAR-1NR-4	MAR-1-4-M5
0-50/3.4	MAR-1-5	MAR-1K-5	MAR-1P-5	MAR-1NR-5	MAR-1-5-M5
0-60/4.1	MAR-1-6	MAR-1K-6	MAR-1P-6	MAR-1NR-6	MAR-1-6-M5
0-70/4.8	MAR-1-7	MAR-1K-7	MAR-1P-7	MAR-1NR-7	MAR-1-7-M5
0-100/6.9	MAR-1	MAR-1K	MAR-1P	MAR-1NR	MAR-1-M5



Part No.	Description
MAF-1	Replaceable Air Filter with Element
12382	Low Pressure Drop, Concentric, Chemically-Inert 35-micron Filter Elements

Pressure Regulator

R-701 is a self-relieving, adjustable pressure regulator with multiple output ports. Pressure can be piped directly from ports 2, 4, 6 and 8. Eliminates need for additional fittings. Unused output ports should be plugged.



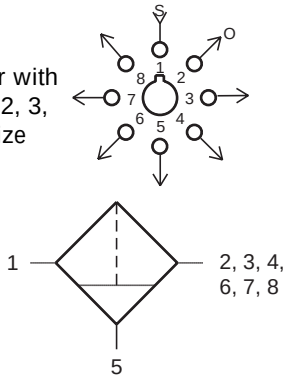
- Multiple porting speeds piping
- Knurled knob for fast, accurate adjustments - no tools needed

Flow: 12 scfm @ 100 psig; 340 l/min @ 6.9 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Part No.	Description
R-701	Pressure Regulator

Filter

R-801 is a 25 micron filter with multiple outlets at ports 2, 3, 4, 6, 7 and 8 to minimize need for fittings. Port 5 is a drain and should be plugged; however, when the valve is mounted vertically port 5 can be tubed to a drain. Unused ports should be plugged.



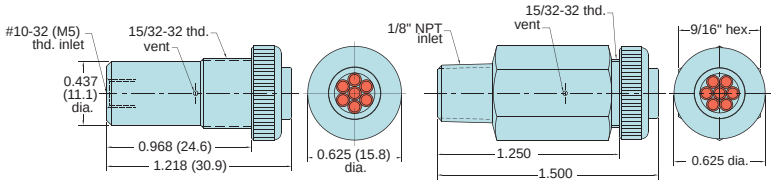
- Multiple porting speeds piping
- Clean out port for easy maintenance
- Protects system - assures proper functioning
- Replaceable filter element (Part No. R-801-14)

Flow: 12 scfm @ 100 psig; 339 l/min @ 6.9 bars
Temperature: 32˚ to 180˚ F
Working Pressure: 0 to 150 psig; 0 to 10.3 bars

Part No.	Description
R-801	Filter

Multi-Pin Air Indicator

Plunger type (when extended 7-pin color display signals “on”)



Medium: Air Only

Input Pressure: 150 psig/1-10 bar max.

Minimum Actuation Pressure: 15 psig (approx)

Response: Approx. 10 ms @ 50 psig

Filtration: 40 micron recommended

Mounting: IND-3: Panel mount in hole. #15/32-32 nut and lockwasher provided; IND-3P: Direct mount into 1/8” NPT hole

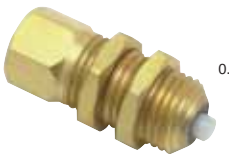
Maximum Panel Thickness: 3/16” (4.8)

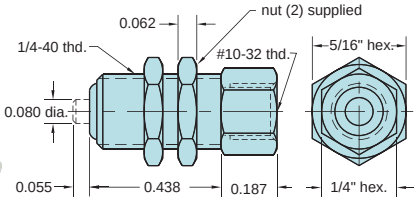
Part No.	Description
IND-3-(color)	**Multi-Pin Air Indicator, #10-32**
IND-3-M5-(color)	**Multi-Pin Air Indicator, M5**
IND-3P-(color)	**Multi-Pin Air Indicator, 1/8” NPT**

GN-Green, WH-White, RD-Red, YL-Yellow

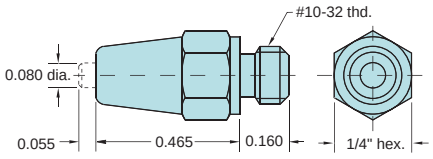
Single Pin Air Indicator

Plunger type (when extended white pin display signals “on”)





Part No.	Description
IND-1-WH	**. .Single Pin Air Indicator**



Part No.	Description
IND-1M-WH	**Single Pin Air Indicator**

Medium: Air Only

Input Pressure: 150 psig/1-10 bar max.

Minimum Actuation Pressure: 12 psig (approx)

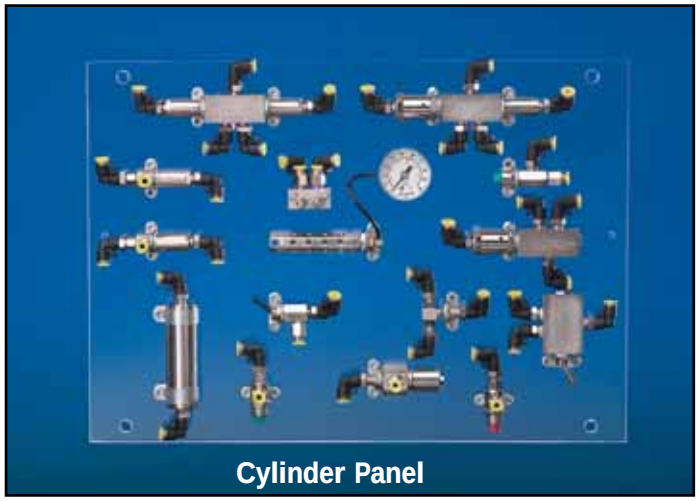
Response: Approx. 10 ms @ 50 psig

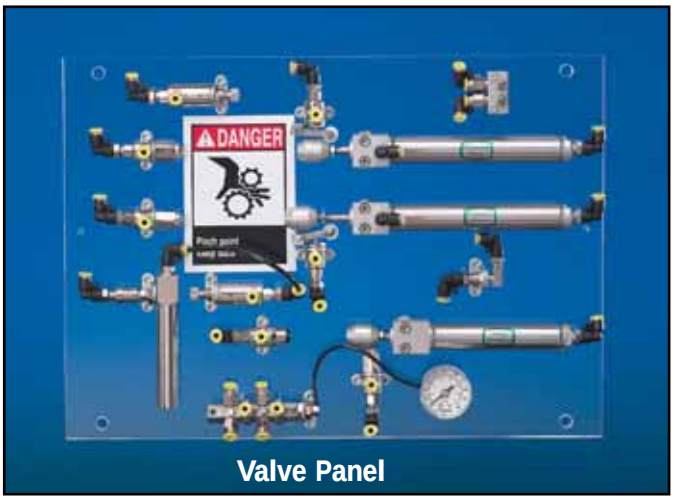
Filtration: 40 micron recommended

Mounting: IND-1-WH: Panel mount 1/4 dia. hole. 1/4-40 thd. nuts provided. IND-1M-WH: Direct mount into 1/8” NPT hole

Maximum Panel Thickness: 3/16” (4.8)

NEW! Educational Training Kits


Cylinder Panel



Valve Panel

Clippard's Fluid Power Eductional Kits are designed to help provide a practical understanding of the basic concepts of fluid power. They consist of many components, the same components used in industry today to provide control and work in thousands of different applications.

These kits are designed to work in conjunction with the Fluid Power Education Foundation's standard curriculum which may be downloaded at no charge at www.fpef.org.


Parts Kit

Order #EK-2 Educational Training Kit, Components Only

Includes:

- All Clippard Pneumatic components as illustrated on the back of this bulletin (Valve & Cylinder Kits)
- Templates for use in making mounting boards for assembly of the components
- Parts in plastic storage box
- "Unit Study" Curriculum*

Order #EK-3 Educational Training Kit, Components Mounted on Acrylic Boards (as shown above)

Includes:

- All Clippard Pneumatic components as illustrated on the back of this bulletin mounted on two acrylic boards (Valve and Cylinder Kits)
- Parts in plastic storage box
- "Unit Study" Curriculum*

Order #CS-2690 "L" Mounting Bracket for EK-3

- For ease of use on a tabletop

Features

- Learn basic Fluid Power concepts and practice "real" applications
- Lessons may be tailored to individual expertise levels
- Design complex circuitry
- Push-Quick fittings allow for easy connections and disconnections
- Available pre-mounted on acrylic boards or by component only with mounting templates
- Boards may be wall-mounted or adapted to mount on a benchtop

** Curriculum produced by Fluid Power Education Foundation*

An air supply of at least 40 psig must be provided (not to exceed 125 psig). These kits are equipped with two pressure regulators, both with a pressure range of 0 to 40 psig, but can operate with an input supply up to 125 psig.

Cylinder Kit Components

1 BFC-2AK, 2-Station Block Flow Control, Meter Out with Adjustable Knob
1 CS-2569, Pressure Gauge
3 CS-2570-2, Connectors
2 FDR-12-4, 3/4" Bore Double-Acting S/S Cylinders, 4" Stroke
1 FSR-12-2, 3/4" Bore Single-Acting, S/S Cylinder, 2" Stroke
1 MAF-1-NP, Air Filter
1 MAN-12-NP, 12-Port Manifold
2 MAR-1-4-NP, Pressure Regulators, #10-32
6 MAV-3-NP, Poppet Valves, #10-32
3 MBA-1-NP, Ball Cam Actuators
1 MEV-2-NP, Poppet Type Quick Exhaust Valve, #10-32
1 PC-1B-NP, Captivated Push Button, 1/8" dia., Black
16 PQ-MC05N, Male Connector Push-Quick Fittings, 5/32" Tube, #10-32 Thread
13 PQ-ME05N, Male Elbow Push-Quick Fittings, 5/32" Tube, #10-32 Thread
6 PQ-ME05P, Male Elbow Push-Quick Fittings, 5/32" Tube, 1/8" NPT
1 SLV-3, 2-Position, 3-Way Sleeve Valve, #10-32
1 SP0-2-BLK, #10-32 to 1/16 ID "L" Slip-On Fitting
1 Miscellaneous Hose & Tubing
3 0107-33, Hex Nuts
1 0107-15-NP, Nut
2 0107-18-NP, Nuts
22 0026-51, Cap Screws
6 0026-52, Cap Screws
2 0026-53, Cap Screws
1 15027-NP, #10-32 Bulkhead Fitting
1 15453, Male Coupling, #10-32
1 17535, Pinch Point Label
1 11750-2-NP, #3-56 to 1/16" ID Hose Barb Fitting
6 11755-NP, Screw Plugs, #10-32
19 11761-2, Buna-N Gaskets
11 11918-1, 90° Mounting Brackets
2 11925, Roller Cam Follower Actuators
1 CS-2568-2, Acrylic Mounting Board*

** Only included with Order No. EK-3*

Valve Kit Components

1 BFC-2AK, 2-Station Block Flow Control, Meter Out with Adjustable Knob
1 CS-2569, Pressure Gauge
1 FV-5-NP, Plunger-Actuated Spring Return Valve, #10-32
2 FV-5D-NP, 2-Position Double Plunger Valves, #10-32
1 MAN-12-NP, 12-Port Manifold
1 MAT-2.0-NP, In-Line Volume Chamber
4 MAV-3-NP, Poppet Valves, #10-32
1 MAVO-3-NP, Normally-Open Spool Valve, #10-32
1 MJTV-5-NP, 2-Position SpoolValve, Brass Toggle, 1/8" NPT
5 MPA-3-NP, Single Acting, Spring Return Actuators, #10-32
2 MPA-5-NP, Single-Acting, Spring Return Actuators, #10-32
1 MSV-1-NP, Shuttle Valve, #10-32 Male Outlet, #10-32 Female Inlets
2 PC-1G-NP, Captivated Push Buttons, 1/8" dia., Green
1 PC-1R-NP, Captivated Push Button, 1/8" dia., Red
9 PQ-MC05N, Male Connector Push-Quick Fittings, 5/32" Tube, #10-32 Thread
30 PQ-ME05N, Male Elbow Push-Quick Fittings, 5/32" Tube, #10-32 Thread
3 PQ-ME05P, Male Elbow Push-Quick Fittings, 5/32" Tube, 1/8" NPT
1 PV-1-NP, Pulse Valve, #10-32
1 SP0-2-BLK, #10-32 to 1/16 ID "L" Slip-On Fitting
1 TV-3SF-NP, 2-Position Spool Valve, #10-32 Thread
1 Miscellaneous Hose & Tubing
1 0107-15-NP, Nut
1 0107-18-NP, Nut
4 0019-4, Screws
26 0026-51, Screws
1 15027-NP, #10-32 Bulkhead Fitting
1 11750-2-NP, #3-56 to 1/16" ID Hose Barb
31 11761-2, Buna-N Gaskets
15 11918-1, 90° Mounting Brackets
1 3822-1, Steel Clamp
1 CS-2567-2, Acrylic Mounting Board*

** Only included with Order No. EK-3*

Length

To Convert	To	Multiply By
inch	millimeter	25.40
millimeter	inch	0.03937

in	mm	in	mm	in	mm	in	mm
0.025	0.635	0.275	6.985	0.525	13.335	0.775	19.685
0.050	1.270	0.300	7.620	0.550	13.970	0.800	20.320
0.075	1.905	0.325	8.255	0.575	14.605	0.825	20.955
0.100	2.540	0.350	8.890	0.600	15.240	0.850	21.590
0.125	3.175	0.375	9.525	0.625	15.367	0.875	22.225
0.150	3.810	0.400	10.160	0.650	16.510	0.900	22.860
0.175	4.445	0.425	10.795	0.675	17.145	0.925	23.495
0.200	5.080	0.450	11.430	0.700	17.780	0.950	24.130
0.225	5.715	0.475	12.065	0.725	18.415	0.975	24.765
0.250	6.350	0.500	12.700	0.750	19.050	1.000	25.400

Flow

To Convert	To	Multiply By
cfm (cubic ft/min.)	L / min (liters/min.)	28.317
L / min (liters/min.)	cfm (cubic ft/min.)	0.03531

cfm	L / min	cfm	L / min	cfm	L / min	cfm	L / min
0.5	14.159	5.5	155.744	10.5	297.334	16.0	453.07
1.0	28.317	6.0	169.903	11.0	311.493	17.0	481.39
1.5	42.476	6.5	184.062	11.5	325.652	18.0	509.71
2.0	56.634	7.0	198.221	12.0	339.811	19.0	538.02
2.5	70.793	7.5	212.380	12.5	353.970	20.0	566.34
3.0	84.951	8.0	226.539	13.0	368.129	21.0	594.66
3.5	99.110	8.5	240.698	13.5	382.288	22.0	622.97
4.0	113.268	9.0	254.857	14.0	396.447	23.0	651.29
4.5	127.427	9.5	269.016	14.5	410.606	24.0	679.61
5.0	141.585	10.0	283.175	15.0	438.924	25.0	707.93

Pressure

To Convert	To	Multiply By
psig (lbs/sq.inch)	bars	0.06895
bars	psig (lbs/sq.inch)	14.50

psig	bars	psig	bar	psig	bars	psig	bars
2.5	0.17	27.5	1.90	52.5	3.62	77.5	5.34
5.0	0.34	30.0	2.07	55.0	3.79	80.0	5.52
7.5	0.52	32.5	2.24	57.5	3.96	82.5	5.69
10.0	0.69	35.0	2.41	60.0	4.14	85.0	5.86
12.5	0.86	37.5	2.59	62.5	4.31	87.5	6.03
15.0	1.03	40.0	2.76	65.0	4.48	90.0	6.21
17.5	1.21	42.5	2.93	67.5	4.65	92.5	6.38
20.0	1.38	45.0	3.10	70.0	4.83	95.0	6.55
22.5	1.55	47.5	3.28	72.5	5.00	97.5	6.72
25.0	1.72	50.0	3.45	75.0	5.17	100.0	6.90

Force

To Convert	To	Multiply By
pounds (lbs)	newtons (N)	4.448
newtons (N)	pounds (lbs)	0.2248

lbs	N	lbs	N	lbs	N	lbs	N
0.25	1.1	2.75	12.2	5.25	23.4	7.75	34.5
0.50	2.2	3.00	13.3	5.50	24.5	8.00	35.6
0.75	3.3	3.25	14.5	5.75	25.6	8.25	36.7
1.00	4.4	3.50	15.6	6.00	26.7	8.50	37.8
1.25	5.6	3.75	16.7	6.25	27.8	8.75	38.9
1.50	6.7	4.00	17.8	6.50	28.9	9.00	40.0
1.75	7.8	4.25	18.9	6.75	30.0	9.25	41.1
2.00	8.9	4.50	20.0	7.00	31.1	9.50	42.3
2.25	10.0	4.75	21.1	7.25	32.2	9.75	43.4
2.50	11.1	5.00	22.2	7.50	33.4	10.00	44.5

Temperature

To Convert	To	Multiply By
Fahrenheit (˚F)	Celsius (˚C)	(˚F - 32) /1.8
Celsius (˚C)	Fahrenheit (˚F)	1.8˚C + 32

˚F	˚C	˚F	˚C	˚F	˚C	˚F	˚C
5	-15.0	55	+12.8	105	+40.6	155	68.3
10	-12.2	60	15.6	110	43.3	160	71.1
15	-9.4	65	18.3	115	46.1	165	73.9
20	-6.7	70	21.1	120	48.9	170	76.7
25	-3.9	75	23.9	125	51.7	175	79.4
30	-1.1	80	26.7	130	54.4	180	82.2
35	+1.7	85	18.9	135	57.2	185	85.0
40	+4.4	90	32.2	140	60.0	190	87.8
45	+7.2	95	35.0	145	62.8	195	90.6
50	+10.0	100	37.8	150	65.6	200	93.3

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Limited Warranty

Clippard Instrument Laboratory, Inc. (seller) warrants its products to be free from defects in material and workmanship for a period of ninety (90) days from the date of sale. Seller's liability shall be limited at seller's option to repair, replacement or refund of purchase price of product found by seller's examination to be defective. All claims under this warranty must be made in writing to seller's factory sales department giving full details, prior to return of product, postpaid, to factory. Seller shall not be responsible for product failure due to normal wear, accident, buyer's misapplication, abuse, neglect or alteration of product. Seller will not be responsible for any consequential damages. Clippard Instrument Laboratory, Inc. makes no other warranty of any kind, expressed or implied. Circuits shown in this catalog are for instructional purposes only. All circuits used on equipment and machinery should be thoroughly tested by qualified personnel under actual working conditions to determine their suitability for buyer's intended use. All technical data and operations are average values based on standard production models. Some deviations can be expected and considerations should be given during initial design stages. All operating characteristics are based on new equipment, under normal conditions of use and environments and oil free air supply.

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